

Introduction to tracing

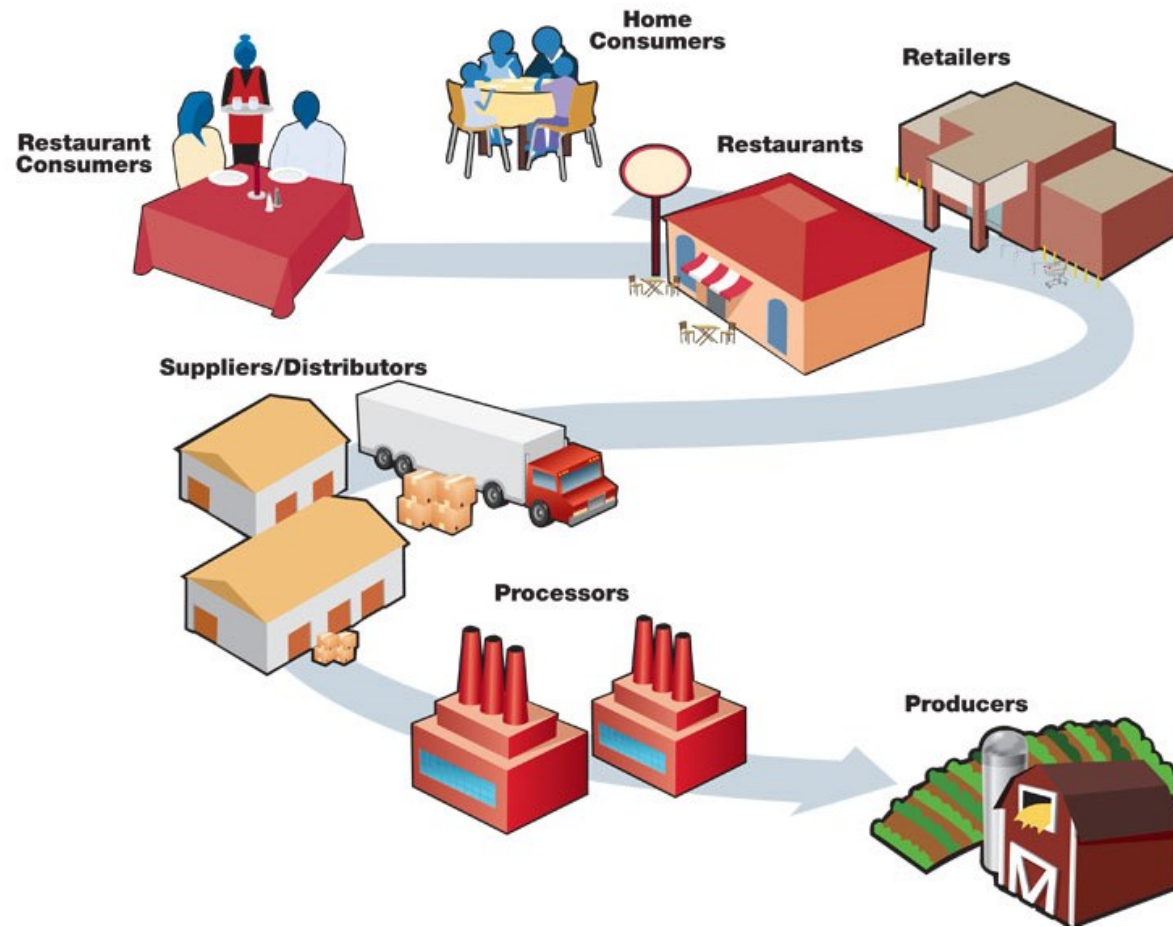
11.02.2025, FCL Workshop, France

BfR: Marion Gottschald, Alexander Falenski, Marco Rügen, Latife Salih, Arne Zerndt, Hanna Hauck, Marc Lorenzen, Daria Savvateeva, Matthew Salewski, Bernd-Alois Tenhagen

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.

Wishful thinking: Supply chains are simple and linear, right?



