Characteristic Elements of "Mediterranean Diet": The Consumption of Vegetables and Legumes in Greece (1950-2005)

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Abstract

This paper describes the dietary consumption of vegetables and legumes in Greece during the period 1950 to 2005. All dimensions of alimentary consumption patterns of vegetables and legumes are examined here with a specific focus on: a) their natural characteristics; b) technical features of the production process (primary, secondary and tertiary transformation processes); and c) socio-economic attributes of these patterns of consumption (i.e. consumption features of the different economic, social, professional, demographic and geographic layers of the population).

Keywords: Consumption of vegetables and legumes, Dietary patterns

1. Introduction

This article describes the consumption of vegetables and legumes in Greece after the 2nd World War and especially during the period 1950-2005, since no officially organized statistical data by E.S.Y.E. (National Statistical Service of Greece) such as HBSs (Household Budget Surveys) and National Accounts are available before. The dietary patterns of vegetables-legumes are described and analyzed according to the financial expenses of households in terms of: a) expenses in the decade of 1950's, ("Mediterranean-traditional" dietary pattern), b) expenses in the modern era (2005) ("Industrial - Internationalized - Western origin" dietary pattern) and c) developments, changes and identification of different patterns during the examined period.

During this period (1950-2005) a complete change of dietary patterns in Greece is observed (Sotiropoulos, 2010a, p. 121). An ancient, 35 centuries old, worldwide tradition ("Mediterranean diet") declines (Renaud, 1996, p. 21) and new dietary patterns ("industrial - internationalised - Western origin") prevail rapidly. The impact is very significant at economic, production, marketing, bio-medical and socio-psychological level for the entire Mediterranean region.

2. Theoretical background and methodology

According to Lancaster (1966, p. 133 and Georgakopoulos and Thomson 2005, Georgakopoulos *et al.* 2006, Georgakopoulos *et al.* 2008) the consumption of food serves not only biological functions of human organism, but multiple, and food is "packages with specific attributes" with many dimensions. The description, therefore, of dietary patterns should include all the aspects of food. According to recent researchers, these dimensions are economic, social, and psychological and they have elements of lifestyles, such as time availability, knowledge and means for household production (Malassis, 1986, p. 82).

Therefore, in order to achieve a more complete, explicit and comprehensive description of dietary patterns for vegetables - legumes a particular analysis of E.S.Y.E. data is necessary, since the primary data refer to the existing consumption per product e.g. peas, lentils, tomatoes, etc. These categories were split in agricultural (fresh) and industrial (processed), domestic and international origin, with medical - health (e.g. industrial nutrition and cancer, consumption of fresh vegetables – legumes and heart disease; Trichopoulou, 1989, 2000) and socio-psychological dimensions (e.g. traditional or modern dietary behaviour; Trichopoulou, 1997, social status, etc.). Indicative examples are: fresh vegetables and frozen vegetables (e.g. fresh peas - frozen peas, fresh tomatoes - processed tomatoes / tomato paste, ready meals packed or canned), imported (e.g. Brussels sprouts) or local, legumes, products of Protected Designation of Origin P.D.O. - Protected Geographical Indication P.G.I. (beans from Prespa, Kastoria, etc.). These analyses (related data are broken down and re-synthesised again using new categorisation dimensions) have resulted in the classification of dietary patterns for vegetables - legumes ("Mediterranean" or "industrial"), and they also provide a valuable stating point to comprehend and interpret their changes over the examined period.

The data come from the "Household Budget Surveys" (HBS 1957/58, 1963/64, 1974, 1981/82, 1988/89, 1993/94, 1998/1999, 2004/05) and "National Accounts" of the “National Statistical Service of Greece” (E.S.Y.E.). Our analysis is based on a descriptive presentation of statistical information with the help of spreadsheets. In order to construct a basis for the qualitative description of Greek alimentation the “formula of patterns classification” from Sotiropoulos (2010b p. 66-70) was used:

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

rewritten as:

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

This formula can be applied to each category of population (with economic, social - professional, geographical, demographical, seasonal, etc criteria).

