Tarım Ekonomisi Dergisi 2013; 19(1): 13-25

DO RASFF NOTIFICATIONS SERVE AS A MOTIVATOR OR A BARRIER TO TRADE BETWEEN TURKEY AND THE EUROPEAN UNION?

Ferit ÇOBANOĞLU[1]

Abstract

The Rapid Alert System for Food and Feed (RASFF) is one of the critical regulatory instruments established in the European Union (EU). This study aimed to determine whether RASFF notifications serve as a motivator or a barrier in food safety in terms of trade between Turkey and the EU. To achieve this aim, first, RASFF notifications for agricultural products and food commodities originating in Turkey during the period 1993-2010 were collected and classified. Then, the export values of the Turkish agricultural products associated with these RASFF notifications were collected for the same period. The results indicate that RASFF notifications serve as a barrier in the short run but as a major motivator in the long run if the required practices are adopted efficiently by all stakeholders. Future studies examining the costs and benefits of RASFF notifications with regard to management of agricultural enterprise at the product level would provide more insight into whether the notifications primarily serve as a motivator or a barrier.

Key Words: Management of agricultural enterprises, food safety, the European Union, RASFF notifications, Turkey

RASFF Bildirimleri Türkiye ve Avrupa Birliği Arasındaki Ticarete Bir Engel Mi Yoksa Bir Teşvik Edici Olarak Mı Hizmet Etmektedir?

Özet

Gıda ve Yemler için Hızlı Alarm Sistemi (RASFF: The Rapid Alert System for Food and Feed), Avrupa Birliği (AB)'nde tesis edilmiş olan, kritik yasal düzenleyeci araçlardan birisidir. Bu çalışma, RASFF bildirimlerinin, Türkiye ve AB arasındaki ticaret açısından gıda güvenliğinde bir teşvik edici ya da bir engel olarak hizmet edip-etmediğini belirlemek için yapılmıştır. Bu amacı gerçekleştirmek için, ilk olarak, 1993-2010 periyodu boyunca, Türkiye orijinli tarımsal ve gıda ürünlerine yapılan RASFF bildirimleri toplanmış ve sınıflandırılmıştır. İzleyen aşamada, aynı periyot için, bu RASFF bildirimlerine ilişkin olarak Türk tarımsal ürünlerinin ihracat değerleri toplanmıştır. Sonuçlar, RASFF bildirimlerinin kısa dönemde bir engel olabileceğini ortaya koyarken, eğer uzun dönemde, tüm paydaşlar tarafından gereksinim duyulan uygulamalar benimsenebilirse, bir teşvik edici olarak hizmet edebileceğini belirtmektedir. Ürün düzeyinde, tarımsal işletmeler için RASFF bildirimlerinin fayda ve maliyetlerini analiz eden gelecekteki çalışmalar, bildirimlerin esas olarak bir engel mi ya da bir teşvik edici mi olarak hizmet edebileceğini ortaya koymaya yönelik daha daha güçlü işaretler sağlayabilecektir.

Anahtar Kelimeler: Tarımsal işletmelerin yönetimi, gıda güvenliği, Avrupa Birliği, RASFF bildirimleri, Türkiye

1. INTRODUCTION

Owing to the series of food scandals and scares that have broken out in the last two decades, countries around the world have been implementing stricter food safety regulations. This series of scares and scandals began with the BSE (bovine spongiform encephalopathy) crisis in 1986 in the United Kingdom (UK). Other incidents occurred later: Belgium (1993); the Netherlands (1997); Denmark (2000); France (2000); Germany (2000); Portugal, Switzerland, and Spain (2000); Italy (2001); and Canada (2003). With the BSE crisis and the other incidents that followed, affected food was often untraceable, illustrating the need for integrated action among the various parts of the food supply chain (Bánáti, 2011). In the context of increasing awareness of food safety measures among all actors forming the production and supply chain, from producers to consumers, authorities in countries around the world acknowledged that they needed to devise and implement special precautions to provide their citizens with confidence when purchasing food. The Beijing Declaration on Food Safety, signed by more than 50 countries, laid out such food safety and security practices (WHO, 2007). These concepts would serve as the foundation for emerging food safety programs. The Declaration provided analyses of food alert patterns; presented a network analysis tool to assist with database interaction; and improved early warning

[1]*Adnan Menderes Üniversitesi, Ziraat Fakültesi, Tarım Ekonomisi Bölümü, 09100 AYDIN.*

procedures/tools, thereby developing and presenting a new understanding of food safety (Kleter et al., 2009; Marvin et al., 2009; Naughton and Petróczi, 2009; Nepusz et al., 2009a,b; Petróczi et al., 2010; WHO, 2006). Soon after, the European Union (EU) developed the Rapid Alert System for Food and Feed (RASFF) as a major regulatory instrument to provide food and feed control authorities with an effective tool for exchanging information about measures taken to address risks posed with regard to food or feed. This information exchange helps member countries to act more rapidly and in a coordinated manner in response to a health threat caused by food or feed. Its effectiveness is ensured by its structural simplicity: Through this system, the Commission, the European Food Safety Authority (EFSA), the EFTA Surveillance Authority, the European Economic Area (EEA), and national food safety authorities in member countries exchange information in a clear and structured manner by means of templates. RASFF has had much more impact on EU-wide acceptance or rejection of imported food since the General Food Law Regulation was published in 2002 (EC, 2002). It targeted multiple food quality problems, including, but not restricted to, dioxins, residues of veterinary medicinal products, illegal dyes, microorganisms, lead and other heavy metals, and illegal processes, such as treatment of tuna with carbon monoxide (EC, 2006).