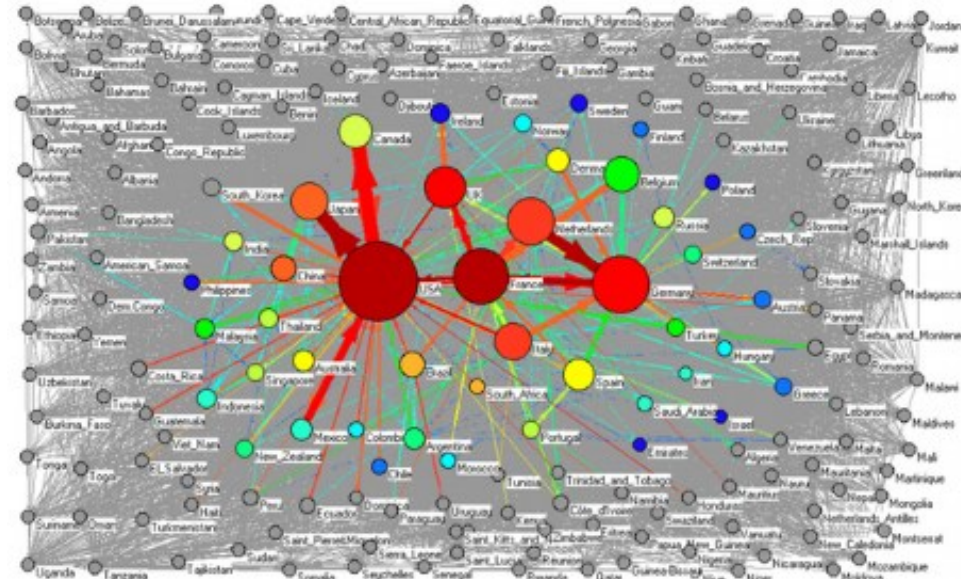
CDC: https://www.cdc.gov/outbreaknet/investigations/figure_traceback.html

The challenges of complex global food and feed supply chains

Long and complex/interlinked supply chains

Multiple stakeholders, countries, languages

Globalised trade



Ercsey-Ravasz M et al. (2012) PLoS ONE 7(5): e37810. doi:10.1371/journal.pone.0037810

Disparate technologies and tools

Large amounts of data

Increased complexity of risk assessment and outbreak control



Importance of adequate digital supply chain tracing strategies (data and tools)

Traceability/Tracing

is defined as the ability to retrospectively follow the movement of food, feed, food-producing animal or substance intended to be, or expected to be incorporated into or in contact with food or feed, through all stages of production, processing and distribution by means of recorded data.

Adapted from the General Food Law (EC regulation 178/2002) Article 3(15)

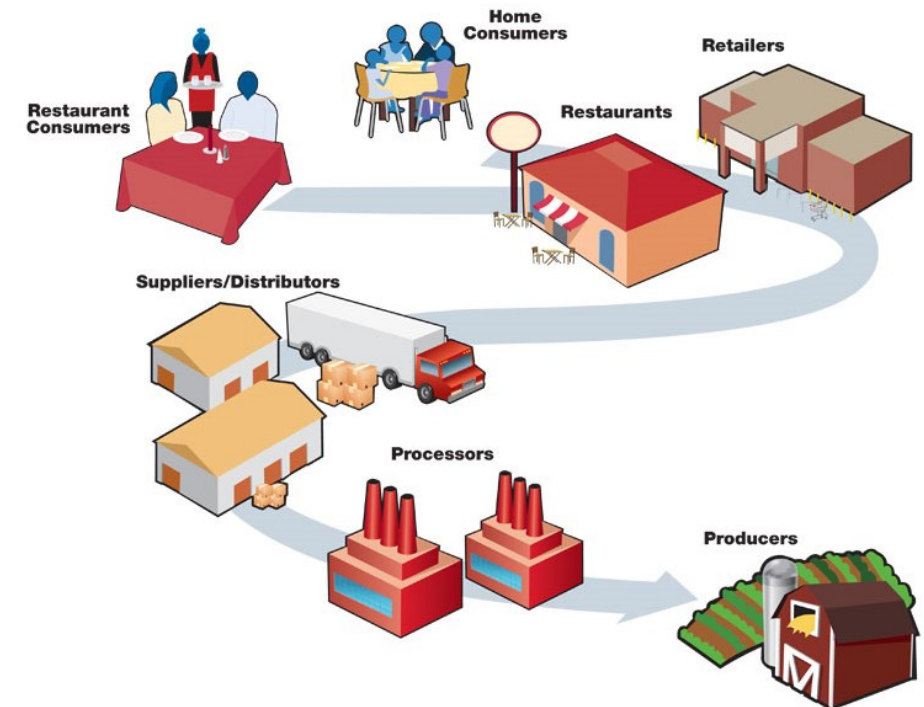
“one step forward, one step back” approach

Importance in foodborne incidents (chemical contamination, outbreak)