Additionally, t-test analysis was used to identify if there is statistically significant difference in the percentage of vegetables’ consumption over the examined period between: a) higher and lower economic groups and b) elderly and young groups. Finally, two linear regression analyses ($y = a + b\ t + e$, where e: random error) were conducted to examine if there is statistically significant a) increase of processed vegetables consumption and b) reduction of legumes consumption over time. Specifically, for the first regression the dependent variable was the percentage of processed vegetables in the total vegetables consumption and the independent variable was the time, while for the second regression the dependent variable was the percentage of legumes in the total vegetables consumption and the independent variable was the time (see tables 5, 6, 7, 8 and figures 1, and 2).

3. Vegetables and legumes consumption by the whole population

The Greek "Mediterranean" traditional dietary pattern, apart from the high consumption of cereals and the limited consumption of meat, is characterized by the high consumption of fruits, vegetables, legumes and olive oil (Malassis, 1986, p. 45). According to data from the “National Accounts”, fruits and vegetables accounted for 26.5% of total food expenditure in 1950’s and despite minor fluctuations (between 23.9% and 29.4%) their share remains still at a very high level at the end of the examined period (2005); 22% for fruit and vegetables, and 2.1% for potatoes and other bulbs (= 24.1% overall), while the expenditure has more than tripled over this period. This is the highest percentage worldwide, which may be attributed, inter alia, to the fact that Greece is situated in one of the largest producing areas of fruit and vegetables in the world (i.e. Mediterranean) (Malassis, 1986, p. 41). Thus, fruits and vegetables account for ¼ of the total food expenditure of Greek consumers.

The “Household Budget Surveys” also confirm this stability of high consumption of vegetables, although, they have a different structure than “National Accounts”, as they include expenditure on food away from home. However, since the decade of 1970’s, the percentage of vegetables share to total food expenditure is decreasing (10% in 1957 when the first data are available, 8.8% in 1982 and 7.5% in 2005) in a slow pace and with fluctuations initially, but much more quickly after the decade of 1990’s (see Table 1).

The analysis within the category of vegetables-legumes is rather important for a more thorough and in depth description of the dietary patterns of this food category, since it highlights important particularities and developments that took place during the examined period.

The vegetables were always key component of the characteristic-traditional Greek-"Mediterranean" dietary patterns (i.e. cereals, bread, fruits and vegetables, legumes, olive oil, wine, small amounts of goat/lamb meat) in two ways: a) increased consumption of vegetables as a whole and b) increased consumption of certain types, such as legumes.

The traditional characteristics were rather intense until the middle to 1970's, when they begin to fade (Table 2). Thereafter, the percentages of fresh vegetables are progressively reduced with minor fluctuations; those of legumes diminish even more, while the share of industrial (processed) vegetable is growing (rather rapidly during the last decade because of the proliferation of neo-industrial types). Potatoes' proportion is stabilized at relatively high levels but with a downward trend, when at the same time in Western Europe and North America is is significantly reduced, since potatoes are considered as a typical example of "inferior good" with long relative tradition (i.e. «Giffen» good in Ireland in 19th century).

The first HBSs (1957/58 and 1963/64) revealed that, during the first decades of the examined period, all the types of vegetables consumed were in line with the traditional alimentary patterns, namely agricultural-fresh (except tomato paste, whose small quantities of consumption in 1950s and 1960s were included in fresh vegetables in HBS 1957/58 and 1963/64). The industrial (processed) vegetables obtain remarkable proportion in HBS 1974 (Sotiropoulos 2010a). Their percentage is growing rather slowly since then, but more rapidly at the end of the examined period. They concern tomato paste, tomato juice, canned peeled tomatoes, pickles, olives preserved in brine, vinegar, oil, etc., canned vegetables, diet food, pre-cooked food, frozen food (vegetables in oil, traditional meals, legumes, vegetables with meat etc.) and "preserved - frozen vegetables" (peas, okra, beans, potatoes, etc.). The latter appeared in the Greek food market in 1969 with 1 kgr per year per capita consumption, which increased to 12 kgr per year per capita in 1998 (Mesini & Mitsopoulos, 1999), with continuous growth trend since then. These are traditional industrial and new industrial products, with international-Western origin, imported or domestically-produced by western standards, satisfying modern dietary trends (e.g. diet products).

