Manual Safefood-Online

Instructions how to use and evaluate the data

1 Introduction to Safefood-Online

SAFEFOOD-ONLINE is a valuable early warning system for the food industry based on a database to present and assess potential risks to food safety.

European and national food law has assigned responsibility for food safety to food companies, primarily to food manufacturers (Regulation (EC) 178/2002 “laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety”). It is therefore the central task of every food company to ensure through appropriate own-check procedures that the food produced is safe and harmless to health, e.g. in order to avoid recall actions. In most cases the effects of biological, chemical, allergenic or physical hazards are very costly, in some cases the consequences of recalls can even threaten the existence of the company.
With the Regulation (EC) No. 852/2004 on food hygiene, which came into force on 01.01.2006, the establishment of a HACCP concept has become mandatory for all food business operators. Within the framework of an HACCP concept, risk management plays an important role with the aim of identifying, minimizing and managing possible risks.

Especially for this task SAFEFOOD-ONLINE was developed:

SAFEFOOD-ONLINE processes the information of the European Rapid Alert System for Food and Feed (RASFF) and other available valid data on food, food contact materials and animal feed.

SAFEFOOD-ONLINE enables a multidimensional analysis and evaluation of risks and helps to quickly and efficiently assess the possible consequences and to take appropriate measures to minimize or control the risks.

SAFEFOOD-ONLINE is aimed at all food producers who wish to use their management system to identify risks at an early stage and thus make a proactive and risk-conscious contribution to positive business development.

SAFEFOOD-ONLINE contains almost 142.000 data records (February 2021, German version). In the English version are more than 63.000 data records available. The content of the database is constantly updated and adapted.

2 Benefits of the SAFEFOOD-ONLINE Database

The results of an Internet-based query are displayed in a risk landscape with recommended instructions. The type of presentation with SAFEFOOD-ONLINE is variable and can be further processed directly on the screen by clicking on the respective fields and results. By clicking on the "test version" tab (without registration), you have limited access to different examples.

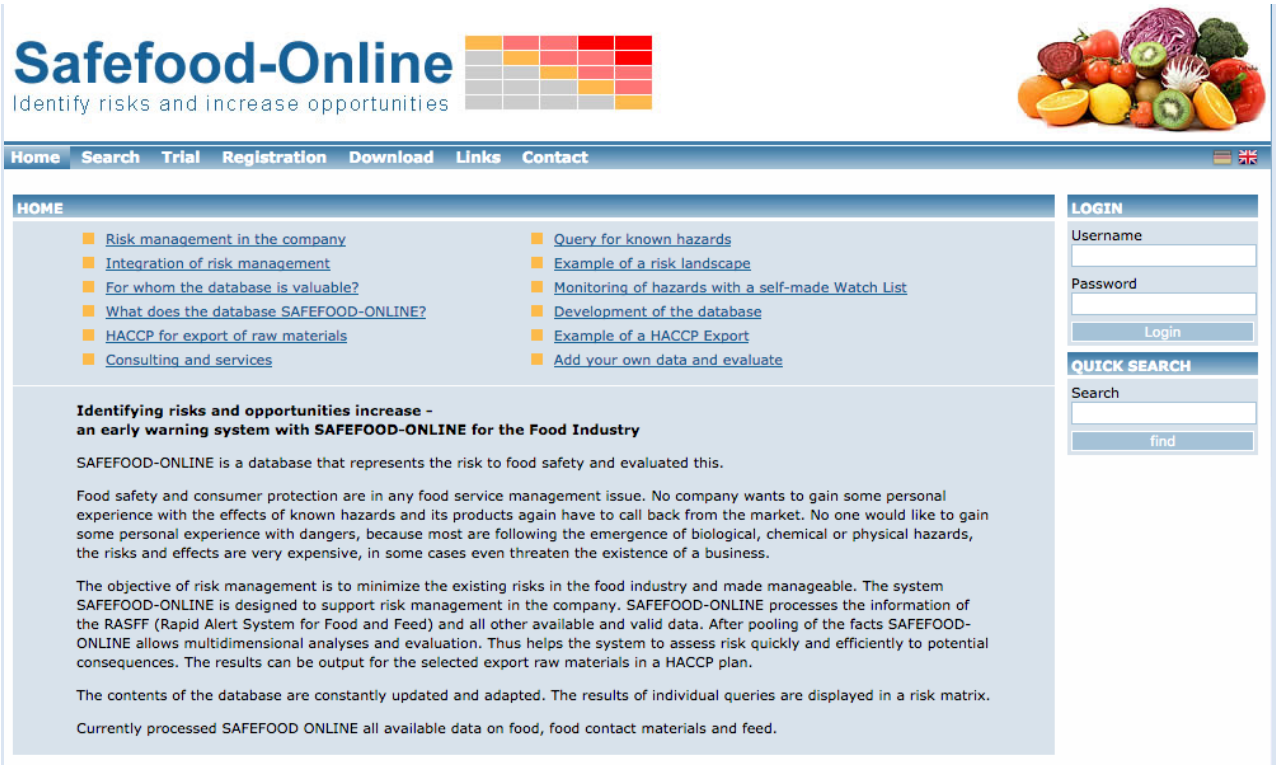
The risk level is based on the frequency of notification of a specific food, contact material or feed. In this way the probable effect of the risk can be displayed.

Several individual risks are classified and represented in the risk matrix. The mutual relationships and dependencies can be determined by querying other available information, such as the country of manufacture, the food concerned, the source of the hazard, the year and the type of notification. This information is useful to evaluate the results. The current database can be viewed directly on the homepage.

By constantly updating and expanding the data, e.g. from the RASFF, it is ensured that the risk landscapes created always contain the latest findings on food safety and make them usable. Via the database, reports on food, food contact materials and animal feed can be retrieved and evaluated according to various possibilities.

3 Trial Version SAFEFOOD-ONLINE

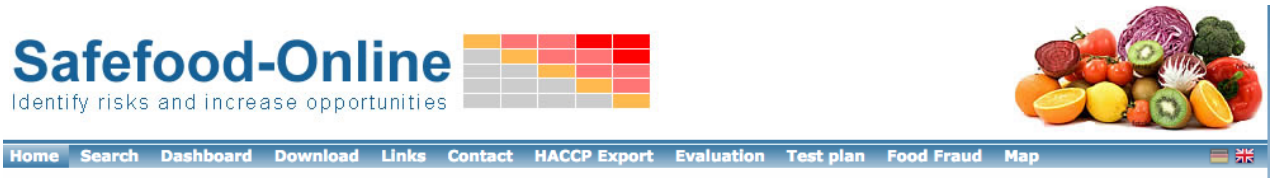
After the first opening of SAFEFOOD-ONLINE the following homepage screen appears:



By clicking on the "Test Version" tab, the functionality of SAFEFOOD-ONLINE can be tested without registration or Login.

For full use of the database it is necessary that you are registered. You can obtain your personal access from SAFEFOOD-ONLINE at www.safefood-online.de after logging in via "Registration". We are also happy to set up a free access for a limited period.

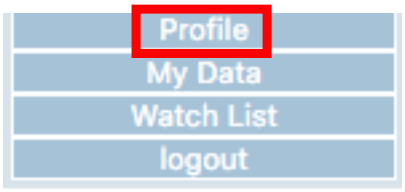
After the Login, the SAFEFOOD-ONLINE Main Menu is changing:



4 First steps (after registration)

After the registration and the first Login it is recommended to make the following basic settings:

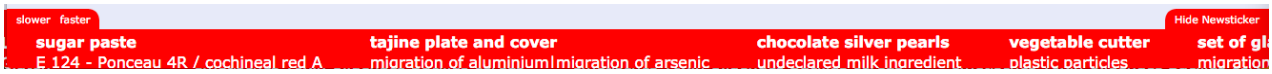
4.1 Adjusting the profile



- Enter or change password and personal data
- Subscribe to newsletter (yes/no)
- Watchlist Notify-Mail (yes/no):
- If you want to be informed automatically about newly added food/ animal feed from the watchlist you have selected, set the display to YES. You will then get an e-mail as soon as a food/ animal feed has been added.

4.2 News Ticker

On a daily basis, all new notifications added to SAFEFOOD-ONLINE are displayed in a banner as a news ticker at the bottom of the page. By clicking on the "Switch off news ticker" tab, the newsticker is closed (and can then be displayed again). The running speed is individually adjustable. If you click on a message, a window opens with details about the notification.



4.3 Creating a Watchlist

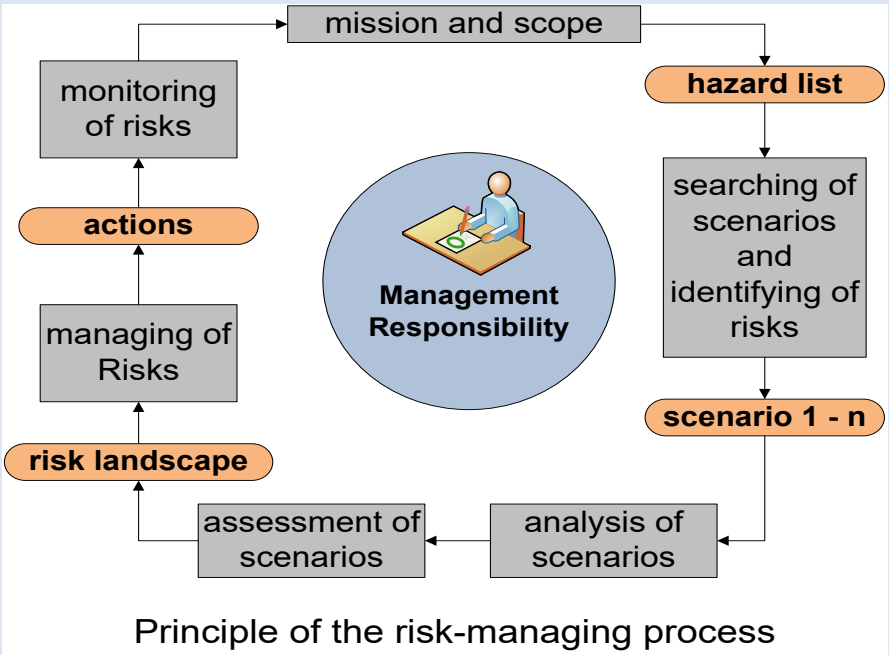
For detailed instructions on how to create your own watch list, refer to point 13: “Monitoring hazards using your own watch list”.

5 Risk management in the company

Risk management should be integrated into the existing management system of every company as part of the planning process and as a management instrument. Both management tools have to support each other. The aim of risk management is not to exclude and to avoid any thread. Risks are generally associated with economic activity and every business activity. The level of a risk, i.e. the product of the probability of occurrence and the extent of damage, can depend on many factors, which can also change at short notice. Therefore, risk assessment is only valid for a limited period of time. The identification and control of risks is possible with the help of the European Rapid Alert System (RASFF) and other available data. Existing risks must be identified quickly and efficiently in order to minimize and control the risks by appropriate measures.

SAFEFOOD-ONLINE applies all elements that belong to an efficient risk management system based on the DIN ISO 31000 and ONR Rule 4900 and thus fulfills the basic requirements for a risk management system for organizations from the perspective of product safety:

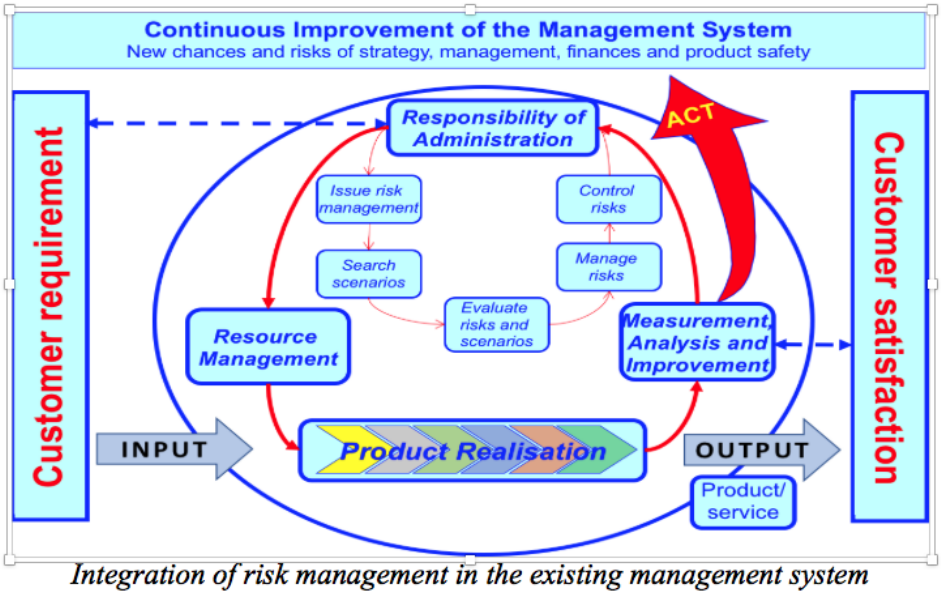
- DIN ISO 31000 Risk management - Principles and guidelines
- ONR 49001 Risk management for organizations and systems - Risk management - Implementation of DIN ISO 31000 in practice



Principle of the risk-managing process

All available and known information as well as own or already known incidents should be included in the risk assessment, e.g. the evaluation of all internal findings after incoming goods inspection, but also external reports from customers and/ or suppliers as well as facts which were known within the scope of an official complaint.
Each company can individually create its own risk landscape for a selected scenario from the information for the raw materials used and also for the final product where the ingredient was used. In this way, the key requirements of food law are implemented, with overall responsibility for the management of each company.

SAFEFOOD-ONLINE not only provides the available data, but also helps to assess the content of the risks. After analyzing, the results are shown and evaluated in a risk landscape.



Integration of risk management in the existing management system

6 Who should use SAFEFOOD-ONLINE?

6.1 The Quality Manager

The quality manager has the possibility to adapt the inspection plan in a way that known or realistically expected risks are minimized or can be controlled. Within the framework of the HACCP verification, which must be carried out at least once a year, the raw materials used and the end products manufactured can be re-evaluated. The results are giving answers to the following questions:

- Which hazards must be included in the specification?
- How should the internal test plan be drawn up in order to monitor effectively known hazards?
- How can the test plan be optimized on the basis of current knowledge?
- How can the requirements of IFS, BRC or ISO 22000 be fulfilled with regard to the determination of the hazards of raw materials used and how can the risks be minimized or controlled?

6.2 Purchase Manager

The knowledge and control of possible hazards starts with the selection of the raw materials to be procured and the selection of suppliers. It is important to consider all existing reports in SAFEFOOD-ONLINE. The database provides answers to the following questions:

- Which hazards are caused by which raw materials?
- Are there any hazards that point to a specific country?
- Which agreements can or must be made with suppliers?
- Which special measures are necessary to ensure fault-free raw materials?
- Are the suppliers aware of the hazards and are they controlled?

6.3 Product Development Manager

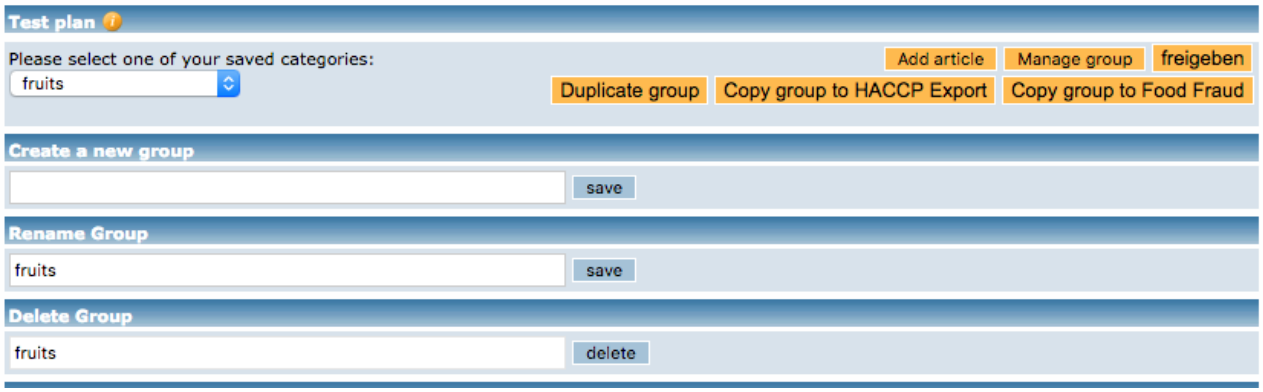
The risk assessment supports the product development manager in answering the following questions:

- What hazards are to be expected on the basis of the available data?
- Can or should certain raw materials be avoided?
- Do certain raw materials possibly have special risks that have to be taken into account?

7 Selection and grouping of articles

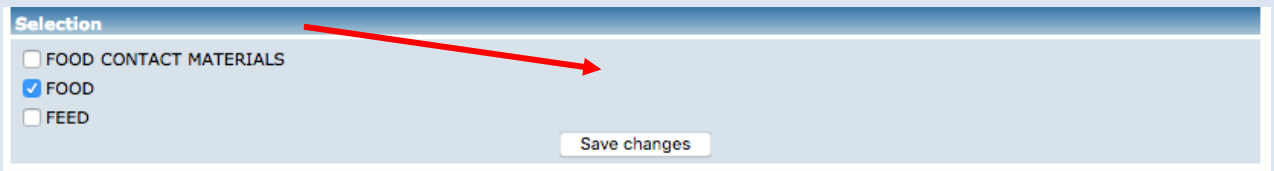
7.1 Managing groups of articles

After clicking on the tab "Test plan", "HACCP Export" or "Food Fraud" a window opens with two options: "Add article" and "Manage group". A new group can be created by pressing the button "Manage group". This group can be named freely (e.g. fruits). Any number of articles can be added to each group, which can then be exported later in a table. Each group can be extended by adding new articles (see point 7.2 Adding articles). The groups can also be renamed or deleted. The created groups are stored individually for each user and can be opened again at any time, so that a new evaluation can take place later.

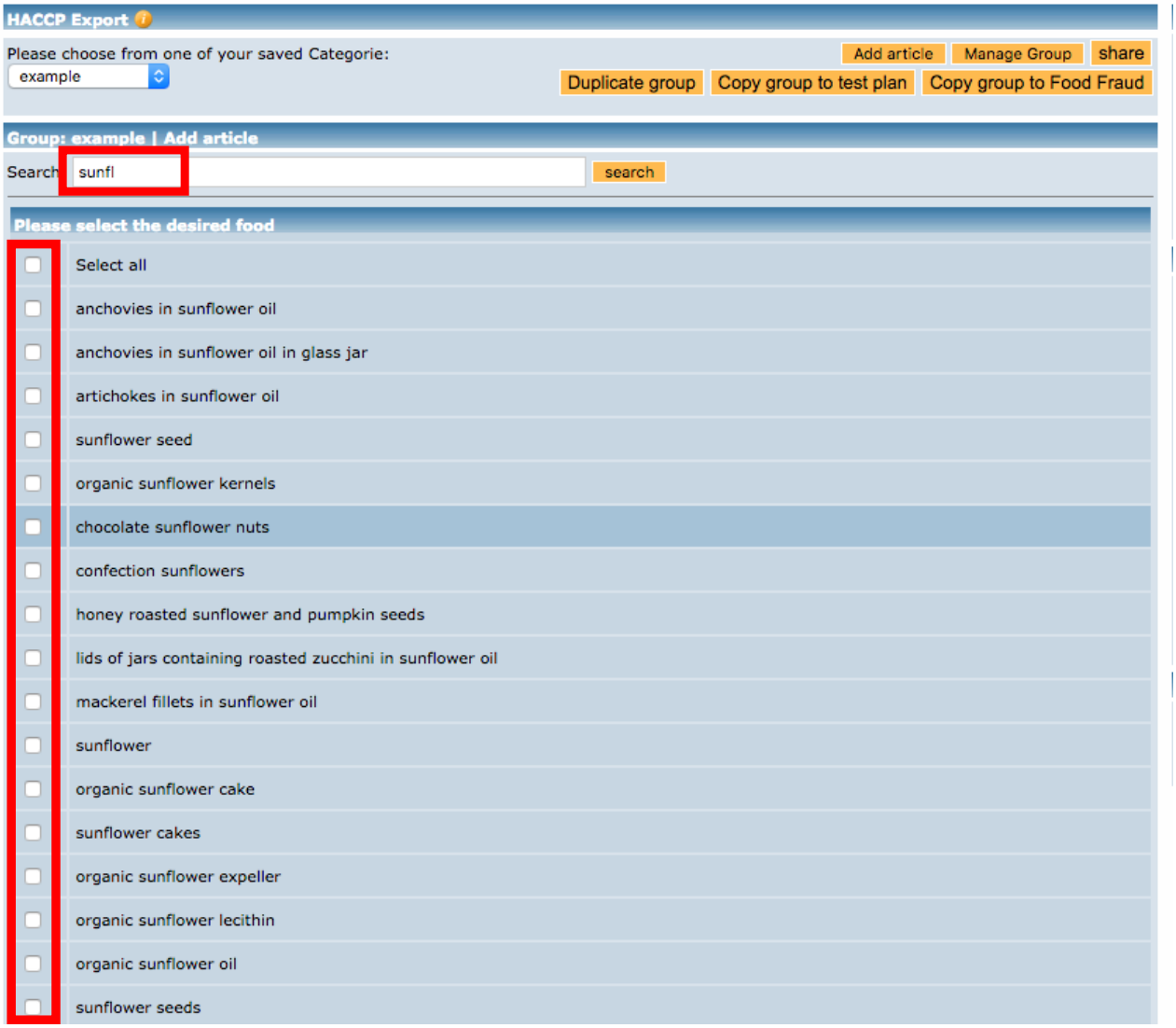


7.2 Adding of articles

Before articles are added to a group, a pre-selection of the data to be accessed must be made: "food" and/ or "food contact materials" and/ or "feed". The selection or changes made are then stored:



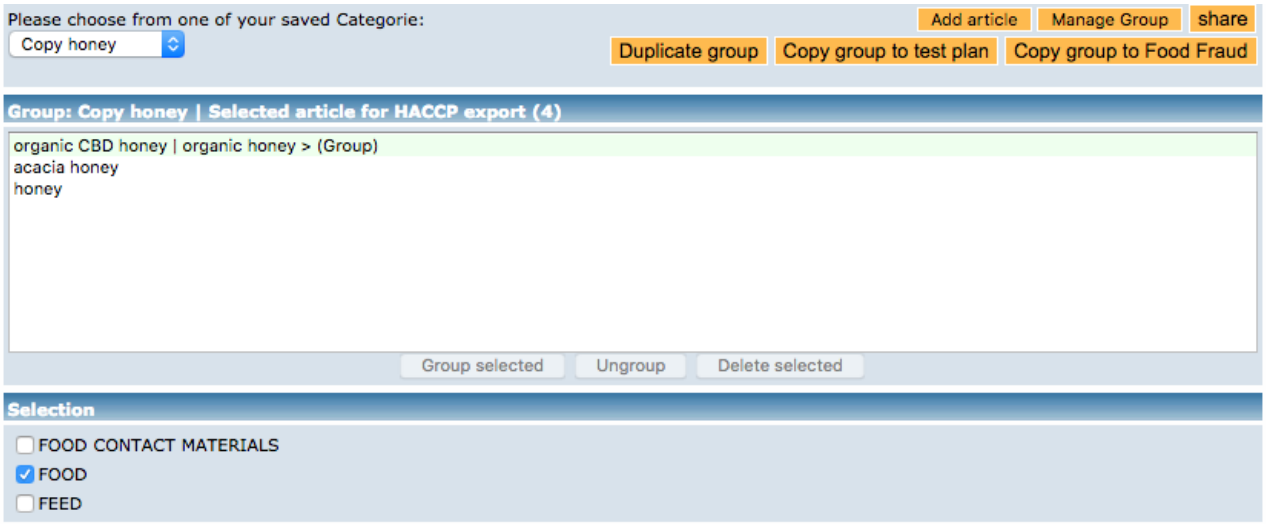
When adding articles, a window opens that lists all matches containing the entered term. It is also possible to enter only a part of the term (article). In the following example “sunfl” was searched:



At the end of the list all results are displayed, in which the selected term is contained in the data set, but not in the word of the article itself. In this way, further articles can also be loaded into the export.

7.3 Grouping of articles

Due to the large number of notifications, it may be useful to group individual articles together. These self-compiled groups facilitate the query: For the next time only the group has to be edited and not every single article. However, this only makes sense for similar articles. In the following example the articles organic-CBD honey and organic honey were grouped (by adding the reference ">(group)"):



7.4 Copy a group (to HACCP Export, Test Plan or Food Fraud)

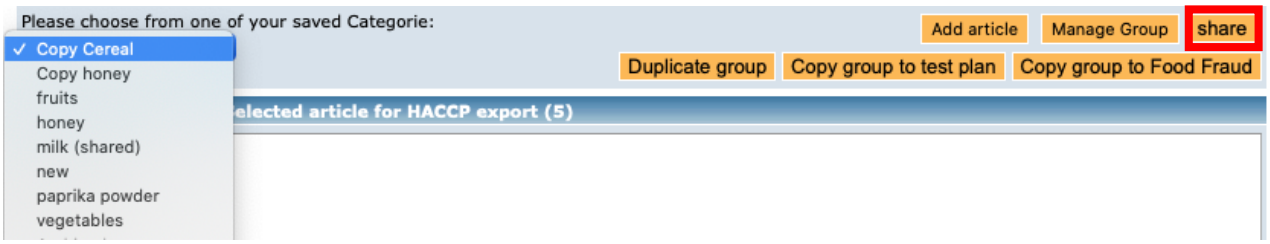
In the modules

- HACCP Export
- Test Plan
- Food Fraud

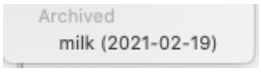
the defined groups can be copied into the other modules. This saves time due to repeated entries. The name of the copied group is not changed. Only the word "Copy" is added. In the example below, the group "Grain" was copied to the “HACCP Export" module:

7.5 Sharing a group (with other users in the same company)

For an efficient working in the company, groups can be shared with other users in the (own) company for use and editing.



In this example, the group "milk" has been shared with other users in the company by clicking on the "share" button. The user who gave the release sees this by the note "shared" with the appropriate group, here "Milk (shared)". In addition, a copy is created when the group is shared, this can be found under "Archived". In parentheses is the day of the release:

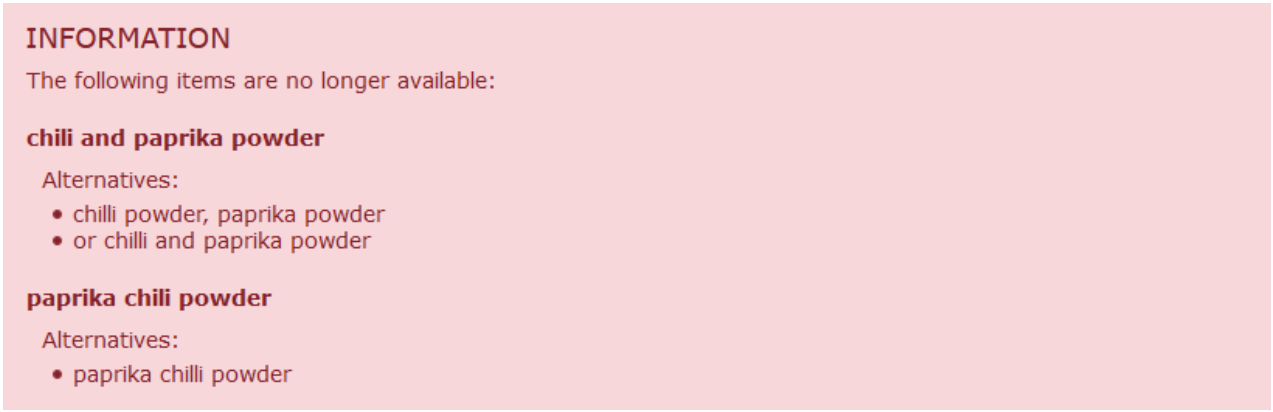


If desired, the archived group can be reactivated. To do this, first click on the archived group and then, in the now changed window, on the "Set group active" button.

The group will then reappear in the selection field with the same name as under "archived", i.e. with the addition of the day when the group was shared.
If a new group should be created on the basis of an existing group, the original group can be duplicated (button "Duplicate group"). The copied group can be renamed.

7.6 Update for the designation of foodstuffs

The content of the SAFEFOOD-ONLINE database is constantly reviewed and/ or updated. In this process, it may be necessary to update the food designation. This means that the old designation (if originally selected and saved in the modules HACCP Export, Test Plan and Food Fraud) cannot be longer found. In such cases, a corresponding note will be displayed:


INFORMATION

The following items are no longer available:

chili and paprika powder

Alternatives:

- chilli powder, paprika powder
- or chilli and paprika powder

paprika chili powder

Alternatives:

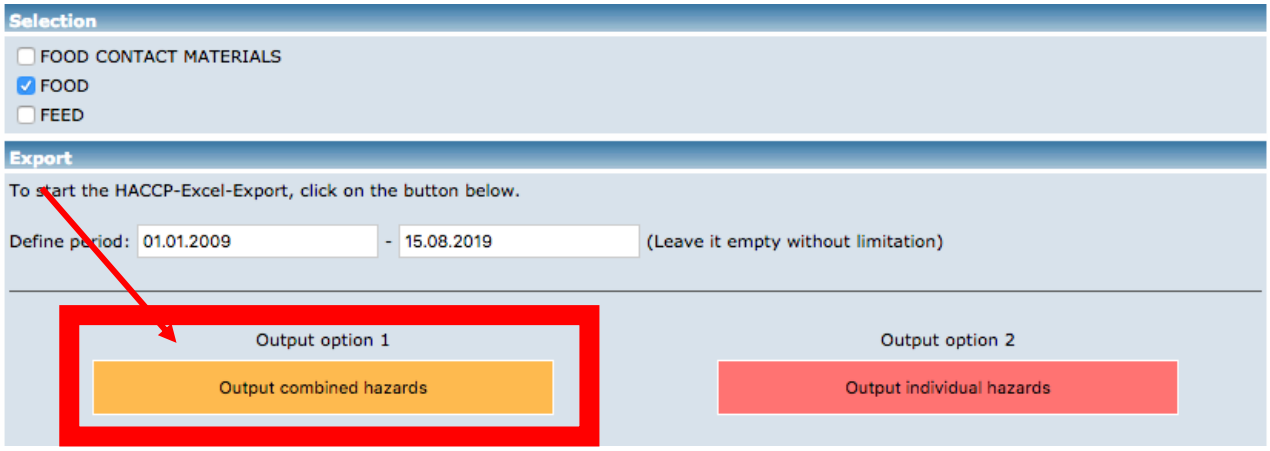
- paprika chilli powder

8 HACCP Export for articles

In the "HACCP Export" module, it is possible to create a HACCP export for food, food contact materials or animal feed on the basis of all messages available in the database.

