



Salmonella Enteritidis outbreak related to Polish eggs

22nd EURL-Salmonella workshop

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European
Commission

OUTLINE

- Background – published ROA
- Human data
- Info on food and environmental investigations
- Conclusions



JOINT RAPID OUTBREAK ASSESSMENT

**Multi-country outbreak
of *Salmonella* Enteritidis phage type 8,
MLVA profile 2-9-7-3-2 and 2-9-6-3-2 infections**

First update, 3 March 2017



Multinational Outbreak investigations

Assessment

ECDC: human data, inquiries, advice for treatments

EFSA: to assess food/animal data, Consumers' advice, investigation to source

Management

DG SANTE: Based on assessment: measures, trade restrictions, negotiations with third countries

Joint Rapid Outbreak Assessment

EURL network: analytical methods, molecular testing

Techn. support

Techn. support



MEMBER STATES' BODIES

EU outbreak case definition

A laboratory-confirmed *Salmonella* Enteritidis case with symptoms onset on or after 1 May 2016 (date of sampling or date of receipt by the reference laboratory if date of onset is not available)

AND

[Confirmed]

Fulfilling the following laboratory criterion: with a strain sharing the same t5-level SNP address as one of the defined UK outbreak clusters based on **WGS analysis** (1.2.3.175.175.175.% or 1.2.3.18.359.360.%).

[Probable]

Fulfilling the following laboratory criterion: with a strain matching the **MLVA** profile 2-9-7-3-2 or 2-9-6-3-2 corresponding to the MLVA protocol with 5 loci.

EU outbreak case definition - historical



A **historical confirmed** case:

A *Salmonella* Enteritidis strain sharing the same t5 level SNP address as one of the defined UK outbreak clusters based on WGS analysis and date of disease onset from February 2012 to April 2016 (date of sampling or date of receipt by the reference laboratory if date of onset is not available).

A **historical probable** case:

A laboratory-confirmed *Salmonella* Enteritidis case with MLVA-type 2-9-7-3-2 or 2-9-6-3-2 and date of disease onset from February 2012 to April 2016 (date of sampling or date of receipt by the reference laboratory if date of onset is not available).

EU outbreak case definition - excluded

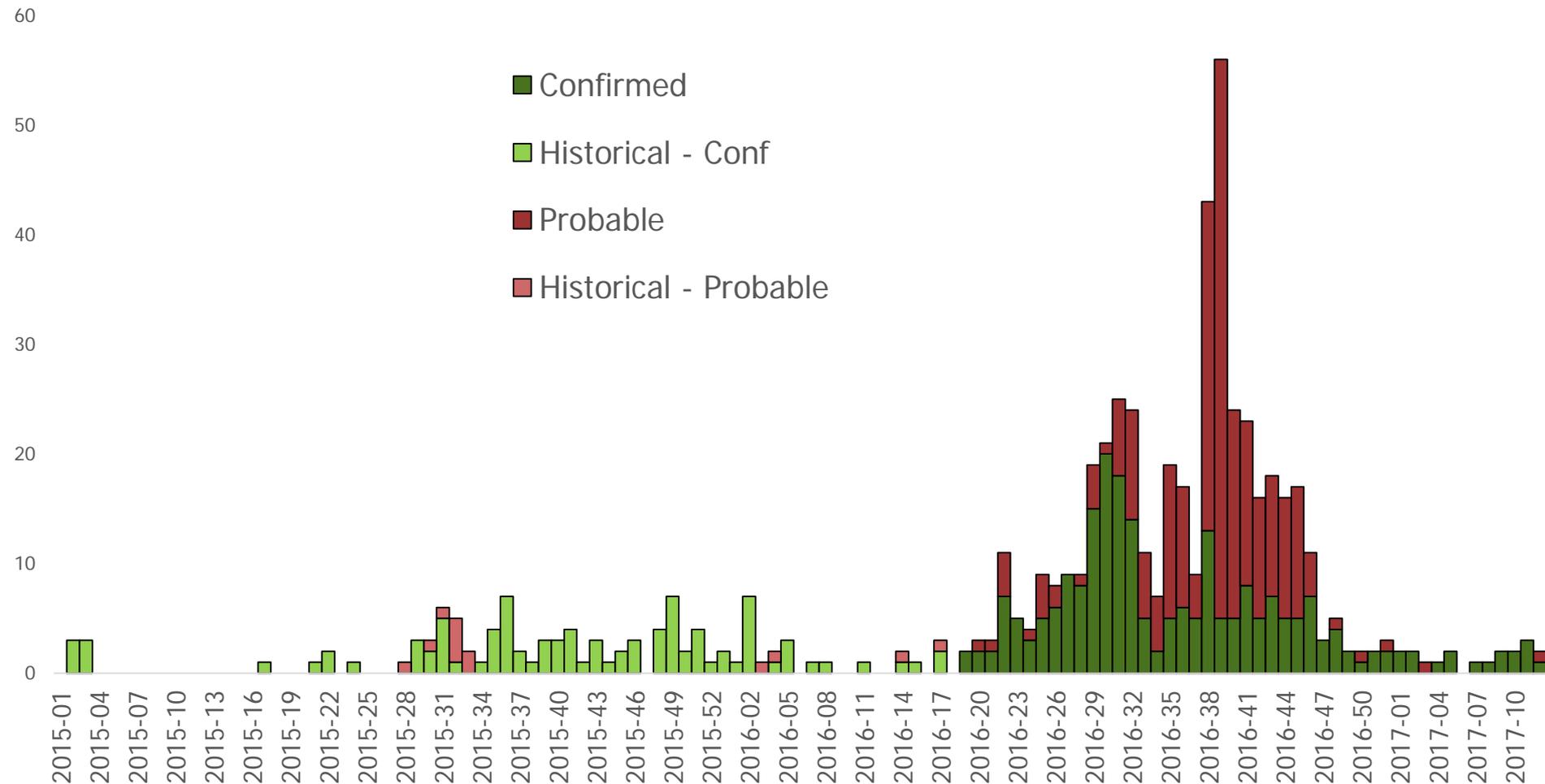
- Cases with travel history outside of the EU/EEA
- Secondary cases defined as those confirmed cases that have had person-to-person contact with a confirmed case and no exposure to a common source
- Cases infected with MLVA-type 2-9-7-3-2 or 2-9-6-3-2, but not sharing the t5-level SNP address as one of the defined UK outbreak clusters based on WGS analysis (1.2.3.175.175.175.% or 1.2.3.18.359.360.%)

Distribution of outbreak cases by reporting country, case classification and genetic cluster (n=606) EU/EEA 2012-2017 as of 05/05/2017



