

Tying up loose ends: How data harmonization fosters interoperability and data sharing

FoodChain-Lab Workshop United Kingdom | 15.-16.05.2025

Marion Gottschald, Alexander Falenski, Marco Rügen, Marc Lorenzen, Daria Savvateeva, Matthew Salewski, Olaf Mosbach-Schulz

FCL was supported by EFSA-BfR Framework Partnership Agreements (FPA) GP/EFSA/AMU/2016/01 and GP/EFSA/AMU/2020/02, and received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 773830 OH EJP COHESIVE.

The current situation: Fipronil incident as example

NL collects data

DE collects data

...

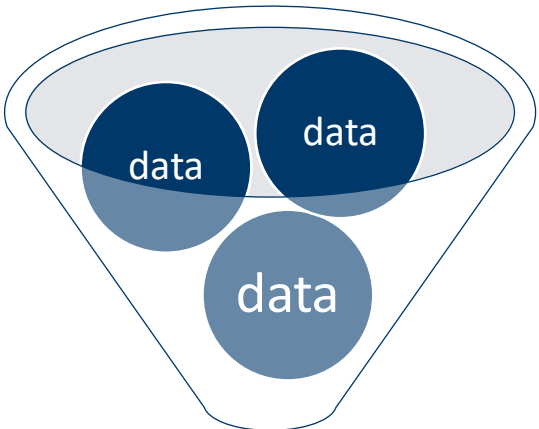
Example for data exchanged between European authorities

The current situation: Fipronil incident as example

NL collects data

DE collects data

...



RASFF system

A scanned image of a CMR (Convention on the Contract for the International Carriage of Goods by Road) form. The form is filled with handwritten text in Italian. The text includes "Reclamazione: Paletti non sono europei!!! Problem con temperatura e -10 gradi no ne e -10!!! Merce con foglie verde." and "Reclamazione: Paletti non sono europei!!! Problem con temperatura e -10 gradi no ne e -10!!! Merce con foglie verde." The form also has fields for "Signature initiator" and "Signature transporter".

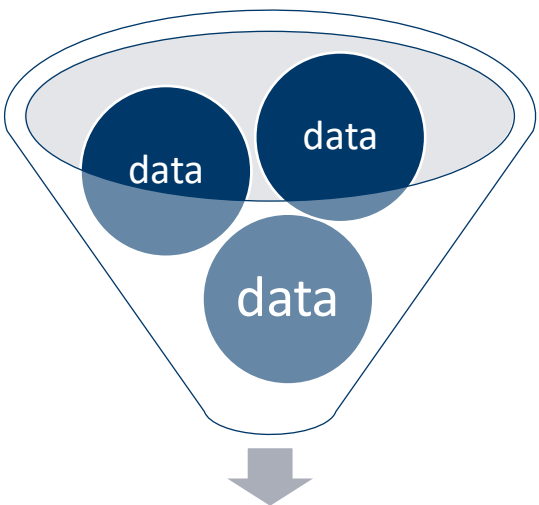
Example for data exchanged between European authorities

The current situation: Fipronil incident as example

NL collects data

DE collects data

...

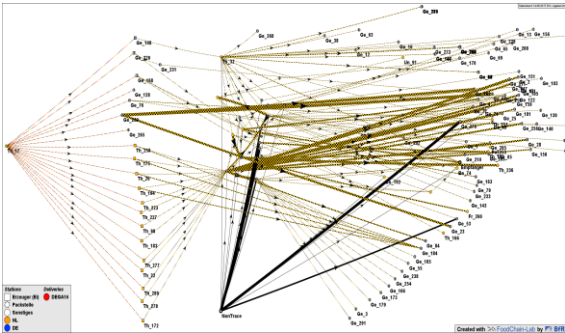


RASFF system

Example for data exchanged between European authorities

The challenge: Getting an overview on situation

Unstructured data, not machine-readable/paper-based, distributed across several follow-up notifications → limited usability of data



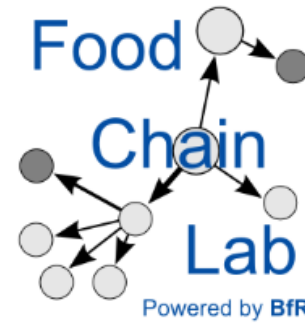
NL extracts data manually

DE (BVL + BfR) extracts data manually

NRW extracts data manually

Duplication of work!

Need: Digital data in pre-agreed formats



Data collection and data extraction: Structured excel templates as a first step

- Ready to use
- Easy to use and easily accessible
- Machine-readable
- Structured but not much standardised
- Tested and applied in real foodborne incidents

Core part										Flexible part									
Company ID	Name	Street	Street Number	Postal Code	City	District	State	Country	Type of business	Latitude	Longitude								
1	Disease case							DE	Disease case										
2	Coffee bar							DE	Coffee bar										
3	Oat milk producer							DE	Oat milk producer										
4																			
5																			

Core part										Flexible part									
DeliveryID	Station	Product Name	Lot Number	Lot size	Delivery Date Departure	Delivery Date Arrival	Unit weight/vol./pck.	Recipient	Additional Fields ->	Item Number									
				Quantity	Type / Unit	Day	Month	Year	Day	Month	Year	Quantity	Type / Unit						
1	1	5 Coffee ground																	
2	2	6 Drinking water																	
3	3	3 Oatmilk																	
4	4	7 White sugar																	
5	5	8 Drinking water																	
6	6	9 Oat grain																	
7	7	10 Rape seed oil																	
8	8	11 Salt																	
9	9	12 Vitamin B12																	
10	10	13 Regulator (dipotassium phosphate)																	
11	11	2 Cappuccino with oat milk and sugar																	

