

Trends in food availability in GREECE – the DAFNE V project

V. Bountziouka, K.Tsiotas, H. Economou, A. Naska and A. Trichopoulou

Department of Hygiene and Epidemiology, Medical School, University of Athens

Introduction

The formulation and monitoring of nutrition policies are in need of records of dietary habits evaluating, in a regular and comparable manner, the nutritional status of the reference population. Such data can be derived from: i) the Food and Agriculture Organisation, assembling the Food Balance Sheets ii) the Household Budget Surveys (HBSs) and iii) the Individual Dietary Surveys (Trichopoulou and Naska, 2002).

The HBSs are country-representative surveys conducted at regular time intervals by the National Statistical Offices of almost all European Countries, collecting information on food availability among a representative sample of households and allowing further links to socio-economic factors (Van Staveren W.A., Van Beem A., Helsing E., 1991).

The HBSs have been acknowledged as a useful source of dietary information, due to: i) their international scope, ii) the application of similar methodologies assuring comparability, iii) the representativeness of the underlying population, iv) the possibility of evaluating socio-demographic determinants of food choices, v) their study size, which is large enough to generate precise estimates for inherently complex patterns, vi) their regular undertaking and vii) their affordability (Trichopoulou and Lagiou, 1997; 1998).

Due to lack of national studies assessing and monitoring food consumption among the Greek population, the aforementioned source of data is being used. The exploitation of HBS data at national and international level for dietary purposes has been evaluated in the context of the Data Food Networking (DAFNE) initiative, which aims at the development of a cost-effective food databank allowing comparisons in food availability within and between the participating countries (Trichopoulou and Naska, 2001).

In the context of the DAFNE V project (Contract No: SPC. 2003117), the Athens coordinating centre was granted support for acquiring the Greek HBS data collected in 2004-05 and was thus given the opportunity to enrich the data available for Greece covering the food choices of the

population during the period of 1981 – 2005. The present report aims at describing the methods for harmonising and analysing the 2004-05 dataset, together with monitoring changes in food availability and their determinants occurring during the last 25 years.

Material and Methods

Material

The Greek HBSs have been conducted every 4-5 years. In the present analysis, daily individual food availability was estimated using data collected in 2004-05. The sample of the survey was defined on the basis of the 2001 population census and was selected through two-stage stratified sampling procedures. The estimated sample size included 6800 households and finally 6555 households participated in the survey. The sample unit was defined as “a person or group of persons, related or not, sharing the same dwelling, the same cooking facilities and having common financial interest”.

Data collection was conducted from February 2004 until January 2005 in order to ensure the capture of seasonal variability. During a period of 14 days, each household provided information on expenditures, purchases and the household’s income, as well as information on demographic and socio-economic characteristics of the household’s members (National Statistical Office of Greece, <http://www.statistics.gr/>).

Methods

The methodology of harmonising food and socio-demographic HBS data has been developed in the context of the DAFNE project (Lagiou P et al, 2001). Individual availability was estimated under the assumption of equal distribution of food within the household and during the survey period.

Food availability was further estimated according to the following socio-demographic characteristics:

- the locality of the dwelling,
- the educational status of the household head,
- the occupation of the household head and
- the household’s composition.

Locality of the residence was classified according to the following categories:

- urban,
- semi-urban,
- rural

Education of household head was classified according to the following three categories, based on the variable reflecting the educational level attained:

- Illiterate/Elementary education
- Secondary education
- Higher education

Occupation of household head was classified under five categories:

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

The above classification was performed on the basis of the person's current participation in gainful employment and, subsequently, the job description.

Household composition: Food availability was further estimated for 8 household types:

- Households with one adult member
- Households with two adult members
- Households with one adult and children (lone parents)
- Households with two adults and children
- Households with adults and elderly
- Households with children, adults and elderly
- Households with one elderly member
- Households with two elderly members

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.

Results

Table 1 presents the overall mean availability of 15 main food groups in Greece in 2004/05. For comparative purposes, data collected in the 1980s and 1990s and analysed through previous DAFNE projects are also displayed in the Table. In addition, time trends in the daily availability of selected food groups are pictorially presented in Figures 1 and 2. According to the 2004-05 data, Greeks reported the acquisition of adequate amounts of vegetables, fruits, added lipids, cereals, meat and products, milk and milk products. Comparing the results to previous HBS data, a decrease in the mean daily availability of potatoes, cereals, milk and milk products, added lipids and fruits is observed. Although the amount of added lipids is decreasing, it still remains high in the Greek diet reflecting the high consumption of olive oil. On the other hand, comparisons between the 1981 and the 2005 data point towards an increase in the mean daily availability of meat and meat products, fish and seafood, fruit and vegetable juices and alcoholic beverages. The influence of a westernised diet is reflected in the daily availability of high amounts of meat and meat products, as well as in the decrease in the daily availability of pulses.

The mean daily availability of the 15 main food groups according to socio-economic characteristics (educational level, degree of urbanization of the residence area and occupational status) in 2004-05, is presented in Tables 2-4. Additionally and in an attempt to better identify the characteristics of individuals who better adhere to traditional eating habits, Figures 2-10 present disparities in the daily availability of plant foods and added lipids versus the daily availability of animal foods, sugar and sugar products by socio-demographic indicators. In general, households with heads of lower education seem to better adhere to the characteristics of the traditional Mediterranean diet, as they report higher daily availability of vegetables, pulses, cereals, added lipids (in principal, olive oil), fish and seafood and lower availability of milk and milk products. At the same time, they are the higher consumers of meat and potatoes. With the exception of meat and vegetables, similar is the pattern observed when manual households (and possibly of lower educational status) are compared with non-manual (and possibly of higher educational status) ones. Retired individuals reported higher food acquisition, reflecting probably either a less frequent eating out of home, or the common habit of preparing food for their children's households. With respect to locality, rural households report higher amounts in almost all food groups, with the exception of milk and milk products, fruits and non alcoholic beverages (including juices).

