Full Length Research Paper

Food consumption patterns in rural Turkey and poverty

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The paper investigates food consumption patterns including total food expenditures and food budget shares, sources of food, food expenditures by major food group and expenditures for food consumed outside the households. The survey with households was conducted in 2007. The survey was performed through face to face interviews with 386 households from the provinces. Of the total household expenditures, an average of 42.29% constituted food expenditures. Food expenditures varied among food groups as well. Milk and dairy products, meat, poultry, fish and other meat products as well as floury foods had the largest share in expenditures. As expected, the value of food expenditures increased with household size and income. About 56.44% of total monthly expenditure of rural households represents the value of consumption from own resources. The average daily food consumption of rural households is about 3519 calories for adults. Approximately 55% of the daily calorie intake is composed of cereals and floury foods whereas 4.60% is composed of meat and fish and 1.42% is composed of vegetable group of foods.

Key words: Food consumption, food consumption patterns, rural diet.

INTRODUCTION

Although it was focused largely on industry in economic development particularly after the 1970s in Turkey, the agricultural sector has still been maintaining its importance in terms of employment besides its importance in socio-economic life. It is a known fact that the rate of agricultural population in Turkey within total population is decreasing day by day as a result of economic development and rapid urbanization. While the rate of rural population was 56.1% in 1980, it fell to 41.0% in 1990 and 29.5% in 2007.

The continuation of an annual mean increase by around 1.1% in national population and an increase in income per capita are two important elements that increase the demand of food products. Despite the two elements concerned, it is rather difficult to state that food security has been fully ensured since the basic food elements are not sufficiently consumed by each individual in low-income groups and in rural areas in Turkey. The idea that food security has been attained can be discussed even when the minimum amount of food substances required to be consumed per capita daily can be consumed.

Food is a basic human need and the major source of nutrients needed for human existence. The problem of adequate nutrition, is regarded as a major strategic issue that attracts intensive attention at all levels. Its importance stems from important political and socio-economic dimensions (Dawoud, 2005). Turkey appears to involve the problems of both developing and developed countries in terms of nutritional state. In Turkey, the nutritional state of people varies significantly by region, season, socio-economic level and urban-rural settlement (SPO, 2003). This is primarily due to low income level and imbalance in the distribution of income.This situation has an effect on quality of nutrition problems and frequency of occurrences. Turkey individual is still suffering from malnutrition and unbalanced essential food elements like energy, protein, and fat content. It is observed that the major sources of calories and proteins in Turkey are crop products with small amounts of nutrients from animal products. Poverty and malnutrition often afflict the same beleaguered groups of people (Adewale, 2005). Malnutrition is a major health problem, especially in developing countries. Malnutrition can come from not eating enough healthy food, or from not getting enough of a particular nutrient, or from getting too many calories or the wrong types of calories such as from saturated fats or highly processed sugar, which creates a stress in the bodily function. Clinically, malnutrition is characterized by inadequate or excess intake of protein, energy, and micronu-

trients such as vitamins, and the frequent infections and disorders that result. A deficiency of protein is more frequent in some countries, as a result of relying too heavily on a single staple food.

29.5% of the population of Turkey's lives in rural areas. According to Turkish Statistical Instutite (TURKSTAT), the ratio of individuals who live in rural areas and below the complete poverty line which was 31.98% in 2006 increase to 32.18% in 2007, all the same the ratio of individuals who live in urban areas and below the complete poverty line which was 9.31% in 2006 increase to 10.61% in 2007. Agriculture has the highest poverty rate among all sectors. While the poverty rate among the people who work in agricultural sector is 30.22% in 2007, it was realized as 33.86% in 2006. There isn't any people whose daily expenditure per capita is below 1 $ but the ratio of individuals who live below the poverty line that daily expenditure per capita is below 2.15 $ was estimated as 3.36% (915000 person), 4.3 $ was estimated as 25.35% (6900000 person) due to purchasing power parity (TurkStat, 2008a) (Table 1).

The access that a household has to food depends on whether the household has enough income to purchase food at prevailing prices or has sufficient land and other resources to grow its own food (Behrman and Deolalikar, 1988).

The aims of this was to study the households of different income groups, including food poverty line and complete poverty line, were able to have sufficient nutrition in line with their calorie intake, whether their calorie intake was met by self-consumption and purchasing, the food consumption patterns according to household groups, and the problems they encountered in terms of nutrition.

