

# Trends in food availability in Italy– the DAFNE III project

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## Introduction

The aim of the Italian Budget Survey is to measure private availability, defined as all goods and services bought, offered as gifts, or consumed from own production, by private households in order to satisfy their needs.

The annual survey started in 1968, before then a survey took place in 1963 as a part of an EU wide exercise. The survey is carried out every year and the fieldwork is performed on a continuous basis throughout the year. Quarterly and annual data are produced, but only the annual ones are published. The information collected via the household budget survey concerning private household's total availability and expenditures are broken down in sufficient details as a function of household characteristics such as size and composition, socio-economic characteristics, region, etc. The survey also provides information on levels of living in terms of income.

Italy has a legal framework for conducting the survey in terms of a general statistical law ruling the collection of statistics. The quarterly survey is used for establishing final consumption in the national accounts and for calculating weights in the consumer price indices. Furthermore, the survey is used in general for social analyses including poverty level studies.

In 1997 the survey was completely restructured, also in order to harmonize the Italian survey to the Eurostat parameters. The new design of the survey attempted to control the set of causes that generally rises non sampling error. The main modifications involved the recording period - decreased from 10 to 7 days -, the design of expenditure diaries eliminating registration of food quantities and the adoption of the COICOP-HBS nomenclature for coding consumption items (Eurostat, 1997).

## Methodology

The target population includes all private resident households on the Italian territory (collective or institutionalised households are excluded) (ISTAT 1992 & 1994 & 1997). A household is defined as a *group of persons sharing marriage, parenthood, adoption or other family or emotional links with each other, living together and dealing with their needs together by sharing part or all of their income*. The sample size reaches about 30,000 households except for 1996 when the sample size was reduced of about 10,000 households in order to carry out two different surveys, one for the *old* survey and one for the *new* survey.

The stratified random sample is selected in two stages. The first stage regards the Italian municipalities: 150 large municipalities are all automatically included in the sample, while 400 smaller municipalities are randomly selected after stratification by region, altitude, and main economic activity of the area; the annual population registers are used to define the demographic dimension of the municipalities. The second stage consists of the random selection of the households; the households are drawn from the population registers with equal probabilities. The sample is representative at regional level (sampling rate just under 2 per 1,000 households). Seasonal variation was captured by surveying household throughout the whole year (1/12 of the sample per month). Non-responding households are substituted with households chosen according to the household dimension and the place of residence (non-response rate about 20%).

An “expenditures/purchased quantities” 10-day diary, a separate sheet for own production and foods received as gifts, and an interview are administered to each household. The interviewer contacts the household, hands out the diary and conduct the interview at the end of one month for demographic, occupation, education, income, savings information and some questions about non-daily, non-food expenditure. Data correction is deterministic, no value imputed for missing data. In the present paper, only data included in the DAFNE databank (1990-1993-1996) are considered. Therefore, foods were aggregated into 15 food groups (*eggs, potatoes and other starchy roots, pulses, nuts, cereals and cereal products, milk and milk products, meat and meat products, vegetables, fish and seafood, fruit, added lipids, alcoholic beverages, non-alcoholic beverages, sugar and sugar products, vegetable and fruit juices*). Food availabilities were analysed according to population subgroups identified by using four socio-economic factors: I) locality (*rural, semi-urban, urban*), II) household composition (*1 adult, 2 adults, 1 adult + children, adults + children,*

*adults + elderly, adults + elderly + children, 1 elderly, 2 elderly members*), III) education of the household head (*elementary education not completed, elementary education completed, secondary education not completed, secondary education completed, college/university*), IV) occupation of the household head (*manual, non-manual, retired, other condition*).

Percentage differences in the availability of the food group X were calculated, for successive survey years, according to the formulas:

$$(1) I_{93-90} \% = \frac{X_{1993} - X_{1990}}{X_{1990}} \times 100 \quad X = 1, \dots, 15$$

$$(2) I_{96-93} \% = \frac{X_{1996} - X_{1993}}{X_{1993}} \times 100 \quad X = 1, \dots, 15$$

An Average Trend Rate (ATR) expressed as percentage over the three analysed years 1990-1993-1996 was calculated per each food group for the total sample and all the sub-groups determined by the four factors locality, household composition, education and occupation of the household head to evaluate the evolution of food availability. The applied formula for the availability of the food group X is

$$(3) ATR_X \% = \frac{I(X)_{96-93} - I(X)_{93-90}}{2} \times 100 \quad X = 1, \dots, 15$$

considering the two periods of variation (1990-1993, 1993-1996). This index provides the constant variation applicable to each period to obtain the total difference observed between the final year (1996) and the initial year (1990). In this case, three periods and then two variations are included. The majority of food groups show a negative ATR% except for 4 food groups. A comparison of the single variation included in the calculation was performed in order to better understand the meaning of the average trend. Figures obtained by calculation are reported in Annex 1 and a graphical presentation of percentage variations vs. daily individual availability figures in 1990 is given in Annex 2.

### **Validation of the Italian data**

The results were compared with other sources of data in order to evaluate similarities of trends and partially the absolute figures. In detail, the following sources were used:

- 1) published HBS data (official publications of the Italian Statistical Institute (ISTAT));

2) Food Balance Sheets (FBS) for Italy published by the Food and Agriculture Organisation (FAO).

The first comparison provided a very good concordance with data published by the ISTAT.

The second comparison was instead more difficult because of two reasons: the different estimation method used and the food aggregation criteria. However, some differences are explicable and some considerations can be made notwithstanding these points. As expected, FBS provided higher value for all the food groups considered. This in general is due to the wastes produced in the whole system. Availability for population consumption, even though FBS data are refined by using HBS data, does not automatically mean that quantities will be bought by families.

Generally, parts of differences could be attributed to the increase of outside of home consumption, but reasons like losses and changes in weight occurring in the food chain may also explain the observed differences. Potatoes could be taken as a countercheck. In fact, potatoes are mainly consumed when they are fresh, but they are also frequently consumed outside of home. In our comparison, differences are minimum both in absolute term and trend.

Considering the evolution, the sign of the average trend rate for the periods 1990-1993-1996 is negative for potatoes, meat, fruit, lipids, alcoholic beverages and sugar product and marginally positive for milk both for FBS and HBS data. Discordant is the sign of the average trend rate for eggs (but very small quantity), pulses, nuts, cereals, vegetables and fish.

The increasing use of processed foods could cause increasing divergence from the weight of crops and the weight of foods as consumed. This is due to the fact that crops are expressed in fresh weight while foods are purchased as frozen, tinned and often as semi-ready or ready-to-eat dishes; as an example 1 kg of fresh spinach (crop) will be sell as 0,83 kg of frozen products. It means that the proportion of processed foods included into one food group can play an important role in comparing the two data.

In summary, three effects are to be considered in comparing FBS and HBS data: edible portion, proportion of consumption outside of home and proportion of processed foods vs. fresh foods. Notwithstanding the occurrence of these factors, the food groups with lower probability to be available for consumption as highly processed foods showed the same sign of ATR%, so indirectly confirming the listed hypotheses.

