Mediterranean Diet and Cereals' Consumption in Greece (1957-2005)

Ioannis Sotiropoulos

Department of Finance and Auditing, TEI of Epirus, Greece

E-mail: sotiropoulosioan@yahoo.gr

Abstract

An attempt is made in this paper to describe the development of dietary consumption of cereals and bread in Greece during the period 1957 - 2005. Greece is a typical example and the cradle of global food culture known as the "Mediterranean diet". This dietary culture has experienced huge changes and has declined, in the period 1950 - 2005. Certain foods which are important (because of their long tradition) for the "Mediterranean diet" like "bread, flour, cereals" have suffered a serious decline in overall food intake and significant changes in characteristics. These changes involve the internal structure of cereal consumption where is also observed the decline of Mediterranean features and "globalization - westernization" of alimentary standards. All dimensions of alimentary consumption patterns of cereals and bread are examined here with a specific focus on socio-economic attributes of these patterns of consumption.

1. Introduction

This paper reports on the consumption of an important food category in the Greek diet, cereals. This category includes bread, a characteristic food with symbolic dimensions in the traditional Mediterranean diet. The reporting time period is 1957-2005, since no officially organized statistical data are available before the 2nd World War. Our analysis is not limited to the description of statistical information of data presented in the National Statistical Service of Greece reports (E.S.Y.E. 1957 - 2005) since: A) Related data are broken down and re-synthesised again using new categorisation dimensions (regarding the whole population and individual socio-economic groups) so that the consumption patterns can be analysed in depth; B) The existing differentiations and inversions identified are then used to provide a tentative answer on the features of cereals' consumption in the period examined.

2. Theoretical background and methodology

The development of food consumption is examined within the wider frame of demand and supply. Demand for food products is taking place within a fluid "alimentary environment" that rapidly changes (Deaton 1992). Supply relates to not simply offering food but complete "food-packages with specific attributes" (Lancaster 1966, Georgakopoulos and Thomson 2005, Georgakopoulos *et al.* 2006, Georgakopoulos *et al.* 2008). This is an issue of high importance especially for bread in Greece, since the Greek diet, from ancient times until now (the ancient poet Homer, in the Iliad and the Odyssey, calls Greeks as "bread eaters", in contrast to north-European peoples, whom he calls as "meat eaters"), is based on bread consumption (Montanari 1993). The high cereals' consumption in Mediterranean basin in terms of quantity and various forms (pasta, pizza, croissant, hoecake, pies, hilopites, frumenty, etc) provides the evidence that such issue has wider dimensions, affecting economic and social lifestyles and cultures.

In order to construct a basis for the qualitative description of Greek diet the qualitative formula from Sotiropoulos (2010b) was used:

$Q_{alimentary\ pattern} = (Q_{natural\ characteristics}, Q_{technical\ characteristics}, Q_{biological\ characteristics})$,

rewritten as:

$Q_{alimentary\ pattern} = (Q_{plant\ components}, Q_{animal\ components}, Q_{agricultural\ components}, Q_{industrial\ components}, Q_{biological\ components})$

This formula arises from the general relationship: $CM_d = (Ch_n, Ch_d)$ and it can be applied to each category of population (with economic, social - professional, geographical, demographic, seasonal, etc criteria). Thus, it is possible to create indices which can be the basis for constructing tables and diagrams that describe and characterize the alimentary patterns. The latter can provide a valuable stating point to comprehend and interpret the cereals' alimentary patterns.

Additionally, ANOVA analysis was used to test if there is statistically significant difference in the percentage of the various food categories over the examined period. Finally, two linear regression analyses (y = a + b t + e, where e: random error) were conducted to examine if there is statistically significant a) reduction of bread consumption and b) increase of processed cereals consumption over time. Specifically, for the first regression the dependent variable was the percentage of bread in the total cereals consumption and the independent variable was the time, while for the second regression the dependent variable was the percentage of processed cereals in the total cereals consumption and the independent variable was the time.