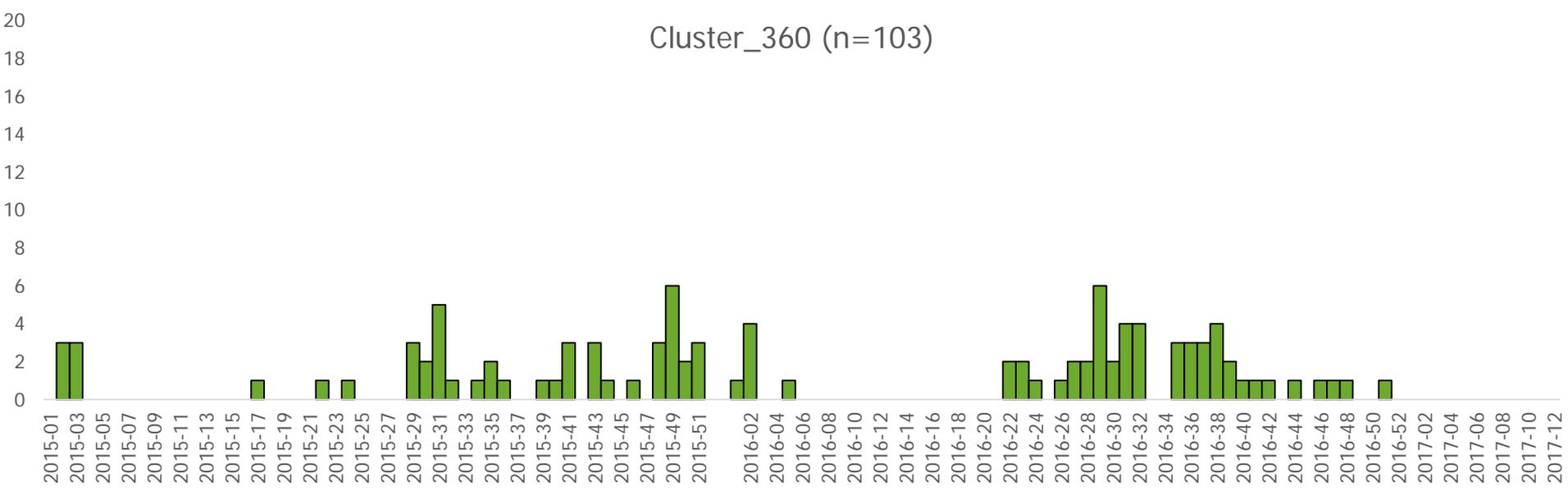
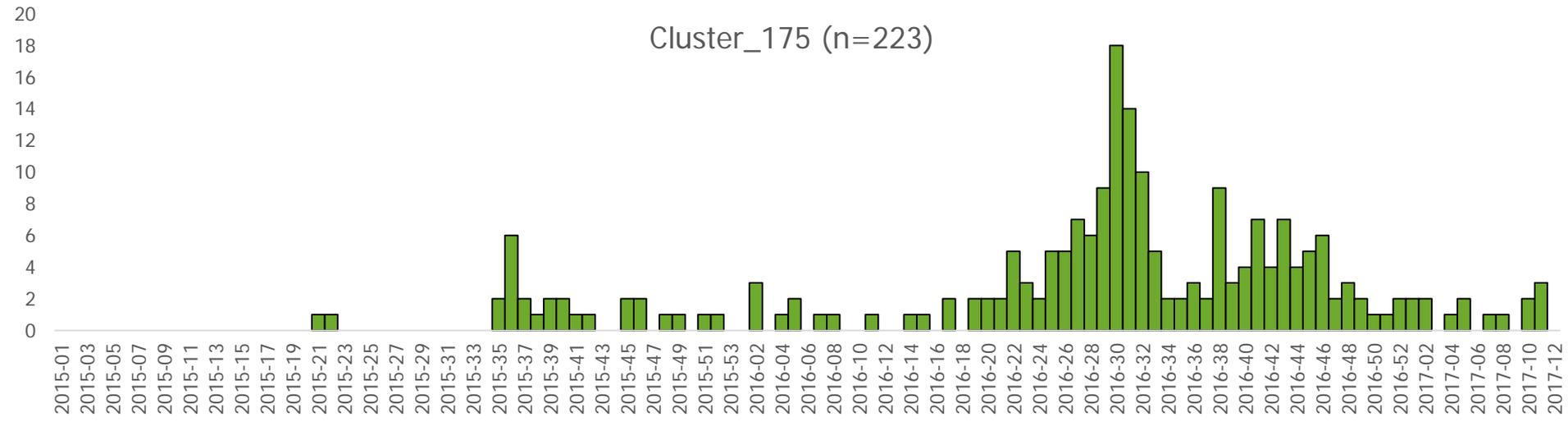
Country	Confirmed				Historical – Confirmed			Total
	Cluster _175	Cluster _360	Probable	Total	Cluster _175	Cluster _360	- Probable	
BE	12	2	119	133	0	0	0	0
DK	5	1	0	6	0	0	0	0
EL	0	0	2	2	0	0	0	0
FI	0	0	1	1	1	0	0	1
FR	3	2	0	5	0	0	0	0
HR	4	0	0	4	0	0	0	0
HU	0	0	5	5	0	0	0	0
IT	1	0	0	1	0	0	0	0
LU	1	3	0	4	0	0	0	0
NL	55	18	98	171	2	13	5	20
NO	9	2	14	25	0	0	19	19
SE	7	3	0	10	2	0	0	2
SI	2	1	0	3	0	0	0	0
UK	82	19	4	105	40	49	0	89
Total	181	49	245	475	45	62	24	89

S. Enteritidis multicountry outbreak cases by week of statistics* and case classification (n=606), EU/EEA 2015-2017, as of 05/05/2017



*Week of onset, or week of sampling or week of received date at reference lab level (four confirmed cases from Croatia missing any date)

S. Enteritidis 2-9-7-3-2: historical confirmed and confirmed cases by week of statistics and genetic cluster (n=337), EU/EEA 2015-2017, as of 05/05/2017





ROA on multi-country outbreak due to S. Enteritidis

- ❑ **Multi-country outbreak of S. Enteritidis** PT 8 with multiple locus variable-number tandem repeat analysis (MLVA) profiles 2-9-7-3-2 and 2-9-6-3-2, **linked to eggs**, is **ongoing in the EU/EEA**.
- ❑ Based on WGS, isolates are part of **two distinct but related genetic clusters** (cluster_175 and cluster_360).
- ❑ ECDC and EFSA liaised with relevant authorities in the Member States and at the EU level to facilitate the coordination of investigation and response measures.

Joint EFSA-ECDC ROA on '*Multi-country outbreak of Salmonella Enteritidis phage type 8, MLVA type 2-9-7-3-2 and 2-9-6-3-2 infections*' [published on 27 October 2016](#).

