KSÜ Tarım ve Doğa Derg 21(Özel Sayı): 67-79, 2018
KSU J. Agric Nat 21(Special Issue): 67-79, 2018
DOI: 10.18016/ksutarimdoga.vi.472965

Household Nutrition Habits and Food Consumption in Turkey

Cuma AKBAY
KSÜ Ziraat Fakültesi Tarım Ekonomisi Bölümü, Avşar Kampüsü, Kahramanmaraş
✉: cakbay@ksu.edu.tr

ABSTRACT

Food consumption and the accompanying nutritional quality of the diet are determined both by income and price as well as by a broad range of the other factors. Changing demographics and household composition, woman's labor force participation, new concerns about health-diet links as well as changes in the food markets can all affect the types and amounts of food consumed. Specifically, the major objective of this study is to develop methodologies and to analyze the effects of socioeconomic and demographic factors on nutrition demand and consumption behavior of households. To accomplish these objectives in this study, the food consumption survey data collected from the national representatives of Turkish households, who live in urban and rural areas. This study also investigated nutrition consumption for socioeconomic and demographic groups in both rural and urban areas in Turkey. According to results of the model, fat income elasticity is considerably higher at 0.57, while those for protein-calorie and carbohydrates are 0.47, 0.43 and 0.38. Thus a given increase in household expenditure will lead to a much larger proportionate rise in consumption of protein and fat than it will for carbohydrate and total calorie intake.

Article History
Received : 21.10.2018
Accepted : 27.12.2018

Keywords
Food Consumption,
Nutrition,
Nousehold,
Protein,
Calorie,
Turkey

Research Article

Türkiye'de Hanehalklarının Beslenme Alışkanlıkları ve Gıda Tüketimi

ÖZET

Gıda tüketimi ve beslenme kalitesi hem gelir hem de fiyat ile diğer birçok faktörler tarafından belirlenir. Hanehalklarının demografik yapısındaki değişiklikler, kadının işgücüne katılımı, sağlık-ve beslenme arasındaki ilişkiler hakkındaki yeni endişeler ve tarım ürünleri piyasalarındaki gelişmeler, tüketilen gıdaların türlerini ve miktarlarını etkileyebilmektedir. Bu çalışmanın temel amacı, sosyoekonomik ve demografik faktörlerin hanehalklarının beslenme talebi ve tüketim davranışı üzerindeki etkilerini analiz etmektir. Çalışmada bu hedeflere ulaşmak için, Türkiye'de kentsel ve kırsal alanlarda yaşayan hanelerden elde edilen gıda tüketimi anket verileri kullanılmıştır. Bu çalışma aynı zamanda Türkiye'deki kırsal ve kentsel alanlarda ikamet eden farklı sosyoekonomik ve demografik grupların beslenme tüketimini araştırmıştır. Model sonuçlarına göre, yağ gelir esnekliği 0.57 gibi oldukça yüksektir. Hanehalklarının protein, kalori ve karbonhidratlar tüketimi gelir esneklikleri ise sırasıyla 0.47, 0.43 ve 0.38'dir. Sonuçlar hanehalkı harcamalarındaki belirli bir artışın hanehalklarının protein ve yağ tüketimini karbonhidrat ve toplam kalori tüketimine kıyasla daha fazla arttıracağını göstermektedir.

Makale Tarihçesi
Geliş : 21.10.2018
Kabul : 27.12.2018

Anahtar Kelimeler
Gıda Tüketimi,
Beslenme,
Hanehalkı,
Protein,
Kalori,
Türkiye

Araştırma Makalesi

To cite: Akbay C 2018. Household Nutrition Habits and Food Consumption in Turkey. KSÜ Tar Doğa Derg 21(Özel Sayı) : 67-79, DOI : 10.18016/ ksutarimdoga.vi.472965

INTRODUCTION

In some parts of the world, there are poverty, hunger and related problems because of the insufficient nutrition, as well as food poisoning, food allergies and other food-based problems. Thanks to the technological developments, today, we can find out the problems, which in societies are encountered, most of the time

directly based on nutrition. Nutrition means, the consumption of foods for the continuation of growing up and development. A healthy life can only be provided by consumption of quality and safe foods.

Safety of foods means, for an active and healthy life, the access and the acquisition of people for the enough, quality, safe, healthy and nutritious foods with the economical and physical aspect (DPT, 2003; Pekcan, 2001a). Adequate food and proper healthy nutrition are vital for economic development and wellbeing of an individual (Akbay, 2013). However, nowadays the world is facing some serious problems due to the insufficient and unbalanced nutrition of people and also the poor access to the safe foods, even though the population has been increasing constantly.

Sufficient and stable nourishment is one of the most, maybe the most important reason for a healthy and strong life, the economic and social development and also the opportunity of living the life with safety and virtue (DPT, 2003). The choices of the consumers on foods are not affecting their own health only, but also it has great effects on economic development, agricultural production, the commerce balance and also the workforce on the other sectors. A healthy nutrition plays an important role in optimized health and productivity, the reduction of the chronic heart and vessel diseases and also other diseases.

Sufficient and balanced nutrition requires the growth and protection of health, easy access to the foods, but also it ought to contain the balanced contents of calories, proteins, fats, carbohydrates, vitamins, fibers and minerals. Today, there is a serious and growing concern because of the relation between nutrition circumstances and cancer. In spite of the importance of nutrition preferences on economic, political, social and nutrition aspects, the consumers have inadequate knowledge about the importance of food consumption and healthy diet. Especially after 1970s, the high rate of sugar on diets, growing of fat diets, the diets, which are poor on fibrous foods and also the poor consumption of fruits and vegetables have become a real and serious problem for our health.

While the experts in Europe and USA have been dealing with the problems of excessive nutrition on most of the time, the problems in Turkey in this respect are actually much more serious. Providing an adequate and balanced diet for the population, and particularly increasing per capita consumption of animal protein, has long been a challenge in Turkey, which over the last 60 years has persistently experienced high population growth (Anil, 1995). Turkey is experiencing nutritional problems not only in developing countries but also in developed countries (Pekcan, 1998). As a result of the great imbalance on the income dispersions, some people face with the problems because of the insufficient nutrition. On the other hand, some other people are also having the problems because of the excessive nourishment in Turkey.

When we are glimpsing on the nutrition circumstances in Turkey, it is found out that the bread from wheat and also the other grain products are the main nutrition elements. The 50 % of the daily energy is provided by bread along with other grains, but over the years it is also claimed that the tendency on consuming bread, milk, yogurt, fresh vegetables and fruits is decreasing, but the consumption of eggs, sugar and dried legumes is constantly increasing. In some societies, because of the insufficient and insecure nutrition and the poor consumption of foods from animal origin, there have been macro and micro deficiency of nourishment elements (DPT, 2003).

