Trusted science for safe food

RIBMINS, Training school on future meat safety

3-5 February 2021

Campylobacter surveillance and control in EU

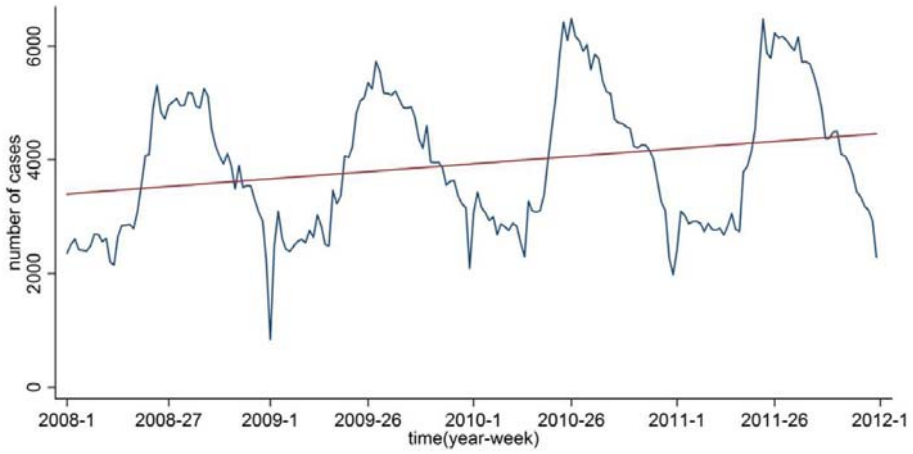
Frank Boelaert

Senior Scientific Officer

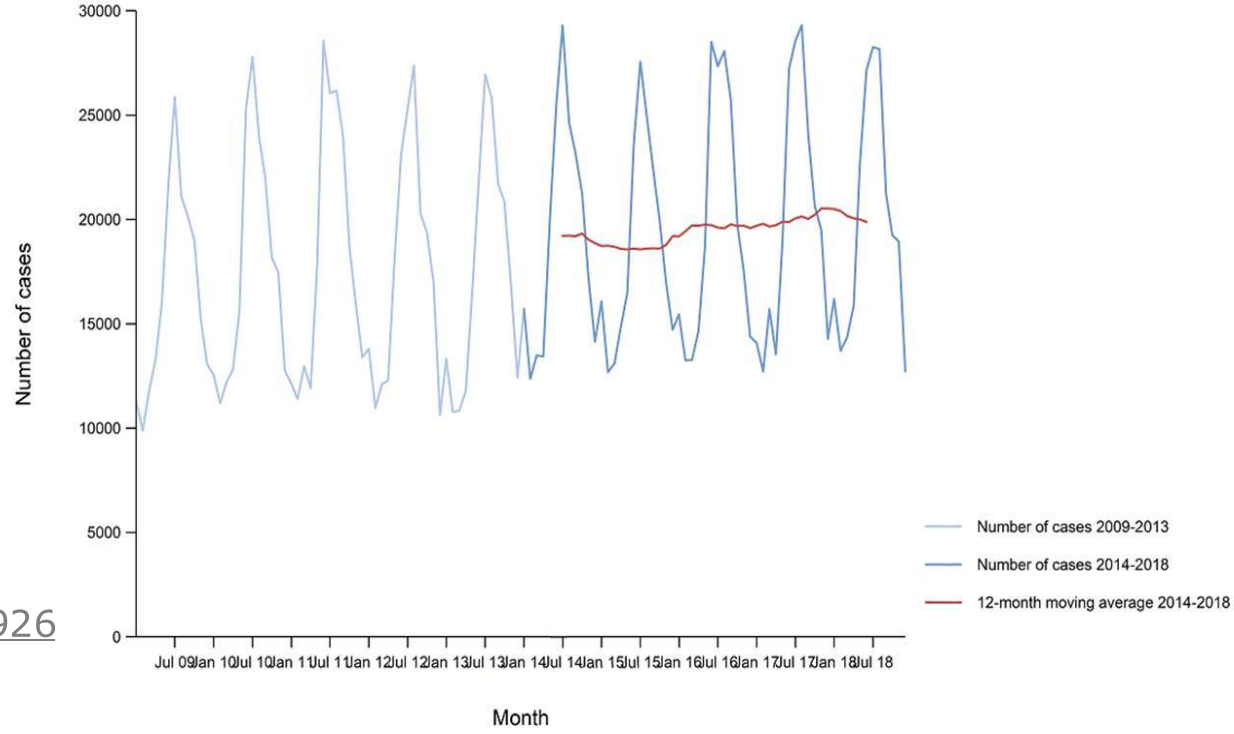
efsa

European Food Safety Authority

Campylobacteriosis in humans, EU, trend

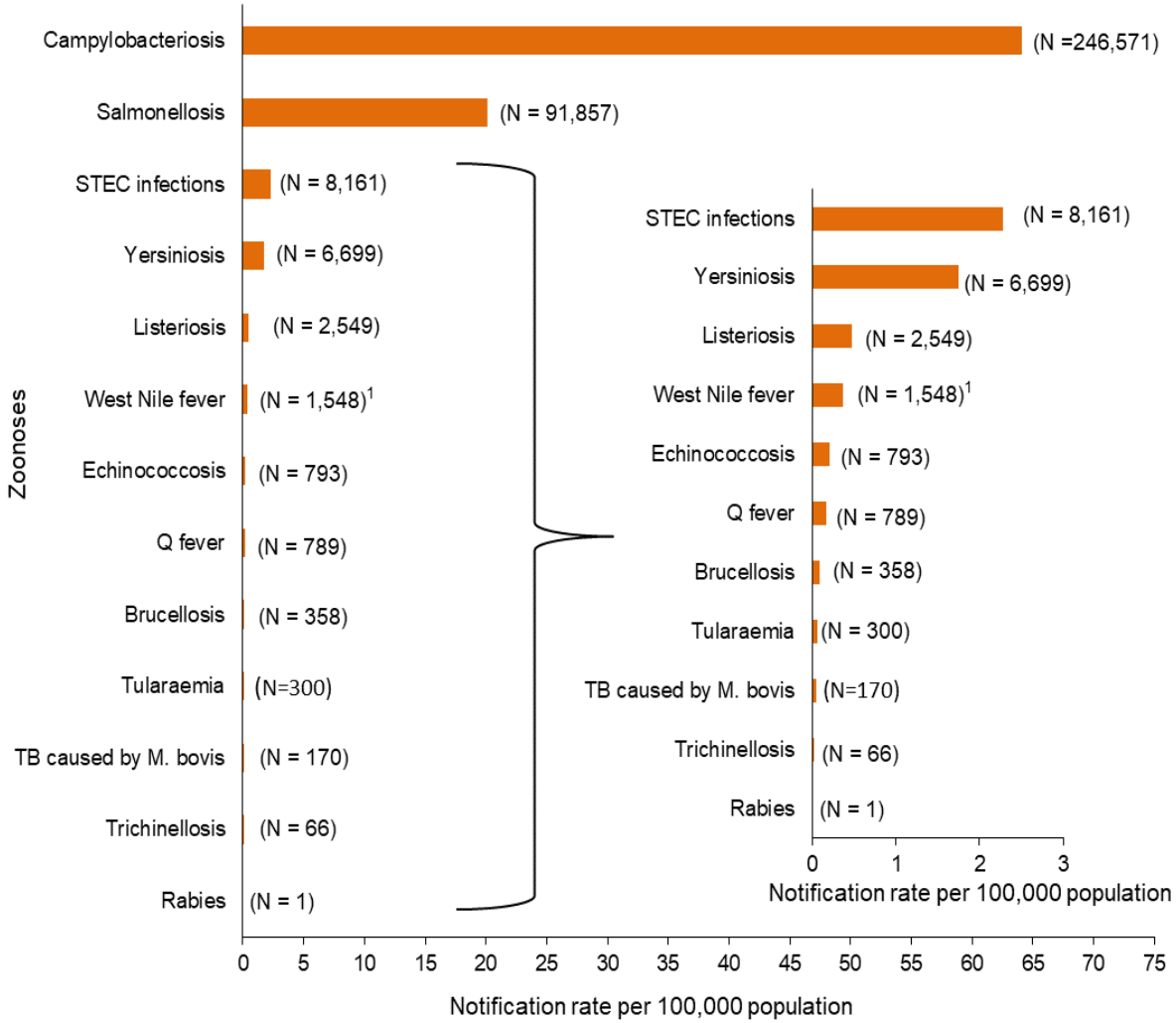


