

Trends in food availability in Sweden – The DAFNE IV project

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Introduction

The first publication on the consumption of households in Sweden was in 1961 by Statistics Sweden. Since then, Family Expenditure Surveys or Family Food Expenditure surveys have been carried out in 1969, 1978, 1985, 1988, 1989, 1992, 1995, and 1996. The most recent publication is the Household Budget Survey (HBS) expenditure and income report in 2003. However, data on quantities of food purchased were collected in 1989 and prices of food purchased are available for 1996/97. In both years, the design, sampling and data collection procedures were also used to collect information on food intake on individual level. These national surveys (Hulken and Riksmaten) were carried out by the national Swedish Food Administration (Statens Livsmedelsverket, SLV).

The information on the food availability at household level can be used to observe trends over time and between countries, providing that the data is fully harmonized between countries and over time. This information could then be used as a tool for policy makers (1).

This report presents the food availability data collected by Statistics Sweden of 1989 and 1996/97 (2, 3). The data were acquired within the framework of the DAFNE (Data Food Networking) initiative, coordinated by the University of Athens and supported by the European Commission, through the Health Monitoring Programme of DG-SANCO. .

Materials and methods

Material

The DAFNE data for Sweden are based on data collected in the Family Food Expenditure surveys in 1989 and 1996/97.

The Family Food Expenditure Survey of 1989

Aim and sampling

The aim of this survey was to detect differences in food consumption between regions, type of households and between households of varying economic status. Subjects were sampled systematically from the population register. Institutionalized subjects and those over 74 years of age were excluded. The original sample consisted of 3052 individuals, 82 of which had emigrated, died or been institutionalized, leaving a sample population of 2970 individuals. Thirteen different survey starting weeks were allocated over this sample.

Data collection

Household composition data were collected in a preliminary interview. The interview was followed by a four week registration of both cost and amount of foods purchased. In addition, expenditure for meals eaten out was recorded, as was the amount of foods from own produce. Information on more than 250.000 foods was collected, 75 percent of which was recorded either in mass or volume units. Most of the remaining food was recorded in household measures and amounts were calculated using standard tables from the Swedish National Food Agency. For some foods, median prices per unit were used to calculate quantities consumed. Food produced by the household (fish, berries, potatoes, gifts etc.) was entered at the time of consumption. Published data are presented in 14 main food groups and 120 subgroups.

The Family Food Expenditure Survey of 1996/97

Sampling and data collection

Data were collected from the second week of 1996 to the third week of 1997. The sampling frame included all individuals aged 18-74 years. The original sample consisted of 2057 individuals, 31 of which had either emigrated, died or been institutionalized, leaving a sample population of 2026 individuals. Twenty-six different survey starting weeks were allocated over this sample. The number of household per starting date was more or less constant. Expenditure data were collected

using a logbook for a period of 4 weeks. However, food expenditure was only collected during the first two weeks.

Methods

Data preparation for inclusion in the DAFNE databank

Food classification

For both years, food items and food groups were classified according to the DAFNE food classification methodology (4) which consists of 15 main groups and 56 subgroups. To be able to classify food items under the corresponding food codes, information on the individual components of recipes, mixed dishes and commercial products was sometime necessary. This information was retrieved from standard recipes compiled by the Swedish Food Administration, manufacturers data and from retail chains. Standard dilution factors were applied for concentrated products.

With respect to the collected data on alcoholic beverages, estimations point to an increased unrecorded consumption for the past 10-15 years in the Nordic countries. Thus, a non-negligible part of the total alcohol consumption goes unrecorded. This is the reason that data on alcoholic beverages are not presented in this report and the reader is referred to the European Comparative Alcohol Studies (ECAS I and II) surveys (5).

Identification of the household head

The classification of the DAFNE household's socio-economic status (as described by educational attainment and occupational status) is based on the information for the household 'head'. The Swedish data did not allow to uniquely identifying this person as the households were identified only by the sampled individual with information on education and occupation on other household members given relative to the sampled person.