3. Cereals' and bread consumption in Greece

The daily diet of Greek consumer becomes, during the examined period (1957-2005), increasingly greasier and richer in calories, proteins, and sugars (Sotiropoulos, 2010a). Specifically, the proportion of plant based foods (cereals, bread, legumes, vegetables, fruits, olive oil, wine, small amounts of goat/lamb meat) compared to animal foods in the traditional Greek "Mediterranean" alimentary model of 1950's was overwhelming. This alimentary pattern changed at the decade of 1980s in favour of animal origin foods, but by the end of 90's, due to the adoption of industrial – international lifestyle, the plant origin foods became again more important than the animal ones. Only to mention that expenses on "bread and other cereals" in 1957 accounted for 22.6% of the total food expenses, but fifty years later their proportion has fallen to 6.8% (Sotiropoulos, 2010a). Moreover, while half of the total food expenditure in 1950's was dedicated to cereals and fruits-vegetables (the two bigger categories of plant products), this proportion has shrunk to one third afterwards because of the reduction of cereals consumption.

According to Figure 1 the structure of alimentary patterns is continuously changing during the examined period. During the 1950s and 1960s cereal (bread), vegetables and legumes, fruits and olive oil dominated Greek alimentation. However, these traditional food categories had been characterised by a gradual reduction in consumers' demand until 1974. A large increase in meat consumption in general was recorded in H.B.S of 1974. This became a typical feature of the Greek alimentation until the end of the 90s. From the beginning of the 80s onwards a new trend emerged that also proved elemental in the formation of the contemporary dietary habits in Greece. There was a progressive and constant increase on food expenditure "away from home". This included expenditure on industrial/processed products (such as non-alcoholic beverages for example).

Louis Malassis (1986) using data from the period 1975/77 distinguished 9 basic alimentary models around the world: Anglo-Saxon, Central-European, Scandinavian, Mediterranean, Eastern-European, Japanese, Traditional rural cereals, Traditional rural vegetables (potatoes etc), and Traditional mixed (cereals, milk, meat) nomadic animal breeding populations (Table 1). Consequently, the differences between Mediterranean patterns and the Anglo-Saxon and European ones are apparent when comparing the structure of alimentary patterns internationally. However, these differences tend to eliminate during the last two decades (Figure 1) because the Greek diet is rapidly industrialized approaching the Anglo-Saxon and Centre-European patterns.

The "flour, bread, cereal" group is an indicative example of the industrialisation of the modern Greek alimentary patterns (Table. 2). Traditional products' percentages are diminishing over time, while simultaneously industrials' are increasing. Bread consumption had stabilised in 2005 at the half of total cereal consumption with a slightly decreasing trend. Other processed cereals substituted traditional agricultural food products and captured the other half of total cereal consumption. This is in sharp contrast to the situation at the beginning of the examined period where processed cereals share was less than 1/5 in total household expenditure on cereals. This is also the case for own-products (farming for self-sufficiency) consumption which captured 15.2% in 1963/64 but less than 2% by 2005 (cereals/ total of own consumption) (Sotiropoulos, 2004).

Thus, the symbolic for the Mediterranean diet category of cereals is slowly industrialised (pastas, biscuits, dried bread etc.) during the first two decades of the examined period, losing at the same time its agricultural - cottage and traditional features (flour, bread, rice, wheat, maize). For bread, the most important element of this group, its percentage is rapidly decreasing from the decade of 1950s until 1980s (15.6% in 1957/58, 8.6% in 1981/82, 10.0% in 1993/94, 8.6% 2004/05). Since then, its percentage is stabilised and this conclusively influences decisive the "behaviour" of the entire category of cereals. After the 1980s this industrialisation accelerated as new cereal-based processed products appeared (such as corn flakes, savoury snacks - crisps, crackers, pancakes, tarts, pop-corn, porridge, homogenised baby food, low calories products, etc.). All these products had western origins and complied with the international alimentary patterns.

However these patterns also had social and biomedical repercussions. Associated physical appearance trends promoted now the slim/thin body type (as opposed to the heavier body type of previous periods in Western Europe). This in turn promoted new lifestyles and values (e.g. tourism growth and the male/female physical appearance on the beach). Cereals containing sugar and pastas decreased their participation in the related food consumption

expenditure. The extent of this change became even more evident during the "sugar/fat-scare" period (after the 1960s - Malassis 1986, Fischler 1990) and it was also based on medical suggestions, work related/professional demands, sovereignty of picture (and physical appearance issues) in the digital era, etc.

4. Cereals (and bread) consumption of the different groups of the population.

Data analysis revealed significant differentiations in the alimentary consumption patterns among the different (economic, vocational, demographic, urban-rural, etc) groups of the population during the examined period (Table 3.1). One can observe various behaviours such as innovative, traditional, intermediate – "average Greek", particular and so on.