→ *Link between the multi-country outbreak and a **egg packing centre (B) in Poland**, pointing at **eggs** as the most likely vehicle of infection for at least part of the outbreak cases*



ROA on multi-country outbreak due to S. Enteritidis

Microbiological & environmental investigations on food

Country information on food and environmental investigations related to this outbreak:

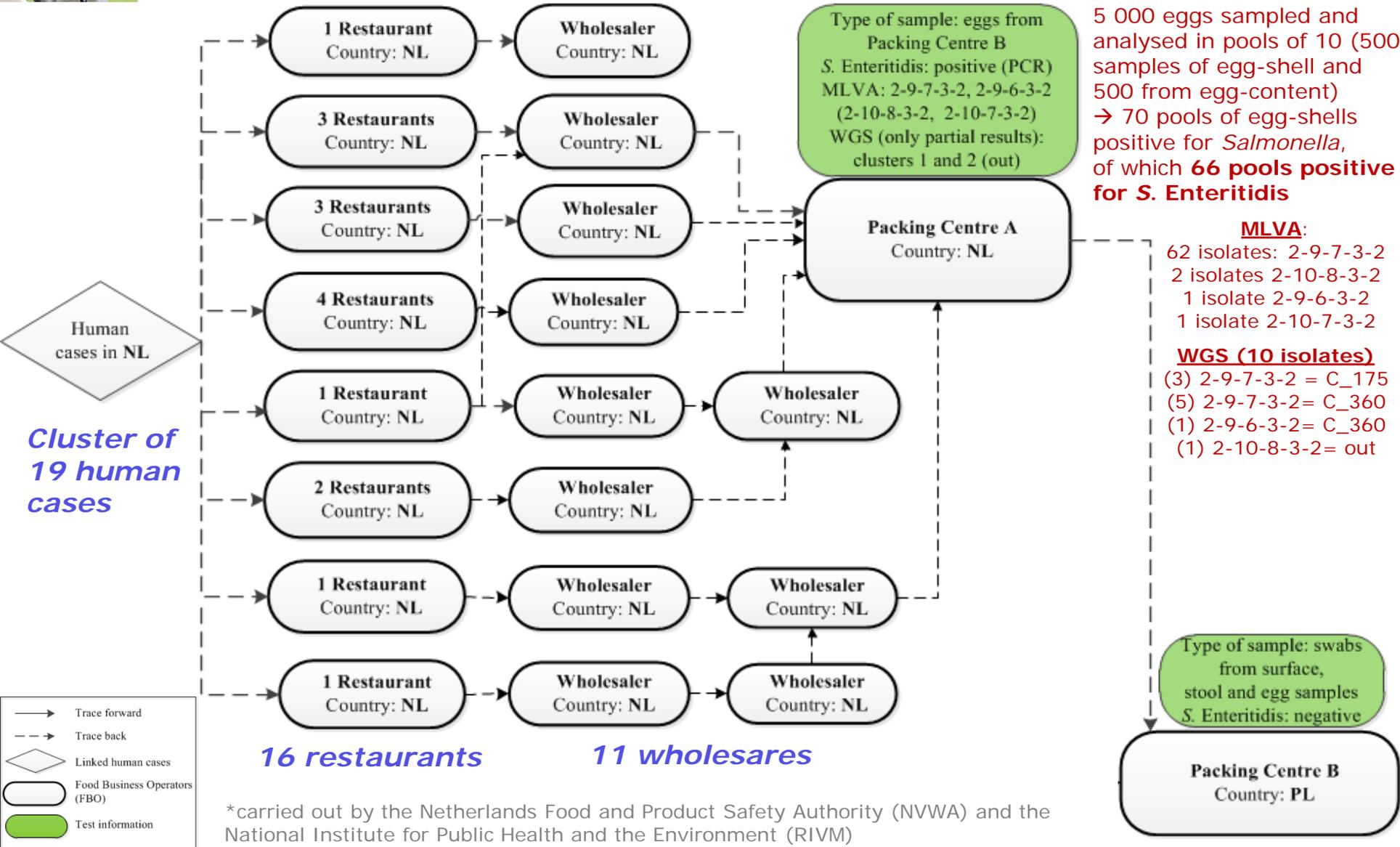
- ❑ Reported to **RASFF** (*as of 1 March 2017*) → food tracing
- ❑ Additional information **reported by the national authorities of the interested Member States to EFSA** (*as of 1 March 2017*)

The food safety authorities in **Belgium, Croatia, Hungary, the Netherlands, Poland and United Kingdom** carried out **extensive environmental and food investigations to identify the source of this outbreak**

→ Main food tracing and testing information visualised in a graph



ROA update: NL [tracing-back investigation*]





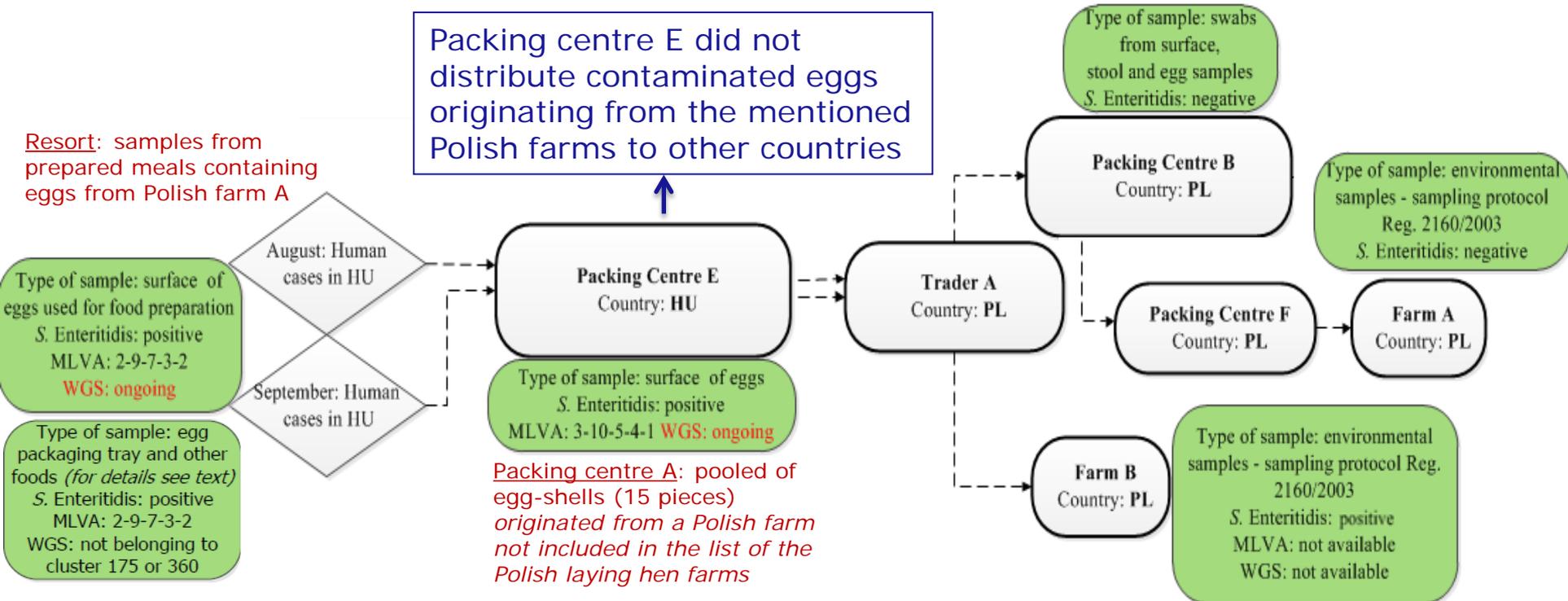
ROA update: **NL** [*tracing-forward investigation*]