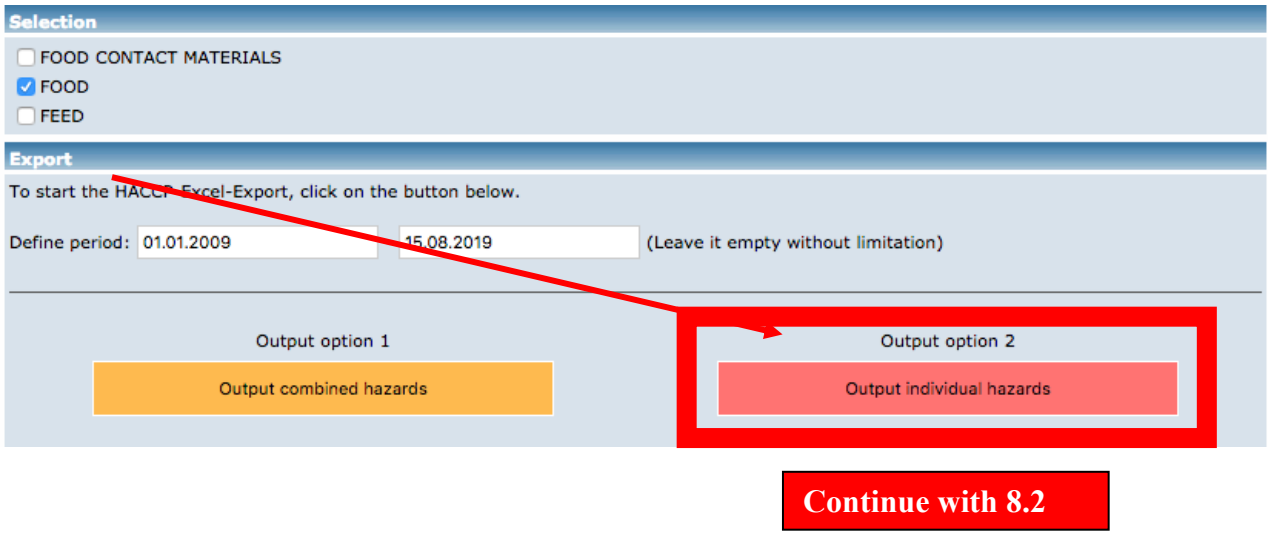
This tool has two options:

a) Output „with all combined hazards“ (see 8.1):
Here, all known hazards are summarized in a table.



Continue with 8.1

b) Output „with individual hazards“ (see 8.2).
Here all known hazards for each selected foodstuff are listed individually.
and displayed in a table:



Continue with 8.2

8.1 HACCP Export „with all combined hazards“ (Example)

With the query "With all combined hazards" in the "HACCP Export" module, it is possible to create a HACCP export on the basis of all notifications available in the database. During the query, all known hazards are summarized and displayed in a tablew).
In the first column of the Excel export article numbers (assigned by the company) can be entered. In the second column, the raw material for which the query was made is listed. The third column represents the known hazards with the number of notifications ("hits"). The division is done in such a way that all known hazards are displayed in a separate field. Multiple answers may be possible in this column if the hazards are named as combinations in different data records. Column four shows all countries of origin that are directly assigned to each hazard. Column 5 (RL 1) shows the risk class for the hazard in question (see also point 11 "Search": query for known hazards). Further explanations can also be found under item 11.4: "Result of search query (risk landscape)". Column 6 (RL 3) indicates the risk class in relation to the entire foodstuff and therefore this risk class is different from RL 1. In the last column "Corrective measures to control", the individual measures to control the hazard(s) can be entered according to HACCP based Codex Alimentarius.
Below is shown the result of the HACCP query (with all combined hazards) for honey. The query covers the period from 01.01.1979 to 08.01.2020. The available reports for the organic honey varieties were queried as a group (summary). See also the explanations under 7.3. (Grouping of articles). The risk class E5 for honey results from the risk matrix (see also item 11.4: "Result of the search query (risk landscape)"):

HACCP PLAN

for raw materials and feedstocks

safefood-online GmbH 19.02.2021

Safefood-Online
Identify risks and increase opportunities

The data output has been limited: 01.01.1979 - 19.02.2021
Selection: FOOD
Group: honey

Art.Nr	Raw material / feed	Known hazards	Country of origin	RL1	RL3	Corrective actions to control
	CBD honey	novel food cannabidiol (CBD), tetrahydrocannabinol (THC) [1]	Spain [1]	D1	D1	
	acacia honey	chloramphenicol [3]	Hungary [1], Argentina, China, Hungary [1], Moldova Republic of [1]	C2		
		sulfamethoxazole [2]	Poland [2]	C1		
		undeclared milk ingredient [2]	China [2]	B1		
		oxytetracycline [1]	Romania [1]	C1	E3	
		sulfathiazole [1]	Romania [1]	C1		
		tylosin [1]	Slovakia [1]	C1		
		sulfadimidine [1]	Slovakia [1]	C1		
		glass fragments [1]	Germany [1]	E1		
		nitrofurazone (SEM) [1]	Hungary [1]	C1		
		sulfadimethoxine [1]	Belgium [1]	C1		
		metronidazole [1]	Serbia [1]	C1		
	honey	chloramphenicol [26]	China [13], Spain [2], Ukraine [2], Portugal [2], India [2], Bulgaria [1], Turkey [1], Argentina [1], Vietnam [1], Russia [1]	C4		
		streptomycin [23]	Romania [5], Mexico [5], Vietnam [4], China [3], Brazil [1], Egypt [1], Italy, Spain [1], India [1], Argentina [1], Poland, Spain [1]	C3		
		sulfonamide [13]	Cyprus [9], Germany [1], Ukraine [1], Serbia [1], Turkey [1]	C3		
		sulfathiazole [11]	Bulgaria [3], Lithuania [2], Romania [2], Italy [1], Ukraine [1], Hungary [1], Mexico [1]	C3		
		nitrofurazone (SEM) [9]	Hungary [2], New Zealand [2], China [1], India [1], United Kingdom [1], Argentina [1], Ukraine [1]	C3		
		oxytetracycline [9]	Argentina [4], Israel [1], Bulgaria [1], Mexico [1], Guatemala [1], Vietnam [1]	C3		
		tylosin [8]	Argentina [5], Spain [1], Italy [1], Hungary [1]	C2		
		erythromycin [7]	China [7]	C2		
		1,4-dichlorobenzene [6]	New Zealand [4], Greece [2]	C2		
		dilution [6]	Italy [1], Thailand [1], China [1], Australia [1], Asia [1], South Africa [1]	B2		
		furazolidone (AOZ) [6]	Turkey [2], Argentina [2], Vietnam [1], Spain [1]	C2		
		lincomycin [5]	China [5]	C2		
		tetracycline [5]	Ukraine [2], Russia [1], India [1], Greece [1]	C2		
		ciprofloxacin, sulfadiazine, sulfamethoxazole, tetracycline, trimethoprim [4]	China [4]	C2		

		sulfamethoxazole [4]	Vietnam [2], Lithuania [1], India [1]	C2	
		metronidazole [3]	India [1], Guatemala [1], China [1]	C2	
		sulfamethoxazole, trimethoprim [3]	China [3]	C2	
		illegal improvement [3]	New Zealand [1], country not mentioned [1], France [1]	B2	
		illegal import [3]	Saudi Arabia [1], United States [1], Lebanon [1]	B2	
		adulterated health certificate(s) [3]	China [3]	B2	
		absence of health certificate(s) [3]	Moldova Republic of [1], United States [1], Australia [1]	B2	
		incorrect labelling [2]	Italy [2]	A1	
		sulfadimidine [2]	Turkey [1], Slovakia [1]	C1	
		unauthorised operator [2]	Italy [1], Ethiopia [1]	B1	
		adulterated use of identity marks [2]	France [2]	B1	E5
		novel food cannabidiol (CBD) [2]	Italy [1], country not mentioned [1]	B1	
		chloramphenicol, streptomycin, sulfamethazine [2]	Vietnam [2]	C1	
		ciprofloxacin [2]	China [2]	C1	
		adulteration [2]	India [1], China [1]	B1	
		improper documents [2]	Italy [2]	B1	
		furaltadone (AMOZ) [2]	Italy [1], Argentina [1]	C1	
		hydroxymethylfurfural (HMF) [2]	Hungary [1], Portugal [1]	C1	
		poor hygienic state [2]	Ukraine [2]	B1	
		glass fragments [2]	France [2]	E1	
		sulfathiazole, sulfadimethoxine, sulfadimidine [1]	Poland [1]	C1	
		dead insects, poor state of preservation [1]	Ukraine [1]	B1	
		undeclared lactose [1]	China [1]	B1	
		colour, illegal improvement [1]	Pakistan [1]	B1	
		chloramphenicol, sulfamethoxazole, trimethoprim [1]	China [1]	C1	
		oxytetracycline, streptomycin [1]	Argentina [1]	C1	
		sulfathiazole, tetracycline [1]	Italy [1]	C1	
		not suitable to contain food [1]	Argentina [1]	B1	
		chloramphenicol, streptomycin, sulfadiazine, tetracycline [1]	China [1]	C1	
		Paenibacillus spp. [1]	Germany [1]	E1	
		dihydrostreptomycin, streptomycin [1]	Moldova Republic of [1]	C1	
		Bacillus cereus, Clostridium perfringens [1]	France [1]	E1	
		dapsone [1]	Argentina, Latvia [1]	C1	
		substitution [1]	Italy [1]	B1	
		sulfamethoxazole, sulfathiazole [1]	Argentina [1]	C1	
		erythromycin, lincomycin [1]	China [1]	C1	
		illegal improvement, presence of unauthorized chemicals [1]	New Zealand [1]	D1	
		chloramphenicol, sulfadiazine [1]	Cyprus [1]	C1	
		chloramphenicol, nitrofurazone (SEM) [1]	India [1]	C1	
		streptomycin, tylosin [1]	China [1]	C1	
		absence of labelling, improper health certificate(s) [1]	Croatia [1]	B1	
		counterfeiting, substitution [1]	country not mentioned [1]	B1	
		counterfeiting, fraudulent use of identity marks [1]	United Kingdom [1]	B1	
		sulfathiazole, sulfadimethoxine [1]	Lithuania [1]	C1	
		defective packaging [1]	Ukraine [1]	B1	
		improper documents, unfit for human consumption [1]	Madagascar [1]	D1	
		Enterobacteriaceae [1]	Bulgaria [1]	E1	
		infested with insects [1]	Mexico [1]	B1	
		chloramphenicol, tetracycline [1]	Vietnam [1]	C1	
		streptomycin, sulfamethazine [1]	Vietnam [1]	C1	
		sulfadiazine [1]	China [1]	C1	
		plastic fragments [1]	Cameroon [1]	C1	

		improper documents, poor hygienic state [1]	Italy [1]	B1		
		oxytetracycline, tetracycline [1]	Vietnam [1]	C1		
		erythromycin, streptomycin [1]	China [1]	C1		
		presence of antibiotics [1]	Ukraine [1]	C1		
		sulfamethazine [1]	Chile [1]	C1		
		ciprofloxacin, erythromycin [1]	China [1]	C1		
		unsuitable transport conditions [1]	Moldova Republic of [1]	B1		
		Clostridium botulinum [1]	Argentina [1]	E1		
		sulfadimidine, sulphamerazine [1]	Mexico [1]	C1		
		furazolidone (AOZ), tylosin [1]	Argentina [1]	C1		
		improper packaging, poor hygienic state [1]	Ukraine [1]	B1		
		metronidazole, sulfonamide [1]	Ukraine [1]	C1		
		impurities [1]	Sri Lanka [1]	C1		
		isoglucose [1]	India [1]	C1		
		undeclared milk ingredient [1]	China [1]	B1		
		improper health certificate(s) [1]	China [1]	B1		
		metal fragments [1]	United Kingdom [1]	E1		
		chloramphenicol, streptomycin [1]	China [1]	C1		
		defective packaging, poor hygienic state [1]	Ukraine [1]	B1		
		pyrrolizidine alkaloids [1]	Mexico [1]	E1		
	Group organic CBD honey > organic honey	not suitable to contain food [2]	Ukraine [2]	B1	D2	
		furazolidone (AOZ) [1]	Argentina [1]	C1		
		novel food cannabidiol (CBD), tetrahydrocannabinol (THC) [1]	Croatia [1]	D1		
		dimetridazole [1]	Belgium [1]	C1		

RL1 = Risk category for individual risk, RL3 = Risk category for total Raw material / feed
* = own records

In this case, the query for honey results in "E5" and thus a critical risk, which is assigned to level 4. In the field "Corrective measures to control" the measures for each known hazard can now be entered individually.
The attached list with the recommended instructions for action should be an assistance to manage the identified risks for honey.

Risklevel	Recommended instructions
A1, A2, A3, A4 B1, B2, B3 C1, C2 D1	Level 1 The identified hazards are defined in the agreement / specification and must be excluded from the subcontractor in writing, so do not enter the hazard.
A5 B4 C3 D2 E1	Level 2 In addition to the agreement / specification requires the supplier for the goods delivered a certificate of analysis by an accredited laboratory to send it in confirming the adherence to the specified hazards or excluded.
B5 C4, C5 D3, D4 E2, E3	Level 3 In addition to confirm the information in stage 2, the supplier that this raw material / product do not come from the concerned country.
D5 E4, E5	Level 4 In addition to the steps 2 and 3, after delivery of the raw material sampled and analyzed this fixed in relation to the hazard (s) in an accredited la-boratory. The release of the raw material (food), done only once the analy-sis results as a positive release. Those suppliers are audited within a speci-fied timeframe (e.g. supplier audits).

The measures for the hazard "antibiotics: Streptomycin" could look like this:

a. The specification contains a reference to the limit value of streptomycin
b. The supplier must submit a certificate of analysis from an accredited laboratory that the delivered goods are within the threshold.
c. The supplier must indicate the country of origin. The following countries should be excluded if possible: Mexico, Romania, Vietnam, Italy, Spain, Argentina, Latin America, India, China and Egypt, as hazards are already known in these countries. The countries result from the query by SAFEFOOD-ONLINE (status: 11.07.2019).
d. After delivering, a representative sample is taken from the entire batch in order to have the sample analyzed in an accredited laboratory. The sample is only released if the values for streptomycin are below the threshold. An active release should always take place, i.e. the raw material remains blocked for further use until the result of the analysis is available. As part of supplier management, a supplier audit should be scheduled and repeated at regular intervals.

Background information on streptomycin in honey

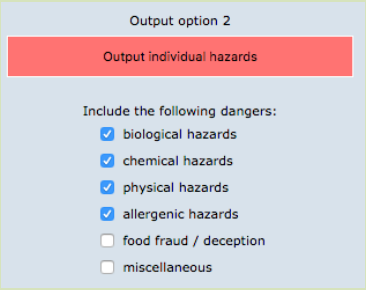
The antibiotic streptomycin is used today in particular to combat fire blight caused by bacteria (Erwinia amylovora) on pome fruit trees. Streptomycin is particularly effective against flower infections, which must be prevented in order to limit fire blight. Streptomycin obviously has the highest efficiency of all currently approved fire blight agents. The main entry of streptomycin occurs through direct hits by bees. In honey streptomycin is however nearly unlimited stable. Streptomycin is used under strict conditions. The use is only permitted to a limited extent during the flowering period and exclusively in fruit cultivation and in pome fruit stocks. The use must be documented. The threshold for streptomycin is 10 µg/kg. In 2008, in Germany especially in Baden-Württemberg more than 50% of all tested samples have been above the threshold. The highest value was analyzed with 114 µg/kg, i.e. 14 times higher. But also from abroad (especially Mexico, Romania and Argentina) were coming goods above the threshold, which must be particularly observed. Several tons of honey and food made from it had to be destroyed.

Tip: It is recommended to analyze all hazards exactly via the query function so that they can be correctly evaluated after the HACCP export.

8.2 Example HACCP Export „with individual hazards“

With the query "With individual hazards" in the "HACCP Export" module, it is possible to create a HACCP export for raw materials and animal feed on the basis of all notifications available in the database. When queried, all hazards are separated and displayed in a table (see the example for paprika powder).

Within the database there are currently six hazard categories:



These hazard categories are divided into further subgroups:

1. biological hazards (four additional subgroups)
2. chemical hazards (nine additional subgroups)
3. physical hazards (foreign bodies subgroup)
4. allergenic hazards (subgroup allergens)
5. fraud / deception (six additional subgroups)
6. other (five additional subgroups)

The positions 5 (Fraud/ Deception) and 6 (Miscellaneous) can be selected by placing a check mark.
In the first column of the Excel export the article numbers (assigned by the company) can be entered. In the second column, the raw material for which the query was made is listed. The third

column lists the hazards with the number of reports (hits). The division is done in such a way that all known hazards are displayed in a separate field. Multiple answers may be possible in this column if these hazards are named as combinations in different data records. Column four shows all countries of origin that are directly assigned to each known hazard. Column 5 (RL 1) shows the risk class for the hazard in question (see also item 11 "Search": Query for known hazards). Further explanations can be found under item 11.4: "Result of search query (risk landscape)". If the option "Output with individual hazards" is selected, a further risk class appears with RL2 (column 6). RL 2 determines the risk class for the group of the respective hazard category. In column 7 (RL 3), the risk class for the entire foodstuff is again indicated (the result can differ from risk class 1). In the last column "Corrective measures to control", the individual measures to control the hazard(s) can be entered according to HACCP based on Codex Alimentarius.
If there is no hazard, this is indicated in the analysis. These evaluations show conclusively that all potential hazards were considered. The allocation of the reports to the individual hazard categories results from the table "Presentation of results". See the HACCP query (with individual hazards) for paprika powder (the query covers the period from 01.01.1979 to 08.01.2020):

The data output has been limited: 01.01.1979 - 19.02.2021
Selection: FOOD
Group: paprika powder

Art.Nr	Raw material / feed	Known hazards	Country of origin	RL1	RL2	RL3	Corrective actions to control
	paprika powder	**biological hazards**			E3	E5	
		pathogenic micro-organisms					
		moulds [1]	China [1]	E1			
		Bacillus cereus [2]	Peru [1], Spain [1]	E1			
		Bacillus licheniformis [2]	Spain [1], United Kingdom [1]	E1			
		Salmonella muenchen [1]	Spain [1]	E1			
		Salmonella muenster [1]	China [1]	E1			
		Salmonella spp. [14]	country not mentioned [1], China [13]	E3			
		TSEs					
		not known					
		non-pathogenic micro-organisms					
		not known					
		insects / parasitic infestation					
		not known					
		chemical hazards			D5		
		biotoxins					
		not known					
		biocontaminants					
		not known					
		pesticide residues					
		not known					
		heavy metals					
		not known					
		hormones / residues of veterinary medicinal products					
		not known					
		chemical / industrial contamination					
		not known					
		mycotoxins					
		aflatoxins [19]	Israel [2], South Africa [1], Spain [5], Sweden [1], Peru [4], China [2], India [1], Ethiopia [2], Netherlands [1]	D3			
		ochratoxin A [25]	Peru [11], China [6], Spain [4], Ethiopia [2], Netherlands [1], Czech Republic [1]	D3			
		migration					
		not known					
		physical hazards			none		
		foreign bodies					
		not known					
		allergenic hazards			E1		
		allergens					
		undeclared almond [1]	Spain [1]	E1			
					E1		
		Fast Garnet [1]	Turkey [1]	E1			

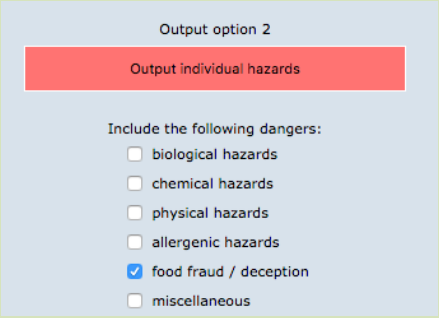
RL1 = Risk category for individual risk, RL2 = Risk category for group of hazard category, RL3 = Risk category for total Raw material / feed

At the end of the output list there is an Excel printout with a four-level recommendation list with possible instructions for the selected article(s). All HACCP exports can also be archived as a file:

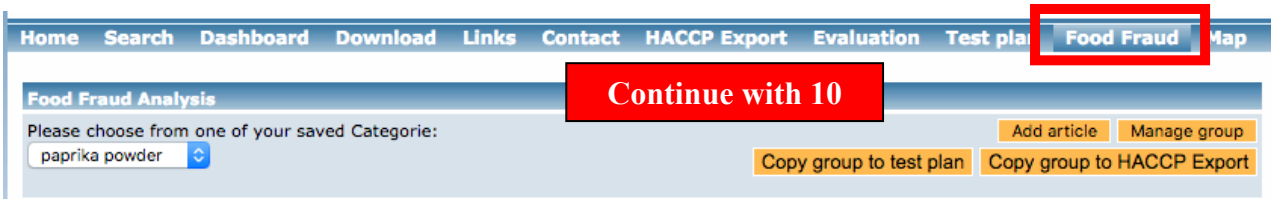
Risklevel	Recommended instructions
A1, A2, A3, A4 B1, B2, B3 C1, C2 D1	Level 1 The identified hazards are defined in the agreement / specification and must be excluded from the subcontractor in writing, so do not enter the hazard.
A5 B4 C3 D2 E1	Level 2 In addition to the agreement / specification requires the supplier for the goods delivered a certificate of analysis by an accredited laboratory to send it in confirming the adherence to the specified hazards or excluded.
B5 C4, C5 D3, D4 E2, E3	Level 3 In addition to confirm the information in stage 2, the supplier that this raw material / product do not come from the concerned country.
D5 E4, E5	Level 4 In addition to the steps 2 and 3, after delivery of the raw material sampled and analyzed this fixed in relation to the hazard (s) in an accredited la-boratory. The release of the raw material (food), done only once the analy-sis results as a positive release. Those suppliers are audited within a speci-fied timeframe (e.g. supplier audits).

Tip: It is recommended to analyze all hazards exactly via the query function so that they can be correctly evaluated after the HACCP export.

With the output option "with individual hazards" it is possible to select only "Food Fraud":



However, this query should not be used for Food Fraud Analysis, since in this case the questions of the Food Fraud module are not included. It is recommended to always use the Food Fraud module (see 10: "Food Fraud") for the Food Fraud Analysis:



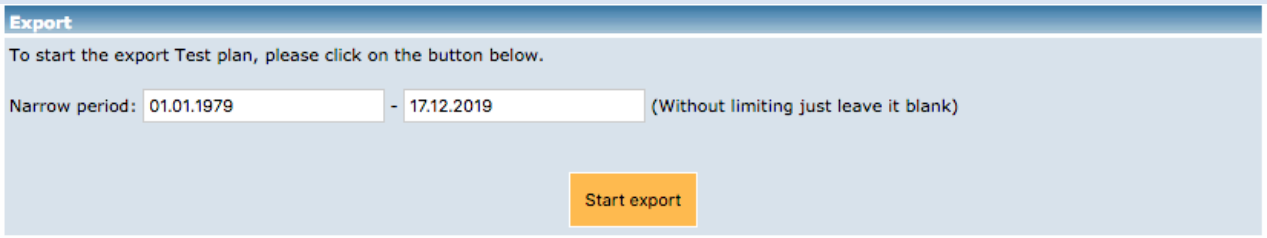
9 Test plan

With the "Test plan" module, it is possible to create an individual test plan for articles and also for final products based on all the notifications available in the database. All hazards are summarized and displayed in a table. This module is helpful to create or optimize a company-specific test plan.

As for the HACCP Export and Food Fraud modules, the articles for the test plan must first be selected. (See 7: "Selection and grouping of articles for HACCP export, Test plan and Food Fraud".

9.1 Example for a Test plan

After selecting the food, the (query) period must be selected. For a meaningful test plan, the period should cover at least 5 years. Afterwards the export can be started for a selected output:



See also the example below.
The hazards are displayed as four-level model (after calculation using a defined algorithm). The evaluation can change daily, if new data are added.
The evaluation provides suggestions for sampling and testing. This should be done at:

(1) each consignment (corresponds to the **classification "critical risks")**
(2) every second delivery (corresponds to the **classification "unacceptable risks")**
(3) twice a year (corresponds to the **classification "conditionally acceptable risks")**
(4) once a year. (corresponds to the **classification "acceptable risks"**)

Test plan

for raw materials and feedstocks

Safefood-Online
Identify risks and increase opportunities

safefood-online GmbH 01/03/2020

The data output was limited: 01.01.1979 - 03.01.2020
Selection: FOOD
Group: paprika powder

paprika powder	Sampling and testing			
	each delivery	every second shipment	twice per year	once per year
Adulteration / fraud				
adulteration				B1
improper health certificate(s)				B2
Allergens				
undeclared almond			E1	
Composition				
Fast Garnet				C1
Food additives and flavourings				
E 160b - annato/bixin/norbixin				B2
Sudan 1			C3	
Sudan 3				C1
Sudan 4			C3	
colour Orange II				C1
Mycotoxins				
aflatoxins		D3		
ochratoxin A		D3		
Pathogenic micro-organisms				
Bacillus cereus			E1	
Bacillus licheniformis			E1	
Salmonella munchen			E1	
Salmonella spp.		E2		
Radiation				
irradiation				B1

The results are grouped according to the corresponding hazard categories. The list also shows the hazards occurred so far. The presentation of the results is only a proposal for test planning. The results are based on the valid RASFF data, which can be completed with data from the company.

10 Food Fraud (a significant food safety risk)

Food fraud is the deliberate placing on the market of adulterated food with the aim of achieving an economic advantage through consumer deception. They are also often referred to as "Economically motivated adulteration" (EMA). In a broader sense, this can also include fraud with food contact materials

There is currently no legal definition of food fraud. The GFSI (Global Food Safety Initiative) standard describes food fraud as:
"*a collective term encompassing the deliberate and intentional substitution, addition, tampering or misrepresentation of food, food ingredients or food packaging, labelling, product information or false or misleading statements made about a product for economic gain that could impact consumer health*".
The FDA (U.S. Food Drug Administration) describes EMA as:
"*fraudulent, intentional substitution or addition of a substance in a product for the purpose of increasing the apparent value of the product or reducing the cost of its production, i.e., for economic gain*".

Food fraud therefore represents a significant food safety risk that must be managed, mitigated or eliminated.

In recent years there have been a number of incidents involving i.e. olive oil, fish, organic products, milk, cereals, honey, maple syrup, coffee, tea and spices. The "horse meat scandal" is not one of the top ten incidents because - in contrast to public/press perception - it was of little economic relevance. The German Federal Ministry of Justice and Consumer Protection is currently investigating how an early warning system can be developed on a scientific basis that identifies incentives to deceive consumers. With such a system, so far not existing, authorities would be able to proactively prevent suspected deceptions as well as the health risks associated with deception in food production. The systematic observation of product volumes, price changes and goods flows can provide the basis for this. The internet site "www.lebensmittelklarheit.de" could be a first approach for this.

10.1 Requirements from existing GFSI-standards

Requirements from GFSI:

Here aspects must be taken into account which go beyond the traditional view of the production of safe food. In the Guidance Document "Tackling Food Fraud Through Food Safety Management Systems" (https://www.mygfsi.com/files/Technical_Documents/201805-food-fraud-technical-document-final.pdfd), the GFSI (Global Food Safety Initiative) published requirements on food fraud.

The GFSI recommends two main steps:

(1) Vulnerability assessment
The standard requires the organization to have a documented vulnerability assessment for food fraud to identify potential vulnerabilities and to prioritize measures to address food fraud vulnerabilities.

(2) Food Fraud Mitigation plan (Control plan):
The standard requires the organization to have a documented plan that defines the control measures the organization has implemented to mitigate public health risks associated with identified food fraud vulnerabilities.

This food fraud mitigation plan must be supported by the food safety management system of the organization.

Questions deriving from these requirements:

1) With a risk assessment it is checked how vulnerable is the production of the food to potential fraudulent measures.

2) Which control measures need to be implemented to mitigate this risk?

Requirements from IFS Food, Version 6.1

Criterion 4.4.4 (purchase):
The purchased raw materials, semi-finished products and packaging materials shall be checked in accordance with the existing specifications and justified by risk assessment for their authenticity. The schedule of these checks shall take into account, at a minimum, defined food safety and product quality risks.
The frequency and/ or scope of sampling shall be based on:
- the impact of the raw materials, semi-finished product and packaging materials on the finished products
- the supplier's status

Questions directly deriving from this requirement:

- Is there a test plan and how is the test plan updated?
- How are criteria regarding authenticity taken into account?

Criterion 5.6.7 (product analysis):
The testing plan shall be regularly reviewed and updated, based on results, changes to legislation or issues that may have an impact on product, safety, quality or legality.

Linked to the requirements of criterion 5.6.7 there are additional questions and references as follows:

If an alarm system informs that a raw material from a certain country regularly contains a hazardous substance and if the company buys this raw material, the company must increase the frequency of analyses of this raw material in order to improve monitoring. However, if the analysis always produces good results and if the raw material is known to be low risk, the company may decide to reduce the frequency of analysis.

Criterion 4.20.1 (Food Fraud)
The responsibility for food fraud vulnerability assessment and mitigation plan shall be clearly defined. The responsible person(s) shall have the appropriate specific knowledge and full commitment from the senior management.

Criterion 4.20.2 (Food Fraud)
A documented food fraud vulnerability assessment shall be undertaken on all raw materials, ingredients, packaging materials and outsourced processes, to determine the risk of fraudulent activity in relation to substitution, mislabelling, adulteration or counterfeiting. The criteria considered within the vulnerability assessment shall be defined.

Criterion 4.20.3 (Food Fraud)
A documented food fraud mitigation plan shall be developed, with reference to the vulnerability assessment, and implemented to control any identified risks. The methods of control and monitoring shall be defined and implemented.

Criterion 4.20.4 (Food Fraud)
The food fraud vulnerability assessment shall be regularly reviewed, at least annually, and/ or in the event of increased risks. If necessary, the food fraud mitigation plan shall be revised/ updated accordingly.

Requirements from BRC Food, Version 8

Criterion 5.4.1
The company shall have processes in place to access information on historical and developing threats to the supply chain which may present a risk of adulteration or substitution of raw materials (i.e. fraudulent raw materials). Such information may come from, for example:
• trade associations
• government sources
• private resource centres.

Criterion 5.4.2
A documented vulnerability assessment shall be carried out on all food raw materials or groups of raw materials to assess the potential risk of adulteration or substitution. This shall take into account:

• historical evidence of substitution or adulteration
• economic factors which may make adulteration or substitution more attractive
• ease of access to raw materials through the supply chain
• sophistication of routine testing to identify adulterants
• the nature of the raw material

The output from this assessment shall be a documented vulnerability assessment plan. This plan shall be kept under review to reflect changing economic circumstances and market intelligence which may alter the potential risks. It shall be formally reviewed annually.

Criterion 5.4.3
Where raw materials are identified as being at particular risk of adulteration or substitution, the vulnerability assessment plan shall include appropriate assurance and/or testing processes to mitigate the identified risks.

Criterion 5.4.4
Where products are labelled or claims are made on finished packs which are dependent on the status of a raw material, the status of each batch of the raw material shall be verified. These claims include:

• specific provenance or origin
• breed/varietal claims
• assured status (e.g. Global G.A.P.)
• genetically modified organism (GMO) status
• identity preserved
• named specific trademarked ingredients.

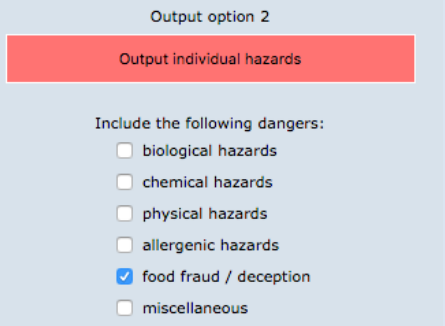
The facility shall maintain purchasing records, traceability of raw material usage and final product packing records to substantiate claims. The site shall undertake documented mass balance tests at a frequency to meet the particular scheme requirements or at least every 6 months in the absence of a scheme-specific requirement.