From DeliveryID	Into DeliveryID
1	11
2	11
3	11
4	11
5	11
6	3

= Recipes

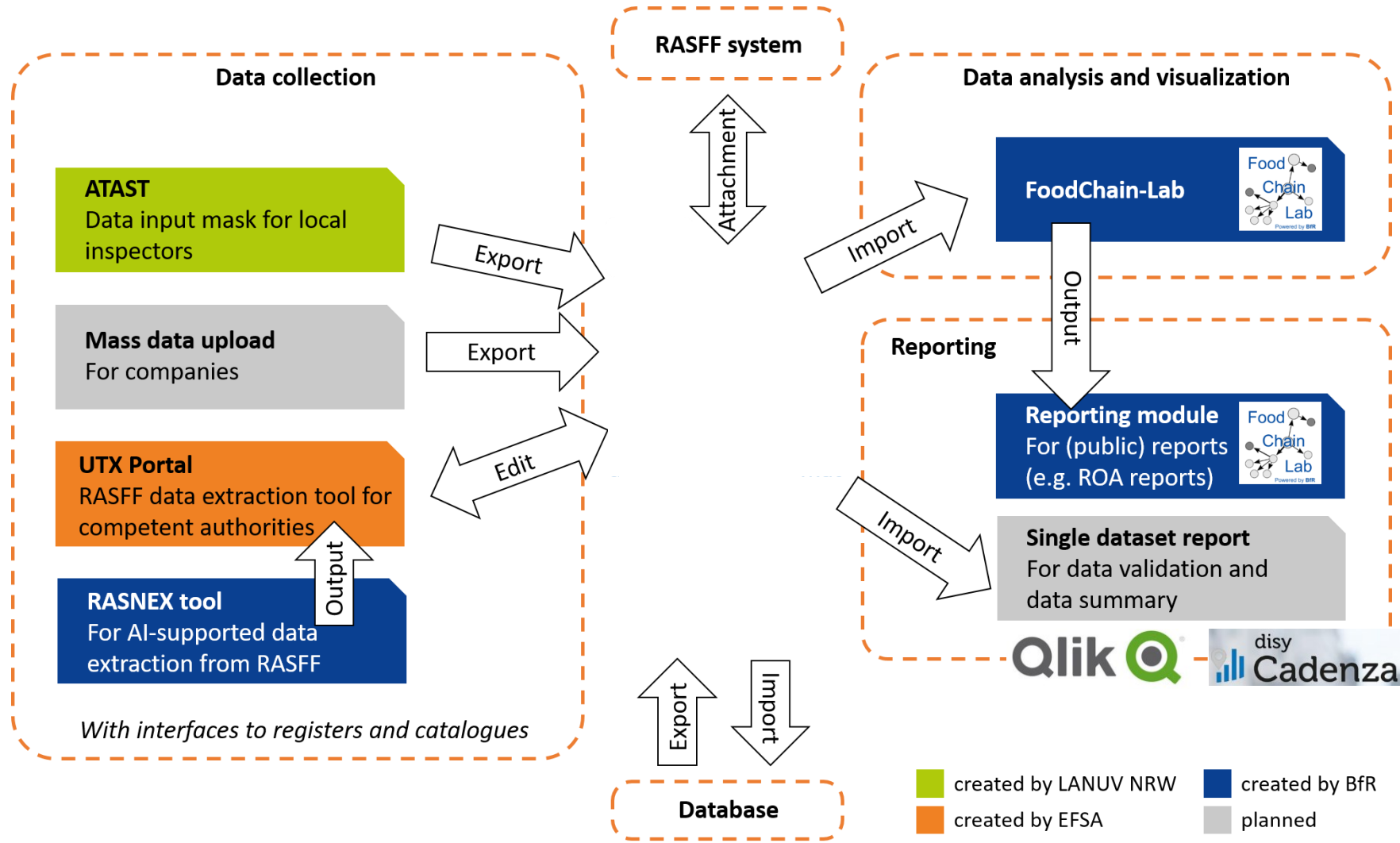
FCL All-in-one template
For data collection + extraction of data of whole incident in one file

