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The Evaluation of Food Security in European Union

Özge Can NİYAZ

Canakkale Onsekiz Mart Unİiversity, Faculty of Agriculture, Department of Agricultural Engineering, 17100, Canakkale/Turkey

Abstract

Hunger and poverty increase day by day all around the world. Thus, concept and evaluation of food security is getting important. Becoming true of food security depends on to provide the all dimensions (food availability, food access, utilization and stability) of food security at the same time. The aim of this study is to evaluate food security of European Union-27 by using official secondary data. Although there are 28 member countries in the European Union, it was not possible to discuss the topic as EU-28 since most of the data covers the period before 2011 and Croatia has become a member of the EU in 2011. Turkey is candidate for nomination for being a member of EU for the long duration. Therefore, it has been important to look at the European Union-27's food security conditions. Because of this, even the title is about EU, some comparison have been done between Turkey and EU-27 to show differences and similarities. As a result of this study, it is possible to say that, even the European Union-27's present conditions of food security are better than Turkey, neither Turkey nor European Union-27 have not been provided food security about the all dimensions.
Key words: European Union, Turkey, food security, dimensions of food security, food safety.

Avrupa Birliği'nde Gıda Güvencesinin Değerlendirilmesi

Özet

Dünyada açlık ve yoksulluk gün geçtikçe artmaktadır. Bu nedenle gıda güvencesi kavramı önemli hale gelmektedir. Gıda güvencesinin sağlanması, gıda güvencesinin tüm boyutlarının (gıdanın bulunabilirliği, gıdaya erişebilirlik, kullanılabilirlik ve kararlılık) aynı anda sağlanması ile gerçekleşebilmektedir. Bu çalışmanın amacı Avrupa Birliği-27 (AB-27)'de gıda güvencesinin mevcut durumunu makro veriler yardımıyla incelemektir. Avrupa Birliğine üye olan 28 ülke bulunmasına rağmen bulunabilen en son verinin 2011 yılına ait olması ve son üye olan ülke Hırvatistan'ın 2011 yılında üye olması nedeniyle konu AB-28 açısından ele alınamamaktadır. Türkiye, uzun bir süredir AB üyeliğine adaydır. Bunun için, Türkiye açısından AB-27'nin gıda güvencesinin mevcut durumunun incelenmesi önemli görülmektedir. Bu nedenle çalışmanın başlığı her ne kadar AB olsa da, Türkiye ve AB arasındaki farklılık ve benzerlikleri görmek açısından bazı karşılaştırmalar yapılmıştır. Sonuç olarak, AB-27'deki mevcut gıda güvencesi koşulları Türkiye'den iyi olsa da, ne AB'de ne de Türkiye'de gıda güvencesinin tüm boyutları ile sağlandığı söylenememektedir.
Anahtar Kelimeler: Avrupa Birliği, Türkiye, gıda güvencesi, gıda güvencesinin boyutları, gıda güvenliği.

Introduction

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (Nord et al. 2005; Anderson 2009; Anonymous 2001; Anonymous 2003; Anonymous 2015a; Anonymous 2015b; Anonymous 2015c; Anonymous 2015d). This

widely accepted definition points to the following dimensions of food security; food availability, food access, utilization and stability (Anonymous 2006; Keskin ve Demirbaş 2012).

Food security measurement methods are classified under 5 groups as follows; the Food and Agriculture Organization (FAO) method, household income and expenditure surveys, individual food intake surveys, anthropometric methods and qualitative methods in general. Despite the food security measurement methods mentioned, it has been stated that food security cannot be measured literally (Keskin and Demirbaş 2012).

Turkey has first applied for membership in the European Union (EU) when it was still called the European Economic Community (Anonymous 2002). Although more than 50 years have been past, Turkey is still not a member of the European Union. In this context, investigating the current situation of food security in the EU countries seem quite significant since Turkey is waiting to be a part of this Union for a very long time.

The aim of this study is to demonstrate the current status of food security in the EU by using the macro data obtained. Although there are 28 member countries in the European Union, it was not possible to discuss the topic as EU-27 since most of the data covers the period before 2011 and Croatia has become a member of the EU in 2011.

