

Analysis of RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019

Friganović, Emilija; Krezo, Anita; Sečan, Ančica; Dorbić, Boris; Matin, Ana; Krička, Tajana; Ćurić, Duška

Source / Izvornik: **GLASILO FUTURE, 2022, 5, 37 - 63**

Journal article, Published version

Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

<https://doi.org/10.32779/gf.5.1-2.3>

Permanent link / Trajna poveznica: <https://um.nsk.hr/um:nbn:hr:204:488188>

Rights / Prava: [Attribution-NonCommercial-NoDerivatives 4.0 International/Imenovanje-Nekomercijalno-Bez prerada 4.0 međunarodna](#)

Download date / Datum preuzimanja: **2024-08-06**



Repository / Repozitorij:

[Repository Faculty of Agriculture University of Zagreb](#)



ISSN 2623-6575

UDK 63

GLASILO FUTURE

PUBLIKACIJA FUTURE - STRUČNO-ZNANSTVENA UDRUGA ZA PROMICANJE ODRŽIVOG RAZVOJA, KULTURE I MEĐUNARODNE SURADNJE, ŠIBENIK

VOLUMEN 5 BROJ 1-2

LIPANJ 2022.

Glasilo Future

Stručno-znanstveni časopis

Nakladnik:

FUTURA



Sjedište udruge: Šibenik

Adresa uredništva:

Bana Josipa Jelačića 13 a, 22000 Šibenik, Hrvatska / Croatia

☎ / 📠: +385 (0) 022 218 133

✉: urednistvo@gazette-future.eu / editors@gazette-future.eu

🌐: www.gazette-future.eu

Uređivački odbor / Editorial Board:Doc. dr. sc. Boris Dorbić, prof. v. š. – glavni i odgovorni urednik / *Editor-in-Chief*Emilija Friganović, dipl. ing. preh. teh., v. pred. – zamjenica g. i o. urednika / *Deputy Editor-in-Chief*Ančica Sečan, mag. act. soc. – tehnička urednica / *Technical Editor*Antonia Dorbić, mag. art. – zamjenica tehničke urednice / *Deputy Technical Editor*

Prof. dr. sc. Željko Španjol

Mr. sc. Milivoj Blažević

Vesna Štibrić, dipl. ing. preh. teh.

Međunarodno uredništvo / International Editorial Board:

Dr. sc. Gean Pablo S. Aguiar – Savezna republika Brazil (Universidade Federal de Santa Catarina)

Prof. dr. sc. Kiril Bahcevandzjev – Portugalska Republika (Instituto Politécnico de Coimbra)

Prof. dr. sc. Martin Bobinac – Republika Srbija (Šumarski fakultet Beograd)

Prof. dr. sc. Zvezda Bogevska – Republika Sjeverna Makedonija (Fakultet za zemjodjelski nauki i hrana Skopje)

Dr. sc. Bogdan Cvjetković, prof. emeritus – Republika Hrvatska (Agronomski fakultet Zagreb)

Prof. dr. sc. Duška Čurić – Republika Hrvatska (Prehrambeno-biotehnoški fakultet Zagreb)

Prof. dr. sc. Margarita Davitkovska – Republika Sjeverna Makedonija (Fakultet za zemjodjelski nauki i hrana Skopje)

Prof. dr. sc. Dubravka Dujmović Purgar – Republika Hrvatska (Agronomski fakultet Zagreb)

Prof. dr. sc. Josipa Giljanović – Republika Hrvatska (Kemijsko-tehnoški fakultet u Splitu)

Prof. dr. sc. Semina Hadžiabulić – Bosna i Hercegovina (Agromeditranski fakultet Mostar)

Prof. dr. sc. Péter Honfi – Mađarska (Faculty of Horticultural Science Budapest)

Prof. dr. sc. Mladen Ivić – Bosna i Hercegovina (Univerzitet PIM)

Doc. dr. sc. Anna Jakubczak – Republika Poljska (Uniwersytet Technologiczno-Przyrodniczy w Bydgoszczy)

Dr. sc. Željko Jurjević – Sjedinjene Američke Države (EMSL Analytical, Inc., North Cinnaminson, New Jersey)

Prof. dr. sc. Mariia Kalista – Ukrajina (National Museum of Natural History of National Academy of Sciences of Ukraine, Kyiv)

Prof. dr. sc. Tajana Krička – Republika Hrvatska (Agronomski fakultet Zagreb)

Doc. dr. sc. Dejan Kojić – Bosna i Hercegovina (Univerzitet PIM)

Slobodan Kulić, mag. iur. – Republika Srbija (Srpska ornitološka federacija i Confederation ornitologique mondiale)

Prof. dr. sc. Branka Ljevnaić-Mašić – Republika Srbija (Poljoprivredni fakultet Univerziteta u Novom Sadu)

Doc. dr. sc. Zvonimir Marijanović – Republika Hrvatska (Kemijsko-tehnoški fakultet u Splitu)

Semir Maslo, prof. – Kraljevina Švedska (Primary School, Lundåkerskolan, Gislaved)

Prof. dr. sc. Ana Matin – Republika Hrvatska (Agronomski fakultet Zagreb)

Prof. dr. sc. Elizabeta Miskoska-Milevska – Republika Sjeverna Makedonija (Fakultet za zemjodjelski nauki i hrana)

Prof. dr. sc. Bosiljka Mustać – Republika Hrvatska (Sveučilište u Zadru)

Prof. dr. sc. Ayşe Nilgün Atay – Republika Turska (Mehmet Akif Ersoy University – Burdur, Food Agriculture and Livestock School)

Prof. dr. sc. Tatjana Prebeg – Republika Hrvatska (Agronomski fakultet Zagreb)

Prof. dr. sc. Bojan Simovski – Republika Sjeverna Makedonija (Fakultet za šumarski nauki, pejzažna arhitektura i ekoinženiring "Hans Em" Skopje)

Prof. dr. sc. Davor Skejić – Republika Hrvatska (Građevinski fakultet Zagreb)