Comparing to the developed countries, in Turkey the daily needed energy is acquired by most of the time by vegetable foods based on grain products and the other products based on fat, which happens to be the dramatic reason of unbalanced nourishment. The consumption of the animal originated foods in Turkey, which have the high prosperity of proteins, is severely meager. Because of the low level of milk and its products, meat and its products and egg consumption, there is less possibility of gaining the sufficient amount of minerals such as calcium, zinc, iodine and iron; and also the vitamins such as vitamin A, riboflavin etc. For example, the rate of the ones, who consume calcium (13-26%), vitamin A (3-31%) and riboflavin (34-40%) is highly less. Especially the poor consumption of milk and its products is the basic reason of calcium and riboflavin insufficiency (Pekcan and Karaağaoğlu, 2000; Pekcan, 2001a; Pekcan, 2001b). In 2002 the daily energy acquisition, protein and fat amounts for each individual based on animal foods origin are respectively 417 calorie, 27.3 gr protein and 26.8 gr fat. These rates are in developed countries in the same order as 1024 calorie, 62.1 gr protein and 77.5 gr fat (FAO, 2005). In addition to that, the daily advised fruits and vegetables consumption by the health facilities' and researchers' motto 'at least five times a day' is actually close to that phrase in Turkey, but day by day it is also decreasing (FAO, 2005).

According to the 'World Nutrition Declaration', which is also signed by Turkey (The International Nutrition Conference, Rom, 1992 – ICN) for a better welfare, economic, social and national development it is desperately needed to have an access to the sufficient, healthy and secure nutrition goods (FAO, WHO, 1992).

The researches have shown that 60 % of children deaths are caused by the insufficiency of energy, vitamins and minerals (TKB, 2000). The results of researchers, which is called 'National Demographic and Health Survey and carried out and verified by The University of Hacettepe, claim that %16 of the children under the age of 5 have been facing with health

problems due to lack of chronic nutrition goods (TKB, 2000).

The demand of food by the society and individuals is affected by income rates and the prices besides the other effects. The change on the household demographics, the growing labor force of the women, the new concern due to the relation between health and nutrition, the food aid programs, the growing knowledge of the consumers on food security and global effects on the marketing changes have considerable roles on the consumption and variety of foods by the households.

For the preparation and generation of the sufficient and balanced nutrition plans and politics it is vital to have the nutrition and health datum of the related country. However, except the nourishment researches made in 1974 and 1984, in the last 30 years the changes on nutrition and health conditions could not be detected (Koksal, 1977; Tonuk et al., 1987; DPT, 2003).

The household surveys are one of the most important sources for the determination of the socioeconomic constructions of the households, their life standards and consumption patterns, distribution of the incomes among the individuals or the households and the test of the validity of the socio-economic politics. Household means one or several few groups of people, whose incomes, expenses and profits are not to be divided into and who are participating in the service and govern of the household.

Most researches of food consumptions and expenses have been made for the examination of the relationship between income and consumption in Turkey. Hereby, the surveys in 1994 and 2003 made by the Turkish Statistics Institution (TSI) on 'Household Income and Consumption Expenditure' have been used by the researchers for the consumption habits and behaviors in Turkey. However, all the researches until today have been organized for the estimation of the tendencies over the foods and prices, but there has not been any research made to examine the nutrition consumption considering all the socioeconomic groups.

The researches made on the analysis of food consumption and nutrition habits based on households are one of the most important methods for the determination of the nutrition habits of a society. The main aim of this research is to investigate the socioeconomic and demographic factors of the individuals and households on the consumption of calorie, protein, fat and carbohydrate. The specific goal of this study is to determine the habits of the individuals and households as social economic and demographic groups, and the prediction of the nutrition product demands.

The findings of this work will have a great contribution on the determination of nutrition production and consumption politics and their reconstruction for better and healthier nourishment circumstances in Turkey.

MATERIAL and METHODS

Material

In this study, the nutrition consumption is analyzed among the individuals and households as socioeconomic and demographic groups. The research contains approximately 26 provinces and 25764 households in 12 regions of Turkey. The TÜİK 2003 Household Budget Survey data provide detailed information on socioeconomic and demographic prospects of individuals and households, consumption constructions, income rates etc. The findings of these questionnaires contain the expenditure amounts and information based on nutrition goods as well.

Method

Model and Estimation

Until nowadays there have been so few researches, which contain the socioeconomic and demographic groups and sub-nutrient groups. Other than that there have been so many researches on certain food groups or main nutrients.

Meanwhile, the differences of the socioeconomic on the food consumption do not mean that there should be also differences among nutrient consumption rates. Thus, the researches in both Europe and also in USA have shown that on food based surveys could lead the differences in socioeconomic groups, however, on nutrient based surveys do not show the differences generally (Adrian and Daniel, 1976; Chung, 1994; Huang, 1996 and 1998; Huang and Lin, 2000; McDowll et al., 1997; Adelaja et al., 1997; Lee and Brown, 1998; Murphy and Bayer, 1999; Chern, 1999; Akbay, 2000; Abdulai and Aubert, 2004). But in Turkey there have been limited researches about this subject. The Nutrition – Health and Food Consumption Research in 1974 is the most comprehensive research ever done in Turkey (Köksal, 1977). According to this research, the average calorie amount is 2291 and protein rate is 68 grams per person. The 26.5% of proteins have been provided by the animal originated foods, and 1984 – Food Consumption and Nutrition Research have been carried out in 3 provinces, but without any health scanning (Tonuk et al., 1987). The other researchers are performed most of time for the local nourishment habits. One of these researches has been carried out in Adana on the household nutrition levels, in which the Logit Analysis method has been used (Dolekoglu and Yurdakul, 2004). In this research, because of the lack of information about the food consumption, with the help of the expenditure amounts, the total calorie rates have been tried to be predicted. Within this research the daily calorie has been predicted as 3059 cal/day,

and the animal originated food rate is predicted as 16%, and the daily carbohydrate consumption is calculated as 451 gr, protein 97 gr and the fat 106 gr.

The analysis consumption of nutrition elements contained by foods the methods of Davis (1982), Ramezani (1995), Leung and Miklius (1997), Adelaja et al. (1997), Huang (1996, 1998), Huang and Lin (2000) and Abdulai and Aubert (2004) have been taken into consideration. The demand of specific nutrition elements can be predicted by the Engel function. The consumption functions of the different kind of nutrients and nourishment elements can be shown with the help of the following function (Adelaja et al., 1997; Nayga, 1994):

$$x_i = f\left(p, Y; S, R\right)$$

where, x_i is the consumption amount for good i; p is prices, Y is income, S is the consumer preference trends and R are the parameters associated with socioeconomic and demographic variables.

Within this context the nutrient amounts are calculated with the usage of their including calorie, fat and carbohydrate quantities based on households. We can also enlarge the last pattern with the usage of any other nutrients:

$$N_k = \sum_j a_{kj} x_j \quad k = 1,2,\ldots,K$$

Where, a_{kj}, is the amount of nutrition k for each food products.

