

Committed *since 2002*
to ensuring that Europe's food is safe



Punto di vista dell'EFSA e raccolta dati

Elena Mazzolini

Unit on Biological Monitoring (BIOMO)

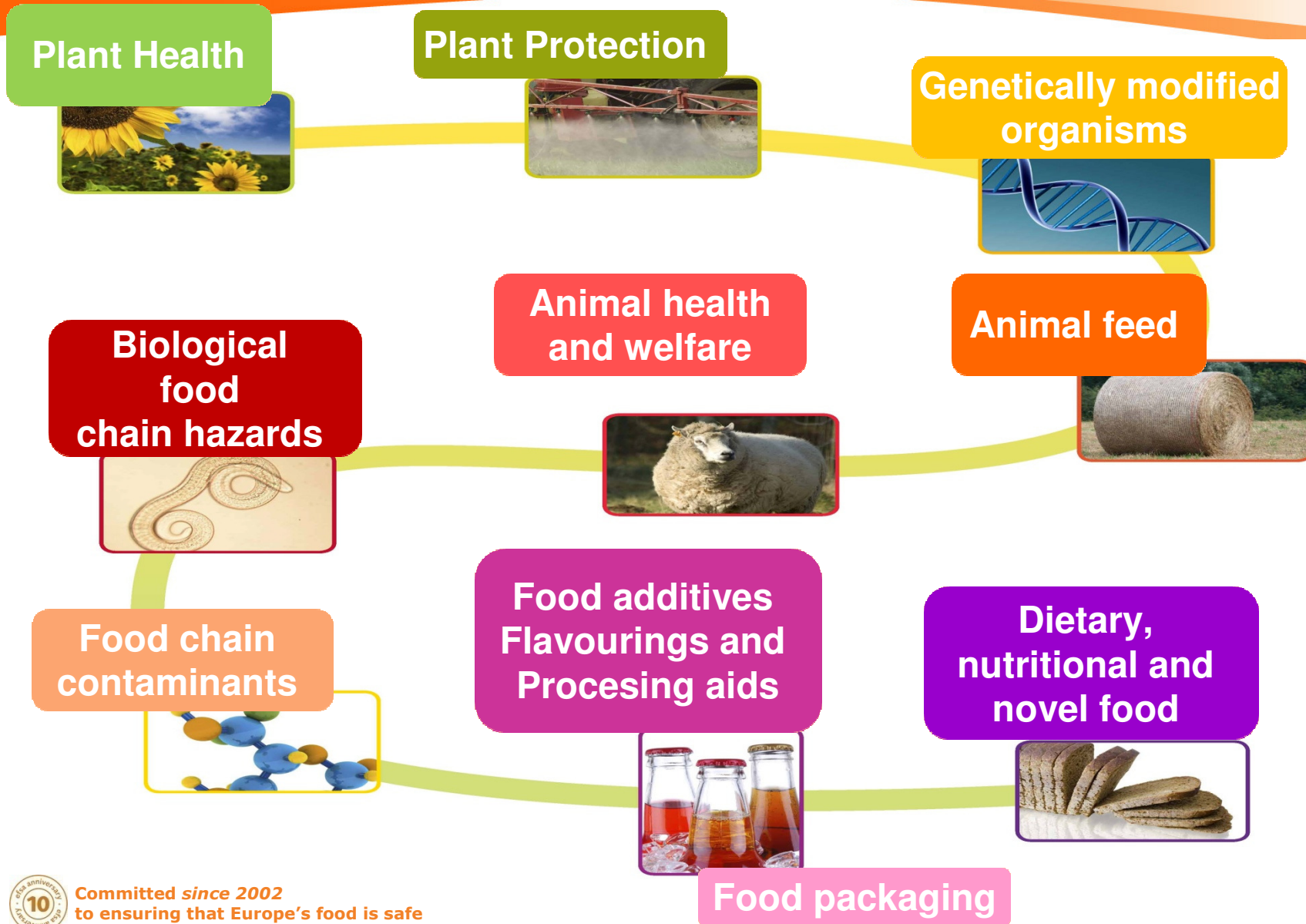
Corso di formazione 'gestione per il contenimento ed il controllo delle malattie trasmesse da alimenti (MTA)'
Ministero della Salute, Roma 28-28 Maggio, 2013

10 years of EU food safety system

- Europeans enjoy **one of the highest levels of food safety** in the world
- **Continued commitment, co-operation and innovation** of EU institutions and its independent agencies
- For 10 years, **EFSA has underpinned the EU's decisions on food and feed safety, animal health & welfare, nutrition and plant health**



Scientific advice from farm to fork



Working together, working for Europe

- 30 national food safety agencies
- 300 research institutes
- Over 1500 experts

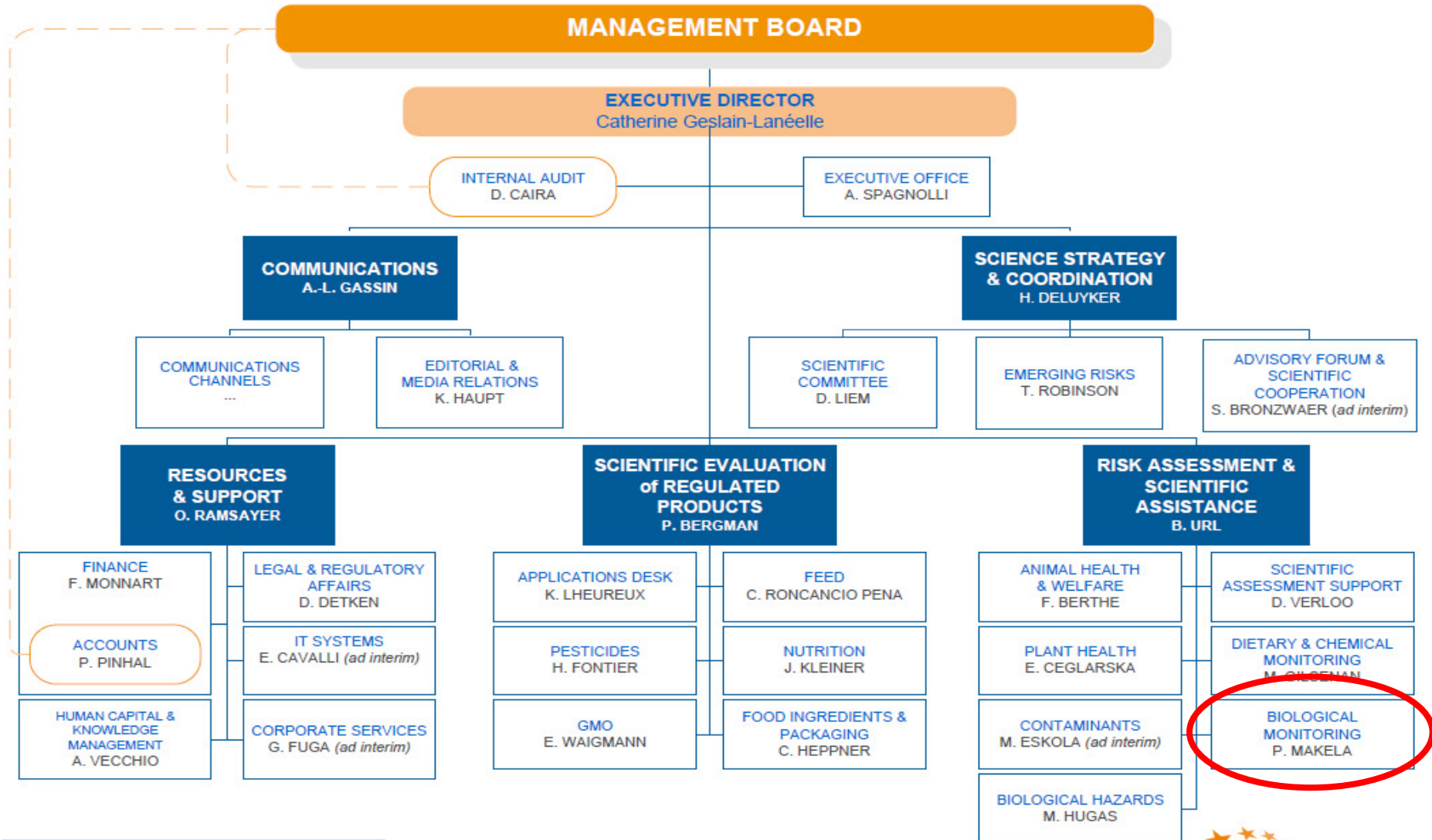


- EU Agencies
- Third country organisations



Committed since 2002
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EFSA's organisational structure



- **Data collection in BIOMO**
 - **annual collection of zoonoses data**
 - legislation 2003/99/EC
 - Network of data collection and analysis
 - Harmonisation of data collection
 - IT tools for collect data
 - **Baseline surveys data**
- **Results**
 - Zoonoses
 - FBO
 - AMR
- **What's cooking in BIOMO?**
 - animal/sample/isolate based data collection (SSD2)
 - Collection of sub-typed isolates
 - DWA

Why: legislation 2003/99/EC

12.12.2003 EN Official Journal of the European Union

DIRECTIVE 2003/99/EC OF THE EUROPEAN PARLIAM AND OF THE COUNCIL of 17 November 2003 on the monitoring of zoonoses and zoonotic agents, amending Council Directive 92/117/EEC

The 2003/99/EC Directive lays down:

- the annual data reporting of Member States
- 1. Obligatory for *Salmonella* and *Campylobacter* (+ antimicrobial resistance), *Listeria monocytogenes*, *Brucella*, tuberculosis due to *Mycobacterium bovis*, *Verotoxigenic Escherichia coli*, *Trichinella*, *Echinococcus*
- 2. based on the epidemiological situation in the Member State for other zoonoses
- The harmonisation of monitoring
- The *ad hoc* data collection → baseline surveys
- The role of EFSA in data analysis at EU level and results dissemination (two EU Summary Reports)

12.12.2003 EN Official Journal of the European Union L 325/31

DIRECTIVE 2003/99/EC OF THE EUROPEAN PARLIAM AND OF THE COUNCIL of 17 November 2003 on the monitoring of zoonoses and zoonotic agents, amending Council Decision 90/424/EEC and repealing Council Directive 92/117/EEC

THE EUROPEAN PARLIAM AND THE COUNCIL OF THE EUROPEAN UNION

Having regard to the Treaty establishing the European Community, and in particular Article 152(4)(b) thereof,

Having regard to the proposal from the Commission ⁽¹⁾,

Having regard to the opinion of the European Economic and Social Committee ⁽²⁾,

After consulting the Committee of the Regions

Acting in accordance with the procedure laid down in Article 251 of the Treaty ⁽³⁾,

Whereas:

(1) Live animals and food of animal origin appear on the list in Annex 1 to the Treaty. Livestock farming and the holding on the market of food of animal origin constitute important economic activities in the Community. The implementation of veterinary measures aimed at raising the level of public and animal health in the Community is essential for the attainment of the objectives of the Treaty.

(2) The protection of human health against diseases and infectious transmissible directly or indirectly between animals and humans (zoonoses) is of paramount importance.

(3) Zoonoses transmissible through food may cause human suffering, as well as economic losses to food production and the food industry.

(4) Zoonoses transmitted through sources other than food, especially from wild animal and pet animal populations, also pose a matter of concern.

(5) Council Directive 92/117/EEC of 17 December 1992 concerning measures to restrict the use of food of animal origin and specific foodstuffs, to limit the use of the products of animal origin in order to prevent outbreaks of food-borne infections and intoxications ⁽⁴⁾ provided for the establishment of a monitoring system for certain zoonoses both at the level of Member States and at Community level.

(6) With the assistance of the Community reference laboratory for the epidemiology of zoonoses, the Commission collects the results of monitoring yearly from Member States and compiles them. Publication of the results has taken place yearly since 1995. They provide a basis for the evaluation of the current situation concerning zoonoses and zoonotic agents. However, the data collection systems are not harmonised and therefore do not permit comparisons between Member States.

(7) Other Community legislation provides for the monitoring and control of certain zoonoses in animal populations. In particular, Council Directive 64/432/EEC of 26 June 1964 on animal health problems affecting intra-Community trade in bovine animals and swine ⁽⁵⁾ deals with bovine tuberculosis and bovine brucellosis. Council Directive 91/68/EEC of 28 January 1991 on animal health conditions governing intra-Community trade in ovine and caprine animals ⁽⁶⁾ deals with ovine and caprine brucellosis. This Directive should not create any unnecessary duplication of those existing requirements.