Can be customized for UK if needed

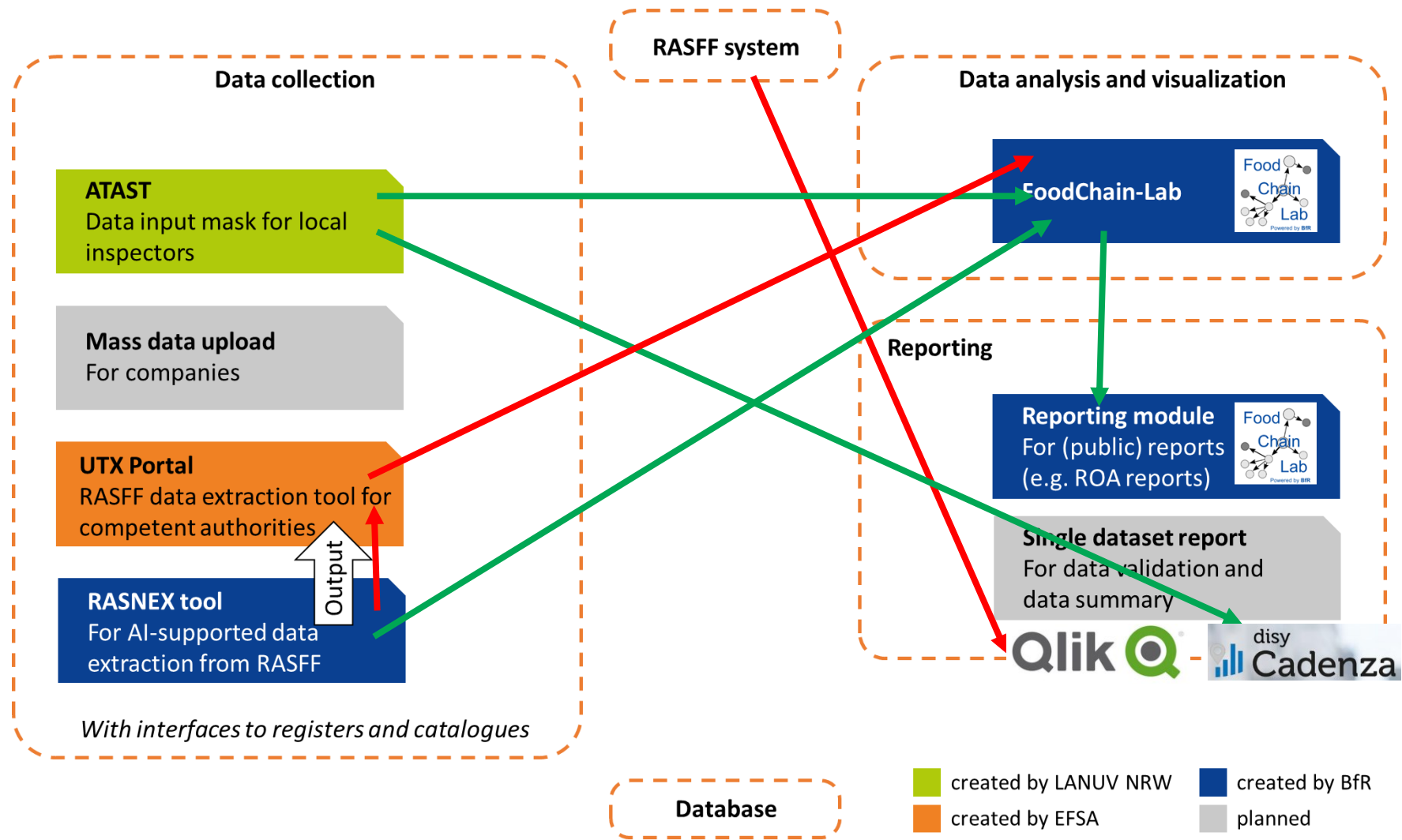
Inquired Company:	Bakersfield Bakery		[Address]		DE		Manufacturer					
For questions please contact the FoodRisk-Labs team, +49 (30) 18412-4444, foodrisklabs@bfr.bund.de												
Outgoing Goods												
	Product		Lot Information		Delivery		Recipient					
	Name	EAN	Lot Number	Best Before Date or Use-by Date	Delivery Date	Amount (e.g. 45 kg)	Name	Address (e.g. Street, ZIP City)	Country	Type of Business	Comments	
	Summer Cake		SC01		6	11	2017	1 Piece	Patient01	DE	Patient	
	Summer Cake		SC02		6	11	2017	1 Piece	Patient02	DE	Patient	
	Summer Cake		SC03		6	11	2017	1 Piece	Patient03	DE	Patient	
	Summer Cake		SC04		6	11	2017	1 Piece	Patient04	DE	Patient	
	Summer Cake		SC05		6	11	2017	1 Piece	Patient05	DE	Patient	
Information to complete the sheet:												
Fill in outgoing goods which are already known (see grey fields above).												
Please keep track of the ingredients of all sent products - do it in a lot-based manner.												
In Column A starting with Line Number 22 please enter the line number of the outgoing good being the product of this ingredient. Afterwards, enter the ingredient information in column B.												
Please repeat the outgoing good as often as necessary in order to capture all its ingredients.												
Incoming Goods - lot-based Ingredient List												
Line Number or Lot Number from Outgoing Goods	Ingredient		Lot Information		Delivery		Supplier					
	Name	EAN	Lot Number	Best Before Date or Use-by Date	Delivery Date	Amount (e.g. 45 kg)	Name	Address (e.g. Street, ZIP City)	Country	Type of Business	Comments	
					Day	Month	Year					
SC01	Butter		Bu100		3	11	2017	6.3 kg	Dairy Products Ltd	DE	Supplier	
SC01	Sugar		Su200		1	11	2017	12.8 kg	Dry Stuff Inc	DE	Supplier	
SC01	Eggs		Eg220		4	11	2017	90 Piece	Chickens & Eggs Farm	DE	Supplier	
SC01	Flour		Fl101		1	11	2017	11.2 kg	Dry Stuff Inc	DE	Supplier	
SC01	Salt		Sal121		1	11	2017	116 g	Dry Stuff Inc	DE	Supplier	
SC01	Baking Powder		BP001		1	11	2017	368 g	Dry Stuff Inc	DE	Supplier	

FCL backward + forward tracing template
For stepwise data collection e.g. done by inspectors on site or by food business operators

