Data for FoodChain-Lab

Collection – Import – Cleaning

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Collecting Data: Excel Template

Outbreak: Tracing workflow using FoodChain-Lab I

First information on food producing company
involved in foodborne disease outbreak

Template

Start tracing template

Data needs for tracing – by type

A station
(e.g. a food producer)

Type of Business

Name

Longitude
Latitude
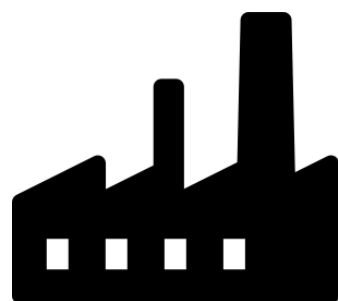
Address

Symbol: A circle

A delivery
(e.g. of a food ingredient)

Lot No.

Name

Amount

Delivery Date

Delivery Relations

Symbol: An arrow

Start Forward tracing template: Bakery and patients

Bakery

Inquired Company:		Bakersfield Bakery		[Address]		DE	Manufacturer

For questions please contact the FoodRisk-Labs team, +49 (30) 18412-4444, foodrisklabs@bfr.bund.de

Products in Focus:	Relevant period of sale:	Onset of disease:

Information to complete the sheet:

Please keep track of all delivered products matching the product descriptions that were sold during the relevant period in a lot-based manner.

Recipient				Product		Lot Information		Delivery					Comments
Name	Address (e.g. Street, ZIP, City)	Country	Type of Business	Name	EAN	Lot Number	Best Before Date or Use-by Date	Delivery Date			Amount (e.g. 45 kg)		
								Day	Month	Year			
Patient01		DE	Patient	Summer Cake		SC01		6	11	2017	1 Piece		
Patient02		DE	Patient	Summer Cake		SC02		6	11	2017	1 Piece		
Patient03		DE	Patient	Summer Cake		SC03		6	11	2017	1 Piece		
Patient04		DE	Patient	Summer Cake		SC04		6	11	2017	1 Piece		
Patient05		DE	Patient	Summer Cake		SC05		6	11	2017	1 Piece		

Patients

Contaminated product

Outbreak: Tracing workflow using FoodChain-Lab II

First information on food producing company
involved in foodborne disease outbreak

Template

Start tracing template

Database

Import template

Tracing View
View network
Generate hypotheses
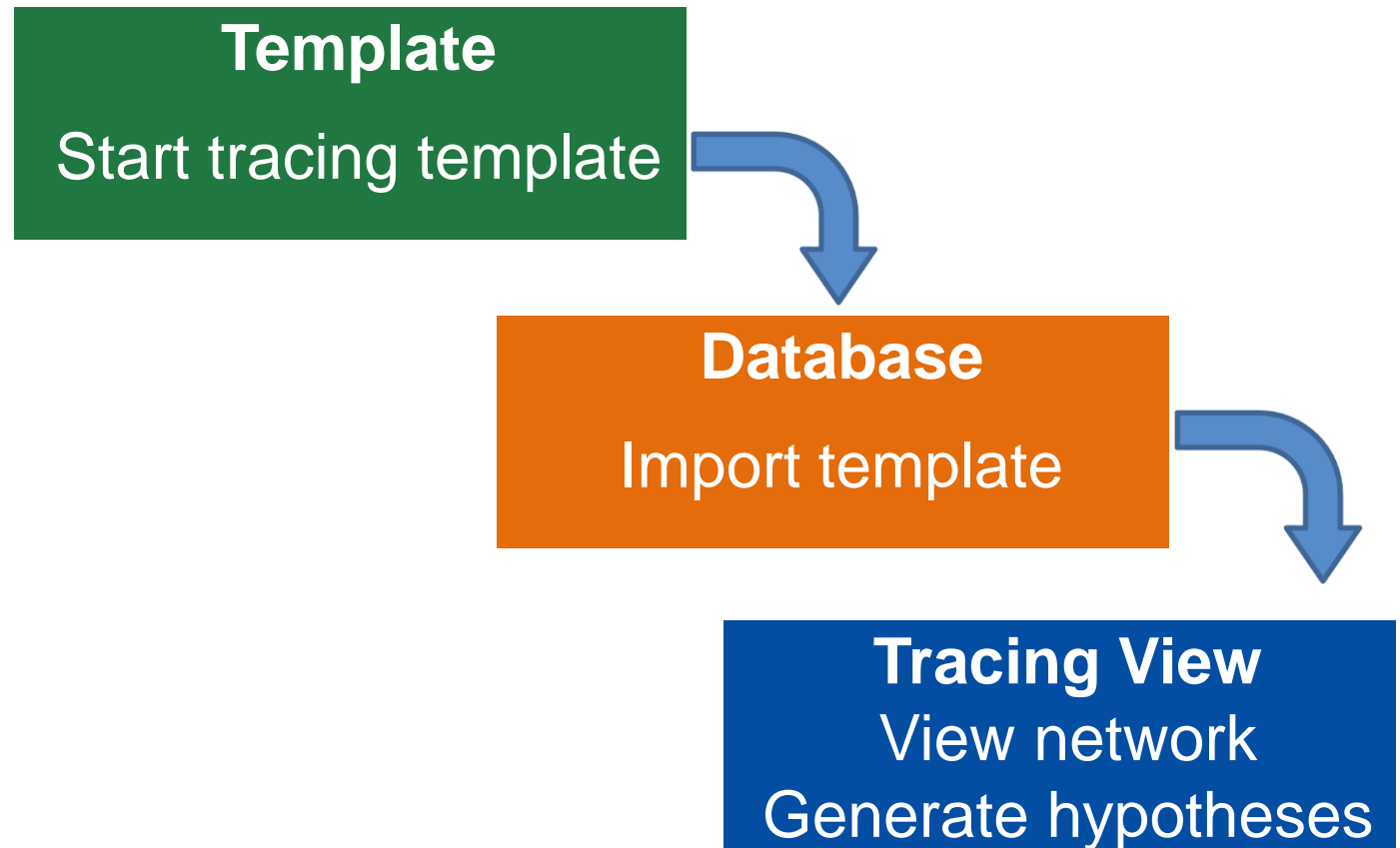
Tracing View: Bakery and patients

Database: Structure of food chains

| Station | Product | Lot | Delivery |

Station

Outbreak: Tracing workflow using FoodChain-Lab III

First information on food producing company
involved in foodborne disease outbreak

Template

Start tracing template

Database

Import template

Tracing View
View network
Generate hypotheses

Template
Pre-filled tracing
template

Database
Generate templates
(backward / forward)

Pre-filled backtracing template generated by the database

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**
						Day	Month	Year						
		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

Please repeat the outgoing good as often as necessary in order to capture all its ingredients.

