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The Rapid Alert System for Food and Feed of the European Union

1. Summary

The Rapid Alert System for Food and Feed (RASFF) of the European Union has been ensuring an efficient flow of information among the authorities of the European states since 1979, in order to protect the population from risky foods and feeds. Part of the information on issues reported in the system are not only available to the authorities, but can be utilized by all interested parties in the field of food safety. Experience has shown that, in addition to authorities, the information is monitored and data are analyzed by manufacturers and distributors, laboratories, consulting firms, NGOs, universities and media professionals. In recent years, rapid, targeted information of the population has been emphasized more and more. This article provides general information about RASFF, starting with the most important events in its history from its creation to today, then the EU and domestic legal background of its operation is outlined, followed by the presentation of the institutions of its network, and the method of information flow. It also describes where and in what form public data managed by the system can be accessed and provides guidance for their interpretation. Finally, the trends of the numbers of notifications managed by the system is illustrated.

2. Historical background

The Rapid Alert System for Food and Feed (RASFF) of the European Union has been operating since 1979. In 1978, oranges contaminated with mercury, harmful to human health, were first found in Maastricht, in the Netherlands, and then in the Federal Republic of Germany. The incident was committed by a Palestinian organization, to hurt Israel's citrus fruit export. The case has triggered concern among the countries involved – how to handle more efficiently food safety crisis situations that require rapid response and the cooperation of several member states. In response, the food safety alert system was established in 1979 by nine member states of the European Economic Community (EEC), starting its operation in the form of a flexible gentlemen's agreement to protect human health.

Since no similar information system had existed before, contact points had to be established to receive reports related to food safety, and the method of communication had to be defined – what information should be shared, how and with whom.

The first large scale RASFF case was related to wines from Austria, not yet an EEC member then, in 1985. Some Austrian wineries tried to improve the quality of their wines by the addition of diethylene glycol ("antifreeze"), making them more full bodied and sweeter (and thus, more expensive), instead of adding sugar which was more easily detected. Although, fortunately, the acute toxic effect of diethylene glycol proved to be rather low, fraud caused severe economic damage to all Austrian wine producers for several years. The need for rapid forwarding of large amounts of data related to the case (the results of nearly 10 thousand analyses) resulted in the significant technical development of RASFF. In March 1986, another wine adulteration case occured with much more serious health consequences, resulting in the death of 23 poeple in Italy. An Italian winemaker increased the alcohol content of his wine with methanol. An alert was sent by the Italian authorities late in the evening. Thanks to the rapid information transfer, French authorities could detain the remainder of the wine lot in question, thus preventing possible further deaths. In the same year, a major food safety challenge was presented by the disaster of the Chernobyl nuclear power plant and the subsequent radioactive con-

[1] National Food Chain Safety Office, Directorate for Food Safety Risk Assessment

tamination. Immediate forwarding of large amounts of fresh information and, thus, the addressing of the crisis situation was significantly facilitated by the technical development of 1985.

In 1992, with the establishment of the European Community (EC), and the creation of a new internal market, the need increased for the authorities of member states to inform one another more efficiently than before about products that endangered consumers' health. In the previous 12 years, on average, there had been only 19 notifications in RASFF annually. Council directive 92/59/EEC on general product safety, published in June 1992 **[1]**, expanded the range of dangerous (unsafe) products to foods and, in addition to the European alert system of non-food dangerous products (the current RAPEX – Rapid Exchange of Information), the need for the operation of an alert system regarding foods was formulated. However, it was not yet clearly defined by this directive what constituted a safe product, and so it is not generally considered legislation that established the legal background of RASFF. In 1992, telex used to transmit texts was replaced by telefax, which brought a significant change in the life of RASFF from a technical point of view, by enabling the transmission of not only texts, but also visual messages.

Both in 1994 and in 1995, 3 new members joined the system, and so the network was expanded to 18 members. The crisis situations of the 1990s (the mad cow disease epidemic that started in the United Kingdom in 1995, the 1998 Iranian case of pistachios contaminated with aflatoxins, and then, in 1999, the poultry disease caused by feed contaminated by dioxins, leading to the death of 6 million poultry in Belgium and the Netherlands) all paved the way to the preparation of Regulation (EC) No 178/2002 **[2]**, which constitutes the legal basis for RASFF, and also of the subsequent "hygiene package".