MATERIAL AND METHODS

There is no single indicator that best measures household food security. One common indicator is calorie adequacy (Payne, 1990; Habicht and Pelletier, 1990; Maxwell and Frankenberger, 1992; Haddad et al., 1994; Maxwell, 1996; Chung et al., 1997). This measure captures food sufficiency in terms of quantity but does not address the quality of the diet or issues of vulnerability or sustainable access. Two different measures could be also used to capture the quantity and quality of household food availability as dependent variable. The first is per capita calories intake per day. The second measure, the price per 1,000 calories per person each day (kcal/aeu/day), will capture the quality and economies of scale associated with household food availability (Iram and Butt, 2004). Per capita calories intake is used for this study because household food availability is a function of food prices, expenditures, household demographics and household tastes and preferences. This paper is based on data collected by a survey of rural households. The survey carried out by the researchers for this study was carried out in the Aegean region of Turkey, which is an important area for both agricultural and non-agricultural production. Further, the three provinces with the highest, average and the lowest socio-economic development index (Izmir, Manisa and Kütahya) were chosen to represent the Aegean region as a whole.

In selecting the counties for study, their development index was also taken into account. Four counties were chosen from each province – the three with the lowest development index, and the one with a high development index. In selecting the villages in each county, the judgment sampling method was used. Villages in each county were placed into one of three groups according to their level of development: advanced, average, or less developed. Then two villages were chosen from the less developed group and one each from the average and advanced groups. In this way a total of 386 households were interviewed in 48 villages situated in 12 counties. Besides, the data obtained from the interviews with managers and representatives of private sector and non-governmental organizations at various statuses at province, county and village levels have been included in this study.

The food poverty line and complete poverty line used by the Turkish Statistical Institute (TURKSTAT) in its annual studies on poverty have been considered and initially the income groups have been determined in the study. In its study on poverty in 2006, TursStat calculated the monthly the food poverty line of a house of 4 households as $ 158 and the monthly complete poverty line as $ 422. For the surveyed households in the study, 4 income groups, namely, $ 0 - 192, $ 193-385, $ 386-577 and $ 577+, have been determined. Among these income groups, the households with an income of $ 0 - 192 have been below the food poverty line whereas the households with an income of $ 193-385 have been at the complete poverty line. Besides this, the households with an income of $ 386 - 577 have been regarded as middle-income households while the households with an income of $ 577+ have been regarded as the households in the highest income group (Table 2).

In the surveys conducted by TurkStat, 2100 calories, required to be the minimum intake of an individual, are determined by converting the consumption amounts of 80 food substances into calories. The cost of basket containing the food substances concerned is calculated as food poverty line (TurkStat, 2008a). A similar method was applied in this survey. In the study, in determining the food basket constituting the base of the food poverty, the data from the consumption expenditures has been used. 80 items having the largest share in the food consumption of the households were determined as the food basket. The amount ensuring an individual to receive 2100 calories per day was formed with these 80 items. The consumption amounts and food expenditures, by the households at the surveyed households, of 80 food substances in 7 distinct food groups including cereals and cereal products, floury foods, meat, poultry, fish and other meat products and related protein rich products, milk and other dairy products, oil andfats, vegetables, fruits and other foods were collected by means of a questionnaire form prepared for the households. Later on, these figures were converted into calories depending on the calorie contents of the food products. In this way, the calorie intakes of households in the selected region according to their income groups were found. Such a case provided an opportunity to make a comparison with the minimum calorie amounts determined at national level by the Turkish Statistical Institute.

RESULTS AND FINDINGS

Socio-economics background of households

The average age of the head of the rural households in the survey was 45 years. About 78% of heads in the households completed at least first level primary school. 5.7% of the household heads completed at least second level primary school. 7.25% the heads of these households were either illiterate or semi-illiterate. The median number of years of schooling for the heads was 5.52. The average size of the households is 3.7. Also, 43% of the

Table 1. The poverty rates according to poverty line methods in Turkey

	Percentage of poor individauals (%)					
	2002	**2003**	**2004**	**2005**	**2006**	**2007**
	Turkey					
Food poverty	1.35	1.29	1.29	0.87	0.74	0.54
Complete poverty (food+nonfood)	26.96	28.12	25.60	20.50	17.81	18.56
Below 1 $ per capita per day	0.20	0.01	0.02	0.01	0.00	0.00
Below 2,15 $ per capita per day	3.04	2.39	2.49	1.55	1.41	0.63
Below 4,3 $ per capita per day	30.30	23.75	20.89	16.36	13.33	9.53
Relative poverty based on expenditure	14.74	15.51	14.18	16.16	14.50	14.43
	Urban					
Food poverty	0.92	0.74	0.62	0.64	0.04	0.09
Complete poverty (food+nonfood)	21.95	22.30	16.57	12.83	9.31	10.61
Below 1 $ per capita per day	0.03	0.01	0.01	0.00	0.00	0.00
Below 2,15 $ per capita per day	2.37	1.54	1.23	0.97	0.24	0.10
Below 4,3 $ per capita per day	24.62	18.31	13.51	10.05	6.13	4.89
Relative poverty based on expenditure	11.33	11.26	8.43	9.89	6.97	8.20
	Rural					
Food poverty	2.01	2.15	2.36	1.24	1.91	1.32
Complete poverty (food+nonfood)	34.48	37.13	39.97	32.95	31.98	32.18
Below 1 $ per capita per day	0.46	0.01	0.02	0.04	0.00	0.00
Below 2,15 $ per capita per day	4.06	3.71	4.51	2.49	3.36	1.53
Below 4,3 $ per capita per day	38.82	32.18	32.62	26.59	25.35	17.45
Relative poverty based on expenditure	19.86	22.08	23.48	26.35	27.06	25.89

