

Trends in food availability in France– the DAFNE III project

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Introduction

The different aspects of a nutrition policy require the regular supply of information to assess nutritional implications of food intake, to improve the knowledge of dietary patterns and of the routes through which they operate. Assessing, as precisely as possible, the average level and the distribution of the consumption of food products and components (nutrients, additives, contaminants) has been recognised among the primary aims of a successful food and nutrition policy. To meet this aim, the various sources of dietary data at both national and international level need to be considered.

In France the first national dietary survey, called ASPCC, was undertaken in 1993-94, based on an individual 7-day dietary questionnaire and collecting data for 1,229 adults aged 18 years and over, consisting a nation-wide sample with good representation of the French population according to specific criteria (Volatier JL, Verger P, 1999). Food consumption data were recently collected in the context of the Individual National Food Consumption Survey (Enquête INCA Individuelle et nationale sur les consommations alimentaires), addressing 1474 individuals aged more than 15 years and collecting dietary data using again a 7-day dietary questionnaire (Volatier JL, 2000).

Food data at national level are also collected through the Taylor Nelson Sécodip household panels, which, for marketing purposes, register the household purchases with a very precise nomenclature of products. The Sécodip data concern food products purchased (or received as gifts) for consumption at home, and exclude food deriving from home gardens, farms, fishing, hunting and food consumed away from home. Households participating in the Sécodip panel are asked to report, for an entire year, their food purchases on a weekly basis, providing detailed information on the purchased or offered food items (i.e their brand name, package size, quantity purchased, price, store where the item was bought etc.).

Lastly, data on all food entering the household are collected every five years, through the French National Food Surveys (NFS). The French NFS are conducted by the National Institute of Statistics and Economic Studies (INSEE) and provide data on the food purchases of a random and country-representative sample of households. All food entering the dwelling during 7 days together with contributions from own production, and food items offered to members as gifts are recorded. Since 1991, INSEE decided to stop NFS and household expenses in relation to food purchases are only recorded in the Household Budget Survey (HBS).

Although similar in nature, the NFS and the Sécodip panels carry different advantages and constraints. The Sécodip panel does not cover all foods, but the recorded data are of extreme detail providing information on the households' food acquisitions during an entire year. The data collection period in the NFS, on the other hand, is relatively short to establish distributions of consumption for toxicological purposes, for example. Nevertheless, the national NFS has been proved to provide more complete information on the household food acquisitions. According to NFS and Sécodip data collected in 1991, the panel covers roughly 64% of food expenses, as those were evaluated by the NFS.

Furthermore, the NFS data may allow international comparisons on daily food availability, through the data stored in the DAta Food NEtworking (DAFNE) databank. For the last 15 years, the DAFNE initiative has been working towards the development of the methodology for rendering the dietary and complementary data collected through the HBS of European countries comparable (Trichopoulou A, Lagiou P (eds) 1997 & 1998). The French participation in the DAFNE III project was aiming at applying the DAFNE methodology to recent NFS undertaken in France and at evaluating the results on food availability for the entire population, as well as for population sub-groups defined on the basis of their socio-economic characteristics.

In this context, the present report summarises the procedures of this application and further present results on the daily availability of 15 main food groups among the French population.

Material and Methods

Daily individual food availability was estimated using data collected in the following French NFS (with sample size in parenthesis): 1985 (7,288 households), 1991 (6,353 households) and 1995 (10,038 households). Participating households were selected randomly using a two-stage sample design. Respondents were asked to record all food items entering their households for a period of 7 days (in the NFS of 1985 and 1991) and 14 days (in the HBS of 1995).

Data collected through the 1985 and 1991 HBS refer to quantities of food available in the household, together with expenses incurred. The situation was however different in the 1995 survey, as food expenses were only recorded. Since data stored in the DAFNE databank refer to food quantities available to household members, the 1995 expenditure data from the HBS needed to be appropriately converted. The calculation of the respective food quantities was accomplished using a 'price per unit weight' vector, built from the Sécodip panels. It should also be noted that in the 1985 and 1991 surveys, the only data available for certain products (such as biscuits, cookies and sweet snacks, savoury biscuits, ice creams, sweet rolls and buns) were referring to expenditures only. Nevertheless, the calculation of quantity using information from the Sécodip panel survey was not feasible for the 1985 HBS data, since no Sécodip panel was undertaken during this period. Consequently, the price vector estimated from the 1995 Sécodip panel to the related HBS data was not applied, as it would create embarrassing methodological discrepancies, when the 1985 and 1991 HBS data were compared.