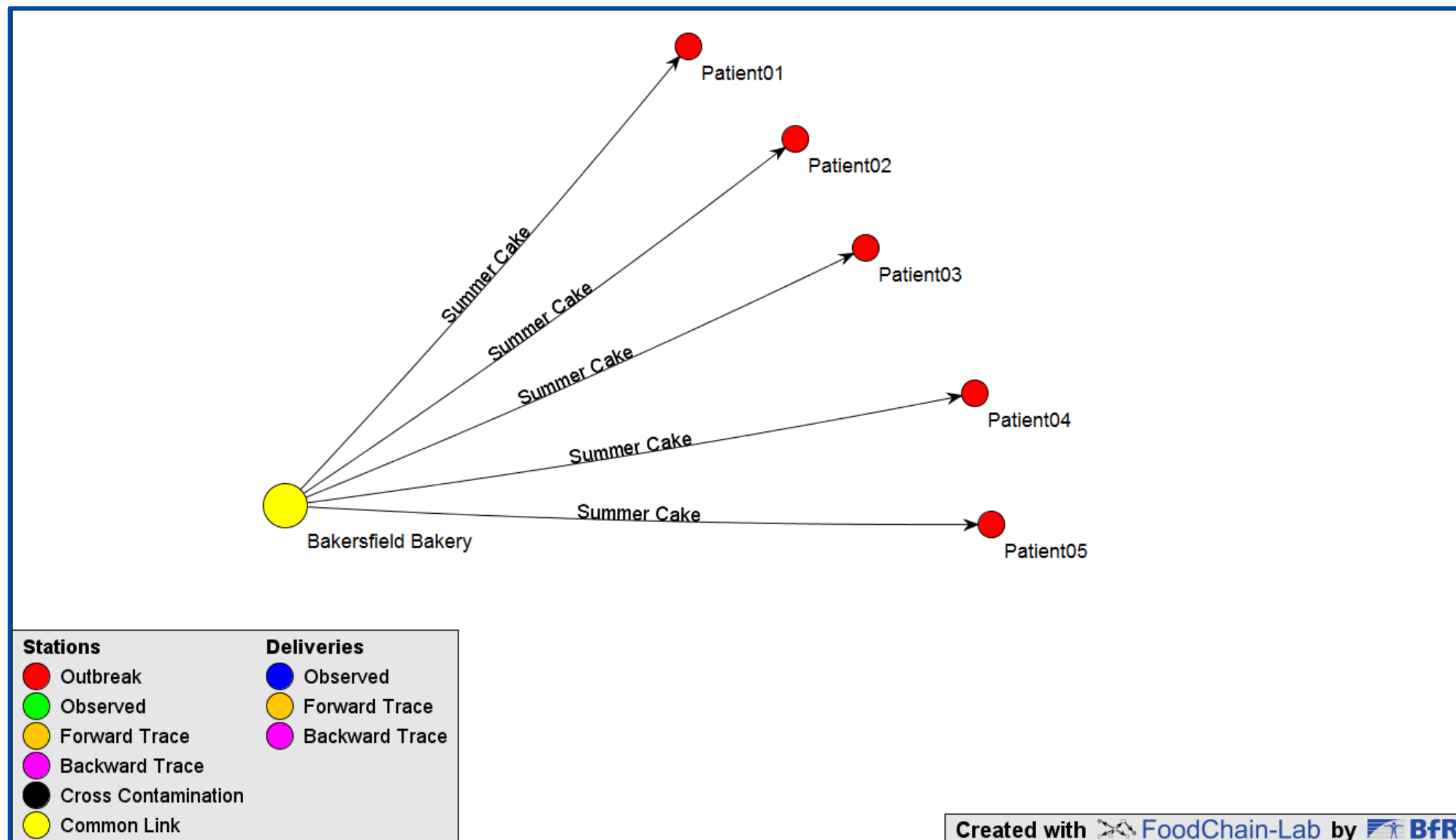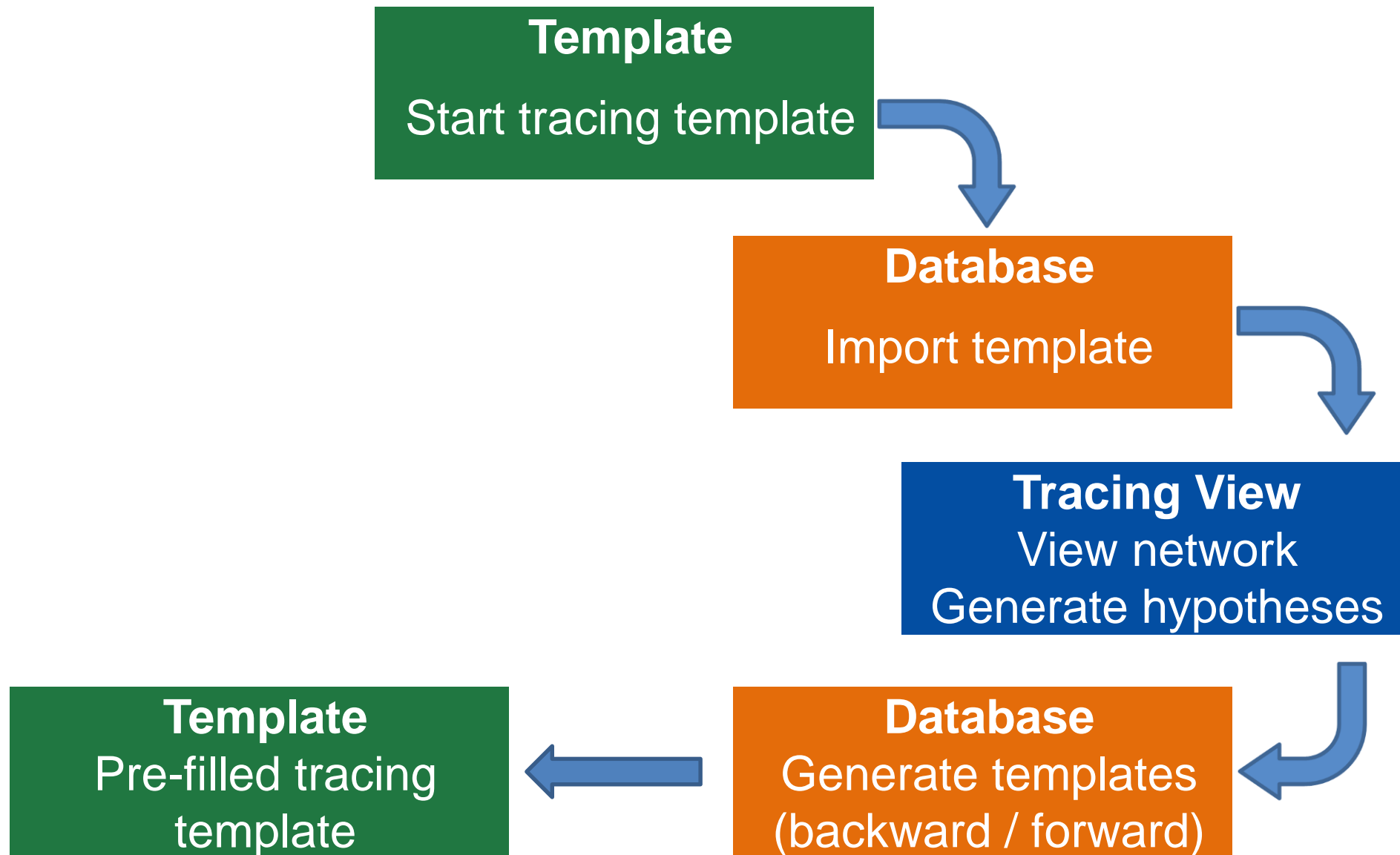|	Incoming Goods - lot-based **Ingredient List**												
Line Number or Lot Number from Outgoing Goods	**Ingredient**		**Lot Information**		**Delivery**				**Supplier**				
	Name	EAN	Lot Number	Best Before Date or Use-by Date	Delivery Date			Amount (e.g. 45 kg)	Name	Address (e.g. Street, ZIP City)	Country	Type of Business	**Comments**
					Day	Month	Year						