The stabilization of fresh vegetables percentage at relatively high levels and the drastic reduction of legumes proportion (like cereals) at home consumption (coupled with a significant increase of non-alcoholic beverages, and especially of the industrial food and of the food away from home), reveal the new characteristics of modern alimentary patterns in Greece (Sotiropoulos, 2010a, p. 122). These characteristics do not seem to sustain the view that the traditional Mediterranean behaviours revive or revert. In fact, they are new type of alimentary patterns, given that, after the significant strengthening of their animal characteristics of "Western" type (1970s-1980s), their plant characteristics are reinforced again (after 1990's) by the introduction of new products with international origin, industrialized, standardized and with increased tertiary (services) value-added.

4. Vegetables and legumes consumption by different population groups

The food consumption in economic (i.e. different economic groups of the population), socio-vocational (e.g. employers, managers, employees, workers, unemployed, etc.), geographic (i.e. urban and rural areas), demographic (i.e. age, family size and composition) and seasonal (i.e. summer, autumn, winter, spring) terms, is of great interest for this period. Thus, differences and similarities in food consumption among different socio-economic groups are identified, as well as the convergences and divergences a) during this half century, and b) at particular periods. This analysis contributes to the identification of the groups that precede and create new behaviours and of the groups that remain traditional.

The higher income groups always had innovative alimentary behaviours adopting international patterns. They preceded other population groups, in terms of increasing the consumption of animal products and expenditure away from home (Sotiropoulos, 2010a, p. 124), and of reducing the consumption of vegetables and legumes (Table 3.1). Thus, while, the gap in percentage between higher and lower income groups was low in the early post war years, when the traditional "Mediterranean" patterns dominated, it significantly expanded since then. Towards the end of this period, the consumption of vegetables-legumes absorb a very small percentage (5.5%) of food expenditure of the higher income groups, but a much higher proportion (12.4%) of expenditure of lower income classes, which exhibit strong traditional characteristics, in contrast to the wealthier groups.

The finding, concerning the diminished plant consumption by the different economic groups of the population, pertains also to all socio-vocational (profession and position in the profession) groups, where differences were also observed. The higher socio-vocational groups are less traditional, with low consumption of vegetables-legumes (Table 3.1), which is decreasing, with small fluctuations, over time. Finally, the two extreme trends are, on one hand the unemployed (consistently high consumption, without decreasing percentages) and on the other hand the managers and employers (low and declining (with minor fluctuations) over time consumption percentages) (Table 3.1).

Differentiations in vegetables-legumes consumption are also evident among the various demographic groups. The younger ages (under 24 years) display novel behaviour (along with higher economic groups) with vegetables-legumes consumption percentages declining over the years, while elder (over 75) show traditional behaviour, retaining very high percentages. The disparity between them is rather great especially after the 1980's,

and despite the common starting point at 1960's (Table 3.1). The expenditure for vegetables-legumes of big households (6-8 members) is steadily scaling down, verging to the percentage of smaller households, as well as of other types of households with traditional, in general, behaviour (couples with 3 children). In contrast, small households (1 member) always dedicated a small percentage of their food expenditure to vegetables-legumes, with small fluctuations over time, which means absence of traditional features in their dietary patterns.

The analysis according to geographical criteria (Tables 3.1 and 3.2) detects two distinct trends. The first one is the behaviour of urban areas, characterized by constantly and steadily declining rates of vegetables consumption-legumes and, therefore, the traditional - 'Mediterranean' features weaken. The second one is the behaviour of rural areas, where the traditional features are, initially, weakened up to 1980's, they recover after the decade of 1980's and, finally, they slowly decrease at the end of this period.

Based on seasonal criteria, the consumption of vegetables-legumes appears to be increased during summer and spring, as these are the seasons of harvesting for fruits and vegetables in Greece. This is a characteristic feature of the traditional consumption patterns, which are directly dependent on the production. In this case, the vegetables are consumed, especially, during the harvest time. This feature does not seem to change significantly (despite the relative mitigation of behaviours), even when the alimentary patterns in Greece have lost their traditional "Mediterranean" characteristics and become industrialized-internationalized. Thus, a positive relationship between summer climate and dietary patterns is detected, with dominant plant characteristics in Greek alimentary behaviour over time.

Analyzing the internal structure of category (fresh vegetables, industrial - processed vegetable, legumes, potatoes), some important conclusions derive for the understanding and characterization of Greek alimentary patterns of vegetables. The internal structure of consumption of vegetables-legumes for each population group reveals an additional feature; the industrialization of consumption, as the dietary patterns rapidly lose their traditional characteristics, while each population category presents particular characteristics. In all cases, a significant increase in the consumption of industrial vegetables is observed, and especially by the higher economic and vocational groups, the younger ages, in urban areas and during winter and spring.