However, a contemporary survey was undertaken in 1989 (though not the same weeks), in which a second set of socio-economic variables (using a different coding and classification scheme) were collected for the same participants and were included in the core dataset. In the end, it was decided to identify as "household head" the person with the 'highest' socio-economic code in 1989. In the case of the 1996/97 data, as "household head" was defined the member with the highest age.

Classification of locality

The classification for locality used in the two surveys in Sweden was based on a combination of population density and geographic location. Due to the discrepancies between the North and the South, the rural, urban and semi-urban categorization is not used in Sweden. However, by combining the information on number of inhabitants within a certain radius and the number of overall inhabitants, it was decided to classify larger cities in the North as *urban*, with rural and sparsely populated areas as *rural*. Medium-sized cities in the South were classified as *semi-urban*, while the larger cities (general) and specific urban population areas were defined as *urban*.

Classification of educational level

Information on the individuals' educational level was available only in the 1996/97 data. The main issue is the distinction between elementary and secondary education. The DAFNE categories are in agreement to the Mackenbach definition (according to which elementary education generally corresponds to the first 6 years of 'basic' education). Information in Sweden emphasizes whether compulsory education was completed or not, and the first category corresponds to less than 9 years of school, which cannot be separated into more detailed levels. Therefore, it was decided only to classify the secondary and tertiary education and leave elementary as unavailable. Completed 9-10 years of schooling were classified as secondary education.

Classification of occupation

According to the DAFNE scheme, occupational status is grouped as *manual*, *non-manual*, *retired*, *unemployed and other* (incl. students, housewives and invalid persons). In the 1989 data, classifications were made on the basis of one variable, which defined the employment status of the individuals, as well as whether they were blue or white collar workers, if employed. In the case of the 1996/97 dataset, a combination of variables was used: the first describing the employment status and the second separating, again, blue from white collar workers.

Conversion of food expenditure into quantities

One of the major limitations of the 1996/97 dataset is the fact that foods were only recorded as expenditures, not as amounts. The estimation of food quantities from food expenditure was carried out as follows:

Median, monthly prices (cost per unit of mass or volume) for 589 foods were available from Statistics Sweden for the year 1996. However, no price information was available for a significant number of foods. Retail prices were collected from three supermarket chains and adjusted using the consumer price index. In cases where data were recorded and reported at food group level, it was firstly necessary to identify the percentage contribution each food item made to the corresponding food group. This information was provided by the Swedish Board of Agriculture, the National Food Administration and published scientific data. Once this was estimated the proportion of expenditure on each food item was calculated. Finally, for those foods that remained, it was decided to calculate a conversion factor based on the average change in the prices of the food items, which belong in the same DAFNE food group with the item of the unknown price. Then, this conversion factor was applied in the 1989 price and the expected 1996 price was estimated. This approach was considered acceptable for those foods that very relatively little in price in their respective food group.

Comparison with other sources of dietary information

Two individual nutrition surveys using the same samples were conducted in Sweden in 1989, 'Hulken' (6) and in 1996/97 'Riksmaten' (7). Becker (8) conducted an comparison of household and individual food consumption for the 1989 surveys. Reasonable agreement was seen for many major food including cereal products, milk, cheese, meat and meat products and fish. We have found similar results for the data provided to the DAFNE centre. Differences between HBS and individual consumption were less than 30% for nine out of 15 food groups.

Results

Table 1 presents the average availability of the main food groups of the DAFNE classification for 1989 and 1996/97, with the exception of alcoholic beverages. Overall food availability has remained fairly constant in this period with a decrease of about 20% in potato availability and 30% increase in the availability of fresh and processed vegetables. Availability of pulses and nut is very

low with small absolute changes over the years. Availability of fish, cereals, milk, meat and their products is remarkably constant between both survey years.

Table 1: Overall mean food availability in Sweden, by survey year (quantity/person/day).