Outbreak: Tracing workflow using FoodChain-Lab IV

First information on food producing company involved in foodborne disease outbreak

Template

Start tracing template

Database

Import template

Food Safety Officer
Conducts interviews with companies

Tracing View
View network
Generate hypotheses

Template
Pre-filled tracing template

Database
Generate templates
(backward / forward)
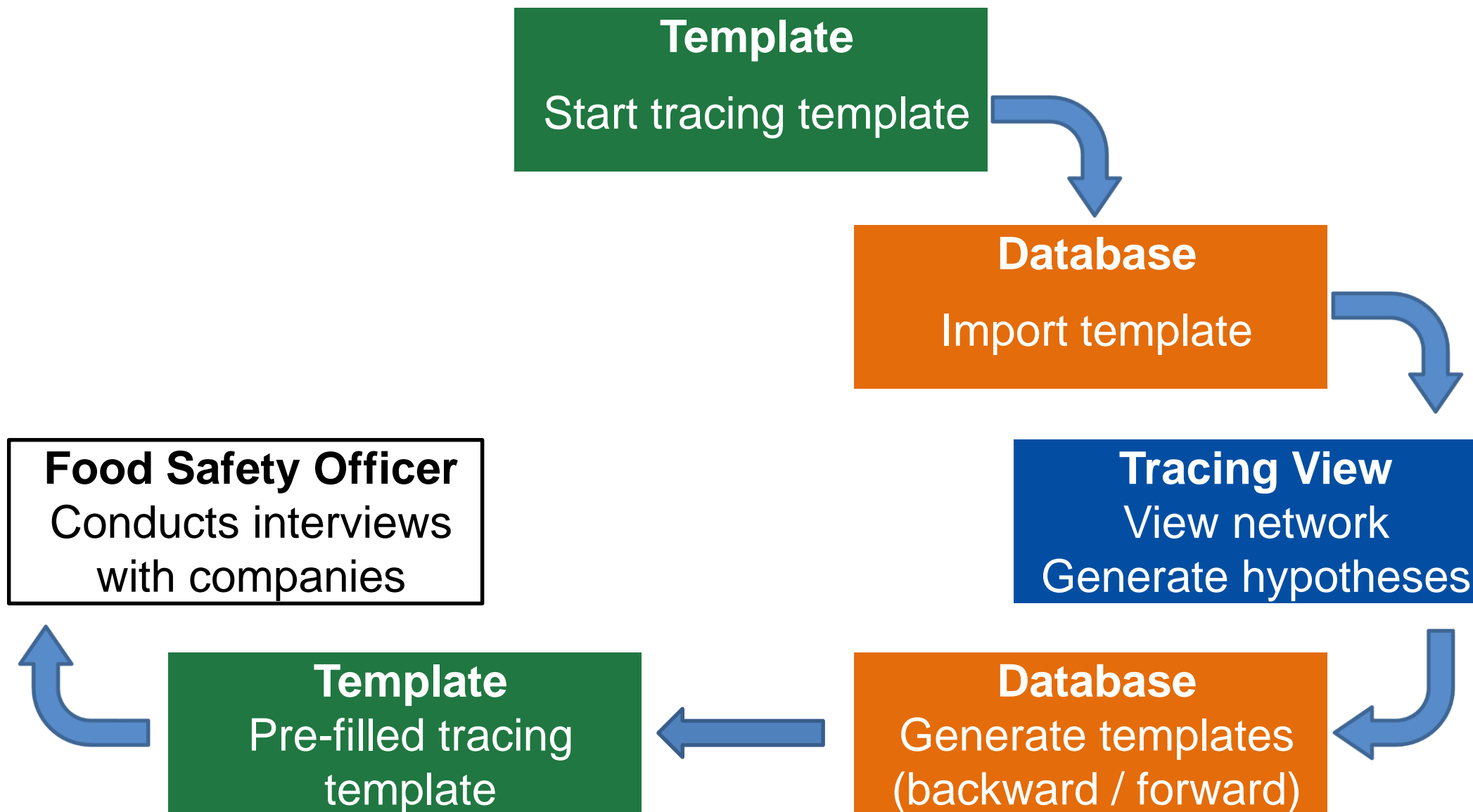
Inquiry at a cake manufacturer

Supplier(s)	Product(s) in	Business inspected	Product out	Receiver

back ← | → forward

Food
Chain
Lab
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(1) The traceability of food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established **at all stages of production, processing and distribution**.

at all stages of production, processing and distribution

(2) **Food and feed business operators** shall be able to **identify any person from** whom they have been **supplied with** a food, a feed, a food-producing animal, or any substance intended to be, or expected to be, incorporated into a food or feed.

Food and feed business operators shall be able to **identify any person from** whom they have been **supplied**

To this end, such operators shall have in place **systems and procedures** which allow for this information to be made available to the competent authorities **on demand**.

(3) **Food and feed business operators** shall have in place systems and procedures to identify the other businesses to which their products have been **supplied**. This information shall be made available to the competent authorities **on demand**.