- ❑ Suspected eggs were further distributed to ~2200 FBOs **within the Netherlands**, mainly Asian restaurants
- ❑ Furthermore, the suspect eggs and (unpasteurised) egg products were shipped to the following **8 EU Member States**: Belgium, Denmark, France, Germany, Italy, Poland, Sweden, and the United Kingdom.
- ❑ Suspected batches of eggs were also distributed to **8 third countries**: Angola, Bahrein, Congo, Gambia, Oman, Sierra Leone, Qatar and United Arab Emirates



ROA update: **HU** [tracing-back investigation]

- Official investigations carried out to investigate the potential source of infection for **two clusters of S. Enteritidis human cases**
 - **Human cases occurred in August '16**: associated with consumption of prepared meal containing eggs in a **summer holiday resort**
 - **Human cases occurred in September '16**: associated with consumption of eggs in a **restaurant**

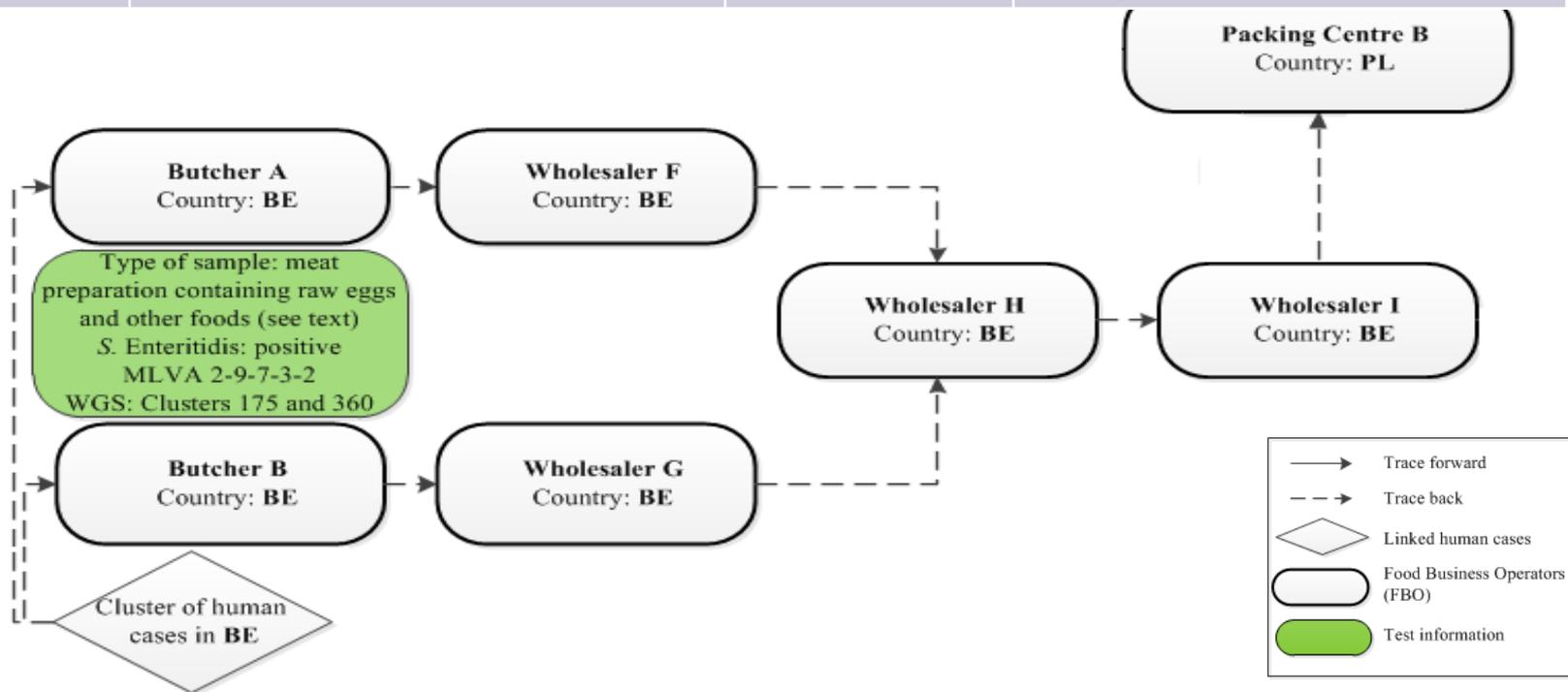




ROA update: **BE** [tracing-back investigation]

At the end of September 2016, the Federal Agency for the Safety of the Food Chain (FASFC) in Belgium investigated **two butchers associated with a cluster of cases**.

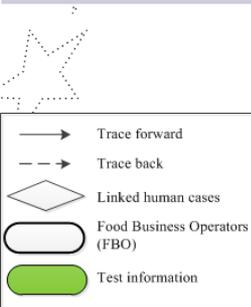
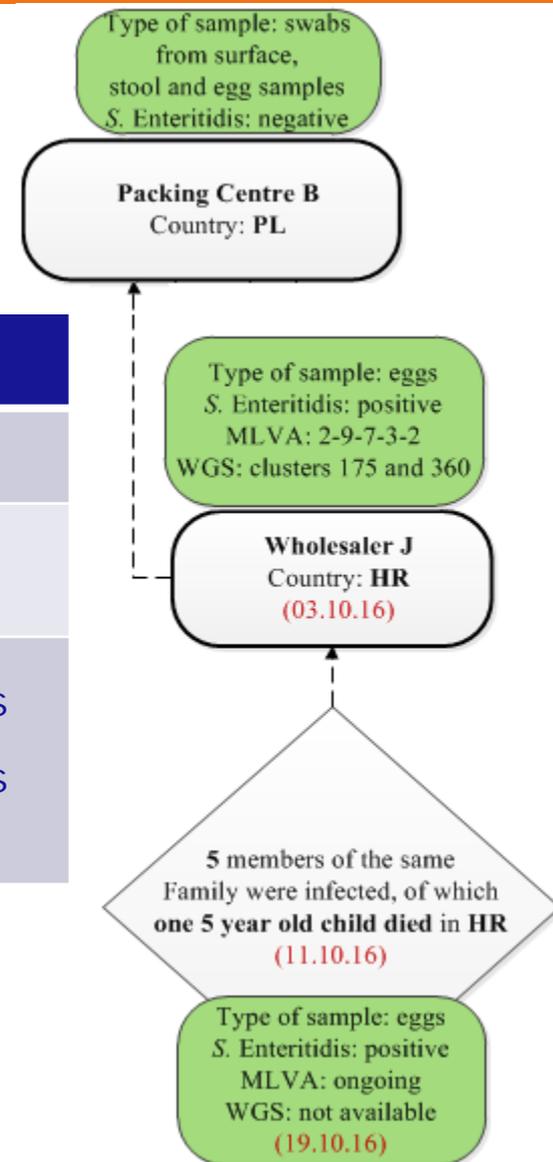
N samples	N pos <i>S. Enteritidis</i>	N isolates WGS	WGS cluster
51 food samples for both butchers	20 positive samples MLVA 2-9-7-3-2 <i>[minced beef/pork (containing eggs), spaghetti sauce (with minced meat), vole au vent (contains raw eggs), pork chop and filet americain (with minced meat)]</i>	6 isolates MLVA 2-9-7-3-2 (successfully performed WGS)	- 4 isolates (from minced beef/pork meat, spaghetti sauce, vol-au-vent, and pork chop) belonged to WGS cluster_175 - 2 isolates (from steak tartare and unspecified meat products) belonged to WGS cluster_360