In this study the nutrition consumption rates are examined by the help of the equation above, which is used for each nutrient, and the diversities in cities or rural areas, regions, provinces have been taken into consideration and their relation to social demographic groups. The analysis does not include the food consumptions outside of the household. Because of this it is possible that the protein, fat, calorie and carbohydrate rates could be less than expected. For the prediction of the nutrients 'the double logarithmic function' has been used.

$$LogN_k = \beta_0 + \beta_1 LogINCOME + \beta_2 HHB + \beta_3 URBAN + \sum_{J=1}^{3} \beta_{3+j} EDU_j + \beta_7 AGE + \beta_8 GENDER + \beta_9 MARITAL + \beta_{10} HB50 + \sum_{j=1}^{3} \delta_{10+j} SEASON_j + \sum_{J=1}^{11} \beta_{14+j} DB_J + e_k$$

Where Nk is the amount of nutrition consumption amount for nutrition k, INCOME is the household income; HHB is the number of members in household; URBAN is household location in urban area; EDU, education level of household head; AGE, age of the household head; GENDER, gender of household head; MARİTAL, Marital status of household head; D50, number of household head aged more than 50 years old on the household; SEASON, Season of survey done; DB is region of residence of the household; ß and δ parameters of variables; e_i is error term. Since INCOME variable in the model is logarithmic, at the same time the estimated coefficients of ß1 is income elasticity.

For the purpose of the prevention of correlation problem and because of the usage of household section data, the price variable has been removed from the pattern.

EMPIRICAL RESULTS

No single food commodity dominates the diets of the Turkish people. The average Turkish diet is still largely derived from grains (mostly wheat), fruits and vegetables (Akbay et al., 2007). As a long-term goal, the government would like to see the consumption of animal protein brought closer to the level in developed countries (Akbay et al., 2007). In Table 1, there is the data of calorie, protein and fat amount for each individual in Turkey. The daily protein amount is 108.1 gr in Turkey and 66.4% of it provided by vegetable products and the 33.6% of it provided by animal originated products. A similar situation can be also detected for calorie consumption. In 1960 the 15.7 % of calories (2881.3 per person) and in 2013, 84.5% of calories (3138.0 per person) have been provided from vegetable foods and the rest is from animal originated foods. On the other hand, there has been observed an increase in per capita fat consumption in Turkey, but the rate of animal originated foods has decreased from 44.5% to 30.6%. Yet, for a sufficient and balanced nutrition, it is necessary to consume the high protein containing animal originated products.

In developed countries, the consumption of daily protein is 75 gr and approximately 29 gr of it provided from animal originated products. Daily protein consumption from vegetable and animal products is in developing countries respectively 68 gr and 21 gr; and in developed countries these rates are respectively 100 gr and 57 gr. In countries belonging to the European Union, the 30% of calories and the 59% of proteins are acquired from animal origin products.

There have been so many researches for the nutrition habits and the demand on food elements in developed countries; yet it is hard to find similar researches in Turkey, where so many of the researches have focused rather than food product consumptions. There has been almost no research about the nourishment habits and nutrient elements. For example, it is not encountered with a research, which focuses on the socioeconomic and demographic effects on the nutrition habits. The main reason for this situation is the lack of data about the subject or the localization of the researches. However, the survey made by TÜİK contains the consumed nutrients of the households; hence there is the possibility to predict the nutrition habits in Turkey as well. With this purpose; the

calorie, carbohydrate, protein and fat rates of every food have been used to calculate the nutrition elements in this study, and then again the nutrition elements have been examined with the aspects of income amounts in locals and also the socioeconomic and demographic groups and finally with the usage of 'logarithmic linear regression' model, the socioeconomic and demographic effects on the nutrition consumption level have been analyzed and the flexibilities have been estimated. The analysis contains only the food consumption within the household, that is why the expected numbers are a bit less than usual but still all these findings have vital significances for the comparing of the socioeconomic and demographic aspects.

Table 1. Per capita energy, protein and fat consumption in Turkey (1960-2013)

Years	Total			Rate of the vegetables			Rate of the Animal products		
	Calorie (cal/day)	Protein (gr/day)	Fat (gr/day)	Calorie (%)	Protein (%)	Fat (%)	Calorie (%)	Protein (%)	Fat (%)
1960	2881.3	90.8	67.7	84.3	72.2	55.5	15.7	27.8	44.5
1970	3017.1	90.5	70.2	86.2	73.4	60.7	13.8	26.6	39.3
1980	3281.3	95.6	83.9	87.0	73.0	67.1	13.0	27.0	32.9
1990	3539.2	102.4	88.0	89.0	75.6	71.5	11.0	24.4	28.5
2000	3371.8	96.4	91.9	89.3	75.0	74.6	10.7	25.0	25.4
2005	3434.0	98.3	99.9	88.8	74.2	75.3	11.2	25.8	24.7
2010	3650.0	103.5	113.8	87.5	70.4	74.3	13.0	29.5	25.7
2013	3706.0	108.1	119.8	84.7	66.4	69.4	15.5	33.6	30.6
(1960-2013) Changes (%)	22.3	16.0	43.5	0.4	-8.7	20.0	-1.0	17.2	-45.7

Source: FAO, 2010. FAOSTAT (calculated from total food production)

In Table 2, we have the findings of the daily proteins, calories, carbohydrates and fat consumptions with the data of the urban and rural areas and income groups. In rural areas, the carbohydrate consumption is average 463.5 gr, but it is 379.4 gr in urban areas and the average in the whole Turkey is 403.8 gr. The households in rural areas consume about 22% (84gr) more carbohydrate than in urban areas. A similar situation can be also observed for the protein and calorie consumption. In rural areas, the average calorie amount is 414.2 cal more than in urban areas and also the protein amount is 9.0 gr more than in urban areas. On the other hand, there has been no significant difference between fat consumption in urban and rural areas. The variation coefficient (standard deviation/average) has been calculated and results that there is a fairer distribution of nutrients consumption in rural areas than urban areas.

In Table 2, the 20% of the income groups the consumption of nutrient elements is shown. Generally, in rural and urban areas there is a parallel growth between increasing of income and calorie consumption. Especially between the lowest income group and the other groups, there has been a great difference observed. While there is not such a big difference for the calorie and protein consumptions in the last four groups, the households in the lower-income group consume so much less calorie and protein than the other groups.

There is no significant difference between households in urban and rural areas for the fat consumption, yet with the changes in income rates, there is a drastic change for the fat consumption per person. The households in the lowest income groups consume about 76.0 gr daily fat; but the households in the highest groups consume 21% (92.3 gr) more fat. This rate changes to 43% in the urban areas. A similar situation could be also observed for the other nutrients. For example, the households of the richest groups in urban areas consume 27% more protein, 16% more calorie and 5% more carbohydrate than the households in rural areas.