to which their products have been **supplied**

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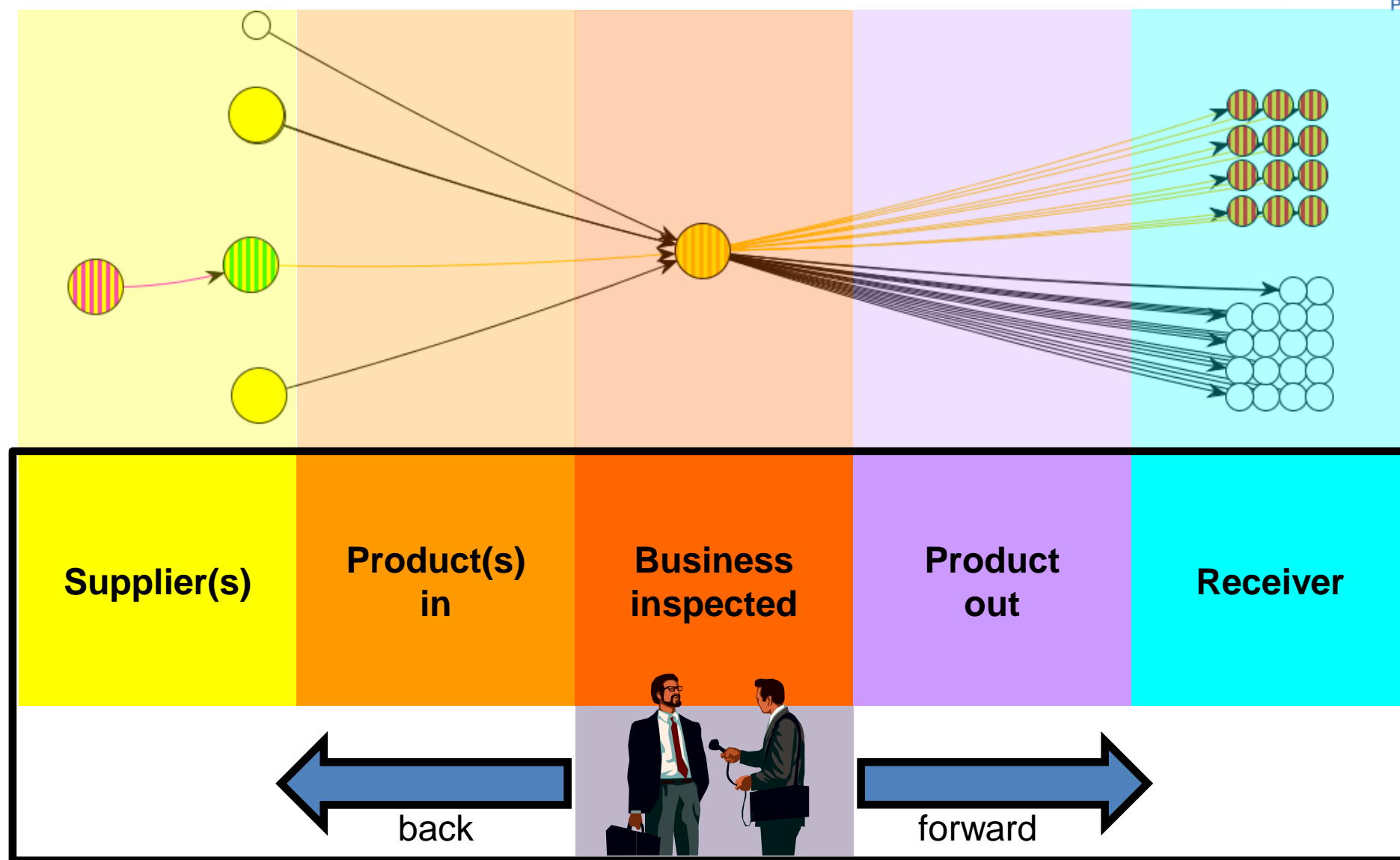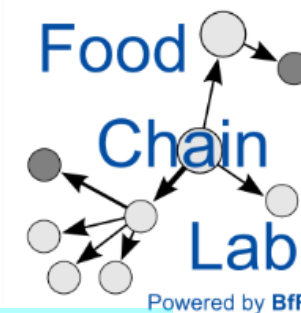# Outbreak: Tracing workflow using FoodChain-Lab V

First information on food producing company involved in foodborne disease outbreak

Template

Start tracing template

Database

Import template

Template
Completed tracing template

Tracing View
View network
Generate hypotheses

Food Safety Officer
Conducts interviews with companies

Template
Pre-filled tracing template

Database
Generate templates (backward / forward)
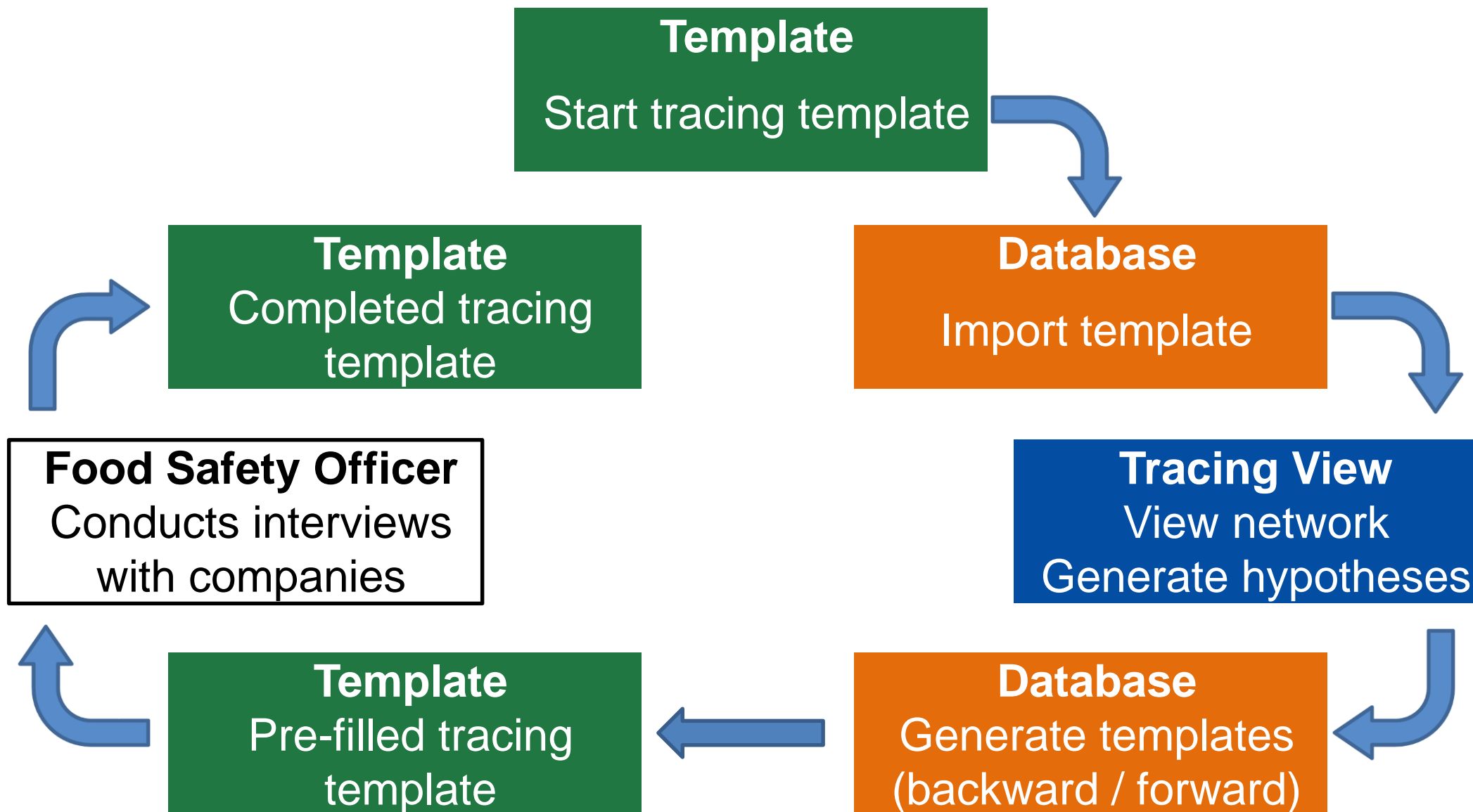
The pre-filled backtracing template has been completed

Food Chain Lab

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				Comments
	Name	EAN	Lot Number	Best Before Date or Use-by Date	Delivery Date Day	Month	Year	Amount (e.g. 45 kg)	Name	Address (e.g. Street, ZIP City)	Country	Type of Business	
	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 columns 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				Comments
	Name	EAN	Lot Number	Best Before Date or Use-by Date	Delivery Date Day	Month	Year	Amount (e.g. 45 kg)	Name	Address (e.g. Street, ZIP City)	Country	Type of Business	
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		Sa121		1	11	2017	116 g	Dry Stuff Inc		DE	Supplier	
SC01	Baking Powder		BP001		1	11	2017	368 g	Dry Stuff Inc		DE	Supplier	