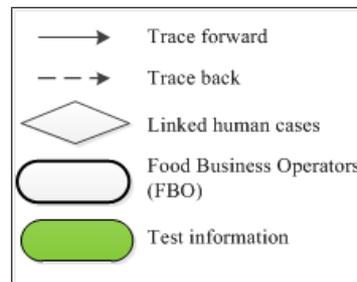
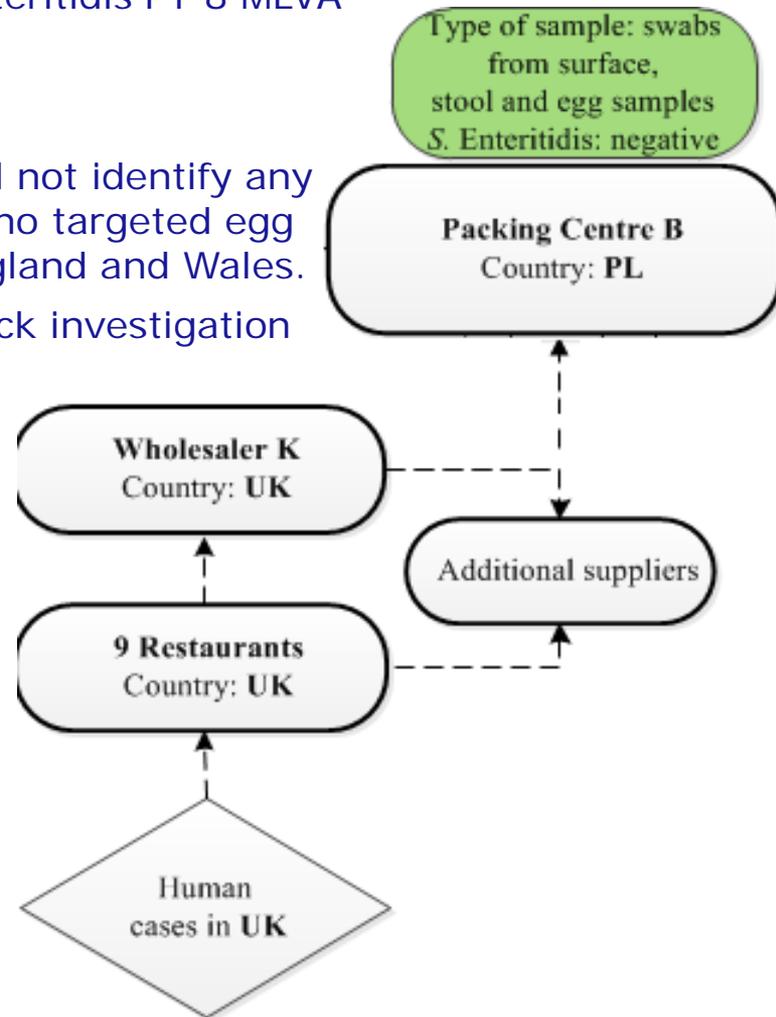
ROA update: **HR** [tracing-back investigation]

Sampling stage	N samples tested	Positive for S.E.	MLVA - WGS
Family house: remaninig eggs	22 eggs (content)	2	Not available
Retail outlet where family bought the eggs	Eggs-shell and content	0	
Wholesaler J	1 070 samples of egg-shell and egg-content analysed in pools of 10	9 pooled samples	9 isolates MLVA 2-9-7-3-2: - 5 isolates belong to WGS cluster_175 - 3 isolates belong to WGS cluster_175 - 1 isolate 'out'



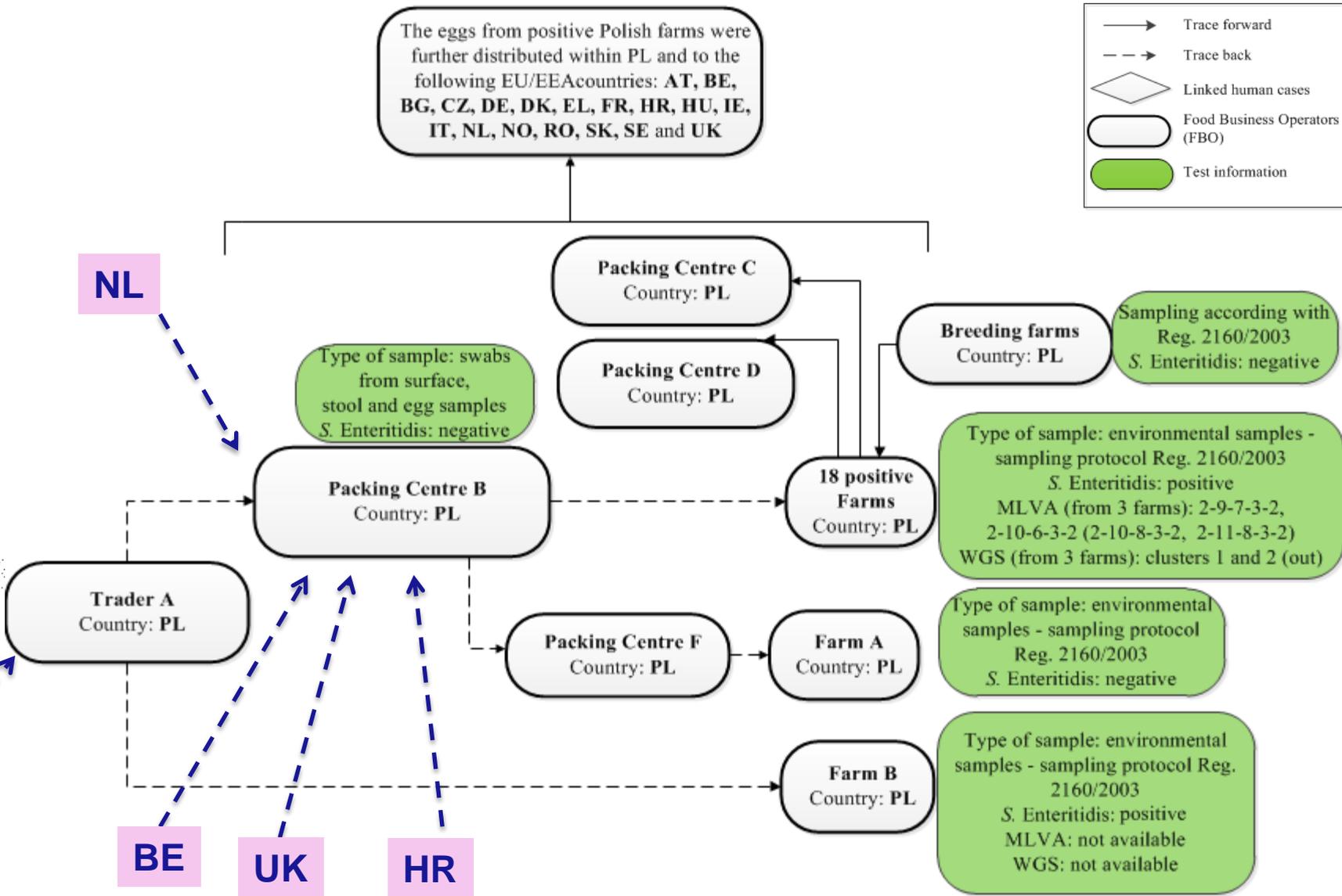
ROA update: **UK** [*tracing-back investigation*]