Source. TurkStat,2008a, Results of The 2007 Povertry Study, Turkish Statistical Institute,Prime Ministry, Rep. of Turkey, Publication No.192.Ankara.

Table 2. Total number of surveyed households (2007).

Income groups	Income size ($/ Month)	Number of surveyed households
1 - Poreest	0 - 192	150
2	193 - 385	102
3	386 - 577	65
4-Richest	577 +	69
Total		386

Source: Field survey, 2007.

43% of the head of households was the members of agricultural cooperatives. The term of use of the houses, where households reside is 32 years and the toilette is located inside the house only in 41.45% of the houses. Almost 85.23% have water, 99% have electricity. Somewhat more than half the households in the sample (65.50%) owned a washing machine, while 94%'s owned a television and 87.30% refrigerator. The percentage owning a tractor was 46.90%. The average farm size was 3.63 hectares. Irrigated area accounted for only 16 percent of total arable land. Most of the households (79,10%) have own land even outside the irrigated area.

But in most cases it is marginal/small holding. Of the total land holdings of the selected households 77% of dry land were treated (Table 3). Number of crop cultivated was 33.

37.05% of the surveyed households do no have any social securities due to their low income. The access to protected drinking water sources is uneven; the majority of households use boreholes and other unprotected sources. The qualitative survey revealed various forms of environmental pollution/sanitation issues in the area such as unplanned settlement, poor sanitation, stream/river and drain pollution, lack of education on hygienic prac-

Table 3. Socio-economics background of surveyed households (2007).

Age (Years)	Min.	Max.	Mean	Education (Years)	Min.	Max.	Mean
1 –Poreest	25.00	44.82	73.00	1 –Poreest	3.00	13.00	5,26
2	25.00	45.72	73.00	2	2.00	12.00	5,66
3	19.00	48.54	74.00	3	3.00	13.00	5,75
4-Richest	19.00	45.46	77.00	4-Richest	3.00	11.00	5,68
Average	*19.00*	*45.80*	*45.80*	*Average*	*2.00*	*13.00*	*5,52*

Toilet facilities	Inside	Outside	Both inside and outside	Water supply	Yes	No
1 –Poreest	30.67	67.33	2.00	1 –Poreest	77.33	22.67
2	38.24	60.78	0.98	2	85.29	14.71
3	50.77	47.69	1.54	3	90.77	9.23
4-Richest	60.87	23.19	15.94	4-Richest	97.10	2.90
Average	41.45	54.40	4.15	Average	85.23	14.77

Household amenities	Refrigerator	Washin Machine	Television	Size of household	ha
1 –Poreest	78.70	48.70	87.30	1 –Poreest	2.74
2	92.20	63.70	99.00	2	3.20
3	87.70	76.90	95.40	3	3.75
4-Richest	98.60	94.20	100.00	4-Richest	6.12

Source: Field survey, 2007.

Table 4. Income per capita at the surveyed households ($/month).

Income Size	Frequency	Mean number of households members	Mean household income ($/month)	Minimum household income ($/month)	Maximum household income ($/month)	Mean income per capita ($/month)	Mean daily income level per capita ($/day)
1 –Poreest	150	4.0	109.54	7.23	190.38	27.39	0.91
2	102	4.3	272.08	192.62	382.92	63.31	2.11
3	65	4.3	471.77	384.69	576.92	109.69	3.66
4-Richest	69	4.8	818.69	581.38	907.69	170.54	5.68
Total	386	4.3	340.23	7.23	907.69	79.15	2.64

Source: Field survey, 2007.

tices, inadequate water supply to the residents and poor planning of drainage systems. Most (80%) of the households perceive the current sanitation facility to be bad.