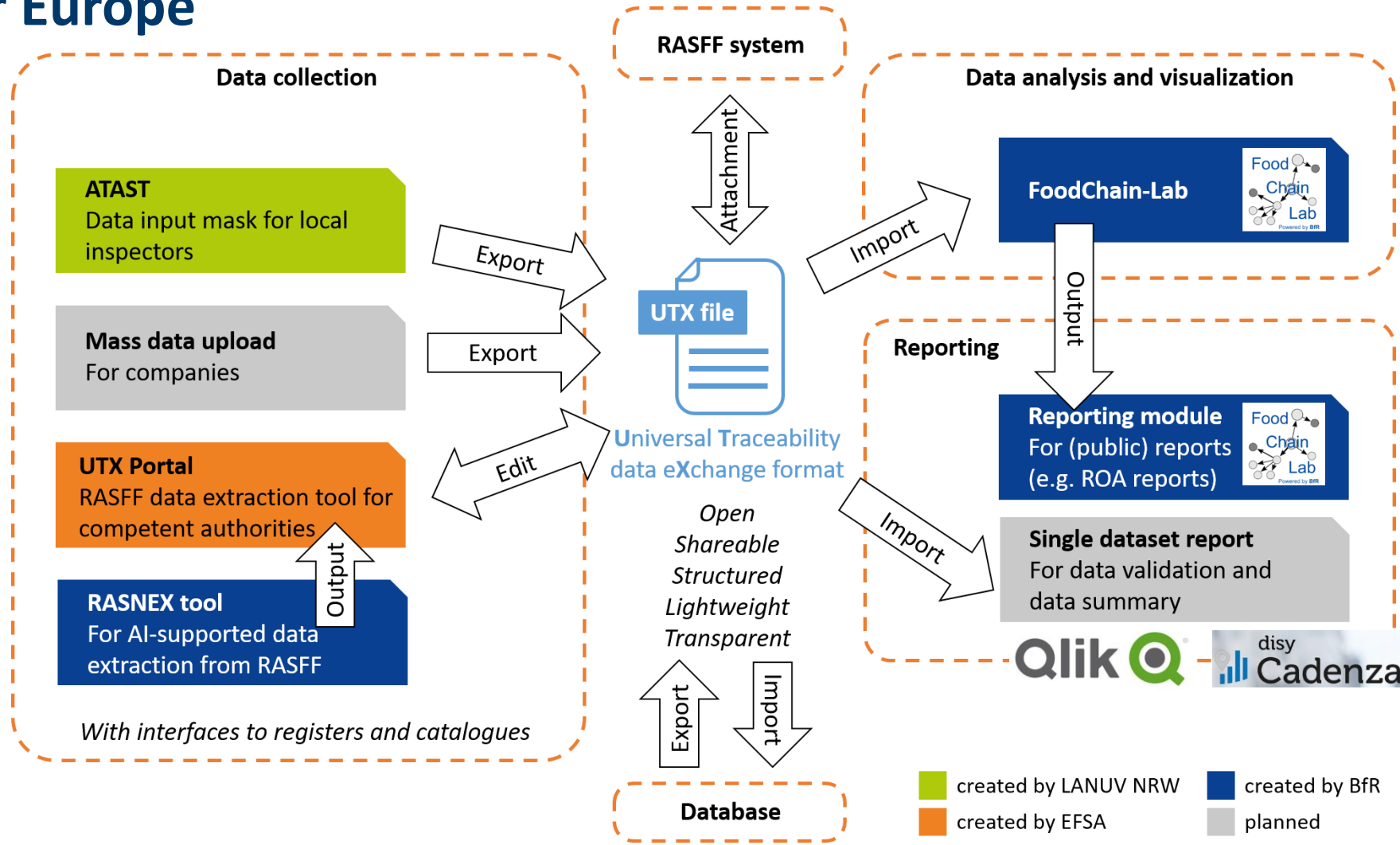
The interoperable multiactor food tracing software ecosystem for Europe



Some data exchange already in practice or under development



The future: An interoperable multiactor food tracing software ecosystem for Europe



Benefits:

*Facilitate data exchange
Avoid double work
Easy visualisation + analysis*

*Your tool?
Feedback on UTX?*

*Please contact
foodrisklabs@bfr.bund.de*

UTX is the container to move all tracing information at once

Successful collaboration needs successful communication!

The UTX format collects, structures and distributes all information. Additional tools in the workflow make the complex information accessible for the users:

- the UTX portal enables actors to collect and extract relevant information
- the tracing data exchange workflow gathers, consolidates, and analyses inputs from multiple actors
- the collaboration tools support specific reporting needs, final documentation, and overarching analysis of the food and feed system.

„The whole
is greater
than the sum
of its parts.“

Aristotle



Universal Traceability data eXchange format (UTX)

Interoperable core data
Standardized, structured informationen



non-interoperable flexible data
Additional tool-specific data

UTX core data:

- Thematic data blocks with hierarchical structure
- Relations between data blocks
- Data blocks with clear structure and controlled vocabulary (catalogues, standards)
- Information stored on highest possible level
- Maximal extent of information vs. minimal requirement of information



Universal Traceability
data eXchange format

Open
Shareable
Structured
Lightweight
Transparent

Main data blocks	Stations	Product	Activity	Information
Hierarchical sub-data blocks	Food business operator	Product	Activity	Investigation
	Station	Lot		Information source
		Traceable resource unit		Contact
				Registration schemes (Measurement)

UTX could be shared between actors (e.g. via the RASFF system)

Published on Zenodo
<https://zenodo.org/records/14775356>



Universal Traceability data eXchange format (UTX)