The methodology for harmonising food and socio-economic HBS data has been developed in the context of the DAFNE project (Lagiou P, Trichopoulou A et al, 2001). A total of 326 food codes in the 1985 and 1991 surveys, and 260 food codes, in the 1995 survey, were classified under the 56 analytical DAFNE groupings, which were further aggregated to form the 15 main food groups reported in the present document. The DAFNE food classification system allows a flexibility that respects the characteristics of each national dataset, but applies a standardization procedure that adds in the comparability of the HBS data of the various countries.

Daily food availability was estimated for the overall population, as well as in relation to four socio-demographic characteristics:

- a) the locality of the dwelling, classified in *rural*, *semi-urban* and *urban*, according to the number of inhabitants in the residence area
- b) the educational level of the household head, grouped in *illiterate/elementary education not completed*, *elementary education completed*, *secondary education not completed*, *secondary education completed* and *college/university*, following a combination of variables reflecting years of schooling and educational attainment
- c) the occupation of the household head, classified in *non-manual*, *manual*, *retired* and *other* (students, housewives, unemployed and invalid persons) and
- d) the composition of the household, studied in terms of the following household types, depending on the number and the age of household members (*adults living alone*; *two-adult households*; *lone parents*; *two adults and children*; *households of adults and elderly*; *households of adults, elderly and children*; *elderly living alone*; *households of two elderly members*).

Results

Because of the different methodology applied in the estimation of food quantities, only data collected in 1985 and 1991 are presented in this report. Table 1 summarises the daily individual food availability of the 15 main DAFNE food groups for the overall population and for the two survey years. Table 2 presents food availability in relation to the urbanisation of the area where the household is located, based on data collected in 1985 and 1991. Individual food availability by household type is presented in tables 3a and 3b for the two survey years. The effect of occupation of the household head is summarised in table 4; while results on the daily individual food availability according to education are presented in table 5.

With respect to the 1995 HBS data, the estimated food quantities were compared to the food intake patterns estimated in national individual surveys and to the quantities of purchases recorded in the Sécodip marketing panel data. The results of these comparisons were presented in the 17th International Congress of Nutrition (poster presentation included in Annex I).

Discussion

According to findings presented in Table 1, the availability of milk and milk products, vegetables and non-alcoholic beverages (including juices) increased during the period of 1985-1991. During the same period, no change was observed in the availability of meat and meat products, nuts, fish and seafood. Since however, the dietary data reported in table 1 is relatively old, emphasis in the present report will be given on demographic and socio-economic determinants of food choice.

Results on the daily individual availability by locality of the dwelling agree well with other findings reporting the preference of urban populations towards the consumption of fruit, non-alcoholic beverages, vegetable and fruit juices. In addition, urban householders consumed fewer vegetables than their rural counterparts. When 1985 and 1991 data were compared, a decrease in food availability was noted in most cases. When however an increase was noted, it was more prominent among rural households. Hence, the differential effect of locality in the 1985 data faded away in 1991, reflecting probably an improvement in commodities available in rural markets. The only exception stands for the availability of non-alcoholic beverages and juices, as the difference between urban and rural dwellings increased in 1991.

The effect of household composition was evaluated with respect to how availability changes when the number of members increases. Emphasis was also given on detecting differences in the food choices of lone parents with those of two adults raising their children. In general and in contrast to what was observed in other countries, individual food availability increased as the number of adult or elderly members increase. Nevertheless when the additional members were children, the daily individual availability decreased. The underestimation in the availability values may partly be attributed to the fact that food availability was estimated under the assumption of equal distribution of food within the household, irrespective of the members' age and gender.

With the exception of non-alcoholic beverages (including juices), food availability in lone parent households decreased during the period of 1985-1991, whereas a less prominent decrease was observed among households of two adults and children.