Information on income and expenditure levels of the surveyed households

The monthly income levels, minimum, maximum and mean incomes and daily income levels per capita of the surveyed households are given in Table 4. The mean income of households is 340.23 $/month whereas it is 109.54 $/month at the households in the 1st group, 272.08 $/month at the households in the 2nd group, 471.77 $/month at the households in the 3rd group and

818.69 $/month at the households in the 4th group. When the mean monthly income per capita is calculated considering the number of households in terms of income groups, the mean household income is 79.15 $/month whereas it is approximately 27.38 $/month per capita at the households in the 1st group, 63.31 $/month at the households in the 2nd group, 109.69 $/month at the households in the 3rd group and 170.54 $/month at the households in the 4th group.

In international comparisons, daily income levels of 1 $, 2.15 $ and 4.30 $ per capita are defined as complete poverty line in various sources according to purchasing power parity (Kapteyn et al., 1988; IFAD, 2002; Philipp, 1999; World Bank, 2006; TurkStat, 2007). With this approach, the mean daily income level per capita according to purchasing power parity was calculated as 0.91 $

Table 5. Expenditure levels of the surveyed households ($/month).

Income size	Min.	Mean	Max.
1 –Poreest	19.87	188.89	602.88
2	49.48	256.28	697.44
3	64.10	299.82	935.25
4-Richest	80.77	487.30	1390.25
Total	46.03	278.72	824.58

Source: Field survey, 2007.

Table 6. Shares of expenditure of households classified by budget item (%).

Food	Health	Transportation	Clothing	Communication	Education	Heating	Accommodation	Holiday	Social Activity	Others*
42.29	11.36	9.61	9..34	6.72	5.55	3.69	1.07	0.11	0.08	10.18

*Others: Electricity, insurance, credit and etc.
Source: Field survey, 2007.

at the households in the 1st group, 2.11 $ at the house-holds in the 2nd group, 3.66 $ at the households in the 3rd group and 5.68 $ at the households in the 4th group among the surveyed households. Within this context, the households in the 1st, 2nd and 3rd groups are at complete poverty line according to daily purchasing power parities of 1 $, 2.15 $ and 4.30 $ per capita.

When food poverty line is regarded as 1 $, it can be expressed that the households in the 1st income group among the surveyed households are at food poverty line. As a matter of fact, it is expressed in the study by TurkStat on complete poverty line in 2007 that there are no individuals with an income of less than 1 $ in either rural or urban areas.

The total expenditures of the surveyed households are composed of food, heating, accommodation, clothing, education, transportation, communication, holiday, health, social activity and other expenditures. The total monthly expenditures of households increase propor-tionally to income size. At the surveyed households, the mean total monthly expenditure per household amounts to 278.72 $/month and the minimum monthly expenditure amounts to 46.03 $/month whereas the maximum expenditure amounts to 824.58 $/month (Table 5).

When the distribution of total expenditures of the inter-viewed households is considered, it is observed that food expenditures (42.29%) rank the first. Among the total expenditures, the second important share belongs to health expenditures with 11.36% (Table 6).

When it was examined whether the various expen-ditures by the households at the surveyed households varied by income group through Kruskal-Wallis Test, it was observed that there was a significant difference among income groups in terms of food, heating, accommodation, clothing, education, transportation, com-munication, electricity and water expenditures (Table 7).

Nutritional pattern of the surveyed households

It is rather difficult to state that people have sufficient nutrition in rural areas in Turkey both due to low education level and ignorance and due to low income and poverty. As a matter of fact, the surveyed household heads were asked "Do you think that your family has sufficient and balanced diet?" and the responses are given in Table 8 in terms of income size. 52.85% of the household heads were of the opinion that their families were unable to have sufficient and balanced diet.

When the household heads were asked the reasons why the households could not have sufficient and balanced nutrition, it was determined that the responses were gathered into three groups (Table 9). According to 95.02% of the household heads, the main reason why the households were unable to have sufficient and balanced nutrition is to have a low income. Besides this, nearly 3% of the household heads stated that they were unable to access some foods in the villages and districts, where they lived, while 2% of them stressed irregular nutrition due to working and living conditions. It is now known by everybody that chronic undernutrition leads to obesity, anemia, rickets, vitamin-mineral deficiencies, cancer, cardiovascular diseases and etc. As a matter of fact, it was observed that particularly cancer and cardiovascular diseases were also common in the villages visited within the scope of the survey (Gumus et al, 2008).

Calorie compositions and food expenditures of the surveyed households

A diet that relies more on cereal items, which are inexpensive calorie sources, and less on animal products such as fish and meat that supply protein and other

Table 7. Monthly expenditures ($) per household by income groups and Kruskal-Wallis test for monthly expenditures.