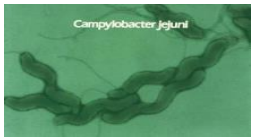
https://www.efsa.europa.eu/en/efsajournal/pub/3129



http://www.efsa.europa.eu/en/efsajournal/pub/5926

Reported numbers and notificaton rates of confirmed human zoonoses in the EU, 2018





Outline

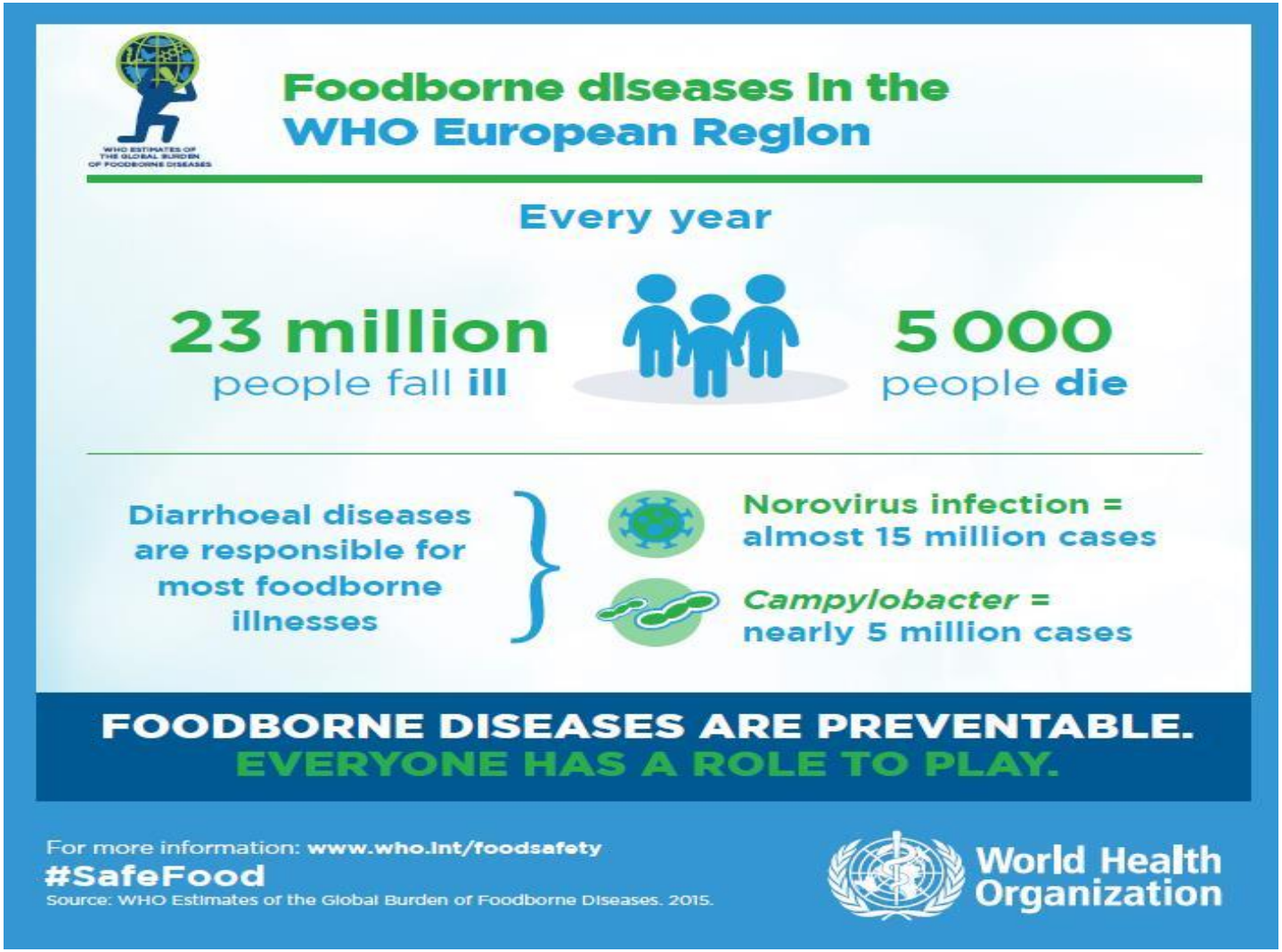
- Background, EFSA
- Legislative framework
- *Campylobacter* monitoring results along the food chain