As a first step to accessing EU markets, investigating RASFF notifications and their economic impacts is of untold value. Many researchers have published studies on food safety, but relatively few have analyzed RASFF notifications and their potential impact on countries' trade volume. For example, one group of researchers (Krisztina et al., 2005) investigated the most prevalent microbiological, chemical, and biological contaminants for different product categories, along with food safety practices and RASFF notifications. Wiig and Kolstad (2005) compared the EU's RASFF with the food safety system of the United States Food and Drug Administration (FDA). Since the data Wiig and Kolstad gathered on these food safety systems reflect the impact of Sanitary and Phytosanitary (SPS) regulations on actual exports to the EU and the United States, a closer examination of their data would be useful. Wiig and Kolstad discovered that the working principles of the two systems are completely different. According to their research, RASFF relates only to food and feed constituting a human health hazard, while the FDA system relates to imports to the United States that do not comply with the Food, Drug, and Cosmetics Act. Consequently, a large proportion of FDA import refusals involve products that are not a direct human health hazard (e.g., incomplete labeling or non-compliance with other formal requirements). Szeitz-Szabo and Szabo (2007) used the data from the EU's RASFF system to perform a quantitative risk assessment. Hollo-Szabone et al. (2008) described RASFF's mechanism in Hungary and information flow among member countries in the EU. Wu (2008) took a case study (U.S. pistachio and almond industries) approach to investigating the economic impacts of the EU's strict standards for mycotoxins, particularly aflatoxins. Wu stressed that U.S. suppliers, EU processors, and consumers suffered from undesirable circumstances due to these strict standards. In their study of imports to the EU between 2001 and 2005, Jaud et al. (2009) found that EU agri-food import regulations affected China, Turkey, and Brazil most negatively because they are the EU's largest suppliers of agri-food products. Jaud et al. concluded that understanding how sanitary standards and their implementation may affect suppliers (exporters) is of critical importance for developing countries. Such an understanding would allow them to maximize their opportunities. Marvin et al. (2009) provided a non-exhaustive global overview of early warning systems for emerging food-borne hazards. They gave special attention to endpoint-focused and hazard-focused early warning systems (i.e., RASFF). Gondarova et al. (2010) investigated RASFF notifications on products originating in the Slovak Republic. They explained that the EU is currently developing a new information system, the Generic Rapid Alert System (GRAS), and stressed that its implementation is one of the most important ongoing projects in product safety. According to them, GRAS is a much more effective alert system for European markets. Wojtyla et al. (2010) described food safety regulations in the EU and Poland, particularly RASFF in Poland. Yorulmaz and Bircan (2010) declared the report of Turkey on RASFF notifications released to the agricultural products and food commodities originating from Turkey during 2003-2008. Kasza et al. (2011) evaluated RASFF notifications in Hungary for 2009 and summarized changes in the number and type of human cases of food-borne diseases registered in Hungary since joining the EU. Based on data from Hungarian food control authorities, the researchers concluded that in Hungary 80% of the food-borne diseases occur in the home and that the major causes are the Salmonella and Campylobacter strains of bacteria. As EU countries are Turkey's main partners in general trade as well as in the trade of agricultural products and food commodities, investigating RASFF activities and notifications may play a crucial role in sustaining Turkey's exports to the EU. This study aimed to determine whether RASFF notifications serve as a motivator or a barrier in food safety in terms of trade between Turkey and the EU. To accomplish aim, RASFF notifications and the

underlying mechanism of this system as related to agricultural products and food commodities originating in Turkey are discussed. The present paper provides detailed information and in-depth documentation on the aforementioned topics. Thus, it will make a significant contribution to the international literature, helping managers and/or practitioners of agricultural enterprises around the world to negotiate EU food safety regulations.

2. CONCEPTUAL FRAMEWORK

The present paper examines RASFF, delineating its structure and working functions. Detailed data from RASFF notifications were taken from the RASFF Web portal (RASFF, 2011). The data were transferred to Excel files and all the parameters evaluated separately. RASFF notifications for agricultural products and food commodities originating in Turkey in the period 1993-2010 were collected and divided into one of five groups: product categories, notification types, number of countries notified, main reasons for notification, and actions taken. The export values of Turkey's agricultural products associated with RASFF notifications were collected for the same period. The first year in the study period, 1993, was taken as the base year. After taking the data from the RASFF Web portal, analyses were performed for products originating in Turkey and related RASFF notifications for each year (from the base year until last year). No data could be collected for years prior to the base year or for 1995-1996. After examining the annual data, the researcher investigated how the changes in RASFF notifications informed products originating in Turkey and impacted export values between 1993 and 2010 (TSI, 2011) in order to determine whether RASFF notifications served as a motivator or a barrier to trade between Turkey and the EU. If an inverse relation is observed between changes in the number and type of RASFF notifications (as compared to previous year) and changes in the export values of Turkey's agricultural products (as compared to the previous year), one could conclude that RASFF notifications serve as a barrier to trade between Turkey and the EU, at least in the short run. If a direct relation is observed between changes in the number and type of RASFF notifications (as compared to previous year) and changes in the export values of Turkey's agricultural products (as compared to the previous year), one could conclude that RASFF notifications serve as a motivator for trade between Turkey and the EU, at least in the short run. Further research should be conducted on circumstances different from those delineated above as well as predictions for future trade between Turkey and the EU. Before investigating RASFF from a multidimensional perspective, the researcher evaluated key issues regarding RASFF procedures and the overall system.

3. THE LEGAL BASIS FOR RASFF AND THE OVERALL SYSTEM

The legal basis of RASFF is Regulation (EC) No 178/2002. Article 50 of this Regulation establishes the RASFF as a network involving Member States, the Commission (member and system manager), and the European Food Safety Authority (EFSA). The European Economic Area (EEA) countries, Norway, Liechtenstein, and Iceland, have employed RASFF for a long time. Whenever a member of the network has any information relating to the presence of a serious direct or indirect risk to human health from food or feed, this information is swiftly passed onto the Commission through RASFF. The Commission immediately conveys this data to the other members of the network. All member organizations are listed in Table 1. The system differentiates between 'market notifications,' 'border rejection notifications,' 'news notifications,' 'original notifications,' and 'follow-up notifications' (RASFF, 2008).

3.1. Market Notifications

Market notifications identify health risks for products placed on the market in the notifying country. The notifying country provides information on the risks present, traceability, and the measures taken. Based on the seriousness of the risks described and the distribution of the product on the market, after evaluation by the Commission, market notifications are categorized as 'alert notifications' or 'information notifications' before the Commission passes them onto the rest of the network. An alert notification, or 'alert,' is sent when a food or feed product presents an immediate risk, that is, when rapid action is needed. Alerts indicate the member of the network that detected the problem and the measures taken, such as withdrawal/recall. Such a notification aims at providing all members of the network with information about the product so that they can determine whether the product is on their market and takes the necessary measures. Products subject to an alert notification have been withdrawn or are in the process of being withdrawn from the market. Member States have their own mechanisms for carrying out such actions, including the provision of detailed information through the media if necessary (RASFF, 2008).

3.2. Border Rejection Notifications

A 'border rejection notification' is issued when a food or feed product has been rejected owing to a health risk.

3.3. News Notifications

A 'news notification' includes any information concerning the safety of a food or feed product that has not been transmitted as an alert, information, or border rejection notification, but that is of interest for the food and feed control authorities in the Member States (RASFF, 2008). News notifications frequently include information accumulated in the media or forwarded by colleagues in food or feed authorities in other Member States, third-party countries, Commission delegations, or international organizations after having been approved by the Member States concerned.

