

# **Trends in food availability in Ireland – the DAFNE III project**

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## **Introduction**

Evaluation of trends in national and regional patterns of household expenditure on food, and household studies of food purchases and consumption at home and out of home, are part of the classical approach to nutrition surveillance (James & Ralph, 1991). As far back as 1979 the Irish Food Advisory Committee suggested a collaborative approach to nutrition surveillance in conjunction with the Household Budget Survey (HBS) (FAC 1979). Individual dietary surveys have been sparse in Ireland. The first took place in 1948 and was not undertaken again until 1990. More recently a detailed North South food consumption survey was undertaken (IUNA 2001) and the first national health and lifestyle survey SLAN, which included a 148 item semi-quantitative food frequency questionnaire (Friel et al. 1999). Whilst these provide food and nutrient information at a point in time, there is no comparable time trend data for dietary habits using individual dietary surveys.

As in many European countries, the Irish HBS is the only regular source of food information collected under governmental jurisdiction. Beginning in 1956 and until 1994, the survey was undertaken every seven years and is now repeated every five years. The data are used primarily as an economic measure to determine the pattern of household expenditure at a specific time, in order to update the weighting basis of the Consumer Price Index (CPI). Extensive household detail is recorded including socio-demographic and economic information, as well as expenditure on all commodities, including foodstuffs. A two week expenditure diary is maintained by the surveyed households and data collection staggered throughout the year to help alleviate seasonal variation in purchasing (CSO 1987, 1995 2001).

## **Methodology**

Irish participation in the DAFNE EU-supported project required compliance with the overall aims and objectives. In the Republic of Ireland, information is collected using a 14 day expenditure diary kept by all members of the household aged 15 years and over. In order to be compatible with the collaborative effort, Irish HBS expenditure data, for at least three surveys, had to be converted into quantities of foodstuffs available per person per day. This was done for data from three time points, 1987, 1994-5 and 1999-2000. Raw data on all commodities for 7,705 households (response rate 60%) in 1987, 7,877 (response rate 59%) households in 1994-95 and 7,644 (response rate 55%) households in 1999-2000 were supplied to the co-ordinating centre in Athens.

Originally, validation work of DAFNE estimates against individual nutrition surveys had begun on the 1987 survey, where, following identification of 188 food items in the HBS dataset, retail prices per unit weight were sought for each food. Adjustment of prices, collected from a number of different sources was made to those of 1987 using the CPI. Simple models were then used to estimate household food availability through application of the adjusted retail prices per unit weight to the expenditure data and further, household level data were then converted to food availability per person per day. An internal validation of quantities estimated using the retail prices was made using twelve foodstuffs for which the Irish HBS collects both expenses and quantities. The availability estimations from expenditure data using retail prices showed good agreement for most foodstuffs when validation with statistical office published quantities was made. (Friel et al. 2001). For the purposes of the trend analyses the 1987 prices were re-adjusted using the CPI to the years 1994 and 1999.

## **Results**

Table 1 contains the mean daily availability per person for each of the 15 food groups for the HBS years 1987, 1994-95, 1999-2000. As shown in Table 1 the overall availability of potatoes and added lipids appears to have decreased substantially over the twelve year period. Conversely, there was a marked increase in the individual mean availability of meat and meat products, vegetables, fruit, alcoholic beverages and fruit & vegetable juices.

### *Locality of Dwelling*

Figures 1-3 show the mean daily availability broken down by locality of dwelling for selected food items. In 1987 there was a substantial difference in the mean availability of potatoes between urban and rural households (Figure 1). Whilst decreasing over time in both localities, by 1999 the mean intake was almost the same.

Similarly but in the opposite direction, fish and seafood availability increased in both areas, but more so in rural localities, to a point in 1999 where the mean values were very close (Figure 2).

The mean availability of milk and products was greater in rural compared to urban areas for each of the three time points, although in both localities the values changed very little (Figure 3).

### *Head of Household Occupation*

In each occupational group [manual, non-manual, retired, other (students, housewives, unemployed and invalid persons)] the mean availability of potatoes decreased over time, but the difference between social groups remained similar in 1999 (Figure 4). In all years non-manual households reported the lowest mean availability and retired the highest.

Figure 5 shows clear differences in the mean availability of fish and seafood across the different social groups. Availability appeared to remain relatively constant in both the

manual and non-manual households, but a substantial increase was observed in the retired and other categories.

Vegetable availability increased over the three time points in retired, non-manual and other participants (Figure 6) whereas those in the non-manual experienced a more modest increase. By 1999 the non-manual and manual participants availed of substantially similar amounts of vegetables.

### *Household Composition*

Food availability was determined across eight categories of household composition in each of the three Irish HBS years. Figure 7 shows the mean potato availability decreasing over time for each household category. Households with elderly members reported the greatest availability, compared to single parent and two adults with children households who showed the lowest mean potato availability.

There was a varied change in fish and seafood availability across the three time points in the different household categories (Figure 8). Between 1987 and 1999, the mean availability actually decreased for lone parent households and very little change observed in two parent households. Households with elderly members showed some increase in mean fish availability as did single member households.