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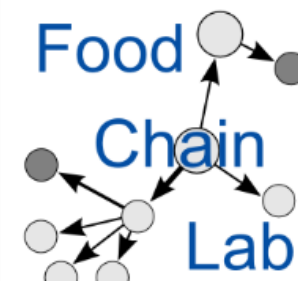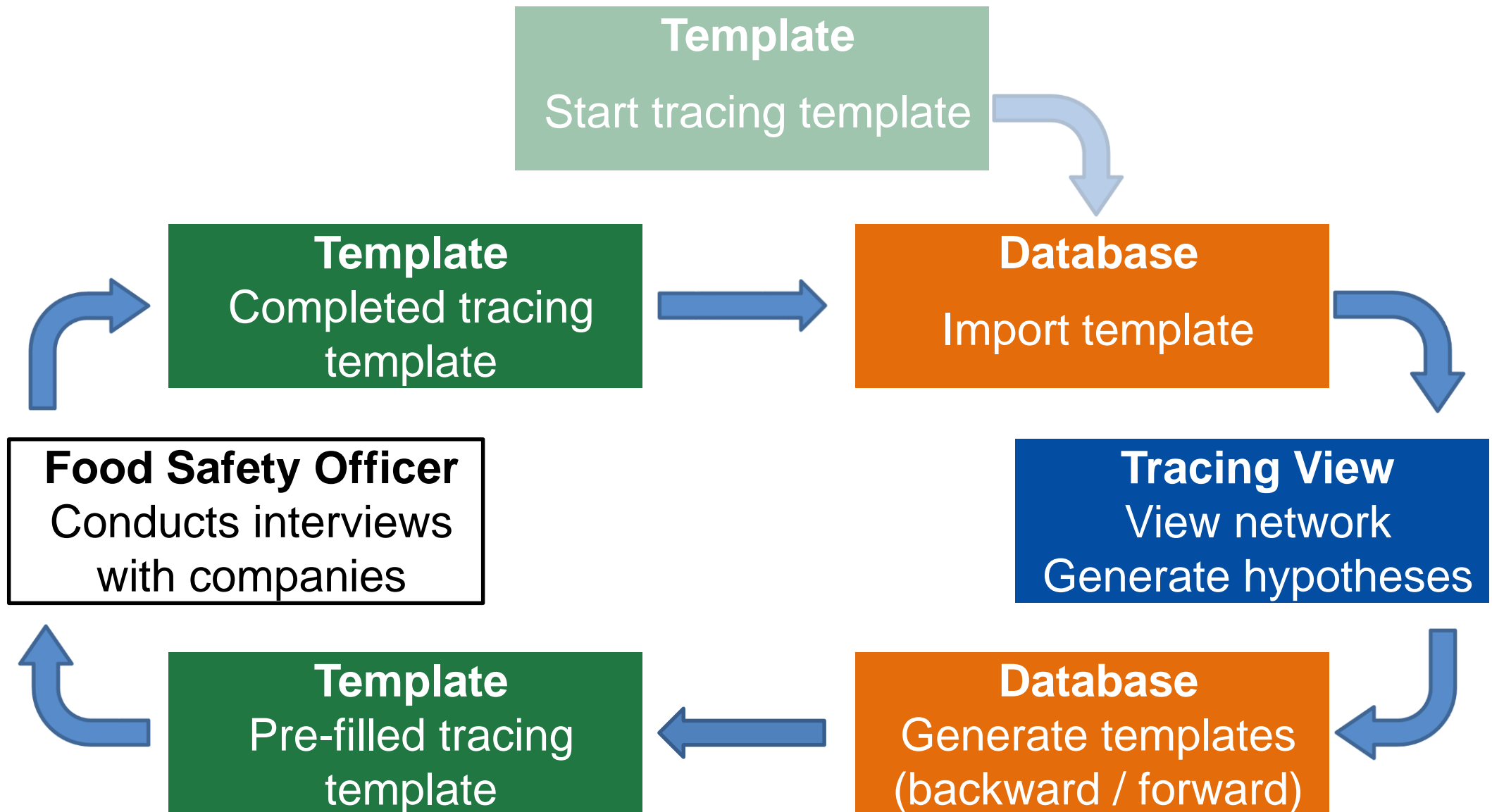# Outbreak: Tracing workflow using FoodChain-Lab VI

First information on food producing company involved in foodborne disease outbreak

Template

Start tracing template

Template
Completed tracing template

Database

Import template

Food Safety Officer
Conducts interviews with companies

Tracing View
View network
Generate hypotheses

Template
Pre-filled tracing template

Database
Generate templates (backward / forward)

Tracing View: Bakery and patients

Stations
- 🔴 Outbreak
- 🟢 Observed
- 🟠 Forward Trace
- 🟣 Backward Trace
- ⚫ Cross Contamination
- 🟡 Common Link

Deliveries
- 🔵 Observed
- 🟠 Forward Trace
- 🟣 Backward Trace

Created with FoodChain-Lab by BfR

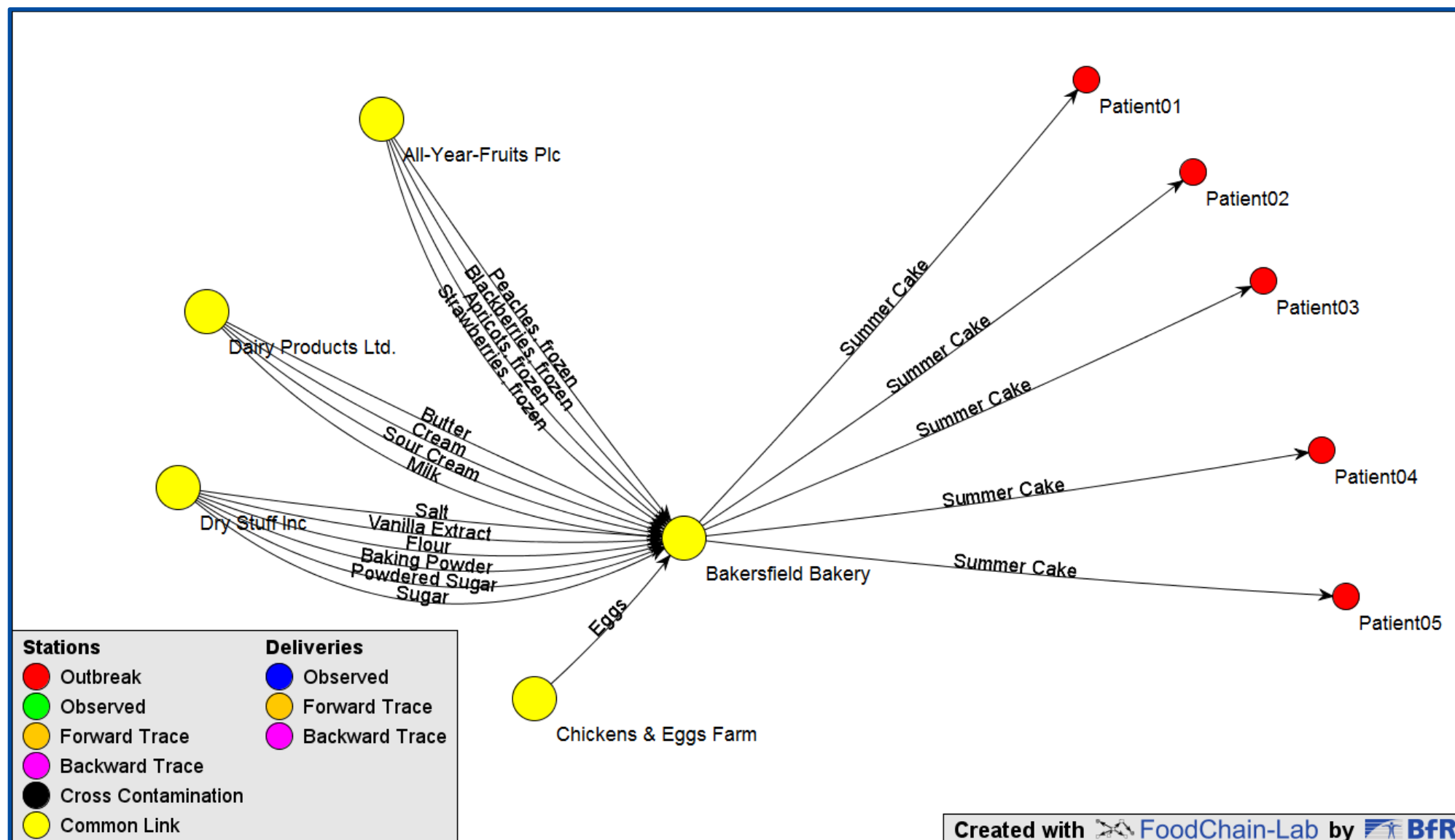# Outbreak: Tracing workflow using FoodChain-Lab VI