The consumption of higher economic groups in (new-international origin) industrial vegetables is high, while it is rather low and diminishing over time in (traditional) legumes and potatoes ("inferior good") and high, but decreasing in (relatively expensive) fresh vegetables (Table 4.1). Quite the contrary, the lower economic groups are characterized by the low consumption in industrial vegetables, by the high but decreasing in legumes and potatoes consumption. Moreover, the lower economic groups' consumption in fresh vegetables is lower than higher economic groups, but with a growing trend, approaching the percentages of higher economic groups. Thus, the leaders of industrialised alimentary patterns for vegetables in Greece are the higher economic groups, while the consumption patterns of the lower economic groups present traditional (though in decline) characteristics.

What is the case for the higher economic groups, it also applies to the higher vocational groups (managers, employers, etc.) (see Tables 4.2.a and 4.2.b), and much more to the younger age groups (Table 4.3). On the opposite side are found the elder (where the traditional characteristics decline slowly, while the industrial characteristics are increasing slowly, too), the big households (Table 4.4), the rural areas (Table 4.5) and the lower vocational groups, but with more intense industrial characteristics (Table 4.2.a and b). The small households (Table 4.4) and the urban areas (Table 4.5) have, always, been characterized by industrial consumption and reduced traditional characteristics, given that since the early 1950's the consumption of legumes was reduced. A notable exception is the group of employers (Table 4.2.b) with increased consumption of legumes in the decade of 1960's, and increased consumption of fresh vegetables (56.6% -62.1%).

The lower economic classes, the big households and the inhabitants of Crete are generally the exceptions of the trend of diminishing consumption of fresh vegetables during this half century, since the consumption of fresh vegetables increases over time. The lowest consumption of fresh vegetables is found to the young consumers, the big households and the rural areas, but at these areas self-consumption is increased. The highest consumption appears at the higher economic and vocational groups and the small households. Potatoes consumption is declining, after increases in percentages, though with fluctuations, until the early 1980s, especially by the higher economic and vocational groups, the older ages, the small households and the urban areas. Although legumes is the most traditional category, it shows rapid decline in consumption by all the groups of the population, mainly by the higher economic and vocational groups, the urban areas, the small households, and even more by the younger ages.

The analysis based on particular local criteria (Table 4.6) highlights the industrialised, and thus, less traditional, behaviour of the residents of the big cities of Athens and Thessaloniki over time. However, their traditional consumption patterns, paradoxically, increase during the last decades. This behaviour is in great contrast to the dietary patterns of the province (for example: Crete and Thessaly). In rural areas the consumption of processed vegetables was low and it grows slowly and the consumption of traditional vegetables reduces with very little pace.

Finally, the analysis with regard to the seasonal criteria (Table 4.7) reveals the relative mitigation of dietary patterns, since, after the 1980s, the correlation between fresh vegetables consumption and harvesting time is not as high as it used to be according to the traditional patterns, and the increased consumption of the industrialized vegetables extends to all seasons of the year. The positive relationship, however, between summer climate and dietary patterns, with dominant plant traits in Greek alimentary behaviour, still applies (though to a lesser extent) and after the prevalence of industrial patterns.

5. Results of statistical analyses

The t-statistics (see tables 5, 6, 7, 8 and figures 1, and 2) showed that there is statistical significant difference in vegetables consumption between higher and lower economic groups. More specifically, the lower economic groups consume more vegetables than the higher over time. Statistical significant difference was also found between the elder and the younger ages, since younger people consume fewer vegetables than elder over time.

The regression analyses revealed that there is reduction in legumes consumption and increase in processed vegetables consumption over time.

6. Conclusions

The main conclusions of this work concern both the methodology and the results. In terms of methodology, the main conclusion concerns the classification of patterns. The "formula of patterns classification" can lead to the identification of the industrial and international characteristics of food patterns and thus, it is feasible to draw conclusions about the traditional, Mediterranean, industrial and internationalized features of dietary patterns. This can also be the case for the biological characteristics, as long as the necessary data are available (Sotiropoulos, 2010a and 2010b).