The most interesting food chain safety event of 2002 was the detection of a female contraceptive hormone (medroxyprogesterone, MPA) in pig feed. Pigs' pregnancy was blocked by the substance, and other adverse physiological effects were caused as well. Rapid authority information transmitted through RASFF prevented the hormone-contaminated pork meat from entering the food chain.

The novelty of 2003 was the detection of the carcinogenic, synthetic industrial dye called Sudan I in spices. This colouring, which is not authorised as food additive, was detected in chilli, spice mixtures, sauces and spicy foods, first in France, then in other member states (including Hungary) as well.

Ten more member states, including Hungary, joined the RASFF network in 2004. This was followed by the EU membership of Romania and Bulgaria in 2007, and the partial membership of Switzerland in 2009.

In 2007, the Swiss authority indicated that guar gum of Indian origin with high dioxin and pentachlorophenol contents, and also numerous additives made from it were shipped to nine EC member states, including Hungary. Restriction of the distribution was ordered by the Hungarian authority immediately, notification and testing obligations were imposed on food and feed industry businesses, and unscheduled inspections and tests were carried out as well. The information of the original alert was supplemented by 159 follow-up notifications by members of the RASFF network. According to reports, large amounts of the contaminated guar gum lots were shipped to all EC states, and also to 15 third countries, and they were used in a wide variety of foods.

Also in 2007, in the United States, diseases and deaths of cats and dogs were observed. The cause of that incidents was proofed to be melamine in vegetable protein concentrates imported from China, used for the manufacture of pet foods. Tests performed because of the information transmitted by RASFF found protein concentrates and pet foods adulterated by melamine in Europe (including Hungary) as well. With the addition of melamine, the nitrogen content of the products was increased by the Chinese companies. The most widely used protein content determination methods are based on the determination of the nitrogen content, and so products "enriched" with melamine appeared to have a higher protein content and, thus, of "higher quality". Melamine itself is only slightly toxic, however, by forming an adduct with cyanuric acid, present in the environment and in foods, it led to kidney damage in warm-blooded species, causing the death of humans, as well as animals **[3]**.

In 2008, the health-damaging melamine was added to milk, milk powder, infant formula and dairy products for the same reason. In China, six children died and 300,000 fell ill. Importing of milk and dairy products, including milk powder, into the European Community from China was already prohibited at that time, and by taking action swiftly, regarding products containing milk ingredients, similar serious consequences could be avoided successfully. However, because of globalized trade, the melamine crisis swept across the whole world.

In 2011, human outbreaks were caused in Germany and in France by ***Escherichia coli*** **(EHEC) O104:H4** (Germany, 2987 people fell ill, 855 people with HUS /hemolytic uremic syndrome/, 53 deaths). The first warning came from the public health system, followed by RASFF information. The suspected sources of the diseases were funegreek seeds from Egypt. Conditions for the distribution of the sprouts and seeds intended for sprouting, and also for the production of the sprouts were regulated by the Commission by regulations.

In 2013, the meat of sports horses was used primarily to replace beef in different beef products and, thus,

to obtain substantial financial gain. To determine the incidence of fraudulent methods, a coordinated inspection was launched. The presence of non-labelled horsemeat (percentage of horse DNA) and of phenylbutazone (a veterinary drug banned in food animals) was investigated. In this case, 86 original RASFF notifications were issued. Adulterated products (lasagna, diced beef, tenderloin) appeared in Hungary as well. Two years of work by the Committee, Member States and the newly established Food Fraud Network (FFN) produced results.

In 2013, with Croatia joining the EU, the number of RASFF member states increased to 32.

For more information on the establishment of RASFF, and the main stages of its 30 years of operation and development, please consult the anniversary publication issued by the European Commission in 2009 **[4].**

3. Legal background of RASFF's operation

Today's legal background of the operation of RASFF is provided by two European Union regulations. Article 50 of Regulation (EC) No 178/2002, also called the general food law of the European Union, provides for the establishment of RASFF **[2]**, while the most important rules of its operation are determined Commission Regulation (EU) No 16/2011 **[5]**.

Article 29 of Regulation (EC) No 183/2005 of the European Parliament and of the Council, laying down requirements for feed hygiene **[6]**, extended the scope of RASFF to serious risks regarding animal health and the environment.