When we are looking at the 12 geographic regions for the calorie consumption for each person, we discover that the highest level of calorie consumption is with the amount of 2949 cal in West Black Sea Region; and the lowest amount is with the amount of 2463cal in Istanbul and with 2492cal Middle East Anatolian Region (Table 3). The amount of 455 gr, the South East Anatolian Region comes in the first place on daily carbohydrate consumption; and Istanbul comes at the last place with 355 gr per day and West Black Sea Region has the highest rate of protein consumption with 85.4 gr and West Anatolian Region has the lowest rate of protein consumption with 73.0 gr. The highest rate for the fat consume is with the number of 94.0 gr West Marmara, followed by with 93 gr West Black Sea Region and with 91 gr Aegean Region; and the lowest is with 70 gr North-east Anatolian Region. As a result of the statistical analysis (F-Test), a great difference between the regions is detected. There have been differences within a region. Hereby, with the calculation of variation coefficient, the numbers for every region coefficient are enormous. The coefficient

of variation is for the calorie between 0.5 and 0.7; for the protein between 0.8 and 0.5; for the fat between 0.6 and 1.2 and for the carbohydrates between 0.6 and 0.8. For example, the difference between Aegean Region and South East Region for energy consumption is wider than between Istanbul and East Black Sea Region, and also the gap among the protein consumers is in north-east Anatolian region wider than in East Black Sea Region. Almost an exact conclusion could be referred by the data for fat consumption between East and West Black Sea Regions.

Table 2. Amount of per capita nutrition consumption by income groups in rural and urban areas

Income Groups	Calorie (cal/day)	Carbohydrate (gr/day)	Protein (gr/day)	Fat (gr/day)
		Rural households		
1. %20 (Low)	2734.36	435.69	75.71	75.98
2. %20 (Medium to low)	2998.01	471.00	84.84	86.67
3. %20 (Medium)	3083.46	480.53	87.87	90.63
4. %20 (Medium to high)	3020.79	469.24	88.80	88.70
5. %20 (High)	3019.70	460.89	89.76	92.27
Average	2971.39	463.46	85.40	86.86
		Urban households		
1. %20 (Low)	2300.06	358.16	66.39	66.88
2. %20 (Medium to low)	2588.87	393.78	75.31	80.42
3. %20 (Medium)	2589.33	383.50	76.42	85.10
4. %20 (Medium to high)	2626.97	384.79	79.22	87.98
5. %20 (High)	2679.91	376.73	84.52	95.95
Average	2557.15	379.39	76.38	83.27
		Turkey		
1. %20 (Low)	2426.23	380.71	69.10	69.52
2. %20 (Medium to low)	2707.70	416.21	78.08	82.24
3. %20 (Medium)	2732.88	411.69	79.75	86.71
4. %20 (Medium to high)	2741.41	409.33	82.00	88.19
5. %20 (High)	2778.63	401.18	86.04	94.88
Average	2677.49	403.82	79.00	84.31

Those differences are getting even higher examining the provinces rather than regions (Chart 4). For example, Gaziantep leads the calorie to consume with the total of 3549cal; yet Van (2206 cal) and Mardin (2306 cal) are the least calories consumed cities in Turkey. A similar situation is valid for protein and carbohydrate consumptions; with 65.7 gr protein and 337.4 gr carbohydrate Van has the lowest rates; and same as the calorie rates, Gaziantep leads the carbohydrate (337.4 gr) and protein (65.7 gr) consumes in Turkey. These both cities are in the same region, and which happens to be an interesting fact. Furthermore, it should be also considered that Gaziantep contains the data of Adiyaman and Kilis; and Van contains the data of Muş, Bitlis and Hakkari. However, for the fat consumption, there is a different situation. Kastamonu leads the fat to consume with 103.9 gr and Agrı and Van come at the last two places with respectively 61.2 and 65.1 gr.

It is also necessary for a healthy nutrition to eat not only sufficiently but also well balanced. The problem of nutrition can actually be divided into two sections: insufficient nutrition and unbalanced or improper nutrition. The insufficient nourishment is the result of the insufficient calorie gaining, which human body needs on daily basis. On the other hand, unbalanced nutrition means the lack of main nutrition elements. Especially it is because of the poor or excessive acquisition of the animal originated products. In reality those two problems are not that different theoretically. The individuals, who take insufficient nourishment, have the unbalanced nutrition problem as well. Yet the opposite of that cannot be valid on every occasion. This means, for the one who takes unbalanced nourishment, cannot be classified under the insufficient nutrition group.

Examining the household rates, has shown that the 21% of the households consume between 2000-2500cal; the 21% of the households have the calorie consumption 3500cal or more; and the 40% of the households consume less than 2000 calories for each person.

Table 3. Amount of per capita nutrition consumption by regions

Regions	Calorie (cal/day)	Carbohydrate (gr/day)	Protein (gr/day)	Fat (gr/day)
Istanbul	2463.14	354.70	76.30	84.82
West Marmara	2764.44	403.96	80.92	94.00
Aegean Region	2746.10	407.02	78.72	91.06
East Marmara	2572.75	388.87	74.27	82.09
West Anatolian Region	2470.25	370.11	72.98	79.28
Mediterranean Region	2726.94	410.75	79.24	86.81
Middle Anatolian Region	2653.17	410.01	78.79	78.46
West Black Sea Region	2949.22	445.93	85.41	92.75
East Black Sea Region	2751.11	412.68	82.89	87.45
North East Anatolian Region	2591.64	405.75	82.17	69.62
Middle East Anatolian Region	2491.79	382.00	75.24	73.52
Southern Anatolian Region	2811.91	455.22	84.15	71.57
Average	2677.49	403.82	79.00	84.31

Table 4. Amount of per capita nutrition consumption by cities

Provinces	Calorie (cal/day)	Carbohydrate (gr/day)	Protein (gr/day)	Fat (gr/day)
Istanbul	2463.14	354.70	76.30	84.82
Tekirdağ	2744.77	401.62	80.72	92.22
Balıkesir	2782.86	406.15	81.11	95.67
İzmir	2548.85	358.53	74.90	92.89
Aydın	2658.41	400.43	76.13	85.81
Manisa	3065.27	474.12	85.56	92.68
Bursa	2617.58	399.99	75.29	81.61
Kocaeli	2470.00	363.37	71.93	83.19
Ankara	2475.28	366.43	73.84	81.17
Konya	2463.64	374.94	71.85	76.78
Antalya	2655.17	387.43	74.49	92.47
Adana	2744.79	418.80	80.44	84.27
Hatay	2780.98	421.84	82.76	85.75
Kırıkkale	2897.23	445.84	85.91	86.46
Kayseri	2514.71	389.69	74.75	73.92
Zonguldak	2893.61	430.00	80.39	95.95
Kastamonu	3220.03	478.07	95.23	103.86
Samsun	2797.30	438.27	83.24	80.42
Trabzon	2751.11	412.68	82.89	87.45
Erzurum	2775.48	434.21	84.24	76.25
Ağrı	2358.55	369.59	79.54	61.22
Malatya	2729.06	418.70	83.15	80.51
Van	2206.36	337.94	65.71	65.12
Gaziantep	3549.54	600.52	110.10	76.08
Şanlıurfa	2763.07	451.15	82.49	68.80
Mardin	2306.36	345.96	66.28	72.88
Average	2677.49	403.82	79.00	84.31