With respect to the dietary patterns of vegetables-legumes during this half century, three main conclusions can be drawn. First, they lose their traditional characteristics as the consumption of fresh vegetables and legumes is drastically reduced, the consumption of frozen and preserved vegetables soars, as well as of the oldest industrial type category of tomato paste. Second, they obtain industrial characteristics directly and indirectly. Directly, because of the increased percentages of industrial vegetables in the consumption of vegetables as a whole; and indirectly due to supply characteristics (i.e. standardization and packaging, for example, of legumes and fresh vegetables). The latter was not feasible to be quantified in this research, but because of its importance in the supply of vegetables and legumes it constitutes the aim of a particular research which is in progress. Third, each population group has particular characteristics regarding the consumption of vegetables-legumes. The main points are the "traditional" consumption patterns of older ages and of lower economic groups, in contrast to the modern industrial - internationalized consumption patterns of higher economic groups and younger ages. These social groups precede in terms of novel consumption patterns, which are adopted by other groups with a time lag of a few years.

It is worth mentioning: a) the traditional behaviour of the rural areas is noteworthy, in contrast with big cities (Athens, Thessaloniki), b) the increased consumption of vegetables in their growing regions (Crete, Western Greece) and c) the seasonality, expressed by increased consumption of vegetables in the summer and spring, despite the mitigation of consumption patterns within this category that is rapidly industrialized after the 1980's. The last finding raises a research hypothesis, which deserves to be addressed by future research; whether the warm climate is associated with agricultural-plant alimentary patterns or not and whether the cold climatic conditions favour industrial-animal alimentary patterns (Sotiropoulos, 2010a).

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Table 1. Alimentary pattern structure in Greece: 1957-2005 (%)

	H.B.S :	**΄57/58**	**΄63/64**	**1974**	**΄81/82**	**΄87/88**	**΄93/94**	**΄98/99**	**΄04/05**
1	Cereal, Bread	15.6	16.9	9.7	8.6	8.8	10.0	8.7	8.6
2	Meat	16.1	14.6	25.9	26.7	23.2	20.2	15.1	14.4
3	Fish	5.3	6.5	4.5	5.0	4.7	5.0	5.1	5.4
4	Vegetable/Olive Oil	11.1	10.2	8.5	6.6	4.8	4.2	3.5	3.6
5	Dairy Products & Eggs	12.1	8.1	11.6	11.9	12.6	13.0	12.0	12.0
6	Vegetables	10.0	8.8	9.9	8.8	8.2	8.4	8.1	7.5
7	Fruits	8.0	5.1	7.9	7.1	7.6	6.3	5.4	4.9
8	Sugar & Pastry Making Products	6.4	8.3	6.8	4.8	5.3	4.7	4.0	4.2
9	Other food categories	0.9	1.1	1.3	0.6	0.9	0.9	0.6	0.9
10	Expenditure on food away from home	12.3	12.8	8.9	17.4	21.1	24.4	33.7	34.7
11	Non alcoholic drinks *	2.1	7.6	5.0	2.3	2.8	3.0	3.7	3.7
	Total of Dietary Expenditure (%)	100	100	100	100	100	100	100	100

* Non alcoholic drinks and ice-creams in H.B.S 1957/58.

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 2. Alimentary pattern structure of vegetables consumption: 1957-2005 (%)

H.B.S :	**´57/58**	**´63/64**	**1974**	**´81/82**	**´87/88**	**´93/94**	**´98/99**	**´04/05**
Legumes	13.5	20.1	12.1	9.1	7.6	7.7	6.9	6.7
Potatoes	16.0	23.6	19.7	24.0	20.7	23.2	20.9	16.2
Fresh vegetables	70.5	56.3	63.8	61.8	65.5	62.0	63.8	62.0
Processed vegetables			1.8	3.2	3.8	3.7	4.8	11.5
Tomato paste/ tomato juice			2.4	2.0	2.5	3.4	3.5	3.7
Total of vegetables	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.a. Vegetables' consumption per demographic group during 1957-2005 (%)

