FoodChain-Lab
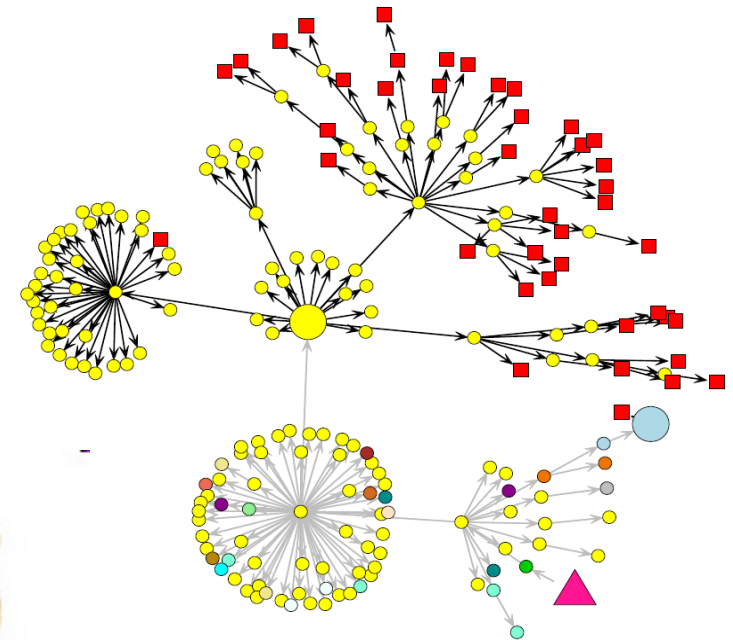

Armin Weiser, Christian Thöns, Matthias Filter, Annemarie Käsbohrer, Bernd Appel

# Outline

1.   **Introduction**

2.   **Data Management**

3.   **Analysis**

4.   **Live Demo**

Tracing - Methodology

- „Disease-Clusters" are identified (by public health authorities)

- Supply Chain Analysis:

  - Trace-back is performed in order to identify common nodes of different clusters: Cluster → Source

  - Trace-forward is performed in order to identify further yet unknown or potential clusters: Source → further Clusters

- This strategy is usually followed in the context of an ongoing process involving company audits and local sampling.

