European Food Safety Authority

STEC O104 outbreaks in Germany and France: EFSA's response and lessons learnt

Causative organism (I)

- **Shiga-toxin producing *Escherichia coli* (STEC) serotype O104:H4 and carries substantial antibiotic resistance.**
- **Reservoir**: not clear –
  - shares virulence characteristics of STEC (animal reservoir) and of enteroaggregative *E.coli* (EAEC) (human reservoir) strains.
- **Origin**: Previously very rare in Europe
  - 10 cases of STEC O104 infection reported to ECDC (2004-2010): only three were of serotype O104:H4 (Finland 2010, Italy 2009 and France 2004): travel in North Africa
  - A review of the literature revealed that STEC O104:H4 has also been isolated in Germany, twice (2001). German isolates differed from the 2011 outbreak strain

Epidemic (I)

-Germany

First case **1st week of May**

Epidemic peak 200 cases per day: **22 May**

-European level

Germany reports to Commission and MS on **21 May**

First audio conference of Commission **24 May**

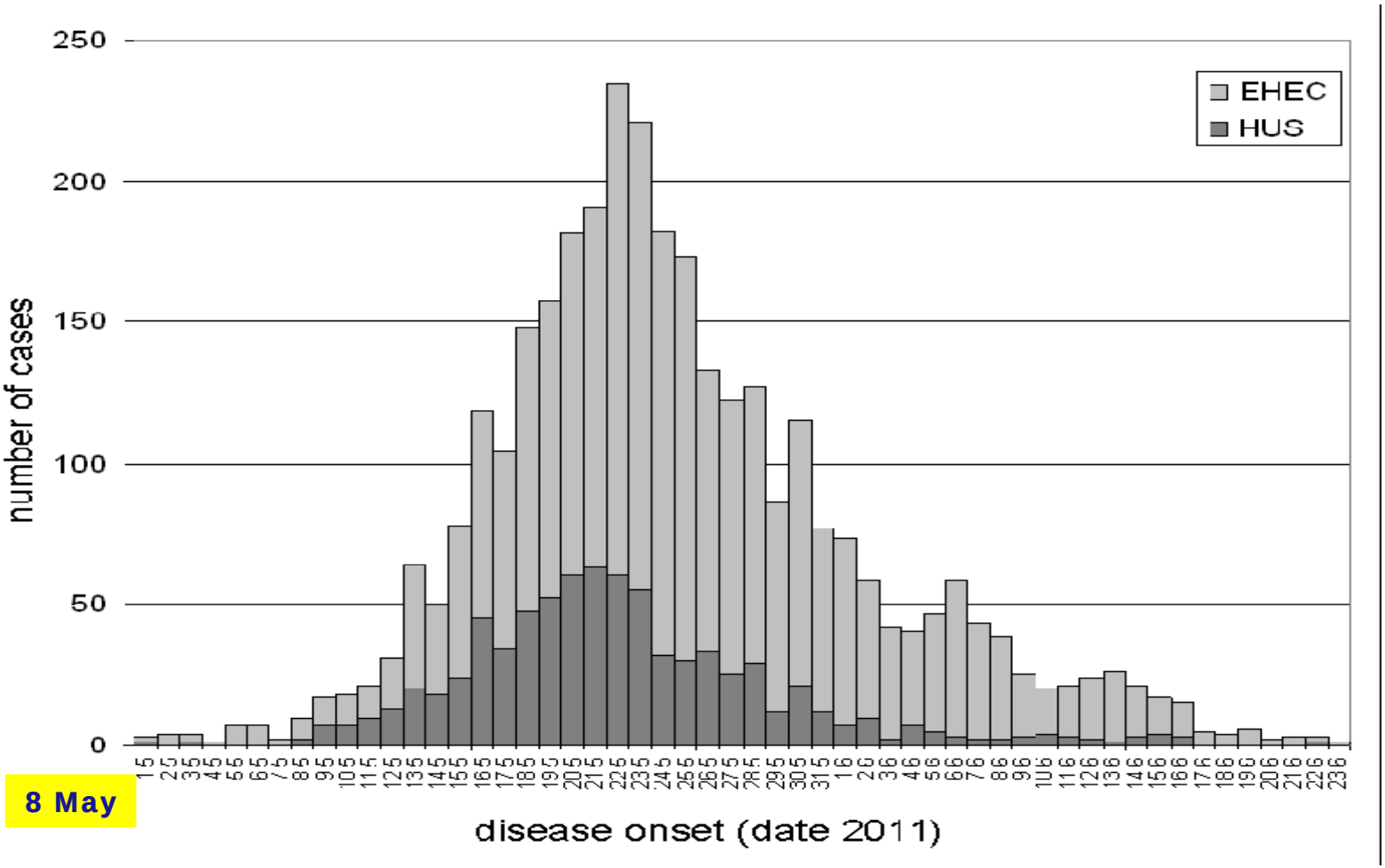
-France

24 June cluster in Bègles (near Bordeaux)

-7 July end of the outbreak

4000 cases, incl. **50 deaths**

Epidemic (II)- German outbreak



Source: Robert Koch Institute, Technical Report - EHEC/HUS O104:H4 Outbreak, 30.06.2011