Akademik prof. dr. sc. Mirko Smoljić, prof. v. š. – Republika Hrvatska (Sveučilište Sjever, Varaždin/Koprivnica, Odjel ekonomije)

Prof. dr. sc. Nina Šajna – Republika Slovenija (Fakulteta za naravoslovje in matematiko)

Doc. dr. sc. Mladenka Šarolić – Republika Hrvatska (Kemijsko-tehnoški fakultet u Splitu)

Akademik prof. dr. sc. Refik Šećibović - Bosna i Hercegovina (Visoka škola za turizam i menadžment Konjic)

Prof. dr. sc. Andrej Šušek – Republika Slovenija (Fakulteta za kmetijstvo in biosistemske vede Maribor)

Prof. dr. sc. Elma Temim – Bosna i Hercegovina (Agromeditranski fakultet Mostar)

Doc. dr. sc. Merima Toromanović – Bosna i Hercegovina (Biotehnički fakultet Univerziteta u Bihaću)

Prof. dr. sc. Marko Turk – Ruska Federacija (University of Tyumen)

Prof. dr. sc. Ivana Vitasović Kosić – Republika Hrvatska (Agronomski fakultet Zagreb)

Prof. dr. sc. Ana Vujošević – Republika Srbija (Poljoprivredni fakultet Beograd)

Sandra Vuković, mag. ing. – Republika Srbija (Poljoprivredni fakultet Beograd)

Prof. dr. sc. Vesna Židovec – Republika Hrvatska (Agronomski fakultet Zagreb)

Grafička priprema: Ančica Sečan, mag. act. soc.

Objavljeno: 30. lipnja 2022. godine.

Časopis izlazi u elektroničkom izdanju dva puta godišnje, krajem lipnja i prosinca, a predviđena su i dva specijalna izdanja tijekom godine iz biotehničkog područja.

Časopis je besplatan. Rukopisi i recenzije se ne vraćaju i ne honoriraju.

Autori/ce su u potpunosti odgovorni/e za sadržaj, kontakt podatke i točnost engleskog jezika.

Umnožavanje (reproduciranje), stavljanje u promet (distribuiranje), priopćavanje javnosti, stavljanje na raspolaganje javnosti odnosno prerada u bilo kojem obliku nije dopuštena bez pismenog dopuštenja Nakladnika.

Sadržaj objavljen u Glasilo Future može se slobodno koristiti u osobne i obrazovne svrhe uz obvezno navođenje izvora.

Časopis je indeksiran u CAB Abstract (CAB International).

Glasilo Future

Stručno-znanstveni časopis

FUTURA – stručno-znanstvena udruga za promicanje održivog razvoja, kulture i međunarodne suradnje, Bana Josipa Jelačića 13 a, 22000 Šibenik, Hrvatska

(2022) 5 (1-2) 01–76

SADRŽAJ:

	Str.
<i>Izvorni znanstveni rad (original scientific paper)</i>	
<i>Aiša Širbegović, Aida Šukalić, Maida Đapo-Lavić, Alma Mičijević, Alma Leto</i> Frequency of consumption of coffee beverages in the city of Mostar and caffeine intake ...	01–14
<i>Emilija Friganović, Antea Nimak, Ančica Sečan, B. Dorbić, Ana Matin, Duška Ćurić, Tajana Krička</i> Analysis of RASFF notifications on cereals and cereal-based products contaminated with mycotoxins in the period from 01/01/2015 to 31/12/2019	15–36
<i>Emilija Friganović, Anita Krezo, Ančica Sečan, B. Dorbić, Ana Matin, Tajana Krička, Duška Ćurić</i> Analysis of RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019	37–63
<i>Stručni rad (professional paper)</i>	
<i>Sandra Mandinić, Katja Kopilaš, B. Dorbić, Marija Vrdoljak</i> Proizvodnja, svojstva i upotreba magarećeg mlijeka (u prehrambene i kozmetičke svrhe) Production, properties and use of donkey milk (for food and cosmetic purposes)	64–73
<i>Nekategorizirani rad (uncategorised paper)</i>	
<i>B. Dorbić</i> Društvene vijesti i obavijesti Social news and announcements	74–74
<i>Upute autorima (instructions to authors)</i>	75–76

Analysis of RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019

**Emilija Friganović^{1*}, Anita Krezo^{1,2}, Ančica Sečan³, Boris Dorbić¹,
Ana Matin⁴, Tajana Krička⁴, Duška Ćurić⁵**

izvorni znanstveni rad (original scientific paper)

doi: 10.32779/gf.5.1-2.3

Citiranje/Citation⁶

Abstract

The aim of this study was to analyse RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019. Allergies caused by food intake due to the presence of an allergen can pose a serious danger to the health of consumers. In order to promptly respond to any health risks related to food, food contact materials, or feed, The Rapid Alert System for Food and Feed (RASFF) enables quick information exchange between the bodies and institutions involved in the system. All data on allergens in cereals and cereal-based products were downloaded from the RASFF database (RASFF portal) and processed in MS Excel 2010. The collected data provided information on the: notifying country, country(ies) of origin and distribution of the food product in question, notification basis, notification type, risk decision, distribution status, action taken, allergen present and respective food product. More than half of the reported food products originated from Italy, Germany, United Kingdom and Netherlands. Almost half of notifications were published by United Kingdom, Germany, Italy and Spain. The most common allergens were milk, gluten and soya. Products in question in more than two-fifths of cases were pastry (sweet or savoury). The majority of the notifications were classified as alert notifications and a vast majority of total number of notifications were of serious risk. Allergen notifications were mainly based on official controls on the market and on company's own check but some were based on food poisoning. Just over two-thirds of products in question were distributed to other (member and non-member) countries and in over two-thirds of the notifications products in question were withdrawn or recalled.