Table 1. The members of RASFF

The Members					
European Union	Estonia	Italy	Poland	Denmark	Czech Republic
EFTA	Finland	Latvia	Portugal	United Kingdom	Iceland
Austria	France	Liechtenstein	Romania	Ireland	Netherlands
Belgium	Germany	Lithuania	Slovakia	Norway	
Bulgaria	Greece	Luxembourg	Slovenia	Switzerland	
Cyprus	Hungary	Malta	Spain	Sweden	

Source: Rapid Alert System for Food and Feed (RASFF), (2011). The RASFF web portal. Retrieved from https://webgate.ec.europa.eu/rasff-window/portal/

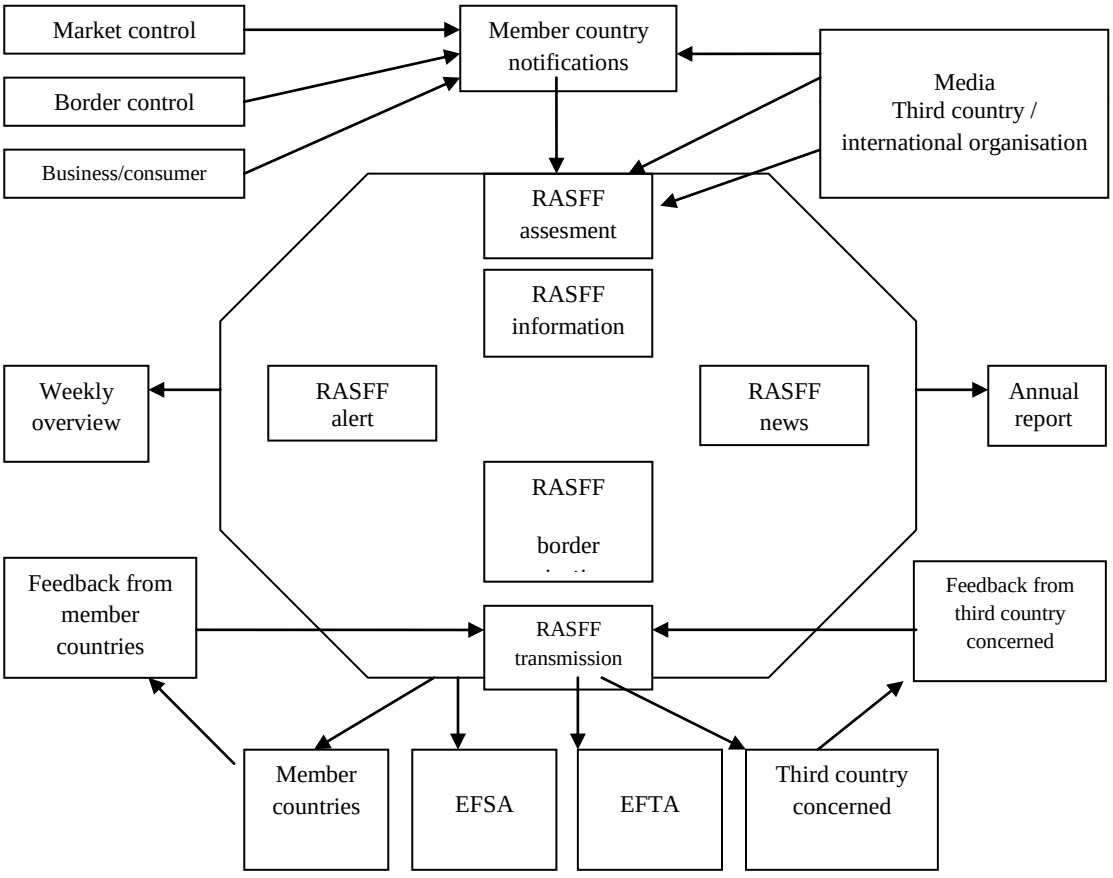

Figure 1. Schematic Representation of the Flow of RASFF.

Source: Rapid Alert System for Food and Feed (RASFF). (2008).
The RASFF Annual Report 2008. Retrieved from http://ec.europa.eu/food/food/rapidalert/report2008_en.pdf

Table 2. RASFF Notifications for Products Originating in Turkey

Periods	Product categories	Notification types[2]	The number of countries notified by[2]	Main reasons of notification[2]	Actions taken[2]
01/01/-31/12/1993	Fruit and vegetables	-	Spain (1)	toxins (1)	-
	Nuts, nut products and seeds	-			
	Others	Alert (1)			
Total		1			
01/01-31/12/1994	Fruit and vegetables	Alert (2)	United Kingdom (1) Commission Services (1)	chemical contaminants (2)	-
	Nuts, nut products and seeds	-			
	Others	-			
Total		2			
01/01-31/12/1997[1]	Fruit and vegetables	-	Germany (2), Italy (1)	aflatoxins in paprika (2) and another reason (1)	product recall or withdrawal (1), destruction (2)
	Nuts, nut products and seeds	-			
	Others	Alert (3)			
Total		3			
01/01-31/12/1998	Fruit and vegetables	Information (1), Alert (1)	Italy (6), Germany (3), Austria (3), Sweden (1)	aflatoxins in dried figs and fig products (2), aflatoxins in peanuts, pistachio nuts (4), and also other reasons (7)	the product in question was not admitted into the European Union (EU) (7), product recall or withdrawal (3), product (to be) sized (2), another (1)
	Nuts, nut products and seeds	Information (4)			
	Others	Information (6), Alert (1)			
Total		13			
01/01-31/12/1999	Fruit and vegetables	Information (11)	Portugal (9), Germany (6), France (2), Italy (2), Netherlands (1), Sweden (1), Norway (1), Spain (1)	aflatoxins in dried figs and fig products (11), aflatoxins in pistachio nuts, peanuts, hazelnuts (7) and also other reasons (5)	the product in question was not admitted into the EU (16), product recall or withdrawal (6), destruction (1)
	Nuts, nut products and seeds	Information (5), Alert (2)			
	Others	Information (4), Alert (1)			
Total		23			
01/01-31/12/2000	Fruit and vegetables	Information (18), Alert (2)	Portugal (11), Germany (6), Italy (6), Greece (3), Spain (1), Denmark (1), Sweden (1)	aflatoxins in dried figs and fig products (15), aflatoxins in pistachio nuts, peanuts, hazelnuts (6), and other reasons (8)	the product in question was not admitted into the European Union (EU) (25), product recall or withdrawal (2), destruction (1), product (to be) sized (1)
	Nuts, nut products and seeds	Information (4), Alert (2)			
	Others	Information (3)			
Total		29			
01/01-31/12/2001	Fruit and vegetables	Information (19), Alert (10)	Germany (6), Spain (6), Greece (5), Portugal (4), Netherlands (4), Norway (4), Italy (4), Iceland (2), Sweden (2), Finland (2), Belgium (3), Austria (1), Denmark (1),	aflatoxins in dried figs and fig products (15), aflatoxins in pistachio nuts, peanuts, hazelnuts (10), too high content of sulphite in dried apricots (6), and other reasons (13)	the product in question was not admitted into the European Union (EU) (25), product recall or withdrawal (5), products (to be) sized (5), and other actions (9)
	Nuts, nut products and seeds	Information (10), Alert (2)			
	Others	Information (1), Alert (2)			
Total		44			

[1]No RASFF notifications were created for products originating in Turkey in 1995 or 1996.
[2]The number of times related to de facto circumstances was indicated in parentheses.