Categories	Income Size				Average	Chi-Square	Df	Asymp. Sig.
	1-Poorest	2	3	4-Highest				
Food	83.97	110.76	124.34	187.85	116.41	36.440	3	.000*
Heating	7.21	6.65	14.99	26.86	11.89	30.779	3	.000*
Accommodation	0.97	1.71	4.97	11.65	3.75	22.604	3	.000*
Clothing	16.62	21.76	27.73	40.43	24.11	35.904	3	.000*
Education	12.28	22.34	16.90	49.44	22.36	6.332	3	.041*
Transportation	16.58	21.10	34.31	50.21	26.77	19.446	3	.000*
Communication	9.45	15.70	23.56	35.97	18.22	75.456	3	.000*
Health	26.30	29.88	22.68	32.67	27.78	1.642	3	.545
Electricity	8.80	11.17	13.58	20.17	12.27	50.658	3	.000*
Water	3.21	4.02	4.06	13.89	5.47	39.134	3	.000*

a Kruskal Wallis Test
b Grouping Variable: income
*Significant by kruskal-wallis test for $p < 0.05$.

Table 8. Opinions of household heads on whether the households had balanced Diet* (%).

Income size	Yes	No
1 –Poreest	34.67	65.33
2	46.08	53.92
3	49.23	50.77
4-Richest	73.91	26.09
Average	47.15	52.85

Source: Field survey, 2007
*Subjective question asked to the household heads: "Do you think that your family has sufficient and balanced diet".

Table 9. Reasons why households were unable to have sufficient and balanced diet (%).

Income size	Low income and poverty	Difficulty in accessing some foods	Irregular nutrition	Total
1 –Poreest	94.50	5.50	-	100.00
2	94.64	-	5.36	100.00
3	94.44	2.78	2.78	100.00
4-Richest	100.00	-	-	100.00
Total	95.02	2.99	1.99	100.00

Source: Field survey, 2007.

nutrients, is likely to produce qualitatively inferior calories than those obtained from a more balanced diet (Ngwenya and Ray, 2007). Table 10 throws some light on this issue by reporting the calorie composition of the turkish rural diet between the various items of food spending disaggregated by rural sectors.

The nutritional state of the households living at the surveyed households was examined in terms of their daily calorie intake. In the study, it was calculated that the adult households living in the 1st income group in the surveyed region had a daily intake of 3324 cal whereas the households in the 2nd income group had an intake of 3756 cal, the households in the 3rd income group had an intake of 3431 cal and the households in the 4th income group had an intake of 3642 cal and their mean intake was 3519 cal (Table 10). Social solidarity mechanisms and interneighbour solidarity in rural areas in Turkey and rather a self-consumption-oriented agricultural production enable the households living at the low-income level to take in their daily calories. Within this scope, it was found out in the study that the households at the households in food poverty line (the 1st group) and at the households in complete poverty line (the 2nd group) also took in their daily calorie needs.

Table 10. Calories intake daily per capita at the households by income size.

Income Size	1-Poorest		2		3		4-Highest		Average	
Foods	Calorie Intake Per Capita (calories/day)	%	Calorie Intake Per Capita (calories/day)	%	Calorie Intake Per Capita (calories/day)	%	Calorie Intake Per Capita (calories/day)	%	Calorie Intake Per Capita (calories/day)	%
Cereals and floury foods	1875	56.41	2121	56.47	1789	52.15	1828	50.19	1916	54.45
Meat, poultry, fish and other meat products	118	3.55	155	4.13	172	5.01	245	6.73	162	4.60
Milk and Dairy Foods	186	5.60	222	5.91	192	5.60	213	5.85	202	5.74
Oil and Fats	641	19.28	638	16.99	602	17.55	707	19.41	646	18.36
Fruits	155	4.66	202	5..38	255	7.43	228	6.26	199	5.66
Vegetables	44	1.32	52	1..38	50	1.46	59	1.62	50	1.42
Other Foods*	305	9.18	366	9.74	372	10.84	361	9.91	343	9.75
Total	3324	100.00	3756	100.00	3431	100.00	3642	100.00	3519	100.00

*Food products such as tea, sugar, tomato paste, honey, halva, water, cook
Source: authors' calculations.

Table 11. Expenditure Levels of the surveyed households ($/month).