Material and Method

The main material of this study consists of secondary data. In this study, current data obtained from institutions such as EUROSTAT (European Statistics) and FAO have been used. The results obtained were supported by the relevant literature review. In this context, some key indicators such as degree of self-sufficiency of basic food groups, distribution of income and food price index, food consumption per capita have been demonstrated in order to identify the current situation of food security in the EU-27. All these data were evaluated by classifying them within the framework of four main dimensions of food security; food availability, food accessibility, quality and food safety and principle of sustainability.

Findings

Availability

One of the most important elements to ensure food security is the presence of sufficient amount of food. Otherwise, even though all other dimensions are provided, we cannot talk about the existence of food security. Therefore, degree of self-sufficiency was presented in percentages by dividing the amount of domestic use into crop and livestock production data of the EU-27.

The EU has focused on agricultural activities after World War II and created Common Agricultural Policy (CAP) for this purpose. The main purpose of CAP, which was born in 1957 with the Treaty of Rome, was ensuring the food security by increasing the amount of food produced, raising the income of farmers to the level of people working in the industry and reducing the prices paid by consumers. To this end, it has acted with support and conservation policies that had adversely affected the equilibrium level in the free market economy (Anonymous 2002). In 1985, some problems such as excess supply, increased budget costs and reduction in farmers' income have emerged. This situation was expressed as that the EU had "'butter mountains, milk and wine lakes and meat banks". The scope of Direct Income Support (DIS), which was first started in 1987 to reduce the inventory costs caused by excess supply, has been expanded gradually. Producers who don't have basic production activities were also supported by this system. As a result of this system, degree of self-sufficiency of some product groups seem to be low.

In the product groups with degree of self-sufficiency greater than or equal to 100, EU-27 is considered to be self-sufficient; whereas in the product groups with degree of self-sufficiency lower than 100, EU-27 is not accepted as self-sufficient. Accordingly, considering the data on cereals for the EU-27

for current years, the union seems to be self-sufficient in terms of the amount of cereals. However, it is not self-sufficient in the group of fresh fruits. Although the degree of self-sufficiency vary from year to year. Degree of self-sufficiency is around 70 % in terms of fresh fruits in the EU which indicates that there is significant deficit in terms of the amount of fruit in the EU.

The degree of self-sufficiency for vegetables, which is another important nutrient, is approximately 98 %. Therefore, it can be concluded that the EU is not self-sufficient in terms of the amount of vegetables produced in the union. Considering the data of meat and milk production in the EU, the union seems to be self-sufficient in terms of the amount of meat produced. Considering the data related to milk production, the degree of self-sufficiency of EU-27 is around 108 % which indicates that the union is quite self-sufficient in this area (see Table 1).

Table 1. Self-sufficiency Ratio of Basic Food Groups in EU-27 (%)

	Cereal (%)	Fruit (%)	Vegetable (%)	Meat (%)	Milk (%)
2007	95.74	74.44	98.60	102.42	106.70
2008	111.58	76.44	98.42	102.88	107.36
2009	108.79	77.76	98.61	102.58	107.49
2010	104.58	78.17	98.99	105.23	109.90
2011	105.20	78.01	100.10	107.05	110.64

Reference: *Anonymous 2015b.*

On the contrary, even though Turkey is self-sufficient in the groups of fruits, vegetables and meat products, there is an instability in the groups of milk and cereals production (Niyaz 2015).

Accessibility

Accessibility is divided into two groups as economic and physical accessibility. Economic accessibility includes income status of the consumers and food prices. Physical accessibility means the lack of geographical and physical barriers to access the food.

Therefore, accessibility is also investigated within the scope of food security in the EU.

Considering the risk of poverty rate after social transfers in the EU, Balkan countries newly become a member of the EU such as Bulgaria and Romania seem to have the highest risk of poverty. This rate is at lowest in the old member countries such as Czech Republic, Belgium and the Netherlands. The average risk of poverty in the EU-27 after having social transfers within the last three years is around 16 % (see Table 2).