EFSA's Involvement

- First phase (May 24 – 8 June): Preparatory Review
  - EFSA/ECDC advice published 3 June
  - Literature Review: presence of enteric pathogens in plant material
  - Summarisation of STEC data previously reported in the EU in humans, food and animals
- Second phase (5 – 16 June): Support Outbreak Investigation in Germany
  - Worked 'shoulder to shoulder' with the colleagues from the Federal Ministry and Research Institutes and the Länder to develop, set up and implement the tracing back and tracing forward investigation
  - Led to the identification of sprouts as the cause and Establishment A as the source of the sprouts
- Third phase (24 June – 5 July): Investigate common cause between French and German outbreaks
  - Set up a European Task Force to trace common link: seeds used to produce sprouts
  - Identified a Lot of Fenugreek seeds imported from Egypt in Germany via Antwerp/Rotterdam
- Fourth phase: follow-up mandate to BIOHAZ Panel (30 Oct)

OUTBREAK INVESTIGATION:

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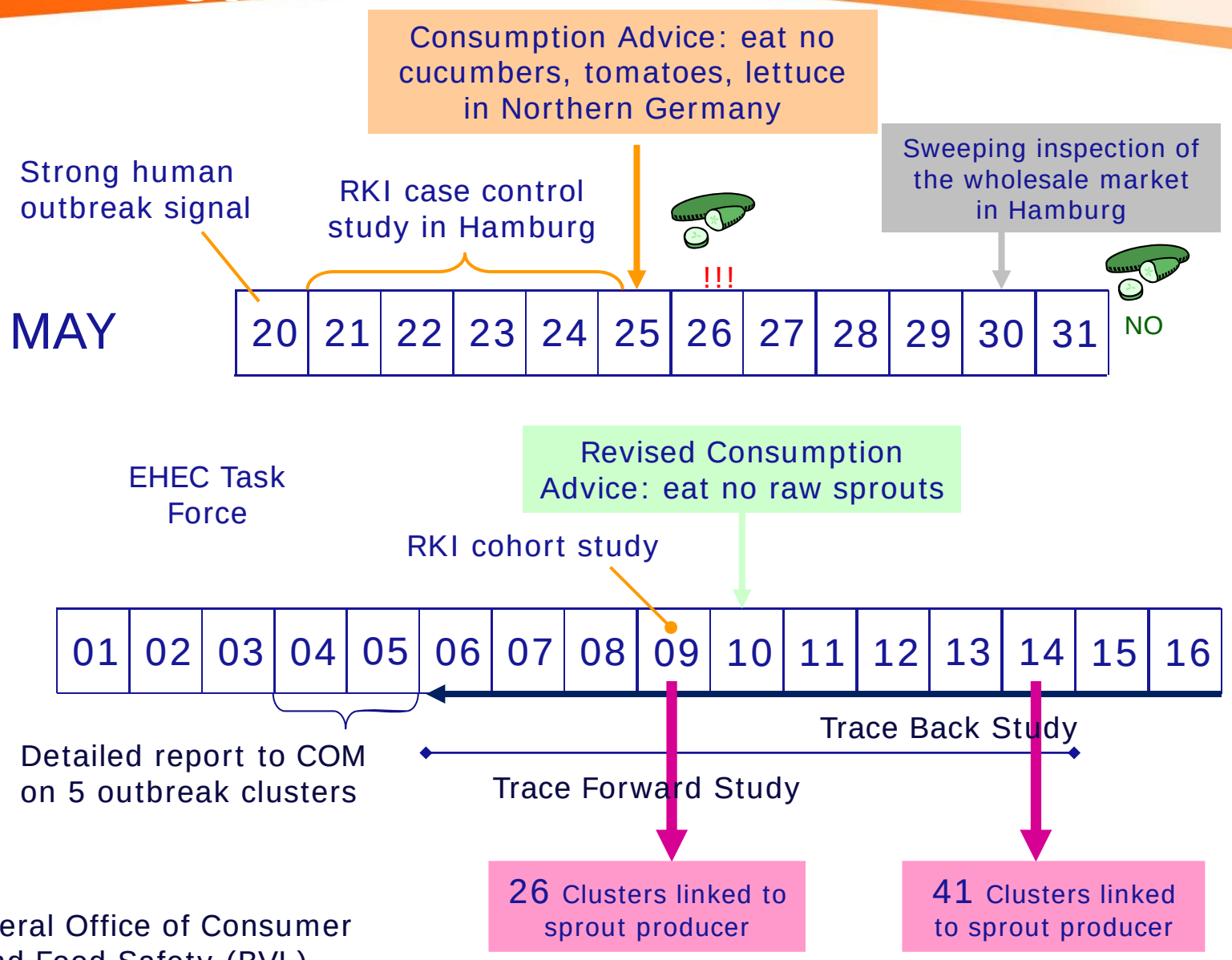
This is like peeling an onion (in a hurry): as soon as have peeled one layer you are merely ready for the next