Purpose of tracing

- identify source of contamination
 - map distribution of contaminated food
- warn consumers
- remove contaminated food from market

Tracing the Food Back to the Source



CDC: https://www.cdc.gov/outbreaknet/investigations/figure_traceback.html

Tracing in foodborne crises

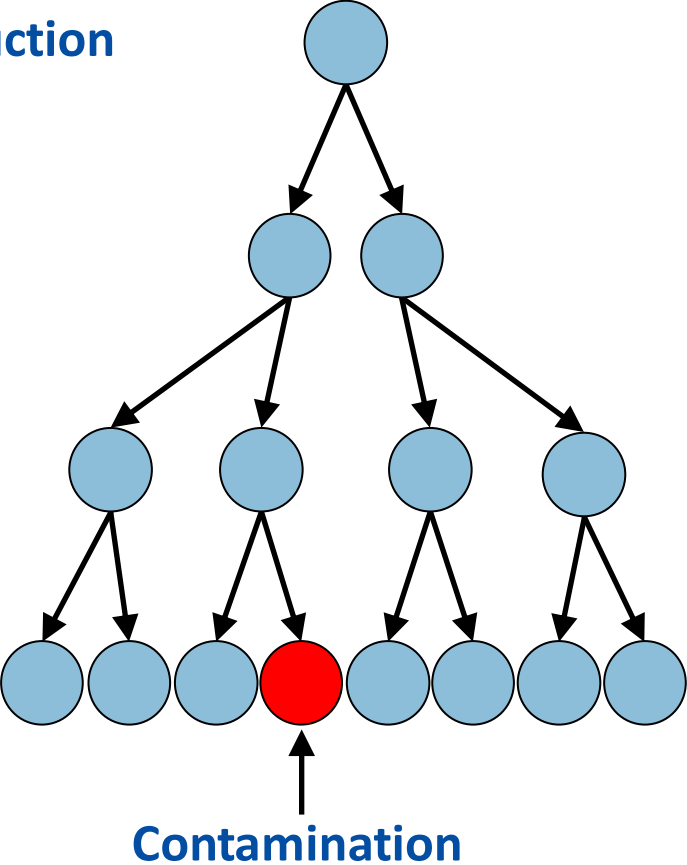
Local foodborne disease outbreak