Table 5 summarizes food choices according to specific household types. Focusing on households without children, i.e. households with one or two adult members and households with one or two elderly members, it can be noted that no substantial differences are observed between households with one or two members. Additionally, households of elderly members report higher amounts of potatoes, pulses, cereals, milk and milk products, meat and meat products, vegetables, fish and seafood, fruits, added lipids and sugar products, as compared to households with adult members.

Discussion

The data used for the evaluation of dietary habits in Greece were collected through the national HBSs which record all the available for consumption food items in a specific time period. The HBS data refer to household level, thus a process of individualization is required, when per person availability is to be estimated. In the present analysis, food quantities available for consumption by each household member are calculated by dividing the household availability by the product of the referent period and the mean household size.

Comparisons over time show a steadily increasing trend in the daily household availability of vegetables, fish and seafood and a preference towards the consumption of meat and meat products with a decrease, however, in the nineties reflecting the meat crisis taking place at that time. The daily availability of alcoholic beverages, fruit and vegetable juices has also increased. On the other hand, a decrease was noted in the mean household availability of eggs, potatoes, and non alcoholic beverages probably resulting from an attempt of the Greek population to follow healthier food choices.

Socio-economic differences in dietary habits are usually studied in the terms of the educational level attained. Educational level is the most useful indicator for the evaluation of the socio-economic status of each family usually reflecting the occupational status and the income of the family members. Additionally, the educational level can be considered as an indicator of the degree of understanding and adopting nutritional guidelines.

Lower educational attainment, and as an extension lower socio-economic status, is associated with lower consumption of fruits milk and milk products. The opposite trend is observed for vegetables, cereals (including bread), added lipids, fish and seafood and potatoes may probably

reflect the traditional dietary habits of Greeks of elementary education, findings supported by previous publications on dietary patterns in South European countries (Johansson et al. 1999, Irala-Estevez et al. 2000) (Figures 3 & 4). Although not consumed in large amounts in the traditional dietary pattern, the availability meat in the households of contemporary Greeks has substantially increased and is higher among households of lower educational status.

Our findings on the effect of professional status are quite similar to results on the effect of educational status on the food choices of the Greek population. An exception is noted in the case of vegetables, fish and seafood, where less amounts are reported by manual households and those of secondary education (Figures 5 & 6).

Urban households seem to acquire fewer amounts of almost all food items, with the exception of milk and milk products (Figures 7 & 8). This pattern may be attributed to more frequent information and easier adherence to recommendations for healthier food choices. Furthermore, people living in urban areas are usually those of higher education or employed in non-manual professions and can more easily adopt new trends in dietary choices. Lastly, one should not overlook the possibility of more frequent eating out (and thus lower in-house consumption) by the residents of urban areas.

The composition of the household is also expected to affect the dietary habits. Results should however be interpreted with caution as gender and age differences were not considered when calculating the estimates and results may be underestimated particularly in households where children were present (Figures 9 & 10).

Although HBS can be used for the estimation of the mean food availability between and within countries, the food data have limitations which need to be considered as HBSs are not primarily designed for collecting nutritional information. Information on the type and quantity of food and beverages consumed outside the home is not usually recorded. Furthermore, information on food waste, food given to pets, meals offered to guests, use of vitamins and mineral supplements and the presence of pregnant or lactating women is not usually collected.

List of References

- Irala-Estévez JD, Groth M, Johansson L, Oltersdorf U, Prättälä R, Martínez-González MA (2000). A systematic review of socio-economic differences in food habits in Europe: consumption of fruit and vegetables. *Eur J Clin Nutr.* 54(9):706-14.
- Lagiou P, Trichopoulou A and the DAFNE contributors (2001). The DAFNE initiative: the methodology for assessing dietary patterns across Europe using household Budget Survey Data. *Publ Health Nutr.*; 4(5B) : 1135- 1141.
- Johansson L, Thelle DS, Solvoll K, Bjørneboe GEA & Drevon CA (1999). Healthy dietary habits in relation to social determinants and lifestyle factors. *Brit J. Nutr.* 81, 211-220.
- Trichopoulou A, Lagiou P, eds. DAFNE I- Methodology for the Exploitation of HBS Data and Results on Food Availability 5 European Countries. Luxembourg: Office for Official Publications of the European Communities, 1997: 142pp.
- Trichopoulou A, Lagiou P, eds. DAFNE II- Methodology for the Exploitation of HBS Data and Results on Food Availability 6 European Countries. Luxembourg: Office for Official Publications of the European Communities, 1998: 162pp.
- Trichopoulou A, Naska A (2002). What consumers eat? In Henry CK, Chapman C, editors. *The nutrition handbook for food processors.* Cambridge:Woodhead Publishing Ltd, 2002: 7-23.
- Trichopoulou A, Naska A and the DAFNE contributors (2001). The DAFNE initiative. Assessment of dietary patterns across Europe using household budget survey data. A European Commission Supported Project. *Public Health Nutr:* 4(5B). pp. 71
- Van Staveren WA, Van Beem A, Helsing E. Household budget surveys. In *Food and Health Data.* WHO Publications, European Series, No. 34. Geneva: World Health Organisation (WHO), 1991.

Table 1: Overall mean availability of foods and beverages in Greece, by year (quantity/day / person).

FOOD GROUPS	1981/82	1987/88	1998/99	2004/05
Eggs (pieces)	0.40	0.51	0.25	0.22
Potatoes (g)	158	154	137	124
Pulses (g)	17	16	14	14
Nuts (g)	2.00	3.71	4.72	4.44
Cereals and cereal products(g)	294	323	253	246
Milk and milk products (g)	273	317	298	295
Meat and meat products (g)	150	174	149	159
Vegetables (g)	N/A	264	271	283
Fish and seafood (g)	36	40	45	46
Fruits (g)	332	350	306	264
Lipids, added (g)	79	82	84	77
Beverages, alcoholic (ml)	36	36	48	60
Beverages, non alcoholic (ml)	N/A	316	328	244
Sugar and sugar products (g)	N/A	83	33	34
Fruit and vegetable juices (ml)	1.79	3.58	23	37

Table 2: Mean food availability in 2004 in Greece, by educational status of the household head (quantity/day/person).