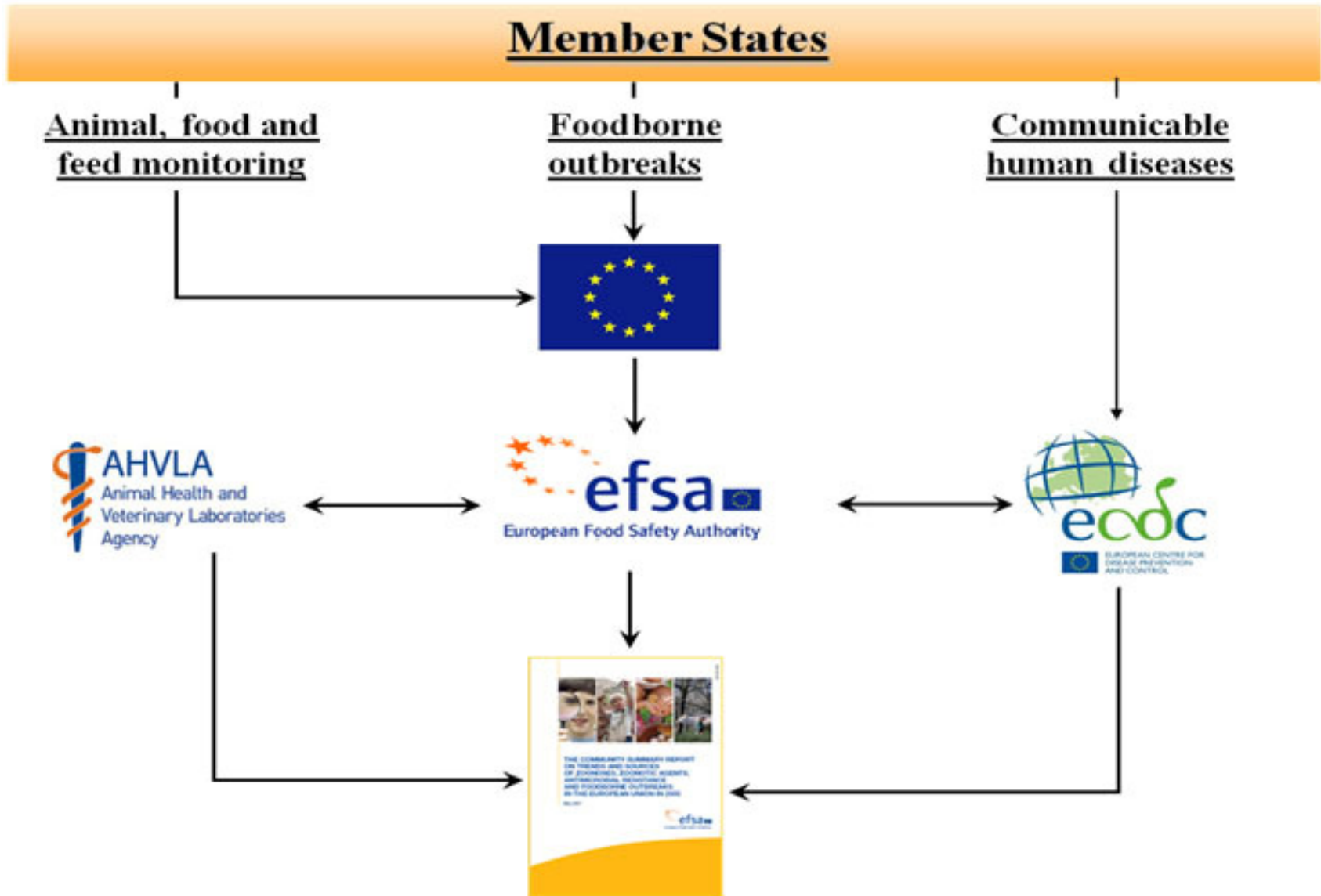
(8) Moreover, a future regulation of the European Parliament and of the Council on the hygiene of foodstuffs should cover specific elements necessary for prevention, control and monitoring of zoonoses and zoonotic agents and include specific requirements for the microbiological quality of food.

(9) Directive 92/117/EEC provides for collection of data on human cases of zoonoses. The aim of Decision No 2119/98/EC of the European Parliament and of the Council of 24 September 1998 setting up a network for the epidemiological surveillance and control of communicable diseases in the Community ⁽⁷⁾ is to reinforce the collection of such data and to contribute to improving the prevention and control in the Community, of communicable diseases.

(10) The collection of data on the occurrence of zoonoses and zoonotic agents in animals, food, feed and humans is necessary to determine the trends and sources of zoonoses.

⁽¹⁾ OJ C 304 E, 30.10.2001, p. 250.
⁽²⁾ OJ C 94, 18.4.2002, p. 18.
⁽³⁾ Opinion of the European Parliament of 15 May 2002 (OJ C 180 E, 31.7.2003, p. 161), Council common position of 20 February 2003 (OJ C 90 E, 15.4.2003, p. 9) and position of the European Parliament of 19 June 2003 (not yet published in the Official Journal).
⁽⁴⁾ OJ L 62, 15.3.1993, p. 38. Directive as last amended by Regulation (EC) No 804/2003 (OJ L 122, 16.5.2003, p. 1).
⁽⁵⁾ OJ L 21, 29.7.1964, p. 1977. Directive as last amended by Commission Regulation (EC) No 1226/2002 (OJ L 179, 9.7.2002, p. 13).
⁽⁶⁾ OJ L 46, 19.2.1991, p. 19. Directive as last amended by Commission Decision 2003/708/EC (OJ L 258, 10.10.2003, p. 11).
⁽⁷⁾ OJ L 268, 3.10.1998, p. 1.

2003/99/EC annual data reporting, analysis and results dissemination scheme in EU

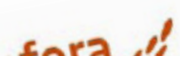


Salmonella, tuberculosis and brucellosis are harmonised by EU legislation

EFSA's manuals and guidelines to harmonise monitoring and reporting of other zoonoses to improve the data comparability of

- ✓ **Antimicrobial resistance in *Salmonella*, *Campylobacter*, commensal *E. coli* and *Enterococci* in animals**
- ✓ **VTEC in animals and food**
- ✓ **Yersinia in animals**
- ✓ **Parasites in food/animals**
- ✓ **Rabies and Q fever in animals**
- ✓ **Survey methods for food-borne pathogens in foods**
- ✓ **Vector-borne zoonoses**

Harmonisation of data collection



Developme



Supporting Publications 2013:EN-410

TECHNICAL REPORT

Manual for reporting of food-borne outbreaks in accordance with Directive 2003/99/EC from the year 2012¹

Food Safety Authority

Supporting Pub



TECHNICAL REPORT

User Manual for Reporting Officers and Reporters
Supporting Member State Standard Terminology to EFSA Standard Terminology
European Food Safety Authority¹

European Food Safety Authority (EFSA)

Supporting Publications 2012:E



TECHNICAL REPORT

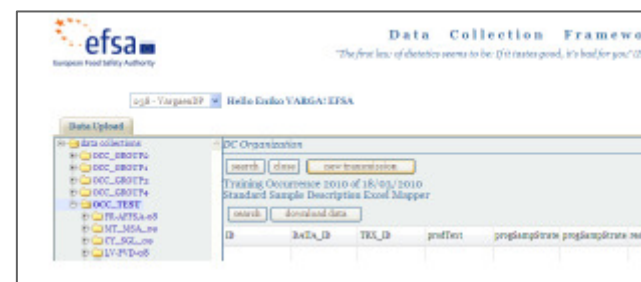
Data dictionaries/guidelines for reporting data on zoonotic
resistance and food-borne outbreaks using the EFSA Data
Collection Framework (DCF) in the Reporting Framework
European Food Safety Authority²

Authority (EFSA), Paris

IT tools for data collection and storage in EFSA

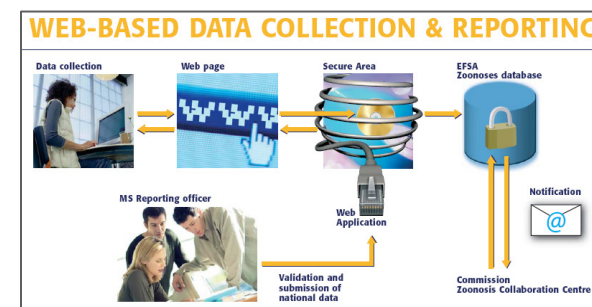
Data are currently collected by:

- A web interface for data reporting, based on manual entering of aggregated data
- DCF (data collection framework) a web based interface for file transmission of aggregated and single records (animal/food/isolate) of data

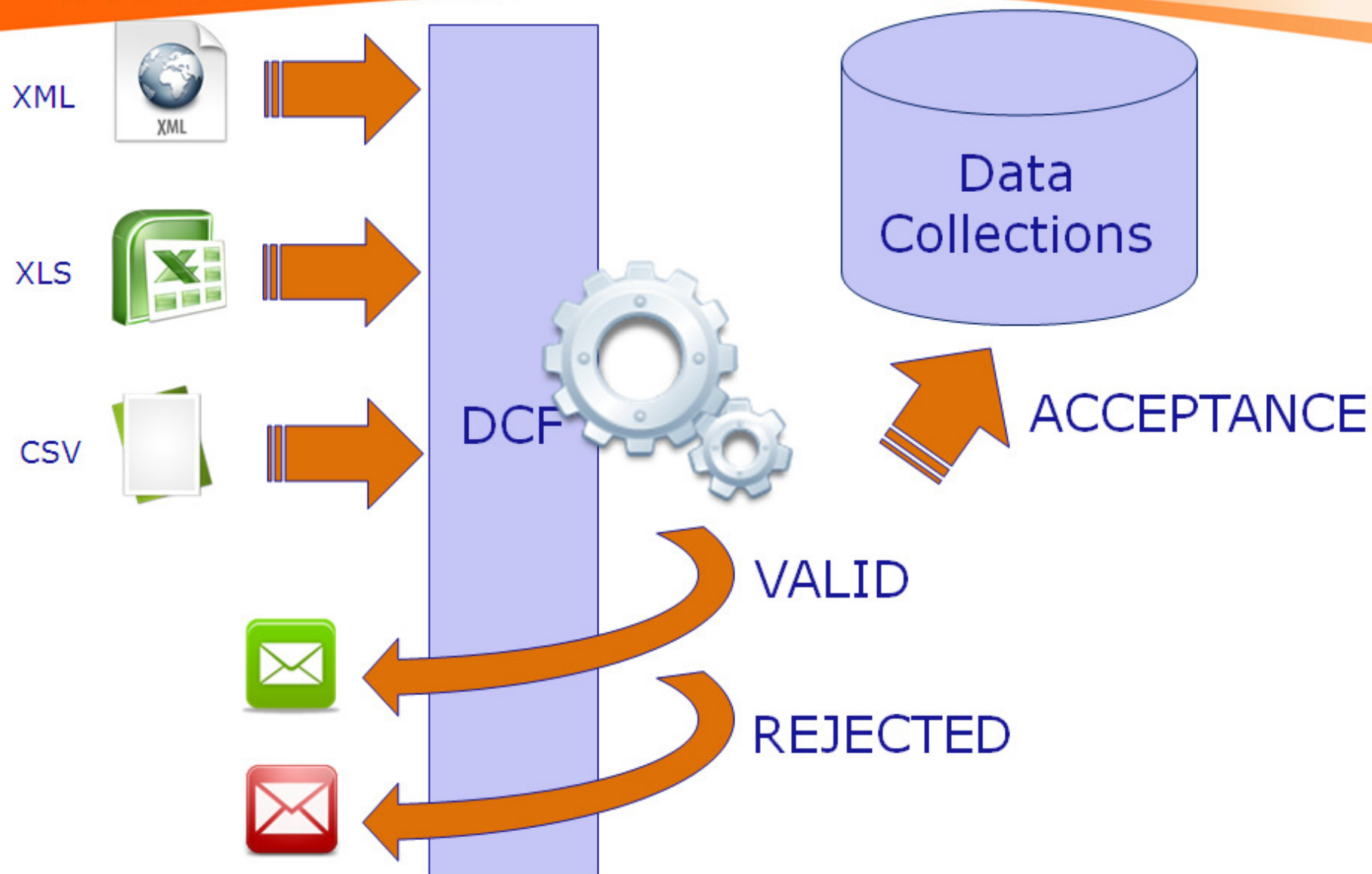


...after validation data are stored in

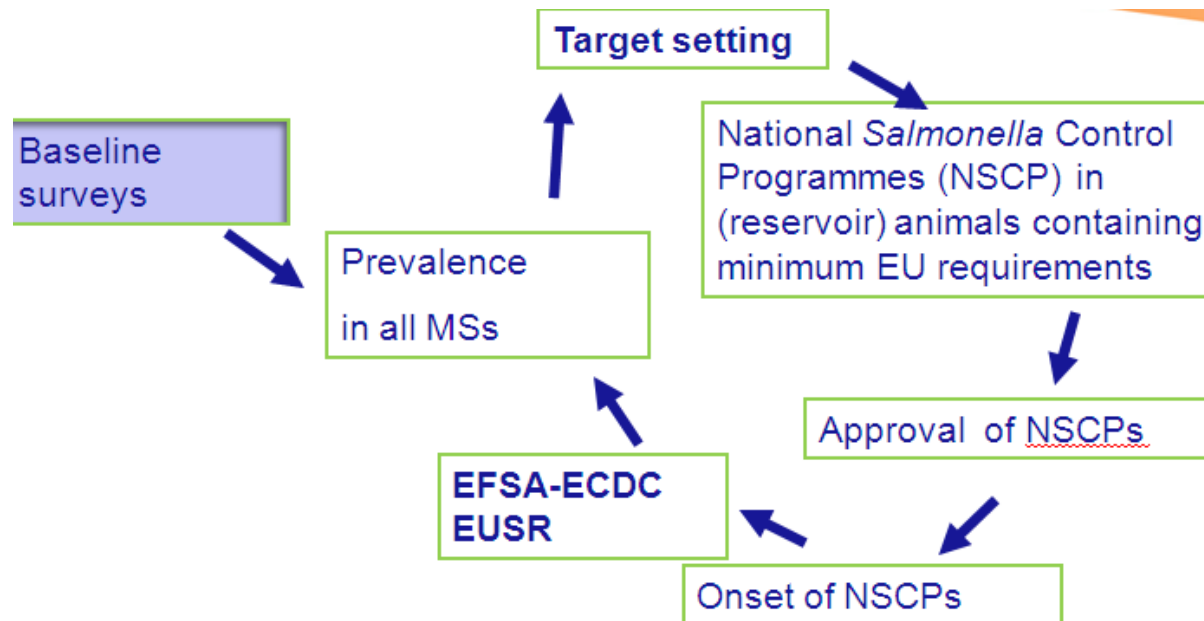
- Zoonoses database
- EFSA's Data Warehouse