Foods	Total expenditure	Rate (%)	Expenditure through purchasing	Rate of the purchased within total expenditures (%)
Cereals	33.57	12.73	14.44	43.01
Floury Foods	40.60	15.39	8.38	20.65
Meat, poultry, fish and other meat products	40.21	15.24	20.51	51.00
Milk and Dairy Foods	44.17	16.75	6.02	13.64
Oil and Fats	27.20	10.31	13.03	47.91
Fruits	19.55	7.41	13.57	69.42
Vegetables	18.28	6.93	6.66	36.43
Other Foods*	40.18	15.23	32.29	80.36
Total	263.76	100.00	114.91	43.56

Source: Field survey, 2007
*Food products such as tea, sugar, tomato paste, honey, halva, water, cook.

It is seen that the amounts of calories taken in from meat and meat products and vegetable groups of food are low (1.42%) at the surveyed households.

56.44% of the food needs of the surveyed households are met through their own productions whereas 43.56% of them are met through purchasing.When food expenditures through purchasing are considered in terms of food groups, it is seen that they are other food products such as tea, sugar, tomato paste, honey, halva, water and cola (80.36%), fruits (69.42%), meat and meat products (51.00%) and vegetable oil and animal fat (47.90%), respectively. Households purchase milk and dairy products and cereals as well as flour and floury products less (Table 11).

The amount of monthly expenditures for food products at the surveyed households increases depending on income size. For instance, while it is 263.08 $ on average,

the monthly food expenditure for the households in the lowest income group (1-the poorest) amounts to 213.25 $, it amounts to 264.74 $ in the 2nd group, 253.84 $ in the 3rd group and 380.33 $ in the 4th group (Table 12). The mean monthly food expenditure according to the average in Turkey amounts to 247.69 $ (TurkStat, 2007).

The food expenditures of the surveyed households also vary by income group. The mean monthly purchased food expenditure of the households amounts to 114.91 $ while it is 99.85 $ at the households in the 1st income group, 108.42 $ in the 2nd income group, 123.18 $ in the 3rd income group and 148.45 $ in the 4th income group (Tables 11 and 12). The fact that some processed food products, having an important place in Turkish nutrition, are produced in houses is among the most important reasons why the food expenditures of the households living in the region are low in the study. Within this scope,

Table 12. Monthly food expenditures of household (($/month).

Income Size / Foods	1-Poorest		
	Total expenditures	Purchasing foods	Rate of purchasing within total expenditures (%)
Cereals	32.24	14.38	44.60
Floury Foods	30.02	7.85	26.14
Meat, poultry, fish and other meat products	24.65	13.28	53.87
Milk and Dairy Foods	39.78	4.78	12.01
Oil and Fats	22.26	13.15	59.09
Fruits	14.22	10.79	75.88
Vegetables	15.02	6.15	40.96
Other Foods*	35.06	29.47	84.05
Total	213.25	99.85	46.82

Income size / Foods	2		
	Total expenditures	Purchasing foods	Rate of purchasing within total expenditures (%)
Cereals	36.12	15.81	43.76
Floury Foods	41.33	7.54	18.24
Meat, poultry, fish and other meat products	36.95	18.15	49.10
Milk and Dairy Foods	45.29	5.94	13.11
Oil and Fats	27.32	11.47	41.98
Fruits	19.15	11.98	62.57
Vegetables	19.00	6.38	33.60
Other Foods*	39.55	31.15	78.76
Total	264.74	108.42	40.96

Income size / Foods	3		
	Total expenditures	Purchasing foods	Rate of purchasing within total expenditures (%)
Cereals	31.12	12.23	39.31
Floury Foods	23.54	6.37	27.06
Meat, poultry, fish and other meat products	42.97	26.32	61.26
Milk and Dairy Foods	42.79	6.22	14.54
Oil and Fats	23.82	12.22	51.29
Fruits	25.37	17.04	67.16
Vegetables	17.57	6.10	34.72
Other Foods*	46.67	36.68	78.61
Total	253.84	123.18	48.53

the surveyed households were asked "Which processed food products, having an important place in your nutrition, are produced in your house?" It was found out in the responses that tarhana (96.11%), bulgur (70.21%), tomato paste (73.83%) and dried vegetables-fruits (68.14%) were largely produced. Homemade macaroni is produced in 52.07% of the households whereas processed olive and jam-marmalade are produced by less than 50% of the households (Table 13). The rate of production of other foods, however, is lower depending on the consumption habit of the region.

In addition, it was found out that there were food substances that the households in the 1st and 2nd income groups, the monthly food expenditures of which were below the mean value of Turkey, had difficulty in purchasing due to low income. Meat, sugar, honey, banana and tea are among the food substances that the surveyed households had difficulty in purchasing.

Table 12. Contd.