With respect to the occupation of the household head, retired households steadily recorded higher availability for all foods and beverages, with the exception of fruit and vegetable

juices, milk and milk products. In 1985 non-manual employment was associated to healthier dietary choices, since non-manual households reported higher purchases of fruits, vegetables and juices, when compared to their manual counterparts. In 1991, both manual and non-manual households recorded a decrease in their fruit and vegetable availability, with this decrease being more prominent in the non-manual households.

The way education affects food choice has not substantially changed during the period of 1985-1991, with highly educated households reporting lower availabilities for meat and products, cereals, potatoes, vegetables, added lipids and beverages (excluding juices). The educational status was not found to shape the availability of milk and milk products, fish and seafood according to both the 1985 and 1991 datasets. It should further be pointed that in 1985 no association could be tracked between fruit availability and educational level, with the sole exception of university graduates who recorded a clear preference towards fruit consumption when compared to the other educational groups. Data collected in 1995 though, revealed a decrease in fruit availability among households of university education and an increase in those of low education.

The HBS data collected in 1995 were compared to food data collected in the French national dietary survey (INCA) in the same time period and in the 1994 Sécodip marketing panel data. In the first comparison, when the food groups under study were directly comparable in terms of contents and level of process, the estimated quantities were comparable. For example, the consumption of poultry reaches 32 g/person/day in the French HBS and 31 g in the French national dietary survey (INCA); for cereal products, the estimates are respectively 259 g and 268 g. In other cases, the observed differences are explainable, given the different methodology in reporting food intake. The HBS leads to higher figures for non-processed products that can be used as ingredients. This induces surely a source of discrepancies, which can be seen on the quantities and on shifts between the nomenclature groups as well.

The comparison of the HBS food availability with the marketing panel data showed a systematic underestimation of quantities in the marketing panel. The differences observed may be explained by discrepancies between the two types of surveys such as :

- a) home made foods and gifts are excluded by definition from the marketing panel

- b) shops other than supermarkets are insufficiently represented in the marketing panels and
- c) the panels record prices in hyper and super markets which are usually cheaper, and this could generate some overestimation when food quantities were calculated in the HBS data.

The French participation in the DAFNE III project showed that the nationally collected HBS data can be used for monitoring food availability both within and between countries. The application of the DAFNE methodology is however required to increase the comparability of the datasets. Due to the French participation in the DAFNE project, the French Statistical Office (INSEE) decided to launch the recent HBS asking respondents to record food availability both in terms of expenses and quantities. After the completion of the project, these data, when available, could be relatively easily analysed and integrated in the DAFNE database.



References

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

Food Group	1985	1991
Eggs (pieces)	0.45	0.38
Potatoes and other starchy roots (g)	116	95
Pulses (g)	6.0	4.9
Nuts (g)	1.6	1.7
Cereals and cereal products (g)	171	161
Milk and milk products (g)	270	291
Meat and meat products (g)	169	161
Vegetables (fresh and processed)(g)	183	187
Fish and seafood (g)	18	19
Fruit (fresh and processed) (g)	161	157
Total added lipids (g)	46	41
Alcoholic beverages (ml)	156	114
Non alcoholic beverages (ml)	276	373
Sugar and products (g)	50	44
Juices (fruit and vegetable) (ml)	14	33

Source: the DAFNE databank

Table 2: Mean food availability in 1985 and 1991 in France, by locality of dwelling (quantity/person/day).

Food Group	1985			1991		
	Rural	Semi-urban	Urban	Rural	Semi-urban	Urban
Eggs (pieces)	0.50	0.44	0.43	0.40	0.38	0.37
Potatoes and other starchy roots (g)	124	116	112	97	100	92
Pulses (g)	6.8	6.4	5.4	5.0	4.7	4.9
Nuts (g)	1.5	1.4	1.7	1.5	1.7	1.8
Cereals and cereal products (g)	199	171	158	177	161	153
Milk and milk products (g)	280	277	264	305	285	287
Meat and meat products (g)	180	171	163	169	160	157
Vegetables (g)	193	179	180	196	192	181
Fish and seafood (g)	16	18	19	17	19	20
Fruits (g)	139	159	172	144	148	166
Total added lipids (g)	50	46	45	44	41	39
Alcoholic beverages (ml)	169	151	151	115	111	114
Non alcoholic beverages (ml)	225	256	305	306	376	404
Sugar and sugar products (g)	55	53	47	48	46	41
Juices (fruit and vegetable) (ml)	9	12	16	23	32	38

Source: the DAFNE databank

Table 3a: Mean food availability in 1985 and 1991 in France, by household composition (quantity/person/day).