Gini coefficient is a value calculated to show the unfair distribution of income in the countries and it takes a value between zero and one. The distribution of income is fair if the value of this coefficient is close to zero, whereas it becomes more unfair as it gets closer to one (Anonymous 2013; Dumlu and Aydin 2008).

Considering the Gini values of EU-27, it is around 30 % in recent years. Latvia, Estonia, Bulgaria, Portugal and the United Kingdom are the most prominent members in terms of unfair distribution of income (see Table 3). This ratio is around 40 % within recent years in Turkey (Anonymous 2015f). It is possible to

suggest that unfair distribution of income is much higher in Turkey compared to other EU countries.

The food price indices, which are other important elements of economic accessibility of food security, were also investigated in general. In this context, the highest food prices are in the developed countries such as Denmark, Sweden and Austria. The lowest prices are in Bulgaria, Romania and Poland. Denmark is the most expensive country in terms of prices of bread, cereals and meat products.

Table 2. Risk of Poverty after Social Transfers in EU-27 (%)

	2009	**2010**	**2011**
Belgium	14.6	14.6	15.3
Bulgaria	21.8	20.7	22.3
Czech Republic	8.6	9.0	9.8
Denmark	13.1	13.3	13.0
Germany	15.5	15.6	15.8
Estonia	19.7	15.8	17.5
Ireland	15.0	16.1	-
Greece	19.7	20.1	21.4
Spain	19.5	20.7	21.8
France	12.9	13.3	14.0
Italy	18.4	18.2	19.6
Cyprus	15.8	15.1	14.5
Latvia	25.7	21.3	19.1
Lithuania	20.6	20.2	20.0
Luxembourg	14.9	14.5	13.6
Hungary	12.4	12.3	13.8
Malta	15.3	15.0	15.4
Netherlands	11.1	10.3	11.0
Austria	12.0	12.1	12.6
Poland	17.1	17.6	17.7
Portugal	17.9	17.9	18.0
Romania	22.4	21.1	22.2
Slovenia	11.3	12.7	13.6
Slovakia	11.0	12.0	13.0
Finland	13.8	12.9	14.0
Sweden	13.3	12.9	14.0
United Kingdom	17.3	17.1	16.2
EU-27	16.3	16.4	16.9
European Area	15.9	16.1	16.9

Reference: *Anonymous 2015e.*

Considering the food price indices of Turkey (food price indices:87, bread and cereals price indices:70,meat price indices:77) to compare with the EU countries, food prices are close the countries that have relatively lower prices (see table 4) (Anonymous 2015e).

Some rates of some EU countries were investigated in order to examine physical accessibility of accessibility dimension. Considering the percentage of paved roads over total roads, it is possible to say that these percentages are low in Romania and Greece. Furthermore, Romania and Greece has the lowest incidence of road density per 100 square kilometres among the five countries. Spain and Greece have the lowest rail-lines density among the EU countries (see

Table 5). Turkey has facilities from this point. Means of transport on the basis of highway is about 85 % except seasonal challenge (Anonymous 2015f).

Utilization

Having sufficient amount of income and an adequate amount of food doesn't mean that food security is provided with its all aspects. The quality of the food is also very important. Therefore, the amount of daily food use in the EU-27 per person is given.

Food security is investigated under this section since it can be discussed within the scope of utilization.

Table 3. Percentage of Gini Coefficient in EU-27 (%)