Figure 9 shows the mean fruit availability across the different household types. Increases were observed in households with one person, either aged 18-65 years or elderly, as well as in households of two adults, two elderly and those with adults and elderly. Very little change was observed over time among lone parent households, two parents and children and households with children, adults and elderly.

## **Discussion**

For the first time, monitoring changes in individual food availability over time has been done using Irish household budget survey data. The stability of the methodology used each year by the national statistical office helps ensure reliability of the original data. The statistical power of the data, through the large samples surveyed in each of the three time points, 1987, 1994-95 and 1999-2000 facilitates comparisons within and across years with a high degree of confidence in the results being both specific and sensitive.

Overall there were a number of substantial differences observed in mean availability of the 15 broad food groups across the three time points. Between 1987 and 1999 Ireland underwent major change, with the emergence of a vibrant economy and net immigration for the first time ever in the history of the State. The labour market structures also changed, and whilst agriculture remained a major sector, the service industry certainly expanded its share of the workforce whilst traditional manufacturing declined. These factors, along with free market economy trading helped create significant changes in Irish lifestyles, including that of dietary habits. What the DAFNE HBS figures show are a decline in the more traditional Irish foodstuffs such as potatoes, milk and added lipids such as butter. Traditionally the availability of food products was somewhat limited and certainly in the 1980s would have included these named Irish produced basic food commodities. Since the start of the nineties the diversity of foodstuffs available in Ireland has increased dramatically and normally seasonal items are now available throughout the year, as is also the case in other countries. The start of the nineties also saw the beginning of a strategic health promotion approach to population health. A number of nutrition related health promotion initiatives were instigated around then, having a potential knock on effect on food availability in the household.

The socio-demographic and economic breakdown of the DAFNE HBS estimates show clear social gradients in the mean availability of some foodstuffs, not unlike findings in individual dietary surveys. Whilst generally decreasing over time, there remained differences between localities in the mean availability of the traditional basic food items, like potatoes, milk and products, cereals and products, with rural areas reporting a greater

availability compared to the urban counterparts. For meat and meat products, the availability increased over time in both areas and may be due to there being a greater combination of meats including poultry plus greater availability of money and reduced meat prices. The expansion of foods on the market is clearly indicated by the large increase in reported availability of fruit and vegetable juices in both urban and rural areas, although with a markedly greater uptake in urban localities. Over the 12 year period of the three surveys, the range of these products increased enormously. Simultaneously there was active national public awareness raising concerning increased consumption of fruit and vegetables, including fruit and vegetable juice.

Differences in mean availability by social class, as indicated by occupational group, are observed for a range of food groups. In each year, retired respondents reported the greatest mean availability of each food group except that of fruit and vegetable juices. The mean availability of foodstuffs associated with affluence or promoted as healthy options, such as vegetables, pulses, fish, fruits and fruit/vegetable juices was greater among non-manual compared to manual households. Most other food items were similar in mean availability between these two groupings and decreased or remained steady over the three time points. It is difficult to interpret the socio-economic meaning of changes in food availability over time in the occupational category *other* (students, housewives, unemployed, invalid persons). The patterns follow those of the other categories but are probably somewhat deflated due to the heterogeneity of the grouping.

The mean food availability estimates made using the DAFNE HBS approach were also broken down across various household compositions. The presence of elderly members living in the household, either alone or with other elderly or adults, appeared to increase the mean availability for most food groups. Likewise, when children were present in the household, the mean availability of many food groups was lower compared to the other household categories. As shown in the previous figures and in attached tables, some foods varied markedly over time within the different households, for example potatoes, milk and products, fruit and vegetable juices, whereas some foods, such as fruit and pulses showed little variation with time.

As discussed in Friel et al (2001), a basic problem with the Irish HBS data for the purposes of DAFNE is that they are recorded mainly as expenditure, which for food availability estimation requires conversion and hence retail prices per unit weight. Using various price sources and specially conducted fieldwork, retail prices for all foodstuffs were eventually obtained. Conversion to the years of the study data, 1987, 1994 and 1999 was done using the national CPI. Clearly, to reach the mean availability per person involves a number of stages at which error may be introduced. Different socioeconomic status households may spend substantially more or less on any one food item depending on brand name and retail outlet pricing policy. Application therefore of an average national price could over or under estimate the true equivalent quantity of a foodstuff bought into a household. The demographic makeup of the household can also influence its purchasing patterns. Over reporting bias is acknowledged for elderly participants plus their inclination towards purchasing more food into the home but incurring more waste. Generic indices used in the CPI may not be sufficiently sensitive to price differentials of the individual food items and hence may result in over or under estimation of quantities from the expenditure data. It is necessary now to test the conversion of expenditure to food availability, using socio-demographic and economic specific models based on retail prices specific to those factors.

In conclusion, use of the HBS to estimate daily food availability per person over time highlighted important changes in food habits of the Irish population between 1984 and 1999 and particularly socio-demographic and economic differentials. This novel approach is particularly useful for nutrition surveillance purposes and provides data crucial for food and nutrition policy development in Ireland.

