



EFSA activities on the molecular typing data collection from *L. monocytogenes* isolates in animals and food

9th workshop of the NRLs for *Listeria monocytogenes*, 25- 27 March 2015
ANSES Maisons-Alfort, France

MOLECULAR TYPING DATA COLLECTION AT EU LEVEL

- Regular joint analyses of the data by ECDC, EFSA and EURLs – integration at the EU level
 - ❖ ECDC to collect molecular typing data from food-borne pathogens isolated from human cases
 - ❖ EFSA to collect similar data from food, feed and animal isolates, in close collaboration with relevant EURLs
- Ownership of the data according to the vision paper
- The data collection to cover initially:
 - ❖ *Salmonella*, VTEC and *Listeria monocytogenes*
 - ❖ PFGE and MLVA (only for *S. Typhimurium*) methods
- Other methods and pathogens can be taken aboard later on



MOLECULAR TYPING DATA COLLECTION AT EU LEVEL

In particular, EFSA is requested:

1. to develop and manage a database on the isolates from food and animals;
2. to develop a data dictionary with harmonised fields and terminology and update them, when necessary;
3. to allow data uploading from EURL, the respective food/feed NRLs and other official control laboratories;
4. to involve EURLs in the data curation of the incoming molecular testing data and the regular verification of database consistency;
5. to perform regular scientific analyses of the data in collaboration with ECDC and the relevant EURLs.

MOLECULAR TYPING DATA COLLECTION AT EU LEVEL

EFSA has set up a Working Group:

■ Objectives:

- ❖ To define the structure of the data collection system and integration with the human data
- ❖ To guarantee compatible data collection systems for human, food, feed and animal isolates, based on:
 - Common nomenclature
 - Common data dictionaries

■ Experts from:

- ❖ ECDC, EURL *Salmonella*, EURL *Listeria*, EURL *E. coli*, NRLs

■ WG Meetings: 10 meetings held

■ Deliverable:

- ❖ Technical specifications for the pilot



MOLECULAR TYPING DATA COLLECTION AT EU LEVEL

EFSA has launched three procurements for assistance related to establishing molecular typing data collection for isolates from food, feed and animals.

- Objectives:

- ❖ To produce Standard Operating Procedures for molecular testing of *Salmonella*, *Listeria* and VTEC isolates and interpretation of molecular typing data

- Procurements signed with the relevant EURLs:

- ❖ *Salmonella*, *Listeria monocytogenes*, *E. coli*

- Meetings: 4 meetings held

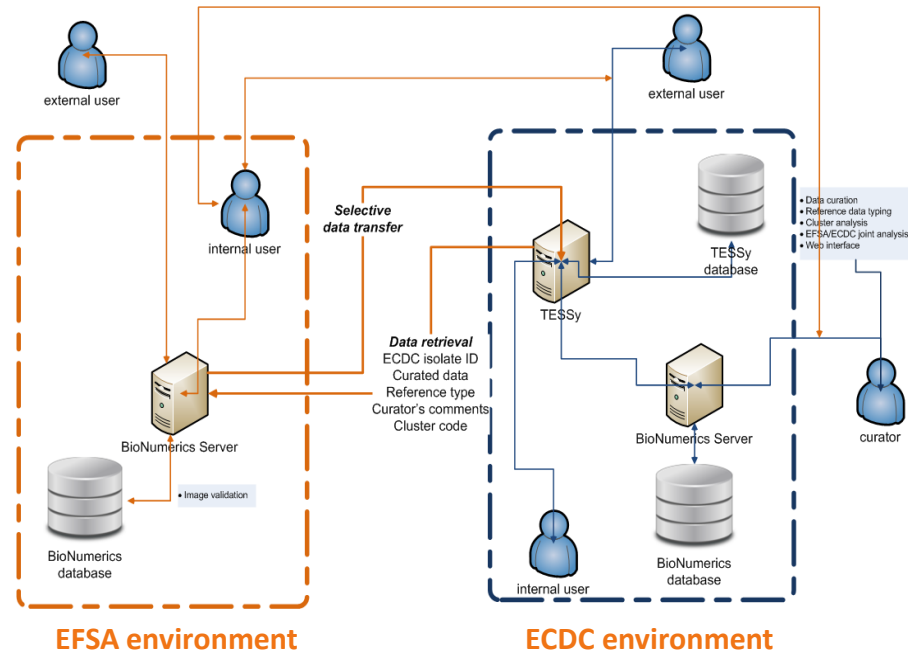
- Deliverable:

- ❖ SOPs for molecular typing data production and interpretation



STRUCTURE OF THE MOLECULAR TYPING SYSTEM

It was agreed to develop a **joint EFSA-ECDC** database hosted by ECDC, where curation of molecular typing data is carried out by the relevant curators.



MOLECULAR TYPING DATA COLLECTION SYSTEM

Users and their roles in the **Joint ECDC-EFSA database**

User	Role for food/feed/ animal data	Role for human data
<i>Users at MS level</i>		
Nominated users for food/veterinary side	Data Provider	-
Nominated users for Public Health side	-	Data Provider
<i>Curators</i>		
EURL	Data Curator / Data analyst	-
ECDC curator	-	Data Curator / Data analyst
<i>European bodies</i>		
EFSA	Data manager/ Data analyst	Data analyst
ECDC	Data analyst	Data manager/ Data analyst

MOLECULAR TYPING DATA COLLECTION SYSTEM

NOTE: Data should be provided at result-based level according to the Standard Sample Description version 2 (SSD2).

Element Code	Section Code	Section	Element Name	Element Label	Type	S/R/C	Controlled terminology	M/O/R
B.04	B	Sampling programme	progType	Programme type	xs:string (5)	S	PRGTYP	M
B.07	B	Sampling programme	sampPoint	Sampling point	xs:string (5)	S	SAMPNT	M
D.01	D	Sample taken	sampId	Sample taken identification code	xs:string (100)	S		M
D.02	D	Sample taken	repCountry	Reporting country	xs:string (2)	S	COUNTRY	M
D.03	D	Sample taken	sampCountry	Country of sampling	xs:string (2)	S	COUNTRY	M
D.05	D	Sample taken	repYear	Reporting year	xs:integer (4)	S		M
D.06	D	Sample taken	sampY	Year of sampling	xs:integer (4)	S		M
E.01	E	Matrix sampled	sampMatType	Type of matrix	xs:string (5)	S	MTXTYP	M
E.02	E	Matrix sampled	sampMatCode	Coded description of the matrix of the sample taken	CompoundType	C	MTX	M
F.03	F	Sample analysed	analysisY	Year of analysis	xs:integer (4)	S		M
I.01	I	Isolate	isoldId	Isolate identification	xs:string (100)	S		M

MOLECULAR TYPING DATA COLLECTION SYSTEM



Controlled terminologies (catalogues) are available for specific data elements.

EXAMPLE:

A02MH Milk from other animal species or unspecified

A02LV Milk, cows'

A02LV#F28.A07HV Milk, cows' - pasteurised milk

A02LV#F28.A07HS Milk, cows' - raw milk

A02LV#F24.A07VR\$F28.A07HS Milk, cows' - raw milk - for direct human consumption

A02LV#F28.A07HY Milk, cows' - UHT milk

A02MB Milk, goats'

A02MB#F28.A07HV Milk, goats' - pasteurised milk

A02MB#F28.A07HS Milk, goats' - raw milk

A02MB#F24.A07VR\$F28.A07HS Milk, goats' - raw milk - for direct human consumption

A02MB#F28.A07HY Milk, goats' - UHT milk

A02MF Milk, mares'

A02MC Milk, sheep's

A02MC#F28.A07HV Milk, sheep's - pasteurised milk

A02MC#F28.A07HS Milk, sheep's - raw milk

A02MC#F24.A07VR\$F28.A07HS Milk, sheep's - raw milk -for direct human consumption