Annex 3 shows the figures related to the mentioned comparison between FBS and HBS results for the periods 1990-1993-1996 in Italy.

## Results

The observed trends in per-capita food availability regards the whole population (table 1a). Availability profiles by the four socio-economic factors (locality, household composition, education and occupation of the household head) do not show remarkable differences comparing the examined three years (tables 1b-1e). In other terms, trends are generally similar for most population subgroups, with some exceptions as reported when analysing the role of each factor.

The negative ATR% resulted from the mean of two negative relative variations for 10 food groups: alcoholic beverages (ATR%=-14%,  $I_{93-90}$ %=-19%,  $I_{96-93}$ %=-11%), added lipids (ATR%=-9%,  $I_{93-90}$ %=-12%,  $I_{96-93}$ %=-7%), potatoes (ATR%=-8%,  $I_{93-90}$ %=-8%,  $I_{96-93}$ %=-8%), meat (ATR%=-7%,  $I_{93-90}$ %=-12%,  $I_{96-93}$ %=-3%), eggs (ATR%=-7%,  $I_{93-90}$ %=-11%,  $I_{96-93}$ %=-4%), vegetables (ATR%=-5%,  $I_{93-90}$ %=-8%,  $I_{96-93}$ %=-2%), fruit (ATR%=-5%,  $I_{93-90}$ %=-5%,  $I_{96-93}$ %=-6%), fish (ATR%=-4%,  $I_{93-90}$ %=-7%,  $I_{96-93}$ %=-1%), cereals (ATR%=-3%,  $I_{93-90}$ %=-6%,  $I_{96-93}$ %=-1%), sugar products (ATR%=-2%,  $I_{93-90}$ %=0%,  $I_{96-93}$ %=-4%). A tendency to reduce the decreasing trend is observable for all the food groups: percentage differences  $I_{96-93}$ % have a lower absolute value than those  $I_{93-90}$ %, except for fruit and sugar products.

The negative ATR% resulted from one negative ( $I_{93-90}$ %) and one positive ( $I_{96-93}$ %) relative variation for 2 food groups: pulses (ATR%=-5%,  $I_{93-90}$ %=-11%,  $I_{96-93}$ %=+1%), nuts (ATR%=-1%,  $I_{93-90}$ %=-3%,  $I_{96-93}$ %=-2%). In these cases,  $I_{96-93}$ % variations evidence an opposite trend vs.  $I_{93-90}$ % ones.

ATR% positive values derived from both positive relative variations for non-alcoholic beverages (ATR%=+5%,  $I_{93-90}$ %=+3%,  $I_{96-93}$ %=+8%), from one negative and one positive value for juices (ATR%=+3%,  $I_{93-90}$ %=-13%,  $I_{96-93}$ %=+21%). Finally, milk products showed 0% for all the indices.

In summary, really decreasing availabilities were shown by alcoholic beverages (-14%) (figure 1), followed by added lipids (-9%) (figure 2), meat (-7%), potatoes (-8%), eggs (-7%), vegetables (-5%), fruit (-5%) and pulses (-5%). The only really positive trends were found for non-alcoholic beverages over the whole period (ATR%=+5%), and for juices, since 1996 ( $I_{96-93}$ %=+21%).

The role of the socio-economic factors was analysed by examining the graded lists of average availabilities of each food group per population subgroup during the studied period. As a general remark, the majority of detected changes have occurred since 1993. Therefore, overall considerations can be made according to availability profiles related to the four factors that will be in-depth analysed in the discussion in order to stress the reasons underlying the provided results. In the present paragraph, the main variations in average availability figures, according to the various modalities of the considered factors, are instead illustrated and two examples are also graphically presented.

Profiles of household foods availability remained enough stable for traditional items like eggs, cereals, vegetables, fish and sugar products relatively to all the considered socio-demographic factors.

**Locality.** Modifications along time have been shown by average availability profiles related to the locality factor for potatoes, milk products, meat, added lipids, non-alcoholic beverages and juices. Particularly, increases occurred in semi-urban population availability for non-alcoholic beverages and juices. Since 1993, urban population reduced meat availability more than their rural and semi-urban counterparts (figure 3) and added lipids (figure 2), while rural population reduced potato and milk product availability.

**Household composition.** Considering the food availability profiles by household composition no evident changes have occurred in the analysed periods. Only in 1996 does the availability of nuts show a pick among single elderly households.

**Education of the household head.** The education of the household head is associated with variations in availability profiles for pulses (figure 4) (increased availability among households whose head has not completed elementary education vs. decreased availability for all the others), nuts (increased availability for elementary completed and secondary completed vs. decreased availability for all the others) and milk products (increased availability for elementary completed, strongly decreased availability for university, slightly decreased availability for all the others).

Other food groups showing similar availability profiles over the three years can be grouped into two sets according to whether they tend to outline smoothed (reduced differences among population groups) profiles or not. Availability profiles tend to be smoothed for potatoes, meat, vegetables, fish, fruits and alcoholic beverages. Availability profiles tend to remain stable for eggs, cereals,

added lipids, sweet products, non-alcoholic beverages and juices. Furthermore, a decreasing availability associated to an increasing education level were found for potatoes, meat, eggs, cereals, sugar products, and added lipids. Juice is the only food group showing an increased availability while the education level is increasing.

***Occupation of the household head.*** According to this factor, the whole profile was altered by nuts availability particularly for the strong increase among households with retired head and the strong decrease among households with head in other condition. The position of each population groups remained stable in the graded list of foods availability for the others 14 food groups. However, considering disparities tended to be reduced when comparing manual vs. non-manual occupation and retired vs. people in other condition, but the differences were more remarkable when comparing employed (manual + non-manual) and not-employed (retired + other condition).

## **Discussion.**

The trends in reducing food consumption is a general phenomenon in western countries. This implies on average a reduction in daily energy intake, as shown also by other studies carried out in Italy. In fact, the strong reduction of alcohol and added lipid intakes are not compensated by an increase in other food groups' consumption like fish and seafood, sugar products and non-alcoholic drinks (Turrini A, Saba A, Perrone D et al, 2001). Aging (reduction in daily energy requirements) and less active life style are considered the most important factors to explain the phenomenon, mainly because contemporary, the average Body Mass Index (BMI) is increasing (D'Amicis A, 1999).

Another aspect to be better investigated is the growth of outside of home food consumption due to changes in scheduling working time. In fact, according to the elaboration provided by the Federazione Italiana Pubblici Esercizi (FIPE) on ISTAT data, expenditures for outside of home food consumption increased from 24.9% of the total food expenses in 1988 to 29.5% in 2000 (<http://www.fipe.it/pub/censtudi/NUMERIDEIPUBBLICIESERCIZI.htm>). This factor can cause biases in daily food intake estimates provided by household budget surveys study if not specifically surveyed. An attempt to correct data for outside of home consumption - by using a weight system based on participation to meals at home and importance of the meals - was made in the study carried out by the INRAN in 1980-84 (SabaA, Turrini A, Mistura G et al, 1990), and some typically

consumed outside of home foods like beer and soft drinks resulted under-estimated. Finally, wastes and left-over are necessarily neglected by this type of surveys.