Outline

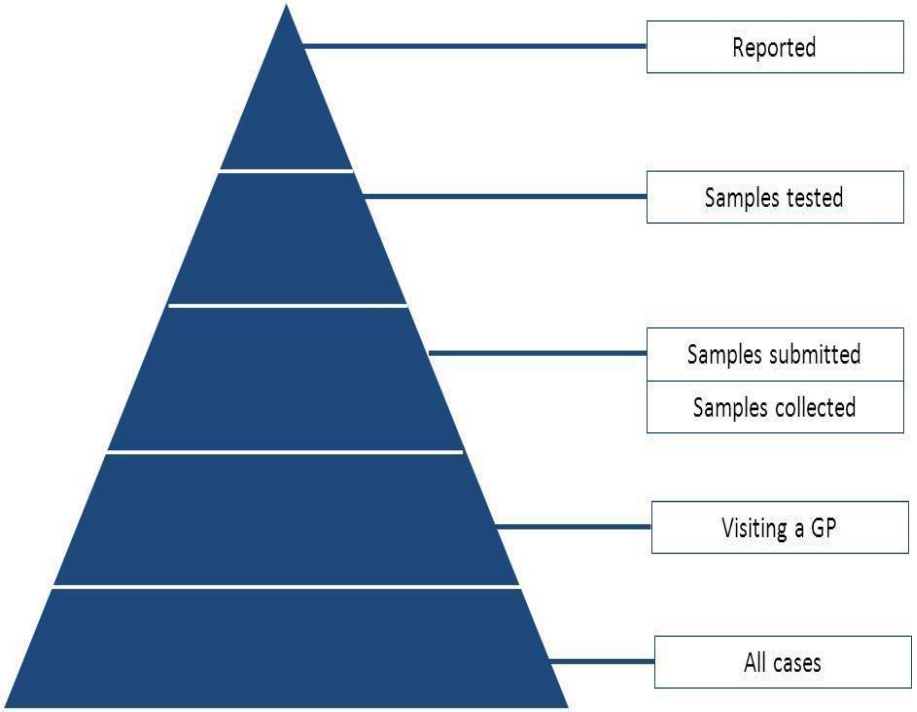
- Background, EFSA
- *Legislative framework*
- *Campylobacter monitoring results along the food chain*

Burden of foodborne diseases

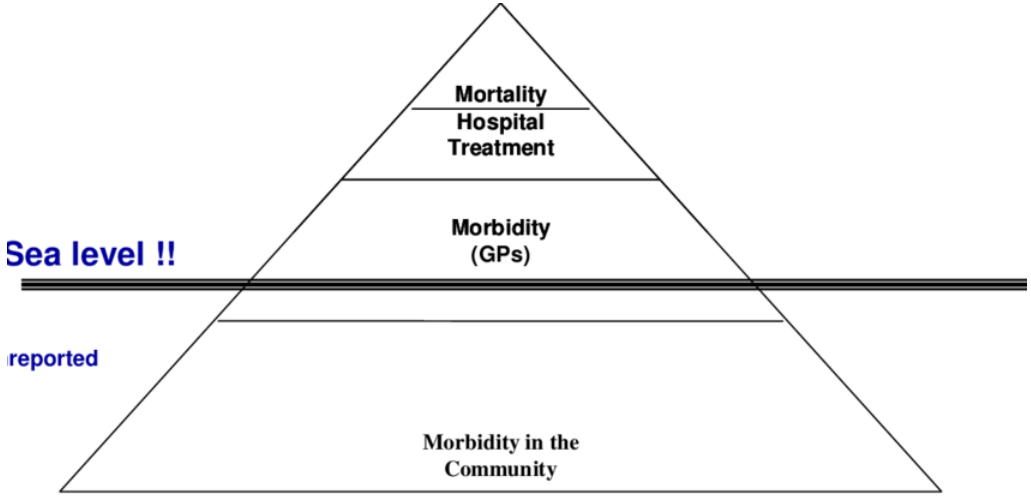
https://www.who.int/activities/estimating-the-burden-of-foodborne-diseases



Food safety : surveillance pyramid



RIVM report 330081001/2007
Disease burden and related costs of cryptosporidiosis and giardiasis in the Netherlands. SMC Vijgen, MJM Mangen, LM Kortbeek, YTHP van Duijnhoven, AH Havelaar