## References

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

<b>Food Group</b>	<b>Mean availability</b>		
	<b>1987</b>	<b>1994-5</b>	<b>1999-2000</b>
<b>Eggs (pieces)</b>	0.36	0.25	0.23
<b>Potatoes and other starchy roots (g)</b>	225	197	186
<b>Pulses (g)</b>	1.29	0.98	1.07
<b>Nuts (g)</b>	0.92	1.12	1.19
<b>Cereals and cereal products (g)</b>	289	301	289
<b>Milk and milk products (g)</b>	466	467	480
<b>Meat and meat products (g)</b>	133	142	166
<b>Vegetables (fresh and processed)(g)</b>	126	137	144
<b>Fish and seafood (g)</b>	11	12	13
<b>Fruit (fresh and processed) (g)</b>	88	89	101
<b>Total added lipids (g)</b>	43	27	22
<b>Alcoholic beverages (ml)</b>	13	30	40
<b>Non alcoholic beverages (ml)</b>	564	569	563
<b>Sugar and products (g)</b>	70	62	61
<b>Fruit and vegetable juices (ml)</b>	15	26	57

Source: the DAFNE databank

**Table 2:** Mean food availability in 1987 in Ireland, by locality of dwelling (quantity/person/day).

<b>Food Group</b>	<b>Mean availability</b>		
	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
<b>Eggs (pieces)</b>	0.36	0.39	0.34
<b>Potatoes and other starchy roots (g)</b>	225	257	206
<b>Pulses (g)</b>	1.29	1.10	1.42
<b>Nuts (g)</b>	0.92	0.74	1.03
<b>Cereals and cereal products (g)</b>	289	326	267
<b>Milk and milk products (g)</b>	466	538	421
<b>Meat and meat products (g)</b>	133	138	130
<b>Vegetables (fresh and processed) (g)</b>	126	129	125
<b>Fish and seafood (g)</b>	11	9.3	12
<b>Fruits (fresh and processed) (g)</b>	88	86	89
<b>Total added lipids (g)</b>	43	47	40
<b>Alcoholic beverages (ml)</b>	13	10	15
<b>Non alcoholic beverages (ml)</b>	564	605	539
<b>Sugar and sugar products (g)</b>	70	82	62
<b>Juices (fruit and vegetable) (ml)</b>	15	11	18

Source: the DAFNE databank

**Table 3:** Mean food availability in 1994-5 in Ireland, by locality of dwelling (quantity/person/day).

<b>Food Group</b>	<b>Mean availability</b>		
	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
<b>Eggs (pieces)</b>	0.25	0.26	0.24
<b>Potatoes and other starchy roots (g)</b>	197	218	184
<b>Pulses (g)</b>	0.98	0.83	1.08
<b>Nuts (g)</b>	1.12	0.93	1.24
<b>Cereals and cereal products (g)</b>	301	332	283
<b>Milk and milk products (g)</b>	467	518	435
<b>Meat and meat products (g)</b>	142	150	137
<b>Vegetables (fresh and processed) (g)</b>	137	141	135
<b>Fish and seafood (g)</b>	12	11	12
<b>Fruits (fresh and processed) (g)</b>	89	90	89
<b>Total added lipids (g)</b>	27	31	25
<b>Alcoholic beverages (ml)</b>	30	17	37
<b>Non alcoholic beverages (ml)</b>	569	606	547
<b>Sugar and sugar products (g)</b>	62	70	56
<b>Juices (fruit and vegetable) (ml)</b>	26	21	29

Source: the DAFNE databank

**Table 4:** Mean food availability in 1999-2000 in Ireland, by locality of dwelling (quantity/person/day).

<b>Food Group</b>	<b>Mean availability</b>		
	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
<b>Eggs (pieces)</b>	0.23	0.25	0.22
<b>Potatoes and other starchy roots (g)</b>	186	198	179
<b>Pulses (g)</b>	1.07	0.93	1.15
<b>Nuts (g)</b>	1.19	0.96	1.33
<b>Cereals and cereal products (g)</b>	289	306	279
<b>Milk and milk products (g)</b>	480	544	442
<b>Meat and meat products (g)</b>	166	178	158
<b>Vegetables (fresh and processed) (g)</b>	144	154	139
<b>Fish and seafood (g)</b>	13	13	13
<b>Fruits (fresh and processed) (g)</b>	101	99	103
<b>Total added lipids (g)</b>	22	24	20
<b>Alcoholic beverages (ml)</b>	40	23	49
<b>Non alcoholic beverages (ml)</b>	563	581	552
<b>Sugar and sugar products (g)</b>	61	66	57
<b>Juices (fruit and vegetable) (ml)</b>	57	50	62