¹ Veleučilište "Marko Marulić" u Kninu, Petra Krešimira IV 30, 22300 Knin, Republika Hrvatska

*E -mail: emilija.friganovic@veleknin.hr (Corresponding author)

² Graduated Food technology student

³ Udruga Futura Šibenik, Bana Josipa Jelačića 13 a, 22000 Šibenik, Republika Hrvatska

⁴ Agronomski fakultet Sveučilišta u Zagrebu, Svetošimunska cesta 25, 10000 Zagreb, Republika Hrvatska

⁵ Prehrambeno-biotehnološki fakultet Sveučilišta u Zagrebu, Pierottijeva 6, 10000 Zagreb, Republika Hrvatska

⁶ Friganović, E., Krezo, A., Sečan, A., Dorbić, B., Matin, A., Krička, T., Ćurić, D. (2022). Analysis of RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019. *Glasilo Future*, 5(1-2), 37–63.

Key words: RASFF, notifications, cereals and cereal-based products, allergens.

Introduction

Some particular foods or food components may not be ingested, digested, absorbed, and/or metabolized by all people without causing adverse reactions (Brouns et al., 2019). There are two types of adverse reactions to food: toxic and non-toxic. Adverse non-toxic reactions can be allergic or non-allergic, i.e. those mediated and those not-mediated by immunoglobulin E (IgE) antibodies (Bošnjir et al., 2009). Food allergies are characterized as an adverse health effect resulting from a particular immune response that happens, reproducibly, upon exposure to a particular food (Waserman et al., 2018; Boyce et al., 2010 as cited in Licari et al., 2019).

Food allergies and anaphylaxis are becoming public health problem of increasing prevalence. There is still no cure for food allergies, despite the high disease burden and potential for fatal consequences. Allergen avoidance, symptomatic treatment, and having an auto-injector on hand in case of reaction are the standards of allergen management (Nowak-Węgrzyn et al., 2016, as cited in Tan-Lim and Esteban-Ipac, 2018; Feuille and Nowak-Węgrzyn, 2018; Waserman et al., 2018). Solely allergen-specific immunotherapy has been identified as the most forthcoming therapeutic approach in the treatment of food allergies (Tan-Lim and Esteban-Ipac, 2018; Licari et al., 2019).

For people who have food allergies, food allergen labelling is a crucial tool for lowering exposure risk and preventing anaphylaxis. Information on potential allergen presence (or substances with an intolerance effect) should be given to enable consumers to make informed choices which are safe for them. *Any ingredient or processing aid listed in Annex II of the Regulation (EU) No 1169/2011 or derived from a substance or product listed in Annex II causing allergies or intolerances used in the manufacture or preparation of a food and still present in the finished product, even if in an altered form* shall be mandatory food information (Regulation (EU) No 1169/2011). Cereals represent the main component of human nutrition in the world, whether consumed directly as a food product or indirectly as components of animal feed (Campbell et al., 1997). As a means to protect the health of consumers, it is highly desirable to know how to recognize potential allergens in production of the staples of our food, cereals and cereal-based products, and to properly inform consumers.

In order to promptly respond to any health risks related to food, food contact materials, or feed, The Rapid Alert System for Food and Feed (RASFF) enables quick information exchange between the bodies and institutions involved in the system which in the event of a health risk initiates an immediate notification procedure (EC, 2020a; EC 2020b). According to European Commission (EC, 2016; EC, 2017; EC, 2019a; EC, 2019b; EC, 2020b) in the period from 01/01/2015 to 31/12/2019 consumers suffered from allergic reactions as a result of the presence of an allergen that was not listed on the label and insufficient labelling not mentioning a potential allergen can be the cause of food poisoning.

Many times, traces of allergens were notified, which occur in foods by reason of cross-contamination. Some of RASFF alert notifications on allergens were linked to fraudulent activities. Milk, soya, nuts and gluten were the most commonly reported allergens. Cereals and bakery products were the most often notified regarding allergens except in 2018 when prepared dishes and snacks were the most often notified food containing allergens. Numerous notifications on allergens imply that considerable endeavour is required to provide better protection of consumers suffering from food allergies. As some of the food poisoning cases in 2015 demonstrated, it can be difficult to assess the risk of allergens because some consumers may react to very low quantities.

The aim of this study was to analyse RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019.

Materials and methods

All data on notifications for the presence of allergens in cereals and cereal-based products were downloaded from the RASFF portal database (EC, 2020c) and processed in MS Excel 2010 (univariate descriptive statistics) (Microsoft Corporation). The search criteria were as follows: "Product type: food", "Hazard category: allergens", "Notified from: 01/01/2015", "Notified till: 31/12/2019" and "Product category: Cereals and bakery products". Notifications that did not relate to cereals (including pseudocereals) and their products were omitted during data processing. The search was repeated with the same criteria for two more hazard categories: "Hazard category: composition", "Hazard category: labelling absent/incomplete/incorrect" whereby the notifications that referred to allergens were singled out for further data processing. The collected data provided information on the: notifying country, country(ies) of origin and distribution of the food product in question, notification basis, notification type, risk decision, distribution status, action taken, allergen present and respective food product.

Results and discussion

A total of 160 RASFF notifications were published on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019. Four countries were notifying countries in 49.4 % of cases. United Kingdom was notifying country in 18.8 % of the published notifications, followed by Germany (10.6 %), Italy (10.6 %) and Spain (9.1 %). Other countries that participated as notifying countries in more than 5 % of published notifications each were Sweden (7.5 %), Netherland (6.8 %) and Denmark (5.6 %) (Table 1.). Products in question originated in 20 RASFF member countries and 15 RASFF non-member countries. The country of origin of products in question in 15.6 % of notifications was Italy, then Germany, United Kingdom and Netherlands in 14.4 %, 11.9 % and 9.4 % of notifications, respectively (Table 2.). Although in 43.1 % of total notifications the country of

product origin was also the notifying country, in 95.6 % of these cases product in question was distributed to other countries (to member countries – 88.4 %; to non-member countries – 7.2 %) and needed to be recalled (58.0 %) or withdrawn (23.2 %) (RASFF Portal, 2020). This points to the conclusion that the threats to public health were not promptly identified. In 89.5 % of its own cases, as a country of product origin, United Kingdom is also the notifying country. For Italy, Germany and the Netherlands, these numbers are lower, 52.0 %, 47.8 % and 46.7 %, respectively. Two countries were countries of origin of the product in question in 3.8 % of cases (Table 2.).