HBS:	**1957/58**	**1963/64**	**1974**	**1981/82**	**1987/88**	**1993/94**	**1998/99**	**2004 / 05**
I	19.5*	4.8	8.3	6.9	7.0	6.8	6.5	6.5
II	18.1*	8.2	8.3	7.5	5.9	6.5	6.8	6.0
III	18.1*	9.2	10.1	8.9	8.1	7.7	7.2	6.8
IV	17.8*	10.0	10.4	9.2	8.3	8.4	8.2	7.5
V	19.2*	9.8	10.5	9.2	9.5	9.6	9.4	8.9
VI	10.1	5.6	7.5	6.9	7.7	7.1	7.2	7.6
VII	11.4	11.8	10.2	8.3	7.9	7.8	7.3	7.4
VIII	13.5	9.9		8.8	7.9	7.8	7.1	6.6
IX	13.1	8.3		9.8	8.3	8.2	7.6	7.4
X	-	8.9	10.5	8.6	10.0	10.2	10.3	10.5
XI	-	8.4	6.9	6.2	4.8	3.7	4.5	3.2
XII	12.1	5.7	5.8	6.7	6.3	7.0	5.4	5.5
XIII	14.2	14.8	13.9	9.7	10.7	11.5	11.8	12.4
XIV	13.4	9.1 (1)	9.9	9.1	8.5	8.3	7.8	7.4
XV	12.6 (2)	9.4	9.8	8.3	7.8	7.9	8.3	7.5

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

*: Fruits and Vegetables as recorded in HBS 1957/58.

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

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

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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.b. 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	≥ 1173,88	≥ 2934,71	≥ 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 3.2. Structure of vegetables' consumption in Athens, Thessaloniki, Crete and Thessaly (%)

	Crete*		**Thessaly ***		**Athens**		**Thessaloniki**	
HBS:	1981/82	2004/05	1981/82	2004/05	1981/82	2004/05	1981/82	2004/05
Vegetables	10.9	8.3	8.1	7.2	9.3	7.3	8.3	6.9

* For Crete and Thessaly earlier data are not available.

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

Table 4.1. Structure of vegetables' consumption of the lower and higher economic groups (%)

	Lower Economic Groups			**Higher Economic Groups**		
HBS	1957/58	1981/82	2004/05	1957/58	1981/82	2004/05
Legumes	26.1	17.0	9.4	9.5	7.2	4.9
Fresh vegetables *	47.8	56.8	61.8	71.7	63.8	62.7
Potatoes	26.1	22.2	17.6	18.8	21.9	14.5
Processed vegetables, tomato paste		3.9	11.2		7.0	17.9

*: and tomato paste in HBS1957/58.

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

Table 4.2.a. Structure of vegetables' consumption of the lower and higher vocational groups (%)

	Directors			**Workers**	**Craftsmen/workers**	
HBS	1963/64	1981/82	2004/05	1963/64	1981/82	2004/05
Legumes	15.3	4.9	4.7	18.8	8.2	6.1
Fresh vegetables*	72.5	62.8	64.3	59.0	62.3	60.5
Potatoes	12.3	26.4	14.6	22.2	24.3	17.9
Processed vegetables		5.9	16.4		5.3	15.5

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

*: and tomato paste in HBS 1963/64.

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

Table 4.2.b. Structure of vegetables' consumption of the lower and higher socio-vocational groups (%)

	Employers			Unemployed or first-time work seekers		Unemployed
HBS	1963/64	1981/82	2004/05	1963/64	1981/82	2004/05
Legumes	21.5	7.4	5.1	17.1	9.1	7.4
Fresh vegetables*	56.6	64.8	62.1	62.6	64.3	63.7
Potatoes	21.9	22.7	15.0	20.4	21.7	15.5
Processed vegetables		5.2	17.8		5.0	13.4

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

*: and tomato paste in HBS 1963/64.

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

Table 4.3. Structure of vegetables' consumption according to age groups (%)

	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
Legumes	20.0	11.1	8.3	35.0	6.0	2.3
Fresh vegetables*	63.9	65.8	65.1	48.3	54.7	51.9
Potatoes	16.1	19.6	15.0	16.6	34.4	22.2
Processed vegetables	-	3.4	11.6	-	4.9	23.6

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

*: and tomato paste in HBS 1963/64.