However, the ability to describe trend along time is the most important characteristic making fundamental the availability of household budget survey data. Harmonisation of coding system of classification variables and food grouping are the actions mainly favouring the adoption of these data for performing cross-section comparisons and trend evaluation in different countries (Trichopoulou A and Lagiou P (eds), 1997 & 1998; Byrd-Bredbenner C, Lagiou P, Trichopoulou A, 2000).

The break-down of the results according to different classification variables can be fruitfully analysed to derive considerations on disparities in food consumption patterns among population groups and to evaluate their stability in time. The provided indications can be used also to plan finalised interventions to correct possible non-healthy food behaviours.

As above mentioned, the analysis of average availability profiles between groups determined by classification variables compared in different time periods provides indications on the tendency to modify daily food intakes or to maintain the same relative position in a graded list of average values. Association with changes has been already illustrated. In the present paragraph, the characteristic observed to be stable along time are used to draw considerations about the nature of their relations with food availability patterns.

The locality factor, at least in Italy, is related to the size of municipalities that in its turn is determined by the altitude (small centres are more likely placed in not flat land) so conditioning the main economic activity and, presumably, the life style of the resident population. However, the links between socio-economic conditions and cultural attitudes, whose food consumption patterns are an expression, are not so direct as it can be initially thought. The results of the present study show that urban population had highest availability of potatoes, pulses, vegetables, fish and fruit. The rural population results to consume more eggs, nuts, cereals, milk products, meat, added lipids and sugar products. Regarding beverages, rural and semi-urban people consumed more alcoholic beverages, while when talking about non-alcoholic beverages urban and semi-urban groups reported higher quantities. Generally, the semi-urban sample units showed an intermediate behaviour except for non-alcoholic beverages and juices. Data on other factors like accessibility to foods and permanence of habits to cook at home could be useful in the interpretation of these results.



The household composition is the classification variable showing the strongest tendency to outline similar profile along time. The interpretation of the role of this parameter can be better understood when considering presence/non presence of children in the family. Stated the evidence that singles (either adult or elderly people) show generally higher availability with respect to other groups, the following higher values are visible for no-child families (2 adults and 2 elderly individuals), and the lowest ranks are occupied by families with child. Furthermore, families of single parents often have an availability profile more similar to the no-child ones. A very different situation is shown for juice only: in this case the highest availability was found for household composed of one adult/adults and children. It should however be pointed that the calculation used to obtain per-capita food intakes reduces the possibility to estimate the age specific values. These results are also concordant with the usual relationship occurring between per-capita food availability and number of family members that means a decreasing per-capita availability vs. an increasing number of individuals in the family.

More interesting are the figures generated considering the “education of the household head” as the classification variable. In this case, major distinctions are observable when considering “up to elementary” vs. “over elementary” education level. For the majority of the food groups higher consumptions were detected for “up to elementary”. A different situation was found for nuts and juices. Other considerations are to be made for milk products and non-alcoholic drinks whose consumption quantities were higher for people living in households with a head that simply completed an education cycle vs. not completed ones. For nuts, vegetables, fruit and fish, availability values were similar for people that had not completed elementary and graduated persons. Finally, secondary education not completed showed the lowest value for milk products, vegetables, fish, and fruit. The similarity between very low education level and graduated people in consuming nuts, milk, vegetables and fish induces to think to different motivations for the same behaviour, like tradition (maybe for elder low-educated people) and information (probably for younger high-educated people).

The analysis according to the “occupation of the household head” factor provided an evident opposition between households of employed head (manual or non-manual) vs. retired and household of persons with other conditions (students, housewives, unemployed and invalid persons), especially since 1993. Only three exceptions were found: nuts, alcoholic beverages (retired have the highest consumption, probably reflecting limited out of home consumption), juices (non-manual workers’ households had the highest consumption). A refined classification of the type of job makes easier the comparison within each couple of modalities. Particularly, manual workers

households' consumption was higher vs. non-manual ones for energy dense foods such as eggs, potatoes, nuts, cereals, meat, added lipids, alcoholic beverages and sugar products. It is interesting to observe that equality was never reached. Different considerations are to be made when comparing food availability between retired and households of other conditions . Equality or similar levels were shown for eggs, potatoes, cereals, milk products, vegetables and sugar products. Retired household head families had higher availability of nuts, meat, fruit, added lipids, alcoholic and non-alcoholic beverages than other conditions household head ones. The opposite occurred in all the other cases. Once more, the relation occupation-food availability is not immediate especially because the only individual considered is the household head. It may be that education and income level often associated to the variable occupation (in its turn related to the type of municipality) could likely influence the different food choices.

To conclude, changes in life style have caused in Italy an increase of outside of home consumption reflecting on the decrease of food purchased to be used as ingredients in favour of mixed dishes.. Furthermore, the problem of classifying and including ready-to-eat dishes is increasing, regarding also food products eaten at home because of their convenience, when spare time is limited. These two phenomena are more evident in the large cities but the rapid modification in scheduling work time like the increasing possibility to work at home could cause other changes in the next future not easily to be forecasted but to be taken into account in advance.

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

<b>Food Groups</b>	<b>Mean food availability</b>		
	<b>1990</b>	<b>1993</b>	<b>1996</b>
<b>Eggs (pieces)</b>	0.40	0.36	0.34
<b>Potatoes and other starchy roots (g)</b>	91	83	76
<b>Pulses (g)</b>	4.6	4.1	4.1
<b>Nuts (g)</b>	0.9	0.9	0.9
<b>Cereals and cereal products (g)</b>	359	338	335
<b>Milk and milk products (g)</b>	269	270	271
<b>Meat and meat products (g)</b>	160	140	136
<b>Vegetables (fresh and processed)(g)</b>	204	188	184
<b>Fish and seafood (g)</b>	41	38	38
<b>Fruits (fresh and processed) (g)</b>	260	248	233
<b>Total added lipids (g)</b>	77	68	63
<b>Olive Oil (g)</b>	42	38	35
<b>Alcoholic beverages (ml)</b>	208	168	149
<b>Non alcoholic beverages (ml)</b>	745	766	824
<b>Sugar and products (g)</b>	51	51	49
<b>Fruit and vegetable juices (ml)</b>	9.1	7.9	9.6

**Table 1b:** Mean food availability in Italy, by locality of dwelling and by survey year (quantity/person/day).

Food Groups	Rural			Semi-urban			Urban		
	1990	1993	1996	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0.43	0.36	0.36	0.38	0.35	0.33	0.41	0.36	0.35
Potatoes and other starchy roots (g)	95	86	73	87	79	73	92	85	82
Pulses (g)	4.2	4.0	3.6	4.6	4.0	4.1	4.9	4.2	4.5
Nuts (g)	0.9	0.9	1.1	0.9	0.8	0.8	0.9	1.0	0.9
Cereals and cereal products (g)	394	371	351	358	340	339	340	317	321
Milk and milk products (g)	280	274	277	263	269	272	271	269	267
Meat and meat products (g)	166	150	144	156	141	137	160	134	130
Vegetables (fresh and processed)(g)	169	168	153	189	173	174	242	216	214
Fish and seafood (g)	36	32	33	39	38	36	46	42	42
Fruits (fresh and processed) (g)	245	237	225	252	245	226	278	259	245
Total added lipids (g)	83	77	65	74	67	63	77	64	61
Olive Oil (g)	47	44	37	40	37	36	42	35	34
Alcoholic beverages (ml)	231	201	165	208	172	156	194	144	133
Non alcoholic beverages (ml)	735	722	733	736	787	846	759	766	848
Sugar and products (g)	62	60	55	48	50	49	47	47	45
Fruit and vegetable juices (ml)	9.3	7.6	9.9	8.6	8.1	10	9.5	7.8	8.8

Source: the DAFNE databank

DAFNE categories for LOCALITY, based on the urbanisation of the residence area

**Table 1c.1:** Mean food availability in Italy, by composition of the household and by survey year (quantity/person/day).