Income size	4-Highest		
Foods	Total expenditures	Purchasing foods	Rate of purchasing within Total expenditures (%)
Cereals	32.33	14.12	43.66
Floury Foods	80.15	11.48	14.32
Meat, poultry, fish and other meat products	78.97	35.27	44.66
Milk and Dairy Foods	49.78	8.36	16.80
Oil and Fats	41.23	15.18	36.81
Fruits	26.38	18.90	71.63
Vegetables	24.53	8.74	35.62
Other Foods*	46.95	36.41	77.54
Total	380.33	148.45	39.03

Source: Field survey, 2007
*Food products such as tea, sugar, tomato paste, honey, halva, water, cook.

Table 13. Processed food products produced in households *(%).

	Bulgur*	Tomato paste	Tarhana**	Olive	Jam-marmalade	Dried vegetables-fruits	Homemade macaroni	Canned food	Pickles	Grape molases
Yes	70.21	73.83	96.11	41.45	46.11	68.14	52.07	10.62	2.07	0.26

Source: Field survey, 2007
*Bulgur is a kind of dried cracked wheat.
**Tarhana is a fermented cereal-based food and can be simply defined as a mixture of yoghurt, cereal flours, yeast, different vegetables, herbs and spices.
*Subjective question asked to the household heads: "Which processed food products, having an important place in your nutrition, are produced in your house?"

Table 14. Foods that the surveyed households had difficulty in purchasing due to low income * (%).

Income size	Meat and fish	Some vegetables and fruits	Sugar	Honey	Banana	Tea	Others*	Total
1-Poorest	35.14	12.62	11.41	6.01	6.91	8.41	19.50	100.00
2	41.38	10.92	7.47	9.77	8.05	5.75	16.66	100.00
3	42.61	9.57	5.22	13.04	11.30	4.35	13.91	100.00
4.Highest	36.59	19.52	8.54	6.10	3.66	8.54	17.05	100.00
Average	38.07	12.50	9.09	8.10	7.53	7.10	17.61	100.00

*Others: oil, dried fruits, flour, fish, jam, dessert, chicken, legumes and etc.
*Subjective question asked to the household heads: "Which food items purchased your current income levels are being difficult?"

Besides, particularly at the households in the 1st group, it was expressed that difficulties were experienced in purchasing products such as vegetable oil, flour, fish, jam, dessert, chicken and legumes besides these foods (Table 14).

DISCUSSION

Turkey appears to involve the problems of both developing and developed countries in terms of nutritional state. In Turkey, the nutritional state of people varies significantly by region, season, socioeconomic level and urban-rural settlement. This is primarily due to low income level and imbalance in the distribution of income. In Turkey, growth and development retardation, iron insufficiency anemia and rickets are observed frequently in children aged 0-5; underweight and obesity, iron insufficiency anemia, vitamin insufficiencies, iodine insufficiency diseases and tooth decays in school-age children and teenagers; underweight and obesity, iron insufficiency anemia, iodine insufficiency diseases and vitamin insufficiencies in female adults; and nutrition-dependent chronic diseases in the elderly (Arslan et al, 1999; Pekcan, 1998).

The causes of malnutrition in Turkey are multidimen-

sional. Various causes of malnutrition have been identified. Survey results indicate that it is not the lack of food per se, but the wrong combination of food, which is the main cause of malnutrition. Other findings show that malnutrition problems in Turkey are primarily a result of low income and unemployment. In Turkey, the nutritional habit particularly in the rural structure is based on carbohydrated foods, in which cereals and floury foods are largely consumed. Therefore, the rural areas have a higher calorie consumption level than the urban areas (SPO, 2003). Within this scope, 52.85% of the surveyed households in the study stated that they had malnutrition while 95.02% expressed that the basic reason for their malnutrition was poverty and low income. Sufficient and balanced nutrition is directly proportional to income level. That is to say, 65.33% of the household heads, who expressed that they were unable to have sufficient and balanced nutrition, are included in food poverty line (1-the poorest group) whereas 53.92% are included in complete poverty line (the 2nd group).

In a similar study by Prime Ministry State Planning Organization (SPO), it has been expressed that rural residents in Turkey have to take in 3,156 cal on average, agricultural laborers have to take in 3.474 cal and farmers have to take in 3,136 cal (SPO, 2003). There is a positive correlation between increase in income and consumption of calories. The more the income increases, the higher the amount of calories is consumed. Also in the study, the more the income level increases, the higher the amount of calories gets. The calorie intake of the households in the 2nd income group was found to be higher than those of the other income groups since they worked as agricultural laborers. The nutritional structure and social relations in Turkey quite differ in comparison to developed countries. Since cereals are produced at almost every household particularly in rural areas, the nutritional habit is based on carbohydrated foods. In the study, it was found out that the calorie intake of the adults at the surveyed households ranged from 3324 calories to 3642 calories in different income groups. 54.45% of the daily calorie intake is composed of cereals and floury foods whereas 4.60% is composed of meat and fish and 1.42% is composed of vegetable group of foods. That is to say, all vegetable consumptions are through purchasing at the households, which do not produce vegetables, due to problems of climate, land structure and irrigation water. This prevents their sufficient consumption at the households with a low income level due to the high vegetable prices together with the difficulty in transportation especially in winter.