Criterion 5.4.5
Where claims are made about the methods of production (e.g. organic, halal, kosher) the site shall maintain the necessary certification status in order to make such a claim.

Criterion 5.4.6
The process flow for the production of products where claims are made shall be documented and potential areas for contamination or loss of identity identified. Appropriate controls shall be established to ensure the integrity of the product claims.

Conclusion:
There are of course many options for a risk assessment and to define corresponding control measures to be implemented in the company in order to mitigate this risk. With SAFEFOOD-ONLINE this is possible in an easy way. Either the analysis can be done within the HACCP analysis or with the Food Fraud Tool developed especially for this purpose.

Remark:
With output option 2 (output with individual hazard categories) in the "HACCP Export" module (see also 8.2), it is possible to select only "Food Fraud":



This query should not be used for Food Fraud analysis, since in this case the questions of the Food Fraud module are not taken into account. It is recommended to always use the Food Fraud module for Food Fraud Analysis.

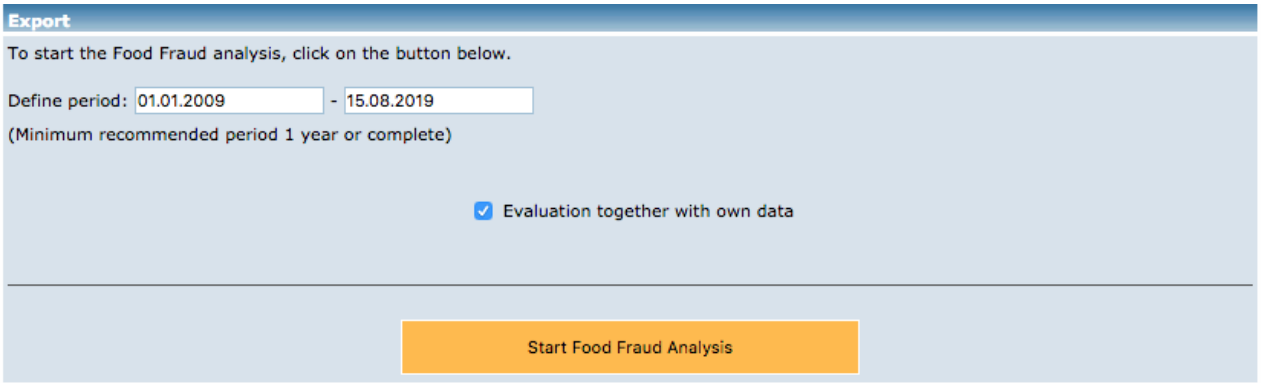
The following notifications are included in the "Food Fraud" query:

- **Irradiation** (irradiated food)
- **GMO** (notifications concerning genetically modified organisms or foodstuffs)
- **novel food**
- **Fraud** (e.g. illegal import)
- **Colours** (illegal addition or incorrectly labelled food)
- **Composition** (e.g. admixtures in the recipe or directly to the food)
- **Labelling** (e.g. incorrect labelling or falsified health certificates)

10.2 Vulnerability assessment Food Fraud

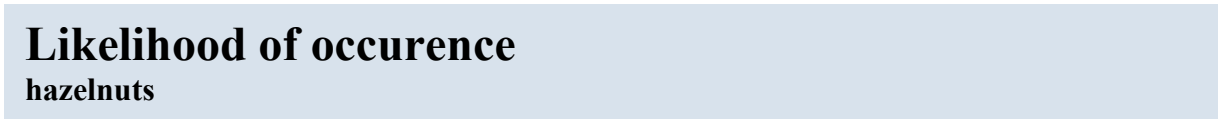
As for the HACCP Export and Food Fraud modules, the articles for the test plan must first be selected. The selection of articles is described under 7 "Selection and grouping of articles for HACCP export, test plan and food fraud".

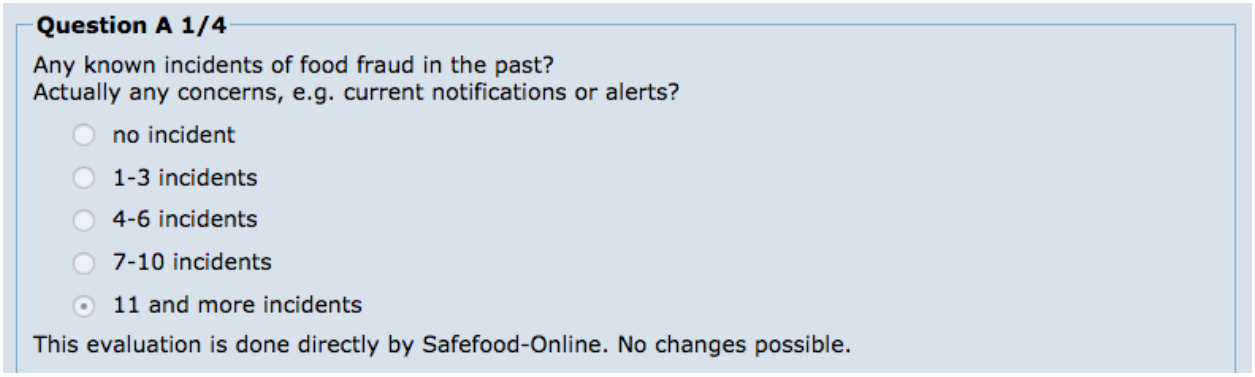
After the selection has been completed, the export can be started:



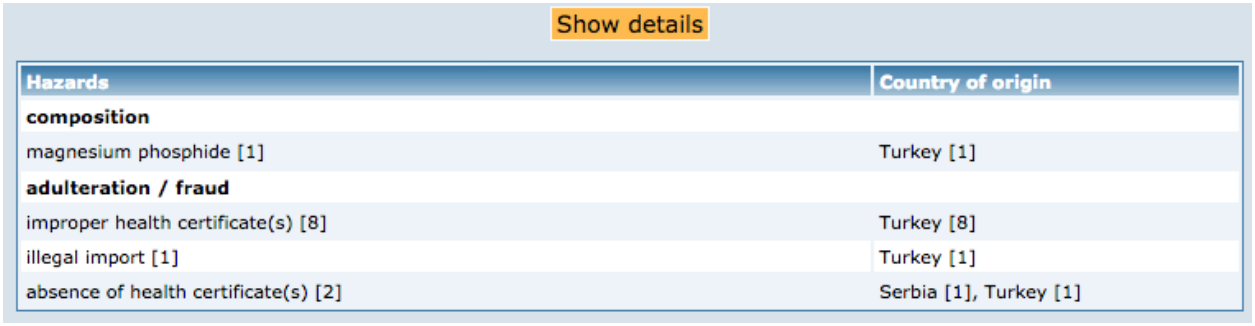
10.2.1 Vulnerability assessment example hazelnuts

10.2.1.1 Questions regarding likelihood of occurrence: example hazelnuts

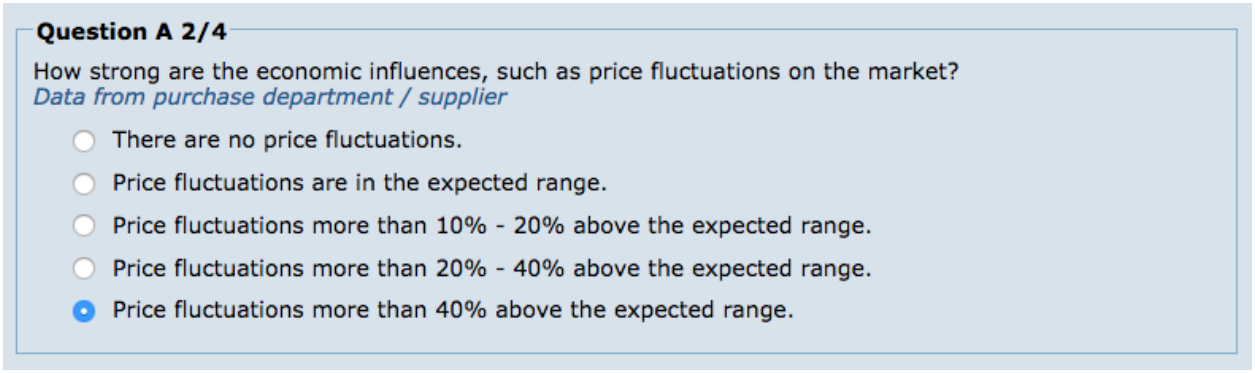


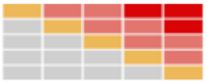


The following known hazards can be shown when the details are displayed:



Remark: In this query for "hazelnuts", the highest level in question A 1/4 already indicates the highest probability of occurrence (the highest risk). In this case, the other questions about the likelihood of occurrence have no influence. The results are later shown in the risk matrix. If, for example, 4-6 incidents were identified as a result, the following three questions can "increase" the probability of occurrence (risk increases).





Question A 3/4

From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?

Select the country of origin for the raw material::

× Azerbaijan × Georgia × Italy × Turkey

several countries can be selected, according to a worst case scenario, the worst rating is used

- ○ no risks
- ○ acceptable risks
- ○ conditionally acceptable risks
- ○ unacceptable risks
- ◉ critical risks

This evaluation is carried out by Safefood-Online using the Corruption Perceptions Index (CPI) and the Global Competitiveness Index (GCI). No change possible.

Question A 4/4

What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?

Assessment of QM / QS and purchasing

- ○ large market, raw material always available, regardless of the time of harvesting.
- ○ The market is well manageable. Raw material is not so valuable and there are many suppliers.
- ○ Procurement is possible all year round. There are rarely bottlenecks.
- ○ Raw material is bought only by dealers.
- ◉ The market is small, often intransparent and there are only few suppliers. Raw materials are very expensive.

For each question an answer must be clicked before proceeding to the step likelihood of detection:

Next step: likelihood of detection

10.2.1.2 Questions regarding likelihood of detection: example hazelnuts

Likelihood of detection
hazelnuts

Question E 1/4

What's the transportation route? How are the raw materials packaged?
Are there tamper-evident closures / seals?

Answer from the incoming goods inspections and corresponding notifications

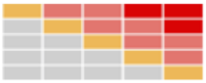
- (●) Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are no known damages.
- ( ) Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are 1 - 2 known damages.
- ( ) Tamper-evident closure always available and required. There are 3 - 10 incidents per year with damaged tamper-evident closures, seals or seals.
- ( ) Tamper-evident closure is missing frequently (more than 10 incidents per year) although required and mandatory.
- ( ) No tamper-evident closure available although required.

Question E 2/4

How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?

Is the supply chain known? The closer to the origin, the less risky.

- ( ) There are no known adulterations for the product and from an economic point of view it can be assumed that it makes little sense to adulterate the raw material.
  Since there are known incidents, this selection is not possible.
- (●) The raw material is directly purchased from the producer or trader. At least one of them is GFSI certified.
- ( ) The raw material is directly purchased from the producer who is classified as trustworthy (e.g. multi-year cooperation).
- ( ) Although the producer is known, he has never been visited and there are at least two intermediate stages to the production of the raw material that is procured.
- ( ) For the production process of the raw meterial from harvesting to the final product there is not much knowledge available, so that possible weak points cannot be recognized and evaluated.



Question E 3/4

Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?

- ○ There is an annual risk-oriented audit planning. The audits are addressing issues such as adulteration and fraud (including detection of such events), traceability, mass balance and ethical aspects that are fully met by suppliers.
- ○ Risk-based supplier audits are carried out. Issues such as adulteration and fraud (including the detection of such events) and ethical aspects are not (yet) are sufficiently addressed.
- ◉ Risk-based supplier audits are carried out. Topics such as adulteration and fraud (including the detection of such events) as well as ethical aspects are not sufficiently addressed and are not fully met by the supplier.
- ○ There are supplier audits, but these audits are not systematically planned and done situational.
- ○ There are no systematic, risk-based supplier audits.

Question E 4/4

Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?

Assessment of QM / QA

- ○ There are no known adulterations.
  Sience there are known incidents, this selection is not possible.
- ◉ A quick test / routine examination is available to determine the possible adulteration. The method is used in our company or at the supplier's side and is part of the inspection plan with a fixed interval.
- ○ Methods with authenticity tests are available, but they are very complex and cannot be carried out in our own laboratory.
- ○ An inspection plan exists laying down the detection method(s) according to a specified interval. External laboratories are also responsible to test for authenticity.
- ○ Although there are analytical methods to detect adulterations, they can only be carried out in a few specialized laboratories. These tests are very costly and are only used when adulterations or fraud are known or reported.

Complete

After clicking on the button “Complete” the following window appears:

Information

Your data has been saved and is now ready for evaluation.

Start FOOD Fraud Analysis Excel-Export

10.2.1.3 Evaluation using a Excel spread sheet

After the query is done an Excel spread sheet with 4 sheets is opened:

10.2.1.4 Sheet 1: Food Fraud Results

The first sheet summarizes all results of the selected group. This allows you to see at any time how the respective questions were answered. The colour indicates the classification in the risk matrix.

This Excel table can be extended as required, e.g. by the name of the supplier or the current price.

Food Fraud Incidents
for raw material, food-contact material, animal feed
safefood-online GmbH 21.06.2019

The data output has been limited to: 01.01.1979 - 21.06.2019
Selection: FOOD
The number of reported incidents is based on the above selection
Group: hazelnuts
Are there outsourced processes? Are packaging materials included?

Questions regarding likelihood of occurence

Name of the group	Selected article	Supplier	Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?					How strong are the economic influences, such as price fluctuations on the market?					From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?							What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?				
			no incident	1 - 3 incidents	4 - 6 incidents	7 - 10 incidents	11 and more incidents	There are no price fluctuations.	Price fluctuations are in the expected range.	Price fluctuations more than 10% - 20% above the expected range.	Price fluctuations more than 20% - 40% above the expected range.	Price fluctuations more than 40% above the expected range.	Country of origin (When selecting several countries, the worst rated country will be used).	Corruption Perceptions Index (CPI)	Global Competitiveness Index (GCI)	no risks	acceptable risks	conditionally acceptable risks	unacceptable risks	ethical risks	large market, raw material always available, regardless of the time of harvesting.	The market is well manageable. Raw material is not so valuable and there are many suppliers.	Procurement is possible at year round. There are rarely bottlenecks.	Raw material is bought only by dealers.	The market is small, often intransparent and there are only few suppliers. Raw materials are very expensive.
hazelnuts	hazelnuts						x					x	Azerbaijan, Georgia, Italy, Turkey	31	61.60					x					x

Questions regarding likelihood of current detection

What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?						How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?					Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?					Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?				
Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are no known damages.	Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are 1 - 2 known damages.	Tamper-evident closure always available and required. There are 3 - 10 incidents per year with damaged tamper-evident closures, seals or seals.	Tamper-evident closure is missing frequently (more than 10 incidents per year) although required and mandatory.	No tamper-evident closure available although required.		There are no known adulterations for the product and from an economic point of view it can be assumed that it makes little sense to adulterate the raw material.	The raw material is directly purchased from the producer or trader. At least one of them is GFSI certified.	The raw material is directly purchased from the producer who is classified as trustworthy (e.g. multi-year cooperations).	Although the producer is known, he has never been visited and there are at least two intermediate stages to the production of the raw material that is procured.	For the production process of the raw material from harvesting to the final product there is not much knowledge available, so that possible weak points cannot be recognized and evaluated.	There is an annual risk-oriented audit planning. The audits are addressing issues such as adulteration and fraud (including detection of such events), traceability, mass balance and ethical aspects that are fully met by suppliers.	Risk-based supplier audits are carried out, issues such as adulteration and fraud (including the detection of such events) and ethical aspects are not (yet) are sufficiently addressed.	Risk-based supplier audits are carried out. Topics such as adulteration and fraud (including the detection of such events) as well as ethical aspects are not sufficiently addressed and are not fully met by the supplier.	There are supplier audits, but these audits are not systematically planned and done situational.	There are no systematic, risk-based supplier audits.	There are no known adulterations.	A quick test / routine examination is available to determine the possible adulteration. The method is used in our company or at the supplier's side and is part of the inspection plan with a fixed interval.	Methods with authenticity tests are available, but they are very complex and cannot be carried out in our own laboratory.	An inspection plan exists laying down the detection method(s) according to a specified interval. External laboratories are also responsible to test for authenticity.	Although there are analytical methods to detect adulterations, they can only be carried out in a few specialized laboratories. These tests are very costly and are only used when adulterations or fraud are known or reported.
							x							x					x				

10.2.1.5 Sheet 2: Vulnerability assessment

In the second sheet, all selected articles in a risk matrix are sorted into the fields A1 to E5, depending on the risk assessment resulting from the analysis. The two evaluations of likelihood of occurrence and likelihood of detection are transferred to the matrix and entered in the corresponding field. This query tool only works if individual foods/food-contact materials and/ or animal feed are queried. For this reason, all groups are broken down into individual articles.

Regarding the classification the following rules are applied:

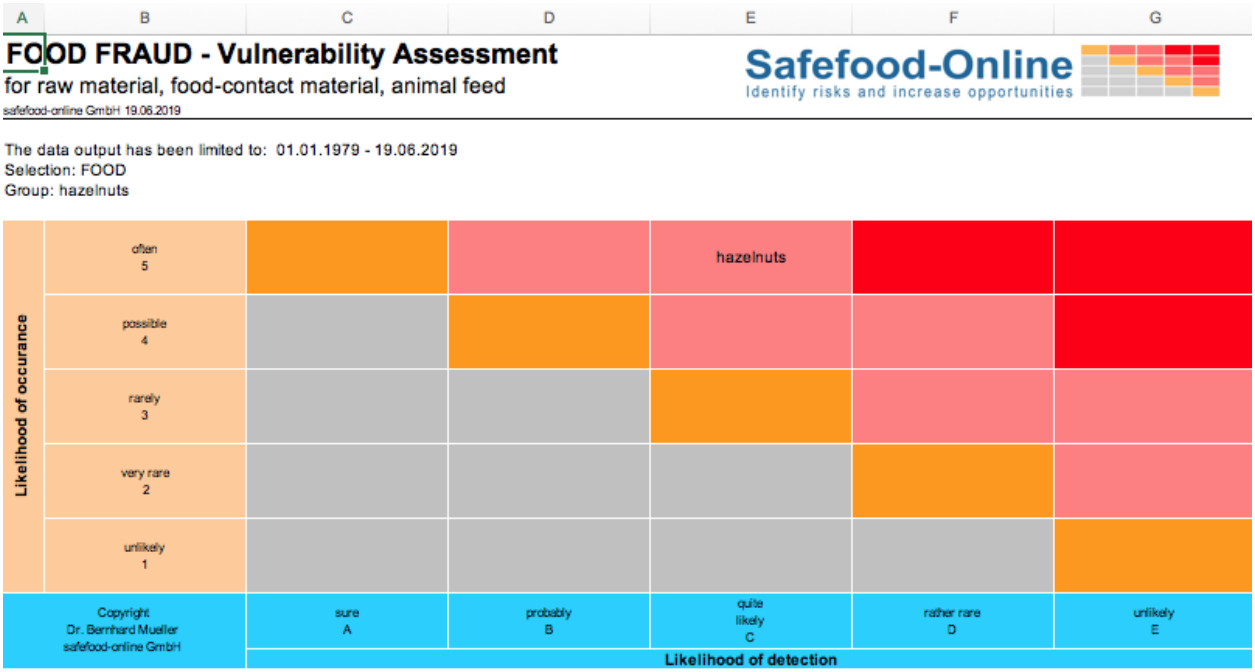
Likelihood of occurence:
field 1: unlikely
field 2: very rare
field 3: rarely
field 4: possible
field 5: often

At the end, the highest ranking of the four questions is adopted in the relevant field (1 - 5). The classification is resulting from answering all questions. The highest rating of the 4 questions is transferred to the corresponding field. The result for the two questions A 1/4 and A 3/4 results from the data already existing in Safefood-online.

Likelihood of detection
field A: sure
field B: probably
field C: quite likely
field D: rather rare
field E: unlikely

Also for the likelihood of detection, the highest rating of the four questions is transferred to the relevant field (A - E).

For the classification rules see 10.3.



10.2.1.6 Sheet 3: Mitigation plan

For every query, a list with "recommended instructions for the selected articles or groups" appears.

FOOD FRAUD - Mitigation Plan
for raw material, food-contact material, animal feed
safefood-online GmbH 19.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 19.06.2019
Selection: FOOD
Group: hazelnuts

hazelnuts

Question	Mitigation plan
Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?	Review the inspection plan so that the known counterfeits / fraud cases are detected as far as possible during the incoming goods inspection.
How strong are the economic influences, such as price fluctuations on the market?	If the price is permanently very volatile and/ or the prices are increasing significantly, an exchange of the raw material should be considered.
From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?	Choose, where feasible, countries of origin with a high CPI and a GCI as high as possible with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?	If the price is very volatile and/or the market is not transparent and there is little competition, an exchange of the raw material should be considered.
What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?	No further measures required.
How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?	No further measures required.
Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?	Further development of risk-based audit planning for suppliers based on estimated raw material risks. The frequency of supplier audits should be reassessed at least once a year through a hazard analysis and assessment of the associated risks. If adulterations and fraud are known, the audits should at least cover adulteration, traceability, mass balance and ethical issues. The audits may also cover the production of the raw materials.
Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?	No further measures required.

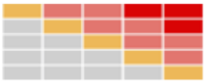
Point 3 lists the applicable rules for the **questions on the likelihood of occurrence (Questions A 1 - A 4) and on the likelihood of detection (Questions E 1 - E 4).**

At the end of each session, the data are stored and are now ready for evaluation. During the next analysis, the previously determined results can be re-evaluated and recalculated at any time. This can result in new recommendations and instructions for action. All results can also be processed electronically and archived after the download.

Important Note: Own Evaluation of the Instructions for Action
At the end of the list with the "instructions for action" there is the possibility to give your own evaluation. This own evaluation is very important, because even the best query tool does not replace the evaluation, which was checked again with common sense. For example, it is certainly not necessary for every container to have a tamper-evident seal when the complete load of a truck is delivered and the truck as such is sealed with a tamper-evident seal. Or another example: if a raw product is still in its original state, such as whole hazelnuts, then the probability of discovering that another shell fruit, such as peanuts, has been added, is certainly easy to detect. This is quite different with hazelnut flour and the possible addition of peanut flour or other components.

10.2.1.7 Sheet 4: Food Fraud Incidents:

On the fourth sheet, all known Food Fraud incidents for each article are shown in tabular form.



FOOD FRAUD - Incidents
for raw material, food-contact material, animal feed
safefood-online GmbH 24.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 24.06.2019
Selection: FOOD
Group: hazelnuts

Art.Nr	Article	Known hazards	Country of origin
	hazelnuts	**food fraud / deception**	
		radiation	
		not known	
		GMO	
		not known	
		novel food	
		not known	
		adulteration / fraud	
		absence of health certificate(s) [2]	Serbia [1], Turkey [1]
		illegal import [1]	Turkey [1]
		improper health certificate(s) [8]	Turkey [8]
		incorrect labelling [1]	Turkey [1]
		food additives and flavourings	
		not known	
		composition	
		magnesium phosphide [1]	Turkey [1]

* = Own records included

This list of food fraud incidents is identical to the list of details that can be displayed for question A 1/4.

Tip:
It is recommended to analyze all results accurately so that they can be evaluated correctly after the Food Fraud Export.

10.2.2 Vulnerability assessment example tuna

Start Food Fraud Analysis

10.2.2.1 Questions regarding likelihood of occurence: example tuna

Likelihood of occurence
tuna

Question A 1/4

Any known incidents of food fraud in the past?
Actually any concerns, e.g. current notifications or alerts?

- ○ no incident
- ○ 1-3 incidents
- ○ 4-6 incidents
- ○ 7-10 incidents
- ◉ 11 and more incidents

This evaluation is done directly by Safefood-Online. No changes possible.

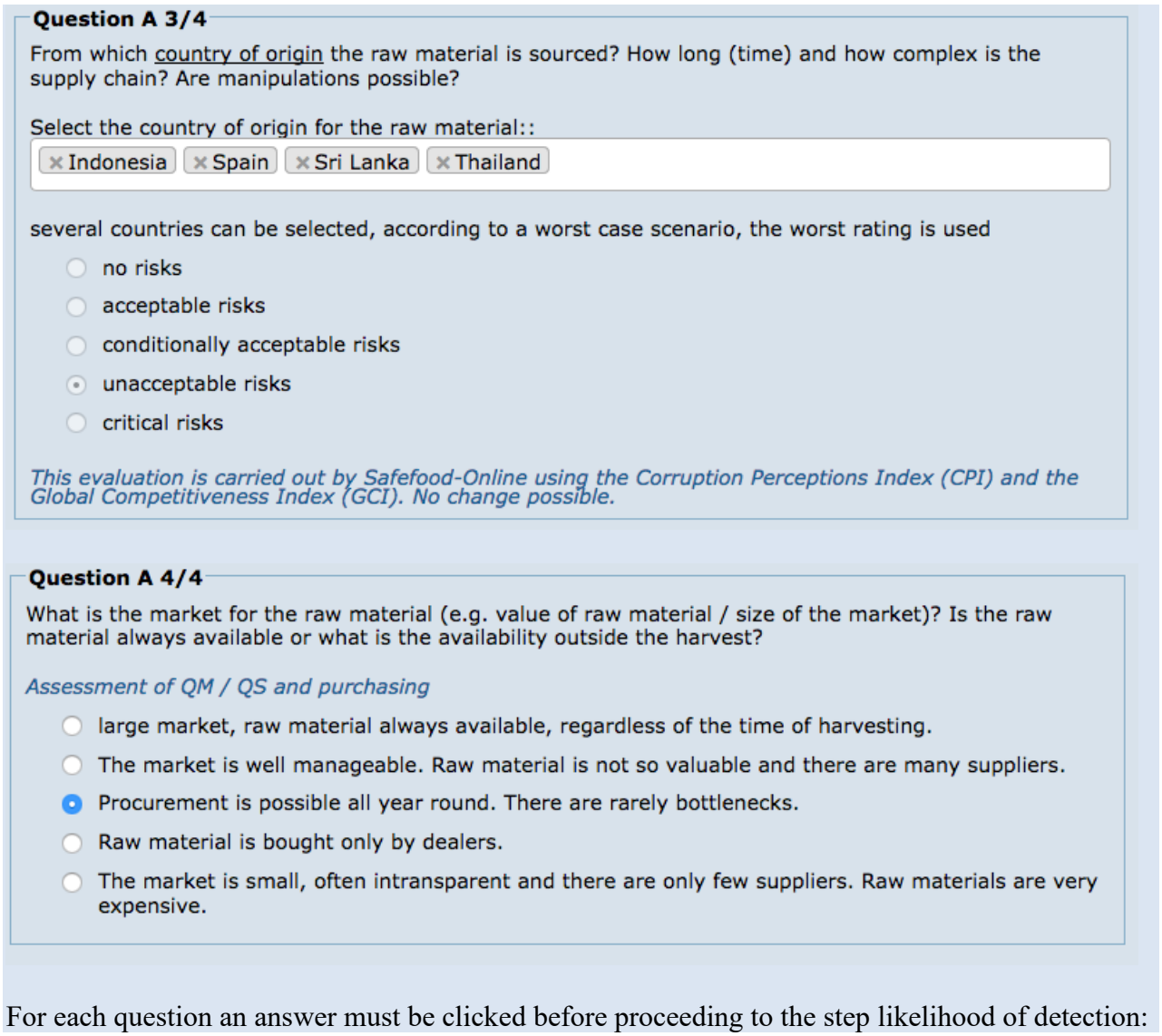
Show details

Note: In this query for "Tuna", the highest level in question A 1/4 is the highest likelihoodof occurrence (highest risk), as in the example under 2.1 Hazelnuts.

Question A 2/4

How strong are the economic influences, such as price fluctuations on the market?
Data from purchase department / supplier

- ○ There are no price fluctuations.
- ○ Price fluctuations are in the expected range.
- ◉ Price fluctuations more than 10% - 20% above the expected range.
- ○ Price fluctuations more than 20% - 40% above the expected range.
- ○ Price fluctuations more than 40% above the expected range.



For each question an answer must be clicked before proceeding to the step likelihood of detection:

Next step: likelihood of detection

10.2.2.2 Questions regarding likelihood of detection: example tuna

Likelihood of detection
Tuna

Question E 1/4

What's the transportation route? How are the raw materials packaged?
Are there tamper-evident closures / seals?

Answer from the incoming goods inspections and corresponding notifications

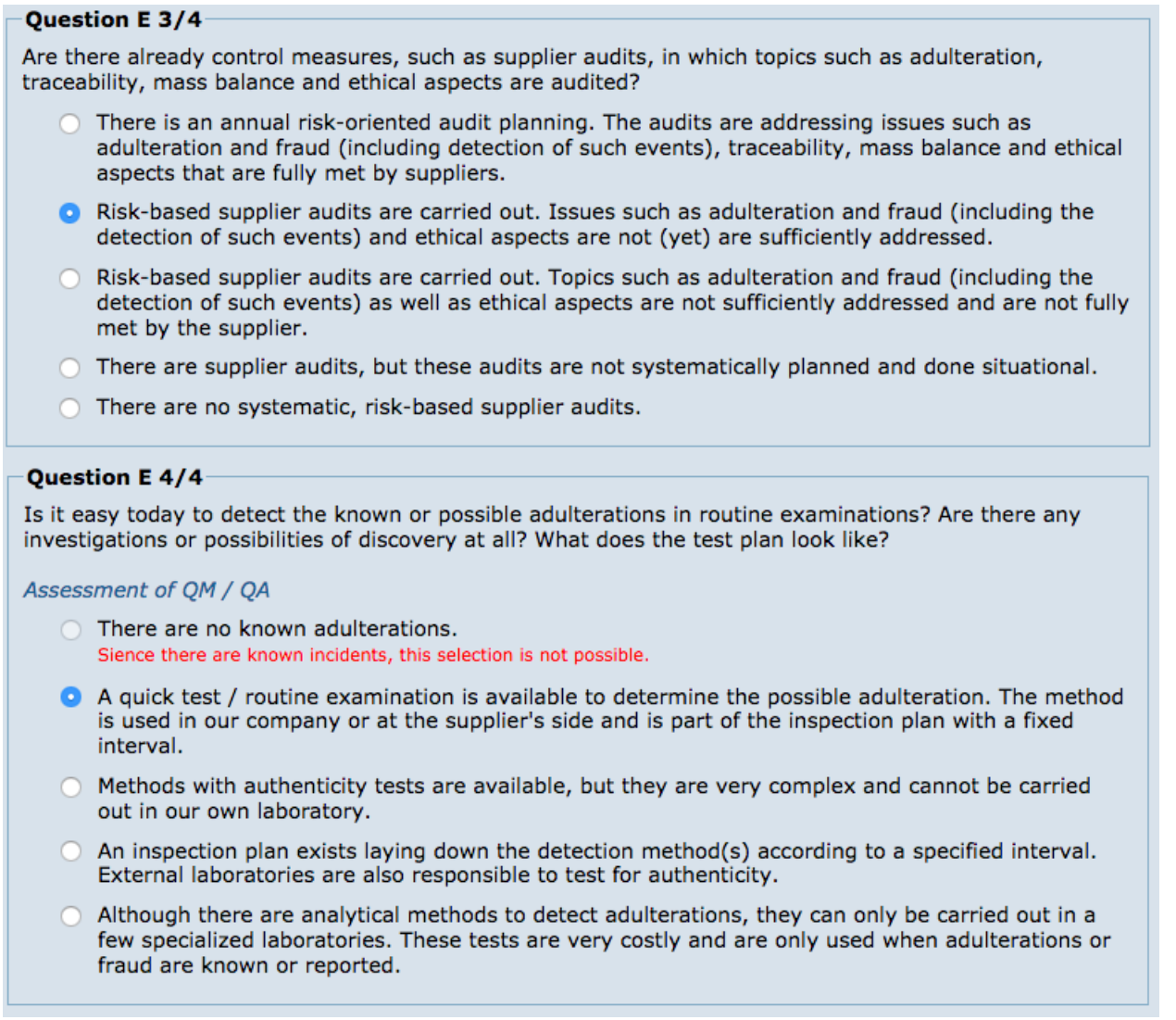
- (●) Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are no known damages.
- ( ) Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are 1 - 2 known damages.
- ( ) Tamper-evident closure always available and required. There are 3 - 10 incidents per year with damaged tamper-evident closures, seals or seals.
- ( ) Tamper-evident closure is missing frequently (more than 10 incidents per year) although required and mandatory.
- ( ) No tamper-evident closure available although required.