Food Group	1985				1991			
	Adult household -single	Adult household-2 members	Adult + children (lone parents)	Adult + children	Adult household-single	Adult household-2 members	Adult + children (lone parents)	Adult + children
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Eggs (pieces)	0.58	0.53	0.46	0.40	0.47	0.41	0.32	0.33
Potatoes and other starchy roots (g)	126	129	102	100	76	95	85	85
Pulses (g)	6.0	7.7	3.9	5.1	4.0	4.6	5.0	4.6
Nuts (g)	2.2	2.1	1.0	1.3	1.6	2.9	2.0	1.3
Cereals and cereal products (g)	184	190	139	155	191	178	133	138
Milk and milk products (g)	285	256	330	276	316	286	274	288
Meat and meat products (g)	183	206	160	153	189	195	130	140
Vegetables (fresh and processed) (g)	231	245	146	145	211	240	121	146
Fish and seafood (g)	19	24	11	15	21	24	11	15
Fruits(fresh and processed) (g)	248	198	171	131	207	194	107	119
Total added lipids (g)	52	56	39	39	48	48	27	33
Alcoholic beverages (ml)	229	238	80	114	156	164	44	81
Non alcoholic beverages (ml)	407	337	268	217	491	476	282	306
Sugar and sugar products (g)	59	57	45	43	52	42	38	40
Juices (fruit and vegetable) (ml)	28	17	24	13	53	38	38	34

Source: the DAFNE databank

Table 3b: Mean food availability in 1985 and 1991 in France, by household composition (quantity/person/day).

Food Group	1985				1991			
	Adult + elderly	Adult + elderly + children	Elderly household-single	Elderly household-2 members	Adult + elderly	Adult + elderly + children	Elderly household-single	Elderly household-2 members
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Eggs (pieces)	0.50	0.45	0.52	0.47	0.44	0.41	0.49	0.42
Potatoes and other starchy roots (g)	139	164	161	139	145	75	105	122
Pulses (g)	9.6	11.1	5.0	6.1	7.2	6.7	4.4	7.5
Nuts (g)	2.0	2.8	1.2	2.3	2.1	3.6	1.9	1.7
Cereals and cereal products (g)	205	187	194	191	194	213	190	187
Milk and milk products (g)	268	215	277	252	269	339	332	282
Meat and meat products (g)	199	152	163	181	199	194	162	167
Vegetables (fresh and processed) (g)	248	145	238	228	239	181	253	253
Fish and seafood (g)	24	10	24	23	31	10	26	26
Fruits(fresh and processed) (g)	193	116	248	202	203	159	233	244
Total added lipids (g)	60	52	66	58	53	69	55	55
Alcoholic beverages (ml)	202	119	158	229	169	100	127	177
Non alcoholic beverages (ml)	368	212	395	396	421	246	561	460
Sugar and sugar products (g)	65	49	72	57	49	63	61	50
Juices (fruit and vegetable) (ml)	7	18	4	10	20	17	18	15

Source: the DAFNE databank

Table 4: Mean food availability in 1985 and 1991 in France, by occupation of the household head (quantity/person/day).

Food Group	1985				1991			
	Manual	Non-manual	Retired	Other*	Manual	Non-manual	Retired	Other*
Eggs (pieces)	0.44	0.43	0.52	0.47	0.37	0.35	0.42	0.42
Potatoes and other starchy roots (g)	122	86	140	199	97	67	131	144
Pulses (g)	6.8	4.2	7.9	5.6	5.3	4.1	6.0	3.9
Nuts (g)	1.4	1.6	1.9	1.9	1.6	1.5	2.1	2.4
Cereals and cereal products (g)	180	142	204	180	163	137	195	174
Milk and milk products (g)	272	267	273	266	290	286	299	303
Meat and meat products (g)	174	153	193	157	168	140	189	153
Vegetables (fresh and processed) (g)	159	176	244	188	162	168	258	188
Fish and seafood (g)	15	17	24	20	14	18	28	18
Fruits (fresh and processed) (g)	131	163	216	176	123	146	230	151
Total added lipids (g)	44	39	64	54	41	33	54	45
Alcoholic beverages (ml)	143	132	233	134	104	93	172	82
Non alcoholic beverages (ml)	234	258	387	302	326	354	478	390
Sugar and sugar products (g)	50	41	65	55	41	40	53	51
Juices (fruit and vegetable) (ml)	12	19	8	11	30	43	21	27