The general rules of procedure (Standard Operation Procedures of the Rapid Alert System for Food and Feed) and the Working Instructions have been prepared by the Commission, providing detailed guidance to members of RASFF on the effective operation of the system. These documents are also available in Hungarian on the Commission's website **[7]**.

According to the national Act XLVI of September 2008 on the Official Controls in the Food Chain the RASFF of the EU in Hungary is operated by the food chain safety inspection body **[8]**. Government decree 22/2012. (II. 29.) of the Government of the Republic of Hungary about the National Food Chain Safety Office (NÉBIH) designated HFCSO (NÉBIH) as the Hungarian Contact Point in the RASFF network **[9]**. According to the decree, tasks arising during the operation of RASFF are also performed by county/district government offices, under the professional guidance of HFCSO (NÉBIH).

According to the Organizational and Operational Regulations, published as an annex to instruction 1/2013. (I. 8.) of the Ministry of Rural Development about issuing the Organizational and Operational Regulations of the National Food Chain Safety Office **[10]**, within the Office, the role of national contact point is fulfilled by the Directorate for Food Safety Risk Assessment (ÉKI), while other directorates of the Office also participate in the work of the network.

The cooperation, duties and powers of the central and territorial units of public health and food safety are determined by ESZCSM decree 36/2004 (IV. 26.) about foods for particular nutritional uses **[11]**, and by ESZCSM decree 37/2004 (IV. 26.) about food supplements **[12]**.

4. Institutions and operation of the RASFF network

Members of RASFF are the 28 EU member states, Iceland, Liechtenstein, Norway (the European Economic Area), the authorities of Switzerland, the Commission and the European Food Safety Authority (EFSA). The system provides for rapid, coordinated and efficient information exchange on risks related to foods, feeds and food contact materials, and on the measures taken. System administrators provide 24-hour standby services on workdays, holidays and weekends as well **[5], [7]**.

Since information is transmitted online (iRASFF), authorities of the countries involved can act in a coordinated way in order to avert food safety risks before they reach the consumers.

When discovering food or feed of inadequate quality, imported from or exported to a non-RASFF member state, the country in question is informed by the European Commission, so that they can take corrective measures and can avoid future recurrence of the problem. If the guarantees provided are not satisfactory or immediate action is needed, an import ban/import restriction or an increased level of EU border control will enter into force. The establishment of a third contry may even be removed from the list of approved companies that fully comply with EU legislation requirements and can export to the EU. Authorities will also notify each other via the RASFF network of other food and feed safety information that can be valuable for some reason to a member state, the Commission or the Health and Food Audits and Analysis (HFAA).

5. Classification of RASFF notifications

According to Commission Regulation (EU) No 16/2011 **[5]**, the two main categories of notifications in RASFF are: the original notification and the follow-up notification. There are three types of original notification: alert, information and border rejection (***Figure 1***). The chronology of some events during the RASFF development is shown in ***Figure 2*** **[22]**.

Issues related to the products on the European Economic Area (EEA) market have to be treated either as alerts or information, depending on whether they require rapid action.

Authorities will notify each other in the form of an **alert**, if the risky product is on the market and rapid action is required. **Information** can be *information notification for follow-up*, related to a product marketed in another member state. Investigation of the case and taking the requierd action is the responsibility of the authority of the other member state in this case. An *information notification for attention* is related to a product which is only distributed in the notifying member state, or has not been placed on the market, or is no longer marketed, and so it is intended primarily to inform the other member state.

Border rejection is a notice of rejection at the border crossing point, because of a health hazard, of a food or feed lot, a container or a shipment. In this case, the risky product will not enter the food chain in the EEA market. In some of the border controls, following sampling, the shipment is allowed to proceed. If subsequent test results indicate a risk, because the product may have already been placed on the market, the case is reported in RASFF as an alert or an information.

Subsequent information related to original notifications are communicated in the form of follow-up notification. In this case, information is provided by the authorities about tracking and tracing affecting other countries, measures taken by them and the results of their investigations.

In addition to the above, information affecting several member states, which cannot be classified into any of the above three original notification categories, are transmitted by RASFF members in the form of **news**. News are currently not available in public databases.