First information on food producing company involved in foodborne disease outbreak

Template
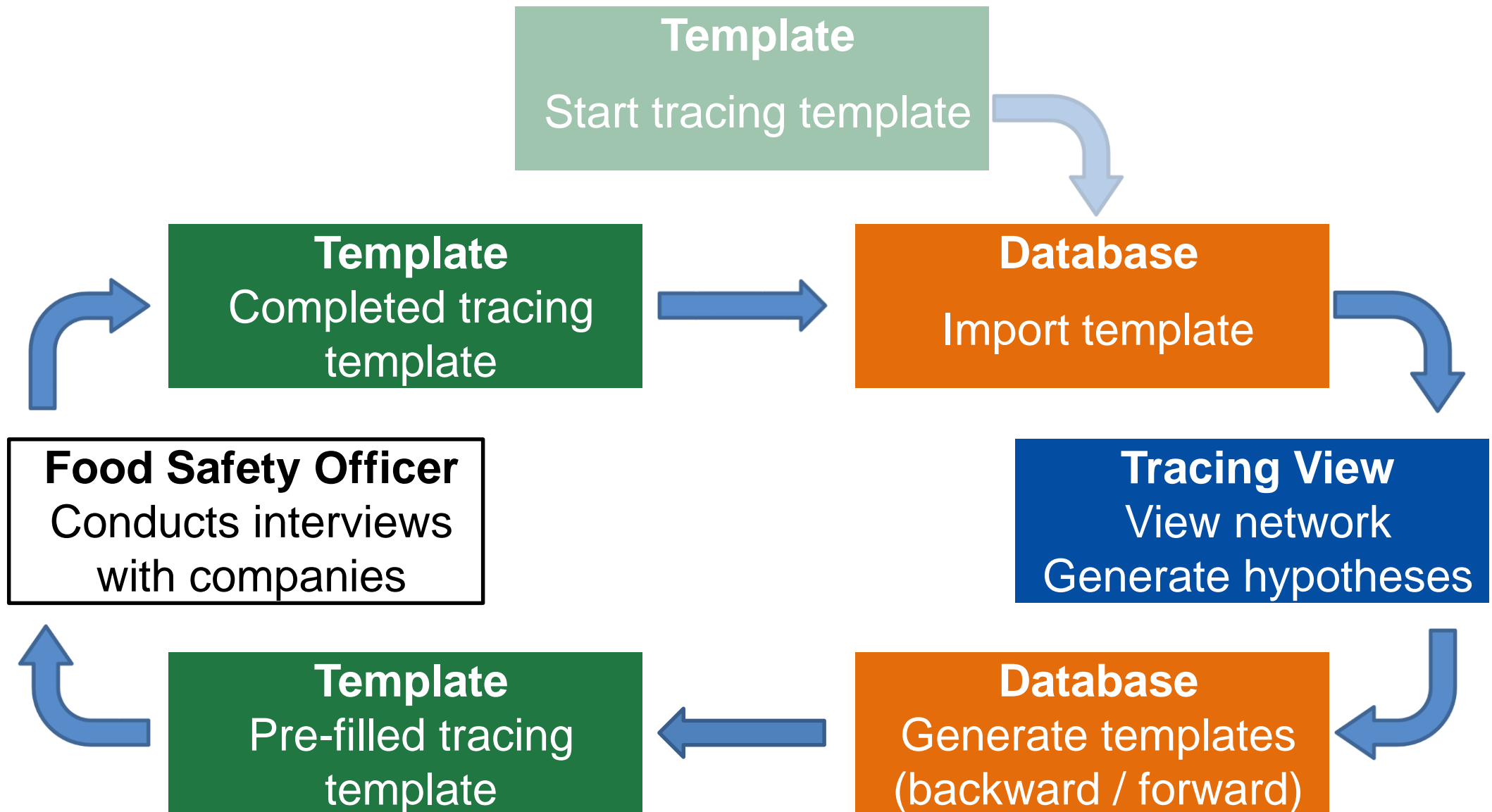Start tracing template

Template
Completed tracing template

Database
Import template

Food Safety Officer
Conducts interviews with companies

Tracing View
View network
Generate hypotheses

Template
Pre-filled tracing template

Database
Generate templates (backward / forward)

Individual import of data from external sources
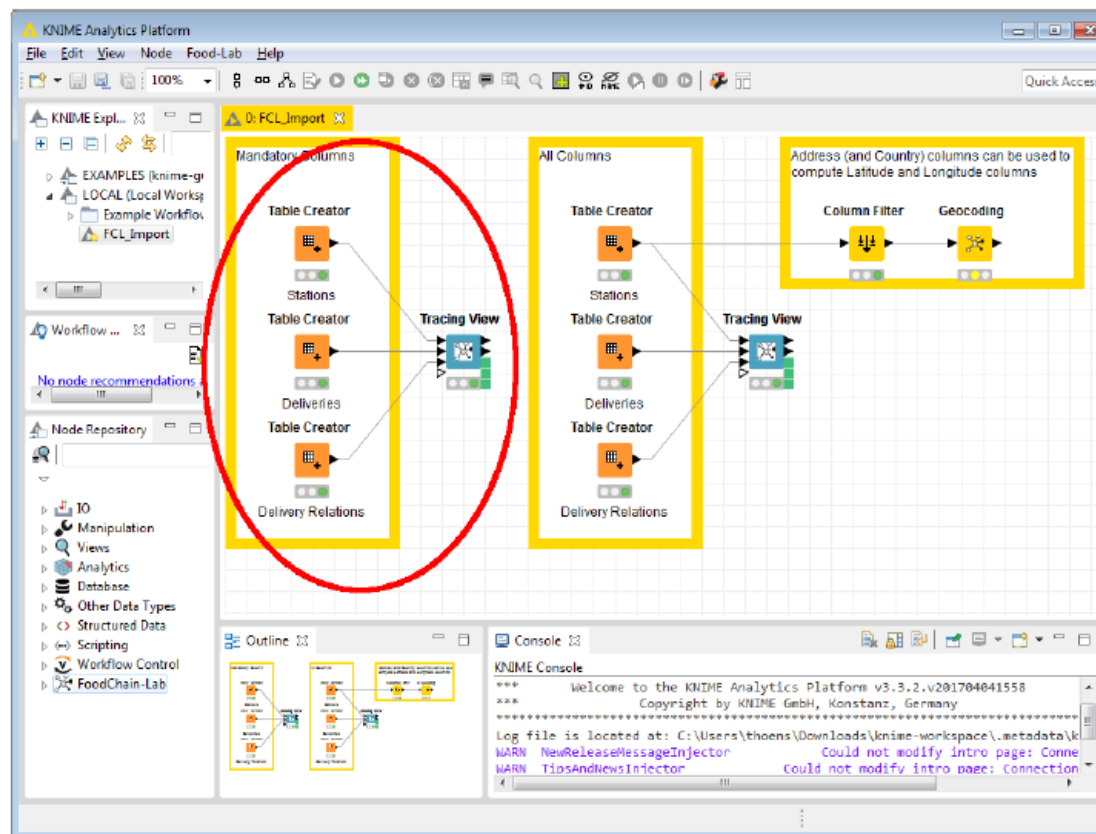
- FoodChain-Lab needs three tables to perform a tracing analysis: **Stations**, **Deliveries** and **Delivery Relations**.
- The **Table Creator** nodes on the left show all mandatory columns for these three tables.