EFSA

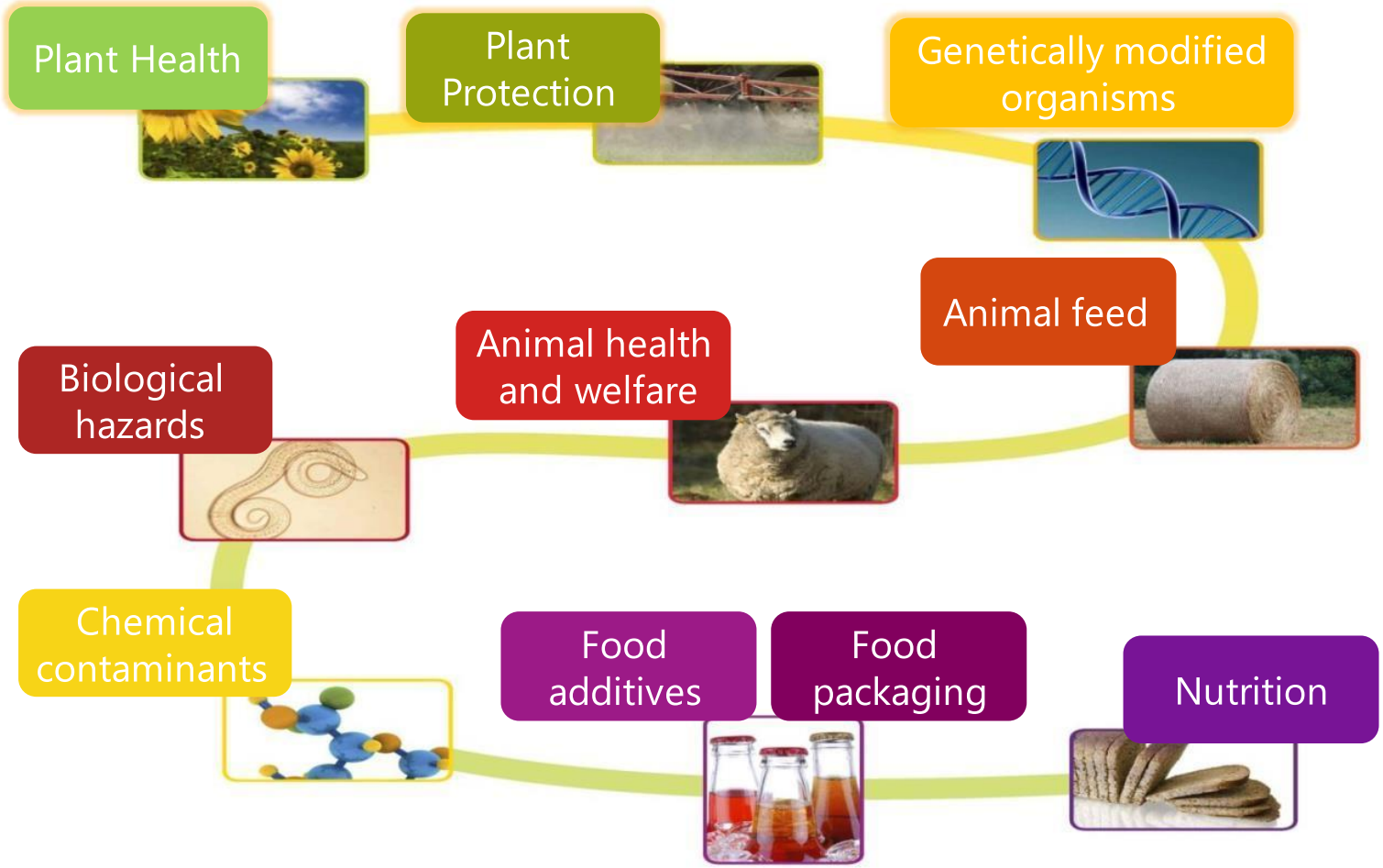
- EFSA is a European agency funded by the European Union that **operates independently** of the European legislative and executive institutions (Commission, Council, Parliament) and EU Member States.

- It was set up in 2002 following a series of food crises in the late 1990s to be a source of scientific advice and communication on risks associated with the food chain. The agency was legally established by the EU under the General Food Law - Regulation 178/2002.