Table 1. RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019 by year and notifying country.

Notifying country	Year and number of notifications					Total		
	2015	2016	2017	2018	2019	No.	%	
1. Austria	0	1	0	0	1	2	1.3	
2. Belgium	0	0	0	1	2	3	1.9	
3. Cyprus	2	0	0	0	0	2	1.3	
4. Czech Republic	2	2	1	1	2	8	5.0	
5. Denmark	1	1	3	2	2	9	5.6	
6. Estonia	0	1	0	0	0	1	0.6	
7. Finland	2	0	0	1	1	4	2.5	
8. France	2	1	1	2	0	6	3.8	
9. Germany	0	9	2	3	3	17	10.6	
10. Ireland	2	0	1	0	2	5	3.1	
11. Italy	1	4	5	4	3	17	10.6	
12. Malta	0	2	0	0	1	3	1.9	
13. Netherlands	1	1	4	3	2	11	6.9	
14. Poland	1	0	0	0	0	1	0.6	
15. Slovakia	0	2	3	2	0	7	4.4	
16. Slovenia	3	0	0	1	1	5	3.1	
17. Spain	2	2	1	4	6	15	9.4	
18. Sweden	1	3	2	2	4	12	7.5	
19. Switzerland	0	0	1	0	1	2	1.3	
20. United Kingdom	5	5	5	7	8	30	18.8	
Total	No.	25	34	29	33	39	160	100
	%	15.6	21.3	18.1	20.6	24.4	100	

Table 2. Countries of origin regarding RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019 (% of cases) with an indication in how many of subject cases (for a particular country) the country of origin was also the notifying country.

Country of origin		Country of origin = Notifying country
Countries	% of total cases	% of subject cases
1. Australia	0.6	-
2. Austria	2.5	25.0
3. Belgium	2.5	-

Country of origin		Country of origin = Notifying country
Countries	% of total cases	% of subject cases
4. Bosnia and Herzegovina	0.6	-
5. Brazil	0.6	-
6. Bulgaria	1.3	-
7. Canada	0.6	-
8. China	1.9	-
9. Czech Republic	2.5	-
10. Denmark	2.5	50.0
11. Estonia	0.6	-
12. Finland	0.6	100
13. France	5.0	37.5
14. Germany	14.4	47.8
15. Greece	1.3	-
16. Hungary	1.3	-
17. India	0.6	-
18. Indonesia	0.6	-
19. Ireland	1.3	100
20. Italy	15.6	52.0
21. Lebanon	0.6	-
22. Netherlands	9.4	46.7
23. Poland	4.4	14.3
24. Republic of North Macedonia	0.6	-
25. Romania	1.9	-
26. Slovakia	0.6	100
27. Spain	4.4	85.7
28. Sweden	3.8	66.7
29. Taiwan	0.6	-
30. Thailand	3.1	-
31. Tunisia	1.3	-
32. Turkey	3.1	-
33. Ukraine	0.6	-
34. United Kingdom	11.9	89.5
35. Vietnam	0.6	-

The most common allergens in RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019 were milk, gluten and soya in 24.4 %, 23.1 % and 15.0 % of published notifications, respectively. In some food products in question more than one allergen was an issue (Table 3.). Allergens were either undeclared as an ingredients, or possible traces of allergen were undeclared, or presence of allergens as contaminants was determined, or content of allergens was too high in allergen-free products, or wrong allergen was labelled instead of the correct one, or wrong product was labelled (the one containing allergen(s)), or information on allergens was not available in the language of the country where the product is sold (insufficient labelling, incorrect labelling, absence of allergen labelling) (RASFF Portal, 2020). Notifications on allergens were related to the following grouped products: "pastry (sweet or savoury)" in 43.1 % of cases, "breakfast cereals (muesli, cereal flakes), cereal bar, muesli bar" in 12.5 % of cases, "grains, flour, gluten" in 10.6 % of

cases, "pasta" in 9.4 % of cases, "cookies and wafers" in 9.4 % of cases, "bread, toast and bagels" in 8.1 % of cases and "crackers and snack food" in 6.3 % of cases (Table 3.).

Table 3. Allergens in RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019

Allergens	% of cases		
	Total	In specific cereal or cereal-based products	
1. Milk	24.4	Pastry (sweet or savoury)	14.4
		Breakfast cereals (muesli, cereal flakes), cereal bar, muesli bar	1.9
		Bread, toast and bagels	2.5
		Cookies and wafers	2.5
		Crackers and snack food	1.3
		Grains, flour, gluten	1.3
		Pasta	0.6
2. Gluten	23.1	Pastry (sweet or savoury)	8.8
		Grains, flour, gluten	4.4
		Pasta	3.8
		Bread, toast and bagels	1.9
		Crackers and snack food	1.9
		Breakfast cereals (muesli, cereal flakes), cereal bar, muesli bar	1.3
		Cookies and wafers	0.6
		Cereal product*	0.6
3. Soya	15.0	Pastry (sweet or savoury)	3.8
		Grains, flour, gluten	3.1
		Breakfast cereals (muesli, cereal flakes), cereal bar, muesli bar	2.5
		Pasta	2.5
		Bread, toast and bagels	1.9
		Cookies and wafers	0.6
		Crackers and snack food	0.6
4. Eggs	7.5	Pastry (sweet or savoury)	3.1
		Cookies and wafers	2.5
		Pasta	1.9
5. Sesame	5.6	Bread, toast and bagels	1.9
		Breakfast cereals (muesli, cereal flakes), cereal bar, muesli bar	1.9
		Pastry (sweet or savoury)	1.9
6. Wheat	5.0	Grains, flour, gluten	1.9
		Pasta	1.3
		Pastry (sweet or savoury)	1.3
		Crackers and snack food	0.6
7. Mustard	3.1	Crackers and snack food	1.3
		Pastry (sweet or savoury)	1.3
		Grains, flour, gluten	0.6
8. Barley	1.9	Breakfast cereals (muesli, cereal flakes),	0.6