FOOD GROUPS	EE	SE	HE
Eggs (pieces)	0.24	0.21	0.20
Potatoes (g)	138	121	105
Pulses (g)	19	12	10
Nuts (g)	4.25	4.18	5.34
Cereals and cereal products(g)	285	228	209
Milk and milk products (g)	278	298	327
Meat and meat products (g)	172	151	152
Vegetables (g)	320	257	264
Fish and seafood (g)	51	41	48
Fruits (g)	273	249	279
Lipids, added (g)	90	70	65
Beverages, alcoholic (ml)	66	55	59
Beverages, non alcoholic (ml)	234	245	254
Sugar and sugar products (g)	38	31	32
Fruit and vegetable juices (ml)	28	38	49

Note: EE: Elementary education, SE: Secondary education, HE: Higher education

Table 3: Mean food availability in 2004 in Greece by occupational status of the household head (quantity/day/person).

FOOD GROUPS	Manual	Non-manual	Retired	Others*
Eggs (pieces)	0.21	0.20	0.25	0.22
Potatoes (g)	121	111	138	148
Pulses (g)	13	10	19	19
Nuts (g)	3.83	4.8	5.43	2.8
Cereals and cereal products(g)	244	213	279	263
Milk and milk products (g)	276	309	301	316
Meat and meat products (g)	152	154	174	160
Vegetables (g)	246	248	355	329
Fish and seafood (g)	38	42	60	49
Fruits (g)	228	251	316	295
Lipids, added (g)	71	63	95	91
Beverages, alcoholic (ml)	64	58	63	43
Beverages, non alcoholic (ml)	224	250	253	275
Sugar and sugar products (g)	31	31	39	40
Fruit and vegetable juices (ml)	36	45	29	39

*Others: including housewives, soldiers, invalid persons.

Table 4: Mean food availability in 2004 in Greece by locality of the dwelling (quantity/day/person).

FOOD GROUPS	Rural	Semi-urban	Urban
Eggs (pieces)	0.26	0.22	0.21
Potatoes (g)	131	133	121
Pulses (g)	20	16	12
Nuts (g)	4.4	4.21	4.5
Cereals and cereal products(g)	310	258	224
Milk and milk products (g)	262	296	305
Meat and meat products (g)	183	159	152
Vegetables (g)	293	299	277
Fish and seafood (g)	47	50	45
Fruits (g)	241	271	269
Lipids, added (g)	92	84	71
Beverages, alcoholic (ml)	79	61	55
Beverages, non alcoholic (ml)	220	278	244
Sugar and sugar products (g)	39	37	32
Fruit and vegetable juices (ml)	30	37	39

Table 5: Mean food availability in 2004 in Greece, by type of household (quantity/day/person).

FOOD GROUPS	One adult	Two adults	Two adults and children	Adults and elderly	Adult, elderly and children	One elderly	Two elderly	Others
Eggs (pieces)	0.26	0.25	0.19	0.25	0.19	0.25	0.25	0.21
Potatoes (g)	153	153	110	131	98	176	146	120
Pulses (g)	11	20	9.81	18	13	27	24	12
Nuts (g)	5.12	5.82	3.84	5.26	4.38	3.43	4.85	4.5
Cereals and cereal products(g)	274	279	214	264	225	350	300	242
Milk and milk products (g)	344	295	301	283	264	402	319	250
Meat and meat products (g)	173	203	141	167	122	194	184	164
Vegetables (g)	334	376	218	331	193	446	378	289
Fish and seafood (g)	57	60	34	58	34	70	62	48
Fruits (g)	357	317	221	296	175	410	329	258
Lipids, added (g)	92	97	60	88	54	133	106	75
Beverages, alcoholic (ml)	97	89	48	67	42	49	64	70
Beverages, non alcoholic (ml)	466	326	211	255	152	310	242	241
Sugar and sugar products (g)	56	41	29	37	26	57	42	30
Fruit and vegetable juices (ml)	67	43	41	29	21	36	23	35

Figure 1: Trends in the mean availability of foods of plant origin and added lipids, by survey year (quantity/day/person).

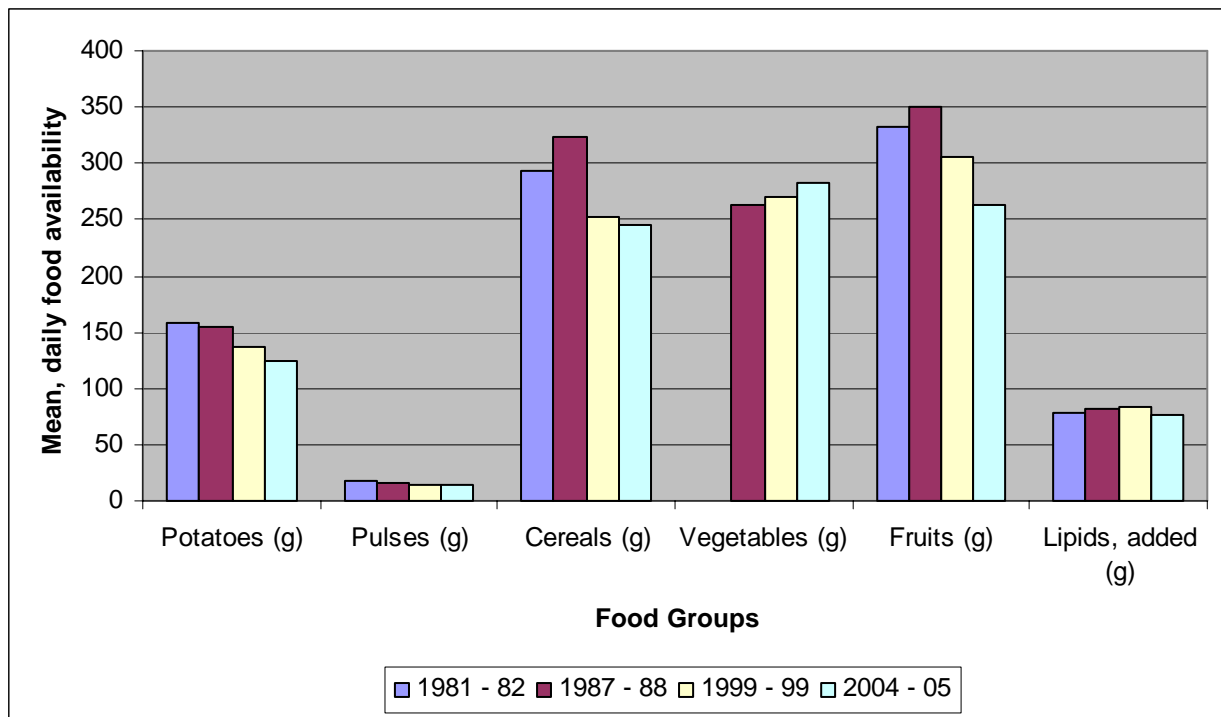


Figure 2: Trends in the mean availability of foods of animal origin, sugar and sugar products, by survey year (quantity/day/person).