Group	Data element	UTX Variable	UTX Type	UTX Constraints	Description	Examples	Value description
Identification	FBO-ID	id	PK: Text	Unique	Automatically assigned identifier		
Surrogate parameters allowing the identification of a FBO, when the FBO-ID is unknown	Description of the food business	description	Text		Short description of the food business, e.g. usual or brand names		Free text, 1000 characters
Surrogate parameters allowing the identification of a FBO, when the FBO-ID is unknown	Name and address of the food business	fboNameAddress	FK: Contact.id		Official food business name and address as registered, see table Contact		Free text, 200 characters
Surrogate parameters allowing the identification of a station, when the Station-ID is unknown	Website of the food business	website	Text		Website of the food business		
Description:	Start of activities of the establishment	activityStart	DateTime		Start of time period, when the food business was active, or time, when establishment started	Date / time	
Description:	End of activities of the establishment	activityEnd	DateTime		End of time period, when the food business was active, or time, when establishment started	Date / time or on-going (missing)	
Sub-table: List of registrations, certifications and alternative identifications	Alternative registration scheme	registrations[i].registrationScheme	FK: RegistrationSchemes.id		Registration of the food or feed business or case identification for consumer; also other registrations, certifications or other identifications of the food business, e.g. the first digits of the Global Trade Item Number (GTIN) identifying the company	Register-ID	Selected from registration list or newly inserted
Sub-table: List of registrations, certifications and alternative identifications	Registration number	registrations[i].registrationNumber	Text		Registration number in the scheme, e.g. the approval number, the GLOBALG.A.P. number etc.; also the Global Location Number (GLN)	Registration number	Text 80 characters
Sub-table: List of registrations, certifications and alternative identifications	Registration type in alternative scheme	registrations[i].registrationType	CV: RegistrationType		Indicator if the registration is done individually or on cooperative level.		Selection list: -Individual -Cooperative
List of contact persons	Name of contact person	personalContacts	FK: Contact.id[]		Contact persons in the food business or responsible authority to contact for retrieval of information		Selected from contact list or newly inserted
Documentation	Order, invoice, bill of lading, delivery note, receiving inspection, product information sheet	informationSources	FK: InformationSource.id[]	Mandatory	Relevant information describing the FBO.	List of information source-IDs	Selected from the information source table or newly inserted
Remarks	Comments	comments	Text		Any comments regarding the activity, mentionable factors, which might have impact on the investigations.		Free text, 1000 characters
Remarks	Investigation	investigations	FK: Investigation.id[]		Investigation, when entry was evaluated and eventually updated	List of Investigation-IDs	Selected from the Investigation table or newly inserted
Remarks	Last evaluation	lastEvaluationAt	DateTime		Date and time of the last evaluation of this entry		Automatic time stamp after explicit confirmation

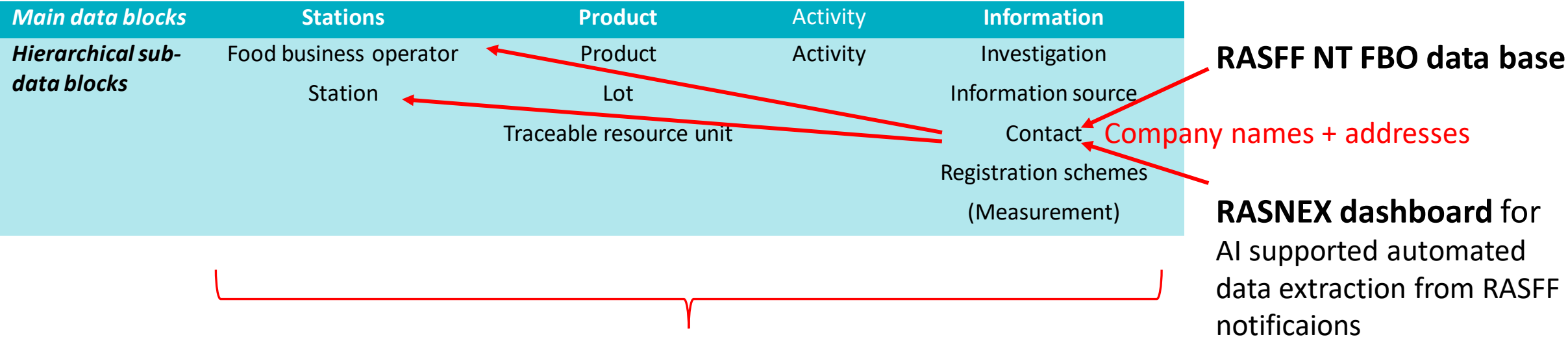
Universal Traceability data eXchange format (UTX)

Group	Data element	UTX Variable	UTX Type	UTX Constraints	Description	Examples	Value description
Identification	Contact-ID	id	PK: Text	Unique			
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Name	name	Text		Name of the responsible contact person or unit for functional contacts; company name if contactType ="Station"		
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Role	role	Text		Short description on responsibilities at FBO, e.g. general contact, contact for specific food sectors, establishments, investigations etc., deputy		
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Contact type	contactType	CV: ContactType		Needed to differentiate a personal contact from a company contact (company address); automatically assigned: "Station" if linked to Station.stationNameAddress, "FBO" if linked to FBO.fboNameAddress, else "Personal"		Hidden list, automatically assigned: -Station; -FBO; -Personal;
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Address: Street	addressStreet	Text		Address to identify the physical location of the establishment; transport: where the transportation mean is regularly checked, cleaned, maintained, supplied; or postal address for sending letters; if FBO: Official postal address of the food business as registered; INSPIRE component: ThoroughfareName	INSPIRE scheme for coding of European addresses	
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Address: House Number	addressNumber	Text		Address to identify the physical location of the establishment; or postal address for sending letters; if FBO: Official postal address of the food business as registered; INSPIRE component: Locator Designator Type 1	INSPIRE scheme for coding of European addresses	
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Address: Other	addressOther	Text	Hidden to user, until he/she states that there are problems to enter all address details; then visible; free text	Anything in addition to the address information; or postal address for sending letters; if FBO: Official postal address of the food business as registered		
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Address: Building	addressBuilding	Text		Address to identify the physical location of the establishment; or postal address for sending letters; if FBO: Official postal address of the food business as registered; INSPIRE component: Locator Name Type 2 + Local Designator Type 5 (building name plus number)	INSPIRE scheme for coding of European addresses	
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Address: ZIP	addressZip	Text		Address to identify the physical location of the establishment; or postal address for sending letters; if FBO: Official postal address of the food business as registered; INSPIRE component: not found	INSPIRE scheme for coding of European addresses	
Surrogate parameters allowing the identification of a station, when the Contact-ID is unknown	Address: City	addressCity	Text		Address to identify the physical location of the establishment; or postal address for sending letters; if FBO: Official postal address of the food business as registered; INSPIRE component:	INSPIRE scheme for coding of European addresses	