Data Flow by Data Collection Framework (DCF)



baseline surveys: the first step to start a virtuous circle for *Salmonella* control programs



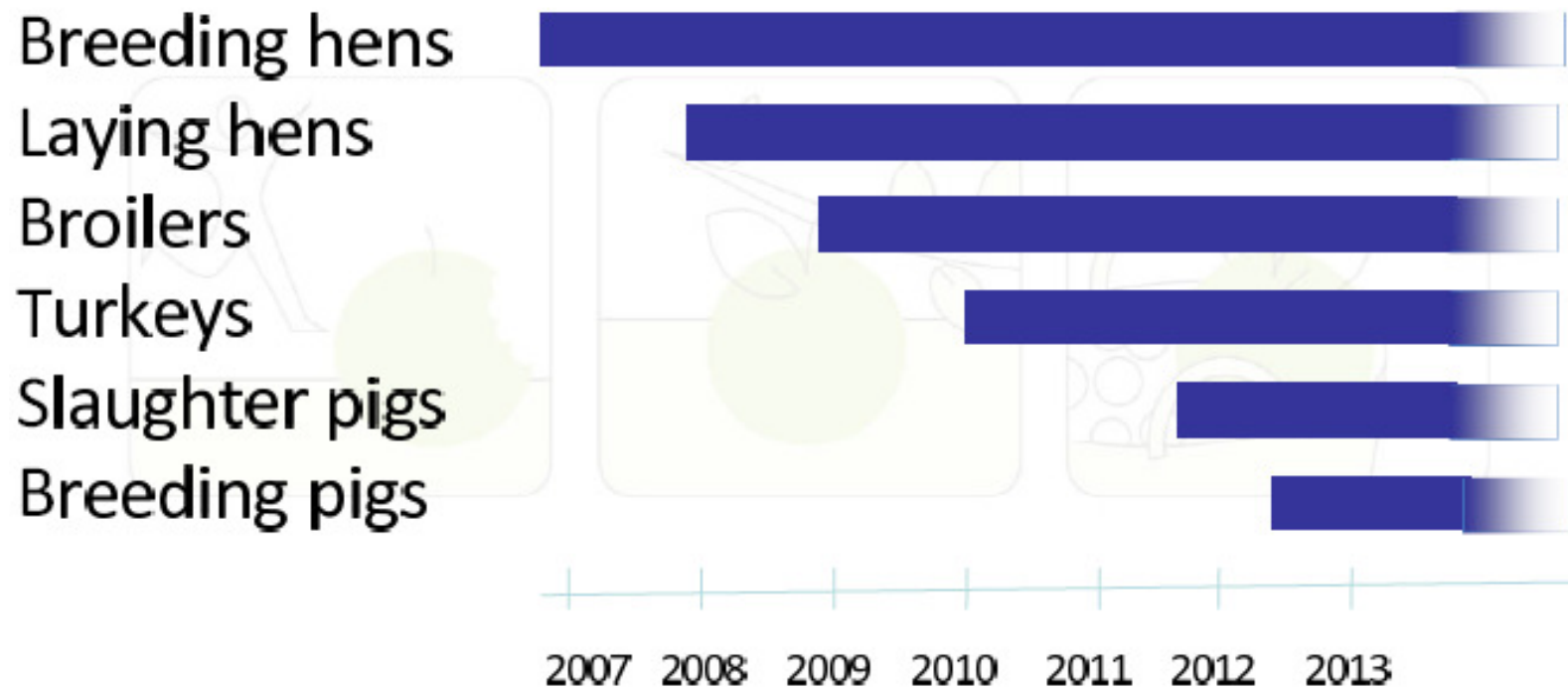
baseline survey data:

- Data collection and validation at EU Commission level (DG Sanco)
- Data analysis at EFSA's level

EU *Salmonella* targets and harmonized monitoring

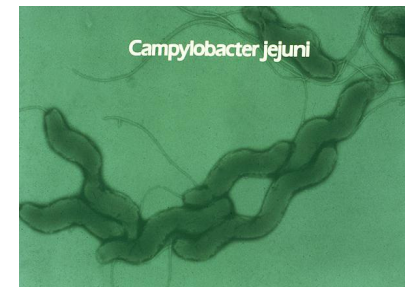
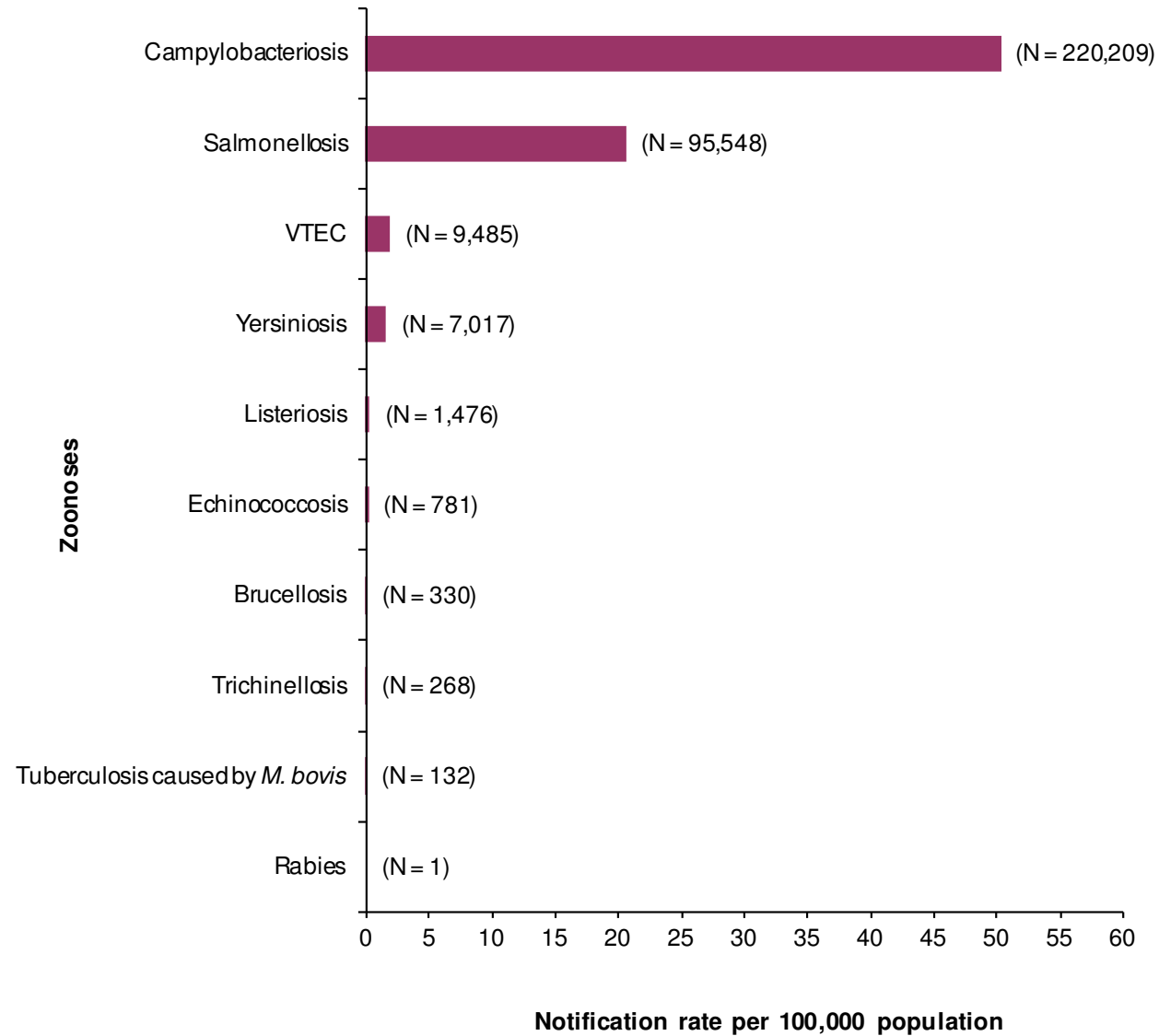


EU *Salmonella* control programmes



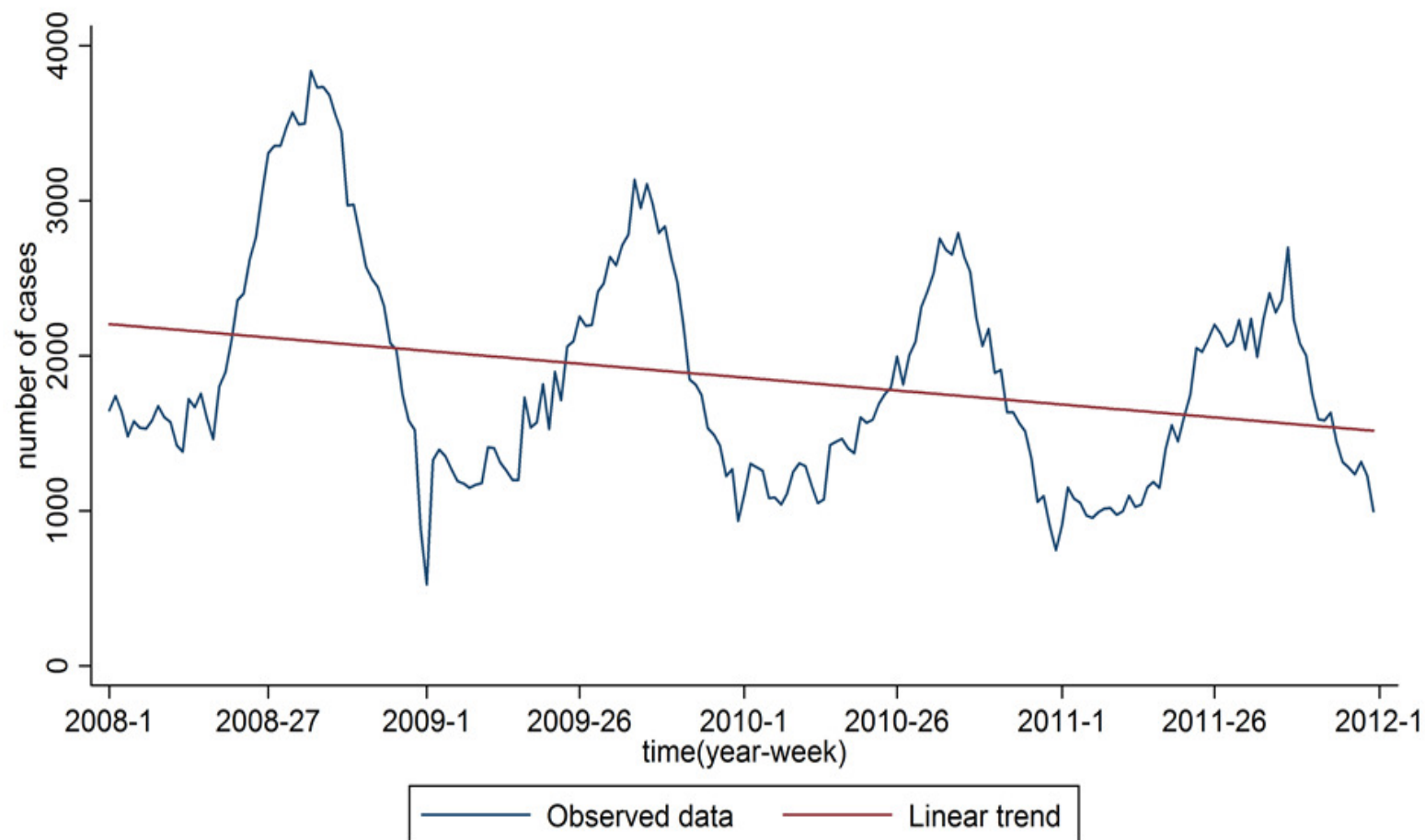
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Human zoonoses cases and notification rates, EU, 2011



Human *Salmonella* cases in EU, 2008-2011

Significant decreasing trend in human cases



Why salmonellosis cases decreased?

source attribution studies:

1st approach: **human single cases** → to food → to food producing animals
by following **sub-typed** zoonotic agents

2nd approach: **Foodborne outbreaks** → to food → to food producing animals
by following the animal species producing the **ingredients** of implicated food