- ❑ Investigation of a national outbreak of *S. Enteritidis* PT 8 MLVA 2-9-7-3-2 (WGS clusters_175 and 360)
- ❑ Human cases linked to restaurants
- ❑ Interviews of cases in England and Wales did not identify any common exposures or exposure settings so no targeted egg supply investigations were carried out in England and Wales.
- ❑ In **Scotland**: exposure to eggs → tracing back investigation





ROA update: **PL** [food&enviroment investigations]



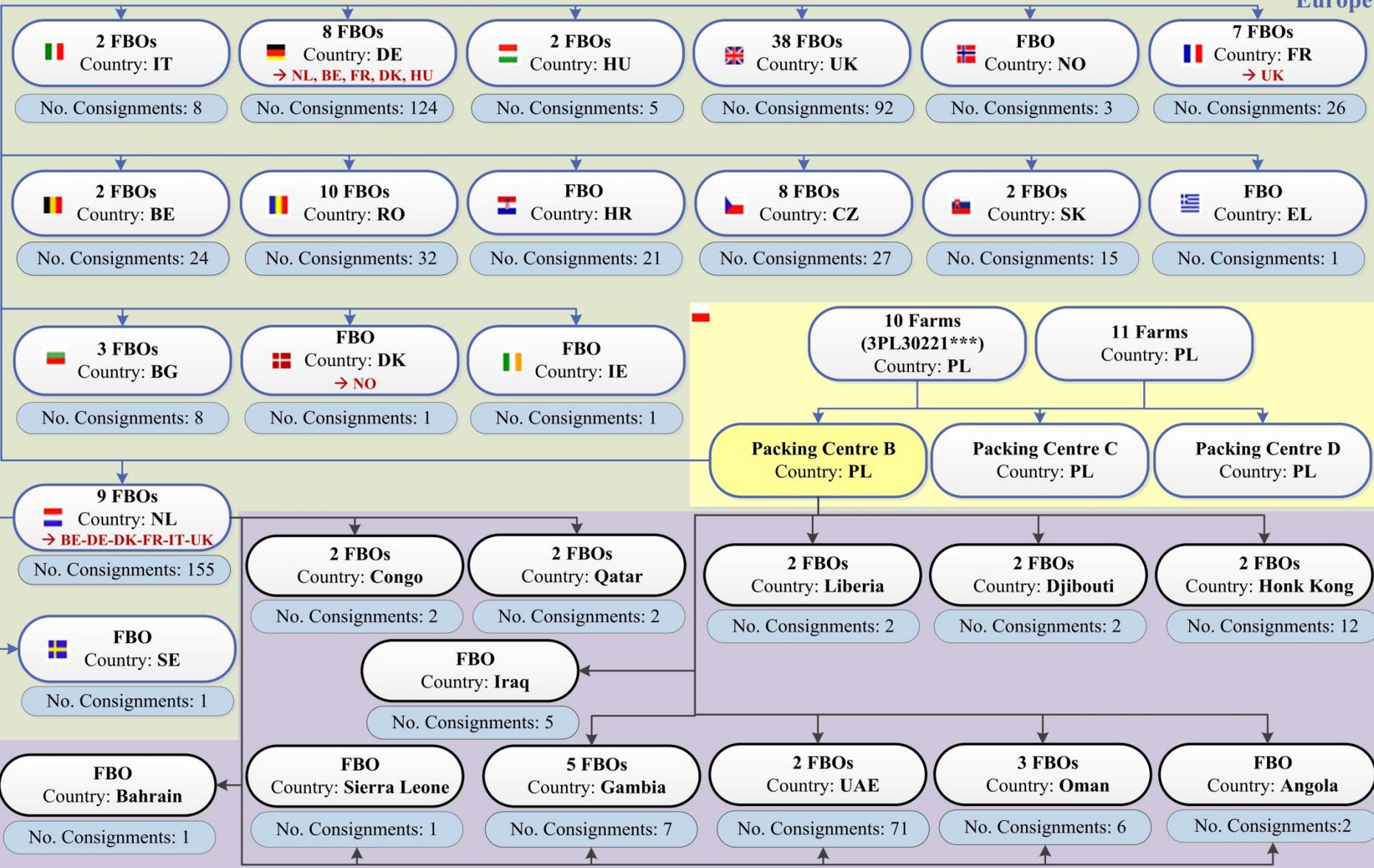


ROA update: **PL** [*tracing-forward investigation*]

- ❑ Contaminated eggs were further distributed to Poland and to the following **EU/EEA 18 countries**: Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Germany, Greece, France, Hungary, Ireland, Italy, the Netherlands, Norway, Romania, Slovakia, Sweden and the United Kingdom
- ❑ Batches of eggs from positive farms were also distributed from Poland to **8 third countries**: Angola, Djibouti, Gambia, Hong Kong, Iraq, Liberia, Oman and United Arab Emirates.