Question E 2/4

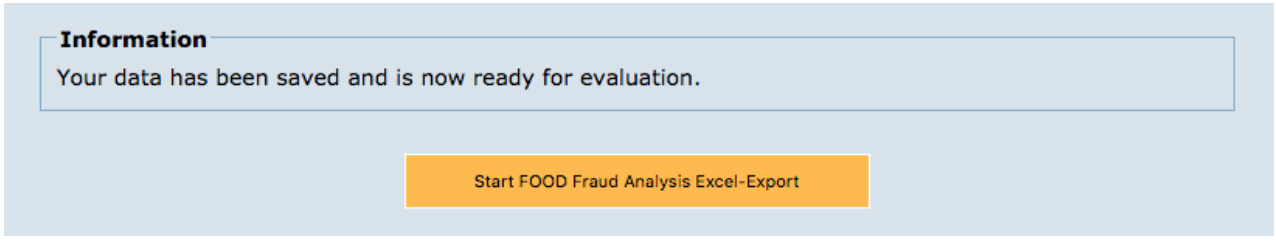
How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?

Is the supply chain known? The closer to the origin, the less risky.

- ( ) There are no known adulterations for the product and from an economic point of view it can be assumed that it makes little sense to adulterate the raw material.
  Since there are known incidents, this selection is not possible.
- ( ) The raw material is directly purchased from the producer or trader. At least one of them is GFSI certified.
- (●) The raw material is directly purchased from the producer who is classified as trustworthy (e.g. multi-year cooperation).
- ( ) Although the producer is known, he has never been visited and there are at least two intermediate stages to the production of the raw material that is procured.
- ( ) For the production process of the raw meterial from harvesting to the final product there is not much knowledge available, so that possible weak points cannot be recognized and evaluated.



After clicking on the button “Complete the following window appears:



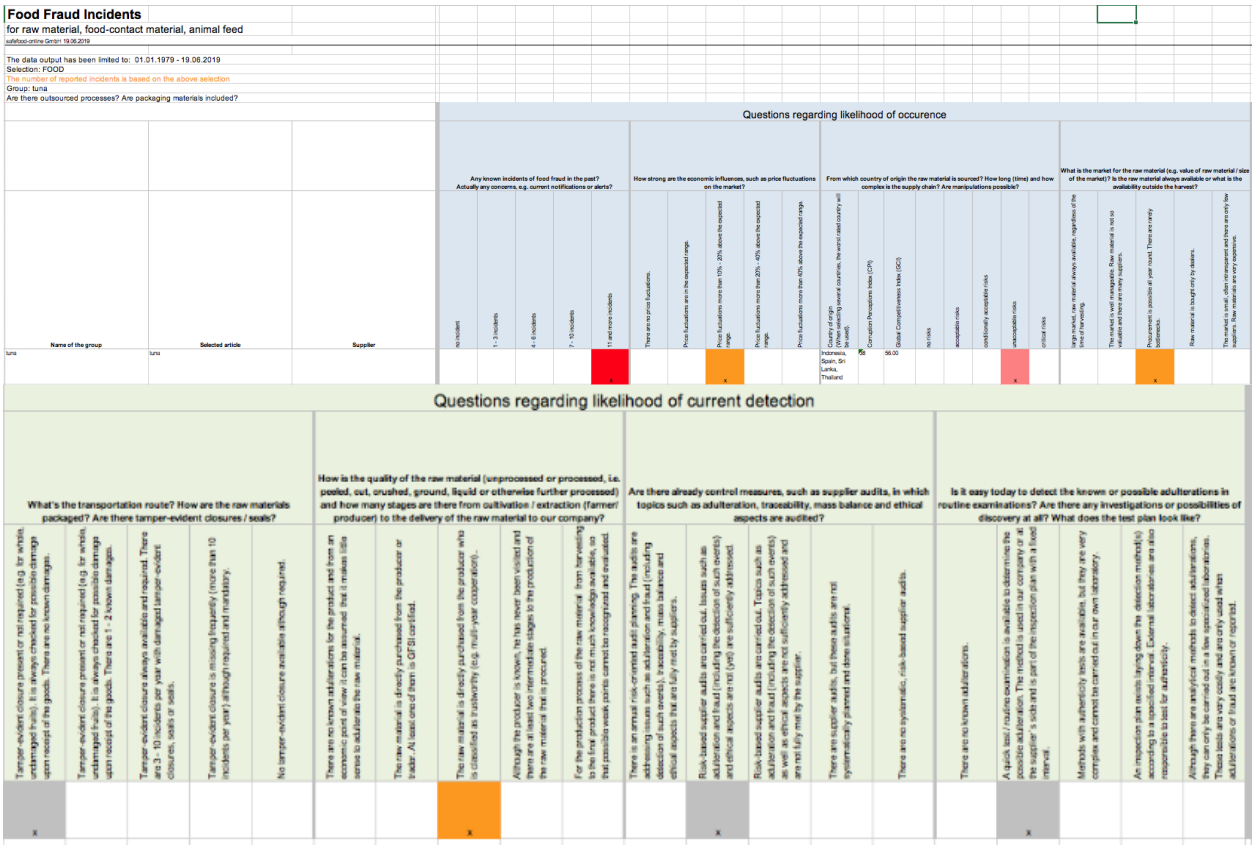
10.2.2.3 Evaluation using a Excel spread sheet

After the query is done an Excel spread sheet with 4 sheets is opened:

10.2.2.4 Sheet 1: Food Fraud Results

The first sheet summarizes all results of the selected group. This allows you to see at any time how the respective questions were answered. The colour indicates the classification in the risk matrix.

This Excel table can be extended as required, e.g. by the name of the supplier or the current price.



10.2.2.5 Sheet 2: Vulnerability assessment

In the second sheet, all selected articles in a risk matrix are sorted into the fields A1 to E5, depending on the risk assessment resulting from the analysis. The two evaluations of likelihood of occurrence and likelihood of detection are transferred to the matrix and entered in the corresponding field. This query tool only works if individual foods/food-contact materials and/ or animal feed are queried. For this reason, all groups are broken down into individual articles.

Regarding the classification the following rules are applied:

Likelihood of occurence:
field 1: unlikely
field 2: very rare
field 3: rarely
field 4: possible
field 5: often

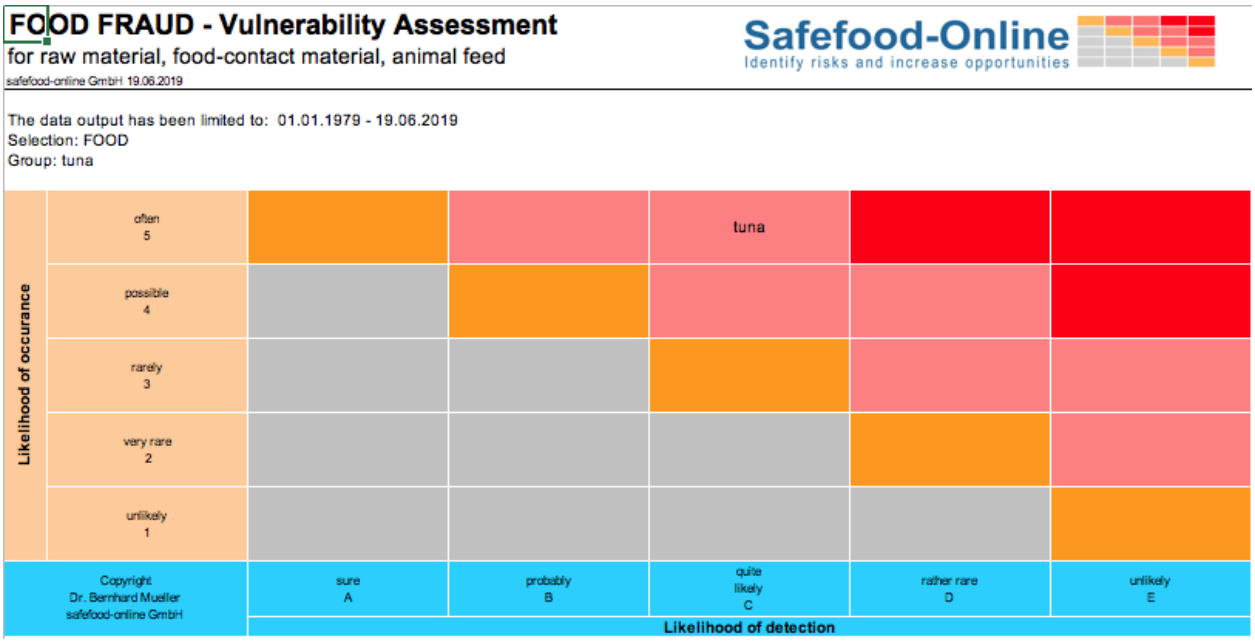
At the end, the highest ranking of the four questions is adopted in the relevant field (1 - 5). The classification is resulting from answering all questions. The highest rating of the 4 questions is transferred to the corresponding field. The result for the two questions A 1/4 and A 3/4 results from the data already existing in Safefood-online.

Likelihood of detection
field A: sure

field B: probably
field C: quite likely
field D: rather rare
field E: unlikely

Also for the likelihood of detection, the highest rating of the four questions is transferred to the relevant field (A - E).

For the classification rules see 10.3.



10.2.2.6 Sheet 3: Mitigation plan

For every query, a list with "recommended instructions for the selected articles or groups" appears.

FOOD FRAUD - Mitigation Plan
for raw material, food-contact material, animal feed
safefood-online GmbH 19.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 19.06.2019
Selection: FOOD
Group: tuna

tuna

Question	Mitigation plan
Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?	Review the inspection plan so that the known counterfeits / fraud cases are detected as far as possible during the incoming goods inspection.
How strong are the economic influences, such as price fluctuations on the market?	Continue tracking price development (volatility), check inspection plan for incoming goods inspection, adjust if necessary. If the price is very volatile and/ or the prices are significantly increasing, an exchange of the raw material should be considered.
From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?	Choose, where feasible, countries of origin with a high CPI and a GCI as high as possible with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?	No further measures required.
What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?	No further measures required.
How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?	Establish risk-based audit planning for suppliers based on estimated raw material risks. It is important to consider all stages of the supply chain.
Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?	Extension of the checklist for carrying out supplier audits covering the topics: adulteration, traceability, mass balance and ethical aspects.
Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?	No further measures required.
Own remarks:	

Point 3 lists the applicable rules for the **questions on the likelihood of occurrence (Questions A 1 - A 4) and on the likelihood of detection (Questions E 1 - E 4).**

At the end of each session, the data are stored and are now ready for evaluation. During the next analysis, the previously determined results can be re-evaluated and recalculated at any time. This can result in new recommendations and instructions for action. All results can also be processed electronically and archived after the download.

Important Note: Own Evaluation of the Instructions for Action
At the end of the list with the "instructions for action" there is the possibility to give your own evaluation. This own evaluation is very important, because even the best query tool does not replace the evaluation, which was checked again with common sense. For example, it is certainly not necessary for every container to have a tamper-evident seal when the complete load of a truck is delivered and the truck as such is sealed with a tamper-evident seal. Or another example: if a raw product is still in its original state, such as whole hazelnuts, then the probability of discovering that another shell fruit, such as peanuts, has been added, is certainly easy to detect. This is quite different with hazelnut flour and the possible addition of peanut flour or other components.

10.2.2.7 Sheet 4: Food Fraud Incidents:

On the fourth sheet, all known Food Fraud incidents for each article are shown in tabular form

FOOD FRAUD - Incidents
for raw material, food-contact material, animal feed
safefood-online GmbH 24.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 24.06.2019
Selection: FOOD
Group: tuna

Art.Nr	Article	Known hazards	Country of origin
	tuna	**food fraud / deception**	
		radiation	
		not known	
		GMO	
		not known	
		novel food	
		not known	
		adulteration / fraud	
		absence of health certificate(s) [3]	Thailand [2], Philippines [1]
		absence of labelling [1]	Portugal [1]
		fraudulent health certificate(s) [1]	Ecuador [1]
		improper health certificate(s) [2]	Senegal [1], Mozambique [1]
		improper shelf life [1]	Italy [1]
		counterfeiting [1]	Italy [1]
		incorrect labelling [2]	Ecuador [1], Spain [1]
		mislabelling [1]	Spain [1]
		unauthorised establishment [1]	Spain [1]
		food additives and flavourings	
		E 120 - carmines [1]	Sri Lanka [1]
		E 251 - sodium nitrate [1]	Spain [1]
		E 452 - polyphosphates [1]	Spain [1]
		composition	
		carbon monoxide treatment [27]	country not mentioned [1], Philippines [2], Indonesia [4], Vietnam [7], Netherlands [2], Poland [1], Thailand [1], Costa Rica [1], Maldives [1], Spain [7]
		E 260 - synthetic acetic acid [1]	Spain [1]

* = Own records included

Tip:
It is recommended to analyze all results exactly, so that they can be evaluated correctly after the Food Fraud Export.

10.2.3 Vulnerability assessment FOOD FRAUD example plastic bowls

Start Food Fraud Analysis

10.2.3.1 Questions regarding likelihood of occurence: example plastic bowls

Likelihood of occurence
Plastic bowls

Question A 1/4

Any known incidents of food fraud in the past?
Actually any concerns, e.g. current notifications or alerts?

- ○ no incident
- ◉ 1-3 incidents
- ○ 4-6 incidents
- ○ 7-10 incidents
- ○ 11 and more incidents

This evaluation is done directly by Safefood-Online. No changes possible.

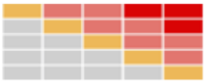
Show details

Note: With this query for "plastic bowls", the "highest" likelihood of occurrence (the highest risk) has not yet been reached with 1-3 incidents. The other questions about the likelihood of occurrence can, however, still influence the overall result (negatively). The results are later transferred to the risk matrix.

Question A 2/4

How strong are the economic influences, such as price fluctuations on the market?
Data from purchase department / supplier

- ○ There are no price fluctuations.
- ◉ Price fluctuations are in the expected range.
- ○ Price fluctuations more than 10% - 20% above the expected range.
- ○ Price fluctuations more than 20% - 40% above the expected range.
- ○ Price fluctuations more than 40% above the expected range.



Question A 3/4

From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?

Select the country of origin for the raw material::

× China × Germany

several countries can be selected, according to a worst case scenario, the worst rating is used

- ○ no risks
- ○ acceptable risks
- ◉ conditionally acceptable risks
- ○ unacceptable risks
- ○ critical risks

This evaluation is carried out by Safefood-Online using the Corruption Perceptions Index (CPI) and the Global Competitiveness Index (GCI). No change possible.

Question A 4/4

What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?

Assessment of QM / QS and purchasing

- ○ large market, raw material always available, regardless of the time of harvesting.
- ◉ The market is well manageable. Raw material is not so valuable and there are many suppliers.
- ○ Procurement is possible all year round. There are rarely bottlenecks.
- ○ Raw material is bought only by dealers.
- ○ The market is small, often intransparent and there are only few suppliers. Raw materials are very expensive.

For each question an answer must be clicked before proceeding to the step likelihood of detection:

Next step: likelihood of detection

10.2.3.2 Questions regarding likelihood of detection: example plastic bowls:

Likelihood of detection
Plastic bowls

Question E 1/4

What's the transportation route? How are the raw materials packaged?
Are there tamper-evident closures / seals?

Answer from the incoming goods inspections and corresponding notifications

- (●) Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are no known damages.
- ( ) Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are 1 - 2 known damages.
- ( ) Tamper-evident closure always available and required. There are 3 - 10 incidents per year with damaged tamper-evident closures, seals or seals.
- ( ) Tamper-evident closure is missing frequently (more than 10 incidents per year) although required and mandatory.
- ( ) No tamper-evident closure available although required.

Question E 2/4

How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?

Is the supply chain known? The closer to the origin, the less risky.

- ( ) There are no known adulterations for the product and from an economic point of view it can be assumed that it makes little sense to adulterate the raw material.
  Since there are known incidents, this selection is not possible.
- ( ) The raw material is directly purchased from the producer or trader. At least one of them is GFSI certified.
- ( ) The raw material is directly purchased from the producer who is classified as trustworthy (e.g. multi-year cooperation).
- (●) Although the producer is known, he has never been visited and there are at least two intermediate stages to the production of the raw material that is procured.
- ( ) For the production process of the raw meterial from harvesting to the final product there is not much knowledge available, so that possible weak points cannot be recognized and evaluated.

Question E 3/4

Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?

- ( ) There is an annual risk-oriented audit planning. The audits are addressing issues such as adulteration and fraud (including detection of such events), traceability, mass balance and ethical aspects that are fully met by suppliers.
- ( ) Risk-based supplier audits are carried out. Issues such as adulteration and fraud (including the detection of such events) and ethical aspects are not (yet) are sufficiently addressed.
- (●) Risk-based supplier audits are carried out. Topics such as adulteration and fraud (including the detection of such events) as well as ethical aspects are not sufficiently addressed and are not fully met by the supplier.
- ( ) There are supplier audits, but these audits are not systematically planned and done situational.
- ( ) There are no systematic, risk-based supplier audits.

Question E 4/4

Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?

Assessment of QM / QA

- ○ There are no known adulterations.
  Sience there are known incidents, this selection is not possible.
- ○ A quick test / routine examination is available to determine the possible adulteration. The method is used in our company or at the supplier's side and is part of the inspection plan with a fixed interval.
- ○ Methods with authenticity tests are available, but they are very complex and cannot be carried out in our own laboratory.
- ○ An inspection plan exists laying down the detection method(s) according to a specified interval. External laboratories are also responsible to test for authenticity.
- ◉ Although there are analytical methods to detect adulterations, they can only be carried out in a few specialized laboratories. These tests are very costly and are only used when adulterations or fraud are known or reported.

Complete

After clicking on the button "Complete the following window appears:

Information

Your data has been saved and is now ready for evaluation.

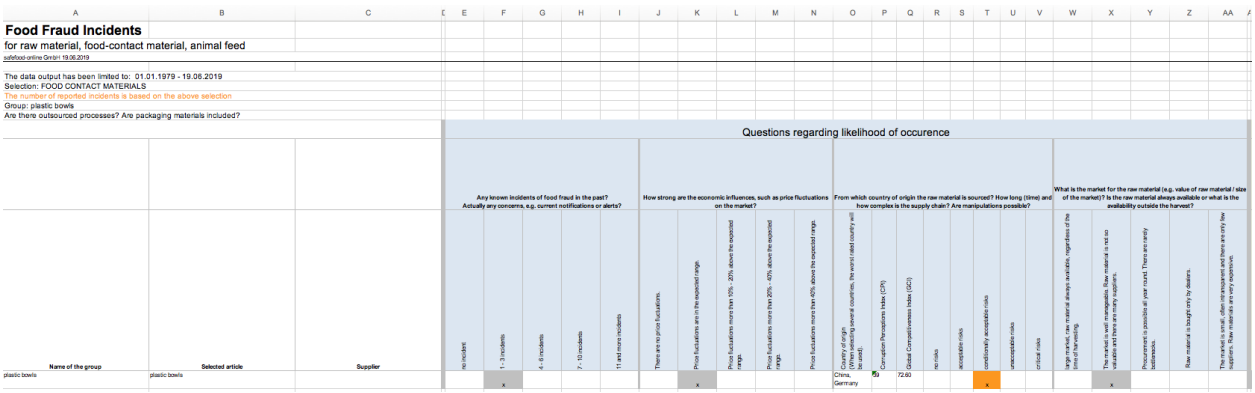
Start FOOD Fraud Analysis Excel-Export

10.2.3.3 Evaluation using a Excel spread sheet

After the query is done an Excel spread sheet with 4 sheets is opened:

10.2.3.4 Sheet 1: Food Fraud Results

The first sheet summarizes all results of the selected group. This allows you to see at any time how the respective questions were answered. The colour indicates the classification in the risk matrix. This Excel table can be extended as required, e.g. by the name of the supplier or the current price.



Food Fraud Incidents
for raw material, food-contact material, animal feed
safefood-online GmbH 19.06.2019

The data output has been limited to: 01.01.1979 - 19.06.2019
Selection: FOOD CONTACT MATERIALS
The number of reported incidents is based on the above selection
Group: plastic bowls
Are there outsourced processes? Are packaging materials included?

Questions regarding likelihood of occurence

Name of the group	Selected article	Supplier	Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?					How strong are the economic influences, such as price fluctuations on the market?					From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?								What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?				
			no incident	1 - 3 incidents	4 - 6 incidents	7 - 10 incidents	11 and more incidents	There are no price fluctuations.	Price fluctuations are in the expected range.	Price fluctuations more than 10% - 20% above the expected range.	Price fluctuations more than 20% - 40% above the expected range.	Price fluctuations more than 40% above the expected range.	Country of origin (including several countries, the worst rated country will be used)	Corruption Perceptions Index (CPI)	Global Competitiveness Index (GCI)	normals	acceptable risks	conditionally acceptable risks	unacceptable risks	critical risks	large market, raw material always available, regardless of the time of the harvest	The market is well manageable, Raw material is not so valuable and there are many suppliers.	Procurement is possible all year round. There are rarely bottlenecks.	Raw material is bought only by dealers.	The market is small, often intransparent and there are only few suppliers. Raw materials are very expensive.
plastic bowls	plastic bowls			x					x				China, Germany	72.60				x				x			

Questions regarding likelihood of current detection

What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?				
Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are no known damages.	Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are 1 - 2 known damages.	Tamper-evident closure always available and required. There are 3 - 10 incidents per year with damaged tamper-evident closures, seals or seals.	Tamper-evident closure is missing frequently (more than 10 incidents per year) although required and mandatory.	No tamper-evident closure available although required.
x				

How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?				
There are no known adulterations for the product and from an economic point of view it can be assumed that it makes little sense to adulterate the raw material.	The raw material is directly purchased from the producer or trader. At least one of them is GFSI certified.	The raw material is directly purchased from the producer who is classified as trustworthy (e.g. multi-year cooperation)..	Although the producer is known, he has never been visited and there are at least two intermediate stages to the production of the raw material that is procured.	For the production process of the raw meterial from harvesting to the final product there is not much knowledge available, so that possible weak points cannot be recognized and evaluated.
			x	

Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?				
There is an annual risk-oriented audit planning. The audits are addressing issues such as adulteration and fraud (including detection of such events), traceability, mass balance and ethical aspects that are fully met by suppliers.	Risk-based supplier audits are carried out. Issues such as adulteration and fraud (including the detection of such events) and ethical aspects are not (yet) are sufficiently addressed.	Risk-based supplier audits are carried out. Topics such as adulteration and fraud (including the detection of such events) as well as ethical aspects are not sufficiently addressed and are not fully met by the supplier.	There are supplier audits, but these audits are not systematically planned and done situational.	There are no systematic, risk-based supplier audits.
			x	

Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?				
There are no known adulterations.	A quick test / routine examination is available to determine the possible adulteration. The method is used in our company or at the supplier's side and is part of the inspection plan with a fixed interval.	Methods with authenticity tests are available, but they are very complex and cannot be carried out in our own laboratory.	An inspection plan exists laying down the detection method(s) according to a specified interval. External laboratories are also responsible to test for authenticity.	Although there are analytical methods to detect adulterations, they can only be carried out in a few specialized laboratories. These tests are very costly and are only used when adulterations or fraud are known or reported.
				x

10.2.3.5 Sheet 2: Vulnerability assessment

In the second sheet, all selected articles in a risk matrix are sorted into the fields A1 to E5, depending on the risk assessment resulting from the analysis. The two evaluations of likelihood of occurrence and likelihood of detection are transferred to the matrix and entered in the corresponding field. This query tool only works if individual foods/food-contact materials and/ or animal feed are queried. For this reason, all groups are broken down into individual articles.

Regarding the classification the following rules are applied:

Likelihood of occurence:
field 1: unlikely
field 2: very rare
field 3: rarely
field 4: possible
field 5: often

At the end, the highest ranking of the four questions is adopted in the relevant field (1 - 5). The classification is resulting from answering all questions. The highest rating of the 4 questions is transferred to the corresponding field. The result for the two questions A 1/4 and A 3/4 results from the data already existing in Safefood-online.

Likelihood of detection
field A: sure
field B: probably
field C: quite likely
field D: rather rare
field E: unlikely

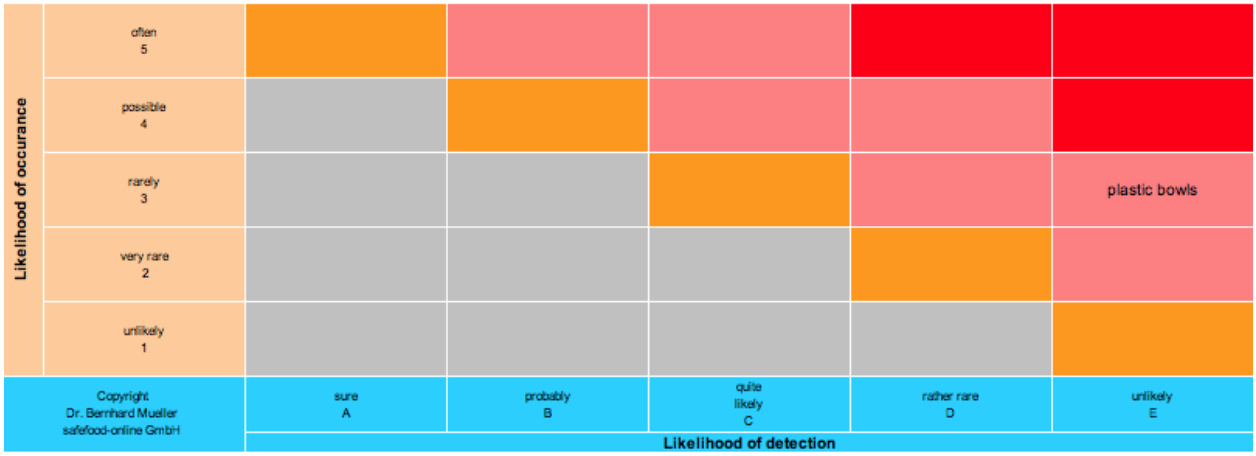
Also for the likelihood of detection, the highest rating of the four questions is transferred to the relevant field (A - E).

For the classification rules see 10.3.

FOOD FRAUD - Vulnerability Assessment
for raw material, food-contact material, animal feed
safefood-online GmbH 19.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 19.06.2019
Selection: FOOD CONTACT MATERIALS
Group: plastic bowls



10.2.3.6 Sheet 3: Mitigation plan

For every query, a list with "recommended instructions for the selected articles or groups" appears.

FOOD FRAUD - Mitigation Plan
for raw material, food-contact material, animal feed
safefood-online GmbH 19.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 19.06.2019
Selection: FOOD CONTACT MATERIALS
Group: plastic bowls

plastic bowls	
Question	**Mitigation plan**
Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?	No further measures required.
How strong are the economic influences, such as price fluctuations on the market?	No further measures required.
From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?	Choose, if possible, countries of origin with a high CPI and the highest possible GCI with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?	No further measures required.
What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?	No further measures required.
How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?	Establish risk-based audit planning for suppliers based on estimated raw material risks. It is important to consider all stages of the supply chain.
Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?	Further development of risk-based audit planning for suppliers based on estimated raw material risks. The frequency of supplier audits should be reassessed at least once a year through a hazard analysis and assessment of the associated risks. If adulterations and fraud are known, the audits should at least cover adulteration, traceability, mass balance and ethical issues. The audits may also cover the production of the raw materials.
Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?	Cooperation with institutes, laboratories, associations, suppliers and/ or other suitable external partners. The aim must be to develop a suitable routine method that can be used in the company's own laboratory or at the supplier in order to detect adulterations quickly and reliably. It is also helpful to ask he supplier for a certificate according to a GFSI standard.
Own remarks:	

Point 3 lists the applicable rules for the **questions on the likelihood of occurrence (Questions A 1 - A 4) and on the likelihood of detection (Questions E 1 - E 4).**
At the end of each session, the data are stored and are now ready for evaluation. During the next analysis, the previously determined results can be re-evaluated and recalculated at any time. This can result in new recommendations and instructions for action. All results can also be processed electronically and archived after the download.

Important Note: Own Evaluation of the Instructions for Action
At the end of the list with the "instructions for action" there is the possibility to give your own evaluation. This own evaluation is very important, because even the best query tool does not replace the evaluation, which was checked again with common sense. For example, it is certainly not necessary for every container to have a tamper-evident seal when the complete load of a truck is delivered and the truck as such is sealed with a tamper-evident seal. Or another example: if a raw product is still in its original state, such as whole hazelnuts, then the probability of discovering that another shell fruit, such as peanuts, has been added, is certainly easy to detect. This is quite different with hazelnut flour and the possible addition of peanut flour or other components.

10.2.3.7 Sheet 4: Food Fraud Incidents:

On the fourth sheet, all known Food Fraud incidents for each article are shown in tabular form.