Therefore, the high rates of insufficient nutrition conditions have shown us that the biggest nutrition problem in Turkey is insufficient nourishment. Especially the households in urban areas, whose income rates are below than average, have been facing with the improper or insufficient nourishment problems. A similar result can also be made for the rural areas, in which actually the rates are not that diverse. Through the increasing of the income rate for each individual and the well-being of the households, the insufficient nutrition problem could be hindered and prevented. As a result of the research made my Adelaja et all. (1997). the education hasn't had a big effect on the consume of the nutrition elements; but it is a fact that education has enormously bigger role to play for avoiding the insufficient or unbalanced nutrition in those societies, whose income rates are vast. Considering the animal originated products, we

can see that the problem is getting bigger and bigger. The 29% of the households consume less than 50 gr proteins; and 47% of the households consume less than 20 gr animal originated proteins. Only 3% consume more than 100 gr protein from the animal origins. The results of the research have shown that with the enhancing of the calorie rates from 2000 to 2500 could be possibly a huge step preventing the lack of protein consumption but the increasing of the animal originated proteins should be also taken into consideration by the enlarging of the general protein rate. Therefore, advancing the income rates and education acts for the animal originated proteins could be also helpful. For example, the growing importance for the milk and milk products and consume of white meat by public and private institutions should be more valued too.

As the Table 1, in which time series are used, the 11.8% of the calorie and 27.4% of the protein have been provided by the animal originated products. These rates are vastly more in developed and European Union countries than Turkey. The same results are also concluded from the Household Survey Analysis (Table 5). The 11.6% of calorie, 33.7% of protein and 23.5% of fat consume are provided from the animal originated products. The 88.4% of calorie consumption is gained from the vegetable food products and 60.5% of its provided from the grains. Among the grain products, wheat and wheat bread, flavor and pasta have an important portion; but rice, corn and other grain products are not used much. The rate of grain products of protein is 76.6%, carbohydrate is 69.4% and fat is 67.5% for the vegetable based consumptions. The consumed and vegetable based fat has been gained from sunflower, corn. olive and other vegetable oils. Analyzing the differences between animal and vegetable based nutrients, we come across that between rural areas and cities there has not been any significant diversity for calorie consume; but tiny difference can be seen between protein and fat consumptions.

In rural areas the rate of the animal originated products in urban areas has with 35.0% more than in rural areas with 31.2% in the total protein consumption. Between income and consume of animal originated products there is a seriously parallel relationship. As Table 5, with the increasing rates of income, there is also an increasing status to be observed. This observation is valid not only for rural and urban areas, but also for the all regions. There is an opposite relationship between income and vegetable based nutrients. In the lowest income group, the protein amount of animal based nutrients is 26.8%, and in the highest group this rate rises to 40.7 and similar situation is also valid for calorie, carbohydrate and fat consumes. In the lowest group of income, the calorie consumes based on animal nutrients is 9.4% and it is 14.3% in the highest-income group. Also the similar and important difference can be observed considering the regions. For example, in both rural and urban areas. Istanbul has the highest rate of animal nutritious calories with13.3% and proteins with 39.7%; the lowest region is with for calorie 8.8% and for protein 25.8% South East Anatolian Region. Therefore, the South East Anatolian Region has the first place for the total calorie and protein consumption; but has the last place for the animal originated nutrients of protein and calorie.

According to the results, we know that the diversity for the mainly nutrition elements could be because of the reason of residential areas, provinces, income groups and consumption structure. In Table 6, we have the consumption of the nutrition elements with the usage of demographic variables. As we can conclude from the table, there has not been a regular change between education levels and nutrition elements consume. The group has the most values for calorie, carbohydrate and protein, contains the individuals whether ignorant (no literacy) or graduated only from the elementary schools. On the other hand, the fat consumption is higher among the university graduates. Among the households, which includes only women or singles have consumed more nutrients than the others. In the households, in which the mother is working, the individuals consume more nutrition elements than the others. Naturally, in the households, which have more than four members, more nutrients have been consumed. The age of the household head has also an important variable on the amount of the consumed nourishments, especially on calorie, carbohydrate and protein amounts.

It is predicted with the usage of the double logarithmic regression form that total amount of food, carbohydrate, calorie, protein and fat elements can be observed from the Table 7. On demand models of every food element, income coefficients are positive and less than 1. And because of adding of the incomes logarithmically, this reflects also the income elasticity. Among the four nutrition demands, the highest income elasticity belongs with 0.57 to the fat demand elasticity and it is followed with 0.47 by protein and with 0.38 by carbohydrate. Therefore, a 10% increase on the income will also increase the fat consume to 5.7%, protein consume to 4.7%, calorie consume to 4.3% and carbohydrate consume to 3.8%.

After these results we conclude that these four nutrition elements belong to the necessary nourishment products category. A possible increase on the income rates will probably lead to an increase on the consumption of fat and protein. Thus, we can understand that there is a tendency from traditional products to the less traditional nutrients such as meat and meat products. These results have also similar conclusions to those researches in other countries.

Table 5. Distribution of nutrition consumption by income groups in rural and urban areas (%)

Income Groups	Calorie		Carbohydrate		Protein		Fat	
	Vegetable	Animal	Vegetable	Animal	Vegetable	Animal	Vegetable	Animal
	Rural households							
1. %20	89.98	10.02	97.97	2.03	73.66	26.34	76.28	23.72
2. %20	89.52	10.48	98.03	1.97	71.52	28.48	76.28	23.72
3. %20	89.28	10.72	98.11	1.89	69.98	30.02	76.31	23.69
4. %20	87.97	12.03	97.89	2.11	66.99	33.01	73.96	26.04
5. %20	86.94	13.06	97.82	2.18	64.54	35.46	72.46	27.54
Average	88.60	11.40	97.96	2.04	68.82	31.18	74.83	25.17
	Urban households							
1. %20	90.88	9.12	98.54	1.46	72.98	27.02	79.96	20.04
2. %20	89.72	10.28	98.37	1.63	69.63	30.37	78.93	21.07
3. %20	88.80	11.20	98.31	1.69	66.40	33.60	78.45	21.55
4. %20	87.52	12.48	98.21	1.79	63.00	37.00	76.63	23.37
5. %20	85.04	14.96	97.92	2.08	56.51	43.49	73.99	26.01
Average	88.22	11.78	98.26	1.74	65.05	34.95	77.27	22.73
	Turkey							
1. %20	90.59	9.41	98.35	1.65	73.19	26.81	78.78	21.22
2. %20	89.65	10.35	98.25	1.75	70.26	29.74	78.06	21.94
3. %20	88.96	11.04	98.24	1.76	67.58	32.42	77.77	22.23
4. %20	87.67	12.33	98.10	1.90	64.33	35.67	75.79	24.21
5. %20	85.73	14.27	97.88	2.12	59.31	40.69	73.49	26.51
Average	88.35+	11.65	98.15*	1.85	66.31x	33.69	76.48&	23.52

*: %69.4 of it are provided from grain; +: %60.5 of it are provided from grain; x: %76.6 of it are provided from grain of it are provided from grain; &: %67.5 of it are provided from vegetable oil.