Trace-back

Source / Producer   **Supplier**   **Cluster**

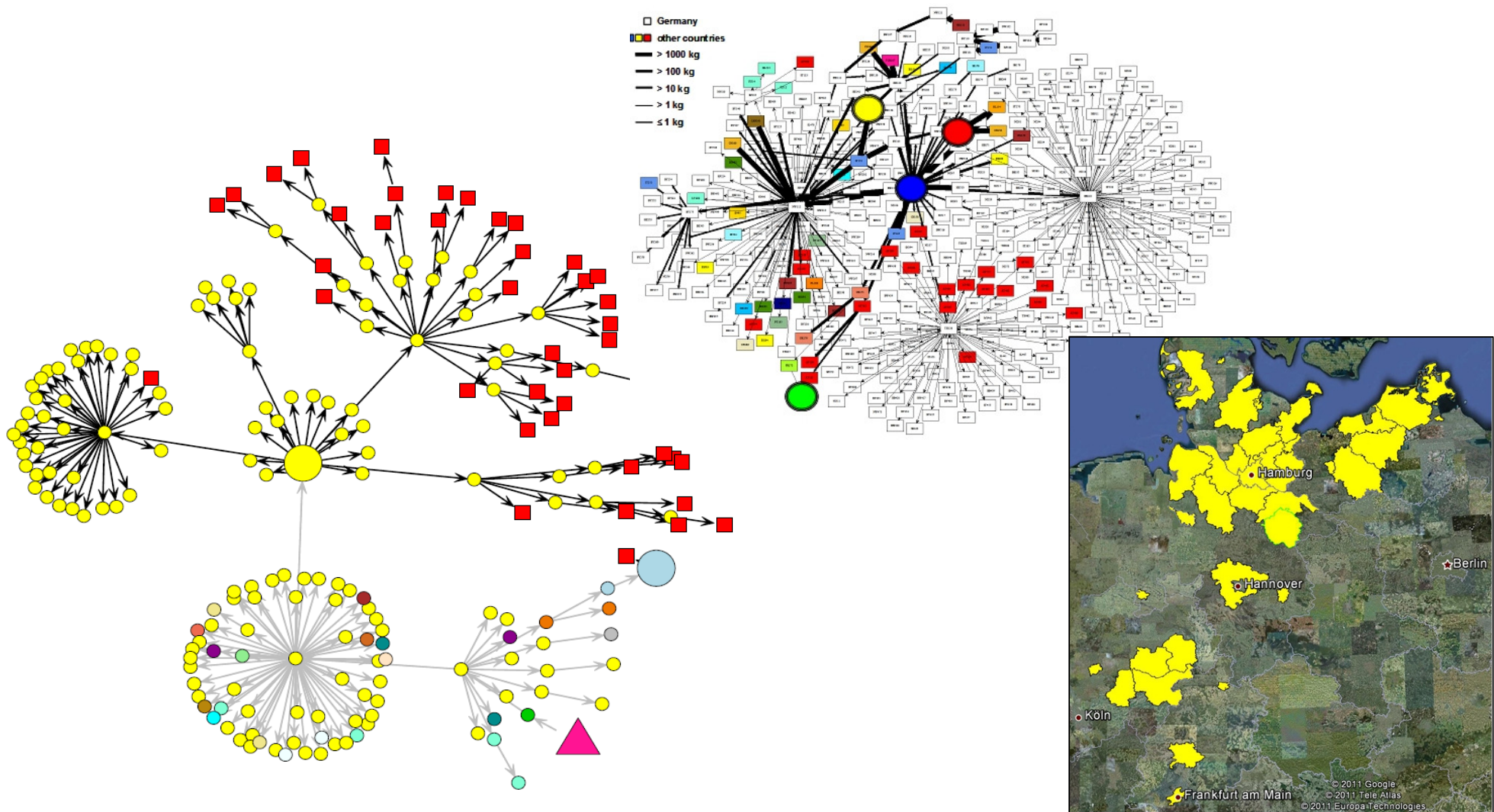**Trace-forward**
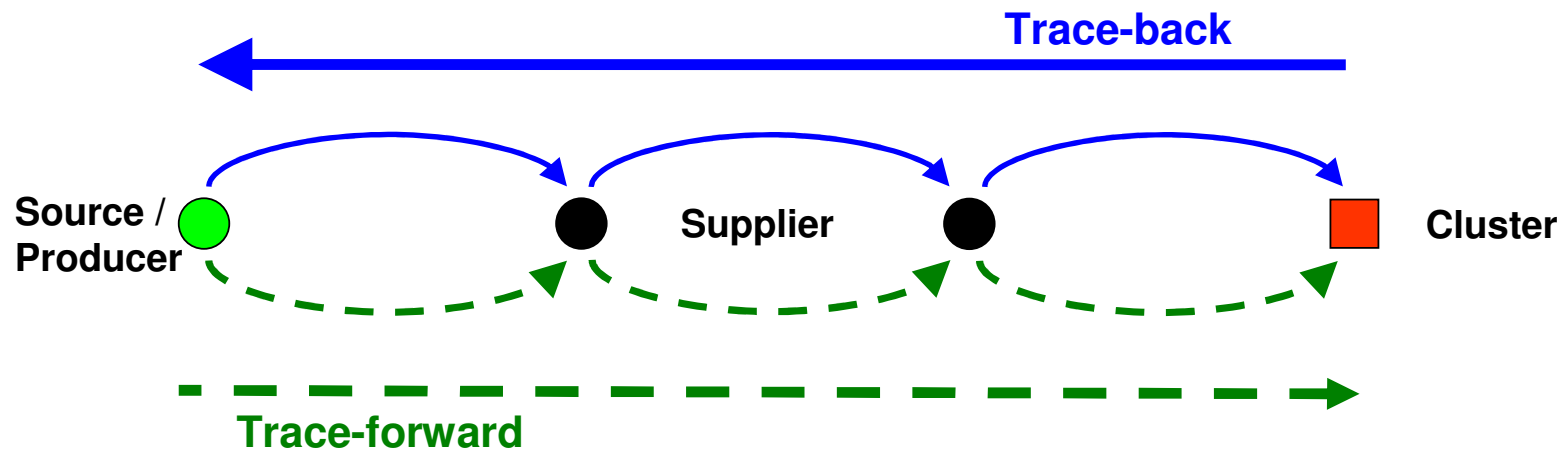
EHEC O104:H4 outbreak
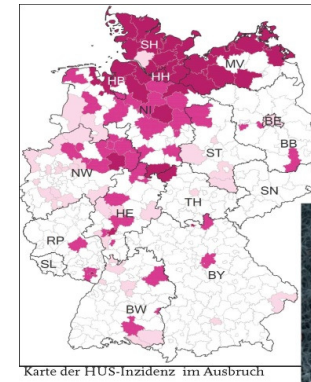
The fatal outbreak from May until July 2011 claimed 53 deaths and about 4000 seriously ill people in Germany, furthermore 75 cases in 12 EU states and 8 worldwide cases.