Tutorial: https://foodrisklabs.bfr.bund.de/data-import-from-external-sources/

FoodChain-Lab: Data Cleaning

Bakery 1, **Sesame** Street 15, 12345 Crumbling Hills, Germany

Summer Cake

Luxury Hotel

Hilltop 1

12234 Pompous Hills

Germany

Chocolate Cake

Bakery 1, **See Same** Street 15, 12345 Crumbling Hills, Germany
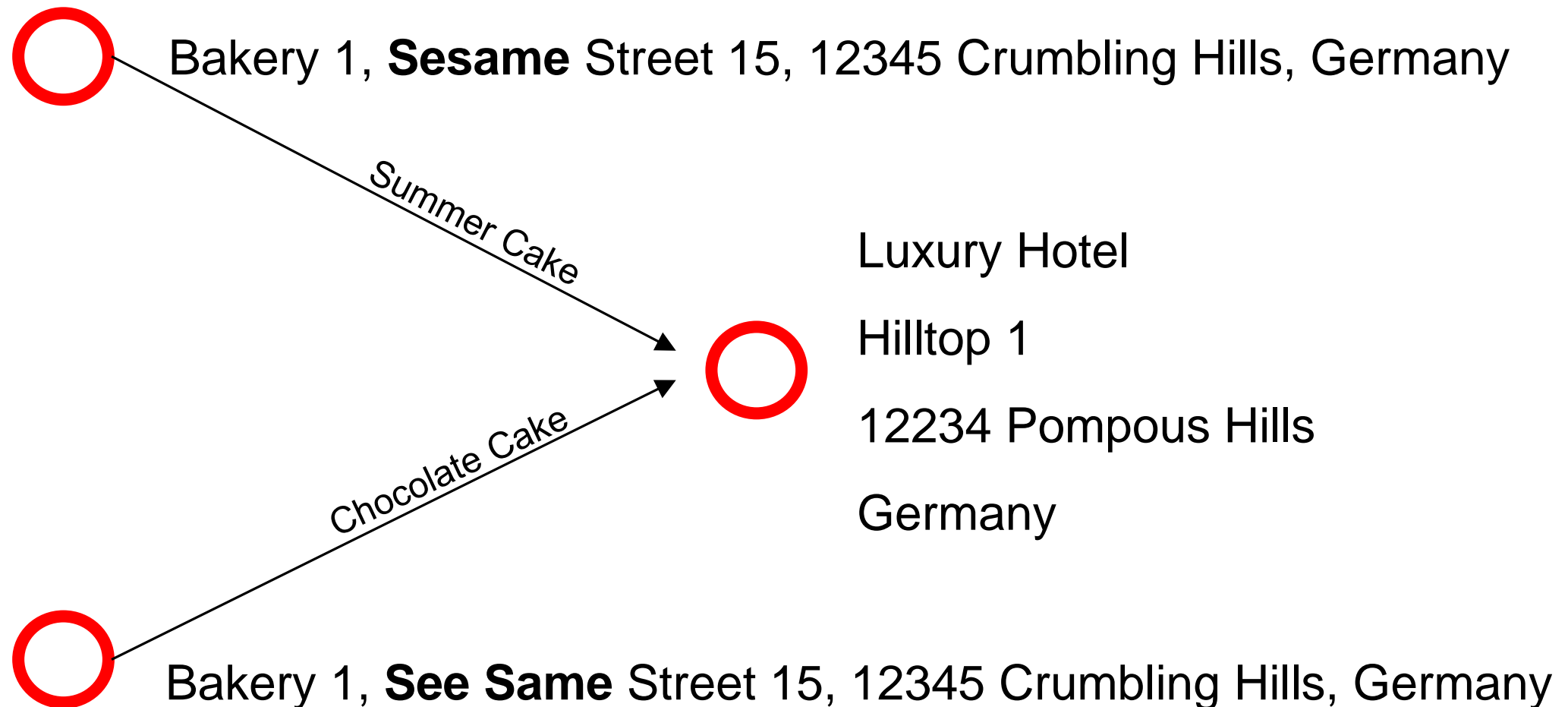
FoodChain-Lab: Data Cleaning
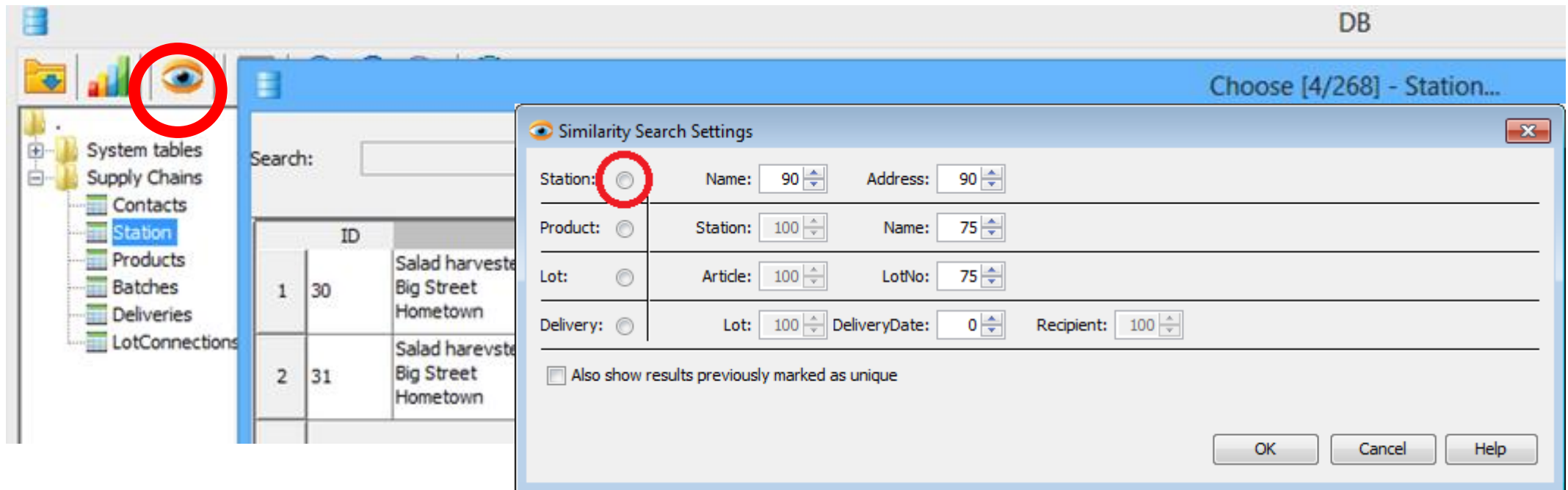
Levenshtein distance