Table 6. Amount of per capita nutrition consumption by other socio demographic groups

Demographic variables	Calorie (cal/day)	Carbohydrate (gr/day)	Protein (gr/day)	Fat (gr/day)
Education level of household head				
Literate or illiterate	2992.05	464.63	86.12	87.56
Graduated from elementary or secondary school	2651.45	405.15	77.65	81.19
Graduated from High school	2493.57	364.03	75.11	84.04
Graduated from University	2758.14	384.56	85.37	101.14
Gender of household head				
Women	3085.99	452.50	89.24	104.13
Men	2634.56	398.69	77.92	82.23
Marital status of household head				
Single	2983.58	437.54	89.14	99.38
Married	2672.10	403.23	78.82	84.05
Status of Mother				
Do not work	2864.01	440.87	83.33	86.48
Work	2605.12	390.53	77.17	83.03
Household size				
≤4	2221.78	351.08	64.76	62.29
>4	2919.94	431.85	86.57	96.03
Age of household head				
≤30 years old	2357.42	353.56	68.63	75.45
Between 31 and 50 years old	2385.29	363.29	69.98	73.66
>50 years old	3202.81	478.37	95.36	102.61

For example, a research made by Rae (1999) in Indonesia has shown us that the income elasticity of fat is the highest with 0.42, and followed by protein with 0.25 and by calorie with 0.16 and finally by carbohydrate with 0.09.

Table 7. Regression results for household calorie consumption amount

Variables	Calorie		Protein		Carbohydrate		Fats	
	Parameters	Standard error	Parameters	Standard error	Parameters	Standard error	Parameters	Standard error
Constant	2.805*	0.043	-0.997*	0.042	1.172*	0.047	-1.741*	0.060
Ln (Income)	0.428*	0.006	0.472*	0.006	0.380*	0.006	0.566*	0.008
Urban	-0.180*	0.008	-0.149*	0.008	-0.177*	0.009	-0.159*	0.011
HHB	0.096*	0.002	0.088*	0.002	0.108*	0.002	0.073*	0.002
AGE50	0.050*	0.004	0.061*	0.004	0.044*	0.004	0.052*	0.006
GENDER	0.144*	0.012	0.157*	0.012	0.165*	0.013	0.096*	0.017
MARITAL	0.193*	0.024	0.209*	0.023	0.175*	0.026	0.237*	0.033
RWORK	0.036*	0.008	0.030*	0.008	0.042*	0.009	0.027*	0.012
WWORK	-0.043*	0.008	-0.044*	0.008	-0.043*	0.009	-0.041*	0.012
SEASON1	0.032*	0.009	0.052*	0.008	-0.012	0.009	0.095*	0.012
SEASON2	-0.042*	0.009	-0.094*	0.008	-0.062*	0.009	0.025*	0.012
SEASON3	-0.034*	0.009	-0.077*	0.008	-0.023*	0.009	-0.035*	0.012
DB1	-0.432*	0.015	-0.458*	0.014	-0.445*	0.016	-0.311*	0.021
DB2	-0.351*	0.017	-0.385*	0.016	-0.361*	0.018	-0.254*	0.023
DB3	-0.331*	0.014	-0.386*	0.013	-0.330*	0.015	-0.288*	0.019
DB4	-0.310*	0.016	-0.376*	0.015	-0.302*	0.017	-0.238*	0.022
DB5	-0.397*	0.015	-0.448*	0.014	-0.401*	0.016	-0.329*	0.020
DB6	-0.214*	0.014	-0.273*	0.014	-0.218*	0.015	-0.115*	0.019
DB7	-0.237*	0.016	-0.265*	0.016	-0.236*	0.018	-0.156*	0.022
DB8	-0.150*	0.015	-0.208*	0.014	-0.170*	0.016	-0.002	0.020
DB9	-0.193*	0.018	-0.215*	0.018	-0.195*	0.020	-0.078*	0.025
DB10	-0.149*	0.022	-0.110*	0.022	-0.136*	0.025	-0.163*	0.031
DB11	-0.201*	0.018	-0.207*	0.018	-0.207*	0.020	-0.159*	0.025
EDU2	-0.052*	0.010	-0.052*	0.010	-0.057*	0.011	-0.021	0.015
EDU3	-0.203*	0.013	-0.187*	0.013	-0.225*	0.015	-0.124*	0.018
EDU4	-0.337*	0.016	-0.315*	0.015	-0.378*	0.017	-0.227*	0.022

*: Statistically significant coefficient by 1% error rate.

Examining the effects of other demographic factors, we can say that all factors have a statistical importance on nutrition elements demand. According to the results of the patterns, the households in the rural areas consume statistically more amounts of calories, proteins, carbohydrates and fats than ones in urban areas. The coefficient, which varies from -0.149 to -0.78, is higher comparing to the coefficient in the food consumption pattern. This result shows us that there are more differences between rural and urban areas on the efficiency of food consumption and nutrient consumption. With the increase in the members of a household, there is a statistical growth of nutrient consumption and also the age diversity in the household has effects on the nutrient consumption. The existence of the member more than the age of 50, has positive and statistically significant effects on nutrient consumption.

The gender (GENDER), marital status (MARITAL) and job status (RWORK) of the household head affect the nutrient consumptions statistically. In the households, whose household head is male and married and has more working members, consume more nutrient products than the others. However, a working woman in a household (WWORK), interestingly, affects the nutrient consumption negatively. The research surveyed by Adelaja et al. (1997) has shown that a working woman in a household affects the fat consume negatively, but the carbohydrate consumes positively. The coefficient of the education level of household head (EDU1, EDU2 and EDU3) is also taken into consideration significantly. Devolving in the education level leads to decrease on the nutrients consumption. But this decreasing has actually greater amount by calories, proteins and carbohydrates than fats. All of the seasonal variables (SEASON1 to SEASON3) and regional variables (DB1 to DB11) are statistically important on nutrition consumption.