Table 2. (continued) RASFF Notifications for Products Originating in Turkey

Periods	Product categories	Notification types	The number of countries notified by	Main reasons of notification	Actions taken
01/01-31/12/2002	Fruit and vegetables Nuts, nut products and seeds Others	Information (52), Alert (12) Information (64), Alert (7) Information (4), Alert (2)	Germany (51), Austria (18), Italy (18), France (18), Greece (8), Spain (7), Netherlands (5), Norway (5), Portugal (3), Belgium (3), Finland (3), Denmark (1), Sweden (1)	aflatoxins in dried figs and fig products (23), aflatoxins in pistachio nuts, peanuts, hazelnuts (69), methamidophos in peppers (18), too high content of sulphite in dried apricots (12), and other reasons (12)	the product in question was not admitted into the European Union (62), re-dispatch (9), complaint (8), product (to be) sized (8), product recall or withdrawal (7), and other actions (47)
Total		141			
01/01-31/12/2003	Fruit and vegetables Nuts, nut products and seeds Others	Information (87), Alert (3) Information (65), Alert (1) Information (39), Alert (7)	Germany (70), Spain (40), Italy (27), France (15), Norway (10), Austria (10), Greece (7), Portugal (6), United Kingdom (5), Denmark (4), Netherlands (3), Belgium (3), Finland (2)	aflatoxins in dried figs and fig products (15), aflatoxins in pistachio nuts, peanuts, hazelnuts (65), too high content of sulphite in dried apricots (36), and other reasons (86)	the product in question was not admitted into the European Union (46), re-dispatch (88), product recall or withdrawal (17), destruction (17), product (to be) seized (5), and other actions (19)
Total		202			
01/01/-31/12/2004	Fruit and vegetables Nuts, nut products and seeds Others	Information (73), Alert (3) Information (45), Alert (1) Information (37), Alert (23)	Germany (44), Italy (41), Netherlands (19), France (18), Greece (14), Spain (9), Austria (7), United Kingdom (4), Portugal (3), Cyprus (2), and other countries (21)	aflatoxins in dried figs and fig products (35), aflatoxins in pistachio nuts, peanuts, hazelnuts (45), unauthorised use of colour E 171 - titanium dioxide in chickpeas (18), unauthorised colours Sudan 1 and 4 in paprikas and peppers and their powders (30), too high content of sulphite in dried apricots (11), and other reasons (43)	re-dispatch (105), destruction (32), product recall or withdrawal (22), and other actions (23)
Total		182			
01/01-31/12/2005	Fruit and vegetables Nuts, nut products and seeds Others	Information (85), Alert (12) Information (67), Alert (2) Information (29), Alert (7)	Germany (70), Italy (16), France (12), Spain (12), Greece (9), United Kingdom (8), Hungary (8), Austria (7), Malta (7), Netherlands (4), Belgium (4), and other countries (55)	aflatoxins in dried figs and fig products (44), aflatoxins in pistachio nuts, peanuts, hazelnuts (68), too high content of sulphite in dried apricots (14), ochratoxin A in raisins and sultanas (9), unauthorised use of colour E 171 - titanium dioxide in chickpeas (5), unauthorised colours Sudan 1 and 4 in paprikas and peppers and their powders (5), and other reasons (57)	re-dispatch (129), product recall or withdrawal (38), destruction (12), prohibition to trade - sales ban (3) and other actions (20)
Total		202			

Table 2. (continued) RASFF Notifications for Products Originating in Turkey

Periods	Product categories	Notification types	The number of countries notified by	Main reasons of notification	Actions taken
01/01-31/12/2006	Fruit and vegetables	Information (108), Alert (9)	Germany (72), Italy (30), France (23), Spain (18), Greece (18), United Kingdom (16), Denmark (8), Hungary (7), Poland (7), Slovakia (7), Norway (5), Czech Republic (4) and other countries (37)	aflatoxins in dried figs and fig products (53), aflatoxins in pistachio nuts, peanuts, hazelnuts (103), unauthorised use of colour E 171 - titanium dioxide in chickpeas (16), unauthorised colours Sudan 1 and 4 in paprikas and peppers and their powders (10), too high content of sulphite in dried apricots (7), and other reasons (63)	re-dispatch (165), product recall or withdrawal (21), destruction (17), return to dispatcher (9), and other actions (40)
	Nuts, nut products and seeds	Information (106), Alert (3)			
	Others	Information (15), Alert (11)			
Total		252			
01/01-31/12/2007	Fruit and vegetables	Information (107), Alert (9)	Germany (93), Italy (34), France (27), United Kingdom (22), Poland (16), Greece (16), Spain (12), Denmark (9), Netherlands (8), Portugal (7), Slovakia (6), Malta (5), and other countries (39)	aflatoxins in dried figs and fig products (56), aflatoxins in pistachio nuts, peanuts, hazelnuts (142), and other reasons (96)	re-dispatch (184), recall from consumers (21), withdrawal from the market (20), destruction (6), and other actions (63)
	Nuts, nut products and seeds	Information (141), Alert (7)			
	Others	Information (21), Alert (9)			
Total		294			
01/01-31/12/2008	Fruit and vegetables	Information (55), Alert (3), Border rejection (112)	Germany (99), Italy (40), France (36), United Kingdom (20), Greece (16), Slovenia (9), Netherlands (8), Denmark (7), Norway (5), and other countries (69)	aflatoxins in dried figs and fig products (97), aflatoxins in pistachio nuts, peanuts, hazelnuts (100), amitraz in fresh pears (30), too high content of sulphite in dried apricots (8), and other reasons (74)	re-dispatch (169), destruction (49), official detention (29), withdrawal from the market (25), and other actions (37)
	Nuts, nut products and seeds	Information (10), Alert (2), Border rejection (100)			
	Others	Information (8), Alert (15), Border rejection (4)			
Total		309			
01/01-31/12/2009	Fruit and vegetables	Information (34), Alert (3), Border rejection (74)	Germany (95), France (40), Italy (22), United Kingdom (20), Greece (20), Austria (18), Poland (14), Netherlands (8), Spain (6), and other countries (37)	aflatoxins in dried figs and fig products (61), aflatoxins in pistachio nuts, peanuts, hazelnuts (111), amitraz in fresh pears (12), and other reasons (96)	re-dispatch (123), destruction (44), under customs seals (36), withdrawal from the market (34), official detention (21), and other actions (22)
	Nuts, nut products and seeds	Information (14), Alert (11), Border rejection (98)			
	Others	Information (12), Alert (3), Border rejection (31)			
Total		280			
01/01-31/12/2010	Fruit and vegetables	Information (38), Alert (12), Border rejection (87)	Germany (61), Greece (37), Italy (24), Austria (21), Denmark (13), United Kingdom (10), France (9), Sweden (9), Slovakia (8), and other countries (65)	aflatoxins in dried figs and fig products (57), aflatoxins in pistachio nuts, peanuts, hazelnuts (50), Salmonella spp. in the products (16), migration of cadmium, benzophenone, chromium, epoxidised in the products (11), amitraz in fresh pears (5), and other reasons (117)	withdrawal from the market (36), re-dispatch (31), re-dispatch or destruction (31), under customs seals (13), and other actions (145)
	Nuts, nut products and seeds	Information (5), Alert (3), Border rejection (57)			
	Others	Information (24), Alert (7), Border rejection (23)			