1st approach - Source attribution based on microbial subtyping, EU-level

Proportion of human cases attributed to food-animal sources in EU:

	%	95% CI
Broilers	3.4	[3.1, 3.7]
Pigs	26.9	[26.3, 27.6]
Turkeys	4.0	[3.8, 4.3]
Layers	43.8	[43.2, 44.4]
Outbreaks¹⁾	3.6	
Travel	9.2	
Unknown	9.0	[8.7, 9.3]

DTU Food
National Food Institute

SCIENTIFIC / TECHNICAL REPORT submitted to EFSA
Estimation of the relative contribution of different food and animal sources to human Salmonella infections in the European Union¹⁾

Prepared by

Sara M. Pires, Leonardo de Knegt and Tine Hald
National Food Institute
Technical University of Denmark

ABSTRACT

EU Member States are required to collect, evaluate and report data on zoonoses, zoonotic agents, antimicrobial resistance and food-borne outbreaks to the European Commission each year. EFSA is responsible for examining, analyzing and summarizing these data, and for publishing the results in the Community Summary Report. The identification of sources of human infections is one of the key analyses in the Community Summary Report. This report provides estimates on the relative contribution of different food and animal sources to human *Salmonella* infections in the European Union, European regions and Member States. Two approaches to attribute human *Salmonella* infections to the responsible food-animal sources were applied. Data used in the models covered the period from 2006 to 2009. The results of the microbial subtyping model showed that the relative contribution of food-animal sources varied between regions and countries. The laying hens reservoir was estimated to be the most important source in the EU contributing with 43.8% (95% Credibility Interval (CI) 43.2 – 44.4%) of cases attributed to this source, followed by pigs (26.9%, 95% CI 26.3-27.6%). Turkeys and broilers were estimated to be less important sources of *Salmonella*, contributing with 4.0% (95% CI 3.8-4.3%) and 3.4% (95% CI 3.1-3.7%), respectively. A total of 9.2% of all salmonellosis cases were reported as being travel-related, and 3.6% of cases were reported as being part of outbreaks with unknown source. Nine percent of cases could not be attributed to any source included in the model. The results of an analysis of data from outbreak investigations attributed salmonellosis to 19 food sources and water. Eggs were estimated to be the most important source of disease in the study period, followed by pork, chicken, the general category "meat and poultry", and dairy products. An analysis by year using data from 2007-2009 showed that the contribution of eggs decreased in 2009, and the proportion of disease attributed to other sources varied over the years and between regions. The report discusses assumptions and limitations of the two approaches and concludes with a number of recommendations.

¹⁾ Question No EFSA-Q-2010-00685, Accepted for Publication on 28 July 2011.

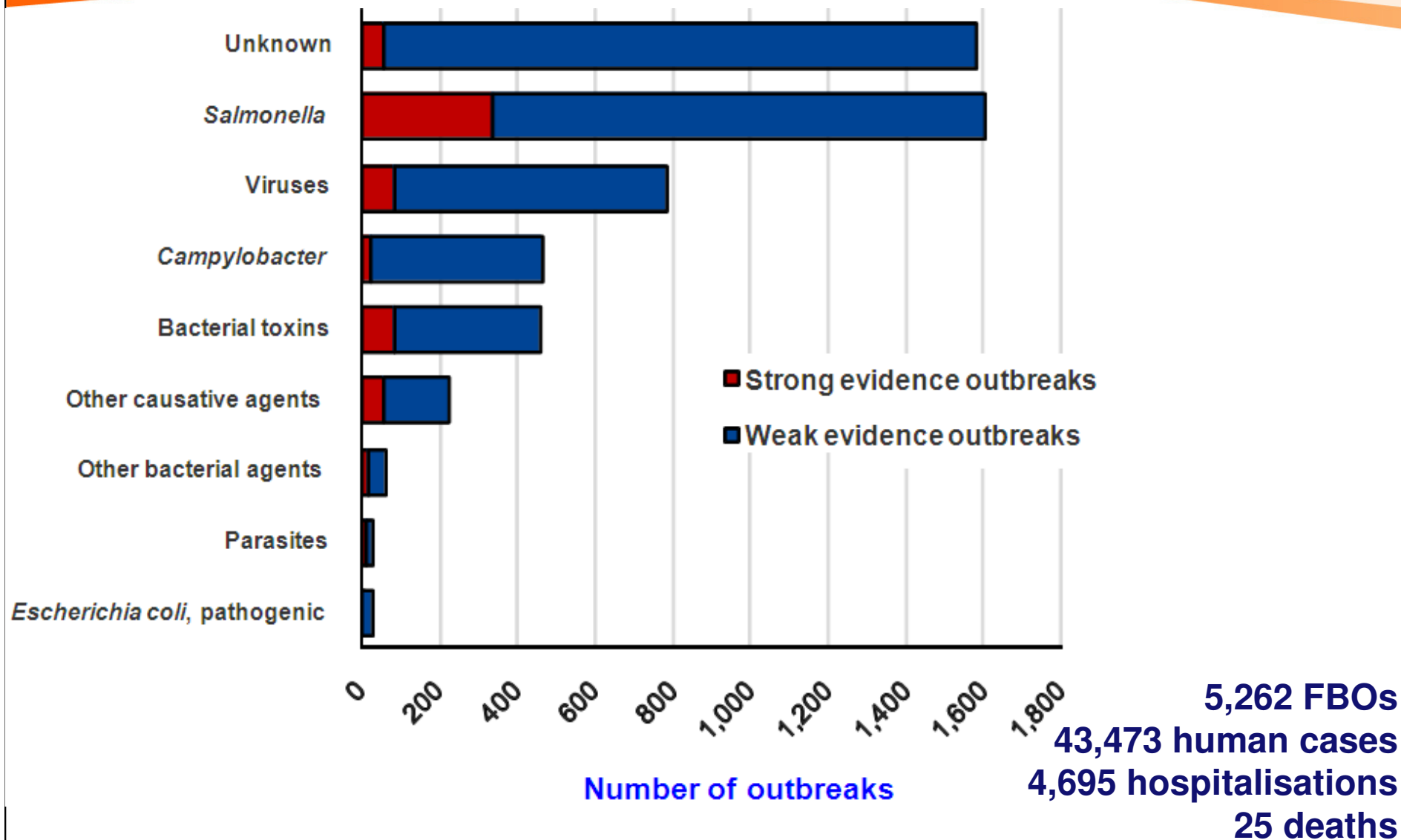
The present document has been produced and adopted by the bodies identified above as author(s). The task has been carried out exclusively by the author(s) in the context of a contract between the European Food Safety Authority and the author(s), awarded following a tender procedure. The present document is published covering with the transparency principle to which the European Food Safety Authority is subject. It may not be considered as an output adopted by EFSA. EFSA reserves its rights, view and position on the issues addressed and the conclusions reached in the present document, without prejudice to the rights of the author(s).



Laying hens were estimated to be the most important source of *Salmonella*, contributing with 43.8%

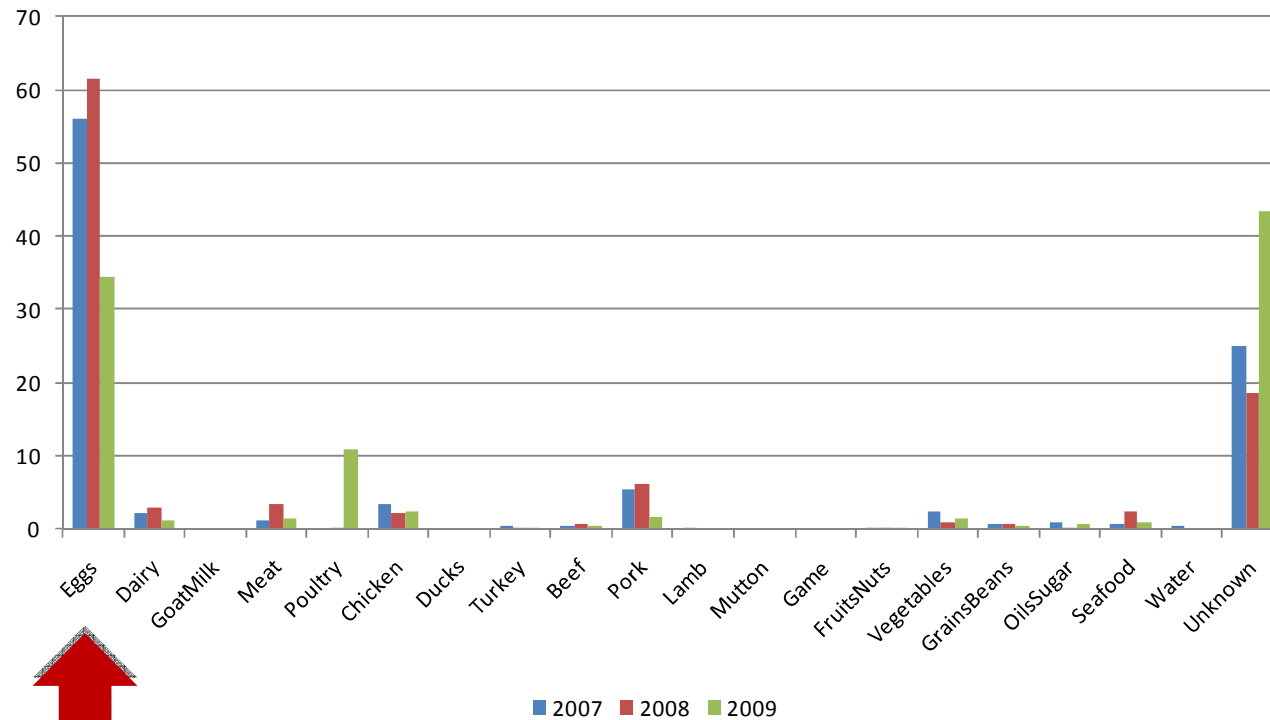
Source: External Report submitted to EFSA : ' Estimation of the relative contribution of different food and animal sources to human Salmonella infections in the European Union ' : <http://www.efsa.europa.eu/en/supporting/doc/184e.pdf>

Food-borne outbreaks (FBOs) in EU, 2010



2nd approach - Source attribution based on analysis of FBO data, EU, 2007-2009

Proportion of *Salmonella* FBO outbreaks attributed to food sources



DTU Food
National Food Institute

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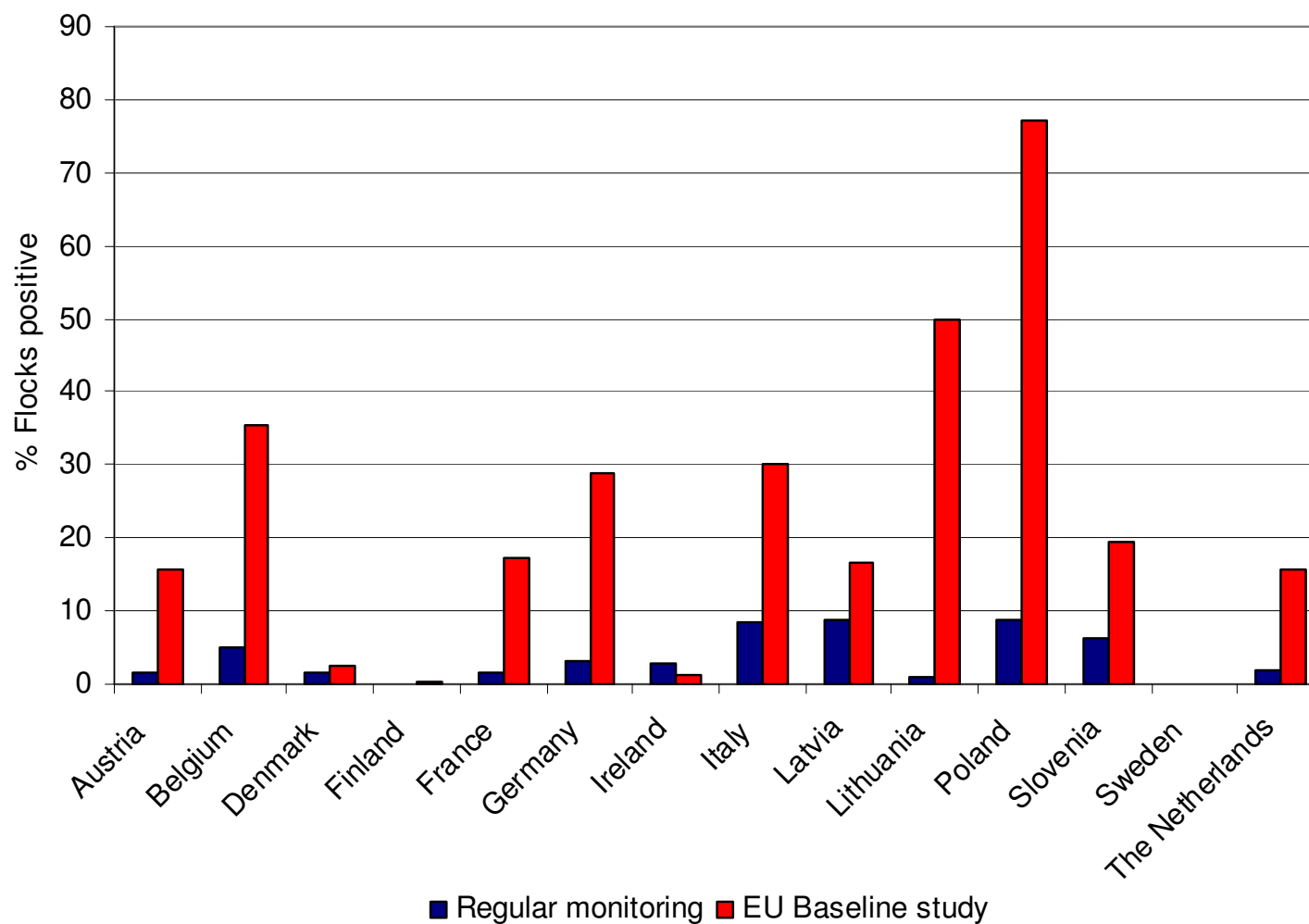
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Why salmonellosis cases decreased?