FOOD FRAUD - Incidents
for raw material, food-contact material, animal feed
safefood-online GmbH 24.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 24.06.2019
Selection: FOOD CONTACT MATERIALS
Group: plastic bowls

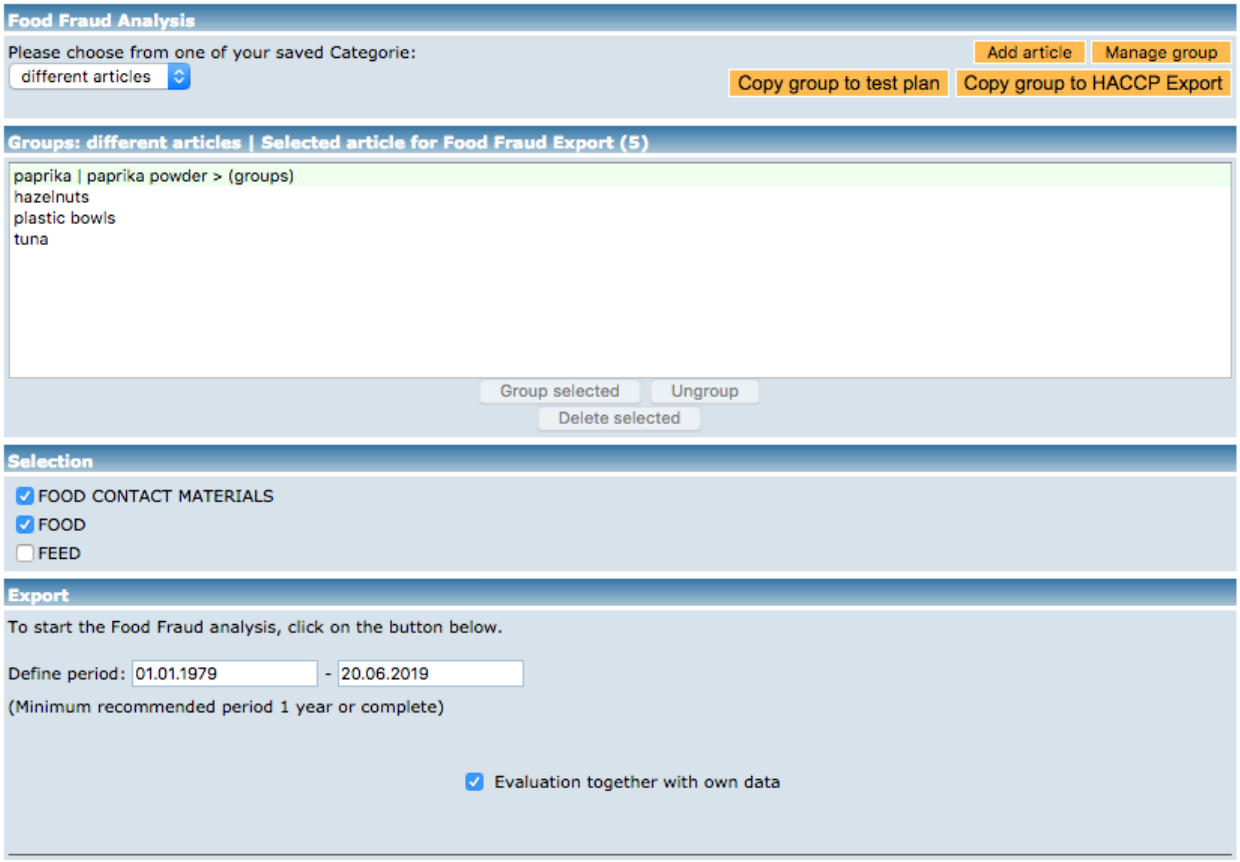
Art.Nr	Article	Known hazards	Country of origin
	plastic bowls	**food fraud / deception**	
		radiation	
		not known	
		GMO	
		not known	
		novel food	
		not known	
		adulteration / fraud	
		improper health certificate(s) [1]	China [1]
		food additives and flavourings	
		not known	
		composition	
		not known	

* = Own records included

Tip:
It is recommended to analyze all results accurately so that they can be evaluated correctly after the Food Fraud Export.

10.2.4 Vulnerability assessment FOOD FRAUD example with different articles

It is possible to combine different articles (food, food contact materials and/ or animal feed. It is recommended only to combine articles to groups making sense, i.e. paprika and paprika powder but not plastic bowls and paprika.

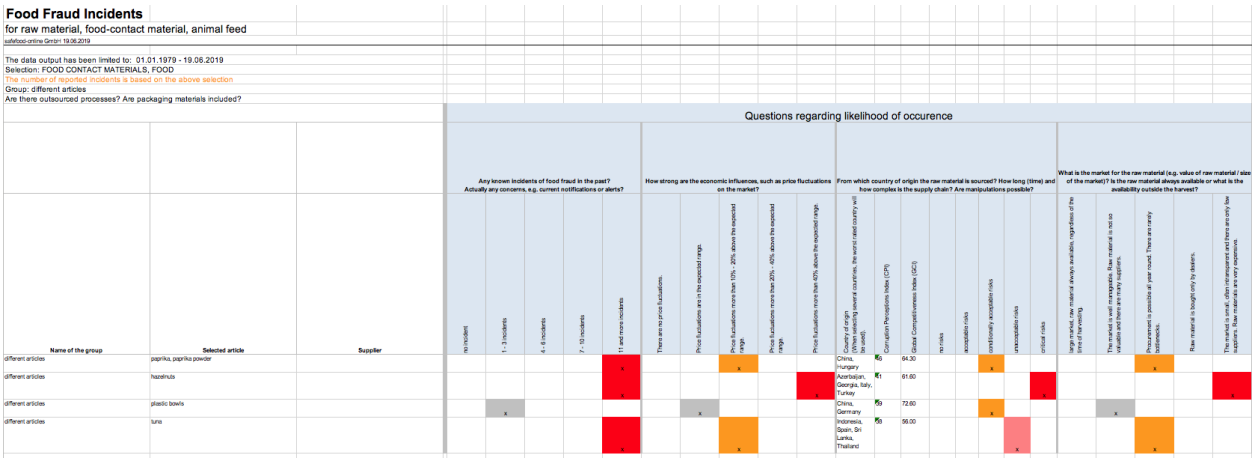


The result might be as follows:

10.2.4.1 Evaluation using a Excel spread sheet

After the query is done an Excel spread sheet with 4 sheets is opened:

10.2.4.2 Sheet 1: Food Fraud Results



Questions regarding likelihood of current detection

What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?				
Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are no known damages.	Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are 1 - 2 known damages.	Tamper-evident closure always available and required. There are 3 - 10 incidents per year with damaged tamper-evident closures, seals or seals.	Tamper-evident closure is missing frequently (more than 10 incidents per year) although required and mandatory.	No tamper-evident closure available although required.
	x			
x				
x				
x				

How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?				
There are no known adulterations for the product and from an economic point of view it can be assumed that it makes little sense to adulterate the raw material.	The raw material is directly purchased from the producer or trader. At least one of them is GFSI certified.	The raw material is directly purchased from the producer who is classified as trustworthy (e.g. multi-year cooperation)..	Although the producer is known, he has never been visited and there are at least two intermediate stages to the production of the raw material that is procured.	For the production process of the raw material from harvesting to the final product there is not much knowledge available, so that possible weak points cannot be recognized and evaluated.
	x			
	x			
			x	
		x		

Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?				
There is an annual risk-oriented audit planning. The audits are addressing issues such as adulteration and fraud (including detection of such events), traceability, mass balance and ethical aspects that are fully met by suppliers.	Risk-based supplier audits are carried out. Issues such as adulteration and fraud (including the detection of such events) and ethical aspects are not (yet) are sufficiently addressed.	Risk-based supplier audits are carried out. Topics such as adulteration and fraud (including the detection of such events) as well as ethical aspects are not sufficiently addressed and are not fully met by the supplier.	There are supplier audits, but these audits are not systematically planned and done situational.	There are no systematic, risk-based supplier audits.
		x		
		x		
		x		
	x			

Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?				
There are no known adulterations.	A quick test / routine examination is available to determine the possible adulteration. The method is used in our company or at the supplier's side and is part of the inspection plan with a fixed interval.	Methods with authenticity tests are available, but they are very complex and cannot be carried out in our own laboratory.	An inspection plan exists laying down the detection method(s) according to a specified interval. External laboratories are also responsible to test for authenticity.	Although there are analytical methods to detect adulterations, they can only be carried out in a few specialized laboratories. These tests are very costly and are only used when adulterations or fraud are known or reported.
	x			
	x			
				x
	x			

10.2.4.3 Sheet 2: Vulnerability assessment

FOOD FRAUD - Vulnerability Assessment
for raw material, food-contact material, animal feed
safefood-online GmbH 19.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 19.06.2019
Selection: FOOD CONTACT MATERIALS, FOOD
Group: different articles

Likelihood of occurance					
often 5			paprika, paprika powder, hazelnuts, tuna		
possible 4					
rarely 3					plastic bowls
very rare 2					
unlikely 1					
Copyright Dr. Bernhard Mueller safefood-online GmbH	sure A	probably B	quite likely C	rather rare D	unlikely E
	Likelihood of detection				

10.2.4.4 Sheet 3: Mitigation plan

FOOD FRAUD - Mitigation Plan

for raw material, food-contact material, animal feed

safefood-online GmbH 19.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 19.06.2019
Selection: FOOD CONTACT MATERIALS, FOOD
Group: different articles

hazelnuts

Question	Mitigation plan
Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?	Review the inspection plan so that the known counterfeits / fraud cases are detected as far as possible during the incoming goods inspection.
How strong are the economic influences, such as price fluctuations on the market?	If the price is permanently very volatile and/ or the prices are increasing significantly, an exchange of the raw material should be considered.
From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?	Choose, where feasible, countries of origin with a high CPI and a GCI as high as possible with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?	If the price is very volatile and/or the market is not transparent and there is little competition, an exchange of the raw material should be considered.
What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?	No further measures required.
How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?	No further measures required.
Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?	Further development of risk-based audit planning for suppliers based on estimated raw material risks. The frequency of supplier audits should be reassessed at least once a year through a hazard analysis and assessment of the associated risks. If adulterations and fraud are known, the audits should at least cover adulteration, traceability, mass balance and ethical issues. The audits may also cover the production of the raw materials.
Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?	No further measures required.
Own remarks:	

GROUP > paprika / paprika powder

Question	Mitigation plan
Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?	Review the inspection plan so that the known counterfeits / fraud cases are detected as far as possible during the incoming goods inspection.
How strong are the economic influences, such as price fluctuations on the market?	Continue tracking price development (volatility), check inspection plan for incoming goods inspection, adjust if necessary. If the price is very volatile and/ or the prices are significantly increasing, an exchange of the raw material should be considered.
From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?	Choose, if possible, countries of origin with a high CPI and the highest possible GCI with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?	No further measures required.
What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?	No further measures required.
How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?	No further measures required.
Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?	Further development of risk-based audit planning for suppliers based on estimated raw material risks. The frequency of supplier audits should be reassessed at least once a year through a hazard analysis and assessment of the associated risks. If adulterations and fraud are known, the audits should at least cover adulteration, traceability, mass balance and ethical issues. The audits may also cover the production of the raw materials.
Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?	No further measures required.
Own remarks:	

plastic bowls	
Question	**Mitigation plan**
Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?	No further measures required.
How strong are the economic influences, such as price fluctuations on the market?	No further measures required.
From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?	Choose, if possible, countries of origin with a high CPI and the highest possible GCI with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?	No further measures required.
What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?	No further measures required.
How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?	No further measures required.
Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?	Further development of risk-based audit planning for suppliers based on estimated raw material risks. The frequency of supplier audits should be reassessed at least once a year through a hazard analysis and assessment of the associated risks. If adulterations and fraud are known, the audits should at least cover adulteration, traceability, mass balance and ethical issues. The audits may also cover the production of the raw materials.
Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?	Cooperation with institutes, laboratories, associations, suppliers and/ or other suitable external partners. The aim must be to develop a suitable routine method that can be used in the company's own laboratory or at the supplier in order to detect adulterations quickly and reliably. It is also helpful to ask he supplier for a certificate according to a GFSI standard.
Own remarks:	

tuna	
Question	**Mitigation plan**
Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?	Review the inspection plan so that the known counterfeits / fraud cases are detected as far as possible during the incoming goods inspection.
How strong are the economic influences, such as price fluctuations on the market?	Continue tracking price development (volatility), check inspection plan for incoming goods inspection, adjust if necessary. If the price is very volatile and/ or the prices are significantly increasing, an exchange of the raw material should be considered.
From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible?	Choose, where feasible, countries of origin with a high CPI and a GCI as high as possible with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest?	No further measures required.
What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals?	No further measures required.
How is the quality of the raw material (unprocessed or processed, i.e. peeled, cut, crushed, ground, liquid or otherwise further processed) and how many stages are there from cultivation / extraction (farmer/ producer) to the delivery of the raw material to our company?	Establish risk-based audit planning for suppliers based on estimated raw material risks. It is important to consider all stages of the supply chain.
Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?	Extension of the checklist for carrying out supplier audits covering the topics: adulteration, traceability, mass balance and ethical aspects.
Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like?	No further measures required.
Own remarks:	

10.2.4.5 Sheet 4: Food Fraud incidents

FOOD FRAUD - Incidents
for raw material, food-contact material, animal feed
safefood-online GmbH 24.06.2019

Safefood-Online
Identify risks and increase opportunities

The data output has been limited to: 01.01.1979 - 24.06.2019
Selection: FOOD CONTACT MATERIALS, FOOD
Group: different articles

Art.Nr	Article	Known hazards	Country of origin
	hazelnuts	**food fraud / deception**	
		radiation	
		not known	
		GMO	
		not known	
		novel food	
		not known	
		adulteration / fraud	
		absence of health certificate(s) [2]	Serbia [1], Turkey [1]
		illegal import [1]	Turkey [1]
		improper health certificate(s) [8]	Turkey [8]
		incorrect labelling [1]	Turkey [1]
		food additives and flavourings	
		not known	
		composition	
		magnesium phosphide [1]	Turkey [1]
	GROUP > paprika / paprika powder	**food fraud / deception**	
		radiation	
		irradiation [1]	China [1]
		GMO	
		not known	
		novel food	
		not known	
		adulteration / fraud	
		adulteration [1]	China [1]
		dilution [1]	France [1]
		improper health certificate(s) [3]	Ethiopia [3]
		food additives and flavourings	
		Sudan 1 [30]	Netherlands [1], Turkey [16], Spain [3], Italy [1], Czech Republic [2], country not mentioned [1], India [1], China [1], Bosnia and Herzegovina [1], Poland [1], Germany [1], Lebanon [1]
		Sudan 4 [17]	Netherlands [1], Turkey [9], Bosnia and Herzegovina [1], Poland [1], Czech Republic [1], Spain [2], Germany [1], Lebanon [1]
		colour Orange II [1]	Ghana [1]
		E 160b - annato/bixin/norbixin [11]	Egypt [1], China [2], Spain [5], Peru [2], Lebanon [1]
		Sudan 3 [1]	Bosnia and Herzegovina [1]
		composition	
		Fast Garnet [1]	Turkey [1]
		Para Red [1]	Spain [1]
	plastic bowls	**food fraud / deception**	
		radiation	
		not known	
		GMO	
		not known	
		novel food	
		not known	
		adulteration / fraud	
		improper health certificate(s) [1]	China [1]
		food additives and flavourings	
		not known	
		composition	
		not known	

	tuna	**food fraud / deception**	
		radiation	
		not known	
		GMO	
		not known	
		novel food	
		not known	
		adulteration / fraud	
		absence of health certificate(s) [3]	Thailand [2], Philippines [1]
		absence of labelling [1]	Portugal [1]
		fraudulent health certificate(s) [1]	Ecuador [1]
		improper health certificate(s) [2]	Senegal [1], Mozambique [1]
		improper shelf life [1]	Italy [1]
		counterfeiting [1]	Italy [1]
		incorrect labelling [2]	Ecuador [1], Spain [1]
		mislabelling [1]	Spain [1]
		unauthorised establishment [1]	Spain [1]
		food additives and flavourings	
		E 120 - carmines [1]	Sri Lanka [1]
		E 251 - sodium nitrate [1]	Spain [1]
		E 452 - polyphosphates [1]	Spain [1]
		composition	
		carbon monoxide treatment [27]	country not mentioned [1], Philippines [2], Indonesia [4], Vietnam [7], Netherlands [2], Poland [1], Thailand [1], Costa Rica [1], Maldives [1], Spain [7]
		E 260 - synthetic acetic acid [1]	Spain [1]

* = Own records included

10.3 Rules regarding the questions

10.3.1 Rules regarding the questions to the likelihood of occurrence (Questions A 1 – A 4)

Question A 1/4 Any known incidents of food fraud in the past? Actually any concerns, e.g. current notifications or alerts?		
1	no incident (-->result directly shown from safefood-online)	No further measures required.
2	1-3 incidents (-->result directly shown from safefood-online)	No further measures required.
3	4-6 incidents (-->result directly shown from safefood-online)	Review the inspection plan so that the known counterfeits / fraud cases are detected as far as possible during the incoming goods inspection.
4	7-10 incidents (-->result directly shown from safefood-online)	Review the inspection plan so that the known counterfeits / fraud cases are detected as far as possible during the incoming goods inspection.
5	11 and more incidents (-->result directly shown from safefood-online)	Review the inspection plan so that the known counterfeits / fraud cases are detected as far as possible during the incoming goods inspection.

Question A 2/4 How strong are the economic influences, such as price fluctuations on the market? Data from purchase department / supplier		
1	There are no price fluctuations.	No further measures required.
2	Price fluctuations are in the expected range.	No further measures required.
3	Price fluctuations more than 10% - 20% above the expected range.	Continue tracking price development (volatility), check inspection plan for incoming goods inspection, adjust if necessary. If the price is very volatile and/ or the prices are significantly increasing, an exchange of the raw material should be considered.
4	Price fluctuations more than 20% - 40% above the expected range.	Continue tracking price development (volatility), check inspection plan for incoming goods inspection, adjust if necessary. If the price is very volatile and/ or the prices are significantly increasing, an exchange of the raw material should be considered.
5	Price fluctuations more than 40% above the expected range.	If the price is permanently very volatile and/ or the prices are increasing significantly, an exchange of the raw material should be considered.

Question A 3/4 From which country of origin the raw material is sourced? How long (time) and how complex is the supply chain? Are manipulations possible? Select the country of origin for the raw material		
several countries can be selected, according to a worst case scenario, the worst rating is used		
1	no risks (-->show result directly from safefood-online)	No further measures required.
2	acceptable risks (-->show result directly from safefood-online)	No further measures required.
3	conditionally acceptable risks (-->show result directly from safefood-online)	Choose, if possible, countries of origin with a high CPI and the highest possible GCI with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
4	unacceptable risks (-->display result directly from safefood-online)	Choose, if possible, countries of origin with a high CPI and the highest possible GCI with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.
5	critical risks (-->display result directly from safefood-online)	Choose, if possible, countries of origin with a high CPI and the highest possible GCI with no or acceptable risks. The Corruption Index (CPI) ranges from 0 to 100, where 100 indicates the lowest perception of corruption and is therefore the best possible result. The Growth Competitiveness Index (GCI) is an indicator of a country's competitiveness, with 100 indicating the highest growth competitiveness.

Question A 4/4 What is the market for the raw material (e.g. value of raw material / size of the market)? Is the raw material always available or what is the availability outside the harvest? Assessment of QM / QS and purchasing		
1	large market, raw material always available, regardless of the time of harvesting	No further measures required.
2	large market, raw material always available, regardless of the time of harvesting	No further measures required.
3	Procurement is possible all year round. There are rarely bottlenecks	No further measures required.
4	Raw material is bought only by dealers	Traders should inform about the producers and for the producers risk-based supplier audits should be planned.
5	The market is small, often intransparent and there are only few suppliers. Raw materials are very expensive	If the price is very volatile and/or the market is not transparent and there is little competition, an exchange of the raw material should be considered.

10.3.2 Rules regarding the questions to the likelihood of occurrence (Question A 1 – A 4)

Question E 1/4 What's the transportation route? How are the raw materials packaged? Are there tamper-evident closures / seals? Answer from the incoming goods inspections and corresponding notifications		
A	Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are no known damages.	No further measures required.
B	Tamper-evident closure present or not required (e.g. for whole, undamaged fruits). It is always checked for possible damage upon receipt of the goods. There are 1 - 2 known damages.	No further measures required.
C	Tamper-evident closure always available and required. There are 3 - 10 incidents per year with damaged tamper-evident closures, seals or seals.	Find the cause of the damage. Supplier must provide other tamper-evident closures. Define inspection at goods receipt as a mandatory inspection step.
D	Tamper-evident closure is missing frequently (more than 10 incidents per year) although required and mandatory.	Supplier must provide packaging with tamper evident closures. Define inspection at goods receipt as a mandatory inspection step.
E	No tamper-evident closure available although required.	Supplier must provide packaging with tamper-evident closure. Define inspection at goods receipt as a mandatory inspection step. It is often also helpful to ask the supplier for a certificate according to a GFSI standard.
Question E 2/4		

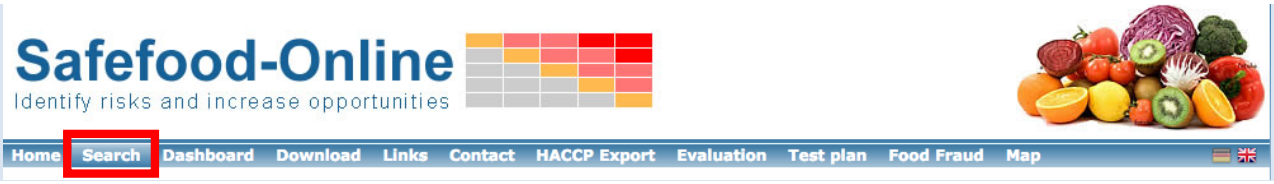
How is the quality of the raw material (unprocessed or processed i.e. peeled, cut, crushed, ground, liquid or otherwise further processed)? and how many stages are there from cultivation/ extraction (farmer/ producer) to the delivery of the raw material to our company? Is the raw material unprocessed or processed (e.g., peeled, cut, crushed, ground, liquid or otherwise further processed)? Is the supply chain known? The closer to the origin, the less risky.		
A	There are no known adulterations for the product and from an economic point of view it can be assumed that it makes little sense to adulterate the raw material. Note: This answer is blocked if there are known adulterations with the note "Since there are known incidents, this selection is not possible." and this answer is always set by Safefood-Online if there were no known adulterations.	No further measures required.
B	The raw material is directly purchased from the producer or trader. At least one of them is GFSI certified.	No further measures required.
C	The raw material is directly purchased from the producer who is classified as trustworthy (e.g. multi-year cooperation).	Establish risk-based audit planning for suppliers based on estimated raw material risks. It is important to consider all stages of the supply chain
D	Although the producer is known, he has never been visited and there are at least two intermediate stages to the production of the raw material that is procured.	Establish risk-based audit planning for suppliers based on estimated raw material risks. It is important to consider all stages of the supply chain.
E	For the production process of the raw meterial from harvesting to the final product there is not much knowledge available, so that possible weak points cannot be recognized and evaluated.	Build up knowledge about the production of raw materials / food in order to learn about possible weak points and pay specific attention to them.

Question E 3/4 Are there already control measures, such as supplier audits, in which topics such as adulteration, traceability, mass balance and ethical aspects are audited?		
A	There is an annual risk-oriented audit planning. The audits are addressing issues such as adulteration and fraud (including detection of such events), traceability, mass balance and ethical aspects that are fully met by suppliers.	No further measures required.
B	Risk-based supplier audits are carried out. Issues such as adulteration and fraud (including the detection of such events) and ethical aspects are not (yet) are sufficiently addressed.	Extension of the checklist for carrying out supplier audits covering the topics: adulteration, traceability, mass balance and ethical aspects.
C	Risk-based supplier audits are carried out. Topics such as adulteration and fraud (including the detection of such events) as well as ethical aspects are not sufficiently addressed and are not fully met by the supplier.	Further development of risk-based audit planning for suppliers based on estimated raw material risks. The frequency of supplier audits should be reassessed at least once a year through a hazard analysis and assessment of the associated risks. If adulterations and fraud are known, the audits should at least cover adulteration, traceability, mass balance and ethical issues. The audits may also cover the production of the raw materials.
D	There are supplier audits, but these audits are not systematically planned and done situational.	Development of a risk-based audit plan for suppliers, based on the estimated raw material risks. The frequency of supplier audits should be reassessed at least once a year by means of a hazard analysis and assessment of the associated risks. If adulterations and fraud are known, the audits should at least cover adulteration, traceability, mass balance and ethical issues. The audits may also cover the production of the raw materials.
E	There are no systematic, risk-based supplier audits.	Development of a risk-based audit plan for suppliers, based on the estimated raw material risks. The frequency of supplier audits should be reassessed at least once a year by means of a hazard analysis and assessment of the associated risks. If adulterations and fraud are known, the audits should at least cover adulteration, traceability, mass balance and ethical issues. The audits may also cover the production of the raw materials.

Question E 4/4 Is it easy today to detect the known or possible adulterations in routine examinations? Are there any investigations or possibilities of discovery at all? What does the test plan look like? Assessment of QM/ QA		
A	There are no known adulterations. *Note: This answer is blocked if there are known adulterations with the note "Because there are known incidents, this selection is not possible." and this answer is always set by Safefood-Online if there are no known adulterations*	No further measures required.
B	A quick test / routine examination is available to determine the possible adulteration. The method is used in our company or at the supplier's side and is part of the inspection plan with a fixed interval.	No further measures required.
C	Methods with authenticity tests are available, but they are very complex and cannot be carried out in our own laboratory.	It should be checked whether and how the methods are included in the own laboratory. This could possibly save time until the positive release of the raw materials.
D	An inspection plan exists laying down the detection method(s) according to a specified interval. External laboratories are also responsible to test for authenticity.	Further development of the test plan, set up on the basis of a hazard analysis and assessment of the associated risks including these raw materials. The inspection plan determines the interval of the specified inspection on a risk basis. The results are regularly evaluated in order to determine trends.
E	Although there are analytical methods to detect adulterations, they can only be carried out in a few specialized laboratories. These tests are very costly and are only used when adulterations or fraud are known or reported.	Cooperation with institutes, laboratories, associations, suppliers and/ or other suitable external partners. The aim must be to develop a suitable routine method that can be used in the company's own laboratory or at the supplier in order to detect adulterations quickly and reliably. It is also helpful to ask he supplier for a certificate according to a GFSI standard.

11 Search: Query for known hazards

The query is made in the "SEARCH" module:



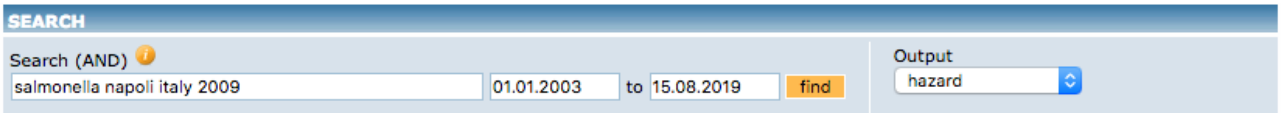
11.1 Search query (AND)

Please enter the terms so that they are separated only by a space (without comma or semicolon). The search query (AND) only searches for records that contain all the terms you have entered (including parts of them).

SAFEFOOD-ONLINE searches for matches in the fields "Product Category, Source of Risk, Country of Origin, Food and Year. Only records where all entered terms are present will be displayed. The more terms are combined, the more selective the result will be. At least one term must be entered in the search query "AND".

Examples:

a) Salmonella napoli Italy 2019:



The search query "Salmonella napoli Italy 2009" contains all terms in the displayed records:

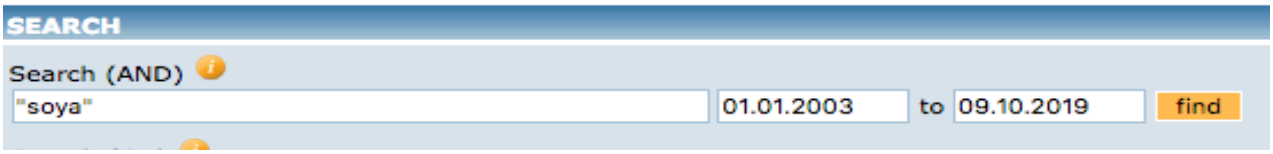
b) Rabbit Meat:

The search query "rabbit meat" gives the term "rabbit meat" as well as all combinations in which the two search terms "rabbit" and "meat" are contained:

☑	2017	Belgium (BE)	unauthorised substance norfloxacin (>2.2 ?g/kg - ppb) in frozen rabbit meat from China	rabbit meat	norfloxacin	China	details 2017.BVB
☑	2017	Belgium (BE)	unauthorised substance ofloxacin (> CCalpha) in frozen rabbit meat from China	rabbit meat	ofloxacin	China	details 2017.BTM
☑	2017	Belgium (BE)	unauthorised substance ofloxacin (> CCalpha) in frozen rabbit hind legs from China	rabbit meat	ofloxacin	China	details 2017.BJW
☑	2017	Belgium (BE)	macrolides (tulathromycin 1000 ?g/kg - ppb) unauthorised in frozen rabbit meat from Belgium	rabbit meat	macrolides	Belgium	details 2017.0562

c) "soya":

If the search term is placed in quotation marks, only exactly this term is searched for (upper and lower case is not to be considered thereby):



Extract from the data records found:

Show	Year	Message	Description	Food	Hazard	Co. of origin	
☑	2019	Belgium (BE)	soya and celery undeclared on lasagne from Belgium	lasagne	undeclared celery, undeclared soya	Belgium	details 2019.3436
☑	2019	Italy (IT)	presence of soya in organic spelt flour from Italy	organic spelt flour	undeclared soya	Italy	details 2019.3159
☑	2019	Belgium (BE)	gluten, soya and fish undeclared on andaluse sauce from Belgium mislabelled as banzai sauce	andaluse sauce	undeclared soya	Belgium	details 2019.3013
☑	2019	United Kingdom (GB)	soya undeclared on chilled soups from the United Kingdom	soups	undeclared soya	United Kingdom	details 2019.2972
☑	2019	Belgium (BE)	soya undeclared on chilled meat preparation from Belgium	meat preparations	undeclared soya	Belgium	details 2019.2885

TIPP:
It is recommended not to limit the search too closely in the first step, otherwise different spellings will not be considered. It may happen that certain terms are written in German and then in English. However, you can also select from the list boxes (Add selection) in which all terms from all datasets are always up-to-date:

Further limitations are possible through:

- product category (all or only selected product categories)
- hazard category (all or only selected hazard categories)
- With or without follow-up messages
- Food and/or food contact and/or animal feed
- Search in all fields of the dataset or only in the field “food”

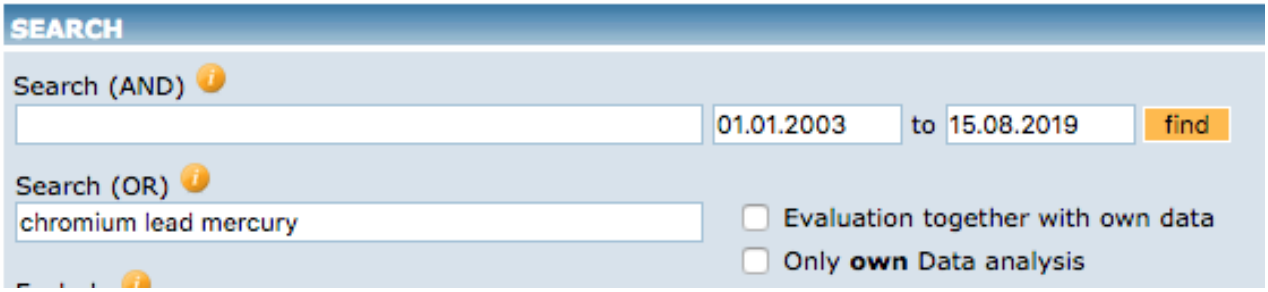
In the field "Output" the grouping of the data records can be controlled by:

- Hazard
- country of origin
- year
- food

11.2 Search query (OR)

Please enter the terms so that they are separated only by a space (without comma or semicolon). The search query (OR) displays all data records that contain at least one of the entered terms. SAFEFOOD ONLINE searches for matches in the fields "Product category, Hazard source, Country of origin, Food and Year.