Suspected causative vehicle: fenugreek sprouts from imported seeds from Egypt.

FoodChain-Lab – ad hoc

Weiser et al., 2013: "Trace-Back and Trace-Forward Tools Developed Ad Hoc and Used During the STEC O104:H4 Outbreak 2011 in Germany and Generic Concepts for Future Outbreak Situations", **Foodborne Pathog Dis. 2013**.

The case of the Norovirus outbreak

- **A total of 10.950 cases, averagely 10 years old**

- **At least 390 affected facilities (cluster), almost exclusively schools and kindergartens**

- **Associated to one main catering company and some minor ones**

- **Ongoing outbreak was detected and submitted to state authorities on Thursday, Sept. 27th 2012**

Foodborne outbreaks in the EU

Year	Number of foodborne Outbreaks	Outbreaks **with** identified foodstuff
2007	5733	1784
2008	5332	890
2009	5550	977
2010	5262	698
2011	5648	701

Source: EFSA

FoodChain-Lab - What is it?

- Database Unit
- Data Consolidation Unit
- Calculation Unit
- Visualization Unit
  - GIS Nodes
    http://sourceforge.net/p/bfropenlab/wiki/Home/
    christian.thoens@bfr.bund.de

BfR

Data Management - Structure
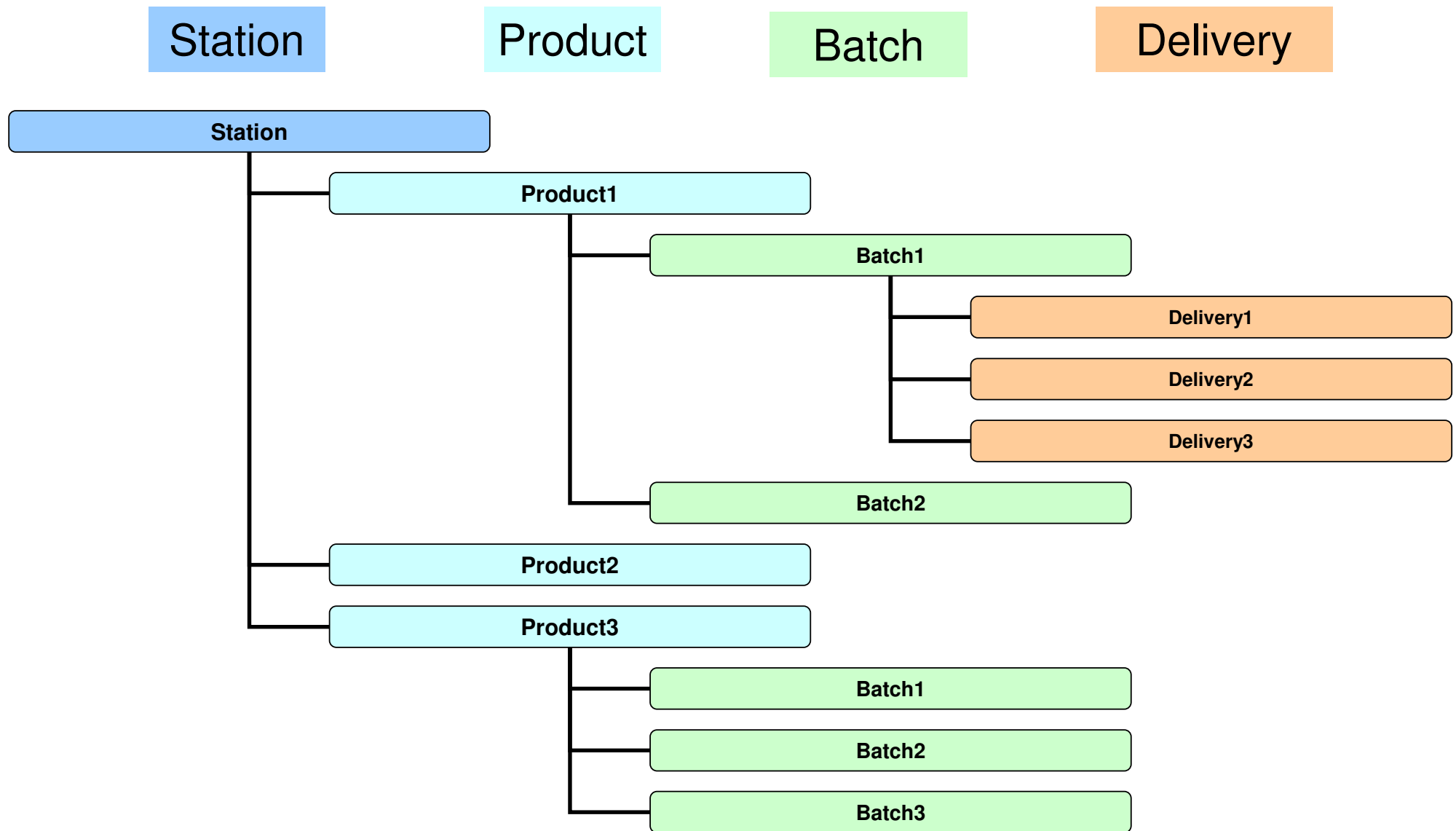
Data Management - Structure
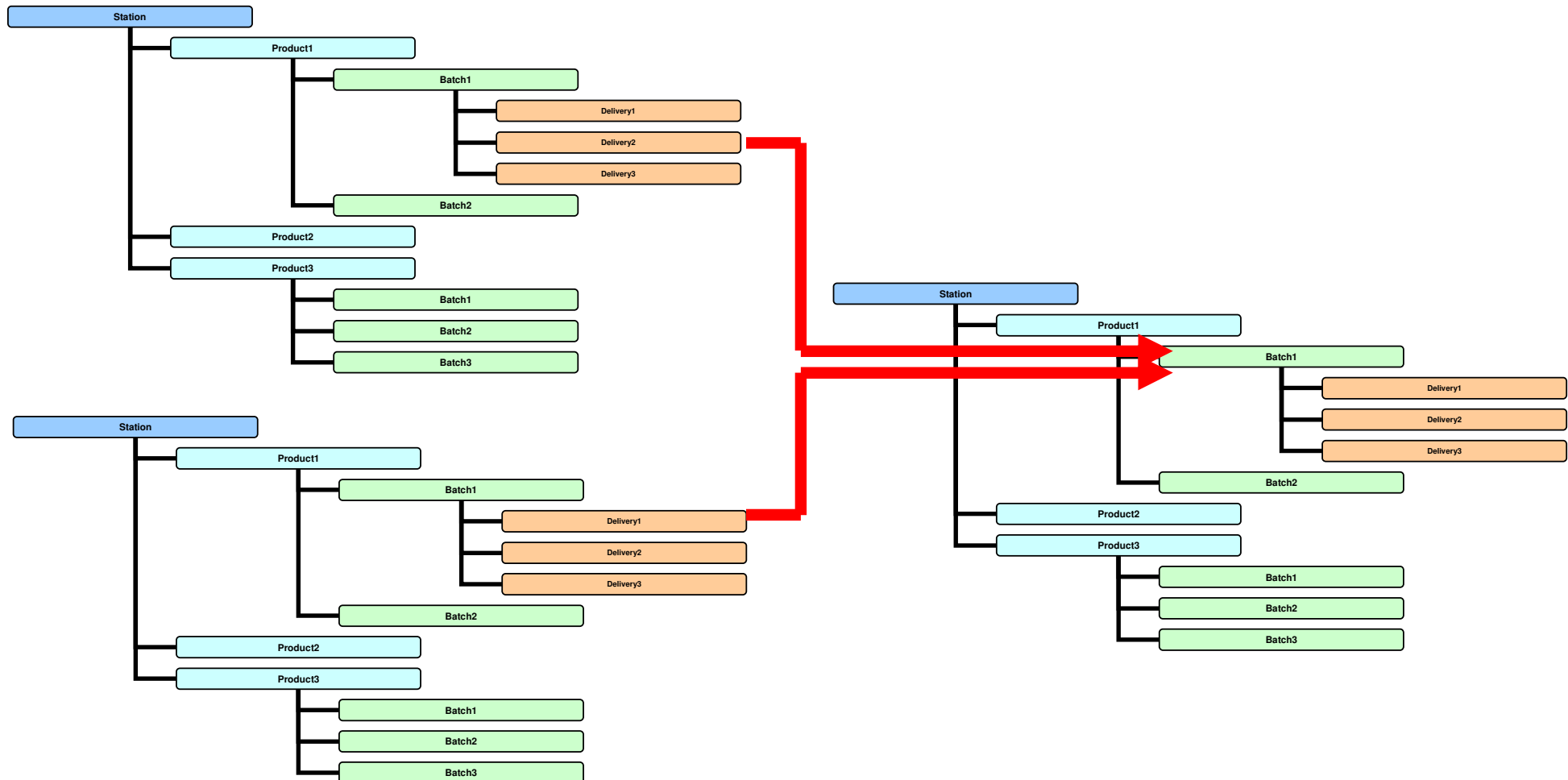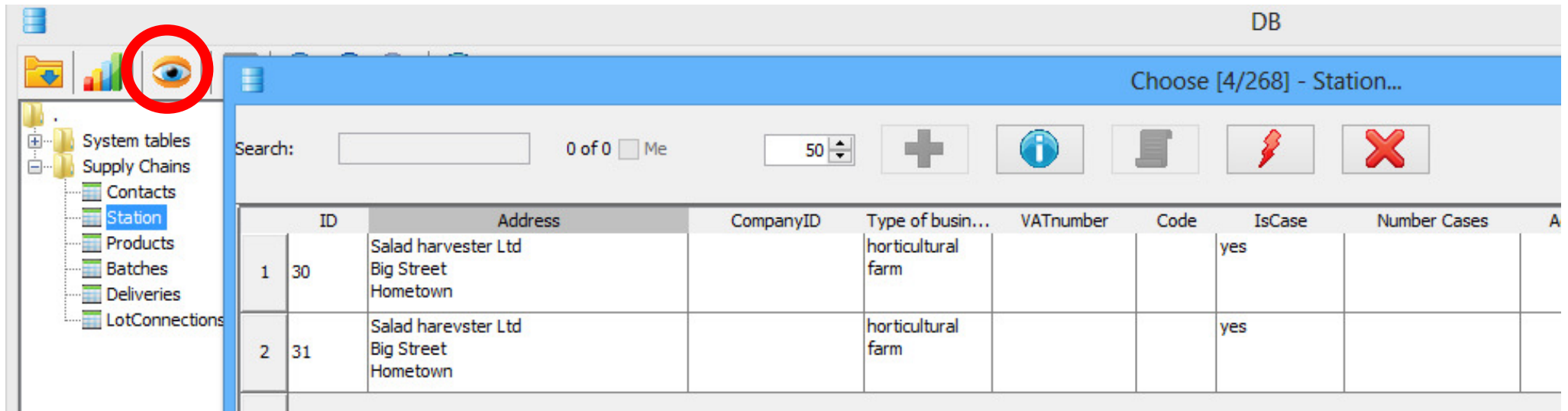
Data Management - Structure
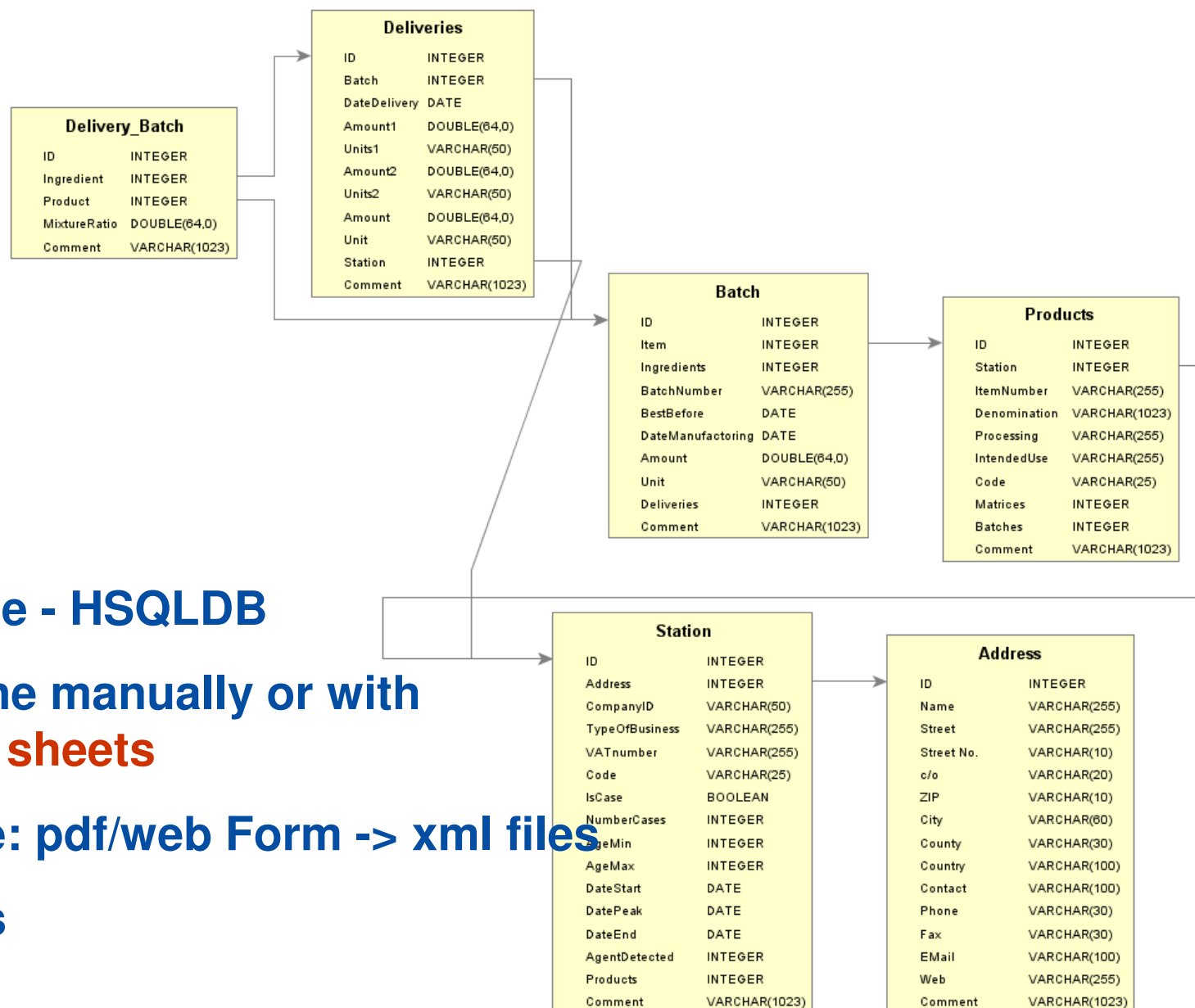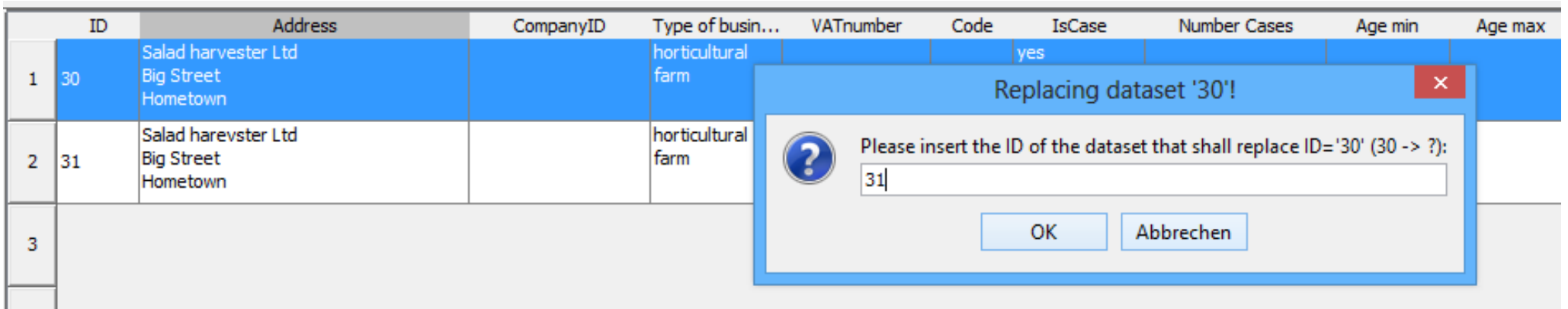
- **Relational database - HSQLDB**