Salmonella's occurrence in poultry and eggs
primary production.....

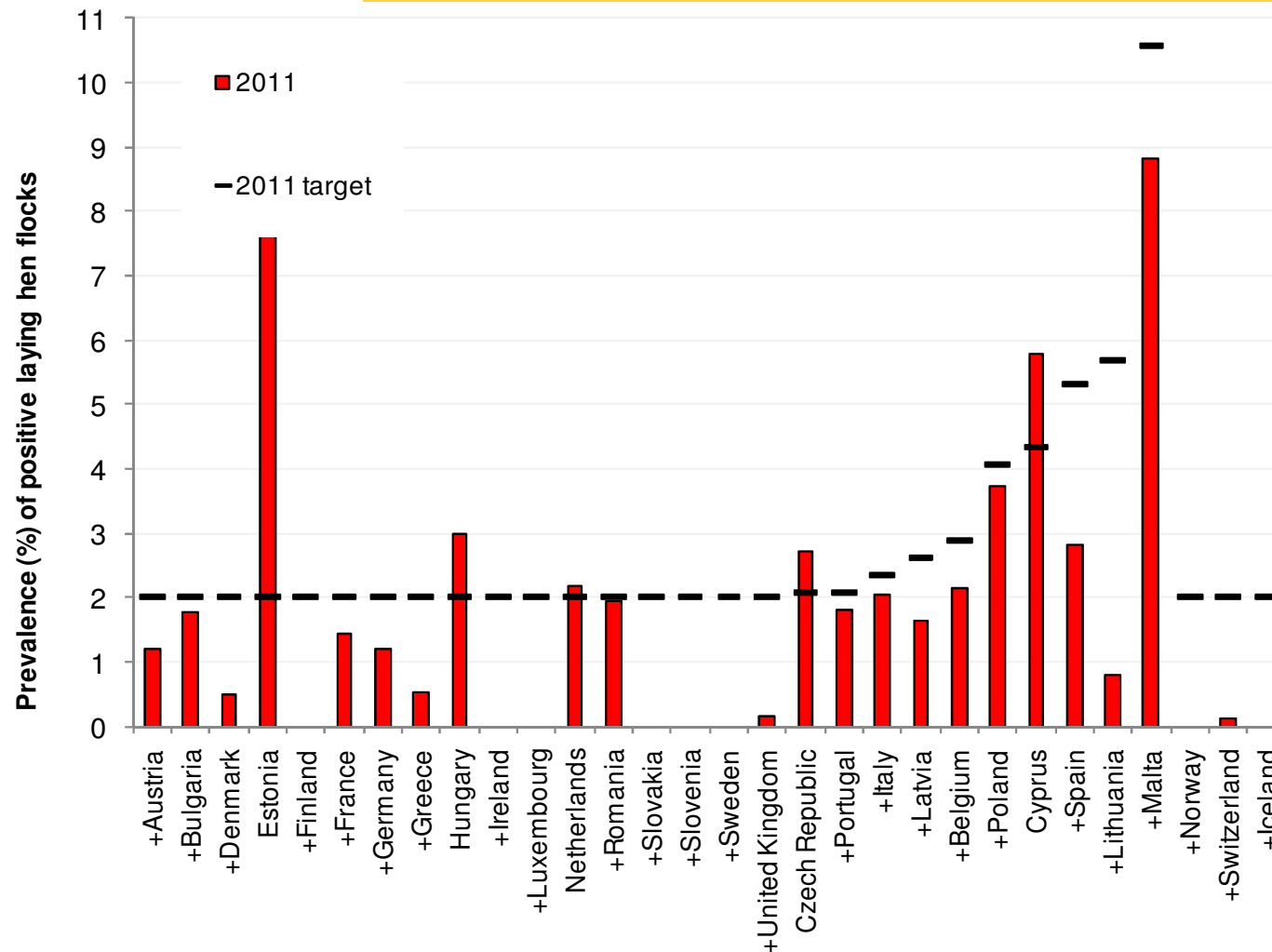
Salmonella monitoring in laying hens in 2004

Proportion of *Salmonella* positive laying hen holdings found through regular monitoring in 2004 and the EU-wide baseline survey

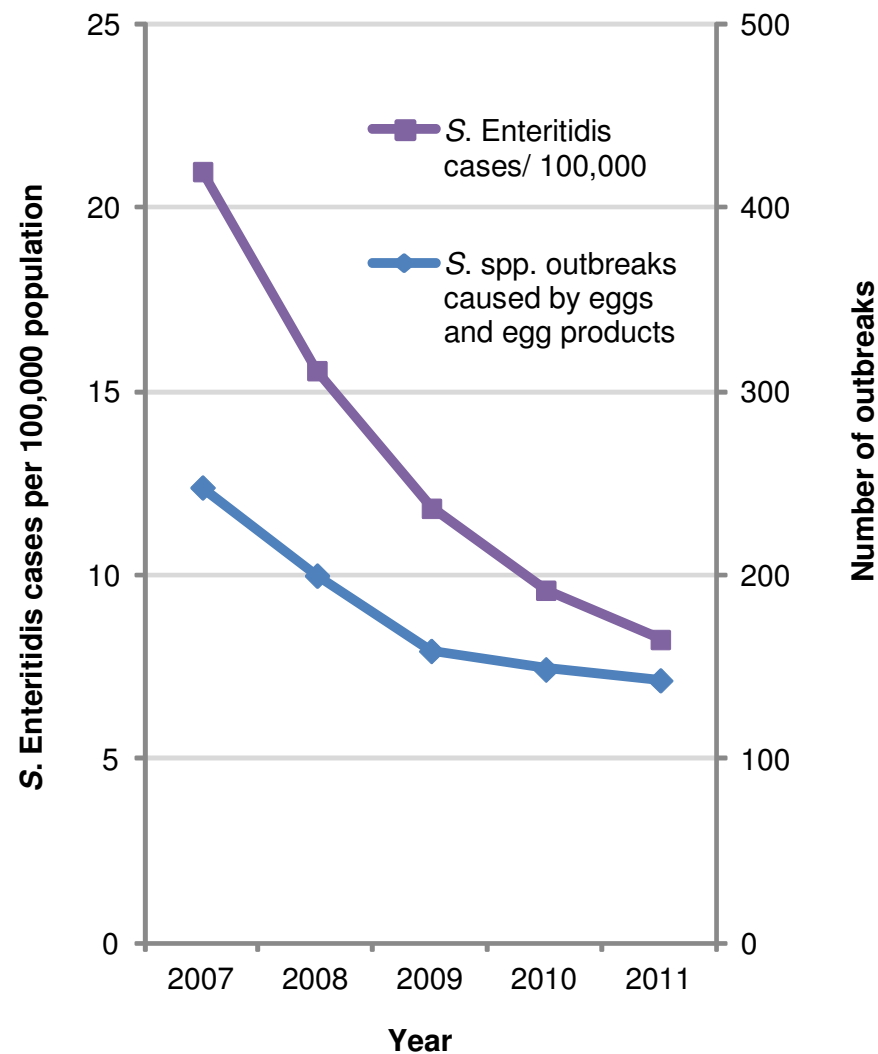
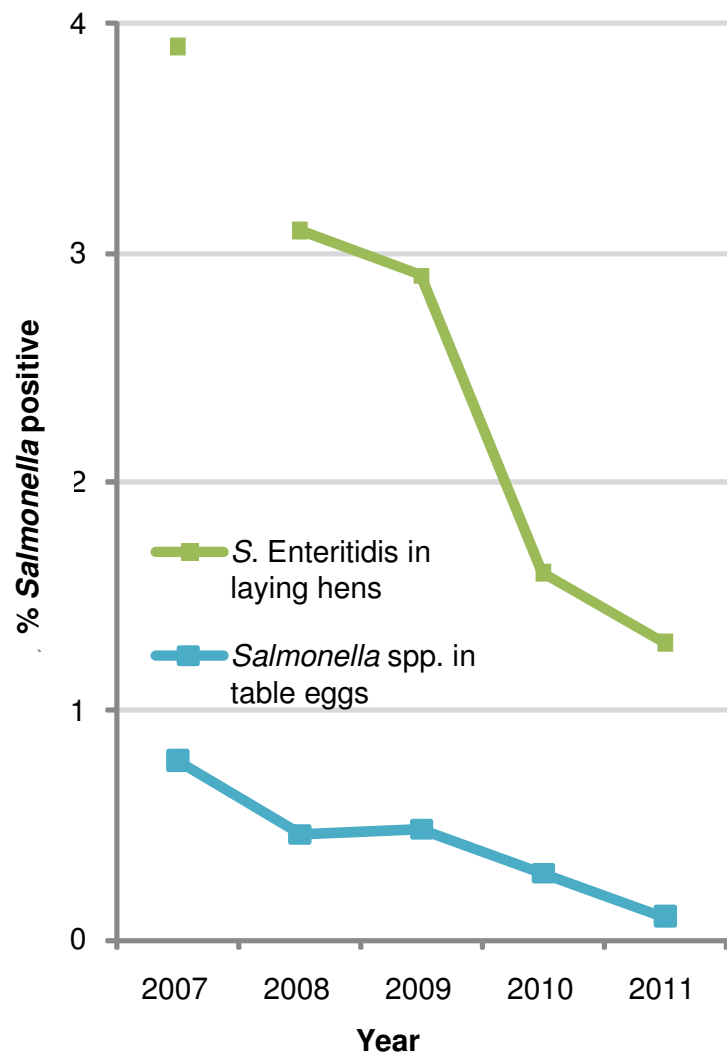


S. Enteritidis – S. Typhimurium EU reduction target in laying hen flocks, 2011

In 2011: 22 MSs and three non-MSs met 2011 targets



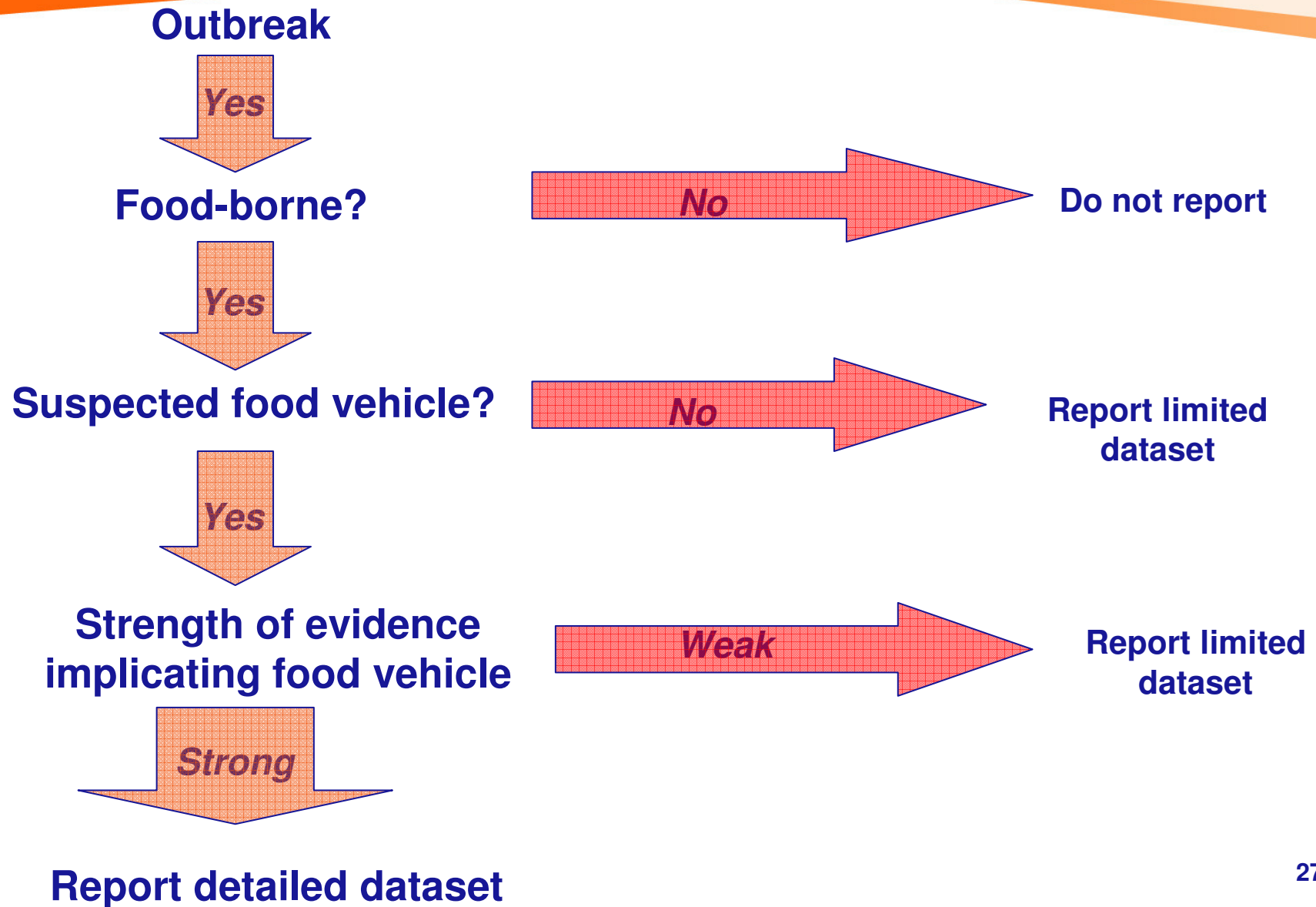
Salmonella in human cases, eggs and laying hens and the number of Salmonella outbreaks caused by eggs within the EU, 2007-2011