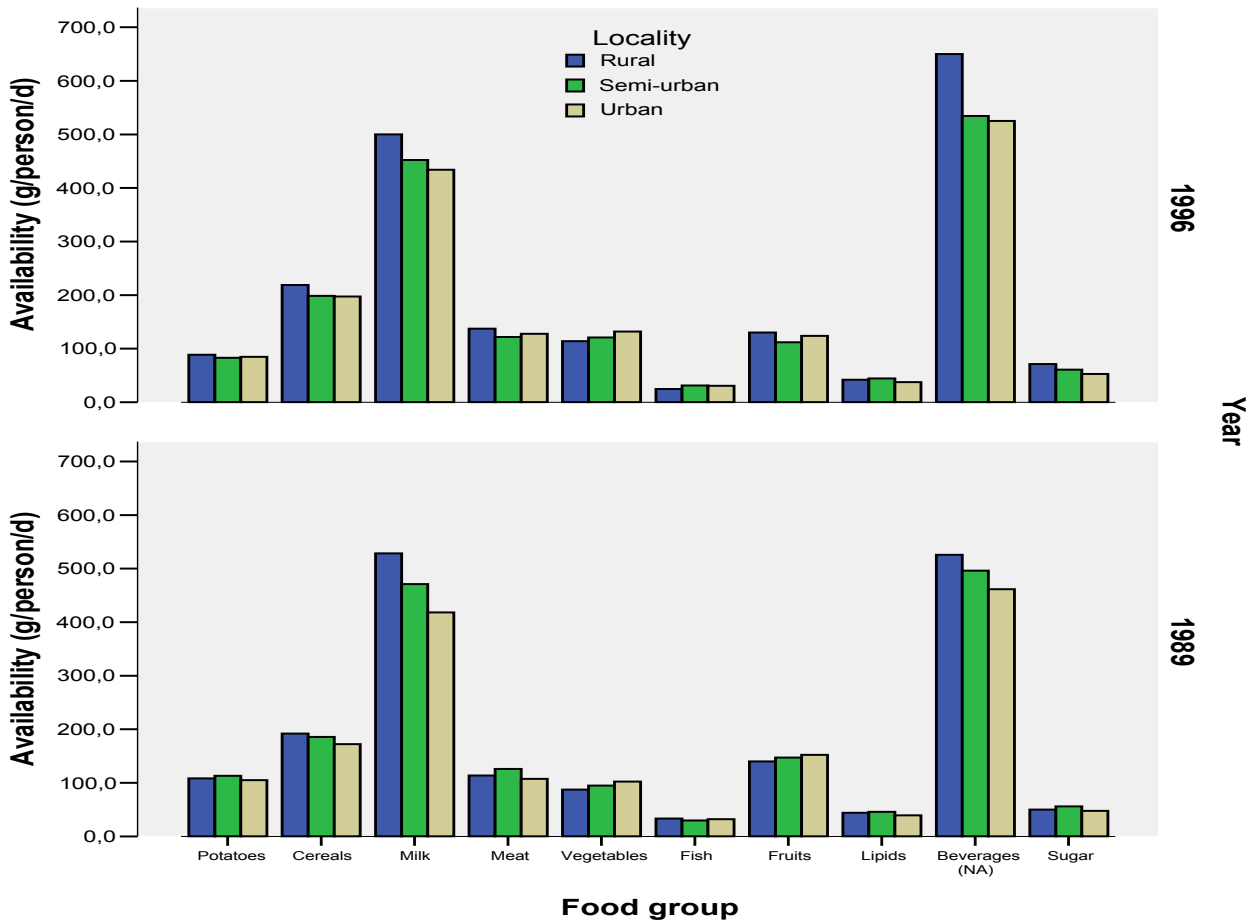
Food Group	Mean availability	
	1989	1996/97
Eggs (pieces)	0.42	0.40
Potatoes and other starchy roots (g)	107	85
Pulses (g)	1.48	2.04
Nuts (g)	2.72	1.92
Cereals and cereal products (g)	177	200
Milk and milk products (g)	437	445
Meat, meat products and dishes (g)	112	128
Vegetables (fresh and processed) (g)	99	128
Fish, seafood and dishes (g)	32	30
Fruits (fresh and processed) (g)	149	122
Total added lipids (g)	41	39
Non alcoholic beverages (ml)	476	492
Sugar and sugar products (g)	49	56
Juices (fruit and vegetable) (ml)	14	N/A

Source: the DAFNE databank.