A02MC#F28.A07HY Milk, sheep's - UHT milk

MOLECULAR TYPING DATA COLLECTION SYSTEM

- ***Data providers shall guarantee the uniqueness of the identifiers for each submitted PFGE image, result, isolate, sample taken at the national level.***
- *The responsibility to guarantee uniqueness is completely on MS side and each country can freely adopt any approach to coordinate laboratories/ data providers in order to satisfy the requirement of having unique ids.*



MOLECULAR TYPING DATA COLLECTION SYSTEM

- Ideally, **all data should be sent to and stored in the joint database** to support a rapid investigation and response in case of outbreaks.
- But to guarantee data confidentiality, only a minimum set of the data stored in the EFSA database will be sent to ECDC for storage in the joint EFSA-ECDC database.



MOLECULAR TYPING DATA COLLECTION SYSTEM

Data stored in the joint database

- All human data collected through TESSy.
- A limited set of data on food, feed and animal samples deriving from the EFSA's molecular typing database, in particular:
 - ❖ all microbiological results, including molecular typing data;
 - ❖ a subset of epidemiological data (these data are considered partly sensitive). It includes:
 - ✓ *'EFSA Isolate ID'*
 - ✓ *'Country of sampling'*
 - ✓ *'Date of sampling'*
 - ✓ *'Laboratory identification code'*
 - ✓ *'Type of sample'*



MOLECULAR TYPING DATA COLLECTION SYSTEM

Accessibility to the joint database

The visibility of data in joint EFSA-ECDC database depends on the type of data and the users.







Use of data

In line with the orientations provided in the Vision paper, a Collaboration Agreement is under development to be signed by all parties to define data ownership, access, use, publication, procedures and confidentiality.

‘Data owners are always consulted for their permission before any written or oral publication and/or communication of the data which have not yet been published’

MOLECULAR TYPING DATA COLLECTION SYSTEM

Example: Visibility of data for the French Food Safety/ Veterinary Competent Authority/ Official Control Laboratories

EFSA ID	EPIDEMIOLOGICAL DATA (PARTLY SENSITIVE)				TYPING DATA (NOT SENSITIVE BY ITSELF)		
	Country of sampling	Laboratory identification code	Sample type	Date of Sampling	Serotype	PFGE_XbaI	AST_NAL
EFSA-001	FR	FR01	Food	2014-06-01	STANLEY		S
EFSA-002	Not visible	Not visible	Food	2015-02-10	DUBLIN		R
EFSA-003	Not visible	Not visible	Food	2014-12-20	ENTERITIS		S
n.a.	FR	FR200	Human	2014-07-01	STANLEY		R
n.a.	Not visible	Not visible	Human	2015-01-23	HADAR		S
n.a.	Not visible	Not visible	Human	2015-01-23	HADAR		SR

Isolate from IE

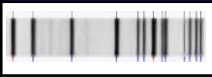
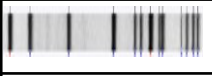
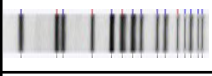
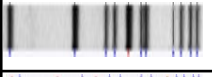
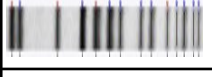
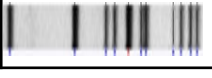
Isolate from IT

Isolate from SE

Isolate from UK

MOLECULAR TYPING DATA COLLECTION SYSTEM

Example: Visibility of data for the **French** Food Safety/ Veterinary Competent Authority/ Official Control Laboratories

EFSA ID	EPIDEMIOLOGICAL DATA (PARTLY SENSITIVE)				TYPING DATA (NOT SENSITIVE BY ITSELF)		
	Country of sampling	Laboratory identification code	Sample type	Date of Sampling	Serotype	PFGE_XbaI	AST_NAL
EFSA-001	FR	FR01	Food	2014-06-01	STANLEY		S
EFSA-002	Not visible	Not visible	Food	2015-02-10	DUBLIN		R
EFSA-003	Not visible	Not visible	Food	2014-12-20	ENTERITIS		S
n.a.	FR	FR200	Human	2014-07-01	STANLEY		R
n.a.	SE	SE09	Human	2015-01-23	HADAR		S
n.a.	UK	SE10	Human	2015-01-23	HADAR		SR