For example, during the traditional decade of 1950s, the superiority of the higher economic groups (i.e. "purchases of more than 4,70 € per month") (Table 3.2) in the new meat products, as well as, in the expenditure on "food away from home", is important, compared to the lower economic classes (i.e. "purchases of up to 0,73 € per month") (Sotiropoulos, 2010a). These differences in the alimentary patterns become radical at the last decade and it is only meat and dairy products that maintain percentages of around the 10%, while the other categories shrink in very small percentages. For higher economic groups the expenditure on cereals approached 10% of the total food expenses during the decade of 1950s, but by 2004/05 (i.e. "purchases of more than 3.501 € per month") this percentage fell to around 5%. On the contrary, the alimentary patterns of the lower economic classes (i.e. "purchases of up to 750 € per month") showed very little changes during the examined period, while the percentage of expenditure for food groups such as bread-cereals, meat and dairy products is rather high (above 16%). Consequently, the alimentary patterns of the higher economic classes could be described as "industrial-internationalized", while those of the lower economic classes never diverged from their rural and traditional features (Sotiropoulos, 2010a).

Table 4.1.a. shows the changes that took place in the structure of cereal consumption during the last half century in Greece. Agricultural products have decreased their contribution to the total of cereal consumption, while simultaneously the processed cereals have raised their share. Flour and rice have decreased their percentages in all economic groups. The same is the case for bread (traditional Mediterranean product), especially in the higher economic groups of the population. The percentages of new processed cereals (i.e. rusks, biscuits, etc) increased very considerably and especially in the higher economic groups more than twofold.

Contrary to the various economic groups of population, where the differences continue to exist or even to be intensified over time, the differences among the various vocational groups (Table 4.2) were also important at the first post-war decades until 1970s, and afterwards they begin to mitigate, although there are differentiations among them, and a time delay is apparent between lower and higher vocational groups. This time delay is due to the earlier adoption of the "new" alimentary patterns by the higher vocational groups (directors, employers, etc) compared to the lower vocational groups (workers, unemployed etc.), which they follow gradually (after HBS 1974, Sotiropoulos, 2002). The quantitative differentiations pertain to the higher percentages of the higher vocational groups compared to the lower vocational groups for these new food products, while the share of cereals in the total food expenses is lower for the higher vocational groups compared to the lower vocational groups (Table 3.1).

The findings based on geographical criteria are similar to the above (Tables 4.3 and 4.4). The differences of alimentary patterns between urban and rural areas at the decades 1950s and 1960s were rather significant. The most indicative example comes from the HBS 1963/64 (Sotiropoulos, 2006). The bigger villages – towns (5.000-9.999 residents) had adopted alimentary patterns close to those of higher socio-economic and vocational groups, while the smaller villages' patterns were based mainly on cereals, which are usually found at certain regions of 3rd World and South Mediterranean (e.g. Morocco) (Malassis, 1986).

According to HBS 1974 (Sotiropoulos, 2006) the differences between rural and urban alimentary models have already considerably been blunted, and from, at least, a qualitative perspective, no substantial differences are observed. However, differences are still apparent in the way that the alimentary behaviours develop in the long term. For example, the consumption of bread-cereals in rural areas is reduced by the end of the fifty-year period, but the fluctuations are more intense than those of urban areas, and the percentages are always bigger than urban areas (Table 3.1).

The percentage of traditional processed products, such as bread, is decreasing in urban households, but on the contrary it is increasing in rural (Table 4.3). However, the share of the new processed products is increasing in both types of households, but with different pace; higher in urban and lower in rural households. Thus, it is evident that the new processed cereals substitute flour and bread in the urban households, while at the rural households the new processed cereals and bread substitute flour. The difference in percentages between the two types of households is considerably important (42.9 % and 29.2 % for urban and rural households, respectively) in HBS 2004/05 (Table

4.3.). Thus, particularities and special divergences in the convergence of alimentary patterns are observed, since at the beginning of the examined period the differences were minimal (18.9% and 17.5% for urban and rural households, respectively).