Total	256

Source: Rapid Alert System for Food and Feed (RASFF). (2011). The RASFF web portal. Retrieved from https://webgate.ec.europa.eu/rasff-window/portal/

Table 3. Comparison of the number of RASFF notifications for products originating in Turkey and the value of exports destined for the EU in the period 1993-2010 (billion US$)

Years	Total exports to the world	Total exports to the EU[1]	Export of agricultural products to the EU[2]	Change[3]	Total notification numbers[4]	Change[3]	Export of agricultural products and food commodities addressed to RASFF notifications	Change[3]
1993	15.35	8.27	1.07	-	1	-	0.69	-
1994	18.11	9.39	1.23	↑	2	↑	0.80	↑
1995	21.64	12.21	1.46	↑	-	-	0.93	↑
1996	23.22	12.56	1.31	↓	-	-	0.82	↓
1997	26.22	13.43	1.45	↑	3	-	0.95	↑
1998	26.98	14.81	1.41	↓	13	↑	0.91	↓
1999	26.59	15.42	1.35	↓	23	↑	0.80	↓
2000	27.77	15.66	1.06	↓	29	↑	0.67	↓
2001	31.33	17.55	1.27	↑	44	↑	0.76	↑
2002	36.06	20.41	1.22	↓	141	↑	0.72	↓
2003	47.25	27.39	1.52	↑	202	↑	0.83	↑
2004	63.17	36.58	1.92	↑	182	↓	1.32	↑
2005	73.48	41.36	2.54	↑	202	↑	1.75	↑
2006	85.53	47.94	2.27	↓	252	↑	1.54	↓
2007	107.27	60.40	2.50	↑	294	↑	1.76	↑
2008	132.03	63.40	2.53	↑	309	↑	1.74	↓
2009	102.14	47.01	2.52	↓	280	↓	1.72	↓
2010	113.98	52.73	2.75	↑	256	↓	1.91	↑

[1] The EU members were evaluated as 15, 25, and 27 countries for the periods 1993-2003, 2004-2006, and 2007-2010 years, respectively.
[2] The statistics obtained from the Turkish Statistical Institute (TSI) based on a harmonized system (HS) included 1-23 chapters associated with RASFF notifications.
[3] The symbol "↑" denotes an increase, while the symbol "↓" indicates a decrease (as compared to the previous year's data).
[4] No RASFF notifications were created for products originating in Turkey in 1995 or 1996.
Source: Rapid Alert System for Food and Feed (RASFF). (2011). The RASFF web portal.
https://webgate.ec.europa.eu/rasff-window/portal/

Turkish Statistical Institute (TSI). (2011). http://tuik.gov.tr/disticaretapp/menu.zul

3.4. Original and Follow-Up Notifications

After investigating market and border rejection notifications, the Commission might send out 'original notifications' or 'follow-up notifications.' An 'original notification' is a notification relating to one or more consignments of a food or a feed product conveying information that was not previously included in the market or border rejection notification. A 'follow-up notification' is a follow-up to an original notification. An original notification sent by a Member State can be rejected (not sent through the RASFF) after evaluation by the Commission if the criteria for notification are not met or if the information conveyed is not accurate. The notifying country is notified of the Commission's intention not to transfer the information through RASFF and is asked to provide supplemental information, at which time the Commission will reconsider the rejection. Alternately, the notifying country might agree with the rejection. A notification transferred through RASFF can be withdrawn by the Commission at the request of the notifying country if the information, upon which the measures taken are based, turns out to be unfounded or if the transmission of the notification was made erroneously (RASFF, 2008). The schematic representation of RASFF information stream is presented below (Figure 1).

4. RASFF NOTIFICATIONS RELATING TO PRODUCTS ORIGINATING IN TURKEY

Details of RASFF notifications for products originating in Turkey between 1993 and 2010 are presented in Table 2.

The number of annual RASFF notifications for products originating in Turkey increased from 1 to 256

during the study period. Most of these notifications focused on aflatoxins in nuts, nut products, and snacks and aflatoxins in hazelnuts and related products, fruits and vegetables, and dried figs and related products. This huge increase confirms the present study's significance. Most of the notifications involve dried fruits, products of critical value for sustaining Turkish exports intended for EU markets. Therefore, the present study will discuss the economic characteristics of these products. Regarding the analysis of the trade structure between Turkey and the EU, of note is that improvements were made during the study period. In order to determine whether RASFF notifications serve as a motivator or a barrier to trade between Turkey and the EU, the researcher investigated the changes in the export values of Turkish products, and also the products which are addressed to RASFF notifications destined for the EU and the changes in RASFF notifications for products originating in Turkey for the period 1993-2010 (Table 3).

In general, Turkey's export volume has increased for both agricultural and general products, although fluctuations have occurred.

While the data showed that the number of annual RASFF notifications increased from 1 to 256 by the end of the study period. An analysis of these notifications was performed based on the five dimensions delineated above: product categories, notification types, number of countries notified, main reasons for notification, and actions taken. Regarding product categories, the notifications most often involved fruits, vegetables, nuts and nut products, and seeds. Regarding notification type, the most prevalent during the period 1993-2007 was information notifications. But, in 2008 and the two following years, border rejections started to become most prevalent. One could infer that after 2007, stricter food safety regulations were adopted in the EU. Between 1993 and 2003, the notifications most often led to a rejection. From 2004 onward, products receiving notifications most often led to 're-dispatch.' A re-dispatch is the return of a consignment that has not been imported into EU territory to the country of origin or to another (third) country that has agreed to accept it. It is permitted under various conditions specified in the regulations (Rios and Jaffee, 2008). Other actions taken based on notifications for Turkish products comprised a relatively smaller share: product recall or withdrawal, seizure, and destruction.

Henson and Hooker (2001) stated that in the event of a food safety failure, the impact on suppliers can be significant, particularly where products are recalled from the market. In the event of a recall, the firms involved can incur significant costs, which can translate into a loss of share market valuation (Salin and Hooker, 2001). First, there may be costs associated with the recovery and disposal or reprocessing of potentially contaminated products that have already been placed on the market. Second, in the event that cases of food-borne illness actually occur, the firms may face costs from liability claims and/or enforcement proceedings. Finally, negative publicity can reduce market demand and cause a loss of brand capital. The costs associated with product recall are complex, can extend into the long term, and are potentially significant (Henson and Hooker, 2001). Thus, RASFF notifications can serve as a barrier to trade between Turkey and the EU in the short run, particularly in cases of recall, but also in cases of re-dispatch and destruction. In the latter two cases, the costs are less, but still substantial.