Universal Traceability data eXchange format (UTX) – the schema

```
{
  utxCore : {
    fbos : {
      current : [ 9 items ]
      0 : {
        id : bd6022ce-8cfa-4344-b31c-69c3253510bf
        informationSources : [ 1 item ]
        name : La Source des Herbes
        addressCountry : BE
        latitude : 50.807253
        longitude : 4.314988
        addressStreet : Rue de l'Eau - Waterstraat 1
        addressCity : Forest - Vorst
        addressCounty : Brussels-Capital
        addressZip : 1190
        investigations : [ 1 item ]
        registrations : [ 1 item ]
      }
      1 : {
        id : 7213ac0b-8803-4723-aa1c-e85ff62d3627
        informationSources : [ 1 item ]
        name : Exclusive Foxon Trading
        addressCountry : NL
        latitude : 51.9036302
        longitude : 4.3852621
        addressStreet : Nieuwe Waterwegstraat
        addressCity : Schiedam
        addressCounty : South Holland
        addressZip : 3115HE
        investigations : [ 1 item ]
        registrations : [ 1 item ]
      }
    }
  }
}
```

Supporting tools to fill UTX



UTX Portal
Guided and structured manual data extraction

Information source

Select information source

General

Short description of the information source (*)

Information owner (*)

Internal identification number

Document type (*)

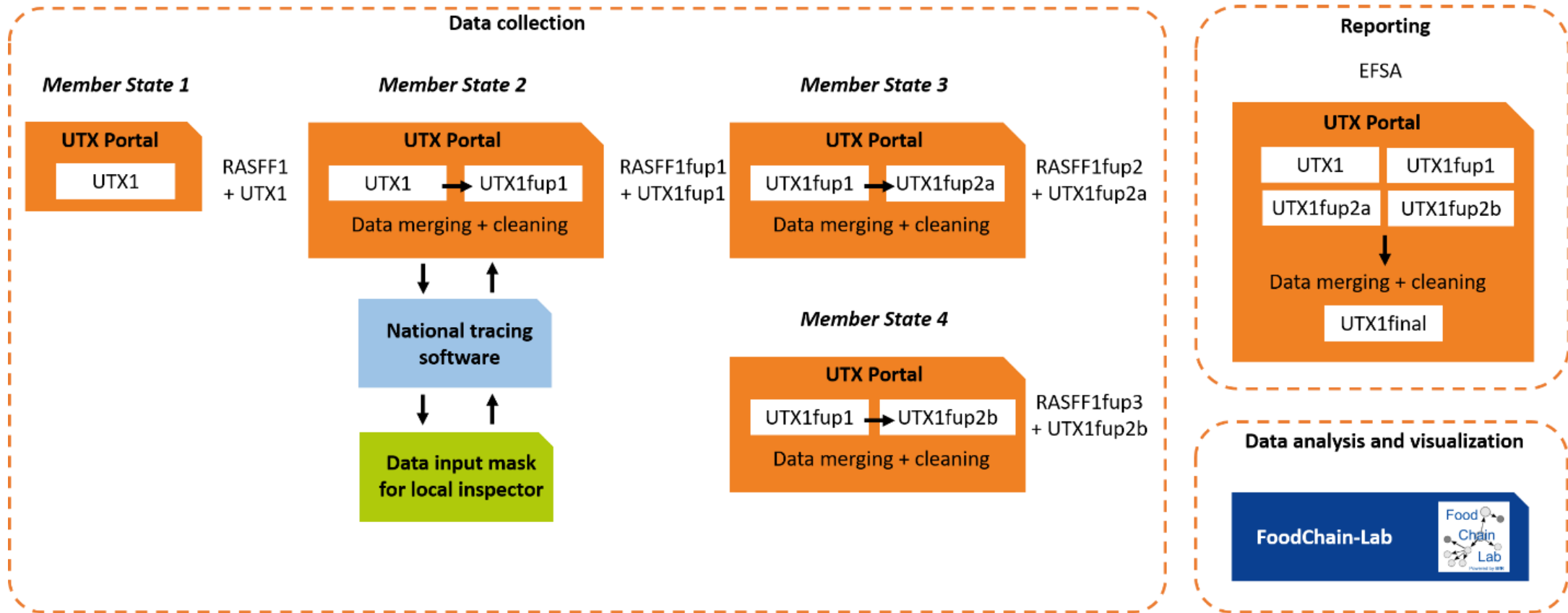
Creation date (*)