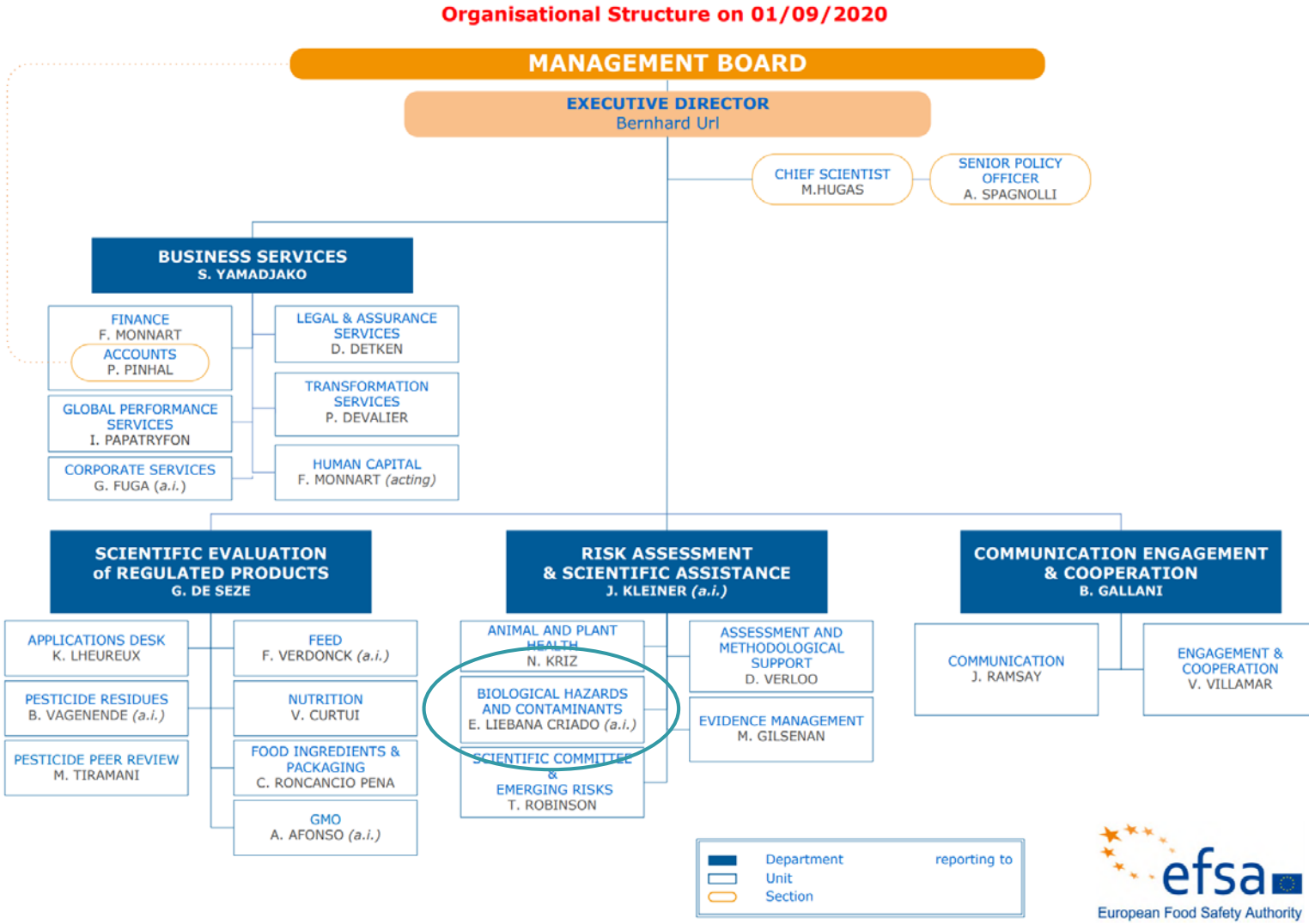
- The General Food Law created a European food safety system in which responsibility for **risk assessment (science)** and for risk management (policy) are kept separate. EFSA is responsible for the former area, and also has a duty to **communicate** its scientific findings to the public.

See https://www.efsa.europa.eu/en/aboutefsa

EFSA – FOOD CHAIN



EFSA Organisational chart



Outline

- *Background, EFSA*
- Legislative framework
- *Campylobacter monitoring results along the food chain*

Outline

- *Background, EFSA*

- Legislative framework
  - > **monitoring**
  - > surveying

- *Campylobacter monitoring results along the food chain*

Monitoring of zoonoses, FBO and AMR in the EU

- **Directive on the monitoring of zoonoses and zoonotic agents (2003/99/EC)**
  - Publication of the annual EU Summary Report
  - MSs have an **obligation** to report each year

- **Data collection mandatory for 8 zoonotic agents**

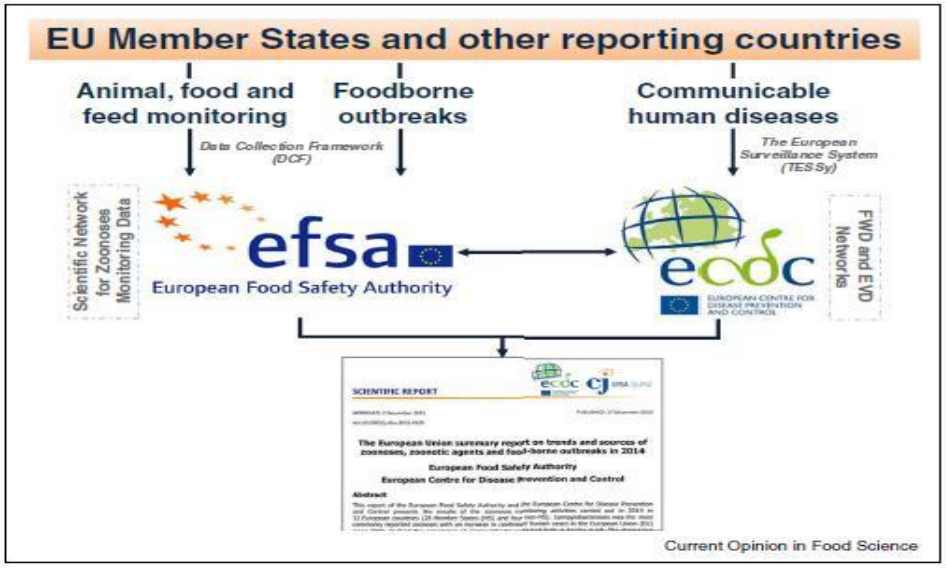
  Salmonella (+ antimicrobial resistance (AMR))
  Campylobacter (+ AMR)
  Listeria monocytogenes
  Brucella
  Tuberculosis due to *Mycobacterium bovis*
  Verotoxigenic *Escherichia coli*
  Trichinella
  Echinococcus

  → **and also for food-borne outbreaks (FBOs)**

  → **and susceptible animal populations**

Annual EU One Health Zoonoses report

http://www.efsa.europa.eu/en/efsajournal/pub/5926



Data flow and EFSA's integrated approach for the production of the joint EFSA-ECDC EU Summary Report on zoonoses and food-borne outbreaks in the EU. Note: FWD Network: European Food and Waterborne Diseases and Zoonoses Network; EVD Network: European Emerging and Vector-borne Diseases Network.

The EUOHZ report is;

- jointly made and co-authored by EFSA and ECDC, and
- the product of intensive collaborative exercise (with ECDC) delivering integrated analyses.

