Rapid Alert System for Food and Feed: The semicarbazide notifications

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ABSTRACT: The recently instituted and easily accessible Rapid Alert System for Food and Feed (RASFF) has been tested on the semicarbazid (SEM), the residue of veterinary antibiotic nitrofurazone, using the RASFF Database Portal launched in July 2009 by the European Commission. The database holds weekly overviews, published by the EU for 30 years from 1979 and offers a number of other possibilities, such as searching for subjects of notification, the date of notification, notifying countries and product categories, countries of product origin and distribution. There is no doubt that the new database portal is an important contribution of the European Union to food safety and consumer protection.

Keywords: food safety; chemical contamination; RASFF; nitrofurazone

A comprehensive review on nitrofuran application, prohibition and residual analysis has been published recently (Vass et al., 2008). The Rapid Alert System for Food and Feed (RASFF) was put in place to provide food and feed control authorities with an effective tool to exchange information about measures taken when responding to serious risks detected in relation to food or feed. This exchange of information helps Member States to act more rapidly and in a coordinated manner in response to health threats caused by food or feed (Szeitz-Szabo and Szabo, 2007; Hollo-Szabone et al., 2008; Vass et al., 2008). The data available from 1979 in the RASFF weekly overviews are newly presented on the RASFF Portal Database, opened in July 2009 (European Commission, 2009) with more than 23 thousands records in November 2009. In the years 2003–2005, almost 200 nitrofuran allerts have been issued by the EU concerning products from 29 countries. Fourty-seven percent of these have involved the detection of SEM; the majority of the remainder being nitrofuran metabolite AOZ (Cooper et. al., 2007).

The easy access to data is demonstrated on the nitrofuran metabolites notified in the RASFF database. The nitrofuran metabolite SEM allerts have been a focus of interest not only as an indicator of the directives banning the application of nitrofuran antibiotics but also due to the previous findings of high volumes of SEM in jars of processed baby foods. SEM was also found during the baking process in of bread (Becalski et al., 2004, 2006) and flour-coated poultry products, in carrageen (a seaweed extract used as a food additive), starch and egg white powder treated with hypochlorite solutions containing 12% active chlorine (Hoenicke et al., 2004). It should be noted that the validity of SEM as a definitive marker for the nitrofurazone illegal use was recently questioned with respect to alternative contamination sources (Barnabas and Miklos, 2005; Bendall, 2009). Despite this fact, in EU legislation SEM remains the marker residue for this nitrofuran antibiotics.

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METHOD

Data obtained by a search on the RASFF database https://webgate.ec.europa.eu/rasff-window/portal/ were pasted into Microsoft Excel tables and were manipulated in the usual manner for sorting, ordering and counting.

RESULTS AND DISCUSSION

Notifications which have appeared in the RASFF database should be interpreted as results of randomly selected samples not directly related to the true prevalence of contamination. Nevertheless, information on the number of samples evaluated, the number of notifiable results, products requiring action according to EU directives, and countries of origin and the RASFF itself contribute to an improvement in food safety and consumer protection. The contribution of reporting authorities to the database and the service carried out by the European Commission in publishing the RASFF data are invaluable contributions of the European Union to citizens of EU member states. The impact, however, is greater still, because data available are openly presented and can be used by parties both inside and outside the European Union. Therefore, national food safety authorities should be aware of the importance of the RASFF, should use the data presented, and should contribute to the knowledge pool for their own benefit and for that of the community at large. Properly used RASFF data and the sharing of results limits the expenditures of member states, promotes the use of approved and reliable methods, and focuses attention on the important gaps in consumer protection.

The numbers of nitrofuran metabolites notified in the RASFF database are summarized in Table 1. SEM has been notified most frequently (340 records).

Table 1. Search criteria and number of results

Nitrofuran	712
Nitrofurazone (SEM)	340
Furazolidone (AOZ)	282
Furaltadone (AMOZ)	105
Nitrofurantoin (AHD)	8

SEM notification by years are summarized in Table 2. The total number of notifications to week 45, 2009 was 340 with an apparent increase in the first six months of the current year, 2009. During weeks 1 to 45 SEM, have been notified in 82 products, whilst during the whole of the year 2008 the total was only 36 products. It is impossible to determine if these numbers result from the increasing interest of the food safety authorities or from increasing contamination in the countries where the products originate.