*Trace forward
- withdrawal
RASFF info on 12/12/16*



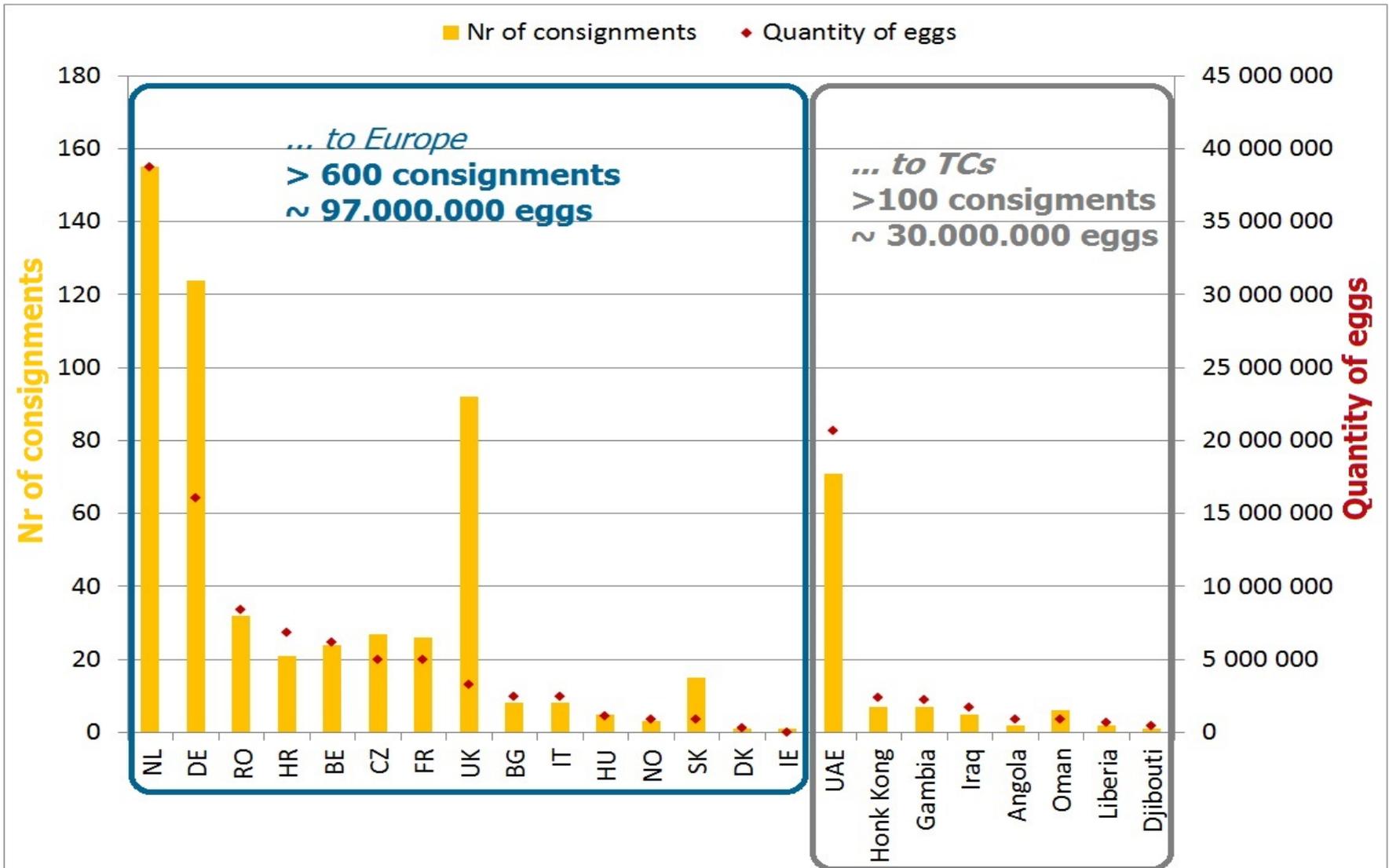
Graphical representation of trace-forward information available in RASFF (12.12.16)

- Trace-forward Europe
- Trace-forward Third Countries
- Re-distribution within Europe
- Food Business Operators
- Estimation of delivered eggs

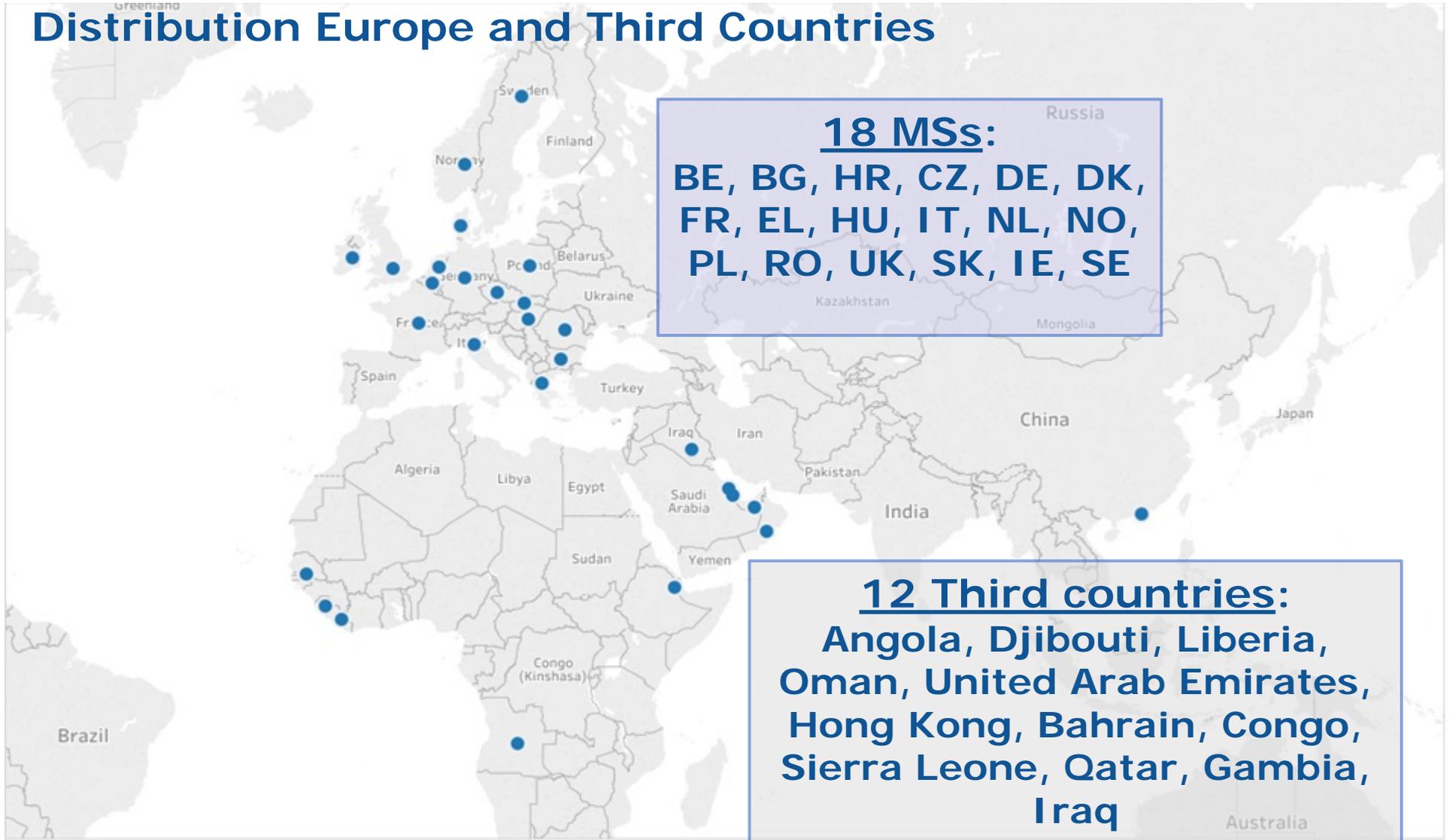
Distribution from PL ...