M	A	Y	O	N	N	A	I	S	E
=	=	=	=	=	-	=	=	=	=
M	A	Y	O	N		A	I	S	E

E	L	E	P	H	A	N	T
=	=	=	o	-	=	=	=
E	L	E	F		A	N	T

Works well for finding duplicates

Plausibility checks: Amounts
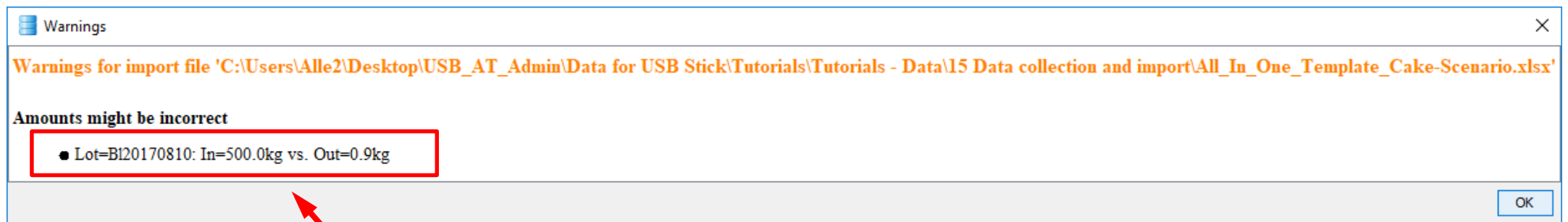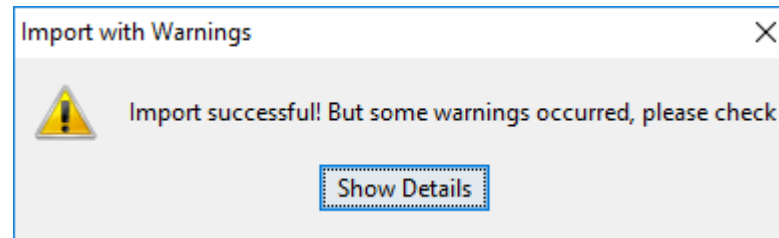
Data – sometimes still analogue…

…luckily often digital

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Excel spreadsheet, XLSX

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Station	Product Name	Lot Number	Lot size		Delivery Date Departure			Delivery Date Arrival			Unit weigt/vol./pck.		Recipient
2				Quantity	Type / Unit	Day	Month	Year	Day	Month	Year	Quantity	Type / Unit	
3	6	Blackberries	BB001	500	kg	9	8	2017	10	8	2017	500	kg	36
4	1	Butter	Bu100			2	11	2017	3	11	2017	6,3	kg	2
5	37	Sugar	Su200			30	10	2017	1	11	2017	12,8	kg	2
6	38	Eggs	Eg220			4	11	2017	4	11	2017	90	Piece	2
7	37	Flour	Fl101			30	10	2017	1	11	2017	11,2	kg	2
8	37	Salt	Sa121			30	10	2017	1	11	2017	116	g	2
9	37	Baking Powder	BP001			30	10	2017	1	11	2017	368	g	2
10	1	Milk	Mi05			2	11	2017	3	11	2017	8,9	Litre	2
11	37	Vani												2
12	1	Crea												2
13	1	Sour												2
14	37	Pow												2
15	36	Peac												2
16	36	Apric												2
17	36	Stra												2
18	36	Black												2
19	39	Doug												2
20	2	Sum												3

```
– <Details>
      <Reference>2015.1658</Reference>
  – <Subject>
      Salmonella (presence /25g) in frozen salted chicken breast pieces from Thailand
    </Subject>
      <DateOfCase>29/12/2015</DateOfCase>
  – <NotificationType>
      food - alert - border control - consignment released
    </NotificationType>
    <ActionTaken>informing authorities</ActionTaken>
    <NotificationFrom>Netherlands (NL)</NotificationFrom>
    <DistributionStatus>distribution to other member countries</DistributionStatus>
    <Product>frozen salted chicken breast pieces</Product>
    <ProductCategory>poultry meat and poultry meat products</ProductCategory>
    <RiskDecision>serious</RiskDecision>
    <PublishedInRCP/>
</Details>
```

Handwritten, sent by fax

RASFF notification, XML

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Tracing in foodborne outbreaks – a case…

- Database takes any data format (XLSX, PDF, XML, CSV)

2) Ministry of federal state
- Accesses database
- Reads results
- Describes situation to food safety officer from administrative district in own words

1) Outbreak investigation team
- Receives supply chain data in an individual data format (e.g. CSV)
- Copies data to FCL templates, adds information (type of business, geolocalisation)
- Analyses
- Sends resulting tracing templates and description to German database

4-6) The same way back
- Time-consuming
  - flow of information
  - re-structuring data
- Information loss

3) Local food safety officer
- Visits food company
- Conducts interviews
- Takes samples
- Fills in FoodChain-Lab templates

… and (a possible) future

- Database with a harmonised data standard (e.g. XML)

Food Chain Lab
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2) Ministry of federal state
- Receives results automatically, no need to actively access the database
- Has a task force which decides immediately whether to block or to forward information

1) Outbreak investigation team
- Receives supply chain data in harmonised data format
- Analyses
- Sends resulting tracing templates and description to German database

* Authorisation by ministry

2*+3) Local food safety officer
- Receives original analysis from outbreak investigation team if ministry approves

… and (a possible) future

- Database with a harmonised data standard (e.g. XML)

2) Ministry of federal state
- Receives results automatically, no need to actively access the database
- Has a task force which decides immediately whether to block or to forward information

* Authorisation by ministry

1) Outbreak investigation team
- Receives supply chain data in harmonised data format
- Analyses
- Sends resulting tracing templates and description to German database

4+5) Direct feedback via database
- Fast
- No data loss
- High data quality

2*+3) Local food safety officer
- Receives original analysis from outbreak investigation team if ministry approves
- Receives order from the ministry
- Visits food company
- Conducts interviews and takes samples
- Fills in tracing data in harmonised standard

COS – a 'bus stop' for FoodChain-Lab – as a first approach on the way to a harmonised standard:

Commodity Online Services (COS)
- Collects (NRW-) Tracing Data
- Contains a food business database with curated data
- Is doing validation internally based on existing master data
- Outputs data into newly defined xml-strukture and sends it into a newly developed webservice

FCL
- Monitors the webservice, awaits new data
- Analyses data (semi)-automatically
- Prepares analysis reports and sends it back to the webservice

COS
- Fetches the report – management measures or further data collections will be initiated

Thank you for your attention

Alexander Falenski

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