Food Groups	Adult single*			2 Adult members*		
	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0.63	0.56	0.55	0.47	0.40	0.40
Potatoes and other starchy roots (g)	136	113	107	103	94	91
Pulses (g)	5.7	5.7	5.4	5.7	5.0	5.0
Nuts (g)	0.9	1.2	1.0	1.1	1.4	1.1
Cereals and cereal products (g)	494	481	454	409	375	371
Milk and milk products (g)	424	411	411	300	294	303
Meat and meat products (g)	204	188	170	187	162	161
Vegetables (fresh and processed)(g)	313	289	278	256	230	230
Fish and seafood (g)	52	52	51	50	44	45
Fruits (fresh and processed) (g)	398	387	355	314	304	291
Total added lipids (g)	123	103	99	93	81	79
Olive Oil (g)	69	60	59	51	45	47
Alcoholic beverages (ml)	287	255	246	287	222	197
Non alcoholic beverages (ml)	1,279	1,329	1,477	971	971	1,028
Sugar and products (g)	91	88	83	60	59	58
Fruit and vegetable juices (ml)	11	7.8	11	9.3	8.2	8.6

\* Mean estimated on the basis of 28.027 households included in the classifications

Source: the DAFNE databank

**Table 1c.2:** Mean food availability in Italy, by composition of the household and by survey year (quantity/person/day).

Food Groups	1 Adult + children*			Adult + children*		
	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0.44	0.37	0.34	0.35	0.31	0.30
Potatoes and other starchy roots (g)	104	89	86	79	73	67
Pulses (g)	4.3	3.8	4.3	4.1	3.5	3.6
Nuts (g)	0.7	0.6	0.6	0.9	0.8	0.8
Cereals and cereal products (g)	353	337	354	329	307	309
Milk and milk products (g)	331	314	320	248	249	254
Meat and meat products (g)	155	134	146	145	126	121
Vegetables (fresh and processed)(g)	205	193	196	177	157	153
Fish and seafood (g)	42	43	36	38	35	34
Fruits (fresh and processed) (g)	272	271	244	227	211	196
Total added lipids (g)	78	68	57	65	56	51
Olive Oil (g)	42	38	34	35	30	28
Alcoholic beverages (ml)	149	101	57	171	134	116
Non alcoholic beverages (ml)	839	843	928	616	644	693
Sugar and products (g)	57	54	53	42	42	41
Fruit and vegetable juices (ml)	20	11	16	10	9.4	12

\* Mean estimated on the basis of 28.027 households included in the classifications

Source: the DAFNE databank

**Table 1c.3:** Mean food availability in Italy, by composition of the household and by survey year (quantity/person/day).

Food Groups	Adult + elderly*			Adult + elderly + children*		
	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0,44	0.38	0.36	0.31	0.28	0.25
Potatoes and other starchy roots (g)	102	90	79	74	68	50
Pulses (g)	5.1	4.4	4.4	3.9	3.4	2.8
Nuts (g)	1.0	0.9	1.0	0.8	1.3	0.7
Cereals and cereal products (g)	371	353	343	306	288	286
Milk and milk products (g)	272	264	264	224	220	222
Meat and meat products (g)	170	149	145	139	127	121
Vegetables (fresh and processed)(g)	215	198	201	159	145	146
Fish and seafood (g)	42	39	40	30	29	31
Fruits (fresh and processed) (g)	279	265	249	199	197	175
Total added lipids (g)	85	77	70	63	55	58
Olive Oil (g)	47	44	40	37	28	31
Alcoholic beverages (ml)	258	213	183	188	134	125
Non alcoholic beverages (ml)	810	781	829	566	592	649
Sugar and products (g)	56	56	50	38	44	39
Fruit and vegetable juices (ml)	5.8	5.3	5.2	9.7	8.3	7.8

\* Mean estimated on the basis of 28.027 households included in the classifications

Source: the DAFNE databank



**Table 1c.4:** Mean food availability in Italy, by composition of the household and by survey year (quantity/person/day).

Food Groups	Elderly single*			2 Elderly members*		
	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0.64	0.54	0.54	0.48	0.44	0.43
Potatoes and other starchy roots (g)	134	133	121	110	108	100
Pulses (g)	5.9	6.7	5.6	5.4	5.1	5.4
Nuts (g)	0.7	1.1	2.5	0.8	0.7	0.8
Cereals and cereal products (g)	487	467	464	399	383	383
Milk and milk products (g)	416	420	411	304	311	307
Meat and meat products (g)	189	170	160	170	157	156
Vegetables (fresh and processed)(g)	275	284	255	236	225	221
Fish and seafood (g)	48	44	46	44	41	44
Fruits (fresh and processed) (g)	364	365	339	305	299	286
Total added lipids (g)	126	108	99	102	95	83
Olive Oil (g)	74	62	58	61	59	47
Alcoholic beverages (ml)	184	137	158	273	250	211
Non alcoholic beverages (ml)	1,191	1,179	1,250	878	872	961
Sugar and products (g)	96	92	86	65	63	65
Fruit and vegetable juices (ml)	10	7.1	8.0	4.5	3.5	4.4

\* Mean estimated on the basis of 28.027 households included in the classifications

Source: the DAFNE databank

**Table 1d.1:** Mean food availability in Italy, by education of the household head and by survey year (quantity/person/day).

Food Groups	Illiterate/Elementary educ. not completed			Elementary educ. completed		
	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0.49	0.44	0.40	0.42	0.37	0.38
Potatoes and other starchy roots (g)	106	103	84	94	89	86
Pulses (g)	4.7	5.2	4.8	4.4	4.4	4.3
Nuts (g)	1.3	1.0	0.8	0.8	0.9	0.9
Cereals and cereal products (g)	453	412	408	377	359	358
Milk and milk products (g)	271	265	269	270	277	277
Meat and meat products (g)	177	157	146	167	149	149
Vegetables (fresh and processed)(g)	213	211	192	199	187	191
Fish and seafood (g)	46	40	41	40	38	38
Fruits (fresh and processed) (g)	259	254	236	261	253	244
Total added lipids (g)	90	82	77	84	75	70
Olive Oil (g)	49	47	46	46	41	38
Alcoholic beverages (ml)	227	183	151	232	194	180
Non alcoholic beverages (ml)	747	714	766	771	808	871
Sugar and products (g)	63	62	58	55	57	55
Fruit and vegetable juices (ml)	7.5	4.6	5.2	7.5	6.0	6.9

Source: the DAFNE databank

**Table 1d.2:** Mean food availability in Italy, by education of the household head and by survey year (quantity/person/day).