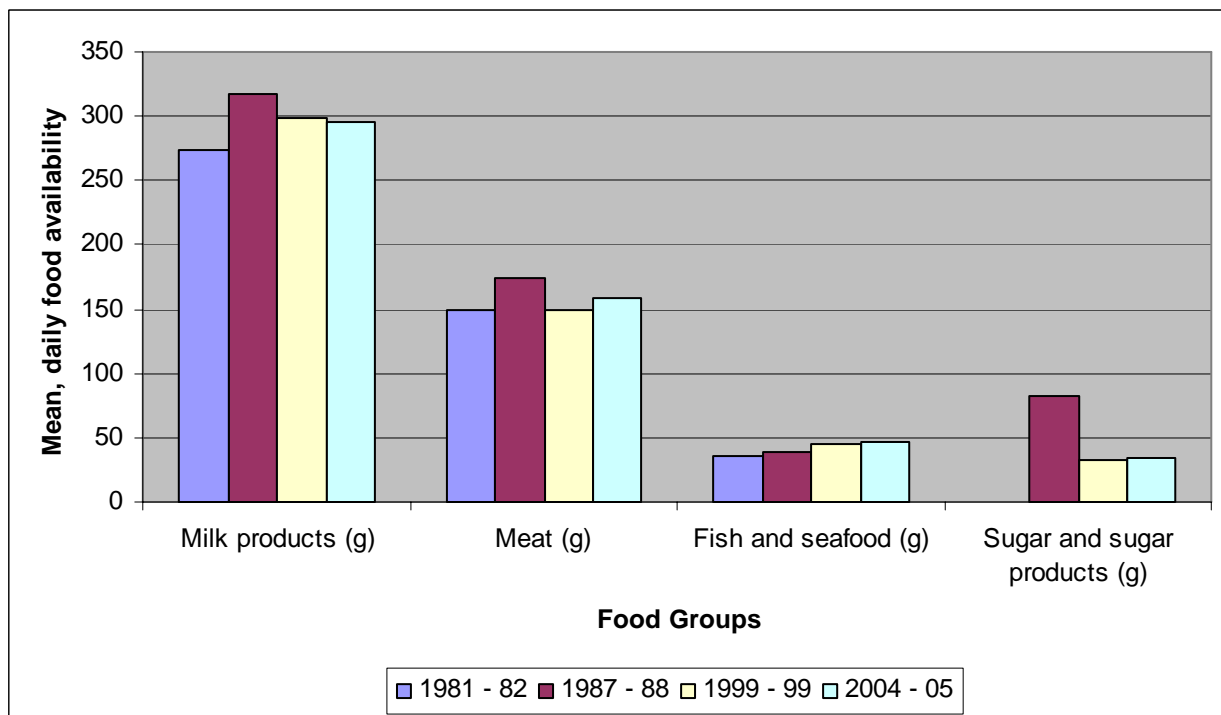


Figure 3: Mean availability of foods of plant origin and added lipids, by educational status of household head (quantity/day/person) in 2004.