The analysis based on demographic criteria (Tables 3.1, 4.5 and 4.6) revealed significant differences among the relevant groups of the population and over time. The structure of alimentary patterns of big households ("8 members and more" in HBS 1957/58 and 1963/64 and "6 members and more" in all the subsequent HBSs), as well as of elderly ages ("75 years old and more") very little changed during the last fifty-year period, even though it slowly diverged from its agricultural and plant features. On the contrary, the small households ("1 member") and even more the younger ages ("up to 24 years old") along with the higher economic are the "leaders" of industrialised-internationalised behaviours and consequently of the changes of alimentary patterns in Greece. Although, at the beginning of the examined period, the differences among the above mentioned groups were minimal, the younger ages show (after the higher economic groups) the lower percentage in cereals consumption, unlike elderly ages, and high degree of industrialisation. Elderly households present a moderate degree of industrialization regarding cereals consumption.

The seasonality of cereals consumption patterns seems to decrease after the HBS 1974 (Sotiropoulos, 2002) and it is becoming even smaller after the decade of 1980s' (Table 4.7). Processed cereals and bread are predominant during all seasons of the year.

Finally, the consumption patterns of bread, the symbolic element of cereals, are highly influenced by the socio-demographic environment. This environment is not positive, from biological perspective, at the end of the examined fifty-year period, in terms of calories, fats, sugars and proteins consumption, since this had already reached to relatively high levels by the decade of 1980s. Moreover, the modern nature of work and social relationships do not require high levels of such elements consumption. The work is not manual any more to the extend it used to be at the decade of 1950s, due to the enormous reduction of farmers and workers' percentage and to the great technological changes in working conditions. Automatisms, air conditioning, ergonomics and other technological improvements, as well as the "office environment", do not require any more a substantial and simultaneously cheap meal or snack based on bread. Instead, more vitamins and minerals, that generally strengthen memory and other intellectual functions, are necessary.

The modern transportation, communication and residential conditions reduced drastically the daily needs for human energy and they contributed to the great increase of food choices and to the association of meals with other activities such as work, entertainment, etc. Thus, the traditional lunch or dinner lost its social and functional role in the patriarchal family and it has been replaced, to great extend, by smaller and more frequent food intakes [snacks, chips, toast, cheese pies, meat (mainly pork) skewers, hamburgers, etc].

5. Results of statistical analyses

Two-Ways ANOVA analysis (Table 5) showed that the F statistic regarding the factor FOOD is 41.95 with 4 and 25 degrees of freedom. P value is less than 0.001, indicating that there is statistically significant difference in the percentage of the various food categories over time.

According to the first regression analysis (bread percentage over time) the estimate of coefficient b is different from zero and it is statistically significant, as $p < 0.01$. The estimate of coefficient b for the second regression analysis (processed cereals percentage over time) is also different from zero and it is statistically significant, at $p= 0.005$. Thus, the analyses confirmed the statements that bread consumption is reducing over time, while processed cereals consumption is increasing.

6. Conclusions

The examination of alimentary consumption in post-war Greece using economical, socio-vocational, geographical and demographical criteria demonstrates the changeable nature of dietary behaviour. Cereals consumption in Greece during the last half century changed significantly in terms of characteristics, industrialisation and internationalisation. The traditional alimentary patterns, based on bread consumption, loose their significance, cereals consumption (and especially of traditional bread) is decreased drastically in favour of processed and international-"western" origin products.

The socio-economic groups that contribute to these changes are the higher economic and vocational groups of population, the younger ages, the urban households, especially of Athens and Thessalonica, and the households with few members. On the contrary, the elderly ages, the lower vocational groups of population, the rural households and mainly the lower economic groups behave relatively traditionally and they industrialise – internationalise their consumption patterns at lower pace.

References

Deaton, A. (1992). *Understanding consumption*, Oxford, Clarendon Press

E.S.Y.E. (several years). *Household Budget Surveys (HBS) 1957/58, 1963/64, 1974, 1981/82, 1988/89, 1993/94, 1998/99, 2004/05.* The National Statistical Service of Greece. Athens, Greece.

Fischler, Cl. (1990). *L' Homnivore*, Paris, Odile Jacob.