- It is a stepwise and complex process:
  - Which is the vehicle – fresh vegetables
  - Which fresh vegetable is it really – sprouts
  - Where do those sprouts come from – from Establishment A
  - Which of the sprouts from Establishment A – can't tell for sure
  - How do these sprouts get contaminated:
    - personnel?
    - water?
    - seeds?
- It comes with 'a lot of tears':
  - The pressure is, understandably, enormous
  - The need for coordination of various organisations is substantial
  - The rule-book has not been written or rehearsed and many existing rules may take weeks
  - Mistakes can be made, when time is of the essence

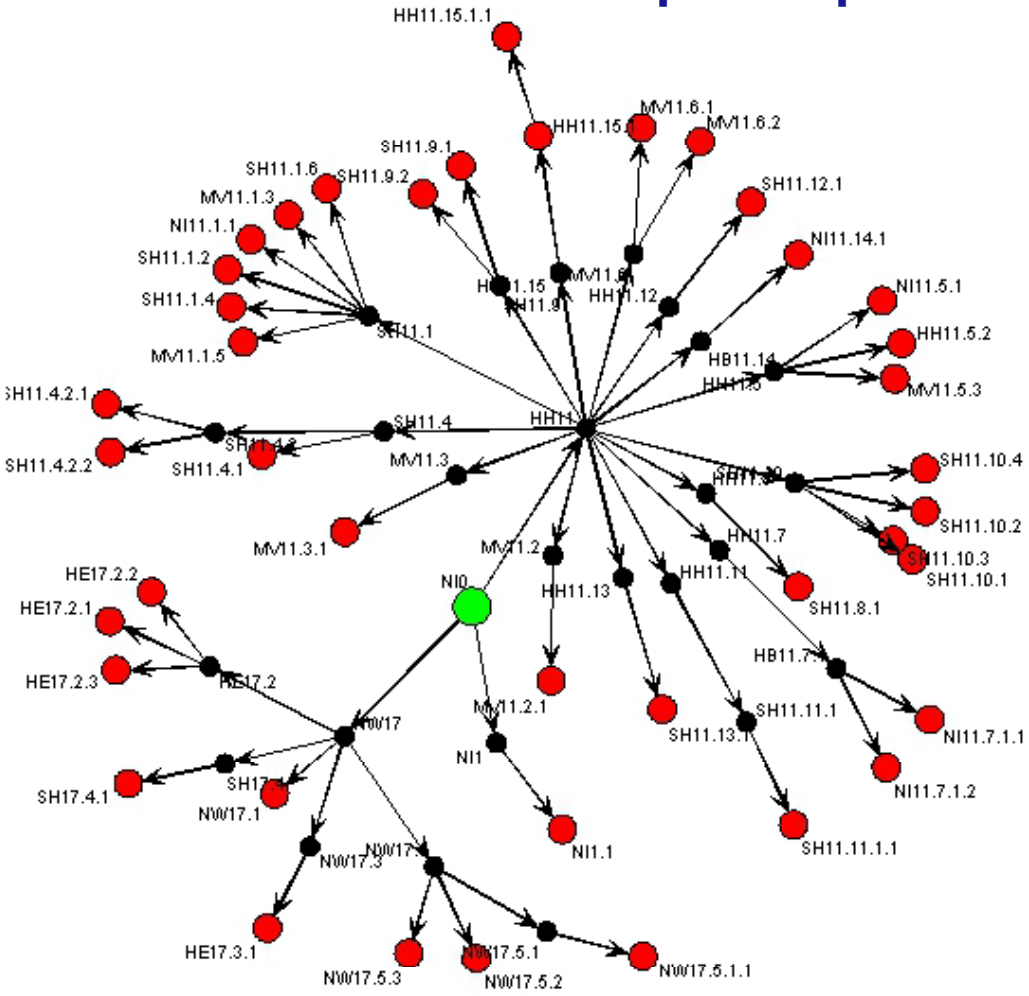
Source of the Infection (I)- Chronology



Source: Federal Office of Consumer Protection and Food Safety (BVL)

Source of the Infection (II)

Network Graphic 'Sprout Supply Chains'



- Sprout Producer
- Distributor