Primary production

Processing

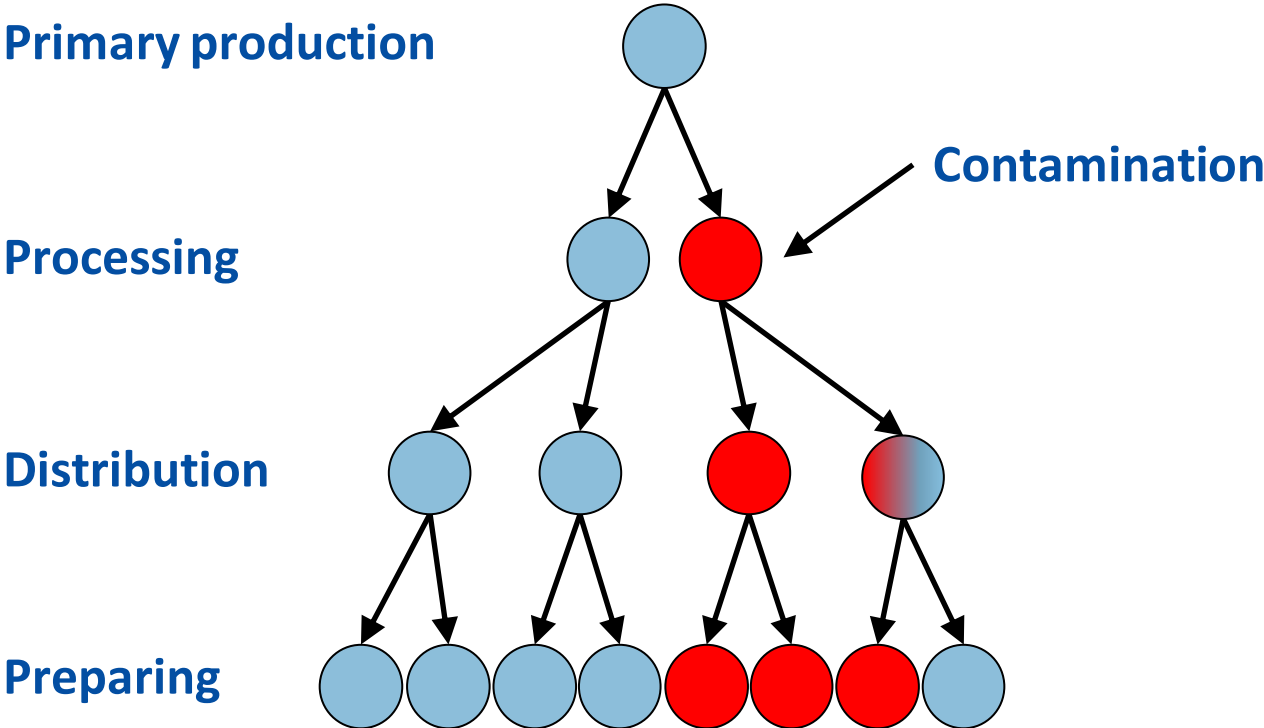
Distribution

Preparing



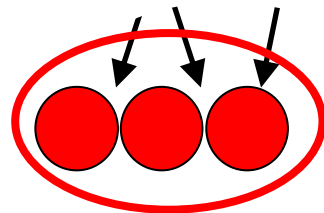
Tracing in foodborne crises

Foodborne disease outbreak affecting multiple locations/countries



Tracing in foodborne crises

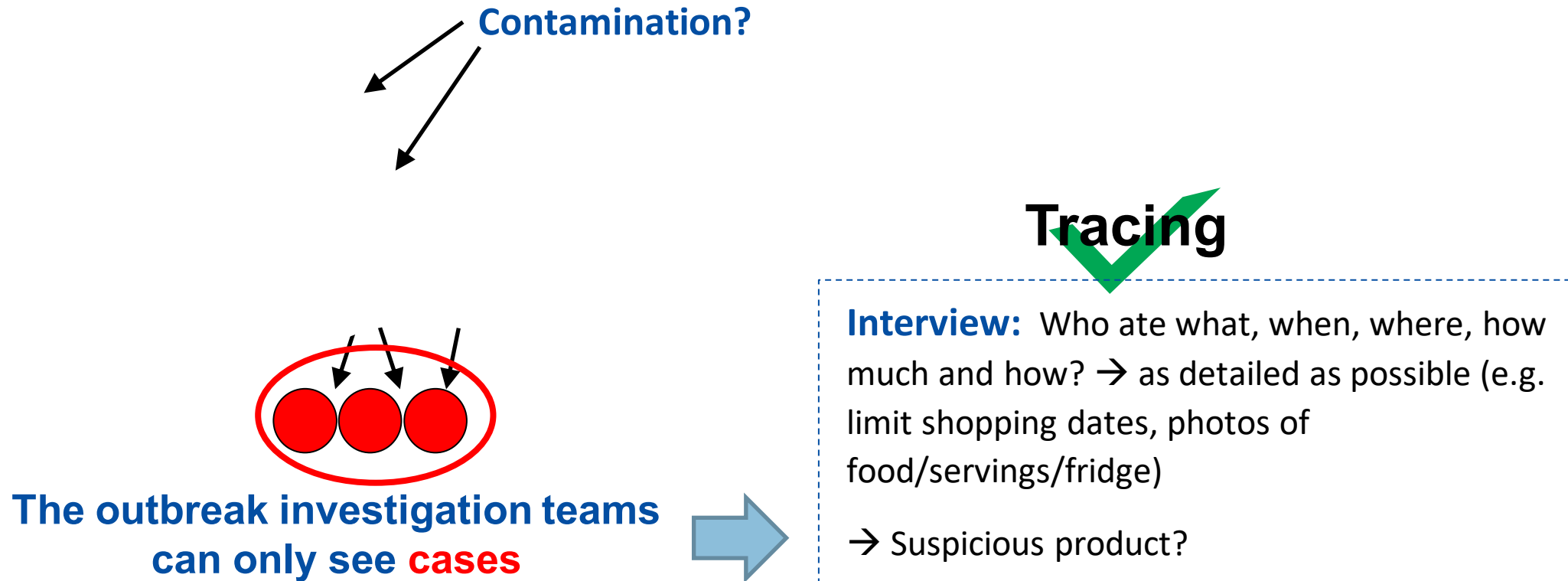
Foodborne disease outbreak affecting multiple locations/countries