Food borne outbreaks (FBO) – focolai di tossinfezione alimentare

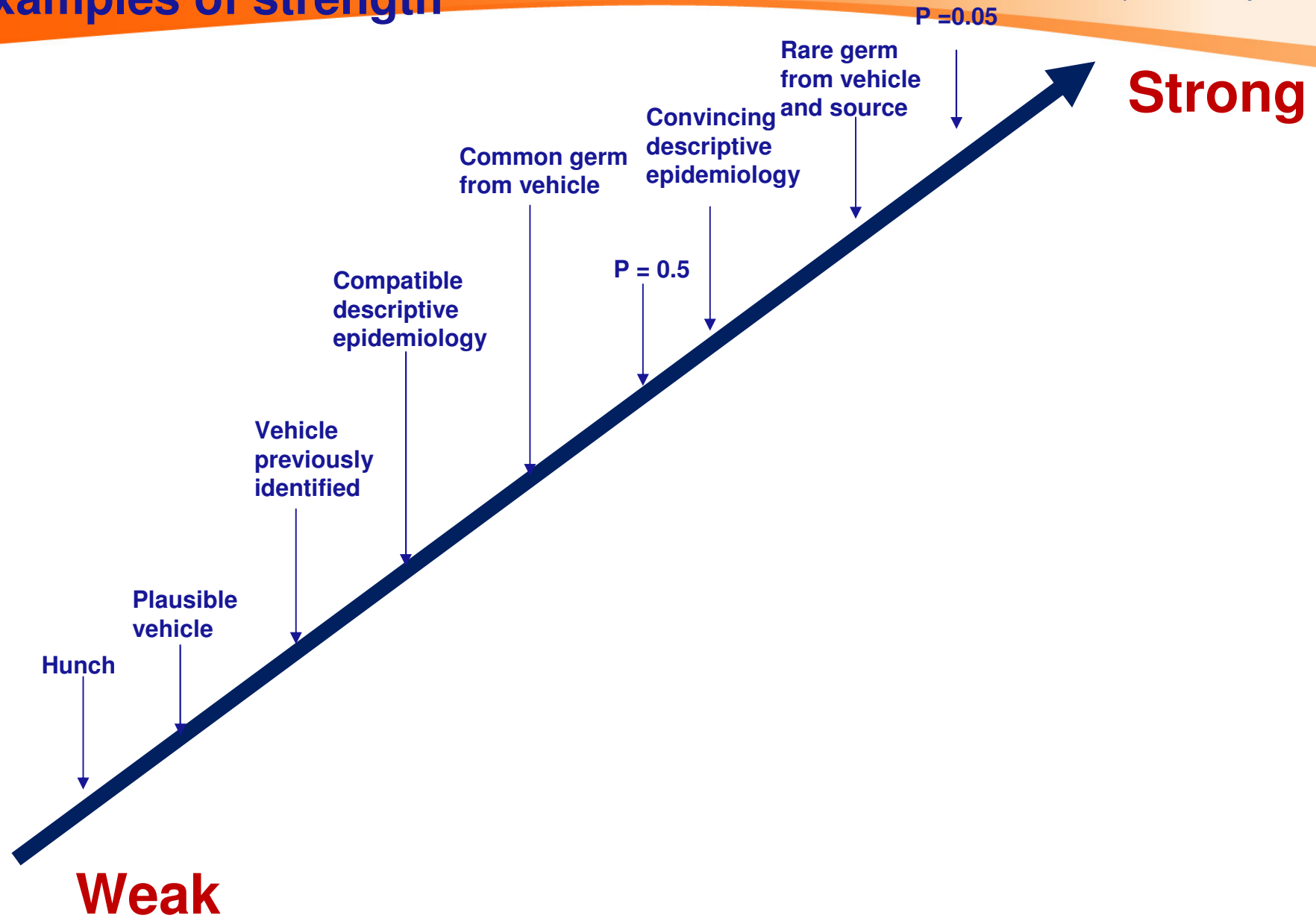
New reporting system (EU-FORS)

When and what MSs should report

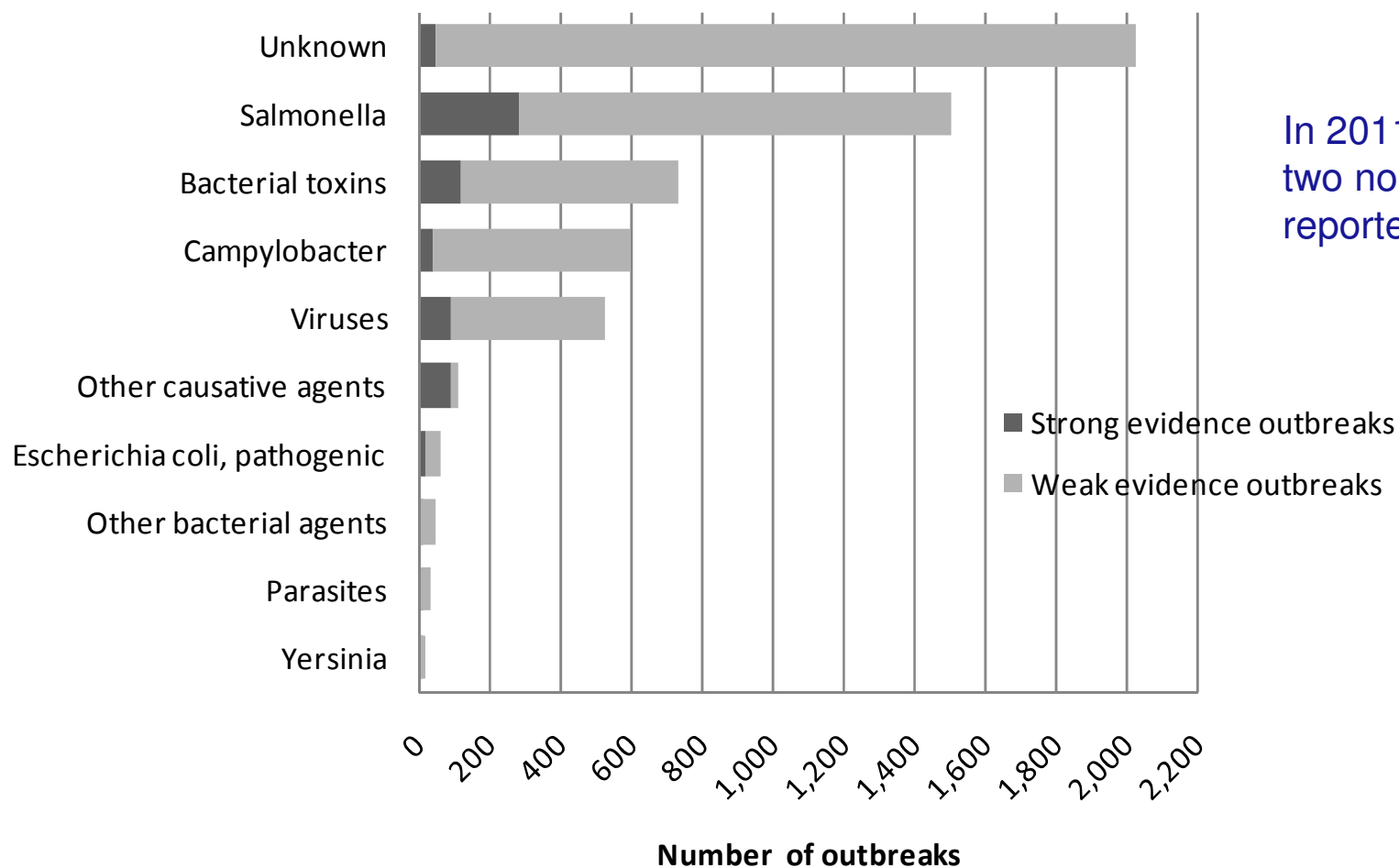


Evidence to support food-borne origin of the outbreak

Examples of strength



Food-borne outbreaks (FBOs) in EU, 2011

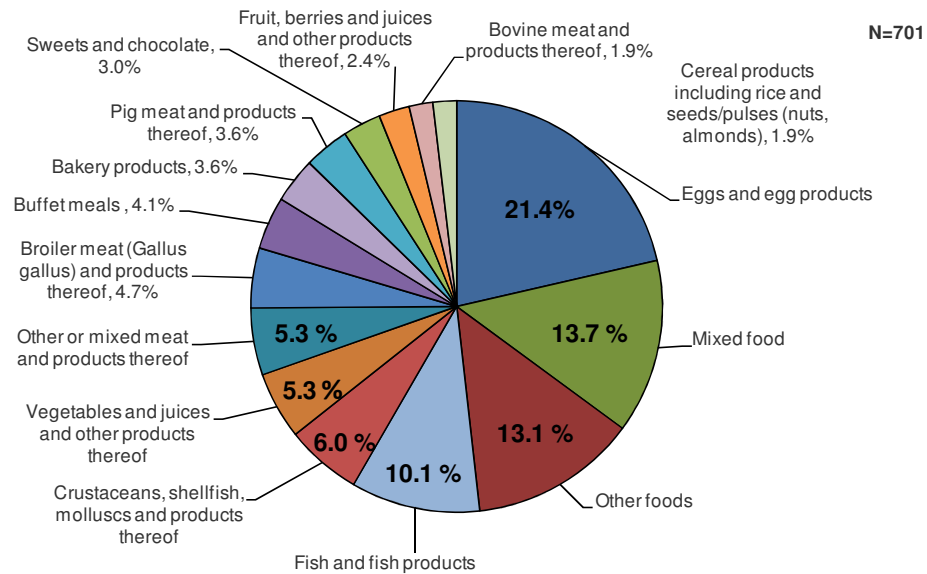


In 2011, 25 MSs and two non-MSs reported data

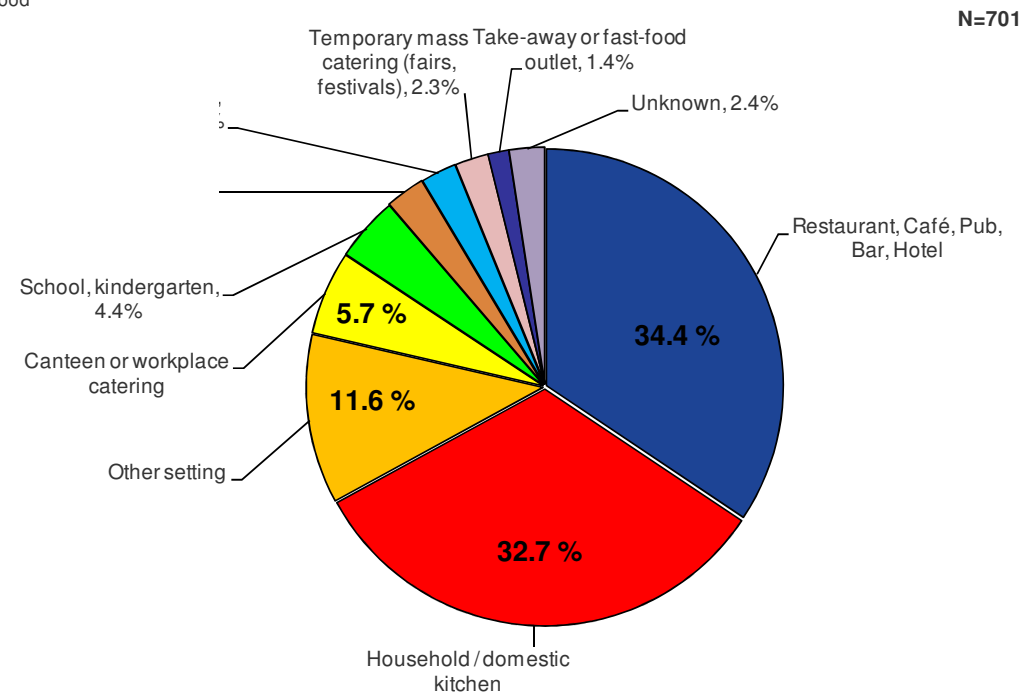
Overall, 5,648 FBOs causing:
69,553 human cases - 7,125 hospitalisations - 93 deaths