Source: the DAFNE databank

**Table 5:** Mean food availability in 1987 in Ireland, by household composition (quantity/person/day).

Food Group	Mean availability							
	Adult household -single	Adult household -2 members	Adult + children (lone parents)	Adult + children	Adult + elderly	Adult + elderly + children	Elderly household -single	Elderly household -2 members
Eggs (pieces)	0.55	0.44	0.34	0.3	0.51	0.33	0.68	0.58
Potatoes and other starchy roots (g)	288	272	199	190	339	254	344	334
Pulses (g)	1.71	2.18	0.75	1.06	2.48	0.71	1.94	2.16
Nuts (g)	1.23	1.57	0.44	0.86	1.13	0.64	0.69	0.67
Cereals and cereal products (g)	437	348	234	249	412	274	489	426
Milk and milk products (g)	542	472	456	444	558	467	628	536
Meat and meat products (g)	182	183	103	114	191	121	194	193
Vegetables (fresh and processed) (g)	184	185	107	105	188	122	199	185
Fish and seafood (g)	15	18	8.1	8.7	16	9.9	17	15
Fruits(fresh and processed) (g)	125	124	68	79	106	83	126	109
Total added lipids (g)	57	52	31	37	63	42	67	62
Alcoholic beverages (ml)	28	27	2.5	9.6	27	7.6	17	26
Non alcoholic beverages (ml)	979	807	441	439	908	497	1241	922
Sugar and sugar products (g)	92	82	55	60	101	73	129	109
Juices (fruit and vegetable) (ml)	21	22	11	16	13	11	9.4	12

Source: the DAFNE databank

**Table 6:** Mean food availability in 1994-5 in Ireland, by household composition (quantity/person/day).

Food Group	Mean availability							
	Adult household -single	Adult household -2 members	Adult + children (lone parents)	Adult + children	Adult + elderly	Adult + elderly + children	Elderly household -single	Elderly household -2 members
Eggs (pieces)	0.36	0.32	0.20	0.21	0.33	0.23	0.49	0.39
Potatoes and other starchy roots (g)	257	247	179	167	275	210	320	287
Pulses (g)	1.54	1.68	0.91	0.75	1.51	0.93	1.8	1.63
Nuts (g)	1.50	1.85	0.66	0.99	1.2	0.62	1.54	1.3
Cereals and cereal products (g)	431	356	239	263	398	305	490	415
Milk and milk products (g)	525	456	430	450	535	478	621	548
Meat and meat products (g)	173	181	102	124	196	140	208	204
Vegetables (fresh and processed) (g)	183	194	115	116	192	132	221	193
Fish and seafood (g)	18	20	7.8	9.5	17	9.9	17	21
Fruits (fresh and processed)(g)	125	126	72	78	113	80	130	125
Total added lipids (g)	36	33	19	22	41	30	51	47
Alcoholic beverages (ml)	49	55	17	25	32	20	25	38
Non alcoholic beverages (ml)	892	740	435	455	834	605	1132	886
Sugar and sugar products (g)	71	65	47	55	80	64	107	102
Juices (fruit and vegetable) (ml)	25	28	25	29	16	18	15	14

Source: the DAFNE databank

**Table 7:** Mean food availability in 1999-2000 in Ireland, by household composition (quantity/person/day).

Food Group	Mean availability							
	Adult household-single	Adult household-2 members	Adult + children (lone parents)	Adult + children	Adult + elderly	Adult + elderly + children	Elderly household-single	Elderly household-2 members
Eggs (pieces)	0.34	0.29	0.19	0.18	0.33	0.23	0.42	0.39
Potatoes and other starchy roots (g)	255	236	166	157	256	171	327	253
Pulses (g)	1.63	1.37	0.86	0.86	1.78	1.26	1.49	2.33
Nuts (g)	1.69	2.01	0.66	0.89	2.57	1.29	1.03	1.59
Cereals and cereal products (g)	402	335	235	256	358	283	434	370
Milk and milk products (g)	555	491	461	459	567	519	627	545
Meat and meat products (g)	185	207	121	147	219	167	216	221
Vegetables(fresh and processed) (g)	187	205	106	118	208	149	221	215
Fish and seafood (g)	19	18	6.4	10	20	14	20	21
Fruits (fresh and processed) (g)	159	146	77	84	128	92	158	144
Total added lipids (g)	33	28	15	17	32	22	39	37
Alcoholic beverages (ml)	70	62	24	35	34	35	30	31
Non alcoholic beverages (ml)	826	698	484	471	725	611	859	759
Sugar and sugar products (g)	74	64	51	54	76	62	104	86
Juices (fruit and vegetable) (ml)	75	65	56	60	47	54	38	40

Source: the DAFNE databank

**Table 8:** Mean food availability in 1987 in Ireland, by occupation of the household head (quantity/person/day).

Food Group	Mean availability			
	Manual	Non-manual	Retired	Other*
Eggs (pieces)	0.34	0.33	0.52	0.35
Potatoes and other starchy roots (g)	220	199	310	242
Pulses (g)	1.23	1.11	2.27	1.29
Nuts (g)	0.81	1.23	0.94	0.55
Cereals and cereal products (g)	287	276	388	277
Milk and milk products (g)	466	463	516	451
Meat and meat products (g)	130	133	181	120
Vegetables (fresh and processed) (g)	116	126	176	120
Fish and seafood (g)	9.3	12	15	9.0
Fruits (fresh and processed) (g)	79	105	106	65
Total added lipids (g)	42	40	60	41
Alcoholic beverages (ml)	9.2	16	27	7.3
Non alcoholic beverages (ml)	526	516	886	561
Sugar and sugar products (g)	68	66	99	67
Juices (fruit and vegetable) (ml)	12	23	12	9.4