EUOHZ report structure

Zoonoses included in compulsory annual monitoring (Dir. 2003/99 List A)

A1. *Campylobacter*
A2. *Salmonella*
A3. *Listeria*
A4. Shiga toxin-producing *Escherichia coli*
A5. Tuberculosis due to *Mycobacterium bovis*
A6. *Brucella*
A7. *Trichinella*
A8. *Echinococcus*

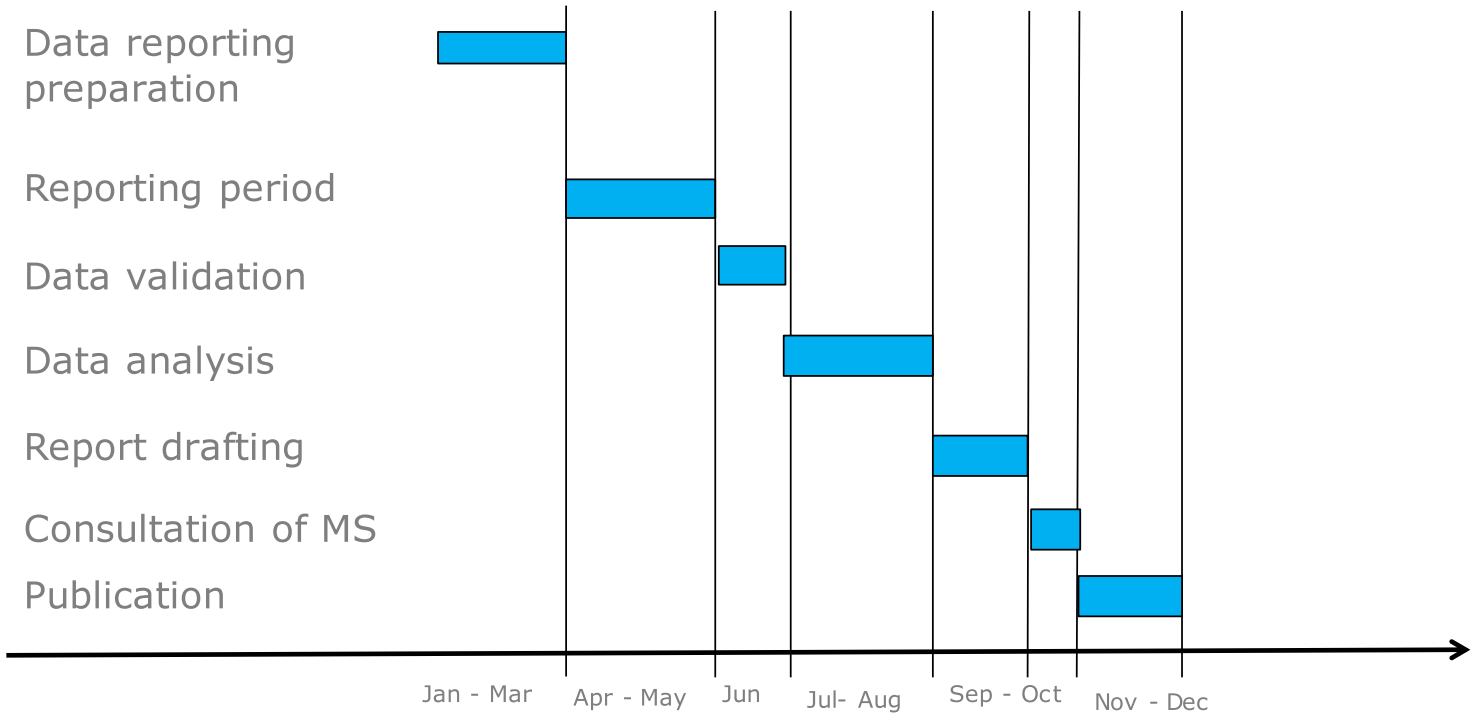
Food- and waterborne outbreaks (according Dir. 2003/99)

Zoonoses monitored according the epidemiological situation (Dir. 2003/99 List B)

B1. *Yersinia*
B2. *Toxoplasma gondii*
B3. Rabies
B4. Q fever
B5. West Nile virus
B6. Tularaemia
B7. Other zoonoses and zoonotic agents

Microbiological contaminants subject to food safety criteria (Reg 2073/2005)

Annual EUOHZ report : production cycle



Resources :