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

Table 4.4. Structure of vegetables' consumption in small (1 member) and big* households (%)

	Small households			Big households		
HBS	1957/58	1981/82	2004/05	1957/58	1981/82	2004/05
Legumes	12.7	6.7	6.5	28.3	14.4	7.3
Fresh vegetables**	68.3	70.2	63.3	44.7	53.5	57.4
Potatoes	19.0	18.2	15.8	27.0	27.6	17.6
Processed vegetables		5.0	14.4		4.4	17.7

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

**: and tomato paste in HBS 1957/58.

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

Table 4.5. Structure of vegetables' consumption in urban and rural regions (%)

	Urban regions			Rural regions		
HBS	1957/58	1981/82	2004/05	1963/64	1981/82	2004/05
Legumes	19.1	6.0	5.6	20.1	16.4	10.7
Fresh vegetables*	58.1	66.4	63.8	56.3	50.3	55.7
Potatoes	22.8	21.9	15.3	23.6	29.2	19.3
Processed vegetables		5.8	15.3		4.1	14.3

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

*: and tomato paste in HBS 1957/58 and 1963/64.

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

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Table 4.6. Structure of vegetables' consumption in Athens, Thessaloniki, Crete and Thessaly (%)

	Athens			**Thessaloniki**			**Crete***		**Thessaly***	
HBS	57/58	81/82	04/05	57/58	81/82	04/05	81/82	04/05	81/82	04/05
Legumes	14.1	5.3	5.0	13.7	4.9	5.6	10.1	6.7	14.8	19.1
Fresh vegetables**	63.5	66.3	63.2	69.2	69.9	65.5	47.1	56.5	59.0	49.1
Potatoes	22.4	22.4	15.7	17.1	19.1	13.0	39.1	24.7	22.9	15.0
Processed vegetables		6.0	16.1		6.0	15.9	3.7	12.1	3.3	16.8

* For Crete and Thessaly earlier data are not available.

**: and tomato paste in HBS 1957/58.

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

Table 4.7. Structure of vegetables' consumption per season of year (%)

	Summer			**Autumn**			**Winter**			**Spring**		
HBS	63/64	81/82	04/05	63/64	81/82	04/05	63/64	81/82	04/05	63/64	81/82	04/05
Legumes	10.0	11.2	3.9	28.5	3.2	6.1	31.2	9.1	10.3	12.7	15.7	6.6
Fresh vegetables*	77.0	52.3	68.2	46.3	74.5	64.6	35.8	61.8	56.4	61.1	50.3	58.8
Potatoes	13.0	26.6	15.9	25.2	19.2	15.0	33.1	24.0	15.9	26.2	27.3	17.7
Processed vegetables	-	9.9	12.0	-	3.1	14.3	-	5.2	17.5	-	6.7	16.9

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

*: and tomato paste in HBS 1963/64.

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

Table 5. T-Test* for Vegetables Consumption between Higher and Lower Economic Groups

	Higher Economic Groups	**Lower Economic Groups**
Mean	6.0571	12.1143
Variance	0.3829	3.1314
Observations	7	7
Hypothesized Mean Difference	0	
Df	7	
t Stat	-8.5487	
P(T<=t) one-tail	0.0000	
t Critical one-tail	1.8946	
P(T<=t) two-tail	0.0001	
t Critical two-tail	2.3646	

*: Two Sample assuming Unequal Variances

Table 6. T-Test* for vegetables consumption between elderly and young groups

	Elderly Groups	Young Groups
Mean	9.8571	5.3857
Variance	0.6095	3.4648
Observations	7	7
Hypothesized Mean Difference	0	
Df	8	
t Stat	5.8610	
P(T<=t) one-tail	0.0002	
t Critical one-tail	1.8595	
P(T<=t) two-tail	0.0004	
t Critical two-tail	2.3060	

*: Two Sample assuming Unequal Variances

Table 7. Regression analysis: processed vegetables consumption – time

Regression Statistics	
Multiple R	0.8302
R Square	0.6893
Adjusted R Square	0.6116
Standard Error	2.1347
Observations	6

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	40.4320	40.4320	8.8725	0.0408
Residual	4	18.2280	4.5570		
Total	5	58.6600			

	Coefficients	Standard Error	TSTAT	P-value	Lower 95%	Upper 95%
Intercept	-0.5200	1.9873	-0.2617	0.8065	-6.0377	4.9977
Score	1.5200	0.5103	2.9787	0.0408	0.1032	2.9368

Table 8. Regression analysis: legumes consumption – time

Regression Statistics	
Multiple R	0.8101
R Square	0.6562
Adjusted R Square	0.5989
Standard Error	2.9251
Observations	8