CONCLUSIONS and RECOMMENDATIONS

Turkey has the features of the developing countries as well as the developed countries. According to the data of FAO, there have been enough energy supplies for the possible nutrients demand in Turkey. Yet, in some parts of the society, it is concluded that the lack of sufficient foods and poor consumption of the animal originated products cause the macro and minor

deficiencies in nutrition elements. In this study, by the information from the socioeconomic and demographic groups, to the prediction of nutrients consumption has been reached. The important effects of consumption structures and amounts have been understood, besides the significant role of residential areas, provinces and income diversity. The results suggest that with the increase of the income levels, households will pay more for the fat and protein consumptions, rather than calorie and carbohydrate consumes. Generally provided by altering data, in rural and urban residential areas the more the income has become, the more calorie consumptions have been surveyed. Especially between lowest income group and the other groups, there have been a huge amount of diversities to be observed. In terms of calorie and protein consumptions only a minor difference has occurred among the last lowest four groups, but by the lowest group there has been significant diversity because of the lack of protein and calorie consumption. For a healthy nutrition, as well as the sufficiency, the balance of the nourishment has a vital role to play. It is also claimed from the researches that because of the low income in rural areas, the insufficient nutrition is detected. The similar situation is also valid for urban areas, which still have minor differences. The increase in the individual income and welfare of the households could be vital elements preventing the nutrition problems. Furthermore, nutrition education programs with the help of raising the awareness and consciousness are decisive in balanced and sufficient nutrition. Thanks to the nutrition education programs, the expenses of health cares could be reduced and those resources could be channeled into other sectors or departments. Strong societies should be created by strong individuals. The prevention of the diseases based on insufficient or unbalanced nutrition could be the main factor for the reduction of labor force lost and other social damages. Briefly, the multi-disciplines will lead to positive effects on several areas and sectors.

Examining the results of the researches, it is concluded that the individuals, whose calorie consumption is less than 2000 cal., could be raised to 2500 cal. per day considering their age, gender and working circumstances, and this might also lead to a sufficient consumption of proteins. But in this matter, it is also important the raising of the animal originated protein amounts as well as the total protein consumes. For this purpose, in addition to the increase in the income rates, it is also vital to supply necessary education for the awareness of healthy nutrition habits. As it is mentioned before, the milk and its products and also the white meat should be chosen for the resolving of the unbalanced nutrition and it should also be supported by public and private commercials and education programs. 11.6 % of the calorie, 33.7% of the protein and 23.5% of the fat consumptions have been supplied by the animal originated nutrition products. 88.4 % of the calorie consumption has been provided by the vegetable products and its 60.5% comes from grain products. Among the grains, wheat and its bread, flavor and pasta have great share, but rice, corn and other grains do not have huge amount of role. The portion of the grains on vegetable protein consumption is 76.6% and on vegetable carbohydrate consumption is 69.4%. The 67.5% of the consumed vegetable based fats are made from sunflowers, corn, olive and other oils. As the household income grows, the rates of the animal-based products grow as well. These observations are valid not only in rural and urban districts, but also in all of the regions. With the same fashion, South East Anatolian Region has the highest levels of protein and calorie consumption, but also has the lowest level of animal sourced nutrition products. These findings will help the private and public institutions for the supply of the lower priced and quality nutrients, which provide the balanced and sufficient nutrition. Likewise, the food and nutrition flexibilities will contribute enormously. Also, it is concluded from this study that only the nutrition based research could lead the findings negatively, without the consideration of income rates, socio demographic aspects and the residential features.

In Turkey, food consumption and nutrition habits could diverse significantly from urban and rural residential aspects, regions, seasons, socioeconomic level of household and the socio-demographic features of the individuals in the household. In addition to those situations, due to the global developments there has been a growing tendency especially among young generations for the fast-food habits, which will affect the nutrition problems even worse than they already are. And it is also inevitable that these nutrition habits will also lead to heart and vessel diseases.

These results will also lead to the prevention of the diseases based on insufficient and/or unbalanced nutrition, which provides also logical reduction on states protective health expenses in the budget. And again thanks to the consistency of expenses, these resources could be channeled into other sectors and this provides the gaining of a more stable and secure health and state system in long term. It is also expected that with membership of Turkey into the European Union there will be diversity on the nutrition demands. With the integration into the food markets in Europe and acceptance of the EU's Common Agricultural Politics it will be possible to have a discount on prices of meat and its products and milk and its products, which provides also an increase the demands on these nutrition products. The income rates of the households have an important part to play in demands of the socioeconomic and demographic groups. Therefore, with the idea of the positive effects of the membership of Turkey into the EU on the

income, we can predict and expect a changing diversity from grain based products to the animal originated products.

The findings from the researches, without any doubt, will evaluate some important new aspects for the public institutions and establishments. With the purpose of leading the food and nutrition politics and plans, the findings will provide a vast knowledge and data of the socioeconomic and demographic group's intentions and habits on nutrition and nourishment goods. The results have shown that there should be a reclamation and establishment of some economic implements and balance for income and price relations. And the access to the secure nutrition products should be one of the main goals of the state and government especially in low income regions. The findings will also help the political and economic plans for the developing the income rates and preventing the poverty and other negative factors especially in areas, in which there have been lower income rates and poor welfare conditions. It is also considered that these findings will also help besides the public institutions, the private sector workers and managers, marketers, whom these findings will help with the developing new strategies. The understanding the present and future of the nutrition consumption structure will also provide great knowledge and foreseen for TÜİK, DPT and other private industry sector groups, which consider to invest on the nutrition sector.

While the reel prices of nutrition products have been increasing, the unemployment and income diversity problems have been growing as well, which rise the need for a nutrition and food politics. The reason of lack of interest in the nutrition field is the lack of data and knowledge. For carrying out the appropriate politics and plans, it is also needed to detect the nutrition and food consumption structures, to define the problems and interruptions and to determine rightly the ones, who are in need of a help by the income and welfare aspects. The research and the study provide also reliable information for the performing of the appropriate politics and plans in mid- and long terms especially for the prevention of the lower income groups.

The results of this research will also contribute and help to the sectors such as agricultural engineering, economics, public administration, medicine, environmental engineering etc. and also for the several professional groups such as the scientists, researchers, native or foreign investors and/or entrepreneurs, deciders, strategy experts, doctors and dietitians for their possible future surveys or researchers.

Due to the non-existence of an updated research in Turkey, where the latest research was made in 2003, in this study the last developments in this area could not be taken into consideration. Because of that, new and current researches should be operated more often and more comprehensively and their results should be explained to the public and researchers more frequently. In this study, the nutrition habits of the socioeconomic and demographic groups have been analyzed, and also other important factors on nutrition are the cultural and social structures of the consumers, different beliefs, characteristic diversities (perception, attitude and motivation) and other attributes, which are developed because of the other factors above. It would be helpful for the future, if the researchers and scientists enlarge the extent of this kind of researches and also the subjects above should be also attached importance.

ACKNOWLEDGEMENTS

The authors wish to thank to the Turkish Statistical Institute for providing the data and to TUBITAK for partly supporting this research.

REFERENCES

Abdulai A, Auber D 2004. A Cross-Sectional Analysis of Household Demand for Food and Nutrients in Tanzania. Agricultural Economics. 31: 67-79.

Adelaja AO, Nayga RM, Lauderbach TC, 1997. Income and Racial Differentials in Selected Nutrition Intakes. Amer. J. Agr. Econ., 79(5): 1452-1460.