Last update

Documentation and remarks

Potential workflow for data exchange using UTX

- uses the RASFF system for exchange
- communicates via UTX files
- exchanges structured information



Similar developments on EU level: iRASFF NT

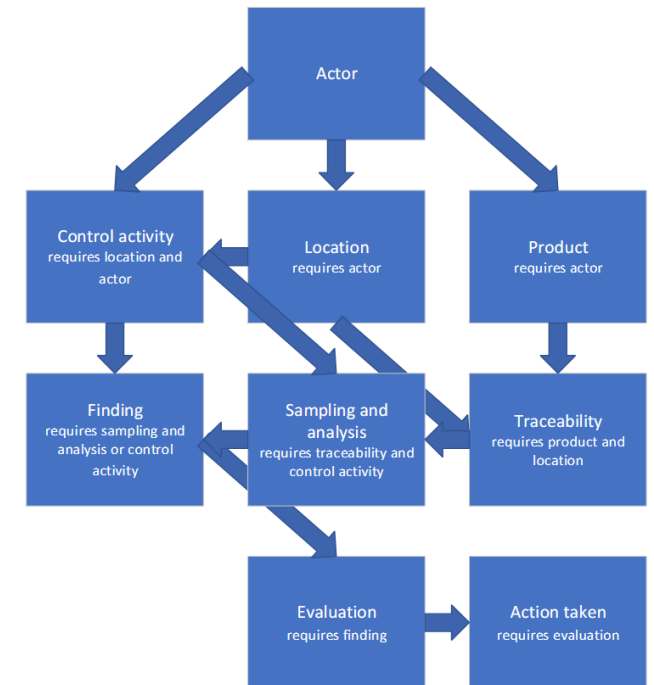
All figures by Jan Baele: https://foodrisklabs.bfr.bund.de/wp-content/uploads/2023/12/EC-presentation_traceability-workshop.pdf

Renewal of RASFF system

The screenshot displays the iRASFF NT web interface. The 'General information' section on the left includes fields for 'Reference' (564059), 'Current Status' (New), 'Notification type' (dropdown), 'Notification basis' (dropdown), 'Notification classification' (dropdown), 'Notifying country' (European Commission), 'Notifying organization' (European Commission), 'Date of notification' (05/08/2022), 'Subject' (text field), and checkboxes for 'INFOSAN (to be) informed', 'Reason INFOSAN', 'eCommerce related', and 'Mutual recognition'. The 'Risk' section on the right includes 'Risk decision' (dropdown), 'Impact on' (dropdown), 'Motivate risk decision' (text area), 'Number of persons affected' (text field), 'Type of illness/symptoms' (text area), 'Hazards observed' (text area), and 'EU legislation' (Reference and Title fields). At the top right of the interface are buttons for 'Check', 'Validate', 'Delete', 'Close', and 'Save'.

iRASFF → iRASFF NT

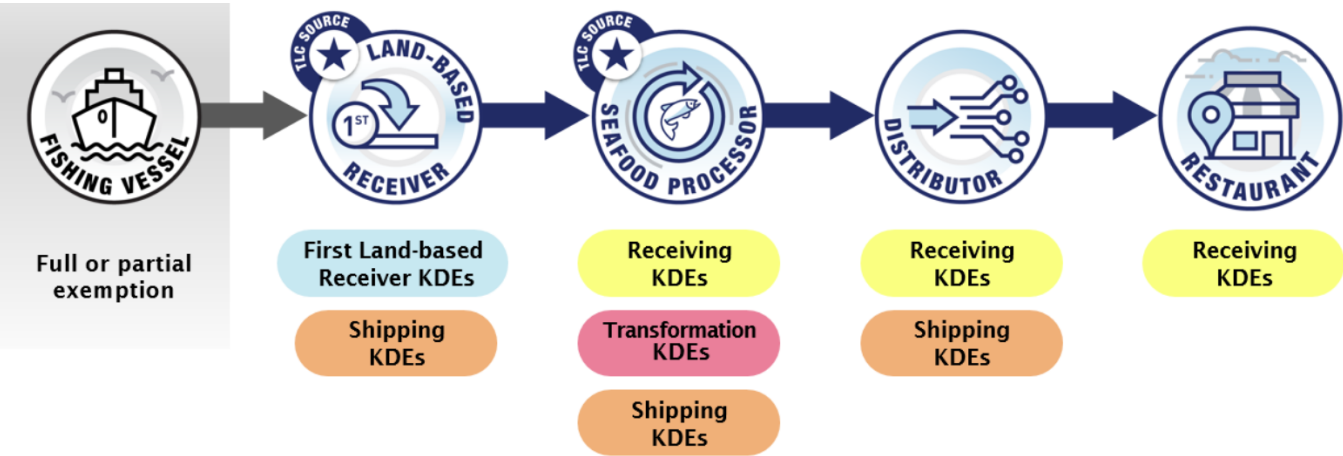
- Relying on data blocks with relations
- Use of standards (FoodEx2, SSD2)
- Focus on interoperability with other systems (TRACES)