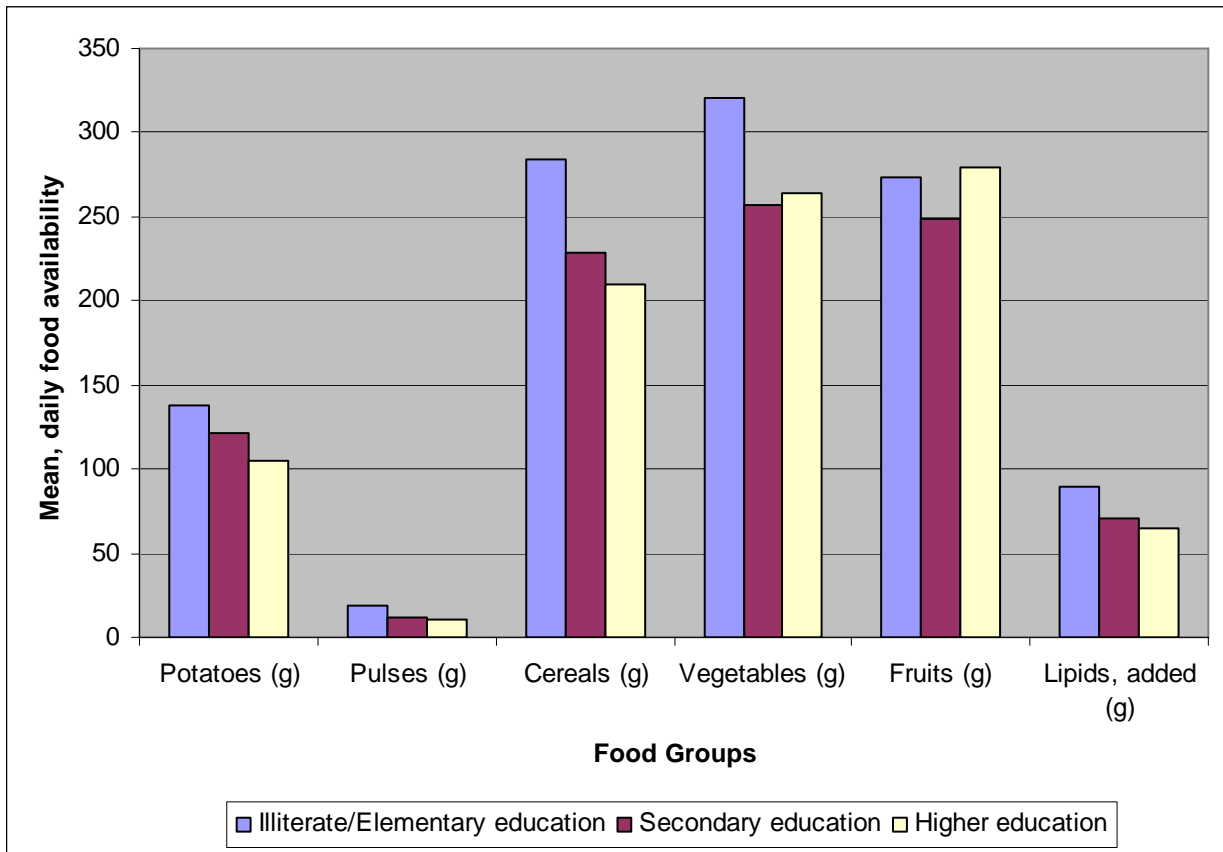


Figure 4: Mean availability of foods of animal origin, sugar and sugar products, by educational status of household head (quantity/day/person) in 2004.

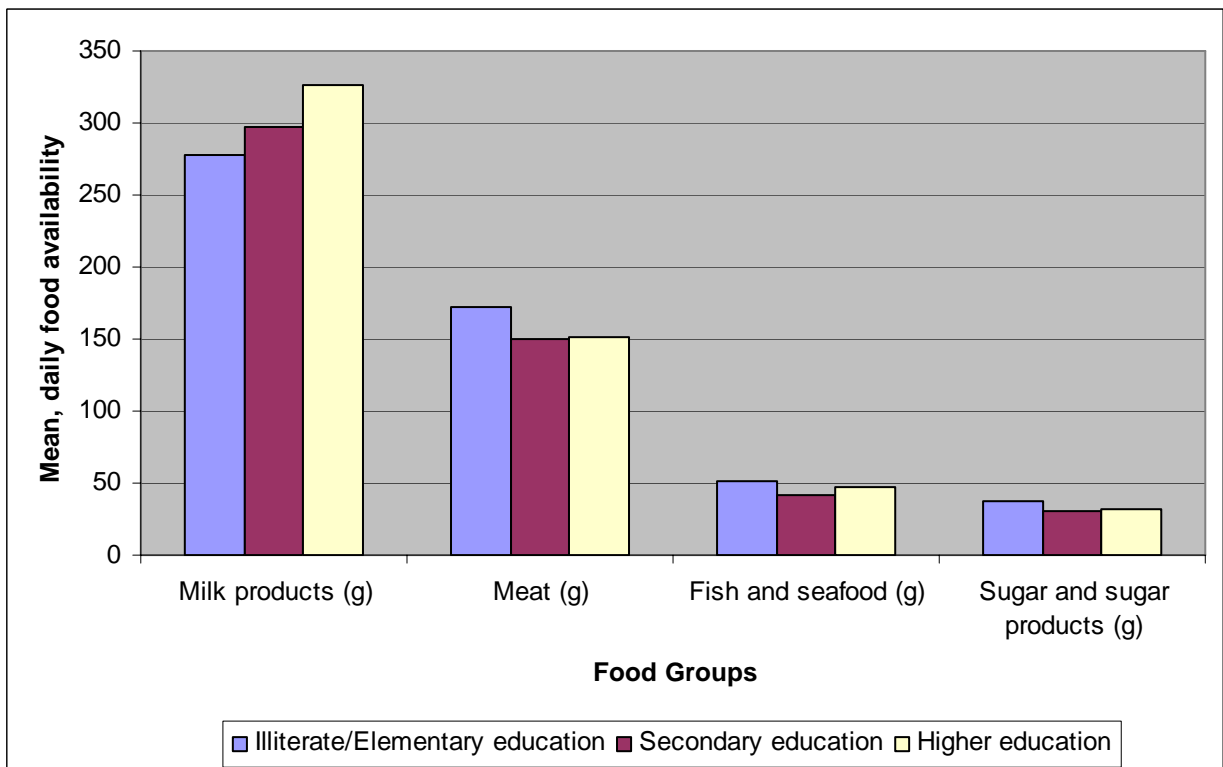


Figure 5: Mean availability of foods of plant origin and added lipids, by occupational status of household head (quantity/day/person) in 2004.