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	97.9815	97.9815	11.4515	0.0148
Residual	6	51.3373	8.5562		
Total	7	149.3188			

	Coefficients	Standard Error	TSTAT	P-value	Lower 95%	Upper 95%
Intercept	17.3357	2.2792	7.6060	0.0003	11.7587	22.9128
Score	-1.5274	0.4514	-3.3840	0.0148	-2.6318	-0.4230

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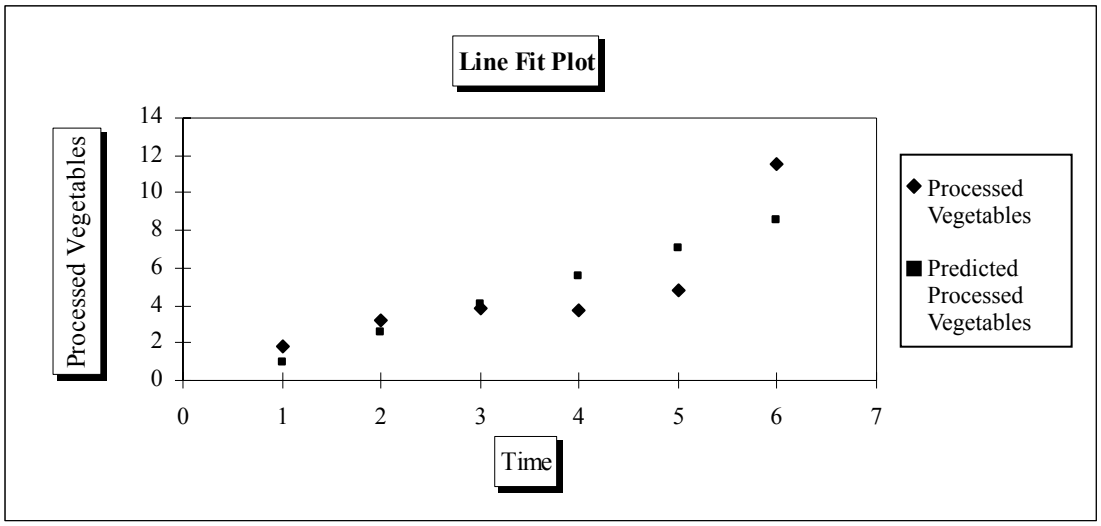

Figure 1. Line fit plot of regression analysis: processed vegetables consumption – time

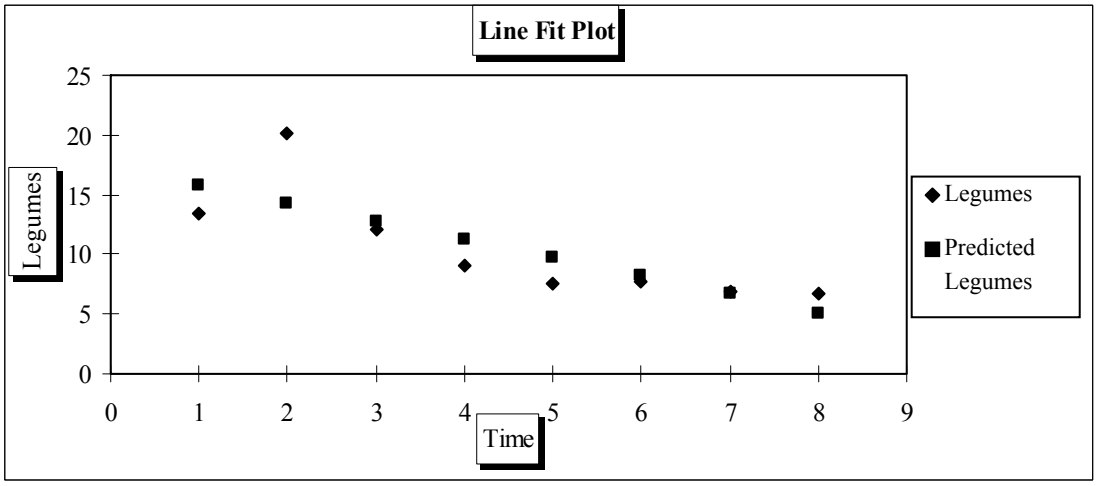

Figure 2. Line fit plot of regression analysis: legumes consumption – time