Allergens	% of cases	
	Total	In specific cereal or cereal-based products
		cereal bar, muesli bar
		Crackers and snack food
		Pastry (sweet or savoury)
9. Sulphite	1.3	Cookies and wafers
		Grains, flour, gluten
10. Celery	0.6	Crackers and snack food
11. Crustaceans	0.6	Pastry (sweet or savoury)
12. ND**	1.3	Pastry (sweet or savoury)

Note: ND = no data available

* Product was not specified in notification but allergen was (subject: too high content of gluten in gluten-free cereal product)

** Allergen not specified in notification (subject: insufficient labelling)

The majority of RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019 were classified as alert notifications (84.4 %) and 97.5 % of total number of notifications were of serious risk. More than two-fifths of the allergen notifications were based on official controls on the market (44.4 %), 40.0 % were based on company's own check and 8.8 % were based on consumer complaint. It is worrying that in 3.8 % of cases allergen notifications were based on food poisoning. Regarding the distribution status, 68.2 % of products in question were distributed to other (member and non-member) countries and in 68.8 % of the notifications products in question were withdrawn or recalled (Table 4.).

Table 4. RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019 by notification type, risk decision, notification basis, distribution status and action taken.

Notification type / Total	Risk decision / Total	Notification basis / Total	Distribution status and Action taken
Alert notification (135; 84.4 %)	Serious (135)	Official control on the market (58)	Distribution to other member countries (37)
			Distribution restricted to notifying country (9)
			No distribution from notifying country (8)
		No distribution to other member countries (3)	
		Distribution to non-member countries (1)	
		Withdrawal from the market (24)	
Recall from customers (16)			
Withdrawal from recipient(s) (6)			
Public warning - press release (3)			
Relabelling (3)			
Informing recipient(s) (3)			
Detained by operator (1)			
Informing authorities (1)			
ND (1)			
		Official control in non-member country (1)	Distribution to other member countries (1)
			Recall from customers (1)
		Company's own check (58)	Distribution to other member countries (49)
			Distribution restricted to notifying country (5)
			No distribution from notifying country (4)

Notification type / Total	Risk decision / Total	Notification basis / Total	Distribution status and Action taken	
			Recall from customers (36) Withdrawal from the market (8) Public warning - press release (5) Informing recipient(s) (5) Relabelling (1) Return to consignor (1) ND (2)	
		Consumer complaint (12)	Distribution to other member countries (9) Distribution restricted to notifying country (3) Recall from customers (8) Withdrawal from the market (1) Withdrawal from recipient(s) (1) Public warning - press release (1) Informing recipient(s) (1)	
		Food poisoning (6)	Distribution to other member countries (6) Withdrawal from the market (3) Public warning - press release (1) Recall from customers (1) ND (1)	
		Not Serious (0)	-	-
		Undecided (0)	-	-
		Border rejection (4; 2.5 %)	Serious (3)	Border control (3)
	Not Serious (0)	-	-	
	Undecided (1)	Border control (1)	Product not (yet) placed on the market (1) Relabelling (1)	
Information notification for attention (18; 11.3 %)	Serious (18)	Official control on the market (10)	Distribution restricted to notifying country (7) Distribution to non-member countries (2) Product (presumably) no longer on the market (1) Recall from customers (3) Withdrawal from the market (3) Relabelling (3) Informing recipient(s) (1)	
		Company's own check (6)	Distribution restricted to notifying country (4) Distribution to non-member countries (2) Recall from customers (3) Public warning - press release (2) Informing authorities (1)	
		Consumer complaint (2)	Product (presumably) no longer on the market (1) Distribution to non-member countries (1) Recall from customers (2)	
		Not Serious (0)	-	-
		Undecided (0)	-	-
		Information notification for follow-up (3; 1.9 %)	Serious (0)	-
	Not Serious (3)	Official control on the market (3)	Distribution to other member countries (1) No distribution from notifying country (1) Information on distribution not (yet) available (1) Withdrawal from the market (1) Return to consignor (1) Informing recipient(s) (1)	
	Undecided (0)	-	-	

Notification type / Total	Risk decision/ Total	Notification basis/ Total	Distribution status and Action taken
Total	Total	Total	Total
Alert notification (84.4 %)	Serious (97.5 %)	Official control on the market (44.4 %)	Distribution to other member countries (64.4 %) Distribution restricted to notifying country (17.5 %) Distribution to non-member countries (3.8 %)
Information notification for attention (11.3 %)	Not Serious (1.9 %)	Company's own check (40.0 %)	No distribution from notifying country (8.1 %) No distribution to other member countries (1.9 %)
Border rejection (2.5 %)	Undecided (0.6 %)	Consumer complaint (8.8 %)	Product not (yet) placed on the market (2.5 %) Product (presumably) no longer on the market (1.3 %)
Information notification for follow-up (1.9 %)		Food poisoning (3.8 %)	Information on distribution not (yet) available (0.6 %)
		Border control (2.5 %)	Recall from customers (43.8 %) Withdrawal from the market (25.0 %) Public warning - press release (7.5 %) Informing recipient(s) (6.9 %)
		Official control in non-member country (0.6 %)	Relabelling (6.3 %) Withdrawal from recipient(s) (4.4 %) Informing authorities (1.3 %) Return to consignor (1.3 %) Detained by operator (0.6 %) Re-dispatch (0.6 %)
			ND (2.5 %)

Note: ND = no data available;