Products contaminated by SEM are listed in Table 3. It is evident that SEM have been analysed and found most frequently in crustaceans from Asian countries, in which the highest concentrations were notified. Poultry meat and poultry meat products, mostly from Brazil, were also notified with the highest SEM concentrations.

Baby food, bread and other products in which SEM can be present have not yet been notified in the RASFF. The main reason is the mentioned food products are not included in EU legislation. The second reason is that toxicity of SEM is relatively low compared with parent nitrofuran drug and also with respect to measured SEM concentrations in foods. Research teams should be encouraged to report data concerning SEM in baked products and the risk it poses for consumers, whilst food safety authorities should add more commodities to the screening programs.

Table 2. SEM notified in the RASSF database

Year	Number of notifications
2002	45
2003	69
2004	24
2005	27
2006	41
2007	16
2008	36
2009 (weeks 1 to 45)	82
Total	340

Table 3. Summary of SEM notification data

Crustaceans and products thereof	
Number of notifications	227
Range of contamination (min–max, µg/kg – ppb)	0.44–7 500
Contamination > 5 µg/kg – ppb (No.)	125
> 10 µg/kg – ppb (No.)	51
> 1 000 µg/kg – ppb (No.)	7
Countries of origin	No. of products
Bangladesh	112
Brazil	1
China	6
India	68
Madagascar	1
Malaysia	1
Myanmar	1
Sri Lanka	6
Thailand	26
Vietnam	5
Eggs and egg products	
Number of notified analyses	4
Range of contamination (min–max, µg/kg – ppb)	1.0–2.4
Countries of origin	No. of products
Brazil	1
France	1
India	1
Israel	1
Farmed crustaceans and products thereof – (obsolete)	
Number of notified analyses	27
Range of contamination (min–max, µg/kg – ppb)	0.6–24.0
Contamination > 5 µg/kg – ppb (No.)	14
> 10 µg/kg – ppb (No.)	4
Countries of origin	No. of products
Bangladesh	15
India	9
Thailand	2
Vietnam	1
Fish and products thereof	
Number of notified analyses	8
Range of contamination (min–max, µg/kg – ppb)	1.0–122.0
Contamination > 5 µg/kg – ppb (No.)	3
> 10 µg/kg – ppb (No.)	1
Countries of origin	No. of products
Bangladesh	1
China	2
Peru	3
Thailand	1
Vietnam	1
Food additives	
Number of notified analyses	2
Range of contamination (min–max, µg/kg – ppb)	> 1.00
Countries of origin	No. of products
Canada, Chile, Indonesia, Tanzania (sea weeds)	1
Italy	1
Honey and royal jelly	
Number of notified analyses	6
Range of contamination (min–max, µg/kg – ppb)	1.1–11.0
Contamination > 10 µg/kg – ppb (No.)	1
Countries of origin	No. of products
Hungary	3
China	1
India	2
Meat and meat products (other than poultry)	
Number of notified analyses	16
Range of contamination (min–max, µg/kg – ppb)	0.1–14.4
Contamination > 5 µg/kg – ppb (No.	5
> 10 µg/kg – ppb (No.)	1
Countries of origin	No. of products
Brazil	1
China	13
Indonesia	2
Poultry meat and poultry meat products	
Number of notified analyses	37
Range of contamination (min–max, µg/kg – ppb)	0.5–47.0
Contamination > 5 µg/kg – ppb (No.)	21
> 10 µg/kg – ppb (No.)	20
Countries of origin	No. of products
Brazil	16
The Netherlands	1
Thailand	20
Wild caught crustaceans and products thereof – (obsolete)	
Number of notified analyses	17
Range of contamination (min–max, µg/kg – ppb)	0.4–19.3
Contamination > 5 µg/kg – ppb (No.)	4
> 10 µg/kg – ppb (No.)	3
Countries of origin	No. of products
Bangladesh	1
India	2
China	7
Thailand	7
Wild caught fish and products thereof (other than crustaceans and molluscs) – (obsolete)	
Number of notified analyses	1
Range of contamination (min–max, µg/kg – ppb)	0.3
Countries of origin	No. of products
Thailand	1

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