Availability of selected food groups by locality

For both survey years, the availability of milk and non-alcoholic beverages is higher in rural areas compared to the semi-urban and urban ones. An increasing trend from rural to urban was observed for vegetables.

Figure 1: Mean food availability in Sweden by locality of the dwelling and survey year, (quantity/person/day)



Beverages (NA): Beverages, non-alcoholic

Availability by occupation of the household head

In table 2, the mean daily food availability is presented by occupation of the household head (manual, non-manual, retired or others) for 1989. The highest figures are for the group of retired persons for almost all of the food groups, possibly due to the fact that meals eaten out of home are not taken into account. Manual workers have higher intakes of milk and milk products and total added lipids but lower intakes of vegetables and fruits. The category others, have low intakes of potatoes, sugar and sugar products, but relatively high intakes of cereals and cereal products, vegetables fruits and non-alcoholic beverages.

Table 2: Mean food availability in Sweden by occupation of the household head in 1989, (quantity/person/day)

Food Group	Mean availability			
	1. Manual	2. Non manual	3. Retired	4. Others
Eggs (pieces)	0.42	0.38	0.58	0.48
Potatoes and other starchy roots (g)	106	98	168	87
Pulses (g)	1.45	1.15	2.92	2.80
Nuts (g)	2.58	2.90	2.64	1.60
Cereals and cereal products (g)	178	171	194	214
Milk and milk products (g)	452	424	464	419
Meat, meat products and dishes (g)	114	107	127	110
Vegetables (fresh and processed) (g)	85	102	119	119
Fish, seafood and dishes (g)	28	31	50	31
Fruits (fresh and processed) (g)	127	154	188	187
Total added lipids (g)	43	36	58	42
Non alcoholic beverages (ml)	451	458	639	546
Sugar and products (g)	50	44	83	39
Juices (fruit and vegetable) (ml)	13	16	8.08	19