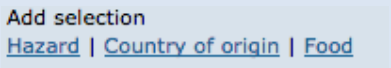
Example:
a) Chromium Lead Mercury:



The data sets displayed contain either the terms chromium, lead or mercury:

☑	2018	Croatia (HR)	lead (0.568 mg/kg - ppm) in chilled deer goulash from Slovenia, with raw material from Hungary	deer goulash	lead	Hungary	details 2018.3774
☑	2018	Italy (IT)	mercury (1.53 mg/kg - ppm) in chilled processed swordfish loins in brine (Xiphias gladius) from Spain	swordfish loins (Xiphias gladius)	mercury	Spain	details 2018.3754
☑	2018	Italy (IT)	mercury (2.2 mg/kg - ppm) in chilled whole swordfish (Xiphias gladius) from Spain	swordfish (Xiphias gladius)	mercury	Spain	details 2018.3742
☑	2018	Italy (IT)	mercury (1.3 mg/kg - ppm) in defrosted swordfish loins (Xiphias gladius) from Spain	swordfish loins (Xiphias gladius)	mercury	Spain	details 2018.3704
☑	2018	Italy (IT)	migration of chromium (0.6 mg/l) and of manganese (29.1 mg/l) and too high level of overall migration (2084 mg/dm?) from steel meat mincer from China	steel mincer	migration of chromium, migration of manganese, overall migration	China	details 2018.3685

TIPP:
It is recommended not to limit the search too closely in the first step, otherwise different spellings will not be considered. It is possible that certain terms are present once in German and then e.g. in English. However, you can also select from the list boxes (Add selection) in which all terms from all datasets are always up-to-date:



Further limitations are possible:

- product category (all or only selected product categories)
- hazard category (all or only selected hazard categories)
- Food and/or food contact material and/or animal feed
- Search in all fields of the dataset or only in the field “food”

In the field "Output" the grouping of the data records can be controlled by:

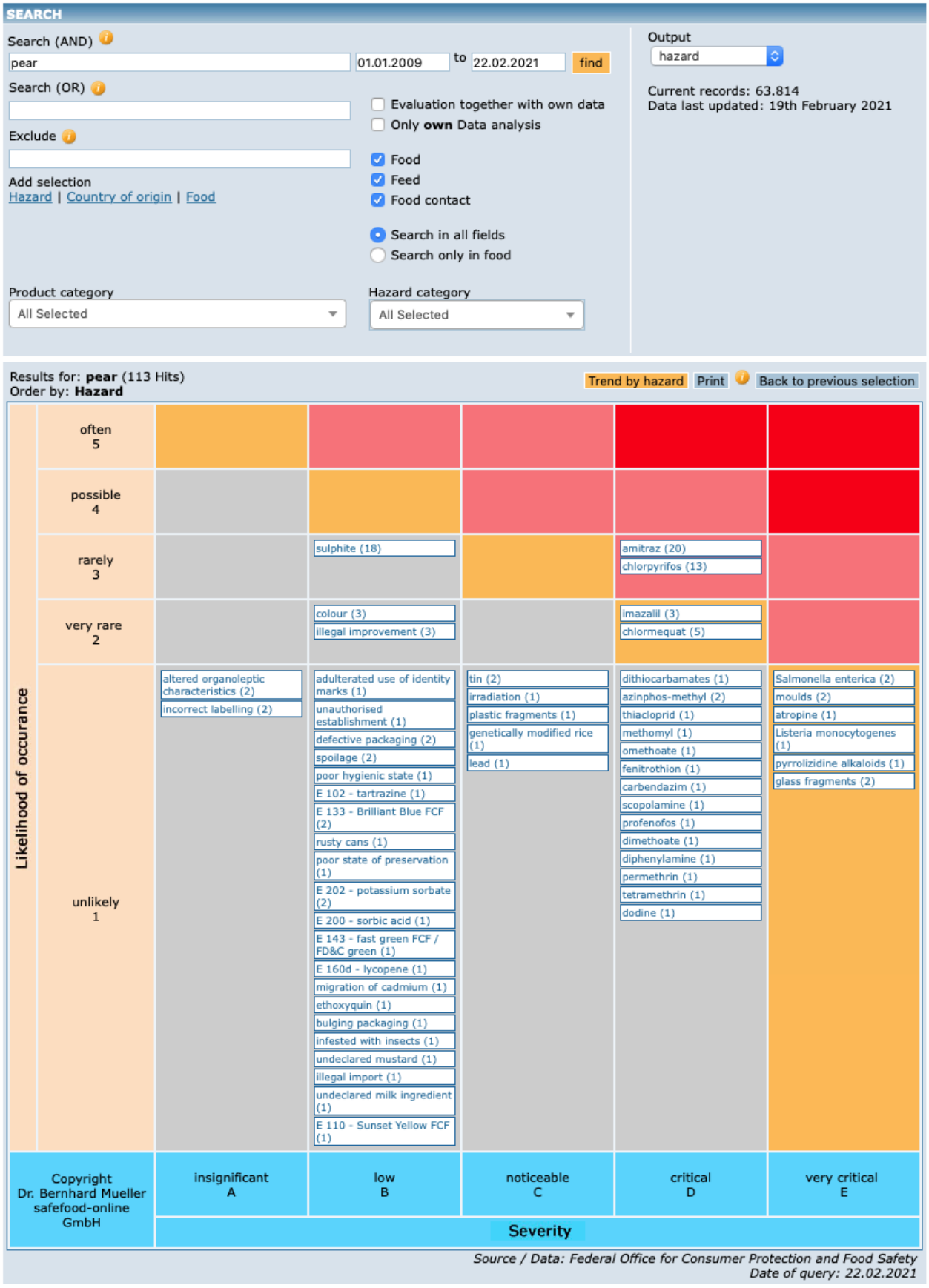
- Hazard
- country of origin
- year

11.3 Search query (Exclude)

You can also use the "Exclude" field to restrict the search further. Terms entered here are excluded from the search (if several terms are entered, they are only separated by spaces):

11.4 Result of the search query (risk landscape)

The results are calculated and assigned to a field from A1 to E5 in a risk matrix:



An attached list shows all available details (excerpt):

Show	Year	Message	Description	Food	Hazard	Co. of origin	
☑	2019	Sweden (SE)	milk ingredient undeclared on chocolate silver pearls from Germany	chocolate silver pearls	undeclared milk ingredient	Germany	details 2019.2950
☑	2019	Finland (FI)	plastic fragments in organic pear puree from Latvia	organic pear pur	plastic fragments	Latvia	details 2019.2048
☑	2019	Sweden (SE)	pear, kiwi & avocado smoothie bowl from France infested with moulds	fruit smoothies	moulds	France	details 2019.1066
☑	2019	Netherlands (NL)	chlorpyrifos (0.066 mg/kg - ppm) in nashi pears from China	nashi pears	chlorpyriphos	China	details 2019.0147
☑	2018	France (FR)	glass fragment in yogurt with pear and pistachios	pear yoghurt with pistachios	glass fragments	country not mentioned	details 2018.2884
☑	2018	Latvia (LV)	irradiation in an unauthorised facility of prickly pear extract from China	pear extract	irradiation	China	details 2018.2546
☑	2018	Spain (ES)	The Spanish Guardia Civil have seized 45 tons of tuna that were foreseen to be canned but were commercialised as fresh. The seizure is part of a broader action called, Atunali that started in January. The fish that was caught by boats not equipped with the appropriate freezers was treated with additives to mimic the appearance of fresh fish	tuna	unauthorised establishment	Spain	details JRC 2018-08.13
☑	2018	India (IN)	35 000 kg of tea mixed with artificial colourants and unfit for human consumption were seized by the police responsible for food safety in India. The forbidden substances were added to tea leaves of inferior quality to improve their appearance	tea	colour	India	details JRC 2018-06.10
☑	2018	Poland (PL)	chlorpyrifos (0.039 mg/kg - ppm) in pears from Italy, via Germany	pears	chlorpyriphos	Italy	details 2018.1496
☑	2018	Germany (DE)	pyrrolizidine alkaloids (1031 ?g/kg - ppb) in organic spearmint tea from Iran	organic spearmint	pyrrolizidine alkaloids	Iran Islamic Republic of	details 2018.0397
☑	2018	Denmark (DK)	chlorpyrifos (0.15 mg/kg - ppm) in pears from China, via Germany	pears	chlorpyriphos	China	details 2018.0311
☑	2017	Italy (IT)	Following a tax audit, 60 people involved in wine production and marketing are being investigated after the discovery of a large scale fraud in the Italian wine sector. A company was falsely labelling a table wine with a PGI label. It appears that at least 254 000 bottles of the wine were already sold all across Europe. 150 000 fake PDO/PGI bottles could be seized in the network of the suspect company, unveiling a complex tax evasion mechanism used by the fraudsters.	wine	fraudulent use of identity marks	Italy	details JRC 2017-09.08

The type of presentation with SAFEFOOD-ONLINE is flexible and can be further edited directly on the screen by clicking on the respective fields and results (see also 11.6 Sorting and fading out of records).

The risk assessment should include in the overall assessment all internally available information like internal findings of the incoming goods inspection and own or known incidents. In addition, the internal evaluation of all external reports from customers, suppliers or official complaints is important. With SAFEFOOD-ONLINE, the company receives the results according to the selected specific scenario.

Examples from practice illustrate how useful it is to evaluate all available information in order to identify potential risks. This information gives the company the results of the selected scenarios, which must now be interpreted individually. In the selected scenario, several fields can be linked together. Both "and" and "or" links can be combined. Depending on the combination selected, the results are displayed in a risk landscape.

By clicking on the results in the risk landscape, there are different listings possible according to the year, hazard source or country of origin. The results show the frequency depending on the

impact. The calculations are performed with a stored algorithm that always accesses all available data (known hazards). Thus, a scenario selected today will change when data records are added and updated.

The impact, ranging from insignificant to very critical (A - E), is mainly calculated according to the type of hazard. A stored algorithm calculates the risks and assigns them to a field between A and E.

The gradation in the frequency from improbable to frequent (1 - 5) results from the number of reports for the respective hazard in the database. For orientation, the number of hits is also given in the output.

The possible classification in the risk matrix ranges from A1 to E5.

If there is based on the available data no indication for a risk the field remains blank.
It is recommended to regularly retrieve the data from SAFEFOOD-ONLINE. This is the only way to ensure that the data is up-to-date.

11.5 Effect (Severity) of the hazards

The classification of the impact of the hazards is based on the EU Commission's Notice "on the implementation of food safety management systems covering prerequisite programs (PRPs) and procedures based on the HACCP principles, including the facilitation/ flexibility of the implementation in certain food businesses" (2016/C278/ 01):

A: insignificant:
no immediate problem due to the food itself; quality aspects; legal aspects (labelling – except allergen labelling).

B: low:
There is no problem for the consumer related to food safety (nature of hazard).
The hazard can never reach a dangerous concentration.

C: low:
No serious injuries and/ or symptoms or only when exposed to an extremely high concentration during a long period of time.
A temporary but clear effect on health.

D: critical:
A clear effect on health with short-term or long-term symptoms which results rarely in mortality.
The hazard has a long-term effect; the maximal dose is not known.

E: very critical:
The consumer group belongs to a risk category and the hazard can result in mortality.
The hazard results in serious symptoms from which mortality may result.

The table below shows an example of how the hazard categories are assigned to impact A - E (severity):

labelling absent/ incomplete/ incorrect (other than allergen labelling)	allergens: allergic reaction, incorrect allergen labelling, cereals containg gluten, crustaceans, eggs, fish, milk, mustard, sulphur dioxide, lupin, molluscs	hormones/ residues of veterinary products	biocontaminants	allergens: nuts, peanuts
organoleptic aspects: abnormal smell, taste, colour	adulteration/ fraud: analytical report, health certificate (s), labelling (absence), with horse meat, urea, cow milk, carbon monoxide treatment	GMO	TSE	adulteration/ fraud: with nuts, peanuts or pathogenic micro-organisms
not determined/ other: unknown hazard, incorrect dosing scoop	food additives and flavourings	radiation: irradition, radioactivity	mycotoxins	biotoxins
	novel food	heavy metals	pesticide residues	pathogenic micro-organisms
	insects/ parasitic infestitaton	foreign bodies (without direct risk for health): fies, spider eggs, stubs, sythetic fibres	adulteration/ fraud: unfit for human consumption, presence of unauthorized chemicals	foreign bodies (with direct risk for health): drugs, glass fragments, stones, lead, asbestos, splinters, thorns, metal, bone fragments, ceramic pieces, suffocation, granules, mouse, poisonous spider
	migration	chemical contamination	composition: vitamin A	
	non-pathogenic microorganisms	allergens: celery, sesame seeds, soybeans		
	organoleptic/ other: numbness	adulteration/ fraud: sawdust, incubated		
	packaging defective/ incorrect: corrosion, packaging defective, bulging packaging			
	composition			
	poor or insufficient controls: poor temperature control, inadequate heat resistance, excessive humidity, insuitable transport conditions			
very limited A	limited B	moderate C	serious	very serious E
effect (severity)				

The gradation in frequency from unlikely to often (1 - 5) results from the number of reports on the respective hazard in the database. For orientation, the number of hits is included in the output.

The possible classification in the risk matrix ranges from A1 to E5.

11.6 Sorting and fading out of records

Below the risk matrix, a list is attached from which the details of each hit can be retrieved. By clicking on the fields "Year", "Report", "Food", "Hazard source" and "Country of origin", the data can be quickly re-sorted. In the column "Show" it is possible to fade out individual records by removing the check mark. At the end of the list, the selected scenario can then be recalculated by pressing the "Update" button (see the following example):

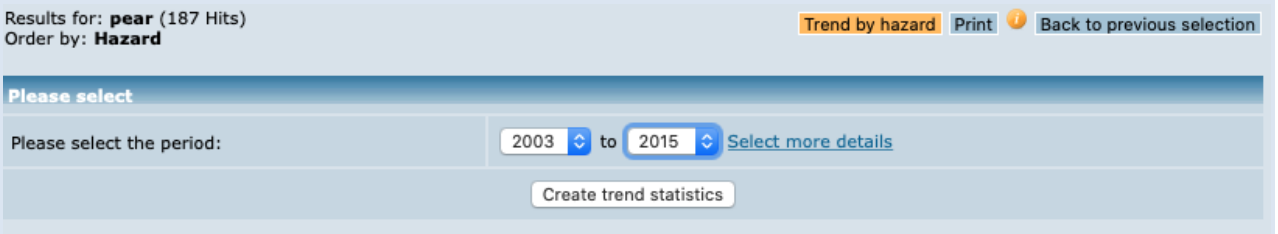
Show	Year	Message	Description	Food	Hazard	Co. of origin	
☑	2019	Sweden (SE)	milk ingredient undeclared on chocolate silver pearls from Germany	chocolate silver pearls	undeclared milk ingredient	Germany	details 2019.2950
☑	2019	Finland (FI)	plastic fragments in organic pear puree from Latvia	organic pear puree	plastic fragments	Latvia	details 2019.2048
☑	2019	Sweden (SE)	pear, kiwi & avocado smoothie bowl from France infested with moulds	fruit smoothies	moulds	France	details 2019.1066
☑	2019	Netherlands (NL)	chlorpyrifos (0.066 mg/kg - ppm) in nashi pears from China	nashi pears	chlorpyriphos	China	details 2019.0147
☑	2018	France (FR)	glass fragment in yogurt with pear and pistachios	pear yoghurt with pistachios	glass fragments	country not mentioned	details 2018.2884
☑	2018	Latvia (LV)	irradiation in an unauthorised facility of prickly pear extract from China	pear extract	irradiation	China	details 2018.2546
☑	2018	Spain (ES)	The Spanish Guardia Civil have seized 45 tons of tuna that were foreseen to be canned but were commercialised as fresh. The seizure is part of a broader action called, Atunali that started in January. The fish that was caught by boats not equipped with the appropriate freezers was treated with additives to mimic the appearance of fresh fish	tuna	unauthorised establishment	Spain	details JRC 2018-08.13
☑	2018	India (IN)	35 000 kg of tea mixed with artificial colourants and unfit for human consumption were seized by the police responsible for food safety in India. The forbidden substances were added to tea leaves of inferior quality to improve their appearance	tea	colour	India	details JRC 2018-06.10

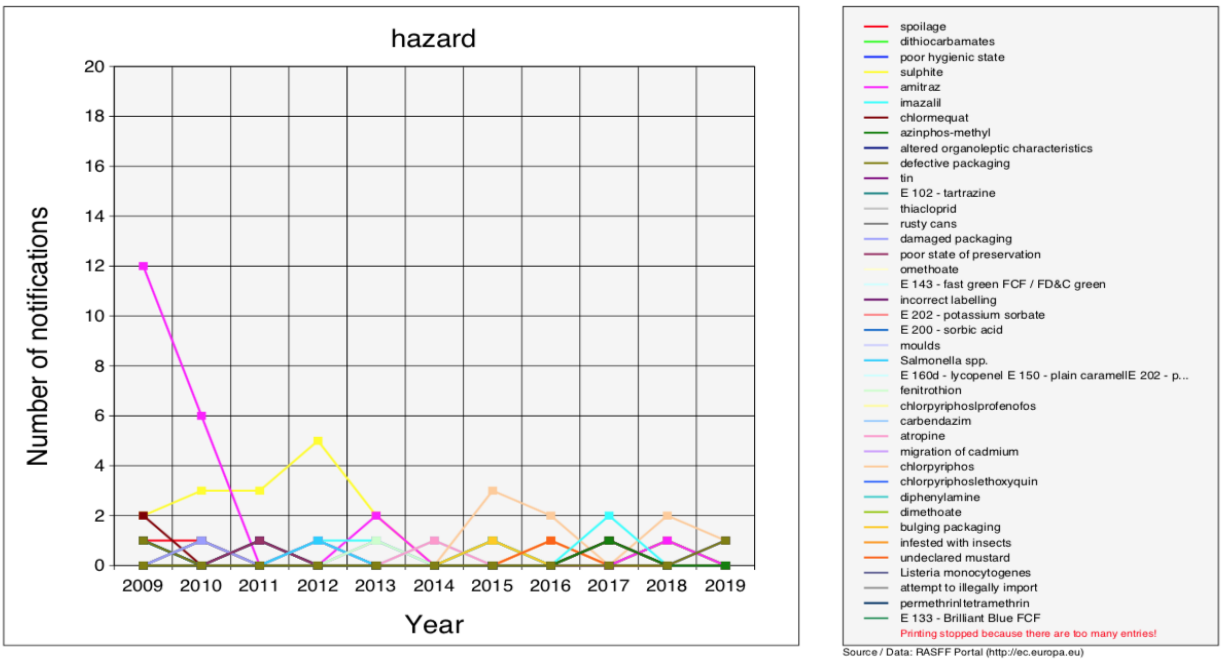
11.7 Generating trend statistics

In addition to the query, a trend statistic can be generated. Here it is possible to select the period individually. When creating the trend statistics there are several options:

a) Query for entire years (e.g. as shown below from 2009-2019):

By pressing the button "Trend by hazard" the output chart shows the trend over the selected years as a line graph. Depending on the default setting, trend statistics can be generated according to the hazard, year, country of origin or food. Only one value is displayed on the x-axis for each year (see example):

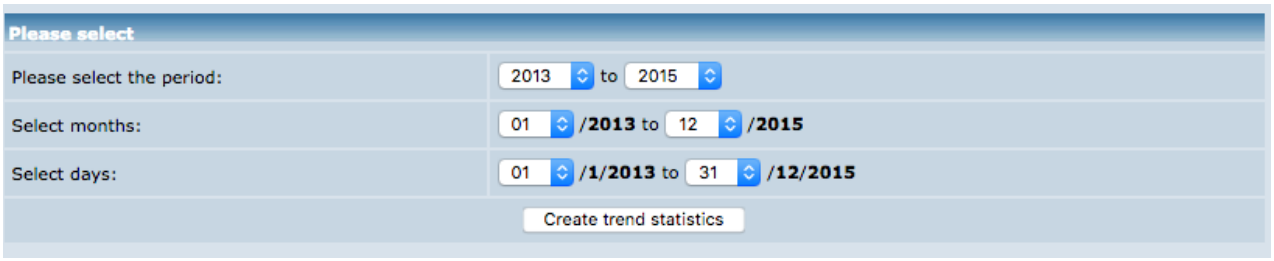


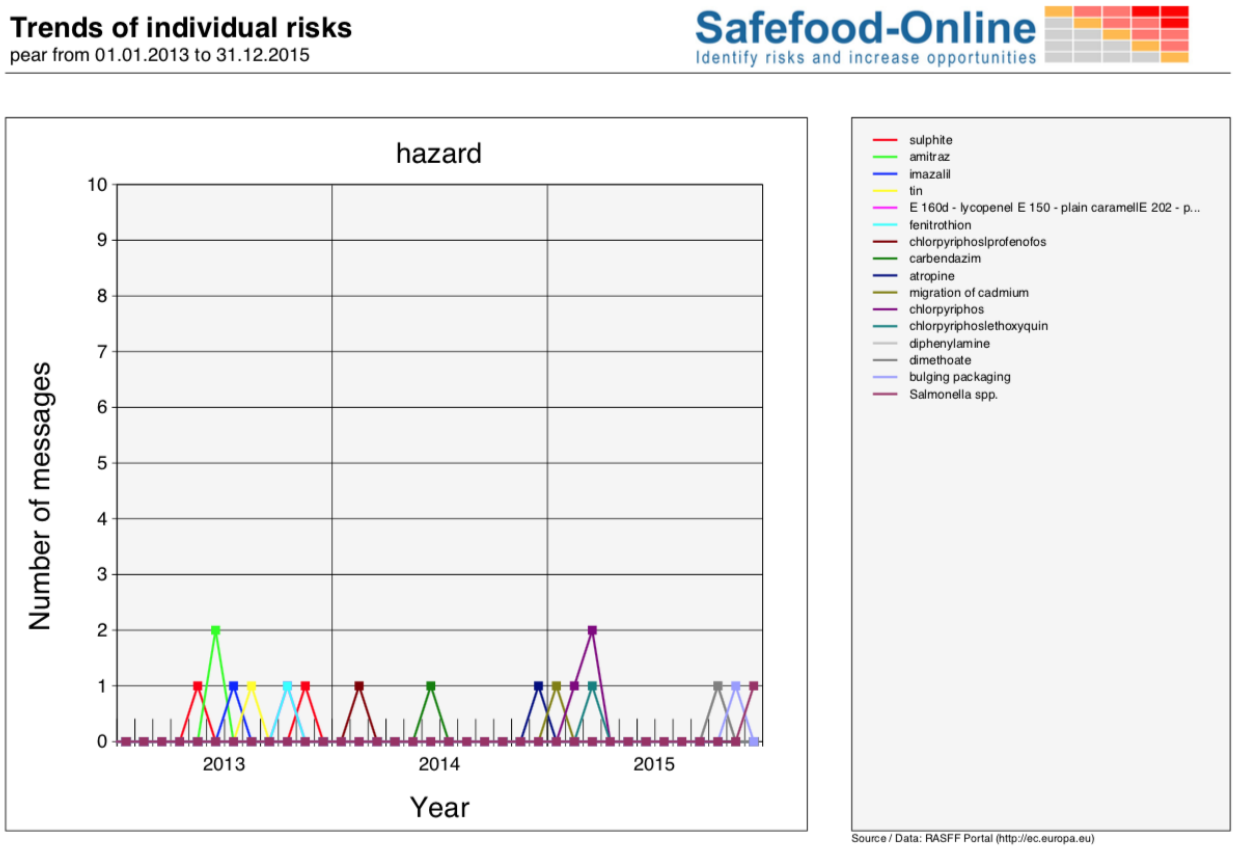


Example for a trend statstic regarding risks for pear from 01.01.2009 bis 31.12.2019

b) Query of selected time periods:

After clicking on "Select more details", the monthly details are taken into account in the chart. The x-axis shows 12 values for each year (see example). With the legend, the colours in the chart can be easily assigned.

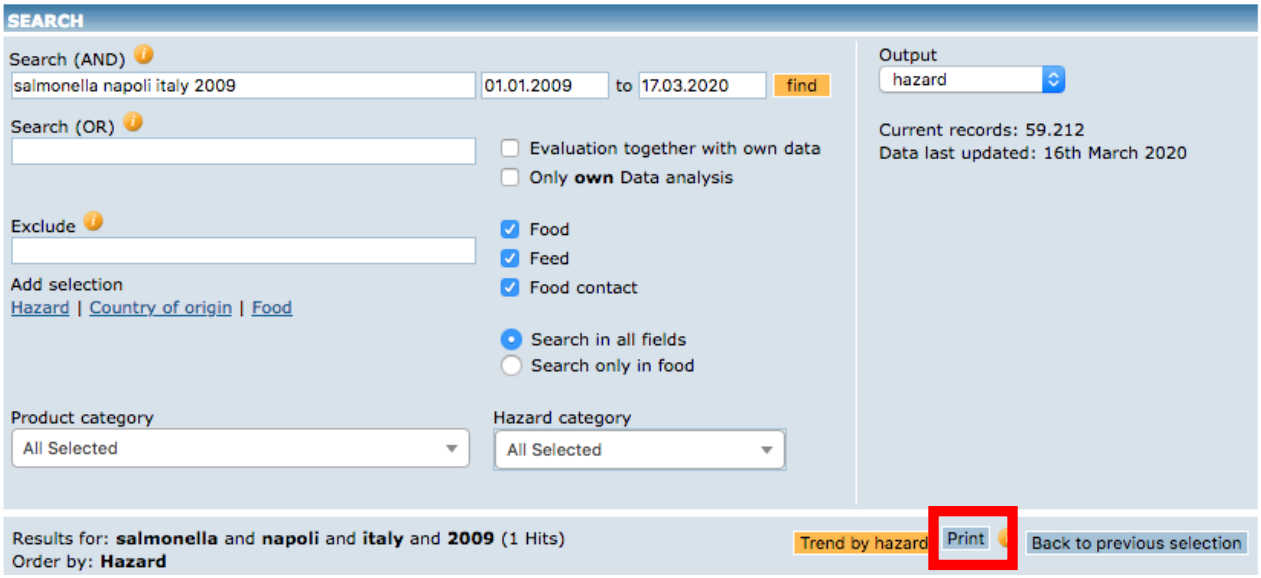




Example for a detailed trend statistic refgarding risks for pear 01.01.2013 – 31.12.2015

11.8 Printing the risk matrix

Depending on the selected browser, it may happen that the selected printout is not in color. Please check and correct the printer settings of your browser:



Microsoft Edge:
Enable the Print background colors and images option.
Chrome:
Select "Print -> "Further settings" and check the box "Background graphics".

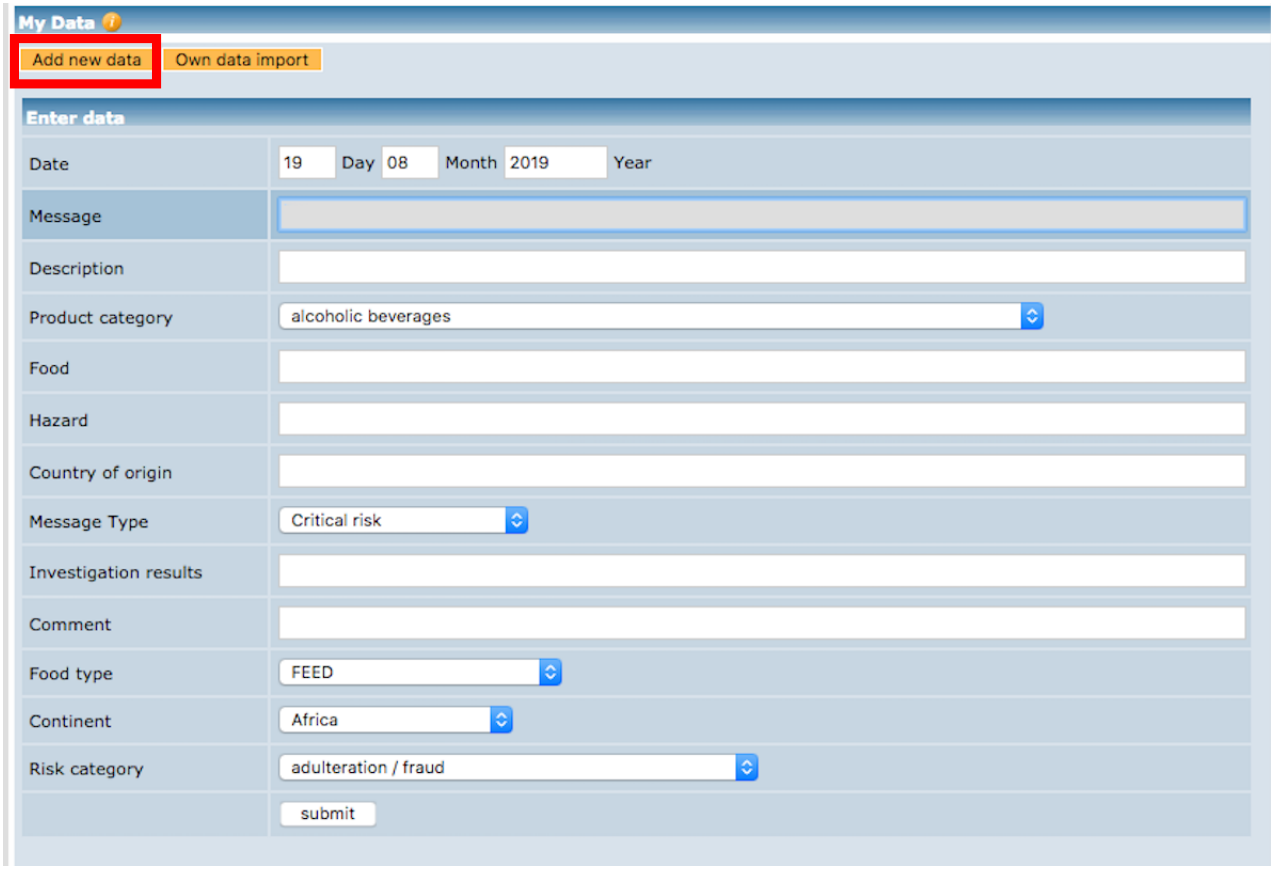
Firefox:
Select "File" -> "Print" and check the boxes for "Print background colors and background images".

Opera:
Select "File"- > "Print" -> "More options" and check the option "Background graphic".