Distribution of strong evidence FBO outbreaks by food vehicle and setting, EU, 2011

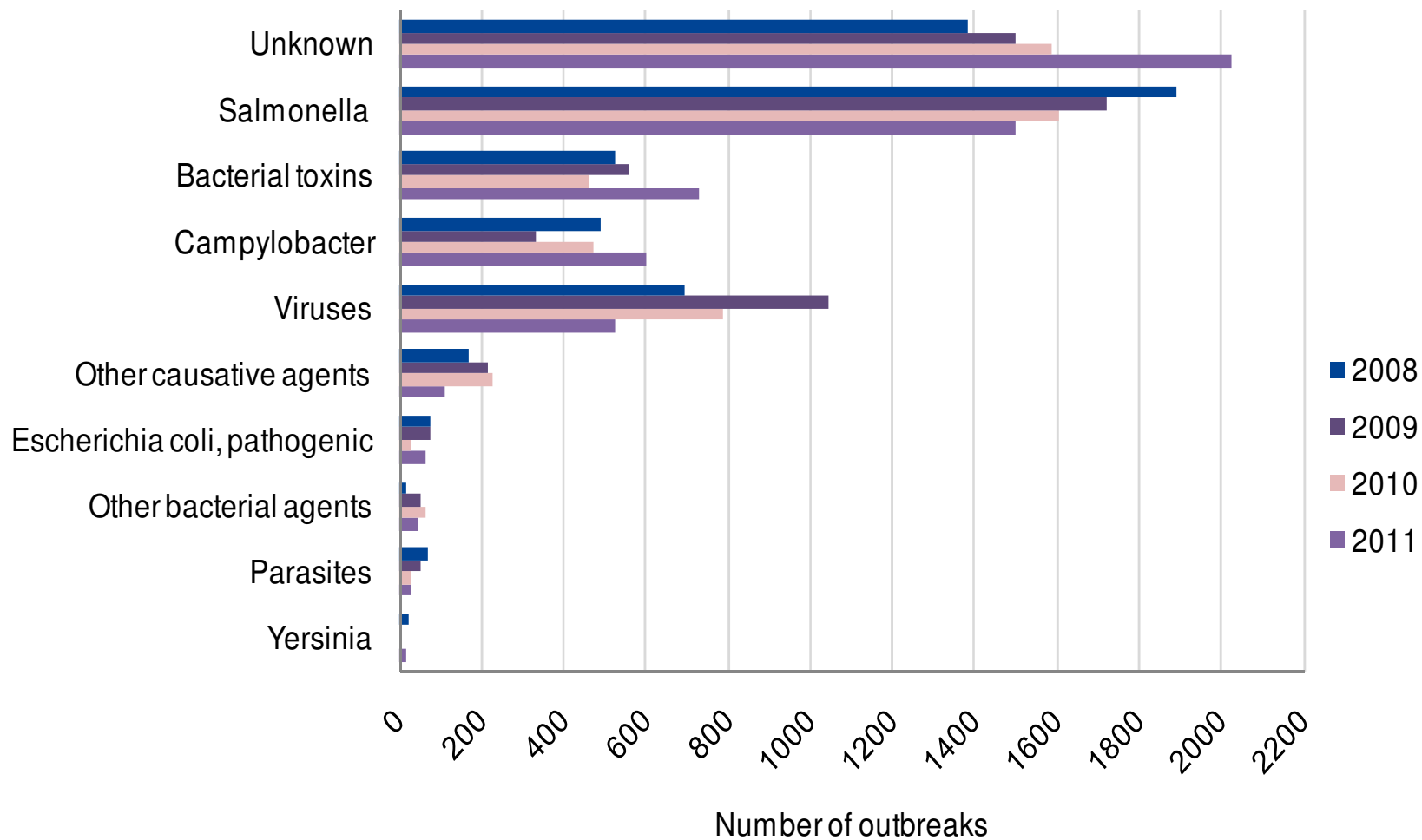
vehicle



setting



Trends in food-borne outbreaks, EU, 2008-2011

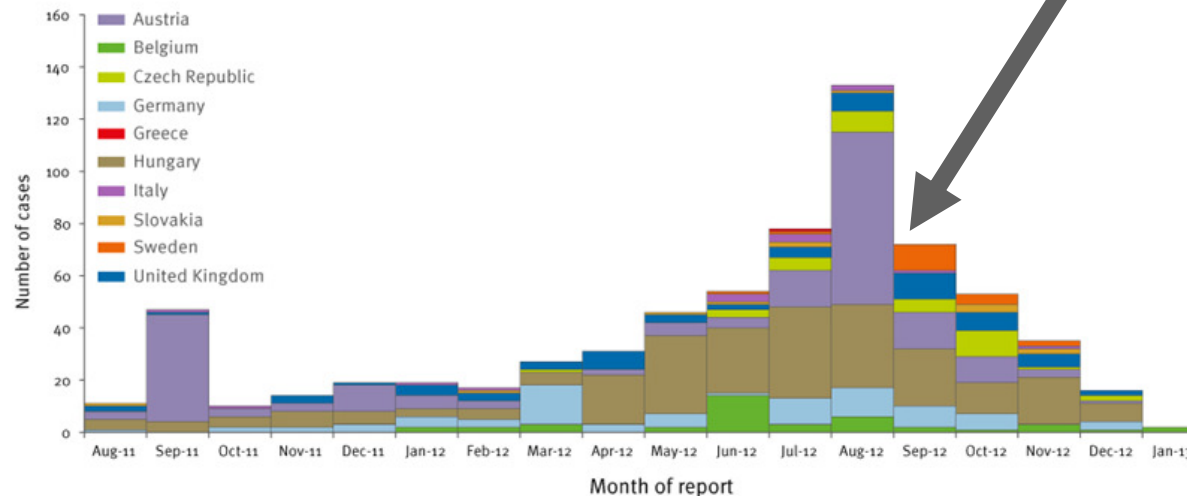


FBO case study: multistate outbreak of *Salmonella* Stanley infection

On July 2012, ECDC initiated a Europe-wide investigation on a *Salmonella* Stanley outbreak, together with the affected Member States, EFSA and EURL *Salmonella*. Cases were associated with strains showing an indistinguishable PFGE pattern not previously reported in Europe

On 21 September 2012 ECDC/EFSA publish a rapid risk assessment that evidenced the implication of the turkey production chain as the probable main source of the outbreak

Figure 1: Distribution of cases of non-travel-related *Salmonella* Stanley infections (probable and confirmed cases*) by Member States and month of report, August 2011 – January 2013, as of 23 January. (n=684)



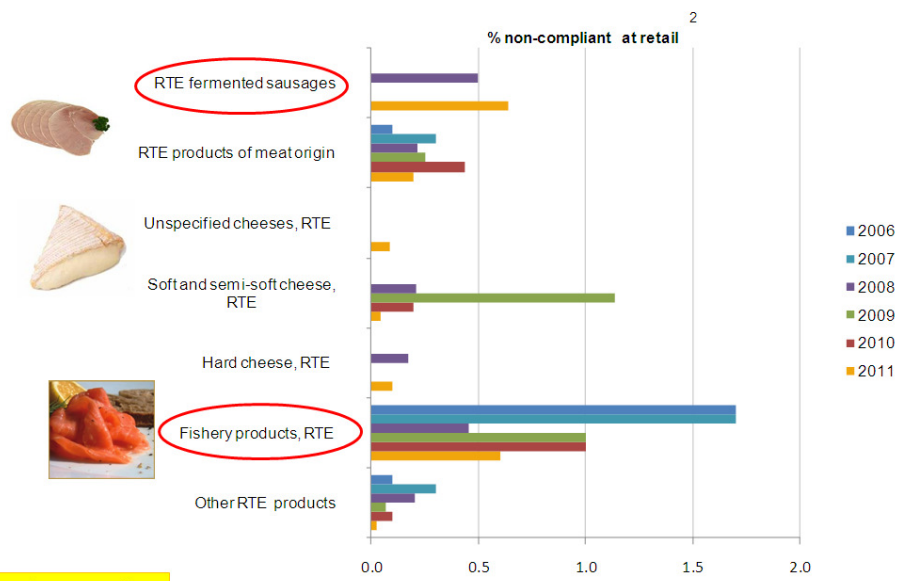
Multi-country outbreak of *Salmonella* Stanley infections Update
20 September 2012

Main conclusions and recommendations

- An outbreak of *Salmonella* Stanley infection involving 167 confirmed and 254 probable cases is on-going in several Member States of the European Union (EU). As cases do not have travel history outside the EU within the usual incubation period for salmonellosis, these findings strongly suggest a multi-state outbreak currently taking place in several countries in the EU. The descriptive epidemiology of human cases indicates a transmission originating from a persistent common source or multiple sources in the EU that are contaminated with isolates indistinguishable by XbaI-PFGE.
- Food and veterinary investigations conducted in Austria, Belgium, Germany, Czech Republic, Poland and Hungary identified an indistinguishable XbaI-PFGE fingerprint and a common resistance to nalidixic acid with concomitant decreased susceptibility to ciprofloxacin, among isolates originating from the turkey production chain (turkeys and turkey meat). Isolates with indistinguishable PFGE patterns were also detected in some cases from broiler flocks (breeding and fattening chicken flocks) and meat from other animal species (broiler meat, beef and pork).
- The epidemiological and microbiological information gathered through the public health, food and veterinary investigations strongly suggest that the turkey production chain is the source of the outbreak. However, the contribution of other food and animal sources, such as beef, pork and broiler meat to the outbreak cannot be ruled out.
- As control measures have not yet been implemented to remove the source of infection and potential food vehicles from the market, it is likely that additional human cases of *S. Stanley* infections will be reported in EU Member States.
- It is important to highlight that persons working in the food chain at all levels (from production to catering) as well as consumers should be very strict with personal (hand washing) and food hygiene (avoid cross-contamination between ready-to-eat and raw meat) when handling raw turkey meat.
- ECDC, EFSA and the EU *Salmonella* Reference Laboratory are encouraging all Member States to perform PFGE analysis on food, animal and human *S. Stanley* isolates from 2011 and 2012, and to submit their data to ECDC (hyg@ecdc.europa.eu). This will provide information on the diversity of *S. Stanley* in the EU, allowing a more accurate assessment of the situation.
- Further information on the trace-back and trace-forward of foods items in the food chain will be necessary to understand and assess the risk associated with this outbreak. In addition, this information will help in the identification of the primary source of the outbreak strain and to track the spreading along the food chain. This information would in turn help to define the risk management actions to be taken in order to control the contamination with this strain in the animal production and food chain. These targeted measures are expected to help control the outbreak and prevent further human cases.
- As soon as the above information becomes available, ECDC and EFSA recommend that further actions should be taken by risk managers to detect and contain the *S. Stanley* infection in turkey production and the subsequent contamination of turkey meat, and when necessary, in the broiler production chain.

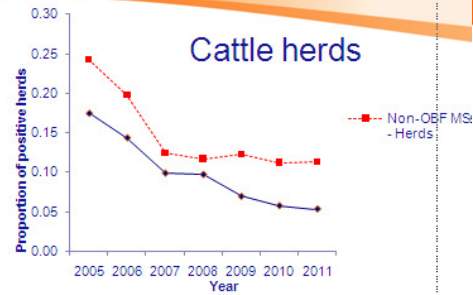
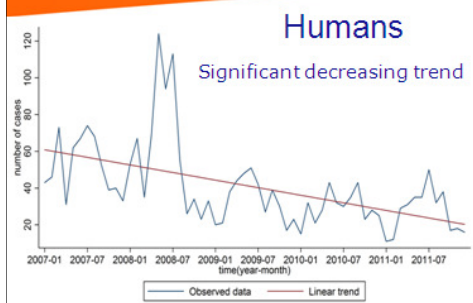
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© European Food Safety Authority, 2012. On request from the European Commission, Question Nos. EFSA-Q-2012-00813 and EFSA-Q-2012-00814. www.efsa.europa.eu

L. monocytogenes in ready-to-eat foods, meeting the EU criterion, 2006-2011



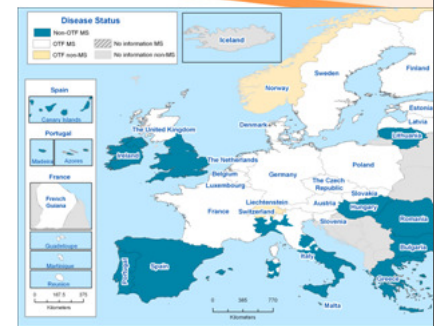
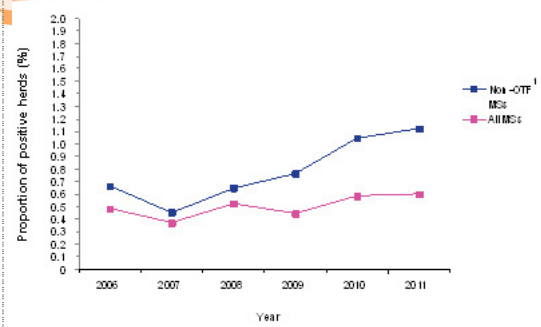
Single samples

Brucellosis in humans and animals in EU, 2005-2011



Decreasing both in humans and ruminants

Tuberculosis in cattle herds in EU, 2006-2010



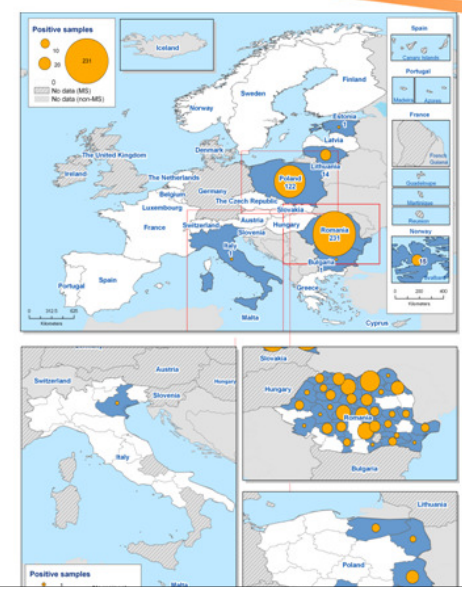
Highest prevalence in UK and Ireland in 2010



Rabies in animals, EU, 2011

In 2011, one travel-associated case of rabies was reported in the EU.