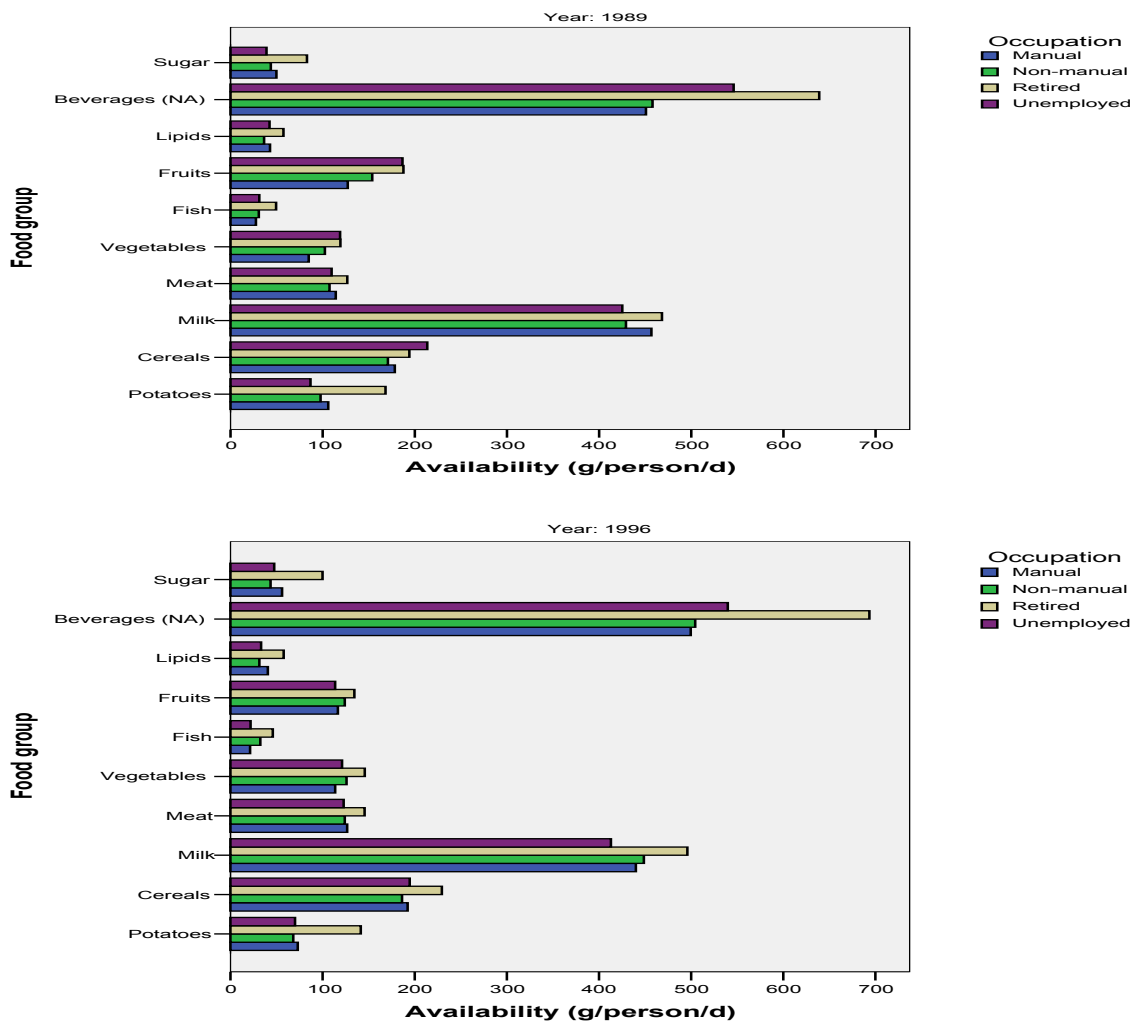
The situation in 1996/97 (table 3) shows a similar pattern with higher daily food availability among the retired persons. Compared to 1989, mean figures have increased for each occupation category for most of the food groups except for potatoes (decreased, all occupations), fruits (decreased, all categories), milk (constant, all categories), , sugar and products (constant for the non-manual group). Added lipids have decreased from 1989 to 1996/97 for all occupations, except for the retired group.

The information for selected food groups is graphically presented in figure 2.

Table 3: Mean food availability in Sweden by occupation of the household head in 1996/97, (quantity/person/day)

Food Group	Mean availability				
	1. Manual	2. Non manual	3. Retired	4. Unemployed	5. Others
Eggs (pieces)	0.34	0.37	0.56	0.41	0.36
Potatoes and other starchy roots (g)	73	68	141	70	60
Pulses (g)	1.18	1.47	3.06	3.05	0.82
Nuts (g)	1.90	1.94	2.39	1.02	1.62
Cereals and cereal products (g)	192	186	230	195	175
Milk and milk products (g)	440	449	496	413	319
Meat, meat products and dishes (g)	128	125	147	123	111
Vegetables (fresh and processed) (g)	114	126	146	121	146
Fish, seafood and dishes (g)	21	32	46	22	15
Fruits (fresh and processed) (g)	117	124	135	114	105
Total added lipids (g)	41	31	58	33	29
Non alcoholic beverages (ml)	454	467	611	492	367
Sugar and products (g)	56	44	100	48	46
Juices (fruit and vegetable) (ml)	N/A	N/A	N/A	N/A	N/A

Figure 2: Mean food availability in Sweden by occupation of the household head and survey year (quantity/person/year)



Beverages (NA): Beverages, non-alcoholic

Availability by household composition

The mean daily availability of food groups for a selection of household types (single adult, lone parents, adults with children and single elderly households) is presented in table 4.

In accordance with the higher overall availability for retired persons, the highest figures are seen for the single elderly for almost all food groups. Lone parent have the lowest availabilities for almost all groups except fresh and processed fruit, which is on the same level as adults with children household.

A similar pattern can be observed for the 1996/97 data set. Single elderly household have the highest availability for most food groups. In the three remaining household types presented, the single adult household have the highest availabilities, whereas the lone parents have consistently the lowest figures except for cereals, meat and non-alcoholic beverages which are similar to the availabilities of the adult with children households. It should however be noted, that not considering age differences when estimating individual availability might result in underestimations in households where children are present.