- Outbreak clusters at the end of supply chains (restaurants, canteens, supermarkets, groceries)

41 well described outbreak clusters with a common link

-Further epidemiological investigations linked disease occurrence with either of 2 sprouted seed mixtures:

Mild blend: 4 types of sprouts

Spicey blend: 3 types of sprouts

-Only lentil and fenugreek sprouts were common to both mixtures

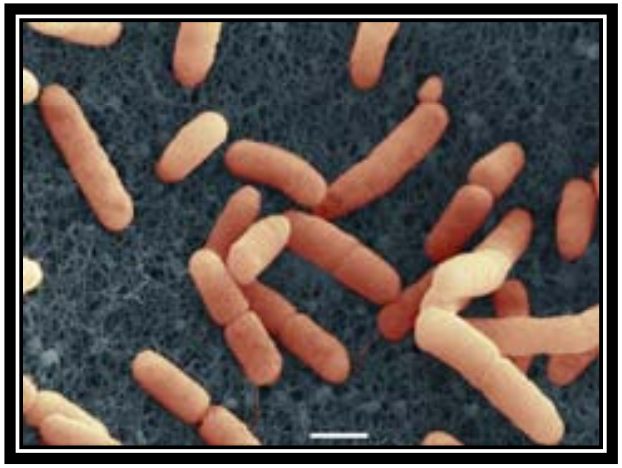
Source: Federal Office of Consumer Protection and Food Safety (BVL)

Epidemic - French outbreak

• Before French outbreak, 13 EU/EEA countries reported cases associated to the outbreak in Germany. All cases linked to travel to northern Germany.

• 24th June France reported a cluster of patients with bloody diarrhoea: none of the food handlers or guests had recently travelled to Germany or had contact with travellers from Germany

• **Microbiological characterization** of the isolates from **French outbreak: indistinguishable**