Classical rabies or unspecified Lyssavirus cases in domestic animals, 2010



Know more on occurrence of zoonoses in EU in just published **2011 European Union Summary Report** → please visit EFSA website at

<http://www.efsa.europa.eu/>



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In Focus: Zoonotic diseases

Rise in human infections from *Campylobacter* and *E.coli*, whilst *Salmonella* cases continue to fall

Campylobacteriosis remains the most reported zoonotic disease in humans, with a continuous increase in reported cases over the last five years. The trend in reported human cases of verocytotoxin-producing *Escherichia coli* (VTEC/STEC) has also been increasing since 2008 and was further strengthened due to the outbreak in the summer of 2011. *Salmonella* cases in humans have continued to fall, marking a decrease for the seventh consecutive year. These are some of the main findings of the annual report on zoonoses and food-borne outbreaks in the European Union for 2011 produced jointly by EFSA and ECDC.

Scientific report – The European Union Summary Report on Trends and Sources of Zoonoses, Zoonotic Agents and Food-borne Outbreaks in 2011

EFSA's work in context

Topic: Zoonotic diseases
Topic: Food-borne zoonotic diseases
Factsheets: EFSA explains zoonotic diseases: Food-borne zoonotic diseases
Feature story: EU measures help reduce human *Salmonella* cases by almost one-half

Understanding Science

What are food-borne zoonotic pathogens? Why are they important for public health?

- ▶ Watch: What is *Salmonella*? How can we control and reduce it?
- ▶ Watch: What is *Campylobacter*? Why is food safety important to prevent it?

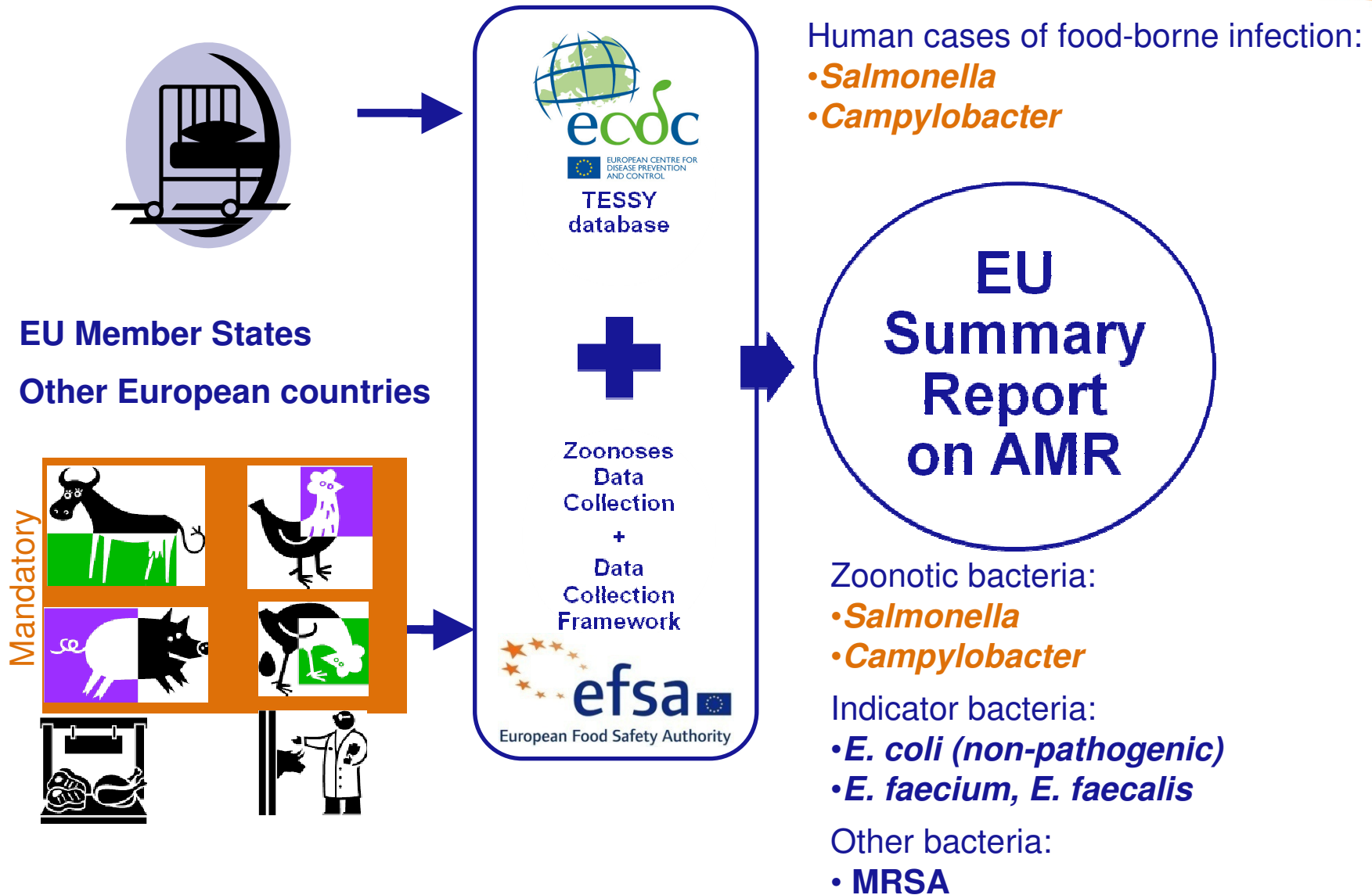
Antimicrobial resistance (AMR) – Farmaco resistenza

AMR monitoring – Why?

- To understand the development and dissemination of AMR
- To provide relevant risk assessment data
- To plan targeted interventions
- To measure the effects of such interventions



Monitoring of AMR in animals and food: European Union Summary Report on AMR



- **AMR commonly found** in zoonotic bacteria from humans, animals and food
- Low levels of **clinical resistance** to **CRITICALLY IMPORTANT ANTIMICROBIALS** in humans
- **Microbiological resistance to CRITICALLY IMPORTANT ANTIMICROBIALS** in human medicine detected in *Salmonella* and *Campylobacter*
 - **Epidemiological cut-off values** used to interpret 'microbiological resistance'
 - **Moderate to high** levels for **fluoroquinolones** from fowl and meat
 - **Low** levels for **macrolides** in *Campylobacter*
 - **Low** levels for **3rd generation cephalosporins**
- **AMR varies among**
 - Animal species and animal populations

- **Data collection in BIOMO**
 - **annual collection of zoonoses data**
 - legislation 2003/99/EC
 - Network of data collection and analysis
 - Harmonisation of data collection
 - IT tools for collect data
 - **Baseline data**
- **Results**
 - Zoonoses
 - FBO
 - AMR
- **What's cooking in BIOMO?**
 - **animal/sample/isolate based data collection (SSD2)**
 - **Collection of sub-typed isolates**
 - **DWA**

What's cooking in BIOMO? /1

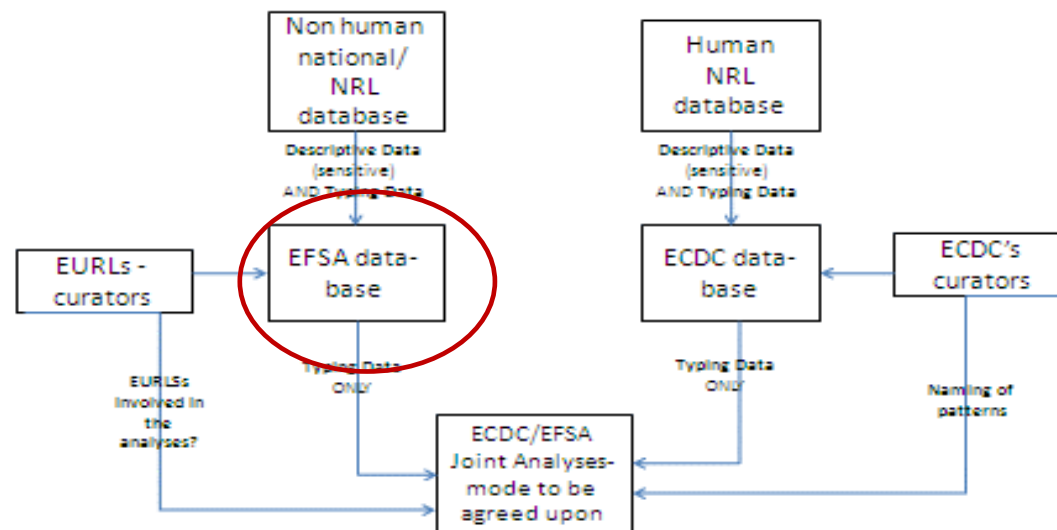
Standard sample description (SSD) → a model harmonising the collection of a wide range of analytical results in several domains of EFSA activity

- It's a list of data elements that are standardised and used by both data providers and data receivers to fully describe samples and analytical parameters
- Includes controlled terminology and validation rules to guarantee data quality (in data export, transmission and storage)
- currently implemented for chemical contaminants, pesticide residues, additives and food contact materials (SSD1)
- SSD2 will be implemented for:
 - ✓ Antimicrobial isolate-based data
 - ✓ Data on microbiological contaminants in food at single sample level
 - ✓ Data on zoonotic agents in animals at single sample of flock/herd level

What's cooking in BIOMO? /2

molecular typing data collection at EU level: objectives

- To enable the comparison of the isolates from human cases, food and animals at high discriminatory power level
- To contribute to epidemiological investigations of (multi-country) food-borne outbreaks at EU/ national level
- Provide data for source attribution analyses at EU level, e.g. to those carried out by EFSA's BIOHAZ panel



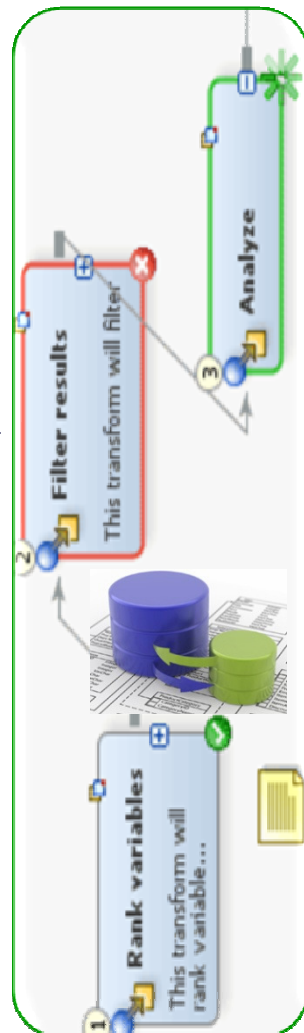
What's cooking in BIOMO? /3

Data Flow in future EFSA's data warehouse

Extract, Transform, Load



Data Collections
DCF, DCF-Z2, other sources

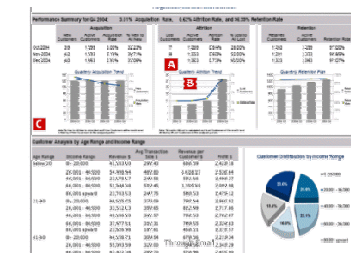
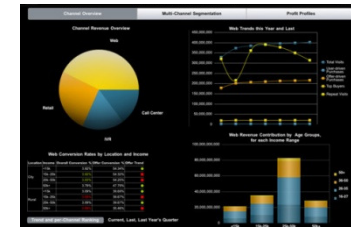
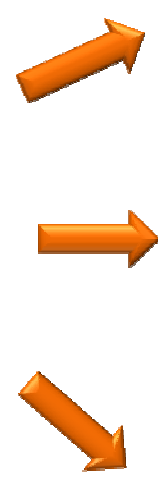


Development of the DWH database

Data Mart



ODS
Operational Data Storage



Reports

Thank you for your attention!

- Acknowledgements
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- Contacts in EFSA
 - zoonoses@efsa.europa.eu
 - <http://www.efsa.europa.eu/en/contact/askefsa.htm>
- All our reports are on
 - www.efsa.europa.eu