\* **Other:** Students / housewives/ unemployed / invalid persons

Source: the DAFNE databank



**Table 9:** Mean food availability in 1994-5 in Ireland, by occupation of the household head (quantity/person/day).

Food Group	Mean availability			
	Manual	Non-manual	Retired	Other*
Eggs (pieces)	0.23	0.22	0.37	0.26
Potatoes and other starchy roots (g)	181	169	266	227
Pulses (g)	0.80	0.87	1.75	1.02
Nuts (g)	0.88	1.54	1.36	0.61
Cereals and cereal products (g)	292	293	400	286
Milk and milk products (g)	462	464	520	455
Meat and meat products (g)	140	141	188	128
Vegetables (fresh and processed) (g)	124	130	189	141
Fish and seafood (g)	11	13	18	9.2
Fruits(fresh and processed) (g)	78	102	118	68
Total added lipids (g)	25	25	42	27
Alcoholic beverages (ml)	26	34	35	25
Non alcoholic beverages (ml)	520	526	837	578
Sugar and sugar products (g)	59	58	84	60
Juices (fruit and vegetable) (ml)	25	35	17	17

\* **Other:** Students / housewives/ unemployed / invalid persons

Source: the DAFNE databank.

**Table 10:** Mean food availability in 1999-2000 in Ireland, by occupation of the household head (quantity/person/day).

Food Group	Food availability			
	Manual	Non-manual	Retired	Other*
Eggs (pieces)	0.21	0.21	0.35	0.24
Potatoes and other starchy roots (g)	176	163	256	210
Pulses (g)	0.86	0.94	1.83	1.17
Nuts (g)	0.85	1.32	2.02	0.80
Cereals and cereal products (g)	278	279	358	286
Milk and milk products (g)	472	462	541	497
Meat and meat products (g)	162	160	211	157
Vegetables (fresh and processed) (g)	131	135	202	150
Fish and seafood (g)	11	13	20	12
Fruits (fresh and processed) (g)	82	109	139	82
Total added lipids (g)	19	20	32	23
Alcoholic beverages (ml)	36	46	41	28
Non alcoholic beverages (ml)	537.	519	746	593
Sugar and sugar products (g)	59	56	79	64
Juices (fruit and vegetable) (ml)	52	69	49	42

\* **Other:** Students / housewives/ unemployed / invalid persons.