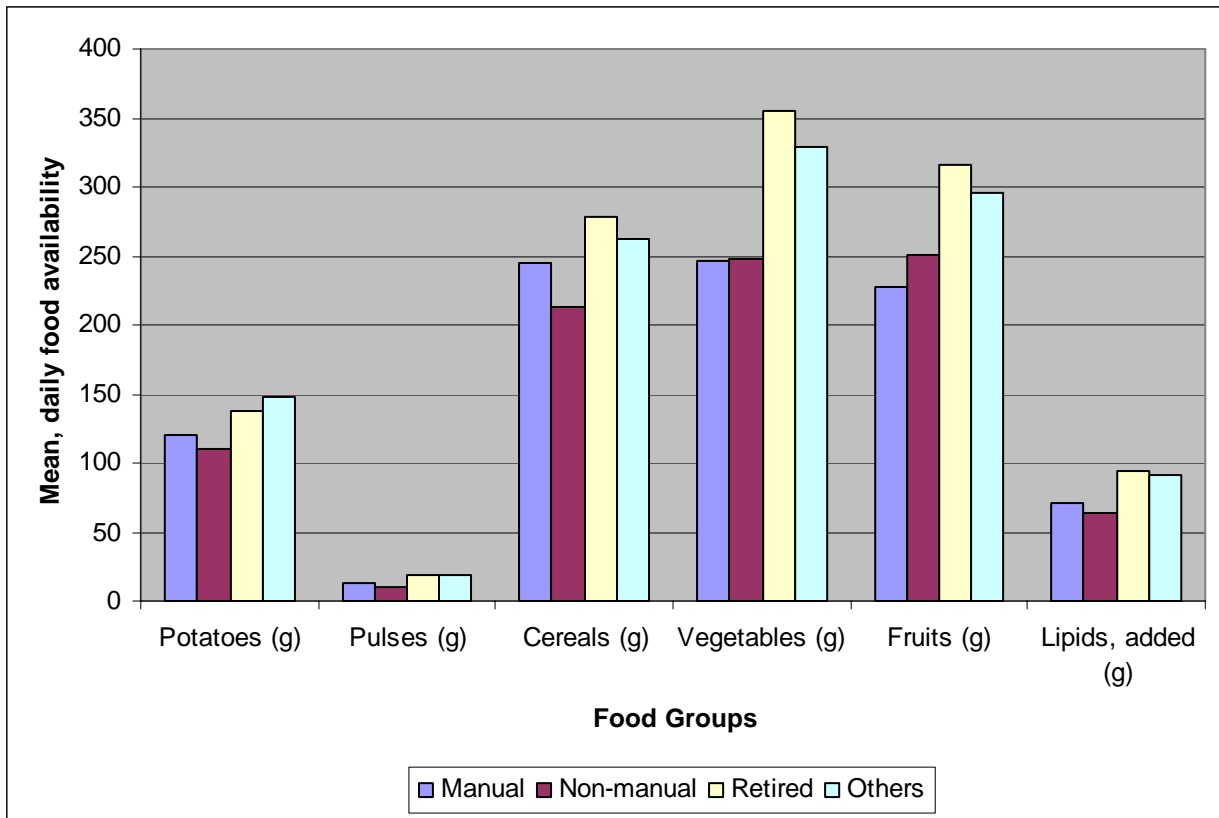


Figure 6: Mean availability of foods of animal origin, sugar and sugar products, by occupational status of household head (quantity/day/person) in 2004.

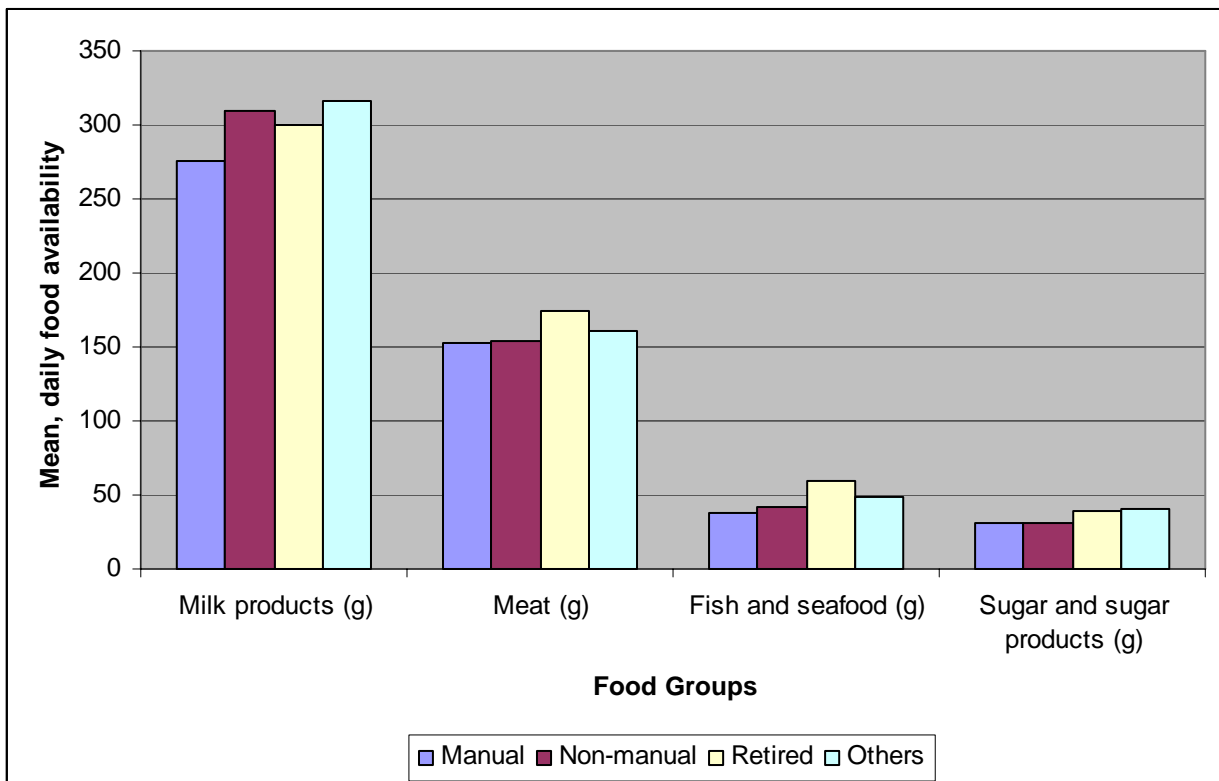


Figure 7: Mean availability of foods of plant origin and added lipids, by locality of dwelling (quantity/day/person) in 2004.