- **Input/Import is done manually or with well-defined Excel sheets**

- **Input/Import future: pdf/web Form -> xml files**

- **Plausibility checks**

Data Management - Similarity Search

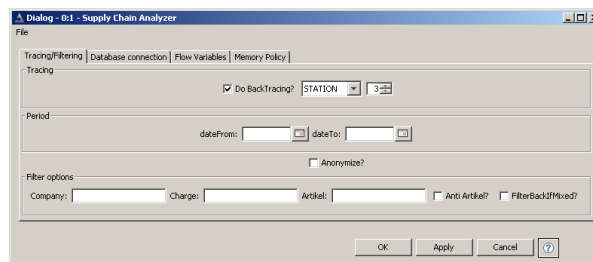# Data Management - Geocoding/Orthography

DEMO
FoodChain-Lab

Tracing back

Starting points for all analyses are predefined outbreak clusters

4 Levels of analysis:
- **<u>Station</u>: search for a common distributor/producer**
- **<u>Article</u>: search for a common product of a distributor/producer**
- **<u>Charge</u>: search for a common charge of a product**
- **<u>Delivery</u>: search for a common delivery of a charge**

- **Tracing unsuccessful?**
  - **Reduction of the number of outbreak clusters**
  - **Re-Definition of Clusters**

- **Analysis and Visualization are quick and highly customizable**

Strawberry distribution Map
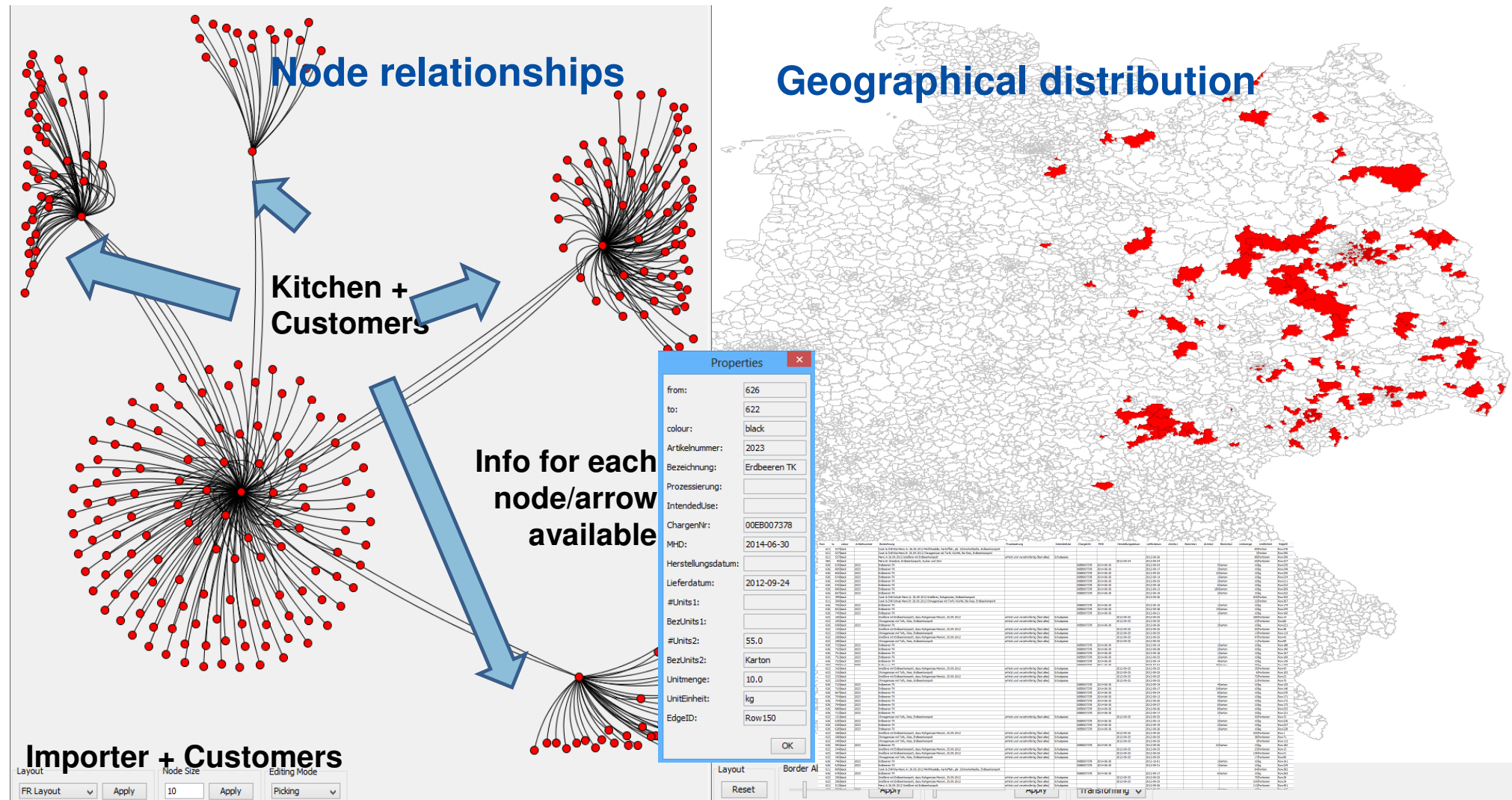
The case of the EHEC outbreak – node relationships