Georgakopoulos, G., & Thomson, I. (2005). Organic Salmon Farming: Risk Perceptions, Decision Heuristics, and the Absence of Environmental Accounting. *Accounting Forum*, Vol. 29(1), 49 – 75. doi:10.1016/j.accfor.2004.12.002, http://dx.doi.org/10.1016/j.accfor.2004.12.002

Georgakopoulos, G., & Thomson, I. (2008). Social Reporting, Engagements, Controversies and Conflict in an Arena Context. *Accounting Auditing & Accountability Journal,* Vol. 21(8), 1116 - 1143. doi:10.1108/09513570810918788, http://dx.doi.org/10.1108/09513570810918788

Georgakopoulos, G., Ciancanelli, P., Coulson, A., & Kaldis, P. (2008). Stewardship and Risk: an Empirically Grounded Theory of Organic Fish Farming in Scotland. *The Agricultural Economics Review*, Vol. 9(2), 16 – 30

Georgakopoulos, G., Thomson, I., Coulson, A., Sotiropoulos, I., & Kaldis, P. (2006). Exploring Social, Financial and Ecological Risks of the Scottish Salmon Industry: an Empirical Evidence for the Business Decision Making to go Organic. *The Southeuropean Review of Business Finance and Accounting*, Vol. 4(1), 5 – 42

Lancaster, K. (1966). A new approach to consumer theory, *Journal of political economy*, n° 74, 132 – 157. doi:10.1086/259131, http://dx.doi.org/10.1086/259131

Malassis, L. (1986). *Economie agroalimentaire,* Tome III, Paris, Cujas

Montanari, M. (1993). *La Fame e L' Abbondanza. Storia dell' Alimentazione in Europa*, Roma, ed. G.Laterza & Figli

Sotiropoulos, I., & Demoussis, M. (2002). Η διατροφική κατανάλωση στην Ελλάδα κατά τη μεταπολεμική πεντηκονταετία 1950-1999. (Dietary Consumption in Greece During the Postwar Period 1950 – 1999). Paper presented in the *7th Panhellenic Conference of E.T.A.G.R.O*. Proceedings, 457-469

Sotiropoulos, I., & Mygdakos, E. (2004). Η διατροφική αυτοκατανάλωση στην Ελλάδα: 1957-1999. (Dietary Self-Consumption in Greece: 1957-1999). Paper presented in the *17th Panhellenic Statistical Conference. The Statistical Insitute of Greece (E.S.I.)*. Proceedings, 407-414

Sotiropoulos, I., Mygdakos E., & Rezitis, A. (2006). Αστικά και Αγροτικά Διατροφικά Πρότυπα στην Ελλάδα την περίοδο 1957-1999: Οικονομική Ανάλυση Χαρακτηριστικών και Εξέλιξη αυτών. (Urban and Rural Dietary Patterns in Greece from 1957 to 1999: An Economic Analysis of their Characteristics and Their Evolution). Paper presented in the *19th Panhellenic Statistical Conference. The Statistical Institute of Greece (E.S.I.)*. Proceedings, 465-472

Sotiropoulos, I., Georgakopoulos, G., & Kyritsis, K. (2010a). Globalisation of the Alimentary Consumption Patterns in Greece (1957 to 2005); An economic analysis, *International Journal of Economics and Finance*, Vol. 2, No 1, 120-130

Sotiropoulos, I., Frangos, Const., & Frangos, Chr. (2010b). On a Broader Descripton of Alimentary Consumption Patterns: The case of Greece (1950-2005), *Journal of Mathematics Research*, Vol. 2, No 2, 65-72

Table 1. Typical Products of Characteristic Alimentary Models.

Anglo-Saxon	Central-European	Scandinavian	Japanese	Mediterranean	Traditional
Meat	Meat	Fatty foods	Fishes	Cereals	A) Cereals
Milk	Milk	Milk	Cereals	Legumes	B) Vegetables
Fats	Fats *	Fishes		Fruits & Vegetables	C) Nomadic people**
Sugar	Sugar *			Olive oil	

* (less quantities than Anglosaxon)

**(cereals, milk, meat)

Source: L.Malassis, 1986, page 45.

Table 2. Structure of Cereals' Consumption during 1957-2005, (%).

HBS:	1957/58	1963/64	1974	1981/82	1987/88	1993/94	1998/99	2004/05
Bread	67.0	31.3	55.3	55.1	49.9	55.6	50.5	50.7
Flour	6.4	24.1	8.7	8.2	5.2	3.9	4.1	3.9
Rice	7.5	11.1	13.2	7.9	8.1	6.5	6.3	6.0
Processed Cereals	18.9	17.5	20.4	23.1	31.1	31.2	39.1	39.4
Wheat, maize, etc		16.0	2.1	5.6	5.7	2.8		
Total	100	100	100	100	100	100	100	100

Data Source: E.S.Y.E., (several years: HBS 1957/58, 1963/64, 1974, 1981/82, 1987/88, 1993/94, 1998/99, 2004/05).