	2007	2008	2009	2010	2011	2012
EU-28	-	-	-	-	30.8	30.6
EU-27	30.6	30.9	30.5	30.5	30.8	30.6
Belgium	26.3	27.5	26.4	26.6	26.3	26.5
Bulgaria	35.3	35.9	33.4	33.2	35.0	33.6
Czech Republic	25.3	24.7	25.1	24.9	25.2	24.9
Denmark	25.2	25.1	26.9	26.9	27.8	28.1
Germany	30.4	30.2	29.1	29.3	29.0	28.3
Estonia	33.4	30.9	31.4	31.3	31.9	32.5
İreland	31.3	29.9	28.8	30.7	29.8	-
Greece	34.3	33.4	33.1	32.9	33.5	34.3
Spain	31.9	31.9	33.0	34.4	34.5	35.0
France	26.6	29.8	29.9	29.8	30.8	30.5
Croatia	29	28	27	31.4	31.0	30.5
İtaly	32.2	31.0	31.5	31.2	31.9	31.9
Cyprus	29.8	29.0	29.5	30.1	29.2	31.0
Latvia	35.4	37.7	37.4	36.1	35.4	35.9
Lithuania	33.8	34.0	35.5	36.9	33.0	32.0
Luxembourg	27.4	27.7	29.2	27.9	27.2	28.0
Hungary	25.6	25.2	24.7	24.1	26.8	26.9
Malta	26.3	27.9	27.2	28.4	27.4	27.2
Netherlands	27.6	27.6	27.2	25.5	25.8	25.4
Austria	26.2	26.2	25.7	26.1	26.3	-
Poland	32.2	32.0	31.4	31.1	31.1	30.9
Portugal	36.8	35.8	35.4	33.7	34.2	34.5
Romania	37.8	36.0	34.9	33.3	33.2	33.2
Slovenia	23.2	23.4	22.7	23.8	23.8	23.7
Slovakia	24.5	23.7	24.8	25.9	25.7	25.3
Finland	26.2	26.3	25.9	25.4	25.8	25.9
Sweden	23.4	24.0	24.8	24.1	24.4	24.9
United Kingdom	32.6	33.9	32.4	32.9	33.0	32.8

Reference: *Anonymous 2015e.*

When we compared the use of animal products per capita in the EU-27 and in Turkey, it has been seen that Turkey is well behind the EU in terms of egg, meat, dairy and fish groups (Anonymous 2015b). If the use of animal-derived protein is considered as a development indicator of food security, Turkey remains well behind the EU.

As of 2011, milk consumption amount per capita in the EU-27 (320 kcal) is

approximately one and a half times of milk consumption amount per capita in Turkey (265 kcal). In the same year, meat and fish consumption amount per capita in the EU-27 (379 kcal, 48 kcal, respectively) is nearly three times of meat and fish consumption amount per capita in Turkey (127 kcal, 14 kcal, respectively) (Anonymous 2015b) (see Table 6).

As of 2011, crop consumption amount per capita in the EU-27 (950 kcal) is around half of the crop consumption amount per capita in Turkey (1.571 kcal). In this regard, it can be concluded that the cereals group is not as important for EU countries as it is important for Turkey as a nutrient group. The daily fruit consumption amount per capita in the EU-27 (112 kcal) is about 20% less than daily fruit consumption amount per capita in Turkey (160 kcal), and daily vegetable consumption amount per capita in the EU-27 (81 kcal) is around half of the daily vegetable consumption amount per capita in Turkey (148 kcal) (Anonymous 2015b) (see Table 7).

Table 4. Food Price Indices in the EU-27 (2012)

	Food	Bread and Cereals	Meat
Denmark	139	159	132
Sweden	124	135	126
Austria	121	134	132
Luxembourg	119	117	129
Finland	118	130	119
Ireland	117	110	110
İtaly	113	114	115
Belgium	110	108	118
France	110	106	123
Cyprus	109	121	89
Germany	106	104	128
Greece	104	115	91
United Kingdom	102	89	100
Slovenia	98	101	93
Netherlands	97	90	117
Malta	97	94	80
Spain	94	111	83
Croatia	90	94	75
Portugal	90	98	75
Estonia	86	84	79
Slovakia	85	82	71
Czech Republic	82	74	73
Hungary	80	74	72
Latvia	85	80	75
Bulgaria	67	57	59
Romania	67	63	57
Poland	60	58	55
EU-27	100	100	100

Reference: *Anonymous 2015e*

Protecting the health of consumers, meeting the quality expectations and constantly raising the quality of life are stated as one of the basic responsibilities of the EU-27. In the last 40 years, extensive legislation, standards and monitoring procedures related to the health of food have been created (Tayar 2007).