The outbreak investigation teams
can only see **cases**

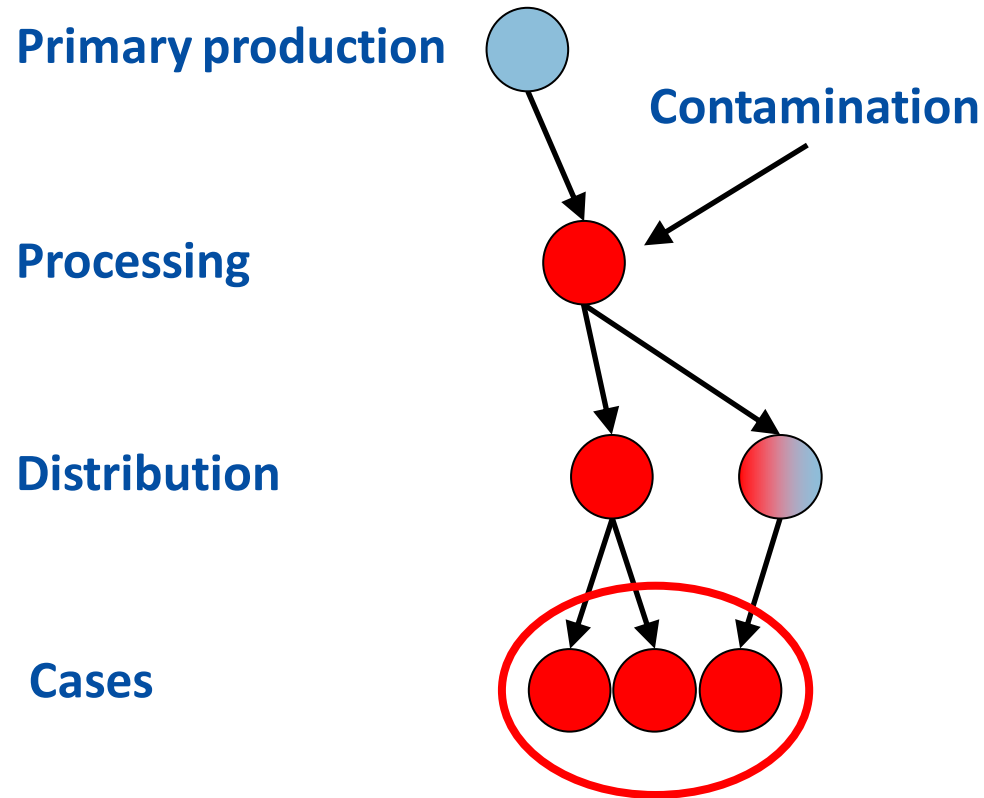
Tracing in foodborne crises

Foodborne disease outbreak affecting multiple locations/countries



Tracing in foodborne crises

Foodborne disease outbreak affecting multiple locations/countries

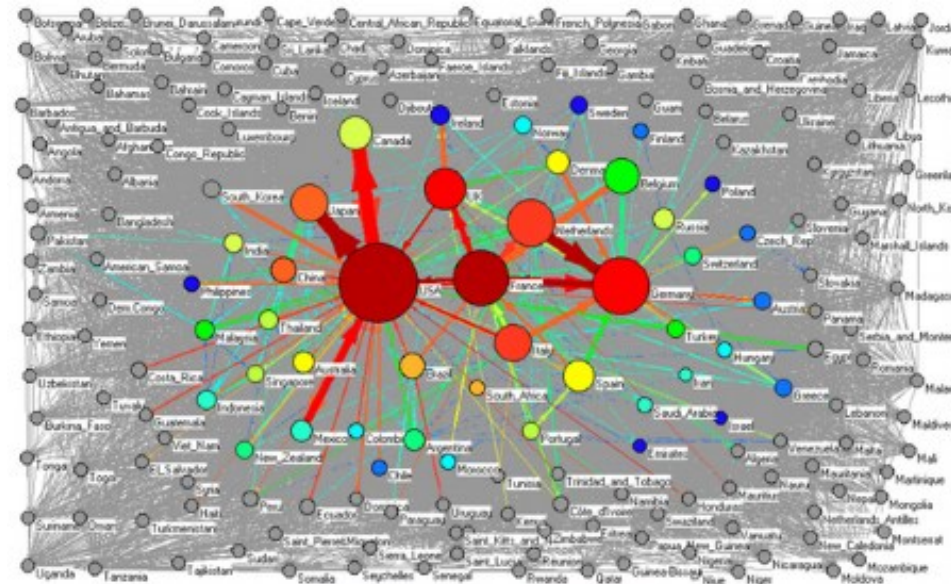


Backtracing

- Step-by-step upstream the supply chain (REGULATION (EC) No 178/2002)
- Collecting delivery data for suspicious products and their ingredients
- Combine fragmented information
- Origin of contamination?