Source: the DAFNE databank

Figure 1

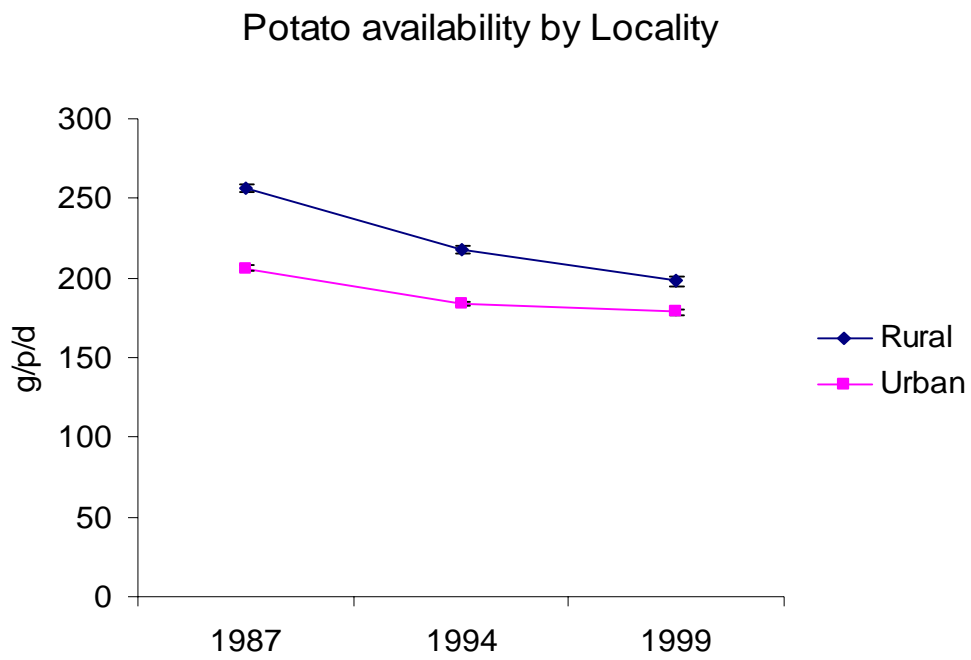


Figure 2

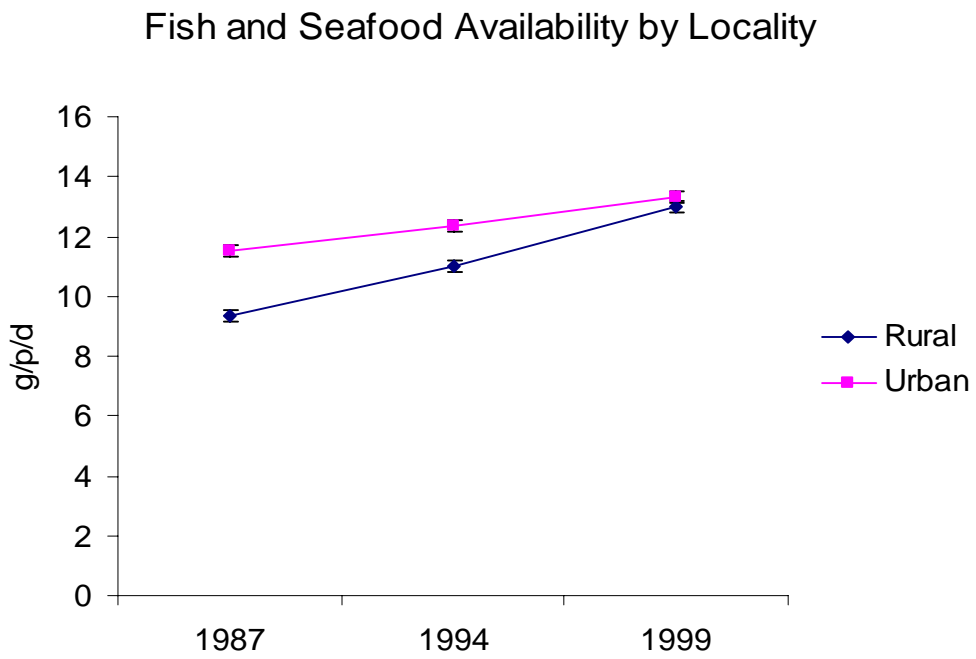


Figure 3

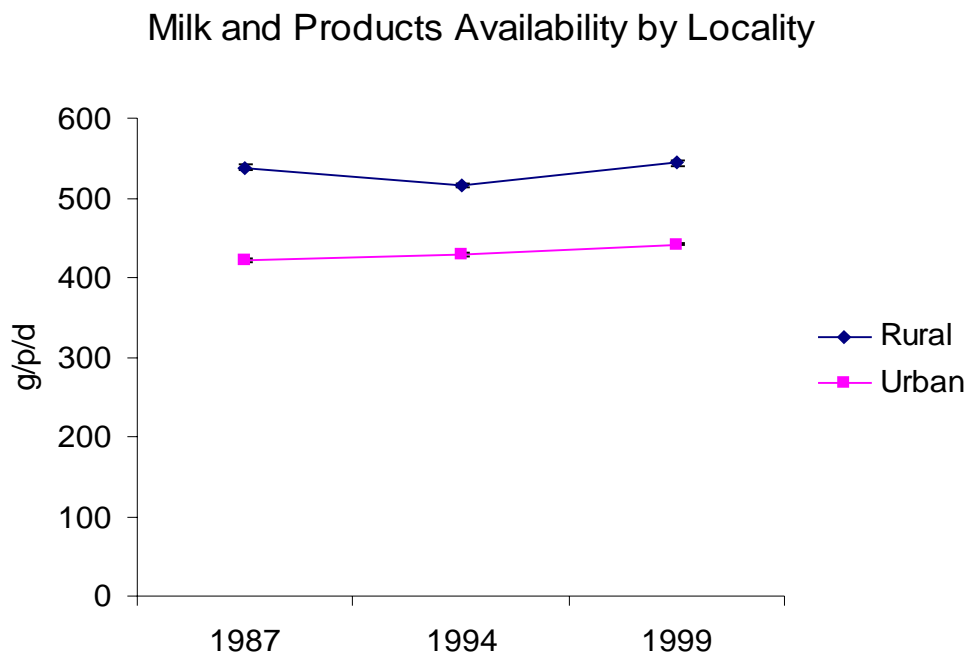


Figure 4

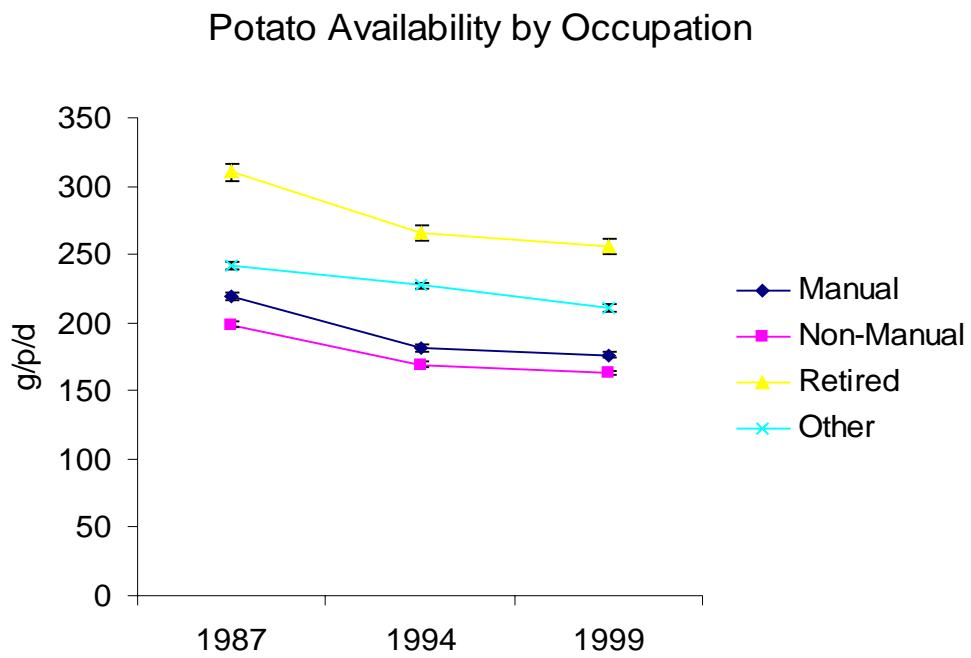