staff; EFSA, ECDC, contractors

data technicians, scientists, communication, webteam, contractors

Outline

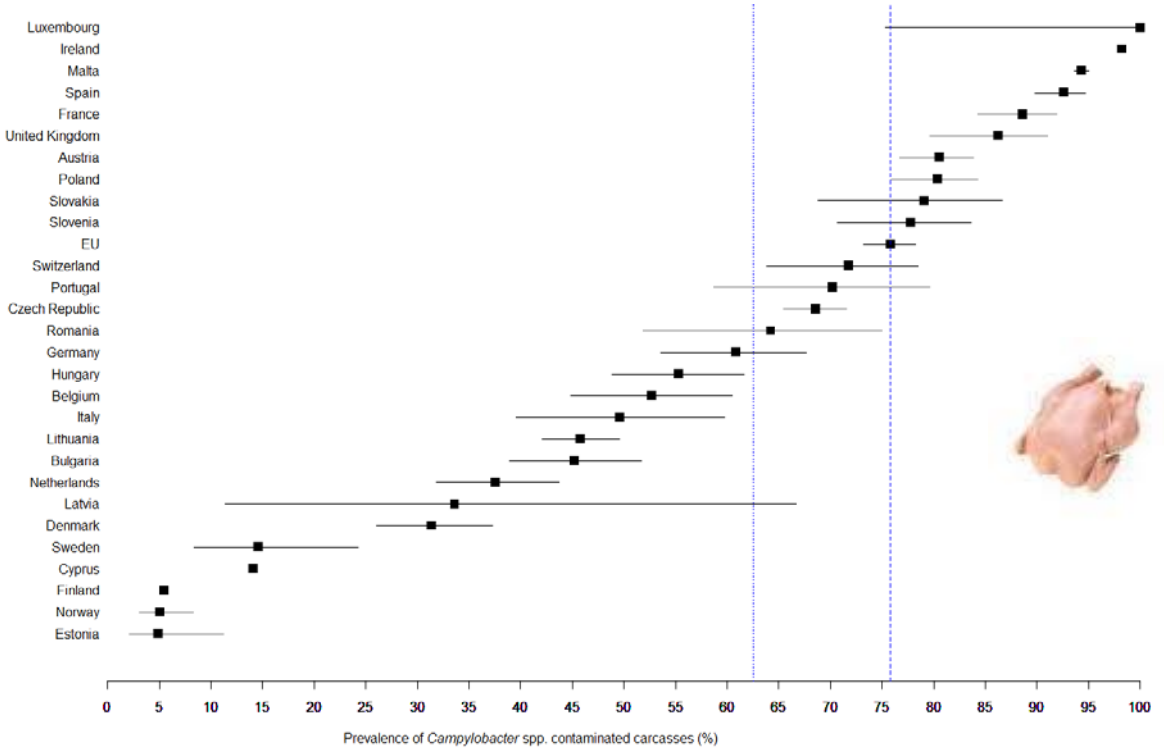
- *Background, EFSA*

- Legislative framework
  - > monitoring
  - > **surveying**

- *Campylobacter monitoring results along the food chain*

EU prevalence of *Campylobacter*-contaminated broiler carcasses, baseline survey, 2008

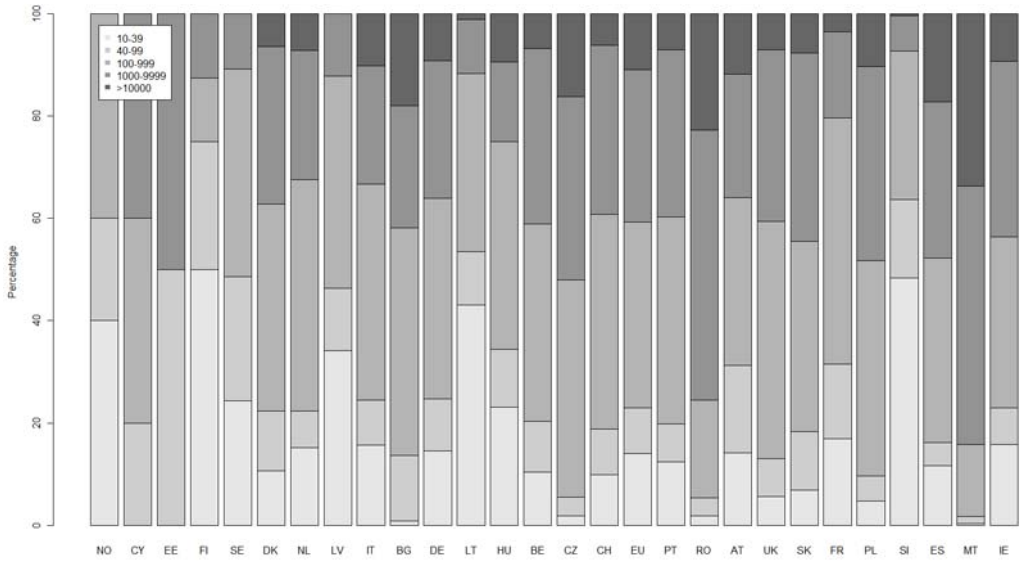
- At EU level the prevalence of *Campylobacter*-contaminated broiler carcasses was 75.8%
- The MS-specific prevalence varied from 4.9-100%
- By species:
  - 2/3 *C. jejuni*
  - 1/3 *C. coli*



https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2010.1503

Baseline survey 2008, *Campylobacter* counts, on broiler carcasses

- Distribution of *Campylobacter* counts on broiler carcasses:
  - 0-10 CFU/g: 47.0%
  - 10-99 CFU/g: 12.2%
  - 100-999 CFU/g: 19.3%
  - 1,000-10,000 CFU/g: 15.8%
  - >10,000 CFU/g: 5.8%



- Counts varied widely between MSs
- Tendency for high counts when high prevalence

Background *Campylobacter* PHC

- **high public health relevance** of *Campylobacter:* most frequently reported foodborne pathogen in the EU
- **broiler meat** identified as the main cause of campylobacteriosis cases (2011 EFSA opinion on "*Campylobacter* in broiler meat production: control options and performance objectives and/or targets at different stages of the food chain" (https://www.efsa.europa.eu/en/efsajournal/pub/2105)
- 2012 EFSA opinion the "public health hazards to be covered by inspection of poultry meat" (https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2012.2741) identified the need to address *Campylobacter* as a high priority. The **introduction of a Microbiological Criterion** for *Campylobacter* on broiler carcases at slaughterhouse was suggested:
  - if broiler meat <1,000 cfu/g → 50% public health risk reduction
- Setting PHC at slaughterhouse: **best cost-effective control option** (Cost-benefit analysis)

Reg. (EC) 2073/2005 *Campylobacter* PHC broiler carcases


REGULATIONS

COMMISSION REGULATION (EU) 2017/1495
of 23 August 2017
amending Regulation (EC) No 2073/2005 as regards Campylobacter in broiler carcases
(Text with EEA relevance)

COMMISSION REGULATION (EC) No 2073/2005

of 15 November 2005

on microbiological criteria for foodstuffs

(Text with EEA relevance)

(OJ L 338, 22.12.2005, p. 1)

Chapter 2. Process hygiene criteria

2.1 *Meat and products thereof*

Food category	Micro-organisms	Sampling plan (1)		Limits (2)		Analytical reference method (3)	Stage where the criterion applies	Action in case of unsatisfactory results
		n	c	m	M			
2.1.9 Carcases of broilers	*Campylobacter* spp.	50 (5)	c = 20 From 1.1.2020 c = 15; From 1.1.2025 c = 10	1 000 cfu/g		EN ISO 10272-2	Carcases after chilling	Improvements in slaughter hygiene, review of process controls, of animals' origin and of the biosecurity measures in the farms of origin

(5) The 50 samples shall be derived from 10 consecutive sampling sessions in accordance with the sampling rules and frequencies laid down in this Regulation.