Food Groups	Secondary educ. not completed			Secondary educ. completed		
	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0.38	0.35	0.33	0.36	0.32	0.32
Potatoes and other starchy roots (g)	89	81	71	83	72	71
Pulses (g)	4.6	3.8	3.9	5.0	3.9	4.1
Nuts (g)	0.9	0.9	0.8	0.9	0.9	1.2
Cereals and cereal products (g)	340	326	326	325	305	311
Milk and milk products (g)	265	263	265	273	273	273
Meat and meat products (g)	156	136	133	147	131	126
Vegetables (fresh and processed)(g)	202	180	173	207	186	188
Fish and seafood (g)	39	38	37	42	39	38
Fruits (fresh and processed) (g)	253	235	223	263	253	234
Total added lipids (g)	73	65	60	69	57	56
Olive Oil (g)	38	37	33	39	32	32
Alcoholic beverages (ml)	198	159	143	174	145	126
Non alcoholic beverages (ml)	707	725	788	743	781	834
Sugar and products (g)	48	48	46	45	44	45
Fruit and vegetable juices (ml)	9.3	8.4	9.9	11	10	13

Source: the DAFNE databank

**Table 1d.3:** Mean food availability in Italy, by education of the household head and by survey year (quantity/person/day).

<b>Food Groups</b>	<b>College/University</b>		
	<b>1990</b>	<b>1993</b>	<b>1996</b>
<b>Eggs (pieces)</b>	0.36	0.31	0.28
<b>Potatoes and other starchy roots (g)</b>	81	71	69
<b>Pulses (g)</b>	4.9	3.6	3.7
<b>Nuts (g)</b>	1.2	1.2	0.7
<b>Cereals and cereal products (g)</b>	321	299	289
<b>Milk and milk products (g)</b>	280	267	266
<b>Meat and meat products (g)</b>	147	125	118
<b>Vegetables (fresh and processed)(g)</b>	223	207	193
<b>Fish and seafood (g)</b>	46	42	38
<b>Fruits (fresh and processed) (g)</b>	282	263	231
<b>Total added lipids (g)</b>	66	60	51
<b>Olive Oil (g)</b>	38	37	32
<b>Alcoholic beverages (ml)</b>	178	122	123
<b>Non alcoholic beverages (ml)</b>	769	760	811
<b>Sugar and products (g)</b>	41	42	38
<b>Fruit and vegetable juices (ml)</b>	16	12	12

Source: the DAFNE databank

**Table 1e.1:** Mean food availability in Italy, by occupation of the household head and by survey year (quantity/person/day).

Food Groups	Manual			Non-manual		
	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0.38	034	0.32	0.36	0.32	0.31
Potatoes and other starchy roots (g)	86	78	70	81	72	68
Pulses (g)	4.3	3.7	3.7	4.6	3.8	3.9
Nuts (g)	0.9	0.8	0.9	0.8	0.9	0.8
Cereals and cereal products (g)	355	331	327	322	306	306
Milk and milk products (g)	249	253	259	265	262	265
Meat and meat products (g)	158	136	134	148	130	124
Vegetables (fresh and processed)(g)	185	166	165	206	184	179
Fish and seafood (g)	39	36	36	42	39	37
Fruits (fresh and processed) (g)	239	225	215	256	241	218
Total added lipids (g)	73	64	57	66	57	54
Olive Oil (g)	39	36	31	37	32	30
Alcoholic beverages (ml)	207	171	149	173	137	117
Non alcoholic beverages (ml)	676	700	763	714	747	789
Sugar and products (g)	47	47	45	43	43	43
Fruit and vegetable juices (ml)	9.1	7.7	10	11	11	12

Source: the DAFNE databank

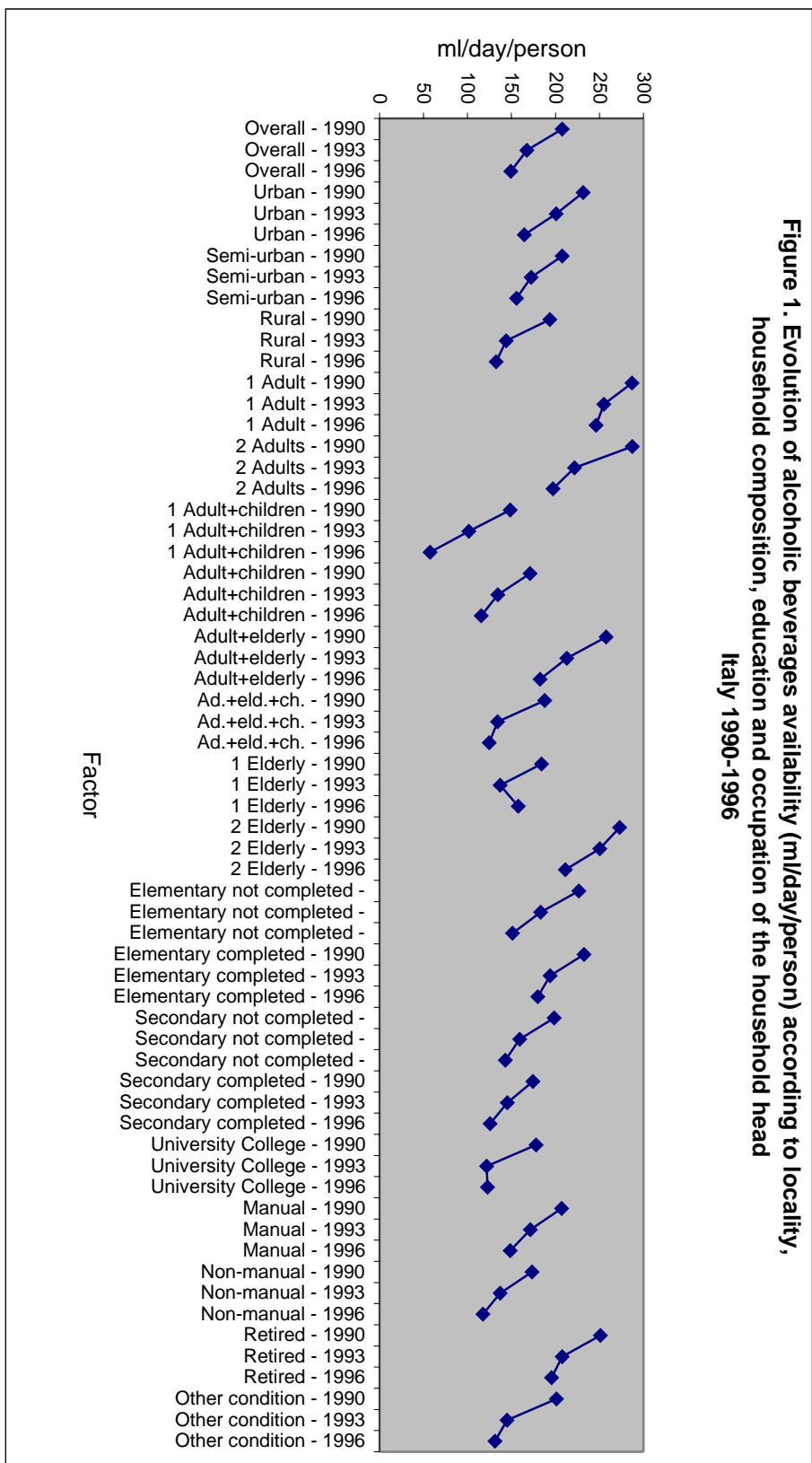
**Table 1e.2:** Mean food availability in Italy, by occupation of the household head and by survey year (quantity/person/day).