Bánáti (2011) stressed that the European food policy and food legislation, especially food safety legislation, has changed substantially in the last decade because of increasing food scares and scandals. Between 2000 and 2007, the number of RASFF notifications (for all exporting countries) mushroomed from 800 to 7,000 per year. This near tenfold increase in the number of notifications represents the EU's need to devise new methods for understanding and combating food security threats (Petróczi et al., 2010). Examining the countries notified over the entire study period for products originating in Turkey could be illuminating. Germany topped the list with 675 notifications, followed by Italy (271), France (168), Greece (143), and the UK (101). These countries took the lion's share (61 percent) of total notifications. Additionally, Italy, Germany, the UK, and Spain were the strictest in policing food safety for the EU. These countries contribute almost 60% of all notifications, whereas the remaining 40% are shared among 26 countries and the Commission Services (Petróczi et al., 2010).

Why do these countries send so many notifications for products originating in Turkey? Pace (2011) can shed some light on this. She examined the relation between tariff rates and non-tariff barriers in seafood trade, specifically by separating EU demand for protection from the inherent risk of products and exports. She discovered that as tariff rates decrease, the probability of a notification increases (Pace, 2011). An examination of the main reasons for the notifications could provide clues as to where the problems lie. During the study period, most RASFF notifications involved aflatoxins in dried figs and fig products, pistachios, peanuts, and hazelnuts. Although the notifying countries provided other major reasons during different segments of the study period, aflatoxins in dried figs and fig products, pistachios, peanuts, and hazelnuts were the most prevalent overall. This result could illustrate the strategic value of dried fruits and nuts for Turkey in terms of trade with the EU. During

the study period, mycotoxins, especially aflatoxins, would become major contaminants and were increasingly cited as the reason for RASFF notifications. Perhaps mycotoxins other than aflatoxins have multiple adverse health effects for humans and animals when combined with aflatoxins at certain levels. Perhaps nations worldwide should thus implement regulatory standards on aflatoxins in food and feed products (Van Egmond and Jonker, 2002).

To test this connection, the data were analyzed in terms of both mycotoxin and aflatoxin levels and economic impacts. Between 1997 and 2006, RASFF sent a total of 14,293 notifications, of which 30 percent concerned mycotoxins. Aflatoxins were consistently reported as the most recurrent mycotoxin problem, representing almost 95 percent of the notifications concerning mycotoxins and 28 percent of the total number of food product notifications received during this period. The notifications on nuts, nut products, and snacks constituted about 28 percent of the total notifications received between 1999 and 2006. Hence, the issue of aflatoxins in nuts and nut products features prominently among the food safety problems highlighted by the EU's RASFF. The number of notifications concerning groundnuts and groundnut products has increased continuously since the late 1990s, reflecting enhanced enforcement of the Community's harmonized tolerance levels for aflatoxins (Rios and Jaffee, 2008). Regarding the direct impacts of EU regulations on groundnut trade, a review of the notifications during the period 2004–2006 indicates that only 3.5 percent of the trade intercepted for raw groundnuts involved full economic loss resulting from destruction of consignments. In terms of trade value, destruction of products for the period 2004–2005 was estimated at only US$230,000 from all sources. These economic implications suggest that RASFF notifications serve as a barrier to trade in the short run.

EC Regulation 1881/2006 permits 2 and 4 μg kg^{-1} of aflatoxin B1 (AFB_1) and total aflatoxin, respectively, in groundnuts, other nuts, and dried and processed fruit intended for direct human consumption or as an ingredient in foodstuffs. The new EC Regulation 165/2010 allows 2 and 4 μg kg^{-1} of AFB_1 and total aflatoxin, respectively, in groundnuts (peanuts) intended for direct human consumption or use as an ingredient in foodstuffs. The same regulation also permits 8 and 10 μg kg^{-1} of AFB_1 and total aflatoxin, respectively, in almonds, pistachios, and apricot kernels intended for direct human consumption or use as an ingredient in foodstuffs, as well as 5 and 10 μg kg^{-1} of AFB_1 and total aflatoxin, respectively, in hazelnuts and Brazil nuts intended for direct human consumption or use as an ingredient in foodstuffs (EC, 2010). Although concerted efforts, backed by scientific research conducted in Turkey, have been made to drive up these limits for dried figs, an EU commission recently published a decision stating that it was not in a position to agree on the proposed maximum level of 10 μg kg^{-1} for total aflatoxin in ready-to-eat dried figs (EU, 2011).

When fruit and vegetable exports as a whole are taken into consideration, Turkey has a clear comparative advantage over competing countries with respect to raisins, dried figs, dried apricots, and hazelnuts (Barbaros et al., 2007). Similarly, the main items exported to the EU are fruits and vegetables from Turkey (Atici et al., 2011). China, Turkey, and Brazil are the major suppliers of foodstuffs for the EU market; however, these countries have to implement strict food safety regulations and precautions based on RASFF notifications in order to obtain a sustainable competitive advantage in the EU (Jaud et al., 2009).

The excessive number of RASFF notifications for Turkey may be caused by insufficient resources and infrastructures in Turkey, as many developing countries in the food industry do. Trienekens (2011) stressed that getting access to markets is not a sufficient condition for developing country value chains to be able to sell their products. Supporting infrastructures and resources, including knowledge and capabilities, are necessary for their success. According to Porter (1990), a nation's endowment with resources (e.g., physical, human, knowledge, technology, and infrastructure) is necessary for success in the world market. Trienekens (2011) declared that these factors enable or constrain value chain upgrading. Typical constraints faced by companies in developing countries include lack of specialized skills and low access to technology, inputs, market, information, credit, and external services (Giuliani et al., 2005). Moreover, Unnevehr (2007) asserted that although higher standards in developed countries impose costs and barriers to trade, they also motivate foreign aid for trade capacity building. Capacity building, including improving employee skills, could lead to research to support management and control of hazards, improved infrastructure for sanitation and preservation, and inspection or monitoring to support certification. This was stressed in a few studies carried out in Turkey. Baş et al. (2006a) suggested that food directors in Turkish food companies had at many times deficient knowledge with respect to primary food sanitation. Baş et al. (2006b) further indicated that the problems faced when undertaking hazard analysis of critical control points (HACCP) in food firms include low-level training in food hygiene management, high rates of staff turnover, motivational deficiency, insufficient financial resources, unsuitable equipment, inconvenient physical structures, and failure of the government to demand or reward enforcement of

standards. Finally, Baş et al. (2007) emphasized that deficient information about HACCP and other food safety systems is the primary impediment for food assurance in food firms. Insufficient prerequisite programs and unsuitable facilities for food processing equipment acquisition are other major impediments. If the undesirable and chronic structural characteristics explained above can be overcome in a suitable time frame, food firms established in Turkey and/or other developing countries would be able to sell their foodstuffs in the EU market. Thus, RASFF notifications could serve as a motivator for trade between Turkey and the EU in the long run.