Figure 5

### Fish and Seafood Availability by Occupation

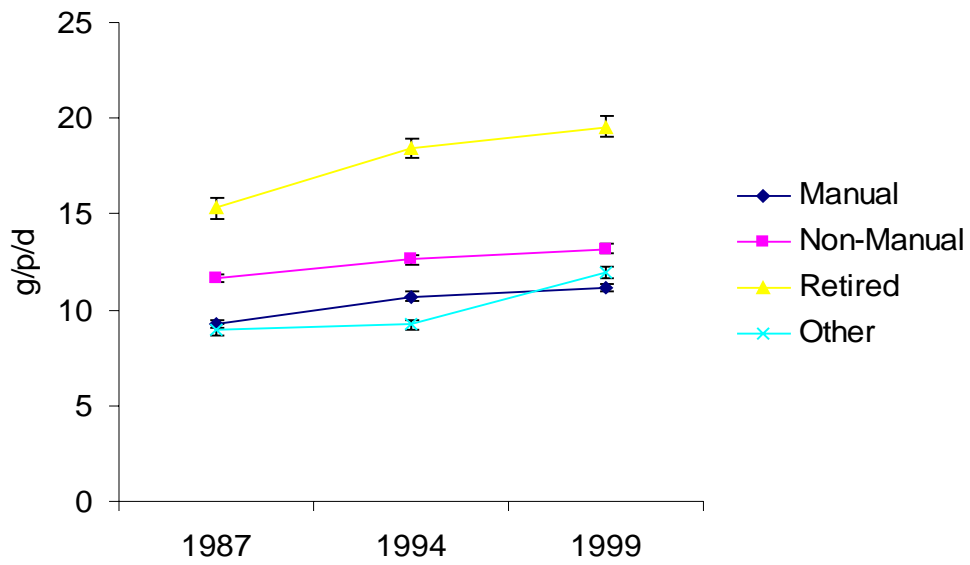


Figure 6

### Vegetable Availability by Occupation

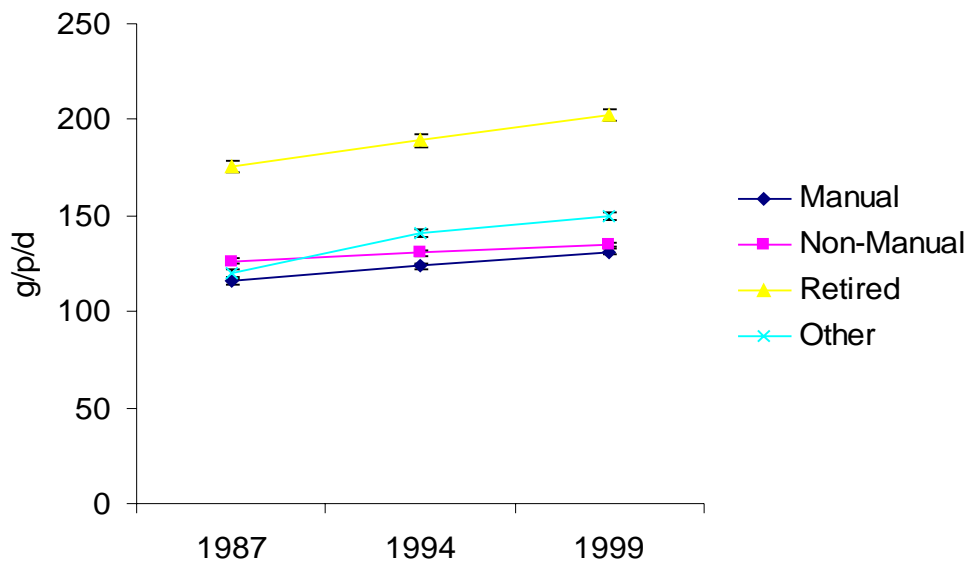
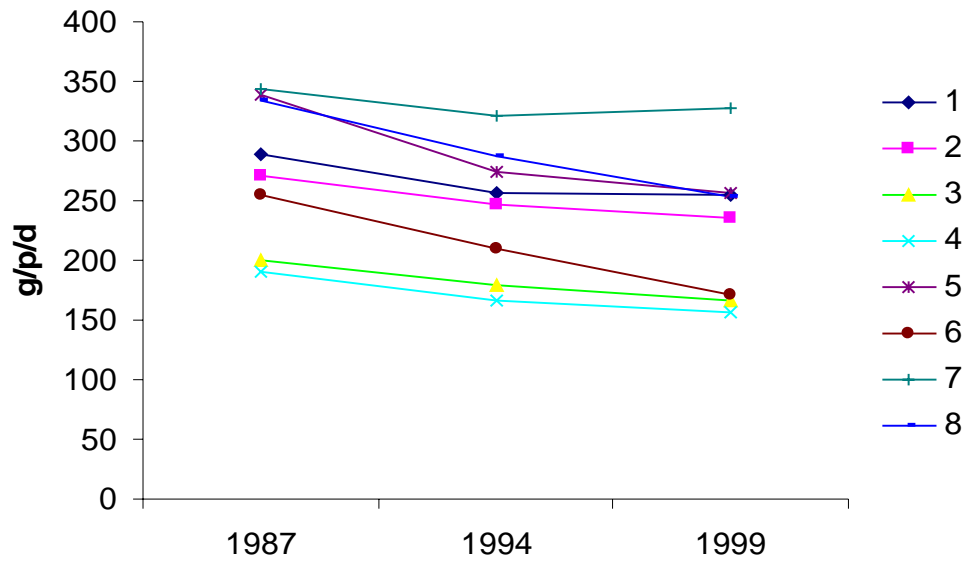