Table 5. Some of European Union Member Countries' Physical Access

	2009				
	United Kingdom	**Germany**	**Spain**	**Romania**	**Greece**
Percentage of Paved Roads over Total Roads (%)	100.00	-	-	56.7	-
Road density	172.27	180.32	132.0	34.28	88.61
Rail-lines density (per 100 square km of land area)	6.64	9.44	2.98	4.52	1.18
	2010				
	United Kingdom	**Germany**	**Spain**	**Romania**	**Greece**
Percentage of Paved Roads over Total Roads (%)	100.00	-	-	56.5	35.4
Road density	172.25	180.27	131.94	34.70	88.63
Rail-lines density (per 100 square km of land area)	12.92	9.44	3.03	5.71	1.93

Reference: *Anonymous 2015b.*

Table 6. Daily Animal Product Consumption Amount per Capita in EU-27 (kcal)

Years	Egg	Meat	Milk	Fish and Seafood	Total Food
2007	49	384	323	49	3.418
2008	48	384	318	49	3.423
2009	47	385	319	48	3.428
2010	47	384	318	49	3.410
2011	46	379	320	48	3.416

Reference: *Anonymous 2015b.*

In parallel with these developments in nutrition and field of health, food security has gained a great importance in the agenda of the governments and become one of the most important concepts in the developed countries and especially in the EU. In the EU, food policies that can be summed up with the principle of having food from farm to the fork are adopted put into practice. In the field of research, this principle is modified as from fork to the farm in order to emphasize the importance of feedback from consumers to producers. In both

approaches, the important and unchanging phenomenon is that health of society and individuals is in the center of research and policy implementation processes (Giray et al., 2006).

Mad cow in the UK, bird flu cases in the Far East countries and Salmonella crisis in EU countries are the most memorable incidents that have accelerated this process. These incidents have encouraged individuals to question food security policies in the developed countries and led to the emergence of social pressure for more secured food production. In a food security system, which defines food as safe if it is not a threat for human health and carrying an acceptable degree of risk, the manufacturer share the responsibility with suppliers and the product can be monitored under responsibility of both manufacturers and suppliers until it reaches the final consumer (Kilit, 2013).

As of today, the new EU food legislation is formed and it has also been largely aligned with the member states. The European Parliament and the Council, who determine the procedures relating to food security and established European Food Safety Authority (EFSA) that identifies the general principles and requirements of food law with number 178/2002, introduce the common principles and explanations of laws related to food and feed. As of January 1st 2005, these laws have come into force in all EU member states (Buzbaş 2010).

Stability

Food security indicators were examined for five EU member states to be an example in extra ordinary times. Accordingly, considering political stability and absence of violence/terrorism index, these values were found to be negative in countries such as Spain and Greece where negative impacts of the economic crisis still exist, while these values were high in developed countries such as Germany and England.

Table 7. Daily Vegetative Product Consumption Amount per Capita in EU-27 (kcal)

Year	Cereal	Fruit	Vegetable	Total Food
2007	934	118	81	3.418
2008	949	118	81	3.423
2009	949	116	84	3.428
2010	957	111	80	3.410
2011	950	112	81	3.416

Reference: *Anonymous 2015b.*

In domestic food price volatility index, the most risky countries are Romanian and Greece. Romania has the highest production variability per capita, whereas England has the lowest rate, respectively. Furthermore, Romania has the highest rate in terms of floating supply variability per capita, which shows that Romania faces the risk of food insecurity (see Table 8). Considering political stability and absence of violence/terrorism index, these values were found to be negative (-0.97) in Turkey in 2010. In domestic food price volatility index (95.1) is much more higher in Turkey than European Union countries at the same year. Considering the food production variability per capita (11.7), Turkey seems to be better than some countries such as Romania, Spain and Greece; but also worse than United Kingdom and Germany in 2010. Turkey is also better than some member countries like Romania in terms of in terms of floating supply of daily food per capita (30), but not as good as some other member states such as United Kingdom, Spain, Greece and Germany in 2010 (Anonymous 2015b).

Results

Healthy, good quality and sufficient quantity of food is a fundamental right of all people. In this context, the concept of food security is becoming increasingly important in the world. Countries cannot provide peace and tranquillity without meeting requirements of food security. Therefore, it is considered to be important to investigate the current situation of food security in the EU since Turkey is working to be a member of this union for a long time.