Conclusion

In the period from 01/01/2015 to 31/12/2019 a total of 160 RASFF notifications were published on allergens in cereals and cereal-based products. In 51,3 % of cases reported food products originated from Italy (15.6 %), Germany (14.4 %), United Kingdom (11.9 %) and Netherlands (9.4 %). Almost half of notifications were published by United Kingdom (18.8 %), Germany (10.6 %), Italy (10.6 %) and Spain (9.1 %). The most common allergens in RASFF notifications on allergens in cereals and cereal-based products in the period from 01/01/2015 to 31/12/2019 were milk, gluten and soya in 24.4 %, 23.1 % and 15.0 % of published notifications, respectively. Whatever was the reason for the publication of the notification related to food allergens, ultimately, consumers were not informed about the substance (potential allergens) in food that may pose a danger to their health. The majority of the notifications were classified as alert notifications (84.4 %) and 97.5 % of total number of notifications were of serious risk. More than two-fifths of the allergen notifications were based on official controls on the market (44.4 %), two-fifths were based on company's own check. It is worrying that in 3.8 % of cases allergen notifications were based on food poisoning. Products in

question were in 68.2 % of cases distributed to other (member and non-member) countries, which is troublesome because threats to public health were not timely identified, as well is the fact that these products were available to consumers. In 68.8 % of the notifications, products in question were withdrawn or recalled. We will advert to the conclusion of Friganović et al. (2019) that the previously stated underlines the need to build up the preventive role of the competent authorities and food business operators themselves.

Acknowledgment

The paper was prepared using some of the results of a final thesis of graduated Food technology student Anita Krezo (see References).

References

- Bošnir, J., Colić Barić, I., Ćurić, D., Mandić, M. L., Polak, L., Teklić, T., Valek, M. (2009). Alergije podrijetlom iz hrane, In: Colić Barić, I. (ed.), *Alergije podrijetlom iz hrane* (13-14). Osijek: Hrvatska agencija za hranu.
- Brouns, F., van Rooy, G., Shewry, P., Rustgi, S., Jonkers, D. (2019). Adverse Reactions to Wheat or Wheat Components. *Comprehensive Reviews in Food Science and Food Safety*, 18(5), 1437-1452. doi: 10.1111/1541-4337.12475.
- Campbell, G. M., Webb, C., McKee, S. L. (1997). *CEREALS, Novel uses and processes*. New York: Plenum Press.
- European Commission (2016). RASFF – 2015 annual report. Luxembourg: Publications Office of the European Union.
- European Commission (2017). RASFF – 2016 annual report. Luxembourg: Publications Office of the European Union.
- European Commission (2019a). RASFF – 2017 annual report. Luxembourg: Publications Office of the European Union.
- European Commission (2019b). RASFF – 2018 annual report. Luxembourg: Publications Office of the European Union.
- European Commission (EC) (2020a). RASFF – Food and Feed Safety Alerts, available at: https://ec.europa.eu/food/safety/rasff_en (accessed: 19/05/2020).
- European Commission (2020b). RASFF – 2019 annual report. Luxembourg: Publications Office of the European Union.

European Commission (2020c). RASFF Portal – online edition: available at:

<https://webgate.ec.europa.eu/rasff-window/portal/?event=SearchForm&cleanSearch=1> (accessed: 02/06/2020)

1. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.4426. (accessed 02/06/2020) Bruxelles: European Commission.
2. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.4175. (accessed 02/06/2020) Bruxelles: European Commission.
3. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.4043. (accessed 02/06/2020) Bruxelles: European Commission.
4. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3984. (accessed 02/06/2020) Bruxelles: European Commission.
5. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3900. (accessed 02/06/2020) Bruxelles: European Commission.
6. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3830. (accessed 02/06/2020) Bruxelles: European Commission.
7. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3782. (accessed 02/06/2020) Bruxelles: European Commission.
8. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3750. (accessed 02/06/2020) Bruxelles: European Commission.
9. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3330. (accessed 02/06/2020) Bruxelles: European Commission.

10. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3336. (accessed 02/06/2020) Bruxelles: European Commission.
11. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3159. (accessed 02/06/2020) Bruxelles: European Commission.
12. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3103. (accessed 02/06/2020) Bruxelles: European Commission.
13. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3033. (accessed 02/06/2020) Bruxelles: European Commission.
14. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.2810. (accessed 02/06/2020) Bruxelles: European Commission.
15. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.2790. (accessed 02/06/2020) Bruxelles: European Commission.
16. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.2556. (accessed 02/06/2020) Bruxelles: European Commission.
17. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.2552. (accessed 02/06/2020) Bruxelles: European Commission.
18. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.2302. (accessed 02/06/2020) Bruxelles: European Commission.
19. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.2228. (accessed 02/06/2020) Bruxelles: European Commission.

20. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.2110. (accessed 02/06/2020) Bruxelles: European Commission.
21. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1814. (accessed 02/06/2020) Bruxelles: European Commission.
22. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1820. (accessed 02/06/2020) Bruxelles: European Commission.
23. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1705. (accessed 02/06/2020) Bruxelles: European Commission.
24. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1676. (accessed 02/06/2020) Bruxelles: European Commission.
25. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1508. (accessed 02/06/2020) Bruxelles: European Commission.
26. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1491. (accessed 02/06/2020) Bruxelles: European Commission.
27. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1420. (accessed 02/06/2020) Bruxelles: European Commission.
28. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1267. (accessed 02/06/2020) Bruxelles: European Commission.
29. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1188. (accessed 02/06/2020) Bruxelles: European Commission.

30. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1170. (accessed 02/06/2020) Bruxelles: European Commission.
31. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1082. (accessed 02/06/2020) Bruxelles: European Commission.
32. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.0590. (accessed 02/06/2020) Bruxelles: European Commission.
33. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.0520. (accessed 02/06/2020) Bruxelles: European Commission.
34. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.0306. (accessed 02/06/2020) Bruxelles: European Commission.
35. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.0156. (accessed 02/06/2020) Bruxelles: European Commission.
36. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.0134. (accessed 02/06/2020) Bruxelles: European Commission.
37. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.3726. (accessed 02/06/2020) Bruxelles: European Commission.
38. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.3701. (accessed 02/06/2020) Bruxelles: European Commission.
39. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.3677. (accessed 02/06/2020) Bruxelles: European Commission.

40. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.3636. (accessed 02/06/2020) Bruxelles: European Commission.
41. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.3274. (accessed 02/06/2020) Bruxelles: European Commission.
42. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.3109. (accessed 02/06/2020) Bruxelles: European Commission.
43. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.3050. (accessed 02/06/2020) Bruxelles: European Commission.
44. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.3049. (accessed 02/06/2020) Bruxelles: European Commission.
45. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.2913. (accessed 02/06/2020) Bruxelles: European Commission.
46. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.2879. (accessed 02/06/2020) Bruxelles: European Commission.
47. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.2850. (accessed 02/06/2020) Bruxelles: European Commission.
48. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.2749. (accessed 02/06/2020) Bruxelles: European Commission.
49. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.2688. (accessed 02/06/2020) Bruxelles: European Commission.

50. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.2529. (accessed 02/06/2020) Bruxelles: European Commission.
51. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.2157. (accessed 02/06/2020) Bruxelles: European Commission.
52. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1968. (accessed 02/06/2020) Bruxelles: European Commission.
53. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1979. (accessed 02/06/2020) Bruxelles: European Commission.
54. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1975. (accessed 02/06/2020) Bruxelles: European Commission.
55. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1950. (accessed 02/06/2020) Bruxelles: European Commission.
56. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1619. (accessed 02/06/2020) Bruxelles: European Commission.
57. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1295. (accessed 02/06/2020) Bruxelles: European Commission.
58. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1265. (accessed 02/06/2020) Bruxelles: European Commission.
59. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1208. (accessed 02/06/2020) Bruxelles: European Commission.

60. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1174. (accessed 02/06/2020) Bruxelles: European Commission.
61. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1026. (accessed 02/06/2020) Bruxelles: European Commission.
62. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.1011. (accessed 02/06/2020) Bruxelles: European Commission.
63. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.0948. (accessed 02/06/2020) Bruxelles: European Commission.
64. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.0841. (accessed 02/06/2020) Bruxelles: European Commission.
65. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.0757. (accessed 02/06/2020) Bruxelles: European Commission.
66. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.0726. (accessed 02/06/2020) Bruxelles: European Commission.
67. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.0672. (accessed 02/06/2020) Bruxelles: European Commission.
68. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.0495. (accessed 02/06/2020) Bruxelles: European Commission.
69. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2018.0078. (accessed 02/06/2020) Bruxelles: European Commission.

70. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.2185. (accessed 02/06/2020) Bruxelles: European Commission.
71. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.2162. (accessed 02/06/2020) Bruxelles: European Commission.
72. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.2005. (accessed 02/06/2020) Bruxelles: European Commission.
73. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1966. (accessed 02/06/2020) Bruxelles: European Commission.
74. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1891. (accessed 02/06/2020) Bruxelles: European Commission.
75. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1792. (accessed 02/06/2020) Bruxelles: European Commission.
76. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1625. (accessed 02/06/2020) Bruxelles: European Commission.
77. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1593. (accessed 02/06/2020) Bruxelles: European Commission.
78. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1589. (accessed 02/06/2020) Bruxelles: European Commission.
79. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1565. (accessed 02/06/2020) Bruxelles: European Commission.

80. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1463. (accessed 02/06/2020) Bruxelles: European Commission.

81. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1397. (accessed 02/06/2020) Bruxelles: European Commission.

82. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1238. (accessed 02/06/2020) Bruxelles: European Commission.

83. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1107. (accessed 02/06/2020) Bruxelles: European Commission.

84. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1009. (accessed 02/06/2020) Bruxelles: European Commission.

85. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0859. (accessed 02/06/2020) Bruxelles: European Commission.

86. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0826. (accessed 02/06/2020) Bruxelles: European Commission.

87. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0627. (accessed 02/06/2020) Bruxelles: European Commission.

88. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0467. (accessed 02/06/2020) Bruxelles: European Commission.

89. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0424. (accessed 02/06/2020) Bruxelles: European Commission.

90. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0322. (accessed 02/06/2020) Bruxelles: European Commission.
91. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0323. (accessed 02/06/2020) Bruxelles: European Commission.
92. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0224. (accessed 02/06/2020) Bruxelles: European Commission.
93. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0201. (accessed 02/06/2020) Bruxelles: European Commission.
94. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0189. (accessed 02/06/2020) Bruxelles: European Commission.
95. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.AEQ. (accessed 02/06/2020) Bruxelles: European Commission.
96. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0091. (accessed 02/06/2020) Bruxelles: European Commission.
97. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.0086. (accessed 02/06/2020) Bruxelles: European Commission.
98. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1821. (accessed 02/06/2020) Bruxelles: European Commission.
99. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1820. (accessed 02/06/2020) Bruxelles: European Commission.

100. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1756. (accessed 02/06/2020) Bruxelles: European Commission.
101. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1606. (accessed 02/06/2020) Bruxelles: European Commission.
102. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1559. (accessed 02/06/2020) Bruxelles: European Commission.
103. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1485. (accessed 02/06/2020) Bruxelles: European Commission.
104. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.BGV. (accessed 02/06/2020) Bruxelles: European Commission.
105. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1286. (accessed 02/06/2020) Bruxelles: European Commission.
106. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1230. (accessed 02/06/2020) Bruxelles: European Commission.
107. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1184. (accessed 02/06/2020) Bruxelles: European Commission.
108. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1189. (accessed 02/06/2020) Bruxelles: European Commission.
109. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1136. (accessed 02/06/2020) Bruxelles: European Commission.

110. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1087. (accessed 02/06/2020) Bruxelles: European Commission.
111. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1088. (accessed 02/06/2020) Bruxelles: European Commission.
112. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1083. (accessed 02/06/2020) Bruxelles: European Commission.
113. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1064. (accessed 02/06/2020) Bruxelles: European Commission.
114. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.1027. (accessed 02/06/2020) Bruxelles: European Commission.
115. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0945. (accessed 02/06/2020) Bruxelles: European Commission.
116. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0890. (accessed 02/06/2020) Bruxelles: European Commission.
117. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0733. (accessed 02/06/2020) Bruxelles: European Commission.
118. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0702. (accessed 02/06/2020) Bruxelles: European Commission.
119. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0621. (accessed 02/06/2020) Bruxelles: European Commission.

120. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0473. (accessed 02/06/2020) Bruxelles: European Commission.
121. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0439. (accessed 02/06/2020) Bruxelles: European Commission.
122. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0415. (accessed 02/06/2020) Bruxelles: European Commission.
123. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0406. (accessed 02/06/2020) Bruxelles: European Commission.
124. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0401. (accessed 02/06/2020) Bruxelles: European Commission.
125. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0267. (accessed 02/06/2020) Bruxelles: European Commission.
126. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0256. (accessed 02/06/2020) Bruxelles: European Commission.
127. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.AJV. (accessed 02/06/2020) Bruxelles: European Commission.
128. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0233. (accessed 02/06/2020) Bruxelles: European Commission.
129. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0223. (accessed 02/06/2020) Bruxelles: European Commission.

130. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0138. (accessed 02/06/2020) Bruxelles: European Commission.
131. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2016.0013. (accessed 02/06/2020) Bruxelles: European Commission.
132. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1638. (accessed 02/06/2020) Bruxelles: European Commission.
133. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1569. (accessed 02/06/2020) Bruxelles: European Commission.
134. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1556. (accessed 02/06/2020) Bruxelles: European Commission.
135. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1552. (accessed 02/06/2020) Bruxelles: European Commission.
136. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1484. (accessed 02/06/2020) Bruxelles: European Commission.
137. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1476. (accessed 02/06/2020) Bruxelles: European Commission.
138. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1407. (accessed 02/06/2020) Bruxelles: European Commission.
139. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1385. (accessed 02/06/2020) Bruxelles: European Commission.

140. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1352. (accessed 02/06/2020) Bruxelles: European Commission.

141. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1318. (accessed 02/06/2020) Bruxelles: European Commission.

142. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1271. (accessed 02/06/2020) Bruxelles: European Commission.

143. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1084. (accessed 02/06/2020) Bruxelles: European Commission.

144. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0839. (accessed 02/06/2020) Bruxelles: European Commission.

145. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0813. (accessed 02/06/2020) Bruxelles: European Commission.

146. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0766. (accessed 02/06/2020) Bruxelles: European Commission.

147. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0730. (accessed 02/06/2020) Bruxelles: European Commission.

148. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0714. (accessed 02/06/2020) Bruxelles: European Commission.

149. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0647. (accessed 02/06/2020) Bruxelles: European Commission.

150. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0476. (accessed 02/06/2020) Bruxelles: European Commission.
151. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0416. (accessed 02/06/2020) Bruxelles: European Commission.
152. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0394. (accessed 02/06/2020) Bruxelles: European Commission.
153. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0241. (accessed 02/06/2020) Bruxelles: European Commission.
154. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0220. (accessed 02/06/2020) Bruxelles: European Commission.
155. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.0061. (accessed 02/06/2020) Bruxelles: European Commission.
156. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.3748. (accessed 02/06/2020) Bruxelles: European Commission.
157. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1854. (accessed 02/06/2020) Bruxelles: European Commission.
158. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2019.1477. (accessed 02/06/2020) Bruxelles: European Commission.
159. RASFF Portal – online edition – notification – https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2015.1401. (accessed 02/06/2020) Bruxelles: European Commission.

Emilija Friganović, Anita Krezo, Ančica Sečan, B. Dorbić, Ana Matin, Tajana Krička, Duška Ćurić / Analysis of RASFF notifications on allergens in cereals ... / Glasilo Future (2022) 5 (1-2) 37–63

160. RASFF Portal- online edition- notification- https://webgate.ec.europa.eu/rasff-window/portal/?event=notificationDetail&NOTIF_REFERENCE=2017.1998. (accessed 02. 06. 2020.) Bruxelles: European Commission.

Feuille, E., Nowak- Wegrzy, A. (2018). Allergen- Specific Immunotherapies for Food Allergy. *AAIR*, 10, 189-206. doi: 0.4168/aair.2018.10.3.189.

Friganović, E., Tokmakčija, N., Sečan Matijaščić, A., Kelava, M., Šarolić, M., Dorbić, B. (2019). *Salmonella* spp. in RASFF notifications involving Croatia in the period from 01/01/2014 to 31/12/2018. *Glasilo Future*, 2(5-6), 24–36.

Krezo, A. (2020). Analiza RASFF obavijesti o alergenima u žitaricama i proizvodima na bazi žitarica u razdoblju 01. 01. 2015. – 31. 12. 2019., Završni rad, Veleučilište "Marko Marulić" u Kninu.

Licari, A., Manti, S., Marseglia, A., Brambilla, I., Votto, M., Castagnoli, R., Leonardi, S., Marseglia, G. L. (2019): Food allergies: Current and future treatments. *Medicina*, 55(120), 1-13. doi:10.3390/medicina55050120.

Microsoft Excel 2010. Redmond, USA: Microsoft Corporation.

Regulation (EU) no 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004, *Official Journal of the European Union*, 304, 22. 11. 2011.,18-63.

Tan-Lim, C. S. C., Esteban-Ipac, N. A. R. (2018.). Probiotics as treatment for food allergies among pediatric patients: a meta-analysis. *World Allergy Organization Journal*, 11(25), 1-13. doi: 0.1186/s40413-018-0204-5.

Waserman, S., Bègin, P., Watson, W. (2018): IgE- mediated food allergy. *Allergy, asthma & clinical immunology*, 14(55), 1-11.

Primljeno: 8. lipnja 2022. godine

Received: June 8, 2022

Prihvaćeno: 30. lipnja 2022. godine

Accepted: June 30, 2022