Table 4: Mean daily availability in Sweden by household composition in 1989, (quantity/person /day)

Food groups	Mean availability			
	Single Adult Household	Adult + children (lone parents)	Adult and children	Single elderly
Eggs (pieces)	0.40	0.33	0.35	0.49
Potatoes and other starchy roots (g)	79	60	98	163
Pulses (g)	1.84	0.96	1.08	2.32
Nuts (g)	2.94	1.87	2.54	2.17
Cereals and cereal products (g)	174	134	173	191
Milk and milk products (g)	415	401	436	515
Meat, meat products and dishes (g)	95	84	100	125
Vegetables (fresh and processed) (g)	97	80	85	143
Fish, seafood and dishes (g)	30	16	23	41
Fruits (fresh and processed) (g)	184	130	129	202
Total added lipids (g)	36	32	35	60
Non alcoholic beverages (ml)	574	384	379	751
Sugar and products (g)	42	33	43	90
Juices (fruit and vegetable) (ml)	17	11	15	12

Source: the DAFNE databank

Table 5: Mean food availability in Sweden by household composition in 1996/97 (quantity/person /day)

Food groups	1996/97			
	Single Adult Household	Adult + children (lone parents)	Adult and children	Single elderly
Eggs (pieces)	0.45	0.34	0.31	0.74
Potatoes and other starchy roots (g)	101	53	57	183
Pulses (g)	2.90	0.99	1.01	2.48
Nuts (g)	1.75	1.29	1.59	5.31
Cereals and cereal products (g)	225	167	178	332
Milk and milk products (g)	468	377	417	659
Meat, meat products and dishes (g)	141	113	108	192
Vegetables (fresh and processed) (g)	150	111	105	178
Fish, seafood and dishes (g)	29	13	22	61
Fruits (fresh and processed) (g)	139	104	111	198
Total added lipids (g)	44	26	32	71
Non alcoholic beverages (ml)	618	374	385	929
Sugar and products (g)	53	41	46	127
Juices (fruit and vegetable) (ml)	N/A	N/A	N/A	N/A

Source: the DAFNE databank

Discussion

Household budget data are presented in this report for the years 1989 and 1996/97. In order to analyze trends over time, it is essential that the methodology used is identical for both survey years. In 1996/97, no food quantities purchased were available and the price to quantity approach presented in the methods section may have compromised direct comparisons between the two years. However, with the exception of fruit and vegetable juice, the mean availabilities and the relative importance of the main groups were comparable to data from other sources.

It remains difficult to reveal trends over time with only two survey years. However, some overall patterns can be seen from the data. There is a general increase in the availability of most food groups and this increase is consistent for each of the subclassification groups (locality, occupation and household composition). A clear decrease in the availability was observed for potatoes, which reflect changes in Swedish eating patterns away from regular (boiled) potatoes towards more processed potato products such as french fries and deep-fried (and deep-frozen) products. This result is similar to the situation in Norway over more or less the same time period (1986-1988 to 1996-1998). The decrease for fruit is more surprising as a larger variety of fruit has become available between 1989 and 1996/97, in contrast to the Norwegian situation where the fruit availability has remained constant. One of the positive trends is the higher availability of fresh and processed vegetables, but the averages for fruit and vegetables are still well below the recommendations by the World Health Organisation (9) and the Nordic Council of Ministers (10).

A clear gradient was seen for both years with respect to household composition and occupation, with the elderly households and retired having higher availabilities for many food groups. The contribution of meals taken out of home has increased considerably the last decade and this may explain the higher availability of the older person household in these surveys. Manual workers have higher intakes of milk and milk products and total added lipids but lower intakes of vegetables and fruits. The unemployed have low intakes of potatoes and sugar and sugar products, but relatively high intakes of cereals and cereal products, vegetables, fruits and non-alcoholic beverages. Lone parent have the lowest availabilities for almost all food groups, although not considering age differences need to be taken into account when estimating individual availability.

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