Isolate from IE

Isolate from IT

Isolate from SE

Isolate from UK

For the **French** Public Health Competent Authority/ Official Control Laboratories: the accessibility is the same, except for human data (all accessible)

ACHIEVEMENTS

Outputs/activities finalised in 2014

- Publication of the **EFSA Technical report** on technical specifications for the pilot phase.
- Publication of the **External Scientific Reports** on SOPs for molecular typing data production and interpretation for *Salmonella*, VTEC and *Listeria monocytogenes*.
- **Launch of the data collection** on molecular typing data (on-going the involvement of laboratories)
- **Training on BioNumerics** of **EFSA staff** in order:
 - ❖ to support data providers,
 - ❖ to support scientific analysis of data.



ON-GOING ACTIVITIES

Collaboration agreement

- The document on *'the management of data on molecular testing of food, feed and animal isolates of selected food-borne pathogens and their use together with molecular typing data on isolates from human infections'*
- It covers aspects related to data ownership, availability, access, use, publication and confidentiality (as requested in the Vision paper attached to the mandate from EC)
- The implementation of this agreement will be supervised by a Steering Committee
- Parties of the agreement:
 - ❖ EFSA, ECDC, EURL *Salmonella*, EURL *L. monocytogenes*, EURL *E. coli*
- Under consultation at level of Legal Unit of the Parties

ON-GOING ACTIVITIES

Joint EFSA-ECDC Steering Committee



■ ToR:

- ❖ Development of standard operating procedures for data analyses
- ❖ Monitoring of the pilot
- ❖ Identification of needs for revision of the data collection system
- ❖ Evaluation of the whole pilot phase
- ❖ Communication on the pilot activities

■ Members:

- ❖ EFSA, ECDC, EURLs, ECDC's curator (EC as an observer)
- Two web-conferences held (15 January and 6 March 2015)
 - Next meeting: in May

ON-GOING ACTIVITIES

Execution of the pilot

- Coordination with and support to participant Laboratories:
 - ❖ Fine-tuning of the client plug-in
 - ❖ Configuration of the DB at Data Provider level (to be compliant with the SSD2 data model defined in the pilot report)
- Testing of the connection with ECDC



Final system preparation

- Analysis of the integration of the pilot system with DCF
- Definition of requirements and development of the final architecture of the Data Collection System

ON-GOING ACTIVITIES AND NEXT STEPS

Communication activities

- Participation to the PAFF meeting to present the collaboration agreement to MSs and the whole project:
 - ❖ MSs will be requested to nominate experts to participate to the Specific WG meeting on Molecular Typing.
- Specific WG meeting on Molecular Typing organised by EC to promote the pilot.



PROCUREMENT ACTIVITIES

- **October 2014 – October 2016:** Procurement activity

‘Closing data gaps for performing risk assessment on *Listeria monocytogenes* in ready-to-eat foods’.

Activity 3: **Molecular characterisation employing Whole Genome Sequencing (WGS) of strains from different compartments along the food chain, and in humans.**

- **Call for proposals by 30 April 2015:** New grants

Molecular approaches for identifying and characterising microbial foodborne pathogens, specifically using whole genome sequence (WGS) analysis

- <http://www.efsa.europa.eu/en/press/news/141112.htm>
- <http://www.efsa.europa.eu/en/art36grants/article36/gpefsaafSCO201501.htm>

OTHER ON-GOING EFSA ACTIVITIES

- **16-17 June 2014: EFSA Scientific Colloquium on Whole Genome Sequencing (WGS) of food-borne pathogens and its application for public health protection.**
 - Summary report published on 16 February 2015
 - <http://www.efsa.europa.eu/en/supporting/pub/743e.htm>

EFSA Scientific Colloquium
Summary Report

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USE OF WHOLE GENOME SEQUENCING (WGS) OF FOOD-BORNE PATHOGENS FOR PUBLIC HEALTH PROTECTION

16-17 June 2014, Parma, Italy



THANK YOU !!!



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Transparency**

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