Table 3.1. Cereals' Consumption per demographic group during 1957-2005, (%).

HBS:	1957/58	1963/64	1974	1981/82	1987/88	1993/94	1998/99	2004/05
I	10.4	10.5	6.0	6.3	7.0	8.2	6.7	7.1
II	12.6	12.9	7.6	7.2	6.9	7.9	7.2	7.0
III	16.1	17.7	9.2	8.4	8.6	9.7	8.4	8.4
IV	18.0	18.6	9.7	8.8	8.7	10.5	9.6	9.1
V	14.4	18.6	9.8	9.0	9.2	10.5	9.1	9.0
VI	12.3	14.9	9.1	7.2	8.2	8.9	7.6	8.2
VII	21.2	19.2	10.9	10.2	10.9	12.8	11.2	10.3
VIII	15.6	17.9	-	8.2	8.8	10.1	9.1	9.6
IX	20.8	27.7	-	9.3	10.2	11.9	11.1	10.4
X	-	15.7	11.4	9.5	10.5	12.2	10.7	10.8
XI	-	15.3	7.1	7.2	6.9	6.8	6.7	5.5
XII	9.8	19.5	5.4	6.3	6.6	8.4	5.9	6.5
XIII	21.9	19.6	23.7	15.5	14.6	17.5	16.3	14.3
XIV	15.6	14.4	8.5	8.0	8.3	9.3	8.1	8.0
XV	18.8	18.0	13.0	9.9	9.9	11.9	10.4	10.7

I.   Higher Vocational Groups A': e.g. Directors, etc

II.   Higher Vocational Groups B': e.g. Employers, etc

III.   Lower Vocational Groups A': e.g. Employees or wage earners

IV.   Lower Vocational Groups B': e.g. Craftsmen or workers

V.   Lower Vocational Groups C': e.g. Unemployed or first-time work seekers

VI.   Small households: 1 member

VII.   Big households: "8 members and more" in HBS 1957/58 and 1963/64 and "6 members and more" in all the later HBSs

VIII."Couple with 2 children"

IX.   "Couple with 3 children"

X.   Elderly ages: 75 years old and more

XI.   Young ages: Up to 24 years old

XII.   Higher economic groups

XIII. Lower economic classes

XIV. Urban regions

XV.   Rural regions

Data Source: E.S.Y.E., (several years: HBS 1957/58, 1963/64, 1974, 1981/82, 1987/88, 1993/94, 1998/99, 2004/05).

Table 3.2. Expenditure of the Lower and Higher Economic Groups (in €).

HBS	1957/58*	1963/64**	1974	1981/82	1987/88	1993/94	1998/99	2004/05
Higher Economic Groups	4.70	4.70	88.04	293.47	880.41	1 173.88	2 934.71	3 501
Lower Economic Groups	0.73	0.22	2.93	29.34	117.39	293.47	293.47	750

Note: HBS 1957/58 involved only urban households, HBS 1963/64 involved only rural households and all the later HBSs involved households of all regions.

*: Data of HBS 1957/58 for smaller urban regions (10.000-30.000 residents) were used

**: Data of HBS 1963/64 for bigger rural regions (5.000-9.999 residents) were used

Data Source: E.S.Y.E., (several years: HBS 1957/58, 1963/64, 1974, 1981/82, 1987/88, 1993/94, 1998/99, 2004/05).

Table 4.1.a. Structure of Cereals' Consumption of the Lower and Higher Economic Groups, HBS 1957/58 and 2004/05, (%).

	Lower Economic Groups		Higher Economic Groups	
HBS	1957/58	2004/05	1957/58	2004/05
Bread	66.1	57.6	63.5	42.9
Flour	10.8	4.1	5.9	3.5
Processed cereals	15.2	31.6	23.2	47.1
Rice	7.9	6.7	7.4	6. 5

Data Source: E.S.Y.E., (several years: HBS 1957/58 and 2004/05).

Table 4.1.b. Structure of Bread Consumption in HBS 1957/58, (%).

	Lower Economic Groups	Higher Economic Groups
Brown bread	57.5	10.0
White bread	42.5	90.0
Total	100.0	100.0

Note: Records on the various types of bread do not exist in HBS 1974 and afterwards.