Adrian J, Daniel R 1976. Impact of Socioeconomic Factors on Consumption of Selected Foods Nutrients in the United States. American Journal of Agricultural Economics. 78: 21-29.

Akbay C, Chern W, Boz I 2007. Household Food Consumption in Turkey. European Review of Agricultural Economics. 34(2): 209-231.

Anonim 1981. Türkiye'de Gıda Maddeleri Üretimi ve Beslenme. Türkiye Gelişme ve Araştırma Vakfı. Yayın No: 3. Ankara.

Davis C 1982. Linkages between Socioeconomic Characteristics. Food Expenditure Patterns. and Nutritional Status of Low Income Households: A Critical Review. American Journal of Agricultural Economics. 68: 1017-1025.

Dölekoğlu ÖC, Yurdakul O 2004. Adana İlinde Hanehalkının Beslenme Düzeyleri ve Etkili Faktörlerin Logit Analizi ile Belirlenmesi. Akdeniz Üniversitesi İİBF Dergisi. 8: 62-86.

DPT 2003. Ulusal Gıda ve Beslenme Stratejisi Çalışma Grubu Raporu. İktisadi Sektörler ve Koordinasyon Genel Müdürlüğü. Tayın No: DPT: 2670. ISBN 975–19–3340-0. Ankara.

FAO 2001. Nutrition Country Profile of Turkey. Food and Nutrition Division. Rome.

FAO/WHO. 1992. World Declaration and Plan of Action for Nutrition. International Conference on Nutrition. Rome. (ICN/92/2).

FAO 2003. FAOSTAT Citation Database Results. FAO. (www.fao.org).

FAO 2005. FAOSTAT Citation Database Results. FAO. (www.fao.org).

FAO 2008. Statistical Database. FAOSTAT Web page. Roma.

FAO 2009. Statistical Database. FAOSTAT Web page. Roma.

Huang KS.1998. How Economic Factors Influence the Nutrition Content of Diets. American Agricultural Economics Association Annual Meeting in Salt Lake City. Utah.

Huang K.S, Lin BH 2000. Estimation of Food Demand and Nutrient Elasticities from Household Survey Data. USDA Economic Research Service Technical Bulletin No. 1887.

Kasnakoğlu H 1998. Food Security Issues in Turkey. World Agricultural Trade. p. 225-253.

Katipoğlu YY 1995. Türkiye Coğrafi Bölgelerinde Yaşayan Hanehalklarının Tüketim Harcama Kalıplarının Belirlenmesi. İstanbul Teknik Üniversitesi Fen Bilimleri Enstitüsü. İşletme ABD, Yüksek Lisans Tezi. 99 s

Köksal O 1977. Türkiye'de Beslenme. Türkiye 1974 Beslenme. Sağlık ve Gıda Tüketim Araştırma Raporu. Aydın Matbaası. Ankara.

Lee JY, Brown MG 1998. Incorporating Nutrients in Food Demand Analysis. American Agricultural Economics Association Annual Meeting in Salt Lake City. Utah.

Leung P, Miklius W, 1997. Demand for Nutrition vs. Demand for Tastes. Applied Economics Letters. 4: 291-295.

Murphy SP 1998. Evaluating Dietary Quality among Low-Income Groups in the United States. Poverty and Food in Welfare Societies. Heausgegeben vom. Wissenschaffszentrum Berlin für Sozialforschung.

Nayga RM 1994. Effects of Socioeconomics and Demographic Factors on Consumption of Seleceted Food NutrientsAgr. Res. Econ. Rev. 23: 171-182.

Özcan KM, Tan S, Dellal İ 2001. Basic Food Consumption in Turkey: Effects of Income. Price and Family Size in Urban Areas. 71st EAAE Seminear. The Food Consumer In the Early 21st Century. Zaragoza. Spain.

Özmucur S 1991. Tüketim Kalıpları 1987. Boğaziçi Üniversitesi. Sosyal Bilimler Enstitüsü. Araştırma Raporu No: ISS/EC 91-07.

Park JL, Holcomb RB, Raper KC 1996. A Demand System Analysis of Food Commodities by U.S. Households Segmented by Income. American Journal of Agricultural Economics. 78: 290-300.

Pekcan G 1998. Türkiye'de Beslenme Durumu. 5. Uluslararası Spor Bilimleri Kongresi Bildiri Özetleri. Ankara. 5-7 Kasım 1998.s. 51-53.

Pekcan G 2001a. Türkiye'de Beslenme Sorunları ve Boyutları. Besin ve Beslenme Politikalarının Önemi. Türkiye'de Beslenme Yetersizliği Sorunları. Besin ve Beslenme Politikaları (Soydal F. Haznedaroğlu D. Çelik . Ekşi A). III. Uluslararası Beslenme ve Diyetetik Kongresi. 12-15 Nisan 2000. Beslenme ve Diyet Dergisi. 30: 1:45-57.

Pekcan G 2001b. Vitamin ve Mineral Yetersizliklerinin Önlenmesinde Besin Desteği. I Ulusal Ana-Çocuk Sağlığı Kongresi. 29-31 Mart 2001. Ankara.

Pekcan G, Karaagaoglu N 2000a. State of Nutrition in Turkey. Nutrition and Health. 14: 41-54.

Pekcan G, Karaağaoğlu N 2000b. Ulusal Gıda ve Beslenme Stratejisi Çalışma Grubu Raporu. DPT. Ankara. (www.dpt.gov.tr/DocObjects/Download/3139/strateji.pdf).

Rae A 1999. Food Consumption Patterns and Nutrition in Urban Java Households: The Discriminatory Power of Some Socio-economic Variables. Australian Journal of Agricultural and Resource Economics. 43(3): 359-383.

Ramazani CA 1995. Determinants of Nutrient Demand: A Nonparametric Analysis. Journal of Agricultural and Resource Economics. 20(1): 165-177.

Spoon MD, Benedict J, Leontos C, Zepponi NK 1998. Increasing Fruit and Vegetable Consumption among Middle School Students: Implementing the 5-A-Day Program. Journal of Extension. 36(4):

Şengül S, Tuncer İ 2005. Poverty Levels and Food Demand of the Poor in Turkey. Agribusiness. 21(3): 289-311.

Tansel A 1986. An Engel Curve Analysis of Household Expenditure in Turkey 1978-1979. METU Studies in Development 13 (3-4): 239-257.

TKB 2000 Strategy for National Agricultural Development. Republic of Turkey Ministry of Agriculture and Rural Affairs. Ankara.

Tönük B, Gültürk H, Güneyli U, Arıkan R, Kayim H, Bozkurt Ö 1987. Gıda Tüketimi ve Beslenme. Tarım ve Köyişleri Bakanlığı/Unicef. Koruma Kontrol Genel Müdürlüğü. Ankara.

TÜİK 1994. Hanehalkı Bütçe Anketi. Türkiye İstatistik Kurumu. Ankara.

TÜİK 2003. Hanehalkı Bütçe Anketi. Türkiye İstatistik Kurumu. Ankara.