In light of the above, RASFF notifications covering chemical substances, microorganisms, parasites, hygiene, packaging, quality, labeling, and fraud (Kleter et al., 2009) might directly impact trade between Turkey and the EU and Turkish agriculture and indirectly impact food subsectors. First, the exports of Turkish agricultural products may be affected negatively in the short run. In particular, food firms might incur significant costs due to mycotoxin notifications and rejections on nuts, nut products, and fruits and vegetables and due to food safety failures and product recalls on Turkey's traditional export products (e.g., hazelnuts, pistachios, and dried figs). The inverse relation discussed above was seen during a few specific years, but one could not generalize that relation to the study period overall. Yet RASFF notifications and strict EU regulations would force the Turkish food sector to adopt technologies, methods, and capacities to control food quality and safety practices. This would be a positive change, even though implementing it would at first be costly. According to Turkish legislation enacted on June 11, 2010, published on June 13, 2010, and known as Law no. 5996 (OGRT, 2010), all stakeholders in food supply chains, from farmers to consumers, must completely obey rules regarding traceability, labeling, and the protection of consumer rights. Food firms must also follow HACCP standards. This law may reduce the number of RASFF notifications for products originating in Turkey.

RASFF notifications and strict regulations have undesirable effects for the economies of developing countries, such as Turkey, particularly regarding food safety, but these negative effects just underline the fact that all stakeholders in the production and supply chain must take action if they want to succeed.

Developed countries with high income levels will likely continue to implement strict food safety regulations. For example, the EU will likely come up with innovative regulatory mechanisms and continue to engage in capacity building to improve its network and increase food safety. In particular, it will likely enhance mechanisms for mycotoxin management. The two large pan-European research and networking projects "BioCop" and "MoniQA" are examples of just this. They were funded in the EC's 6th Framework Programme. "BioCop" is an integrated project (IP) with more than 30 partners focusing on "new technologies to screen multiple chemical contaminants in foods". The project was designed to supply regulators, consumers, and the industry with long-term solutions to the complex problems associated with chemical contaminant monitoring. "MoniQA" is a network of excellence (NoE) launched in 2007. It has more than 60 partners. One of MoniQA's specific work packages will evaluate the economic effect of implementing the analytical methods required by the new regulations in food quality and safety (e.g., effectiveness, efficiency, and consistency) and compare different options in qualitative, quantitative, and monetary terms. Risk–benefit analysis is obviously receiving more attention (Van Egmond et al., 2007).

5. CONCLUSIONS

EU Members States are major economic partners for Turkey because they have relatively well enough economies although these countries are within economic crisis during the present years but few agricultural resources. Furthermore, agricultural products and foodstuffs play a crucial role in the strategic baseline for both sides. Because of increasing food scares and scandals, the members of the EU have needed to implement strict regulations for food and agricultural products. RASFF is a network established to inform Member States about potential threats, enabling them to take necessary precautions. This study aimed to determine whether RASFF notifications primarily serve as a motivator or a barrier to trade between Turkey and the EU. Changes in the export values of agricultural products originating in Turkey and sent to the EU and changes in the number, type, and cause of RASFF notifications for Turkish products were analyzed. Although variations in both parameters exhibited parallel change in some years, no generalization can be made regarding whether RASFF notifications truly have a clear impact on trade between Turkey and the EU. These variations could be explained by exogenous factors, such as economic crises, export performance of food firms, and climatic factors. Thus, the data do not indicate conclusively whether RASFF notifications serve as a motivator or a barrier to trade between Turkey and the EU. The inverse relation observed between the number of RASFF notifications for products originating in Turkey and their export value between 1993 and 2010 was not observed in every year.

What strategies could decrease the negative effects of RASFF notifications? First, Turkish food firms, with

scientific research in hand, could try to push the EU to accept products with higher levels of mycotoxins. Second, stakeholders in agricultural product supply chains could implement good agricultural and manufacturing practices, ensuring safe food from farm to fork. Managers of food firms should take more responsibility in this process because they have more financial capabilities and key solution skills as compared to other stakeholders. Since Turkish dried figs and fig products and nuts and nut products have been rejected for too high levels of mycotoxins, food firms should implement comprehensive management practices, such as shortening their supply chains, tightening supplier oversight, insisting on good practices, increasing product testing to ensure compliance, and shifting the locus of processing functions for traditional products (Rios and Jaffee, 2008).

For food firms in Turkey, RASFF notifications have served as a barrier in the short run due to product recalls and the costs of implementing the required food safety, but these notifications will be able to act as a major motivator in the long run. Managers who want to sustain their food exports to the EU must implement the required practices. Future studies examining the costs and benefits of RASFF notifications with regard to management of food firms at the product level would provide more insight into whether the notifications primarily serve as a motivator or a barrier.

REFERENCES

Atici, C., Armagan, G., Tunalioglu, R., Cinar, G., 2011. Does Turkey's integration into the European Union boost its agricultural products?, Agribusiness, 27:280-291.

Bánáti, D., 2011. Consumer response to food scandals and scares. Trends in Food Science and Technology, 22:56-60.

Barbaros, R., Akgungor, F., Aydogus, O., 2007. Competitiveness of Turkey's organic exports in the European Union Market. International Marketing and International Trade of Quality Food Products, 8-10 March, Bologna, Italy, p.418-440, http://ageconsearch.umn.edu/bitstream/7888/1/cp070028.pdf
[Accessed: 15.10.2011]

Baş, M., Ersun, A. Ş., Kıvanç, G., 2006a. The evaluation of food hygiene knowledge, attitudes, and practices of food handlers' in food businesses in Turkey. Food Control, 17:317-322.

Baş, M., Ersun, A. Ş., Kıvanç, G., 2006b. Implementation of HACCP and prerequisite programs in food businesses in Turkey. Food Control, 17:118-126.

Baş, M., Yuksel, M., Cavusoglu, T., 2007. Difficulties and barriers for the implementing HACCP and food safety systems in food businesses in Turkey. Food Control, 18:124–130.

European Commission, 2002. Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 Laying Down the General Principles and Requirements of Food Law, Establishing the European Food Safety Authority and Laying Down Procedures in Matters of Food Safety. Official Journal of the European Communities L31, p.1-24.
http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:031:0001:0024
EN:PDF
[Accessed: 22.06.2011]

European Commission, 2006. Rapid Alert System for Food and Feed (RASFF) – 2005 Weekly Overview.
http://ec.europa.eu/food/food/rapidalert/archive_2005_en.htm.
[Accessed: 15.09.2011]

European Commission, 2010. European Commission Regulation 165/2010. Maximum levels for Certain Contaminants in Foodstuffs as Regards Aflatoxins.
http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:050:0008:0012:EN:PDF
[Accessed: 22.11.2011]

European Union, 2011. European Union Competence, European Union Vote, 2011. http://ec.europa.eu/food/fs/ifsi/eupositions/cccf/docs/cccf_5th_comment_.
[Accessed: 15.06.2011]

Giuliani, E., Pietrobelli, C., Rabellotti, R., 2005. Upgrading in global value chains: lessons from Latin American clusters. World Development, 33(4):549-574.