He7

He9

Nodes forwarding
contaminated sprouts/seeds

NU85

No40

NU53

NU87

Sc16

Ni4

Sc3

Me2
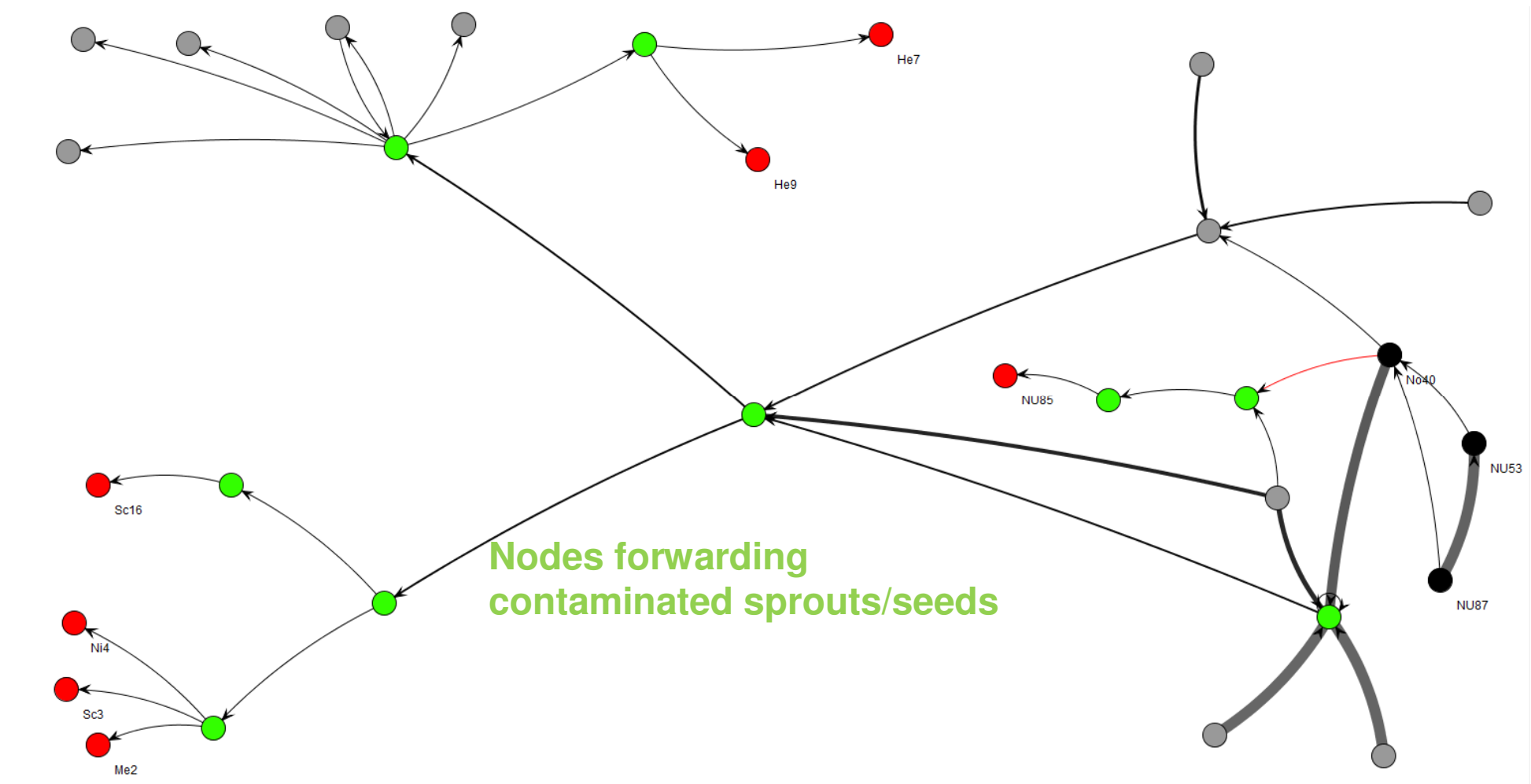
Outbreak Cluster

Sources of the outbreak

Thank you for your attention

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