Food Groups	Retired			Other condition (*)		
	1990	1993	1996	1990	1993	1996
Eggs (pieces)	0.47	0.40	0.39	0.47	0.44	0.39
Potatoes and other starchy roots (g)	105	96	88	108	103	90
Pulses (g)	5.1	4.4	4.9	5.2	5.7	4.6
Nuts (g)	0.9	1.1	1.2	1.4	0.8	0.8
Cereals and cereal products (g)	396	363	366	404	399	369
Milk and milk products (g)	302	296	289	302	299	286
Meat and meat products (g)	171	154	154	173	153	135
Vegetables (fresh and processed)(g)	231	214	211	227	224	199
Fish and seafood (g)	42	40	41	46	43	41
Fruits (fresh and processed) (g)	298	288	276	280	267	235
Total added lipids (g)	93	82	79	91	81	69
Olive Oil (g)	52	47	46	49	44	37
Alcoholic beverages (ml)	251	208	196	201	145	131
Non alcoholic beverages (ml)	876	872	940	845	831	849
Sugar and products (g)	63	60	58	63	64	57
Fruit and vegetable juices (ml)	6.3	5.9	6.7	10	5.7	7.5

(\*) Students, housewives, unemployed invalid persons.

Source: the DAFNE databank

**Figure 1. Evolution of alcoholic beverages availability (ml/day/person) according to locality, household composition, education and occupation of the household head Italy 1990-1996**



**Figure 2. Evolution of the availability of added lipids (g/day/person) according to locality, household composition, education and occupation of the household head Italy 1990-1996**

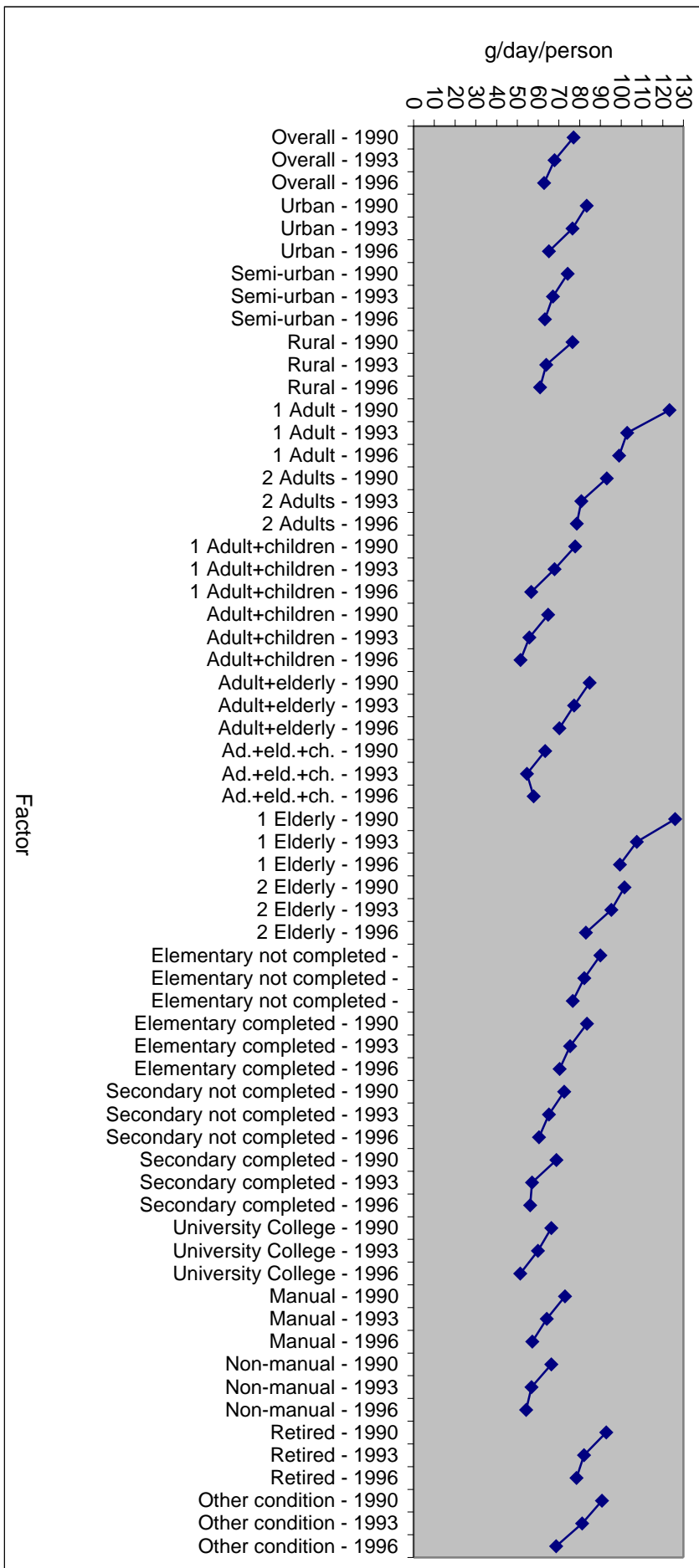




Figure 3. Availability of meat and meat products (g/day/person) by year and household's locality  
ITALY 1990-1996