UTX should not put double work on MS!
Digital data formats can be translated

Similar development: FDA’s New Era of Smarter Food Safety

„Food Traceability Rule“ for harmonized data and data sharing

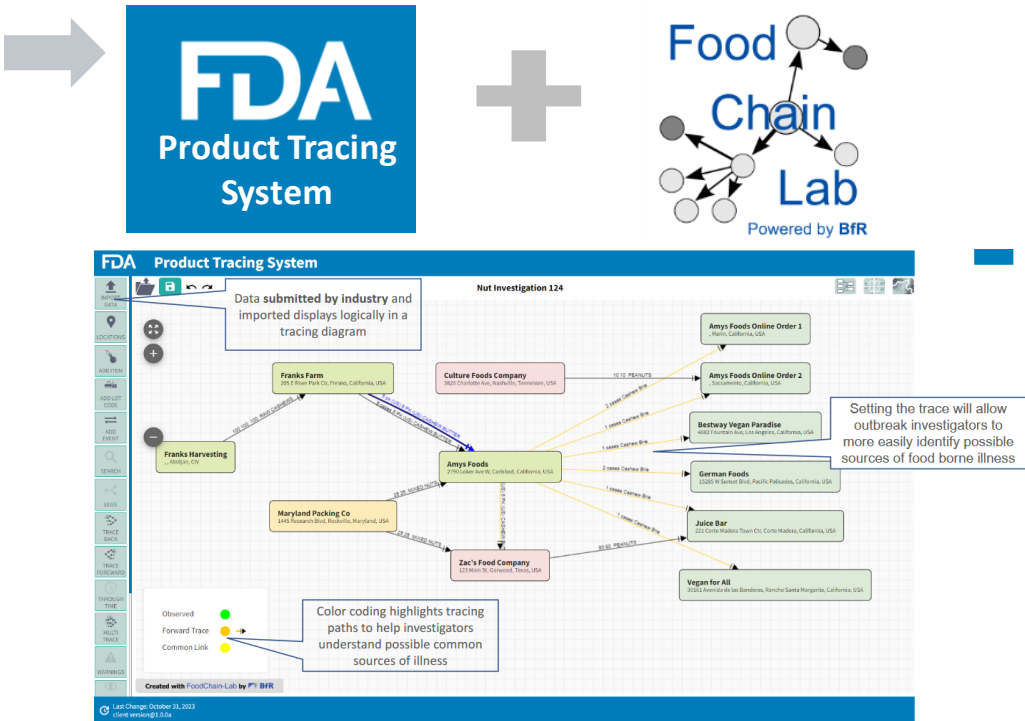


Demo video of PTS + FCL in action
<https://www.fda.gov/food/new-era-smarter-food-safety/product-tracing-system>



Product Tracing System

- Receive, process and visualize traceability data
- Improve traceback and traceforward analysis
- Government and industry collaboration
- FCL integrated in FDA system



Collaboration between FDA and BfR

Understanding UTX – A moodle course



Startseite Dashboard Meine Kurse Website-Administration

The course clarifies...

- Why the data format is needed for the exchange of tracing data
- The concept behind the new data format
- The properties of the data file

Course material

- Slides, pictures, a video
- Quizzes
- A forum for questions and answers

Mastering the Universal Traceability data eXchange (UTX) format

Kurs Einstellungen Teilnehmer/innen Bewertungen Berichte Mehr ▾

> Course description

[Alles einklappen](#)

▼ Overview & course objectives

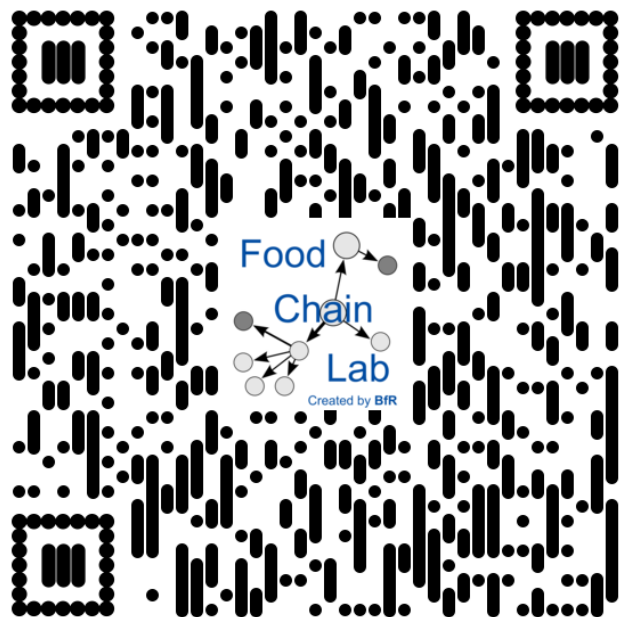


This course is designed to provide you with a comprehensive understanding of the Universal Traceability data eXchange (UTX) format. Rather than focusing on the technical intricacies, we will emphasize the key concepts of the UTX format – what it is, how it is structured, and its significance in the food traceability ecosystem. You will explore UTX's role in achieving interoperability between tracing software tools, and its contribution to efficient data exchange.

The course will be delivered through a combination of lectures, readings, videos, and quizzes, ensuring that you gain a thorough understanding of UTX and its impact.

Course objectives

- Understand the principles and importance of the Universal Traceability data eXchange (UTX) format
- Explore the structure and key components of the UTX format
- Understand how UTX enhances traceability and data interoperability



Marion Gottschald

**German Federal Institute for
Risk Assessment**

foodrisklabs@bfr.bund.de
<https://foodrisklabs.bfr.bund.de>

Thank you for your attention!



German Federal Institute for Risk Assessment

EFSA-BfR tracing team

BfR: Marion Gottschald, Alexander Falenski, Matthew Salewski, Daria Savvateeva,
Marc Lorenzen, Marco Rügen

EFSA: Olaf Mosbach-Schulz



FCL was supported by EFSA-BfR Framework Partnership Agreements (FPA) GP/EFSA/AMU/2016/01 and GP/EFSA/AMU/2020/02, and received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 773830 OH EJP COHESIVE.