* Students / housewives/ unemployed / invalid persons

Source: the DAFNE databank

Table 5: Mean food availability in 1985 and 1991 in France, by education of the household head (quantity/person/day).

Food Group	1985					1991				
	EI	EC	SI	SC	C/U	EI	EC	SI	SC	C/U
Eggs (pieces)	0.45	0.47	0.45	0.43	0.43	0.38	0.42	0.37	0.37	0.34
Potatoes and other starchy roots (g)	136	140	106	88	74	112	121	87	89	62
Pulses (g)	8.1	6.6	5.7	4.0	3.4	6.3	6.2	4.4	4.0	3.3
Nuts (g)	1.4	1.2	1.6	2.4	2.1	1.9	1.7	1.5	1.4	2.2
Cereals and products (g)	214	183	154	138	135	191	183	152	143	127
Milk and products (g)	275	271	270	257	276	290	298	289	291	287
Meat and products (g)	187	183	163	153	135	176	181	159	146	131
Vegetables (g)	177	203	172	176	180	195	210	176	176	176
Fish and seafood (g)	17	19	16	19	20	17	22	17	21	20
Fruits (g)	155	158	151	166	195	162	172	138	161	166
Total added lipids (g)	54	53	43	36	38	47	49	39	35	32
Alcoholic beverages (ml)	151	194	145	122	135	113	150	109	106	82
Non alcoholic beverages (ml)	268	304	263	262	268	362	426	367	372	332
Sugar and products (g)	58	53	46	43	46	46	49	41	39	43
Juices (fruit and vegetable) (ml)	9	12	12	21	24	26	24	34	33	51

EI: Illiterate/Elementary education incomplete, **EC:** Elementary education completed, **SI:** Secondary education incomplete, **SC:** Secondary education completed, **C/U:** College/University

Source: the DAFNE databank

ANNEX I
Poster presented in the 17th International Nutrition Congress
(Vienna, Austria)

**AN ESTIMATION METHOD OF QUANTITIES OF FOOD AVAILABILITY
IN A HOUSEHOLD BUDGET SURVEY**

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Objectives

In the frame of the European DAFNE III project, disparities of food consumption and availability in Europe have to be based on the same type of surveys, i.e. on “Household Budget Surveys” (HBS). Unfortunately, the most recent survey for France collects only household expenses and not quantities. It is then necessary to add a price system to estimate quantities from these expenses.

Method

The 1995 French HBS from the National Institute of Statistics has been used. The chosen price system comes from a consumer marketing panel (Sécodip panel 1996). It describes in a detailed way the food products and consequently makes possible the appropriateness with the HBSs.

Results and discussion

The estimated quantities of food availability at home from the HBS are compared to the food intake patterns estimated in national individual surveys and to the quantities of purchases from the marketing panel data.

- When the groups of products are directly comparable in terms of contents and by their level of process, the estimated quantities are comparable. For example, the consumption of poultry reaches 32 g/person/day in the French HBS and 31 g in the French national dietary survey (INCA); for cereal products, the estimates are respectively 259 g and 268 g.
- In other cases, the differences are explainable by the methodology of report. The HBS leads to higher figures for non processed products that can be used as ingredients. This induces surely a source of discrepancies, which can be seen on the quantities and on shifts between the nomenclature groups as well.

The comparison of the HBS food availability with the marketing panel data shows a systematic underestimation of quantities in the marketing panel. The fact that home made foods and gifts are excluded by definition from the marketing panel and moreover the insufficient representation of shops other than supermarkets can explain this underestimation.

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