According to the results of the study, all aspects of food security were examined with the macro data. According to the results obtained, in terms of **availability** dimension, the EU is self-sufficient in terms of cereals, meat and dairy groups, whereas it seem insufficient in terms of fruit and vegetable groups. In Turkey, there is an opposite situation. Turkey is self-sufficient in terms of fruit, vegetable and meat groups, while it seem insufficient in cereals and dairy products. From this perspective, it is thought that there is a complementary relationship between the EU and Turkey in terms of ensuring the food security if Turkey's accession to the EU is achieved. Furthermore, the further development of foreign trade between the EU-Turkey seems important.

Accessibility is examined in terms of economic and physical accessibility. Food security is not achieved completely in Turkey and in the EU in terms of income level and justice of income distribution. Although there are EU member states with high Gross National Product (GNP), it should be noted that there are many member states experiencing significant problems in terms of income levels. Within the scope of economic accessibility, it is possible to mention insecurity in terms of food prices. Although food prices are lower in Turkey compared to most of the EU member countries, unfair income distribution seems to be a major obstacle to ensure the accessibility. Although there is not an important problem in terms of physical accessibility in Turkey, conditions seem to be quite insufficient in some EU countries.

Considering the dimension of **utilization**, it has been determined that the amount of cereals use per capita in Turkey is nearly two times of the cereals use per capita in the EU, whereas the amount of meat and dairy products use in the EU is higher than the amount of meat and dairy products use in Turkey. Bread and cereals products seem to be important elements in the nutrition of Turkish people, but consumption of foods of animal origin has an important place for ensuring food security and human health. The food consumed should meet food security criteria. In this regard, it has been seen that EU countries have a more professional structure compared to Turkey, and Turkey hasn't fully achieved the desired level.

The last dimension of food security **stability** was investigated for Turkey and some EU member states. Considering political stability and the period index without any terrorism/violence, Turkey seems to remain well behind the EU countries. According to domestic food volatility index, Turkey seems to remain well behind the EU countries by taking quite higher values compared to the EU. Considering the food production variability per capita, Turkey seems to be better than some countries such as Romania, Spain and Greece; but also worse than England and Germany. Finally, Turkey is also better than some member countries like Greece and Romania in terms of in terms of floating supply of daily food per capita, but not as good as some other member states such as England, Spain and Germany.

As a result, we cannot talk about food security fully achieved in terms of all aspects for neither Turkey nor the EU and they have the risk of food insecurity. The current situation of the EU seems to be better than that of Turkey. The main reasons of food insecurity in Turkey are the lack of economic availability, accessibility, usability and consistency.

Table 8. Food Security Indicators of Extraordinary Period in Some of European Union Countries

	2009					2010				
	United Kingdom	Germany	Spain	Romania	Greece	United Kingdom	Germany	Spain	Romania	Greece
Political Stability and Absence of Violence/Terrorism Index	0.16	0.86	-0.33	0.36	-0.18	0.44	0.81	-0.16	0.27	-0.10
Domestic Food Price Volatility Index	15.2	11.7	8.9	31.0	18.7	30.7	15.5	13.1	23.3	20.1
Per Capita Food Production Variability (I$ per constant 2004-06)	4.2	11.5	19.2	45.2	17.7	4.5	10.1	14.5	27.5	19.1
Per Capita Food Supply Variability (kcal/capita/day)	15.0	15.0	18.0	46.0	19.0	15.0	15.0	15.0	45.0	17.0

Reference: *Anoymous 2015b.*

The most important obstacle stands in front of food security in Turkey are determined as disruptions in the agricultural structure, implementation of unfavorable agricultural policies, irrational privatizations, failure to implement policies, difficulties in foreign trade, inadequate supports provided for agriculture compared to EU countries, failure to provide food security standards, unfair distribution of income and volatility of food prices.

In the EU, major gaps were determined in terms of the distribution of income and prices. The EU countries can be considered as a threat for food security in Turkey since they protect their interests by using tariffs and quotas enforced by Customs Union Agreement.

It has been concluded that removal of these obstacles threatening food security will improve economic prosperity and development indicators of both sides.

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