12 Adding and evaluating own files

By clicking the button "My Data" (under the "Login" field) the page "Own files" opens. There are 2 options in SAFEFOOD-ONLINE to import own data:

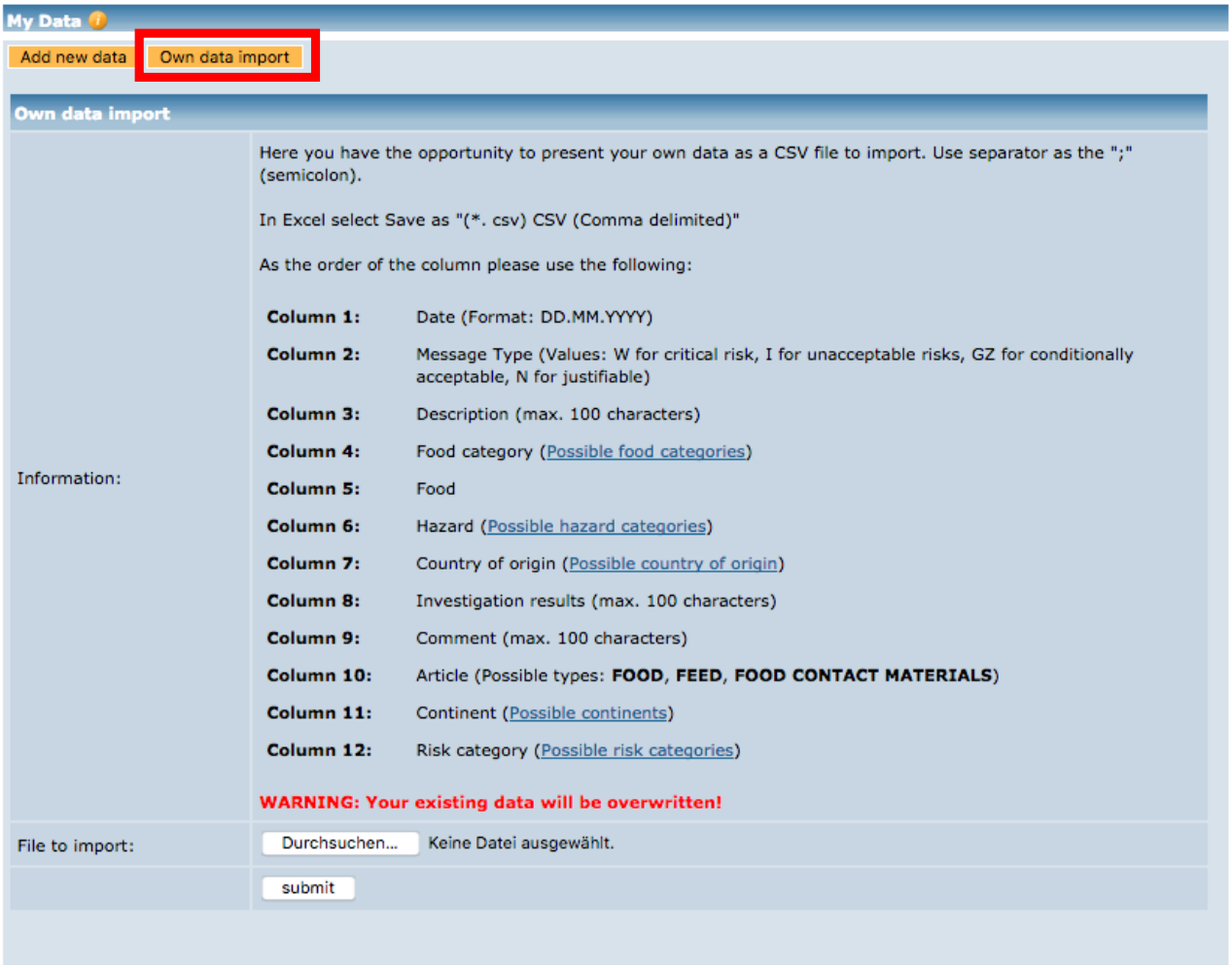
1.) By pressing the button "Add new data" it is possible to import own data individually:



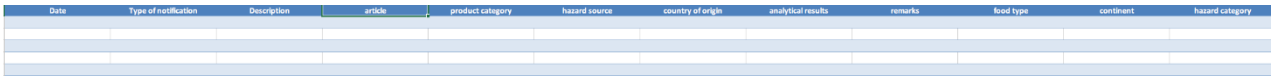
An example of self-added data could look like this:

This data can be further processed or deleted at any time.

2.) Button "Own data import" if several data sets are to be imported:

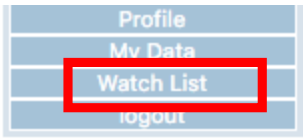


A formatted Excel spreadsheet is available under "Download" (import file for own messages):

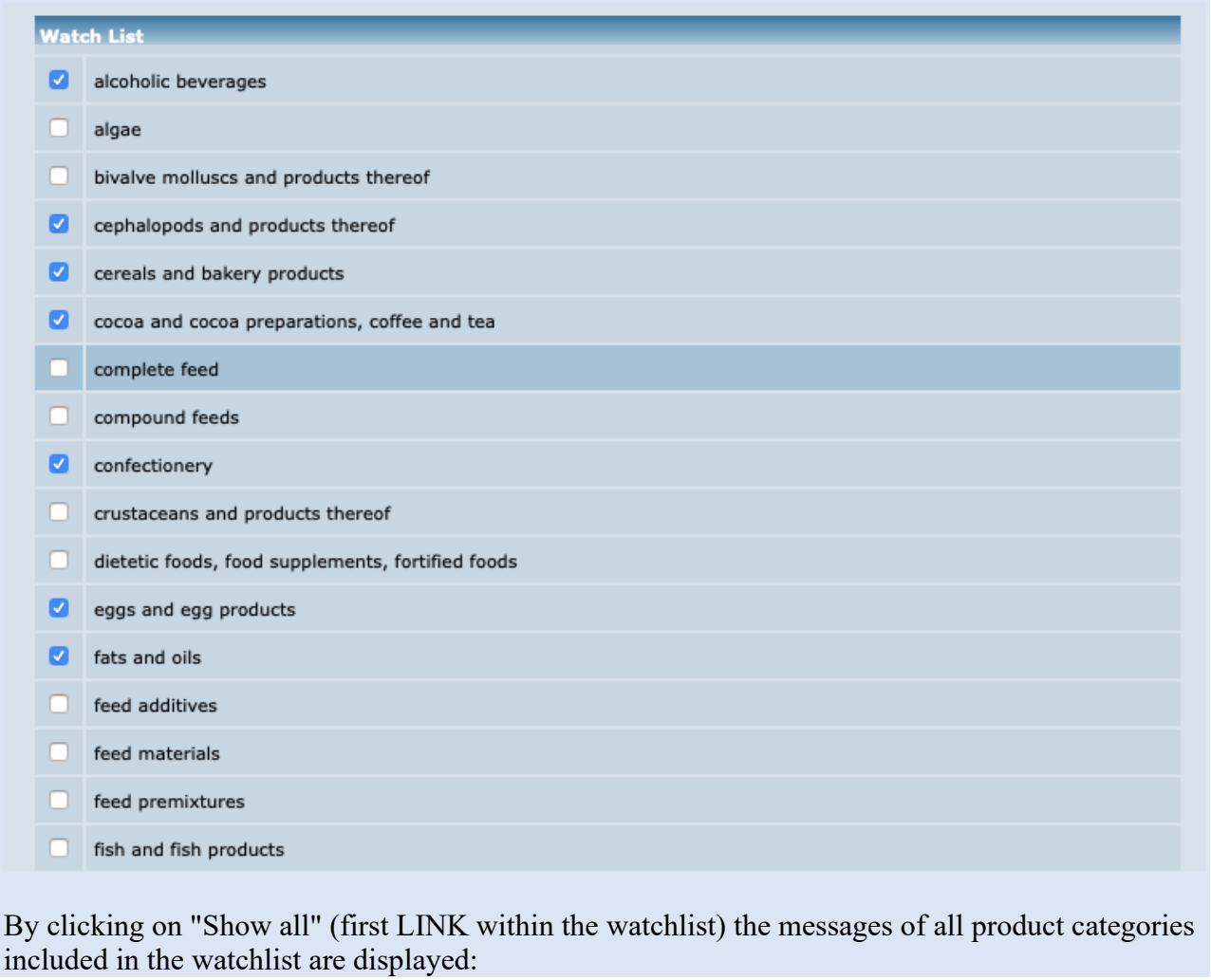


The own data (i.e. own findings from incoming goods reports or complaints) are available to all users of the assigned user group (= company). Other participants from other user groups have no access to the data and they cannot see the messages entered by other participants. Each company can therefore work with all available SAFEFOOD-ONLINE data and also with internal information.

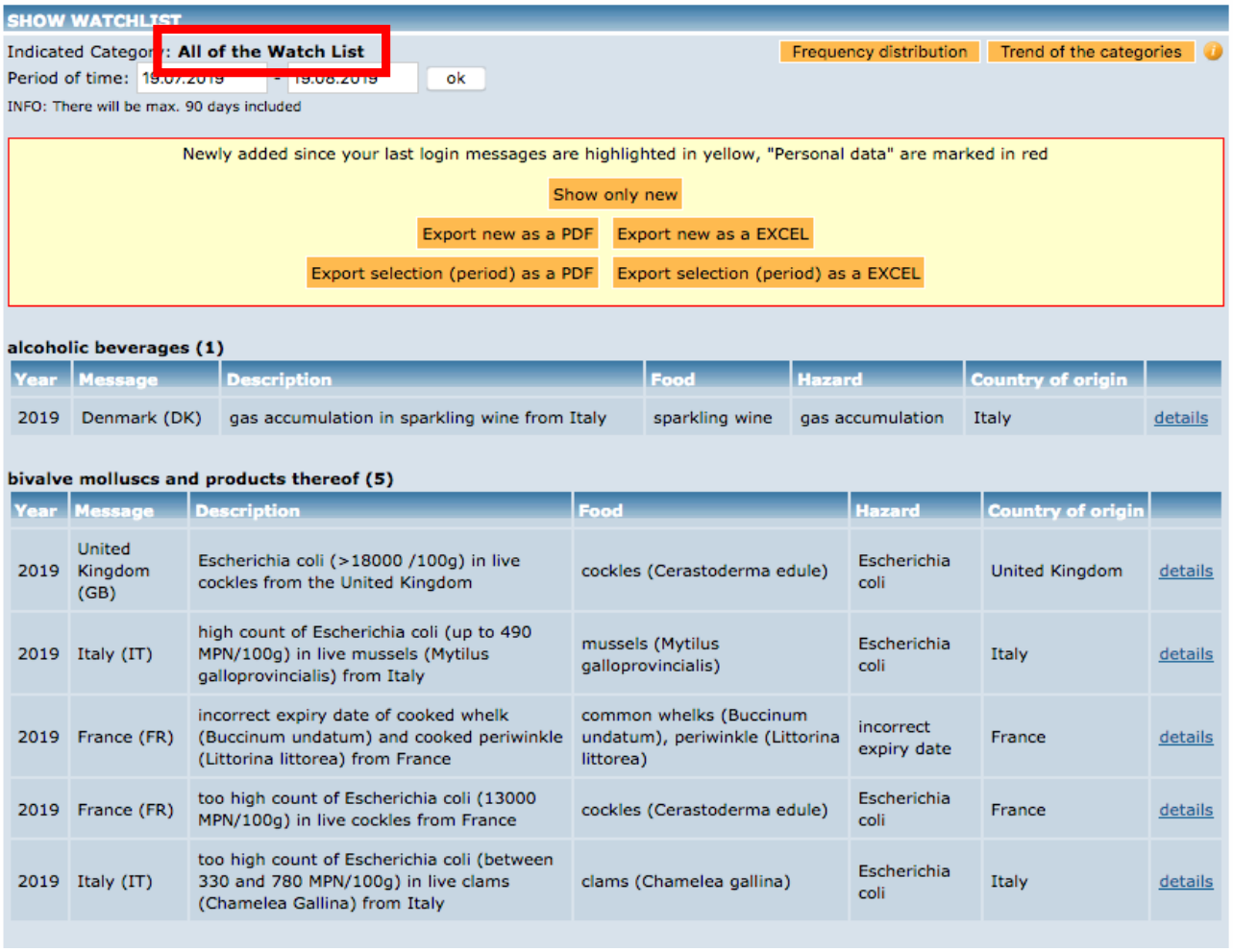
13 Monitoring hazards using your own watch list



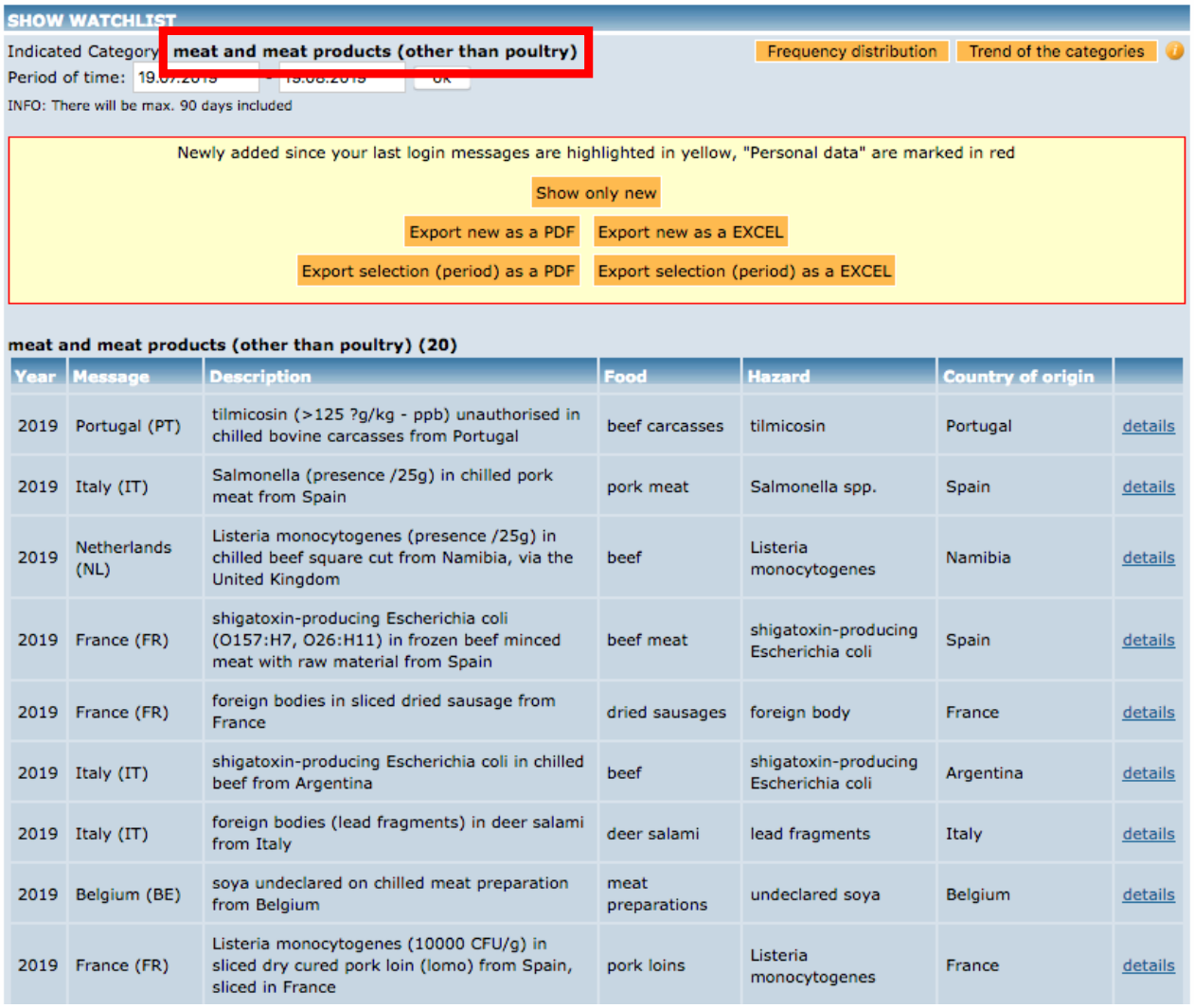
SAFEFOOD-ONLINE contains notifications for a large number of articles. With a "watchlist" it is possible to retrieve only the current reports on product categories used by the company. By clicking on "Watch List" below the "Login" field, a list opens in which individual fields (or all fields) can be selected from the product categories. This profile is saved after the selection and can be used during the next search. The selected product categories are listed under the field "Watchlist". The corresponding messages are displayed in a list box when the respective product category is selected and can be individually selected:



By clicking on "Show all" (first LINK within the watchlist) the messages of all product categories included in the watchlist are displayed:



By selecting the appropriate product category, it is also possible to display only the messages of individual product categories (here meat and meat products (except poultry)):

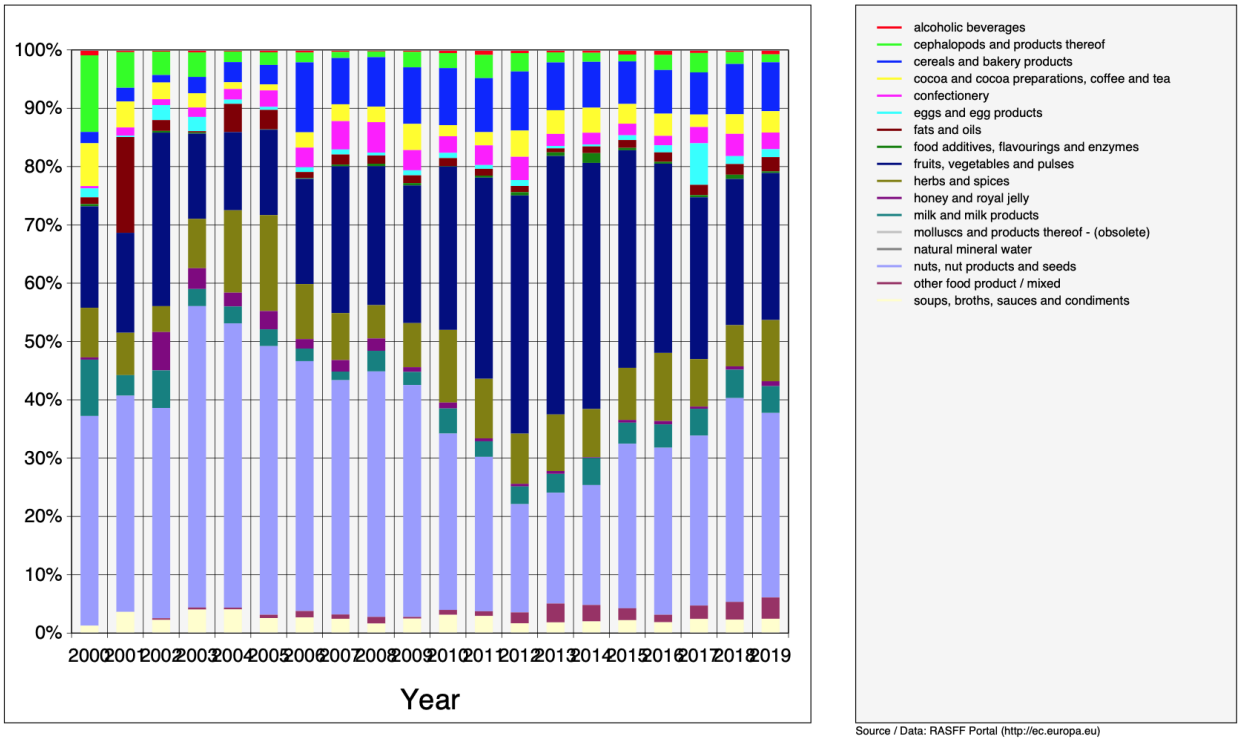


meat and meat products (other than poultry) (20)

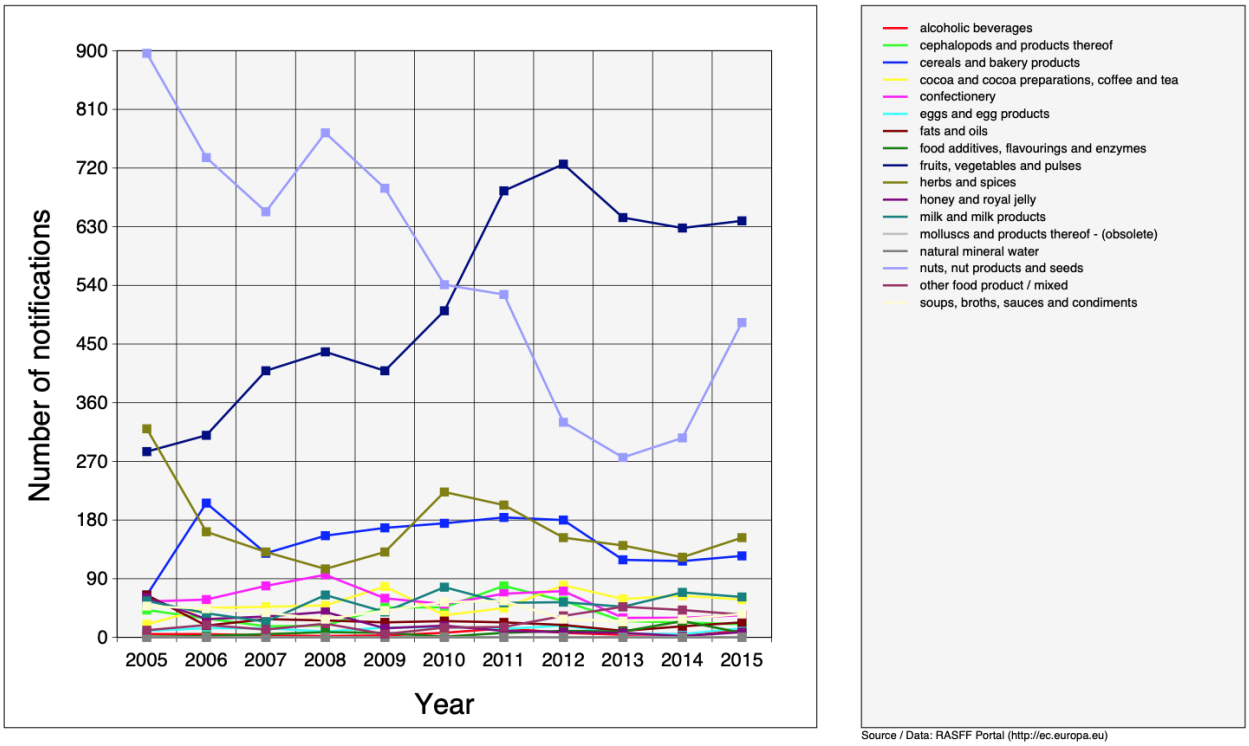
Year	Message	Description	Food	Hazard	Country of origin	
2019	Portugal (PT)	tilmicosin (>125 ?g/kg - ppb) unauthorised in chilled bovine carcasses from Portugal	beef carcasses	tilmicosin	Portugal	details
2019	Italy (IT)	Salmonella (presence /25g) in chilled pork meat from Spain	pork meat	Salmonella spp.	Spain	details
2019	Netherlands (NL)	Listeria monocytogenes (presence /25g) in chilled beef square cut from Namibia, via the United Kingdom	beef	Listeria monocytogenes	Namibia	details
2019	France (FR)	shigatoxin-producing Escherichia coli (O157:H7, O26:H11) in frozen beef minced meat with raw material from Spain	beef meat	shigatoxin-producing Escherichia coli	Spain	details
2019	France (FR)	foreign bodies in sliced dried sausage from France	dried sausages	foreign body	France	details
2019	Italy (IT)	shigatoxin-producing Escherichia coli in chilled beef from Argentina	beef	shigatoxin-producing Escherichia coli	Argentina	details
2019	Italy (IT)	foreign bodies (lead fragments) in deer salami from Italy	deer salami	lead fragments	Italy	details
2019	Belgium (BE)	soya undeclared on chilled meat preparation from Belgium	meat preparations	undeclared soya	Belgium	details
2019	France (FR)	Listeria monocytogenes (10000 CFU/g) in sliced dry cured pork loin (lomo) from Spain, sliced in France	pork loins	Listeria monocytogenes	France	details

Hint:
All messages from the last 90 days (calculated from the day of the message) are listed in groups according to the selected product categories.
By regular updating the data, i.e. from the RASFF, it is ensured that the risk landscapes created will always contain the latest findings on food safety.

By selecting a period, a trend statistic or a frequency distribution can be selected. In this way, trends can be identified which are included in the risk management.



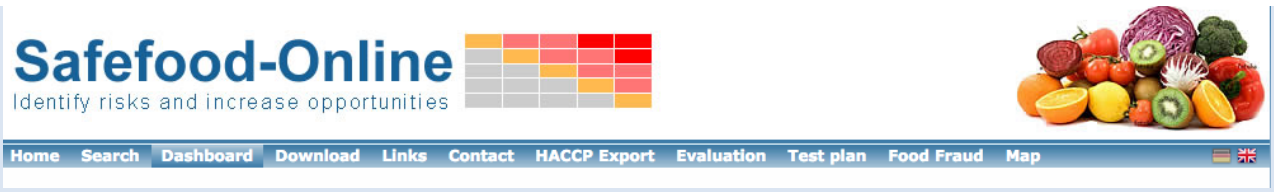
Frequency distribution according to food categories (period 01.01.2000 bis 31.12.2019)



Trend statistic for selected food according to the selected food categories (period 01.01.2005 bis 31.12.2015)

14 Dashboard

For a quick overview the Dashboard shows a chart based on the following parameters:



- notifications
- product categories
- hazard categories
- Product category for selected hazard categories
- Hazard category for selected product categories
- World Map with Countries by Risk Class (CPI)
- newly added notifications (articles)

14.1 Notifications

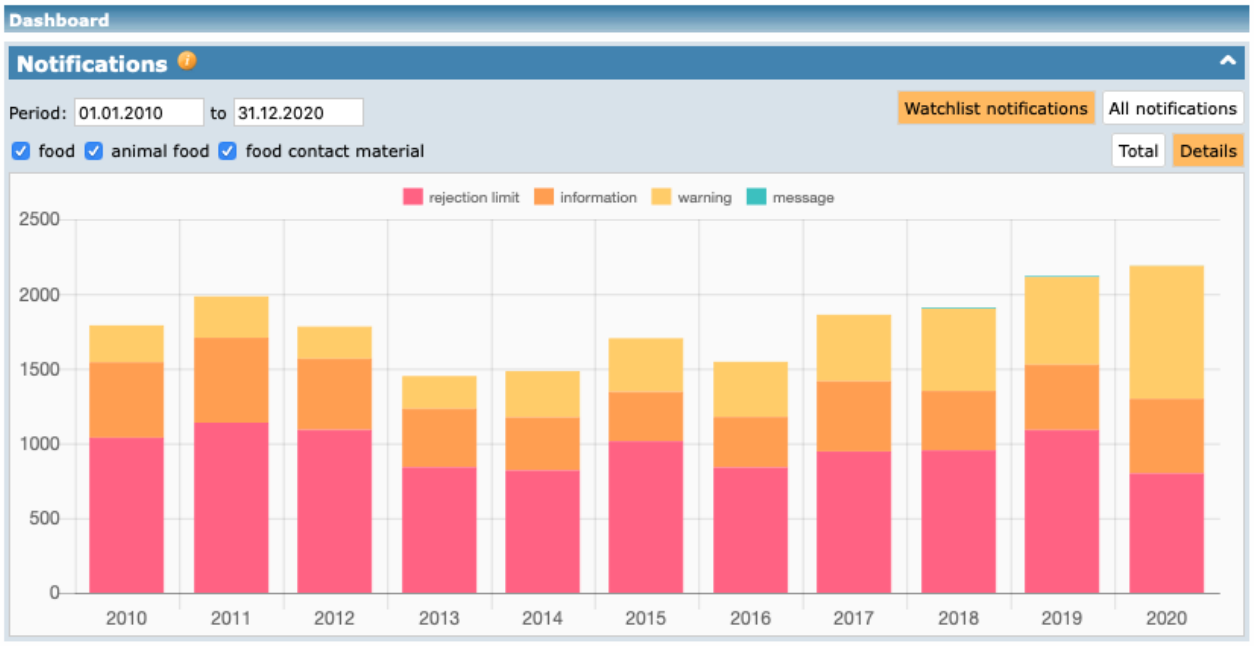
The following parameters can be selected for the graphic display of the messages:

- Period
- Food and/or feed and/or contact materials
- Watchlist messages or all messages
- Total or Details

When the parameters are defined, the number of notifications is displayed as a bar graph.
In the "Details" parameter, the number of notifications is displayed as a bar graph grouped by the following types of notifications:

- Request
- border rejection notification
- information notification for attention
- information notification for follow-up
- alert notification

Notifications in the selected period

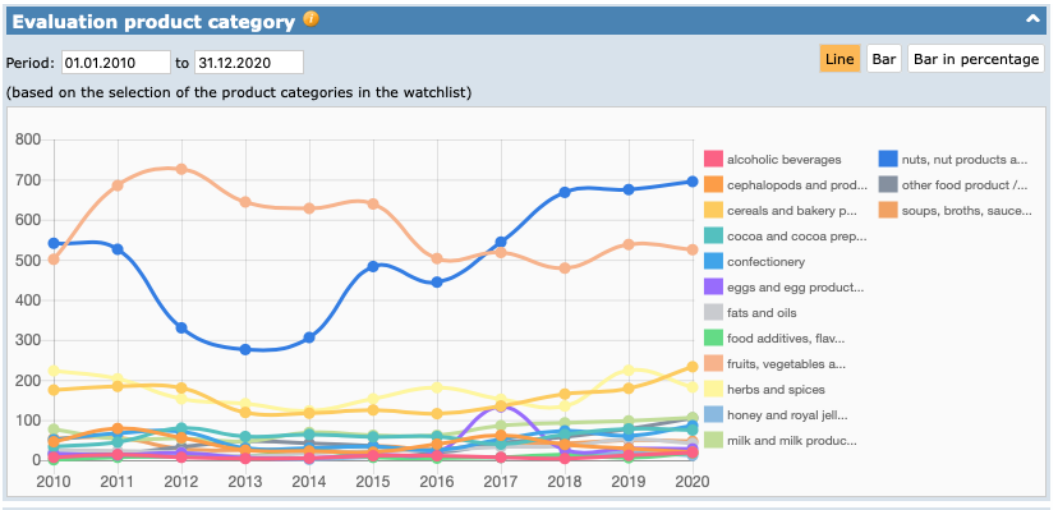


Notifications in the selected period according to the type of notification

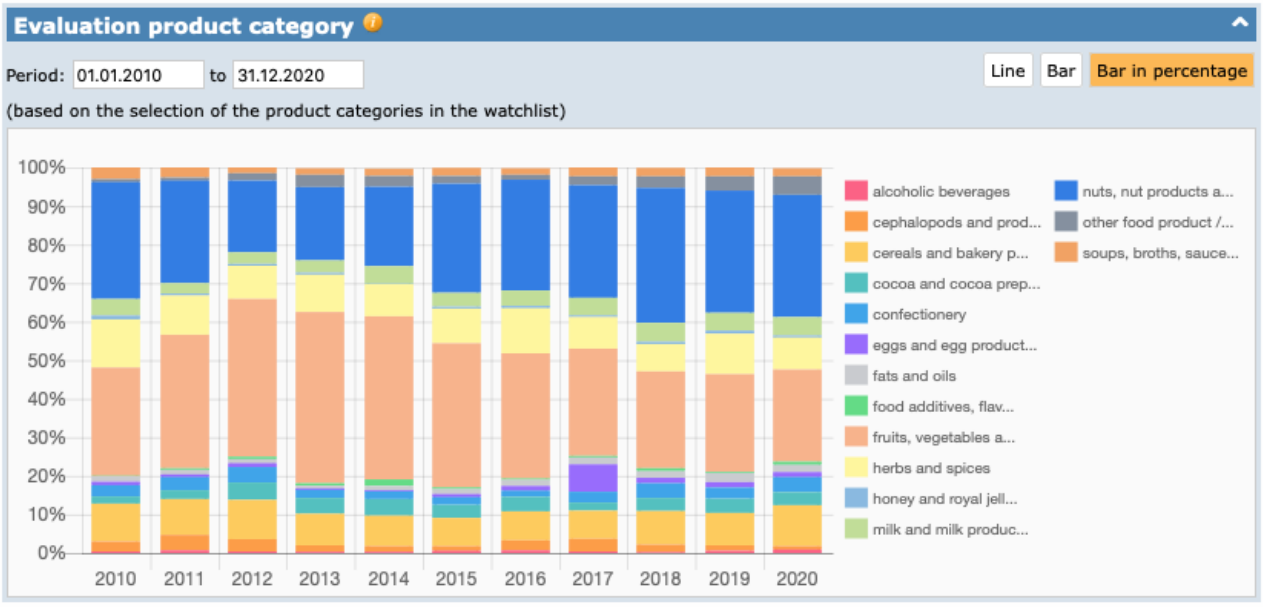
14.2 Evaluation Product category

The following parameters can be selected:
- Period
- Line or bar chart
- Bar chart in percent

The number of notifications is based on the selected product categories in the watchlist.
The product categories can be removed or added by a mouse click:



Notifications according to product categories in the selected period

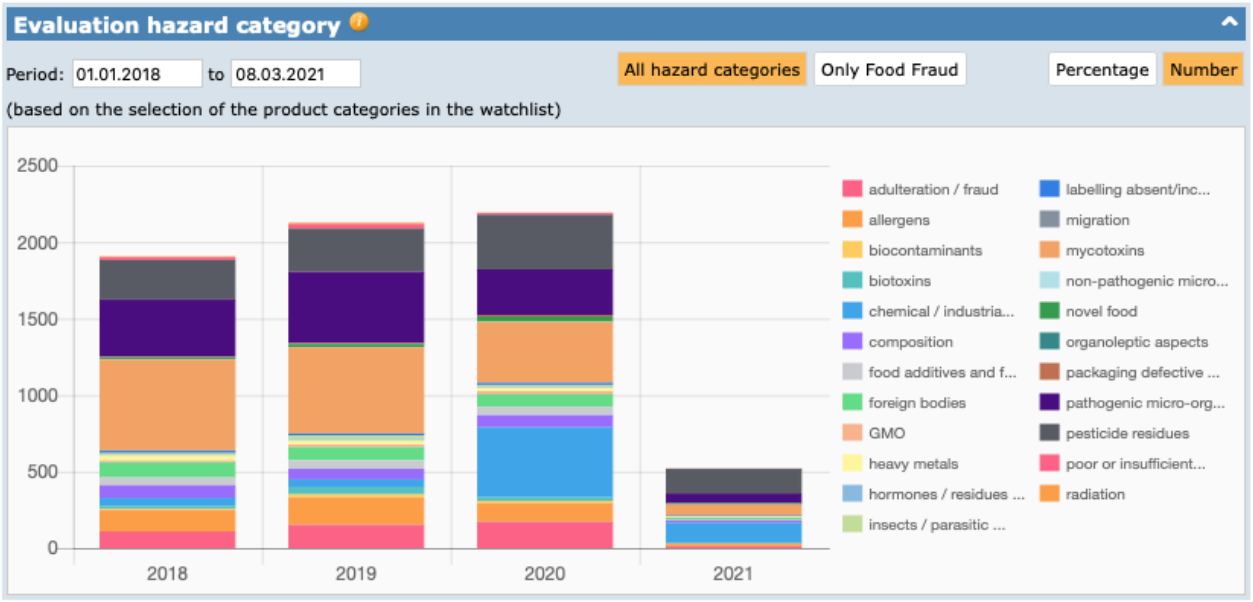


Distribution (in percentage) according to product groups in the selected period

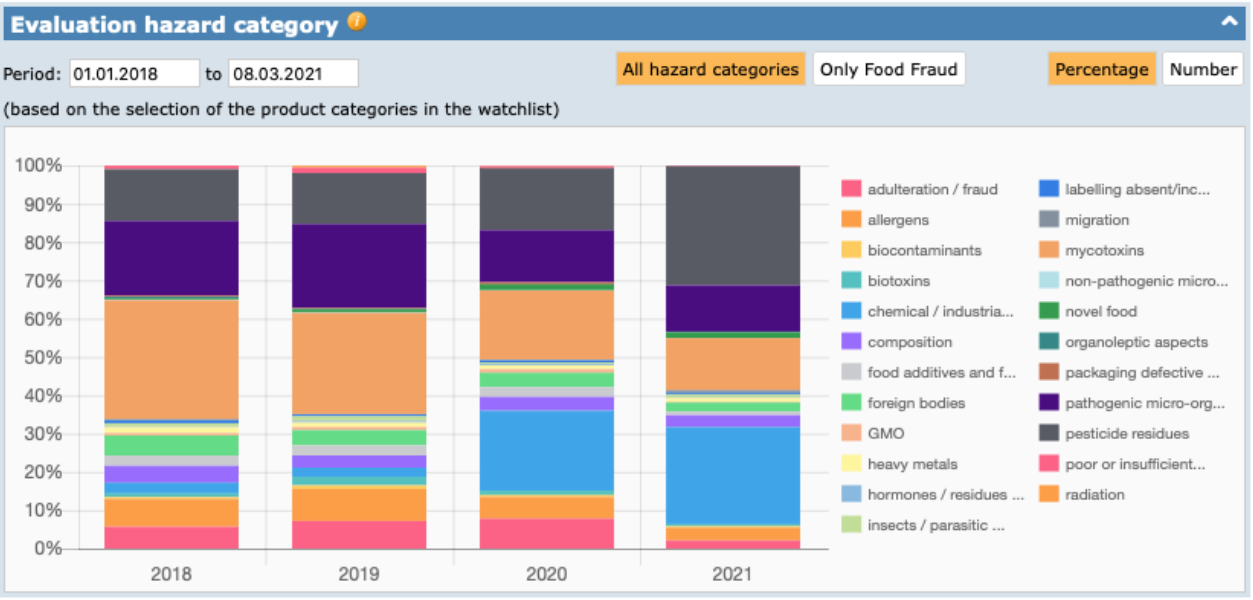
14.3 Evaluation hazard category

The following parameters can be selected:
- Period
- all hazard categories
  or just Food Fraud
- Display by percent or number
- hazard categories

The number of notifications is based on the selected product categories in the watchlist. The risk categories can be removed or added by a mouse click:



Notifications according to hazard categories for the selected period

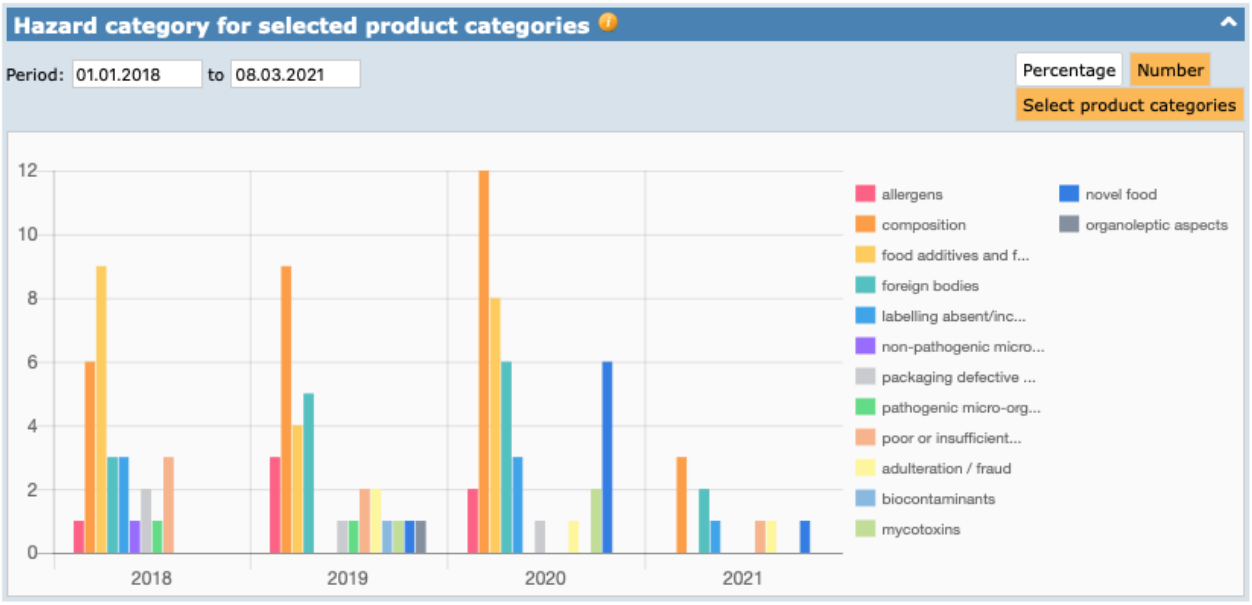


Distribution (in percentage) according to hazard categories for the selected period

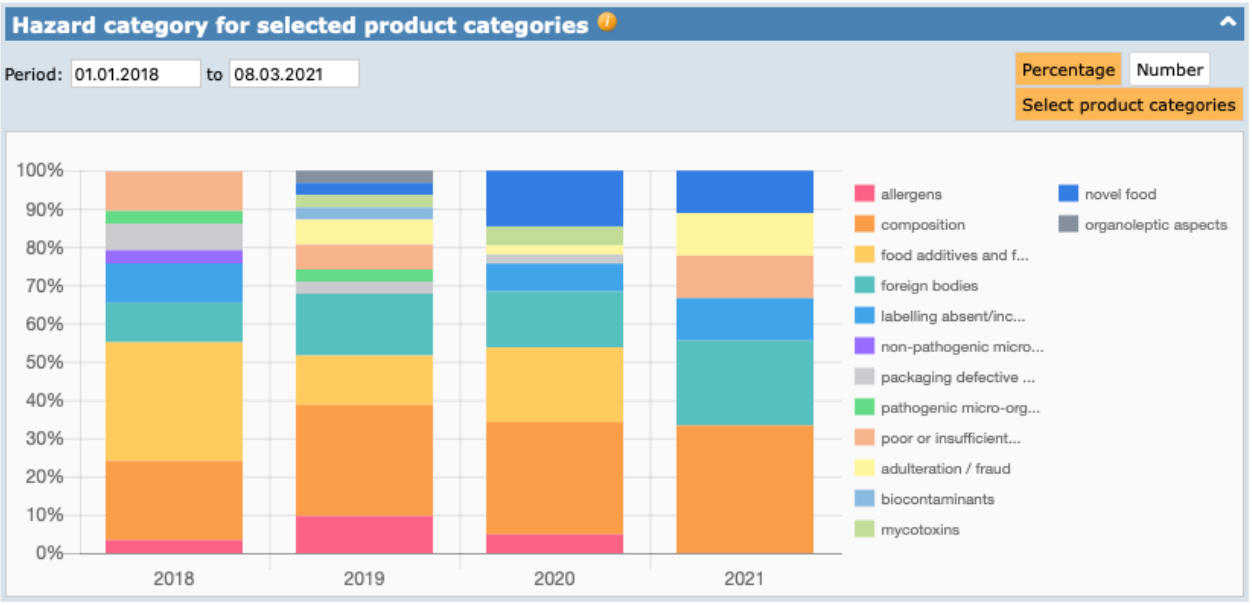
14.4 Hazard category for selected product categories

Here the desired product categories are selected. In addition, the query can be adjusted by selecting:

- Period
- all hazard categories or only Food Fraud
- Display in percent or number



Notifications according to hazard categories (for selected product groups) in the selected period

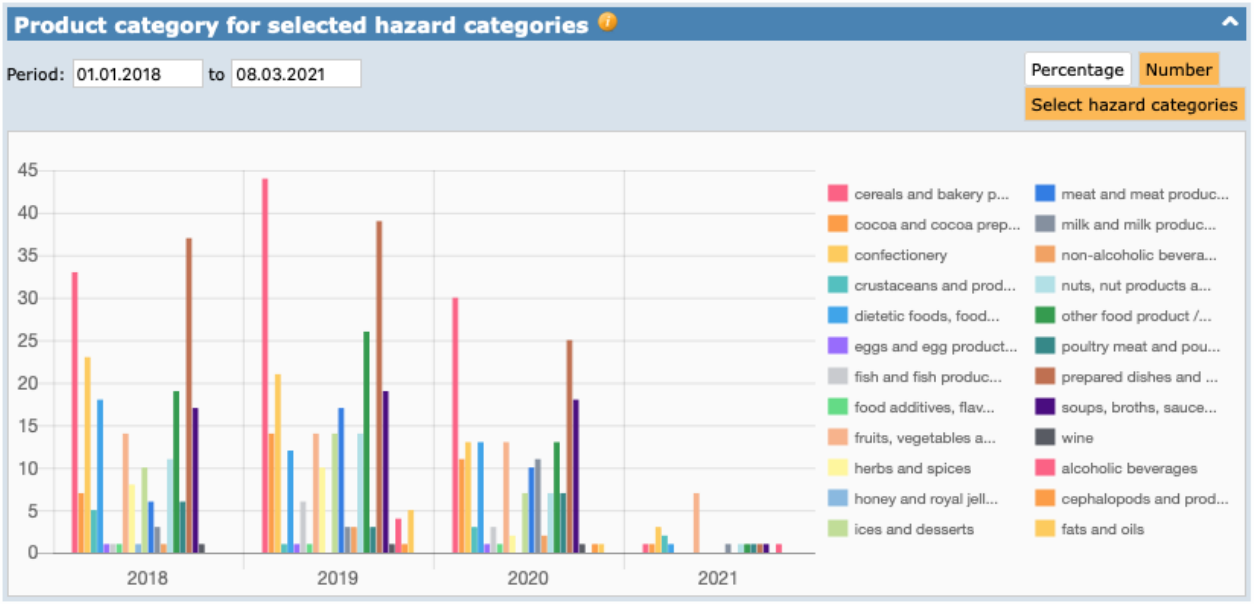


Distribution (in percentage) according to hazard categories (for selected product groups) in the selected period

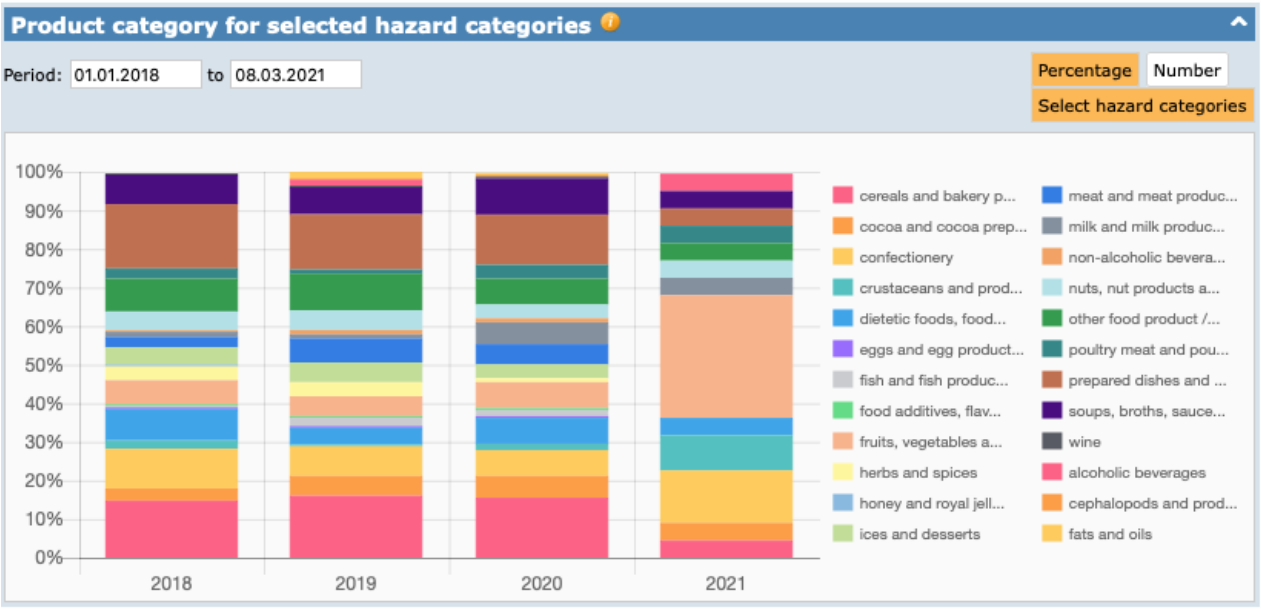
14.5 Product category for selected hazard categories

Here, the desired hazard categories are selected. In addition, the query can be adjusted by selecting:

- Period
- all hazard categories or only Food Fraud
- Display in percent or number



Notifications according to product groups (for the selected hazard categories) for the selected period

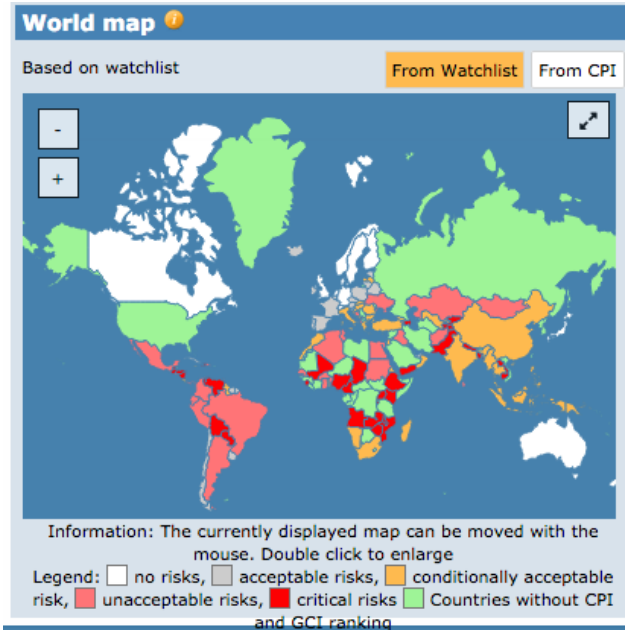


Distribution (in percentage) according to product groups (for the selected hazard groups) in the selected period

14.6 World map

The world map shows the countries by risk in relation to their Corruption Perception Index (CPI). The following display can be selected:

- from Watchlist: Shows the countries with their risk classification that are listed in the Watchlist
- from CPI: shows all countries, independent from the settings in the watchlist



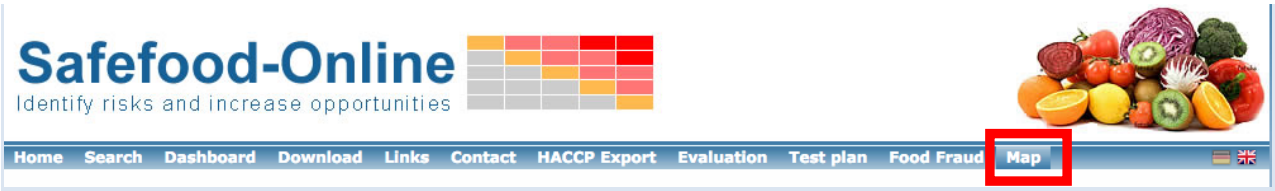
14.7 Latest notifications (15)

This table shows the last 15 notifications for articles where no notifications have been made before:

The latest notifications (15)

- **chocolate silver pearls** > undeclared milk ingredient
- **cups** > migration of formaldehyde
- **vegetable cutter** > plastic particles
- **bamboo coffee mugs** > migration of formaldehyde
- **squid tentacles** > poor temperature control
- **organic elderflowers** > Salmonella spp.
- **pork hemoglobine** > presence of ruminant DNA
- **brie de Meaux** > Listeria monocytogenes
- **chromed steel grid** > migration of nickel
- **meal set** > migration of melamine
- **peppermint (Mentha spp.)** > pyrrolizidine alkaloids
- **organic vegan butter alternative** > undeclared milk ingredient
- **glucosamine sulphate** > undeclared crustaceans
- **flavoured water, sparkling water, still water** > arsenic

15 Countries of origin according to CPI and GCI (Modul „Map)



On the homepage of SAFEFOOD-ONLINE you will find the module "Map". You can enter any food/ product in the "Search" field. On the world map, all countries of origin are displayed, from which the searched food originates and for which notifications are available.

It is possible to set the display mode that the Corruption Perceptions Index (CPI) and/ or the Global Competitiveness Index (GCI) is included in the calculation for the relevant countries.

Corruption Perceptions Index (CPI)

The Corruption Perception Index (CPI) is based on surveys and research conducted by more than ten independent institutions. The index ranges from 0 to 100, with 100 indicating the lowest perception of corruption and thus the best possible result (source: http://www.transparency.org/research/cpi/overview).

The current index includes 180 countries listed according to their CPI.

Global Competitiveness Index (GCI)

The growth competitiveness index is an indicator of the current competitiveness of 140 countries. It is compiled by the World Economic Forum and published as part of the Global Competitiveness Report. The maximum score is 100.

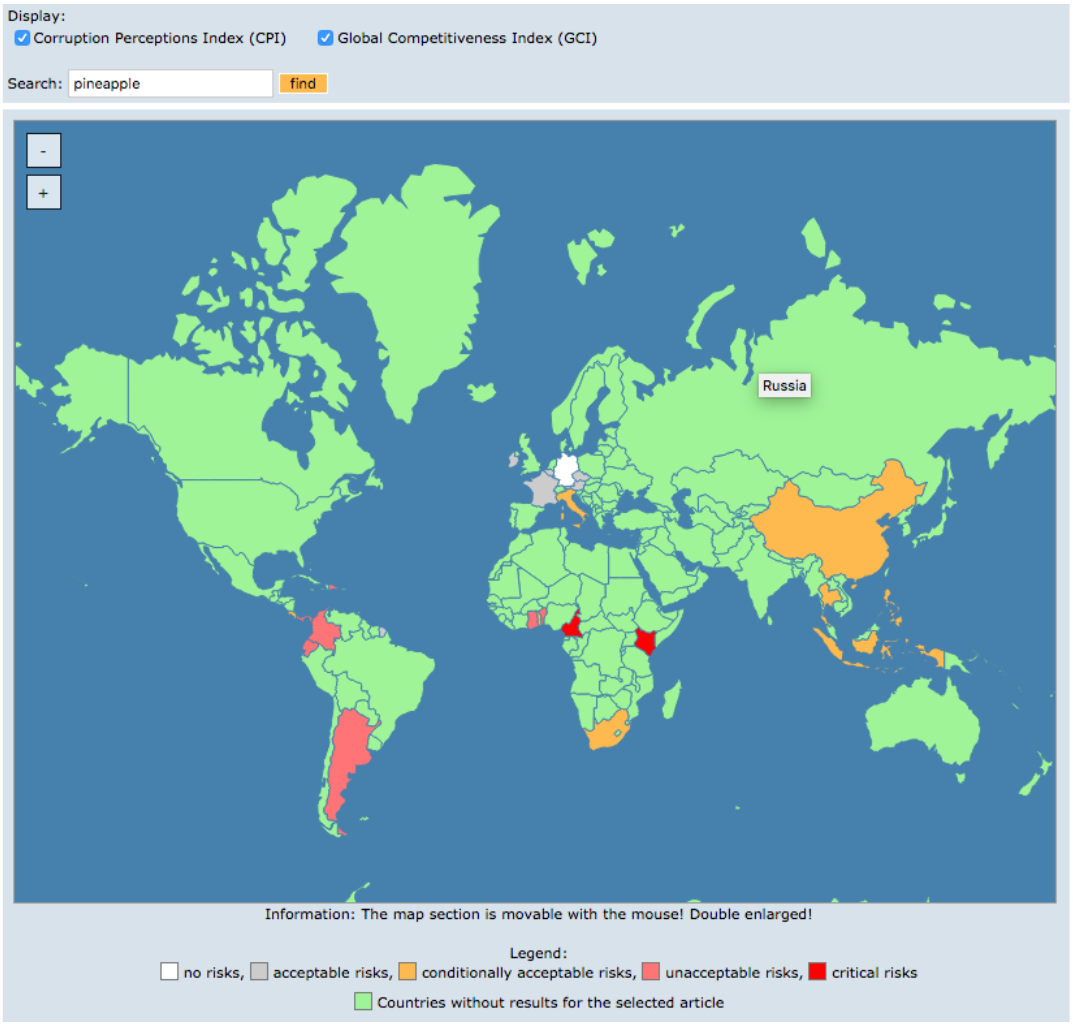
The Global Competitiveness Index is calculated from three sub-indices: the basic requirements and needs, the efficiency-enhancing factors and the innovation and sophistication factors. Currently 12 categories are considered: Institutions, infrastructure, information/communication technology, macroeconomic environment, health, education and training, product market efficiency, labour market efficiency, financial systems, market size, business dynamics and innovation capacity. The individual factors are assessed differently. Further information is available at: https://www.weforum.org/reports/the-global-competitveness-report-2018.

The colours displayed correspond to the hazard queries (Search module), the HACCP Export or the Test Plan.

The map section can be moved easily with the mouse or enlarged individually or can be reduced in size.

The figure shows an example for the query "Pineapple", taking into account the Corruption

Perceptions Index (CPI) and Global Competitiveness Index (GCI) data:

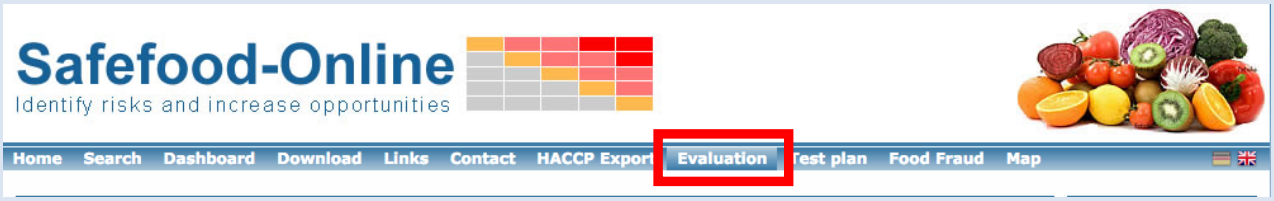

Display:
Corruption Perceptions Index (CPI)
Global Competitiveness Index (GCI)
Search: pineapple
find
-
+
Russia
Information: The map section is movable with the mouse! Double enlarged!
Legend:
no risks, acceptable risks, conditionally acceptable risks, unacceptable risks, critical risks
Countries without results for the selected article

At the end of the query, a table appears from which the details can be seen:

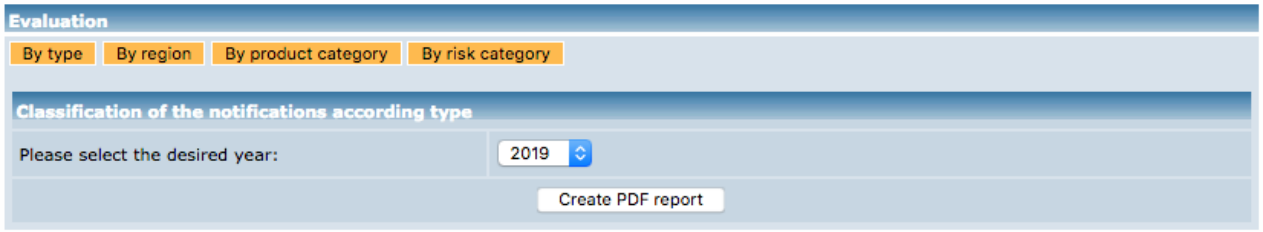
Country	Foods	CPI	GCI	
Austria	packaging of pineapple juice	76	76.60	
Belgium	pineapple	76	76.40	
Benin	pineapple	41	45.80	
C?te d'Ivoire	pineapple	-	-	
Cameroon	pineapple	25	46.00	
China	pineapple, pineapple syrup	42	73.90	
Colombia	pineapple	39	62.70	
Costa Rica	pineapple, organic pineapple	57	62.00	
Czech Republic	dried pineapple	-	-	
Dominican Republic	pineapple	28	58.30	
Ecuador	avocados, bananas, lemons, pineapple	39	55.70	
France	pineapple, mango	69	78.80	
Germany	pineapplecream chocolate bar, aronia extract herbal drink with pineapple juice, dried pineapple	80	81.80	
Ghana	baby pineapple, pineapple	43	51.20	
Indonesia	pineapple	37	64.60	
Ireland	pineapple soft drink	72	75.10	
Italy	packaging of pineapple juice	53	71.50	
Kenya	pineapple	31	54.10	
Mauritius	pineapple	53	64.30	
Panama	pineapple	35	61.60	
Philippines	dried and lightly sweetened pineapple, banana, mango, pineapple	34	61.90	
South Africa	pineapple, baby pineapple	44	62.40	
Thailand	green apple flavoured pineapple slices, canned pineapple, pineapple, candied pineapple slices, dried pineapple, red strawberry flavoured pineapple slices, mango flavoured pineapple slices, dried ginger, dried melon, dried papaya, candied pineapples	36	68.10	

16 Graphical display of notifications

In this menu item various graphical evaluations of notifications can be done.



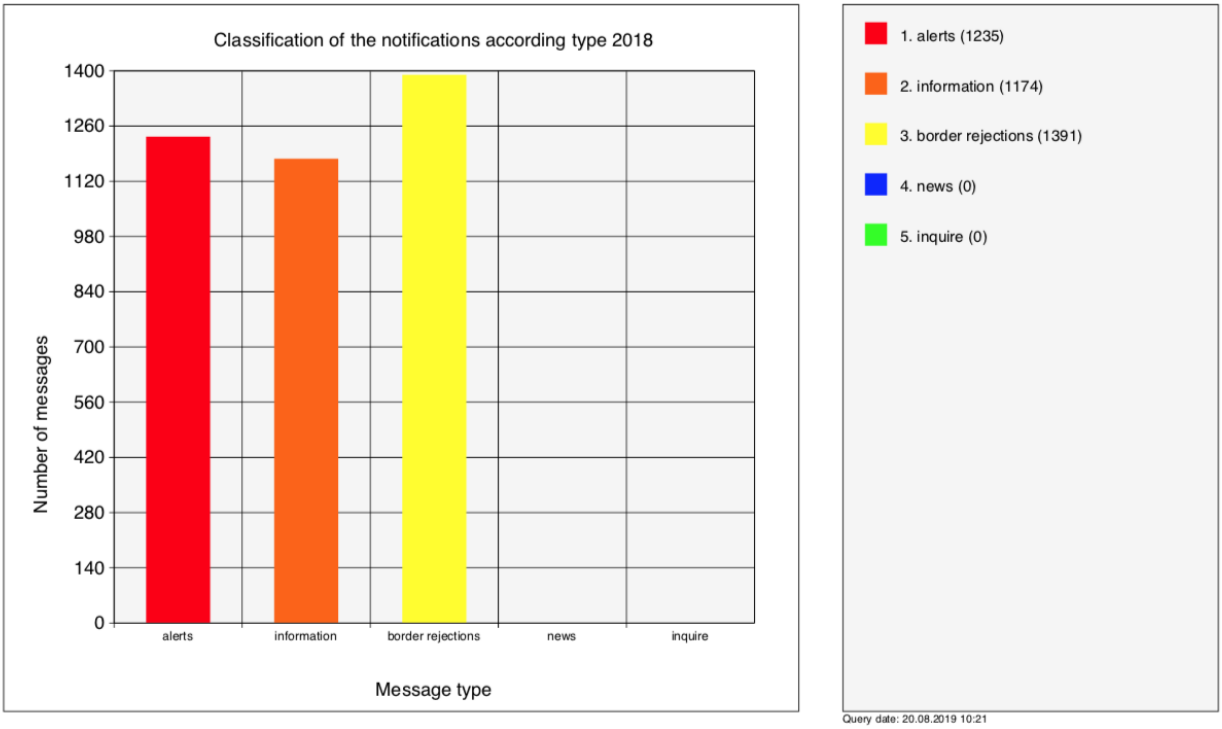
The output is always in PDF format. The options of the evaluation are available directly after opening the corresponding window.



After a click on "By type" (the year 2018 is selected) an overview of all messages in the year 2018 appears according to the type of messages:

Classification of the notifications according type
Evaluation: for 2018

Safefood-Online
Identify risks and increase opportunities



17 Consulting and services

Individual advice to establish or develop further the risk management process or HACCP concept is available on request.

Offered services and consulting:

- Taking over individual queries on the risk management process
- Support to establish individual HACCP plans for existing raw materials and animal feed
- Competent support for inspection planning
- Queries and advice on Food Fraud
- Conducting supplier audits
- Answering questions about product safety
- On-site consultations on the development of a risk management system (according to DIN ISO 31000)
- Integration of the risk management system into the existing management system
- In-house training on risk management

Please address your questions directly to SAFEFOOD-ONLINE (bernhard.mueller@safefood-online.

Please address your suggestions, questions and requests directly to:

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