European Commission



Distribution Europe and Third Countries



18 MSs:
BE, BG, HR, CZ, DE, DK,
FR, EL, HU, IT, NL, NO,
PL, RO, UK, SK, IE, SE

12 Third countries:
Angola, Djibouti, Liberia,
Oman, United Arab Emirates,
Hong Kong, Bahrain, Congo,
Sierra Leone, Qatar, Gambia,
Iraq

ROA Update: threat assessment & conclusions

- ❑ A **multi-country outbreak** of *S. Enteritidis* has been **confirmed by WGS analysis on isolates belonging to MLVA type 2-9-7-3-2 and 2-9-6-3-2**. By WGS, the human isolates split into two distinct genetic clusters WGS cluster_**175** and WGS cluster_**360**.
- ❑ Outbreak still **ongoing** with cases reported since May 2016 by 14 EU/EEA MSs
- ❑ Number of confirmed and probable cases increased steadily from May 2016 to the **first week of October 2016** (peak with 60 new reported cases) → plateau (about 15 cases/week) → decrease from last week of Nov to first week of May (<5cases/week)
 - **Decline in number of cases is encouraging**



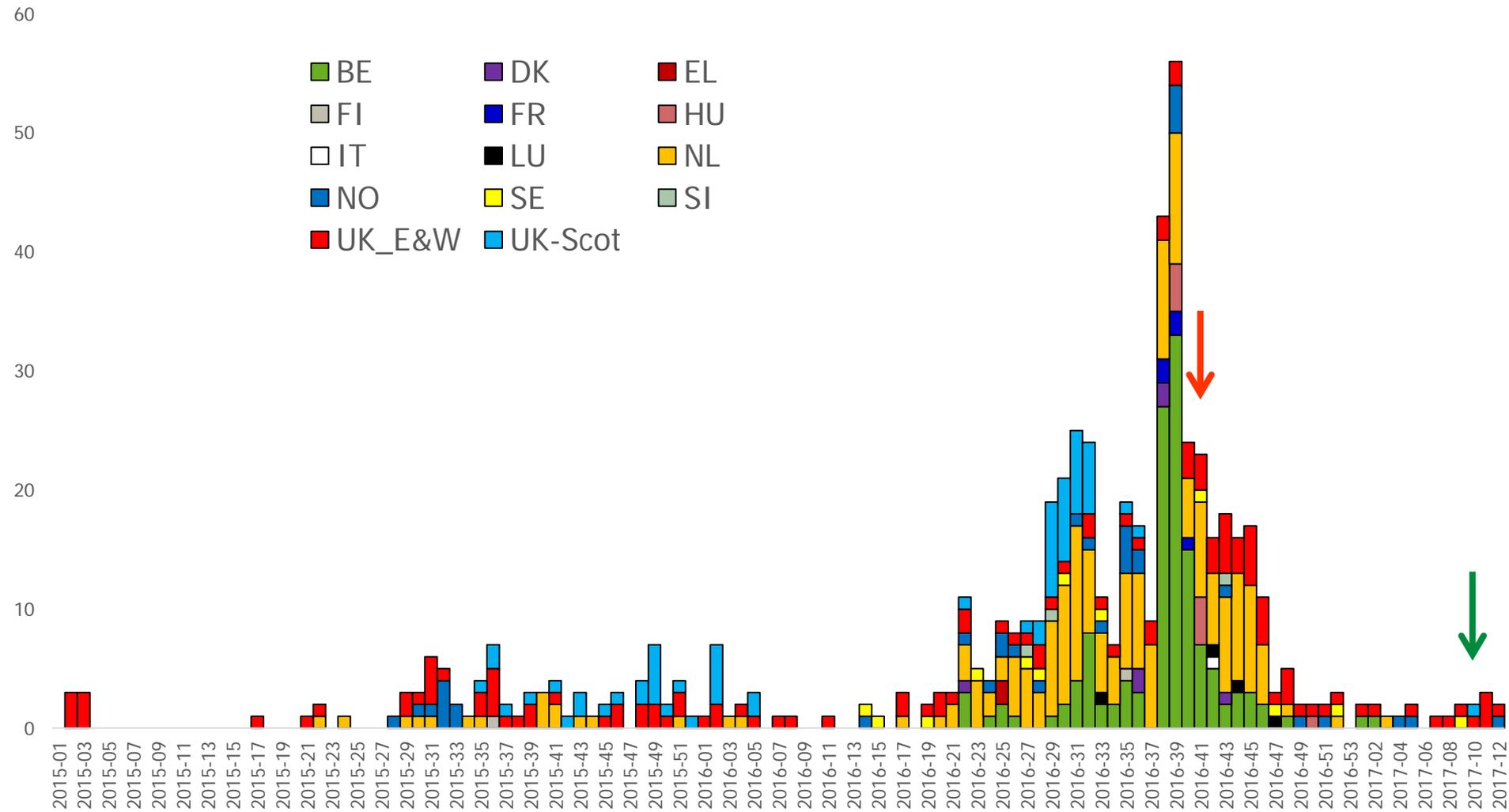
ROA Update: conclusions

- ❑ Available evidence from epidemiological, WGS, environmental and tracing investigations identified **eggs originating from three Polish packing centres** as the vehicle of infection in this outbreak.
 - **18 S. Enteritidis positive farms reported by Poland**
 - According with the information provided by Polish authorities, **no S. Enteritidis positive breeding flocks** was detected in 2016.
 - Based on the assessment of the current evidences, the **source of infection** of this outbreak is very likely to be at **laying hen farm level**

ROA Update: conclusions

- 
- ❑ The outbreak peaked in Oct 2016, when the vehicle of infection was identified & **control measures implemented at farm and distribution level** → *decrease in human cases*
 - ❑ In order to monitor the public health impact of control measures, an **enhanced surveillance period** has been established by the international outbreak investigation team.
 - MS were recommended to perform WGS on any human isolate characterised by the MLVA profile 2-9-7-3-2 or 2-9-6-3-2. All countries identifying new confirmed or probable cases should also consider timely interviewing the new cases
 - ❑ EU/EEA countries should also consider performing **WGS** of non-human isolates when **isolates** are found to have a **link to Polish eggs/farms**

S. Enteritidis 2-9-7-3-2: cases by country, and week of statistics (n=606), EU/EEA 2015-2017, as of 05/05/2017



*Week of onset, or week of sampling or week of received date at reference lab level (five confirmed cases from France missing any date)

Conclusions

- Example of successful multi-sectorial approach and collaboration between public health authorities (follow-up of human cases), food safety authorities (investigations to source), laboratories and risk assessors
- Systems and network in place to manage foodborne outbreaks
- Important role of molecular typing data supported by epidemiological and traceability information
- Strong collaboration between EC, EFSA, ECDC, EURLs at EU level + similar approach observed at national level of countries involved



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Thank you very
much for your
attention!

Questions?