Gondarova, J., Kovacova, N., Stefanak, P., 2010. Product safety in the European Union. Studia Commercialia Bratislavensia, 3:196-208.

Henson, S., Hooker, N. H., 2001. Private sector management of food safety: public regulation and the role of private controls. International Food and Agribusiness Management Review, 4:7-17.

Hollo-Szabone, P. O., Apjok, A., Buza, L., 2008. National and international experiences in 2006 of the operation of Rapid Alert System for Food and Feed (RASFF). Magyar Allatorvosok Lapja, 130:57-62.

Jaud, M., Cadot, O., & Eisennann, A. S., 2009. Do Food Scares Explain Supplier Concentration? An Analysis of EU Agri-Food Imports. Working Paper, 28. Paris School of Economics.
http://halshs.archives-ouvertes.fr/docs/00/57/49/63/PDF/wp200928.pdf
[Accessed: 09.08.2011]

Kasza, G., Szeitzne, S. M., Meszaros, L., Oravecz, M., Zoltai, A., Vasarhelyi, A., Cseh, J., Hidi, E., Horvath, Z., Suth, M., Laczay, P., Ozsvari, L., 2011. Food-borne diseases in Hungary in the light of our EU membership. Magyar Allatorvosok Lapja, 133:368-375.

Kleter, G. A., Prandini, A., Filippi, L., Marvin, H. J. P., 2009. Identification of potentially emerging food safety issues by analysis of reports published by the European Community's Rapid Alert System for Food and Feed (RASFF) during a four-year period. Food and Chemical Toxicology, 47:932-950.

Krisztina, B., Zsolt, H., Peter, B., 2005. Rapid Alert System for Food and Feed (RASFF) in the European Union. Magyar Allatorvosok Lapja, 127:299-306.

Marvin, H. J. P., Kleter, G. A., Prandini, A., Dekkers, S., Bolton, D. J., 2009. Early identification systems for emerging food borne hazards. Food and Chemical Toxicology, 47:915-926.

Naughton, D. P., Petroczi, A., 2009. Mercury, cadmium and lead contamination in safefood: a comparative study to evaluate the usefulness of target hazard quotients. Food and Chemical Toxicology, 47:298-302.

Nepusz, T., Petroczi, A., Naughton, D. P., 2009a. Network analytical tool for monitoring global food safety highlights China. PLoS One, 4(8):e6680.

Nepusz, T., Petroczi, A., Naughton, D. P., 2009b. Food recall patterns for metal contamination analyses in seafoods: longitudinal and geographical perspectives. Environmental International, 35:1030-1033.

Official Journal of Republic of Turkey, OGRT. (2010). Law no. 5996, came into force in 11.06.2010.

http://www.resmigazete.gov.tr/eskiler/2010/06/2010/0613-12.htm [Accessed: 11.05.2011]

Pace, K.M., 2011. EU Import Notifications as a Protectionist Move: An Examination of the Relation between Tariff and Non-Tariff Barriers in Seafood Trade. The Thesis of Master of Science. Agricultural and Applied Economics in the Graduate College of the University of Illinois at Urbana-Champaign, 2011.

http://www.ideals.illinois.edu/bitstream/handle/2142/24294/pace_kathryn.pdf?sequence=1 [Accessed: 19.12.2011]

Petroczi, A., Taylor, G., Nepusz, T., Naughton, D. P., 2010. Gate keepers of EU food safety: four states lead on notification patterns and effectiveness. Food and Chemical Toxicology, 48:1957-1964.

Porter, M. E., 1990. The competitive advantage of nations. Journal of Development Economics, 40(2):399-404.

Rapid Alert System for Food and Feed, 2008. The RASFF Annual Report 2008. http://ec.europa.eu/food/food/rapidalert/report2008_en.pdf [Accessed: 10.09.2011]

Rapid Alert System for Food and Feed, 2011. The RASFF web portal. Retrieved from https://webgate.ec.europa.eu/rasff-window/portal/ [Accessed: 19.12.2011]

Rios, L. B. D., Jaffee, S., 2008. Barrier, catalyst, or distraction? Standards, competitiveness, and Africa's groundnut exports to Europe. Agriculture and Rural Development Discussion Paper, 39. The World Bank.

Salin, V., Hooker, N. H., 2001. Stock market reaction to food recalls. Review of Agricultural Economics, 23(1):33-46.

Szeitz-Szabo, M., Szabo, E., 2007. Presence of mycotoxins in food: can we use the data from the EU Rapid Alert System for quantitative risk assessment. Acta Alimentaria, 36:127-138.

Trienekens, J. H., 2011. Agricultural value chains in developing countries: a framework for analysis. International Food and Agribusiness Management Review, 14(2):51-82.

Turkey Statistical Institute, 2011.
http://tuik.gov.tr/disticaretapp/menu.zul.
[Accessed: 20.12.2011]

Unnevehr, L. J., 2007. Food safety as a global public good. Agricultural Economics Supplement issue, (37):149-158.

Van Egmond, H. P., Jonker, M. A., 2002. Worldwide regulations on aflatoxins – the situation in 2002. Toxin Reviews, 23, 273-293.

Van Egmond, H. P., Schothorst, R. C., Jonker, M. A., 2007. Regulations relating to mycotoxins in food. Perspectives in a global and European context. Analytical and Bioanalytical Chemistry, 389:147-157.

World Health Organization, 2006. The International Food Safety Authorities Network (INFOSAN), 2006.
http://www.who.int/foodsafety/fs_management/infosan/en/
[Accessed: 10.10.2011]

World Health Organization, 2007. Beijing Declaration on Food Safety.
http://www.who.int./foodsafety/fs_management/meetings/Beijing_decl.pdf
[Accessed: 05.06.2012]

Wiig, A., Kolstad, I., 2005. Lowering barriers to agricultural exports thorough technical assistance. Food Policy, 30:185-204.

Wojtyla, A., Bilinski, P., Jaworska-Łuczak, B., 2010. Regulatory strategies to ensure food and feed safety in Poland-update Review. Annals of Agricultural and Environmental Medicine, 17:215-220.

Wu, F., 2008. A tale of two commodities: how EU mycotoxin regulations have affected U.S. tree nut industries. World Mycotoxin Journal, 1(1):95-102.

Yorulmaz, A., Bircan, C., 2010. Gıda ve Yem için Hızlı Alarm Sistemi (RASFF)2003-2008 Türkiye Raporu. Hasad Gıda, 25:42-49.

Sorumlu Yazar:
Ferit ÇOBANOĞLU
ferit.cobanoglu@adu.edu.tr

Geliş Tarihi : 28/3/2013
Kabul Tarihi : 10/7/2013