The challenges of complex global food and feed supply chains

Globalised trade



Long and complex supply chains

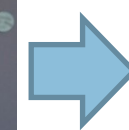
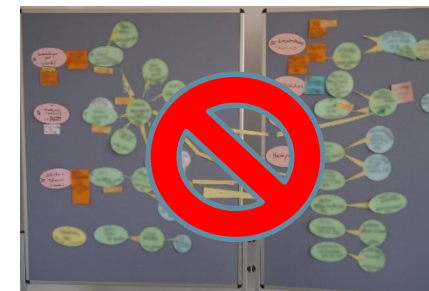
Large amounts of data

Ercsey-Ravasz M et al. (2012) PLoS ONE 7(5): e37810. doi:10.1371/journal.pone.0037810

Increased complexity of risk assessment and outbreak control



Importance of powerful interoperable software tools e.g. for tracing food and feed



When and what to trace?

Tracing is resource-intensive

→ decide when and what to trace

**You might not have the resources to trace all suspected foods.
Some paths might be misleading.
You have to weigh the effort and benefit.**

→ review all available data in a multidisciplinary team to decide on promising starting points for tracing
detailed information on cases, delivery dates, quantities, sources + conditions of food received, shipping containers, labels, documents, lot numbers, facilities involved, sampling results

Which cases to trace back?

Focus on e.g.

Confirmed cases

Well-described cases

- Detailed information on diet
- Limited period of when products were bought/restaurant was visited
- Kitchens with well-defined menus (catering, restaurants, community catering (schools/elderly homes/hospitals/meals-on-wheels) → person-specific information on consumed food)

Retained samples (voluntary)

Evidence higher for clusters of diseased persons than for single diseased persons

e.g. EHEC outbreak 2011 → 4000 cases → only 7 clusters traced back (well described; in part travel groups)

CAVE: All outbreaks are different!

Summary

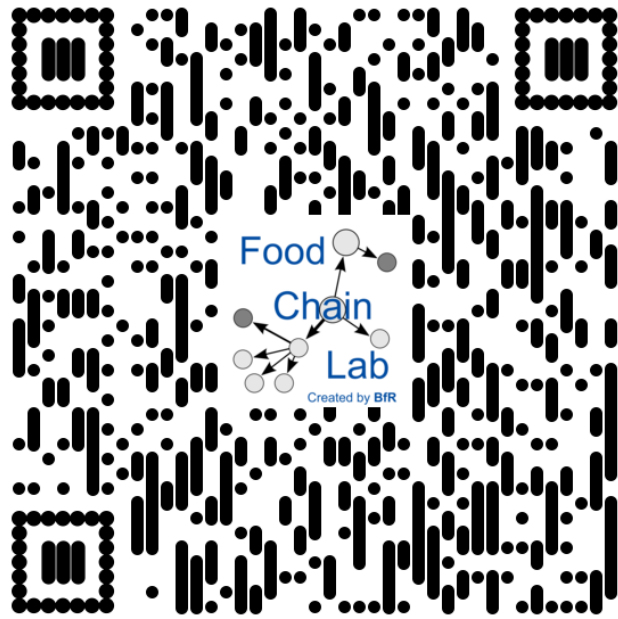
Tracing is resource-intensive

→ Focus on promising starting points for tracing

Use synergies between public and food safety authorities

→ E.g. for interviewing the cases

Use digital tools to handle investigations in complex global supply chains



Thank you for your attention!

Marion Gottschald

German Federal Institute for Risk Assessment

Max-Dohrn-Str. 8-10, 10589 Berlin

Tel. +49 30 - 184 12 - 0

Fax +49 30 - 184 12 - 99099

bfr@bfr.bund.de

www.bfr.bund.de

FoodChain-Lab Team

Marion Gottschald

Alexander Falenski

Marco Rügen

Latife Salih

and Contributors

Hanna Hauck

Arne Zerndt

Birgit Lewicki

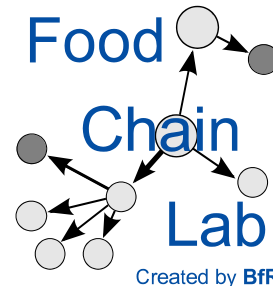
Jakub Fusiak

Isaak Gerber

Dominic Tölle

Christian Thöns

Armin Weiser



Tel. +49 30 - 184 12 - 88888

foodrisklabs@bfr.bund.de

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

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.