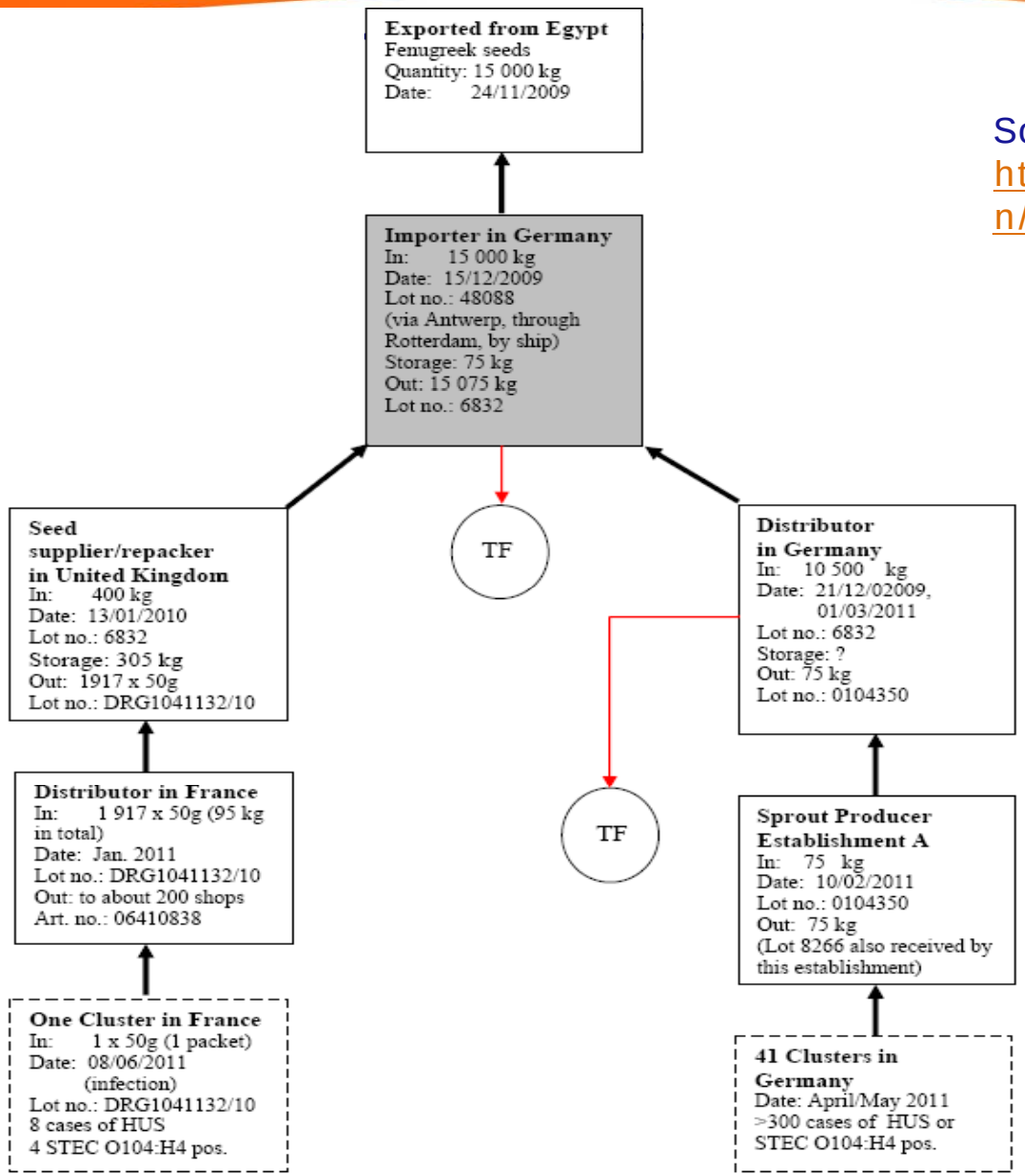
EFSA's Task Force

- 25th June EFSA asked by the European Commission to initiate tracing back investigation to identify p**ossible link between French cluster and German outbreak?**

- EFSA set up a **Task Force** composed of experts from European Commission, concerned MS (Germany, France, United Kingdom, the Netherlands, Italy, Sweden, Austria and Spain), ECDC, WHO, and FAO.

- EFSA **data collection, data management and data analysis** using spreadsheets developed for German outbreak. Rapid Alert System for Food and Feed (RASFF) for data exchange. Collaboration with German EHEC Task Force members: Exchange of staff from the BfR

EFSA Task Force: Link between German and French outbreaks



Source: http://www.efsa.europa.eu/en/supporting/doc/176e.pdf

Investigation completed without positive bacteriology

- The outbreak strain was not isolated from seeds or sprouted seeds.
- The outbreak strain has not been isolated from foods where *the possibility of cross-contamination* could be excluded.
- The lack of positive microbiological results is not unexpected:
  - Test sensitivity for very low levels of contamination
  - Sampling volumes/strategies for low contamination levels,
  - Possibly heterogeneously distributed in large lots.
  - Specific physiological considerations due to the seed matrix; soaking seeds prior to testing may aid recovery of contaminants (ANSES and EU-RL)