Figure 7

### Potato Availability by Household Composition



- 1: Adult household-single
- 2: Adult household-2 members
- 3: Adult + children (lone parents)
- 4: Adult + children
- 5: Adult + elderly
- 6: Adult + elderly + children
- 7: Elderly household-single
- 8: Elderly household-2 members

Figure 8

### Fish & Seafood Availability by Household Composition

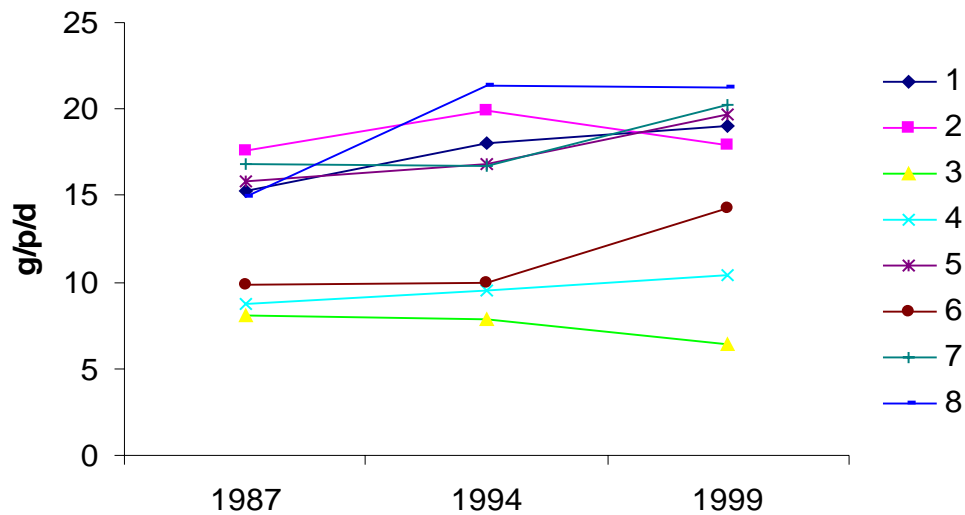
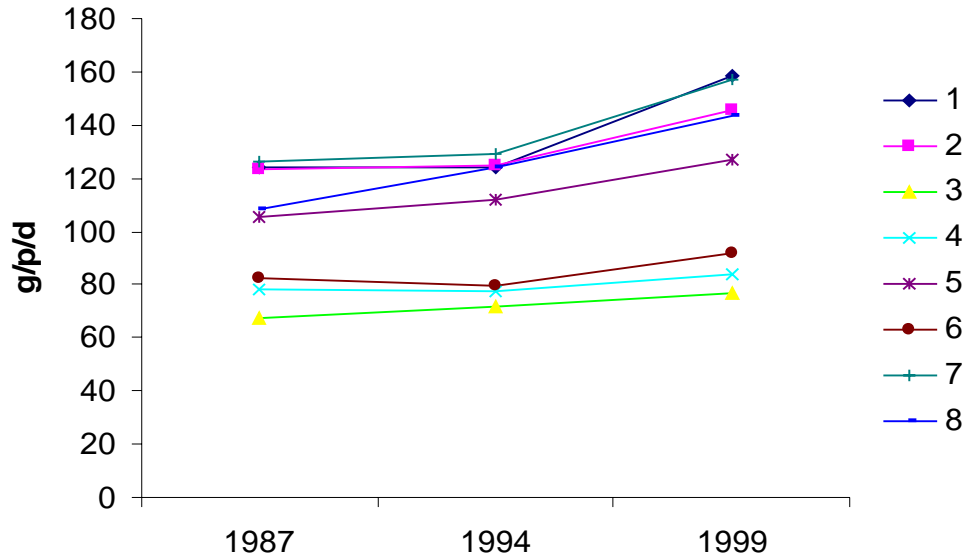


Figure 9

### Fruit Availability by Household Composition



1: Adult household-single  
4: Adult + children  
7: Elderly household-single

2: Adult household-2 members  
5: Adult + elderly  
8: Elderly household-2 members

3: Adult + children (lone parents)  
6: Adult + elderly + children

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