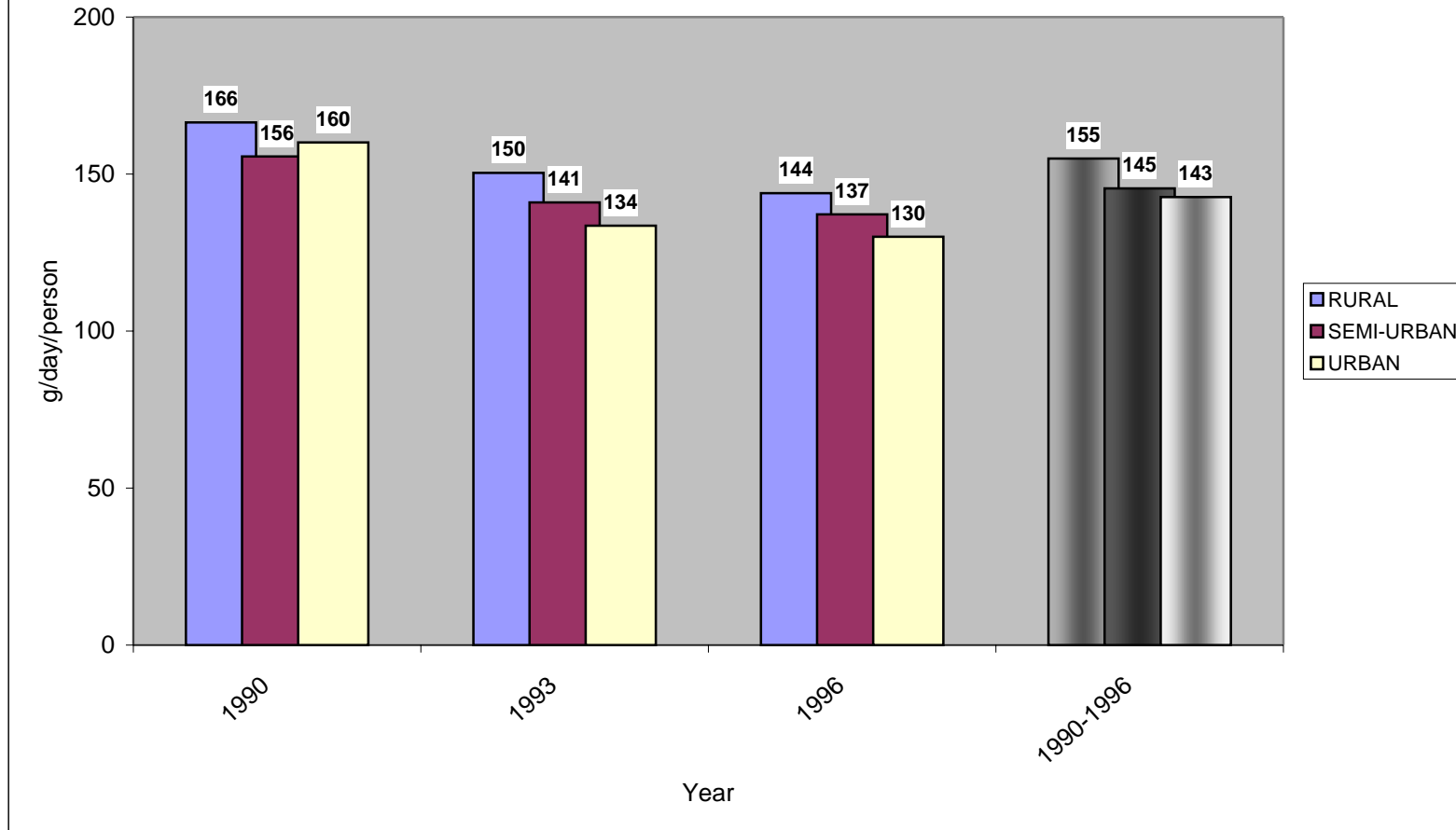
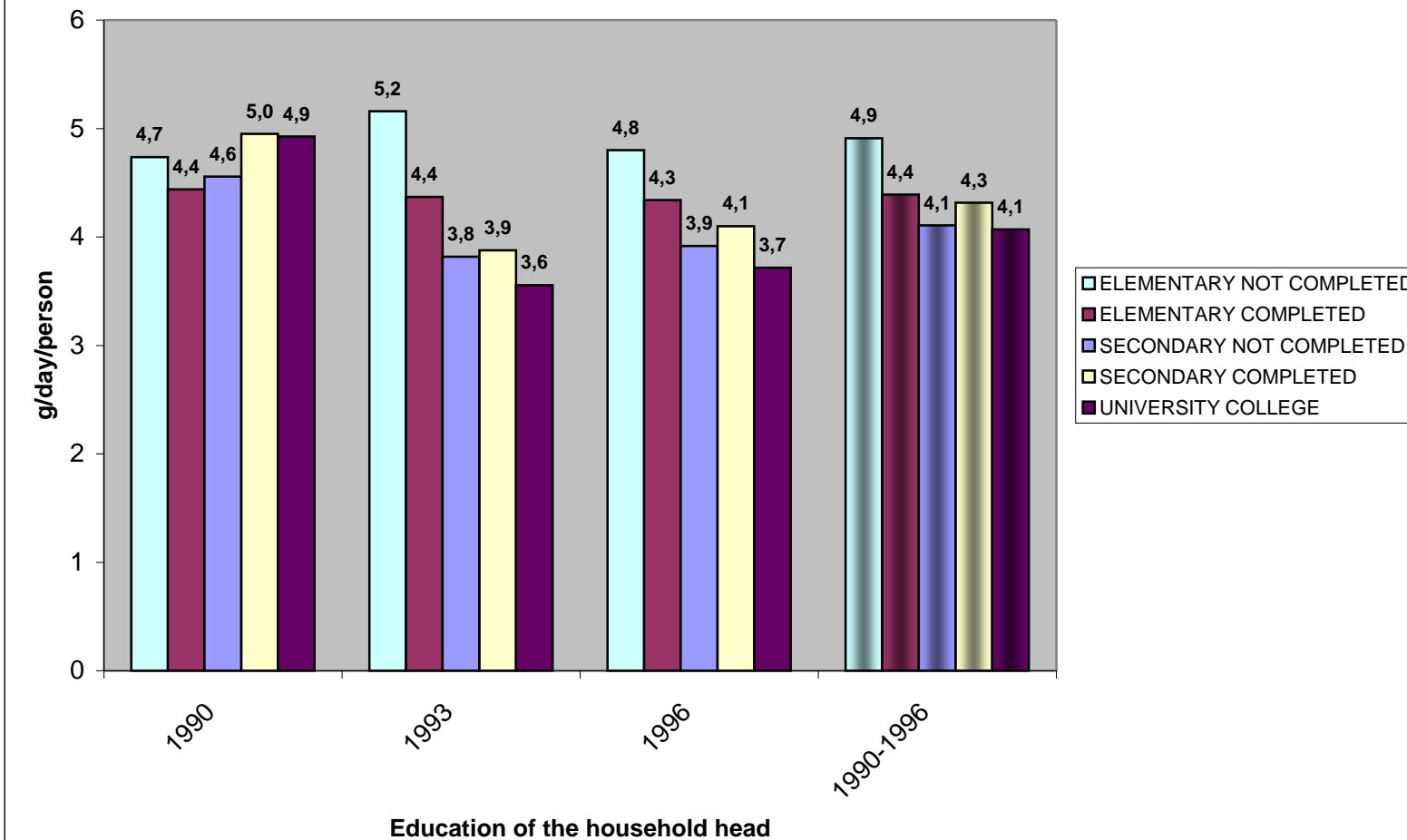


Figure 4. Pulses availability (g/day/person) by year and education of the household head  
ITALY 1990-1996



ANNEX 1 – Calculation of ATR%,  $I_{93-90}$ ,  $I_{96-93}$  for the daily individual availability (X) of 15 food groups, in Italy