Complete Forward tracing

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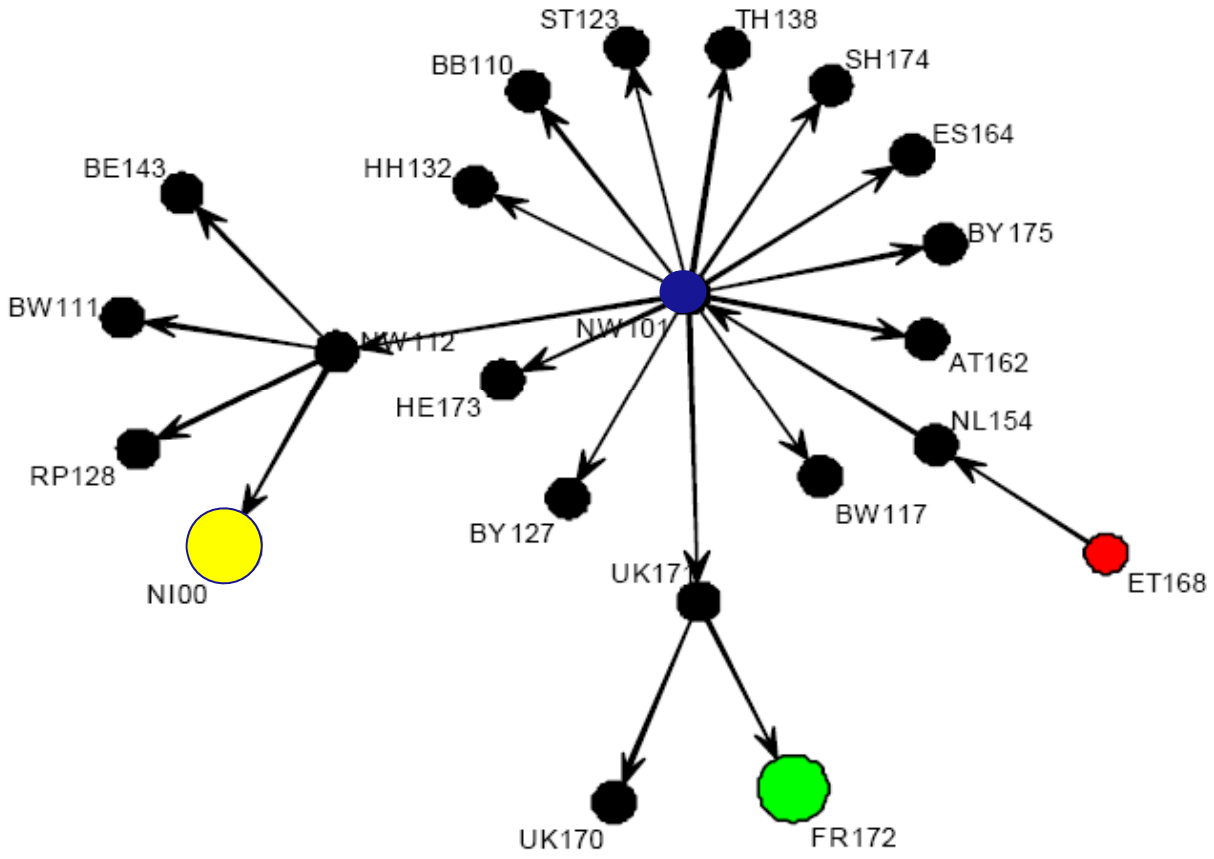
Fenugreek seeds batch from 2009 (batch 48088)



- French sales outlet
- German importer
- Egypt exporter
- Sprout producer

Sources: Opinion No. 23/2011 of BfR of 5 July 2011 and http://www.efsa.europa.eu/en/supporting/doc/176e.pdf

CONCLUSIONS

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- Lot 48088 of fenugreek seeds imported from Egypt was the common link for both outbreaks. Possible implication of other lots. **Import ban**

- While the **trace-forward activities** were ongoing, consumers were advised not to grow sprouted seeds for consumption and not to eat sprouts or sprouted seeds, unless they were cooked thoroughly. When the trace-forward was completed and the implicated lot(s) removed from the market, such advise was revised (**3rd October, EFSA website**)

  (http://www.efsa.europa.eu/en/press/news/111003a.htm)

- Contamination with STEC O104:H4 with faecal material of human and/or animal origin during production or distribution process. Typically, such contamination occurs during production at farm level. **Mandate to BIOHAZ panel**