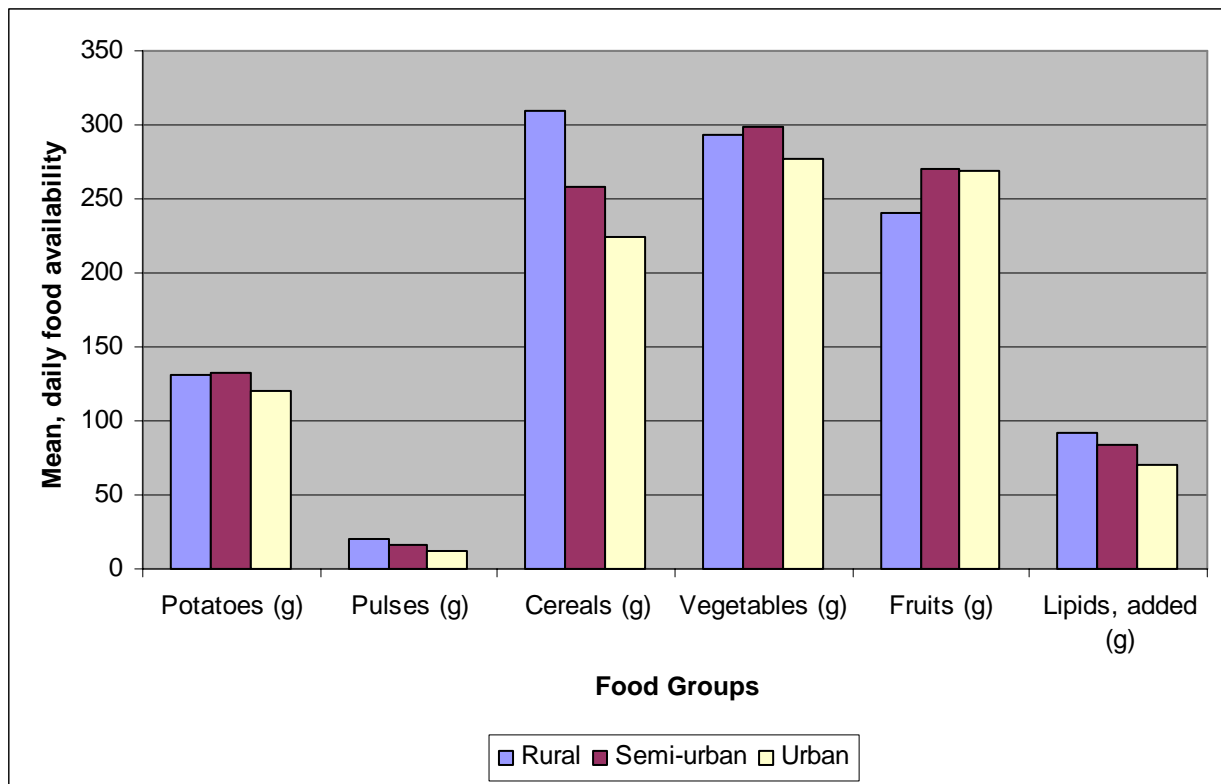


Figure 8: Mean availability of foods of animal origin, sugar and sugar products, by locality of dwelling (quantity/day/person) in 2004.

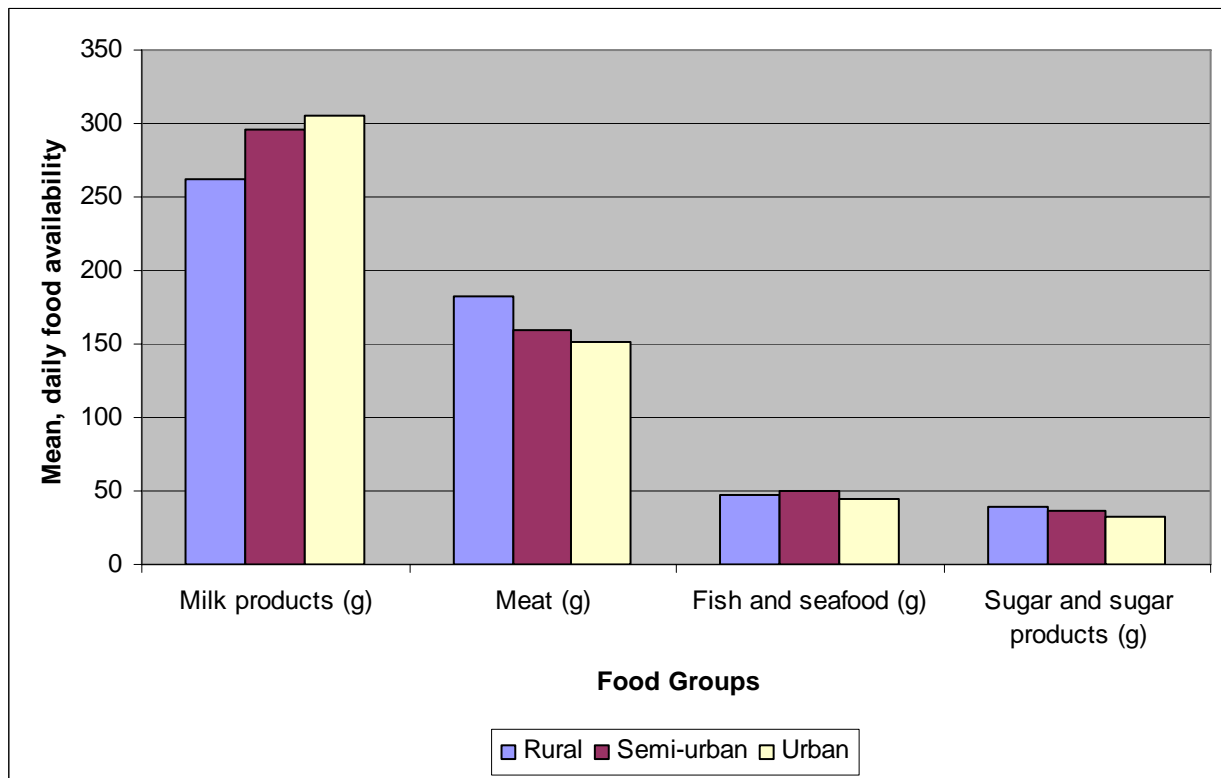


Figure 9: Mean availability of foods of plant origin and added lipids, by household type (quantity/day/person) in 2004.