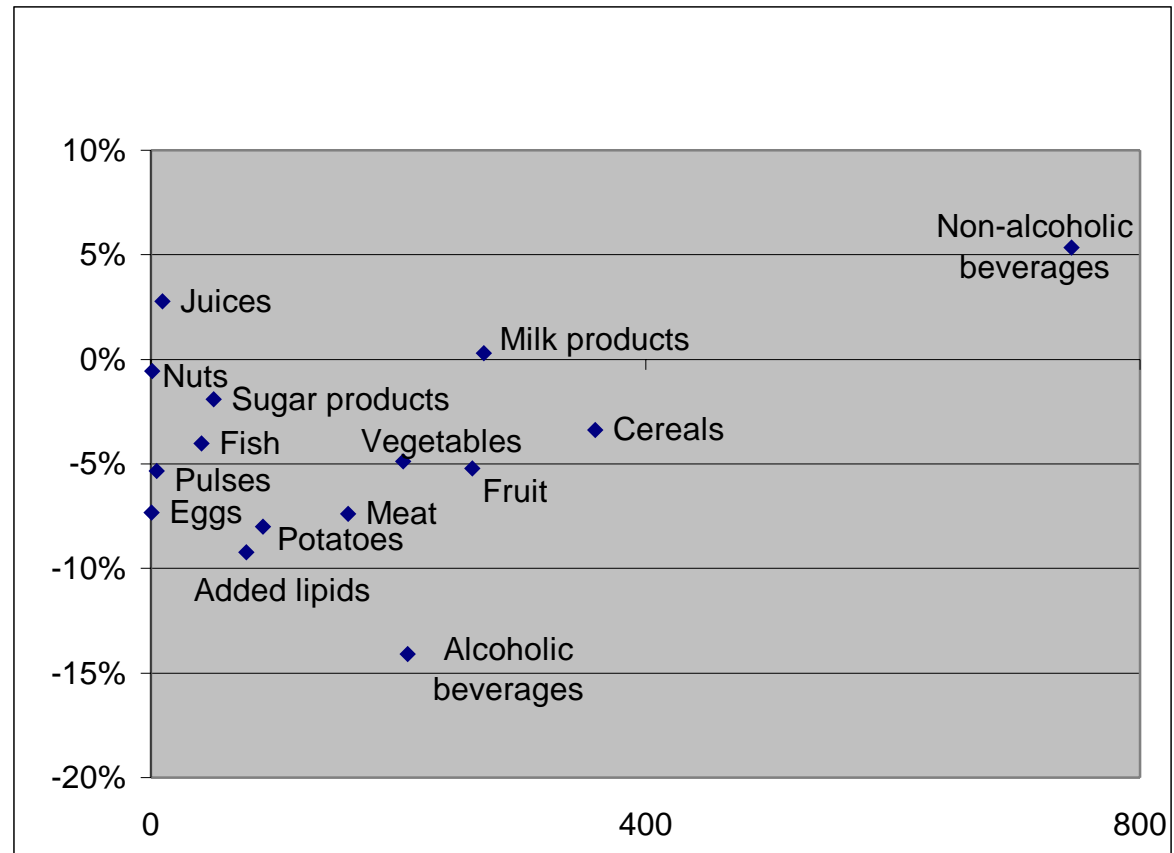
Food Groups	Indices (%)		
	ATR	$I_{93-90}$	$I_{96-93}$
Eggs	-7%	-11%	-4%
Potatoes and other starchy roots	-8%	-8%	-8%
Pulses	-5%	-11%	1%
Nuts	-1%	-3%	2%
Cereals and cereal products	-3%	-6%	-1%
Milk and milk products	0%	0%	0%
Meat and meat products	-7%	-12%	-3%
Vegetables (fresh and processed)	-5%	-8%	-2%
Fish and seafood	-4%	-7%	-1%
Fruits (fresh and processed)	-5%	-5%	-6%
Total added lipids	-9%	-12%	-7%
Olive Oil (g)	0.5%	-9.5%	-7.89%
Alcoholic beverages	-14%	-19%	-11%
Non alcoholic beverages	5%	3%	8%
Sugar and products	-2%	0%	-4%
Fruit and vegetable juices	3%	-13%	21%

$$I_{93-90} \% = \frac{X_{1993} - X_{1990}}{X_{1990}} \times 100, X = 1, \dots, 15$$

$$I_{96-93} \% = \frac{X_{1996} - X_{1993}}{X_{1993}} \times 100, X = 1, \dots, 15$$

$$ATR_x \% = \frac{I(X)_{96-93} - I(X)_{93-90}}{2} \times 100, X = 1, \dots, 15$$

ANNEX 2 – Percentage ATR% vs. the daily individual availability of 15 food groups in 1990, in Italy.



**ANNEX 3 – Comparison of food supply (Food Balance Sheets – FBS) and food availability (Household Budget Surveys – HBS) data: Means, absolute and relative differences, Average Trend Rates**

	Means (quantity/day/capita)						Differences (FBS– HBS)						Average Trend Rate	
	FBS <sup>1</sup>			HBS <sup>2</sup>			(a.v.)			(%)			FBS	HBS
Food group	1990	1993	1996	1990	1993	1996	1990	1993	1996	1990	1993	1996		
Eggs (pieces)	0.53	0.56	0.57	0.40	0.36	0.34	0.13	0.20	0.23	32.0%	56.5%	66.4%	3.79	-7.32
Potatoes and other starchy roots (g)	117	117	103	91	83	76	27	34	27	29.6%	40.4%	35.4%	-6.12	-8.00
Pulses (g)	13.7	14.7	14.3	4.6	4.1	4.1	9.1	10.6	10.1	196.1%	257.1%	244.7%	2.00	-5.33
Nuts (g)	13.5	12.7	15.9	0.9	0.9	0.9	12.6	11.8	15.0	1358.7%	1312.0%	1632.5%	8.70	-0.57
Cereals and cereal products (g)	431	416	432	359	338	335	72	79	97	20.1%	23.3%	29.0%	0.10	-3.39
Milk and milk products (g)	702	671	704	269	270	271	432	401	433	160.5%	148.3%	159.6%	0.12	0.28
Meat and meat products (g)	235	240	234	160	140	136	75	100	98	47.1%	71.2%	72.3%	-0.10	-7.40
Vegetables (fresh and processed)(g)	473	441	485	204	188	184	268	253	301	131.5%	134.6%	163.4%	1.36	-4.86
Fish and seafood (g)	63	62	64	41	38	38	22	24	27	54.1%	62.2%	70.6%	0.91	-4.01
Fruits (fresh and processed) (g)	354	376	348	260	248	233	93	128	115	35.9%	51.5%	49.4%	-0.76	-5.21
Total added lipids (g)	99	95	97	77	68	63	22	27	34	28.5%	39.9%	53.9%	-1.16	-9.24
Alcoholic beverages (ml)	237	221	222	208	168	149	29	54	73	14.0%	32.0%	49.1%	-3.03	-14.08
Non alcoholic beverages (ml)	n.c.	n.c.	n.c.	745	766	824	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.
Sugar and products (g)	83.2	83.3	83.0	50.8	50.7	48.8	32.4	32.6	34.2	63.9%	64.3%	70.1%	-0.10	-1.92
Fruit and vegetable juices (ml)	n.c.	n.c.	n.c.	9.09	7.9	9.59	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.

1. Original data were expressed in kg/year/capita. Daily values were derived by multiplying with 1000 and dividing by 365

2. DAFNE FOOD CLASSIFICATION SYSTEM

n.c. = not quantifiable

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