Data Source: E.S.Y.E., (HBS 1957/58).

Table 4.2. Structure of Cereals' Consumption of the Lower and Higher Vocational Groups, HBS 1963/64 and 2004/05, (%).

	Higher Socio-Vocational Groups		Lower Socio-Vocational Groups		Higher Vocational Groups		Lower Vocational Groups	
	Employers	Employers	Unemployed	Non-workers	Directors	Directors	Workers	Craftsmen/ workers
HBS	1963/64	2004/05	1963/64	2004/05	1963/64	2004/05	1963/64	2004/05
Bread	34.5	45.9	35.5	52.4	55.5	47.6	39.2	54.0
Flour	24.2	3.5	23.8	4.7	13.8	3.5	13.1	3.3
Processed cereals	21.7	44.9	19.9	36.3	15.6	43.0	15.6	37.2
Rice	9.7	5.7	11.5	6. 6	15.1	5.9	8.1	5.5
Other cereals *	10.0		9.3				24.1	

Note: Data of HBS 1963/64 were used since detailed data per product from HBS 1957/58 did not exist for these population groups.

*: (wheat, maize etc.)

Data Source: E.S.Y.E., (several years: HBS 1963/64 and 2004/05).

Table 4.3. Structure of cereals' consumption in urban and rural regions, HBS 1957/58 and 2004/05, (%).

	Urban regions			Rural regions		
HBS	1957/58	1981/82	2004/05	1963/64 *	1981/82	2004/05
Bread	67.0	58.7	47.6	31.3	4.6	59.2
Flour	6.4	4.3	3.4	24.1	71.5	5.6
Processed cereals	18.9	30.2	42.9	17.5	17.0	29.2
Rice	7.5	6.8	6. 1	11.1	6.9	6.0

Note: HBS 1957/58 involved only urban households, while HBS 1963/64 involved only rural households.

* (wheat, maize etc=16%)

Data Source: E.S.Y.E., (several years: HBS 1957/58, 1963/64, 1981/82 and 2004/05).

Table 4.4. Structure of Cereals' Consumption in Athens, Thessaloniki, Crete and Thessaly, HBS 1957/58, 1981/82 and 2004/05, (%).

	Athens			Thessaloniki			Crete		Thessaly	
HBS	1957/58	1981/82	2004/05	1957/58	1981/82	2004/05	1981/82	2004/05	1981/82	2004/05
Bread	68.6	57.6	45.6	75.5	66.4	48.5	48.0	40.9	51.5	58.4
Flour	3.0	3.2	3.1	3.8	3.0	3. 7	9.5	5.2	9.3	3.9
Processed cereals	20.8	32.7	45.2	13.6	24.4	41.2	31.6	48.5	29.4	31.8
Rice	7.4	6.6	6. 1	7.2	6.2	6.6	10.9	5.4	9.8	5.9

* For Crete and Thessaly earlier data are not available.

Data Source: E.S.Y.E., (several years: HBS 1957/58, 1981/82 and 2004/05).

Table 4.5. Structure of Cereals' Consumption in Small (1 member) and Big* households, HBS 1957/58, 1981/82 and 2004/05, (%).

	Small households			Big households		
HBS	1957/58	1981/82	2004/05	1957/58	1981/82	2004/05
Bread	61.2	50.6	46. 6	64.3	49.8	55.6
Flour	1.7	5.5	3.5	6.8	14.1	5.4
Processed cereals	28.1	34.1	42.2	22.8	27.8	34.0
Rice	8.4	9.7	7.7	6.3	8.3	5.0

*: "8 members and more" in HBS 1957/58 and 1963/64 and "6 members and more" in all the subsequent HBSs.

Data Source: E.S.Y.E., (several years: HBS 1957/58, 1981/82 and 2004/05).

Table 4.6. Structure of cereals' consumption according to age groups, HBS 1963/64, 1981/82 and 2004/05, (%).

	Elderly person (75 years old or more) as head of the household			Young person (up to 24 years old) as head of the household		
HBS	1963/64	1981/82	2004/05	1963/64	1981/82	2004/05
Bread	41.4	55.9	51. 4	24.8	54.1	43.3
Flour	25.4	7.5	4.5	27.0	1.5	1.0
Processed cereals	20.1	24.7	37.7	16.5	39.6	50.8
Rice	12.6	11.8	6.4	8.4	4.9	4.9
Other cereals	0.5			23.4		

Note: Data of HBS 1963/64 were used since detailed data per product from HBS 1957/58 did not exist for these population groups.