6. Availability of RASFF data

6.1. RASFF data on the Commission's website

The public is also informed of risks to human health. Public information on all RASFF cases could be found on the website of the European Commission **[13]** by the public as well. These include two online databases: the "*RASFF Portal*" that contains all original notifications since 1979 in a searchable way, and also a simplified database intended for consumers about recent RASFF product recalls called the "RASFF consumers' portal".

At the RASFF Portal **[14]**, all public data of the original notifications can be retrieved using different filters, can be exported for further analysis (in Excel or XML format), or can be printed. In addition to the date and reference number of the notification, this database can be searched by notification type, subject or country of origin, by the type or country of origin of the non-compliant product, by the countries involved in the distribution, or the risk giving rise to the notification, among others.

The **RASFF consumers' portal [15]** has been providing a consumer-friendly online interface, since June 2014, on information related to the latest RASFF product recalls published by the authorities or businesses, if specific data necessary for the identification of the recalled product have also been published on a member state website.

Annual RASFF reports starting from 2002, prepared according to the provisions of Regulation (EC) No 178/2002, are also found as downloadable pdf documents on the Commission's RASFF website. These are more extensive information materials. They present trends with data of the previous years and the year investigated, and describe in more detail the causes that give rise to the threat. The 2015 report was published in June 2016 **[16].** The preliminary report for 2016 was published at the beginning of 2017 **[17].**

6.2. RASFF data on the HFCSO (NÉBIH) website

The RASFF page can be found on the HFCSO (NÉBIH) website among the international alert systems, where we can read a brief description of the system **[18]**. The English language „RASFF Portal" and consumer portal of the Commission are also available from here. Since 2012, most important data of all original notifications are available on the HFCSO (NÉBIH) website in Hungarian as well.

From January 2012, data of RASFF notification are available in two downloadable Excel files **[19]**. In one of the files, data for the last five full years (2012-2016) are stored on separate worksheets fore each year, while the other file contains the 2017 data, updated weekly. The tables include the date of the notification, the reference (identification) number, the subject of the notification in Hungarian and English, the notifying country, the type of the notification and the product type.

In addition to the above, a Hungarian **online database** contains the original RASFF notifications of the last three months **[20]**.

"Hungarian cases" (currently from November 2014) are also found on the HFCSO (NÉBIH) website **[20]**, and the list is continuously updated. A case is considered Hungarian if:

- the product is manufactured/produced in Hungary,
- the product has ben delivered to Hungary,
- the product has not been distributed in Hungary, but the headquarters of the company that can be associated with the product is in Hungary.

There is also detailed information on the HFCSO (NÉBIH) website, updated continuously, about the recall of non-compliant products marketed in Hungary. Here, besides identification data of the product, you

can read about the reason for the recall, HFCSO's (NÉBIH) advice on how to avert the risk, actions taken by the authority and, in most cases, a picture of the product is shown for easier identification.

The annual English language RASFF reports published on the Commission's website (2005-2015) are also available from the HFCSO (NÉBIH) website **[19]**.

7. A few figures from the RASFF system

RASFF notification data have been collected since the establishment of the system in 1979. Initially (1980-1996), only a few notifications were received by the system, while the number increased to 3,200 per year for the years between 2005 and 2016. The number of follow-up notifications has been recorded since 1998. Their numbers have been increasing continuously, from 28 then, to 7,200 per year by the end of 2016. The total number of original and follow-up notifications in 2016 exceeded 10 thousand.

The annual numbers of RASFF notifications (original and follow-up), together with the news, for the period 2000 to 2016 are shown in ***Figure 3***.

By the end of 2016, according to the EU database, more than 48 thousand (48,052) original RASFF notifications have been issued by the Member States. On average for the entire 39-year period, 87% of all original notifications concerned foods, 6% were related to feeds and 7% were related to food contact materials. In recent years, the number of food-related notifications have been decreasing, but the proportion of feed-related RASFF cases has been increasing.

Up until May 4, 2017, a total of more than 40 thousand (43,182) food-related original notifications were issued in RASFF by the relevant authorities, 14,182 of which concerned products from EU member states (roughly one third of all notifications), and 261 of the latter were related to products of Hungarian origin. The proportion of RASFF notifications regarding Hungarian foods for the entire period is 0.60% of all notifications, and 1.84% of notifications from EU member states.

8. Literature

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