When the rate of meat and meat products within the daily calorie intake of households is examined in terms of income groups, it is observed that the households in the 4th income group (the richest) are higher than the households in the 1st and 2nd income groups. 56.44% of total monthly expenditure of rural households represents the value of consumption from own resources. These findings

agreed with many publications about food consumption patterns in the low-income families. Carbohydrates clearly had a prominent role as energy source in the diet of the rural populations (Mazengo et al., 1997; Jiménez-Contreras et al., 2007; Petrovici and Ritson, 2000; Thang and Popkin, 2004;).

The average frequency of food shopping was about 1 times/week or two weeks for all household and low income households had a significantly higher frequency for food insecurity worries than other income households. The monthly food expenditures of the households in the 1st and 2nd income groups are 213.25 \$ and 264.74 \$, respectively whereas the food expenditure of the households in the 4th income group is 380,33 \$. As the income levels of households increase, the amounts of expenditures for meat and fish and vegetables-fruits, which have higher prices than other food groups, rise. As a matter of fact, the monthly expenditure for meat and fish is 24.65 \$ in the 1st income group, 36.95 \$ in the 2nd income group and 42.97 \$ in the 3rd income group. Furthermore, the amounts of expenditures for cereals and floury foods are higher in each income group than the expenditures for other foods since their purchasing prices are lower. The results obtained exhibit similarities to the Survey entitled "results of questionnaire on Household Consumption Expenditures of 2007" carried out by TurkStat. In the survey by TurkStat, the annual consumption of red meat, margarine and granulated sugar, among basic food substances, per capita fell depending on consumption habits and developments in the market whereas the consumption of rice, macaroni, poultry meat, egg and yoghurt rose. On the other hand, bread maintained its importance in the nutrition (TurkStat, 2008b).

In the other words, particularly since the households in the food poverty line and complete poverty line (the 1st and 2nd income groups) are poor and the product prices are high, there are foods that they had difficulty in purchasing such as sugar, honey, banana, tea and vegetable oil and animal fat besides meat, vegetables and fruits (Table 13).

When nutrition-health relationship in Turkey is studied, it is observed that there are nutritional problems, the considerable majority of which is thought to be likely to be related to poverty. As expressed in many literatures, the difficulties experienced in purchasing the food substances, which are important for balanced diet, due to low income are effective on the emergence of various health problems. Cancer is the 2nd-ranking reason for mortality among adults in Turkey. 11% of all mortalities are due to types of cancer. Breast, colon, prostate and gastric cancers are observed frequently due to reasons dependent on nutritional habits (Pekcan and Karaagaoglu, 2000). As a matter of fact, it was detected that mortalities due to various types of cancer and cardiovascular diseases were common in the study area besides diseases such as obesity and development disorder.

As a result, considering the relatively low and diminishing level of consumption of meat, vegetables and fruit and dairy products in rural Turkey, there are potential deficiencies of certain nutrients (e.g. calcium and vitamins) especially amongst poor households. As well as the economic pressures associated with high prices and declining real incomes and unemlpoyment, a strong preference for these foods in Turkey may account for these patterns. Another significant factor may be a low awareness of the relationship between diet and health.

For this reason, measures are needed, such as nutrition education, raising awareness concerning improved feeding and weaning practices; and access to supplementary foods. These measures would help to ensure food security and improve the nutritional status of the population in rural Turkey.

As last words, this study highlighted the critical role of household income in achieving adequate average calorie intake within the household. This supports the idea that household income is the most important determinant of per capita calorie intake, because higher income level groups can purchase more appropriately required nutritious food compared to low-income groups. A low-income group has low opportunities to acquire required and nutrious food. Open-ended questions were prepared in order to obtain objective opinions of the surveyed household heads.The study was carried out objectively despite lack of time and financial constraints. The insufficiency of records regarding the amounts and expenditures of food consumed by some households restricted the calculation of calorie intake. In order to eliminate this restriction, preliminary studies, which took a long period of time, were performed in the study area before the survey. In Turkey, no studies have been made with respect to nutritional status and calorie intake at village level in particular. In this aspect, the fact that this study is the first in this field is another constraint of the study. However, this study is quite important for being a reference for the future studies.

ACKNOWLEGEMENT

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