Data Source: E.S.Y.E., (several years: HBS 1963/64, 1981/82 and 2004/05).

Table 4.7. Structure of Cereals' Consumption per Season of Year, HBS 1963/64, 1981/82 and 2004/05, (%).

	Summer			Autumn			Winter			Spring		
HBS	1963/64	1981/82	2004/05	1963/64	1981/82	2004/05	1963/64	1981/82	2004/05	1963/64	1981/82	2004/05
Bread	41.8	51.2	52.9	29.3	58.0	52.7	21.8	55.1	47.3	31.8	55.3	50.5
Flour	18.1	9.4	3.5	33.3	6.7	3.4	22.1	8.2	4. 3	23.9	5.7	5.0
Processed cereals	15.0	31.9	37.6	19.9	27.0	37.5	19.0	28.8	42.5	16.4	30.5	39.9
Rice	11.1	7.6	6.0	11.9	8.3	6.4	10.2	7.9	5.9	11.2	8.5	4.6
Other cereals	14.1			5.6			26.9			16.6		

Note: Data of HBS 1963/64 were used since detailed data per product from HBS 1957/58 did not exist for these population groups.

Data Source: E.S.Y.E., (several years: HBS 1963/64, 1981/82 and 2004/05).

Table 5. Results of statistical analyses

Tests of Between-Subjects Effects

Dependent Variable: Percentage of Consumption

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	28959,592[a]	12	2413,299	35,260	,000
PARATROF	11485,562	4	2871,391	41,953	,000
PARBXRON	19,542	7	2,792	,041	1,000
Error	1711,088	25	68,444		
Total	30670,680	37			

a. R Squared = ,944 (Adjusted R Squared = ,917)
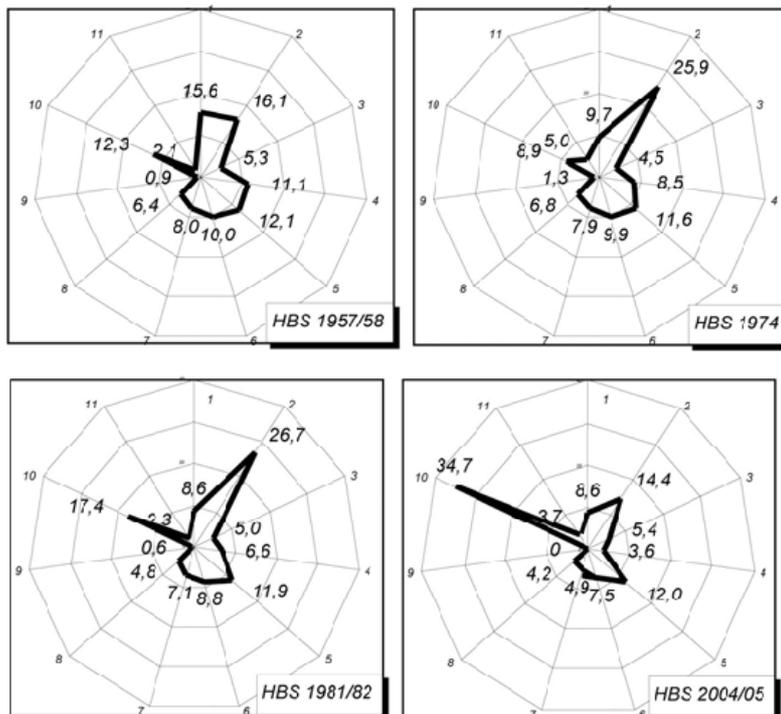
Figure 1. Alimentary Pattern Structure: 1957/58, 1974, 1981/82 & 2004/05, (%).

1. Cereal, 2. Meat, 3. Fish, 4. Vegetable/Olive Oil, 5. Dairy Products, 6. Vegetables, 7. Fruits, 8. Sugar and pastry making products, 9. Other food categories, 10. Expenditure on food away from home, 11. Non alcoholic drinks (and ice-creams in HBS of 1957/58).

Data Source: E.S.Y.E., (several years: HBS 1957/58, 1974, 1981/82 and 2004/05).