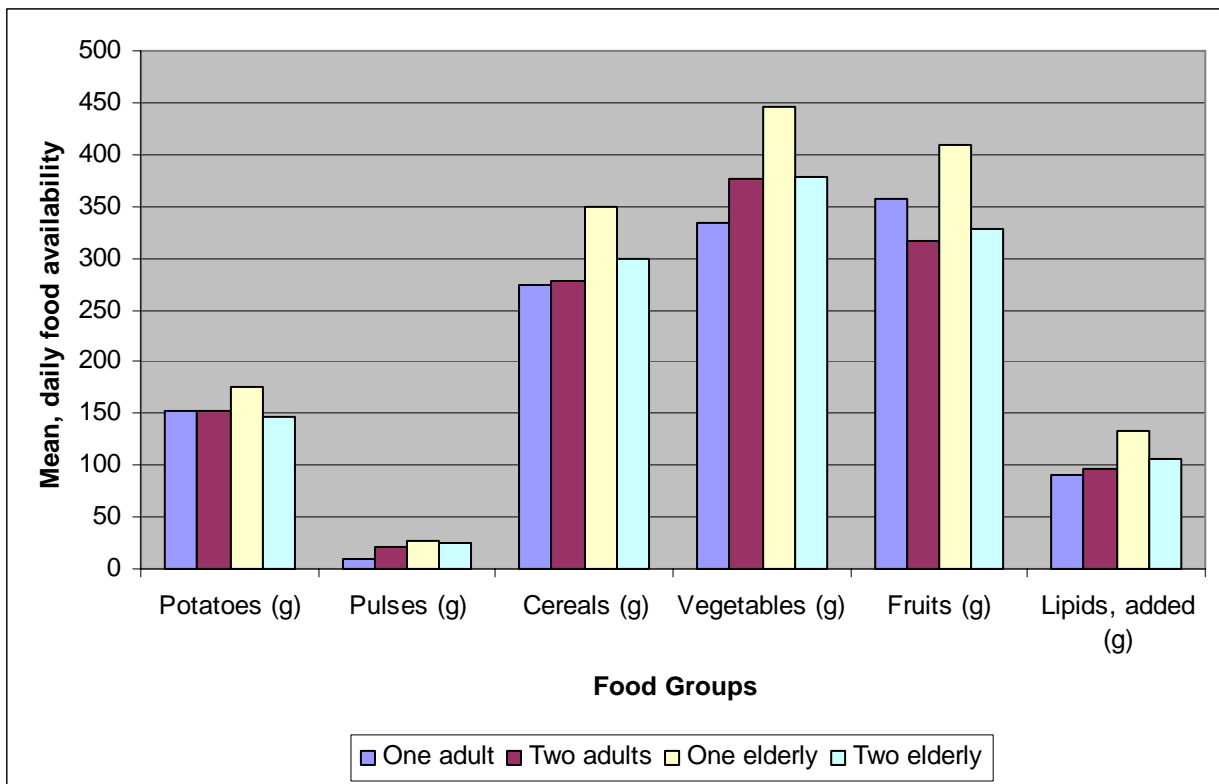
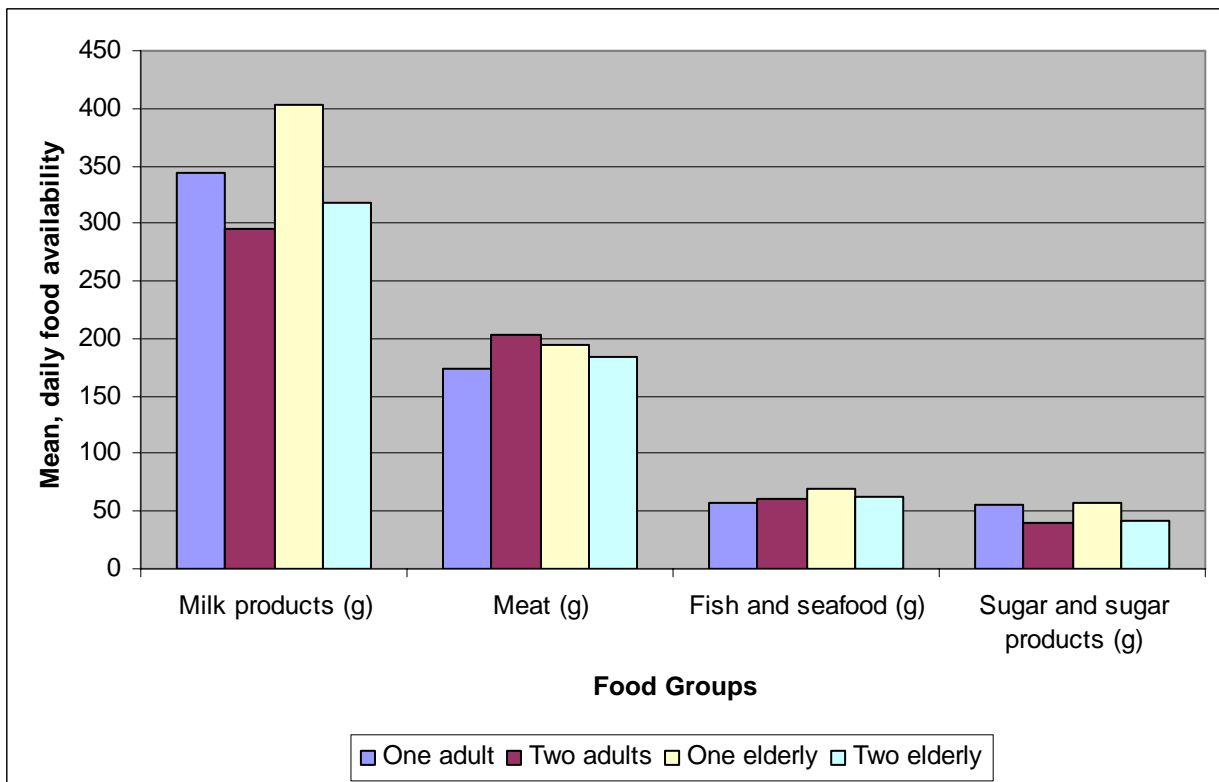


Figure 10: Mean availability of foods of animal origin, sugar and sugar products, by household type (quantity/day/person) in 2004.



Acknowledgement

This study was conducted in the context of the DAFNE V project entitled “Expansion of the DAFNE databank to new European Union Member States: Data Food Networking, based on household budget surveys.” of DG-SANCO of the European Union.

Notification

This report was produced by a contractor for Health & Consumer Protection Directorate General and represents the views of the contractor or author. These views have not been adopted or in any way approved by the Commission and do not necessarily represent the view of the Commission or the Directorate General for Health and Consumer Protection. The European Commission does not guarantee the accuracy of the data included in this study, nor does it accept responsibility for any use made thereof.

This report was produced by a contractor for Health & Consumer Protection Directorate General and represents the views of the contractor or author. These views have not been adopted or in any way approved by the Commission and do not necessarily represent the view of the Commission or the Directorate General for Health and Consumer Protection. The European Commission does not guarantee the accuracy of the data included in this study, nor does it accept responsibility for any use made thereof.