<< Moving window

Interpretation of the test results

Campylobacter spp. in poultry carcases of broilers:

— satisfactory, if a maximum of c/n values are > m,

— unsatisfactory, if more than c/n values are > m.

In force for food business operators since 1 January 2018

Campylobacter PHC broiler carcases: reporting of data

COMMISSION IMPLEMENTING REGULATION (EU) 2019/627

of 15 March 2019

laying down uniform practical arrangements for the performance of official controls on products of animal origin intended for human consumption in accordance with Regulation (EU) 2017/625 of the European Parliament and of the Council and amending Commission Regulation (EC) No 2074/2005 as regards official controls

Article 36

Practical arrangements for official controls for *Campylobacter*

1. The competent authorities shall verify the correct implementation by food business operators of point 2.1.9 (process hygiene criterion for *Campylobacter* on carcases of broilers) of Chapter 2 of Annex I of Regulation (EC) No 2073/2005 by applying the following measures:

(a) official sampling using the same method and sampling area as food business operators. At least 49 random samples shall be taken in each slaughterhouse each year. This number of samples may be reduced in small slaughterhouses based on a risk evaluation; or

(b) collecting all information on the total number and the number of *Campylobacter* samples with more than 1 000 cfu/g taken by food business operators in accordance with Article 5 of Regulation (EC) No 2073/2005, in the framework of point 2.1.9 of Chapter 2 of Annex I thereto.

2. Where the food business operator fails on several occasions to comply with the process hygiene criterion, the competent authorities shall require it to submit an action plan and shall strictly supervise its outcome.

3. The total number and the number of *Campylobacter* samples with more than 1 000 cfu/g, differentiating between samples taken under points (a) and (b) in paragraph 1, when applied, shall be reported in accordance with Article 9(1) of Directive 2003/99/EC.

Reporting of data came into force on 14 December 2019 and will impact 2019 and 2020 data:
Campylobacter control is now part of official controls in poultry slaughterhouses, and specific data (3) need be reported.

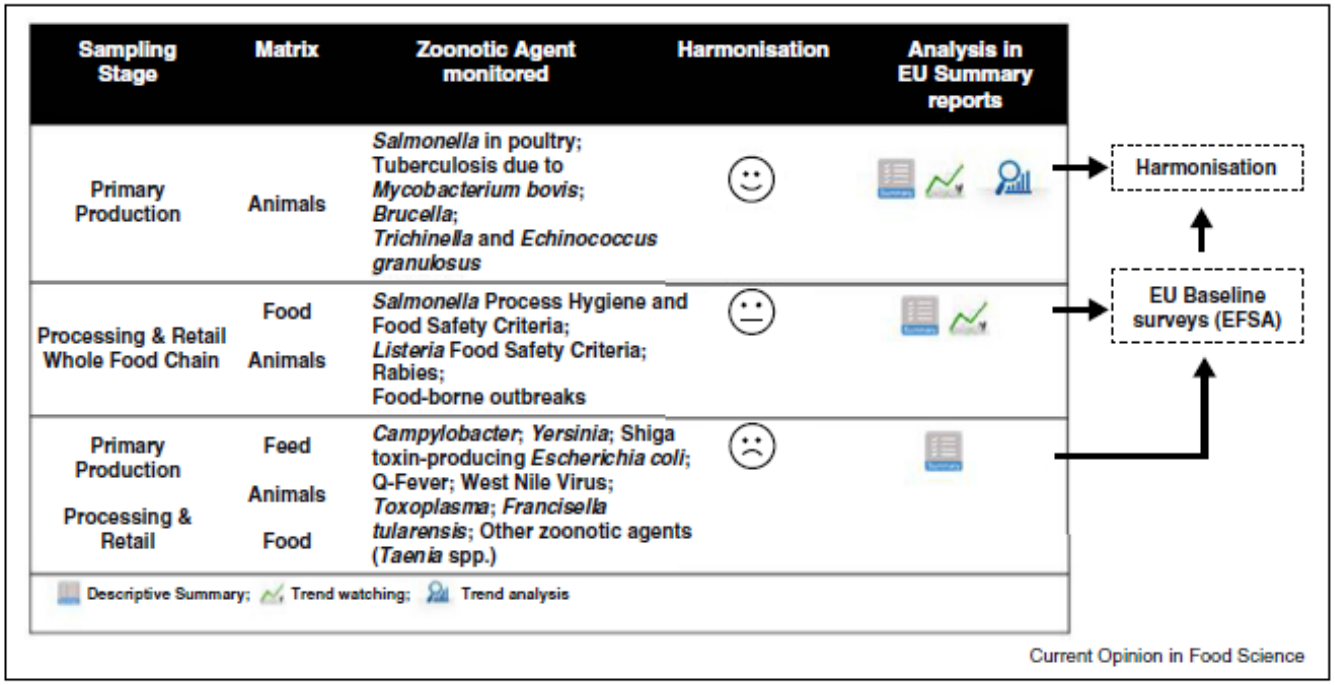
Still, reporting of campylobacteriosis is under Directive 2003/99/EC and applies already more than 10 years.
So, while official controls on *Campylobacter* ware more harmonised from end of 2019 on, monitoring and reporting was already mandatory (whatever way MS are carrying out such monitoring).

Outline

- *Background, EFSA*
- *Legislative framework*
- *Campylobacter* monitoring results along the food chain

Appropriate use of zoonoses monitoring data

The degree of harmonisation of the applied monitoring schemes and collected data limits the type of analysis that can be performed. Based on the obtained data, three main data categories can be distinguished:

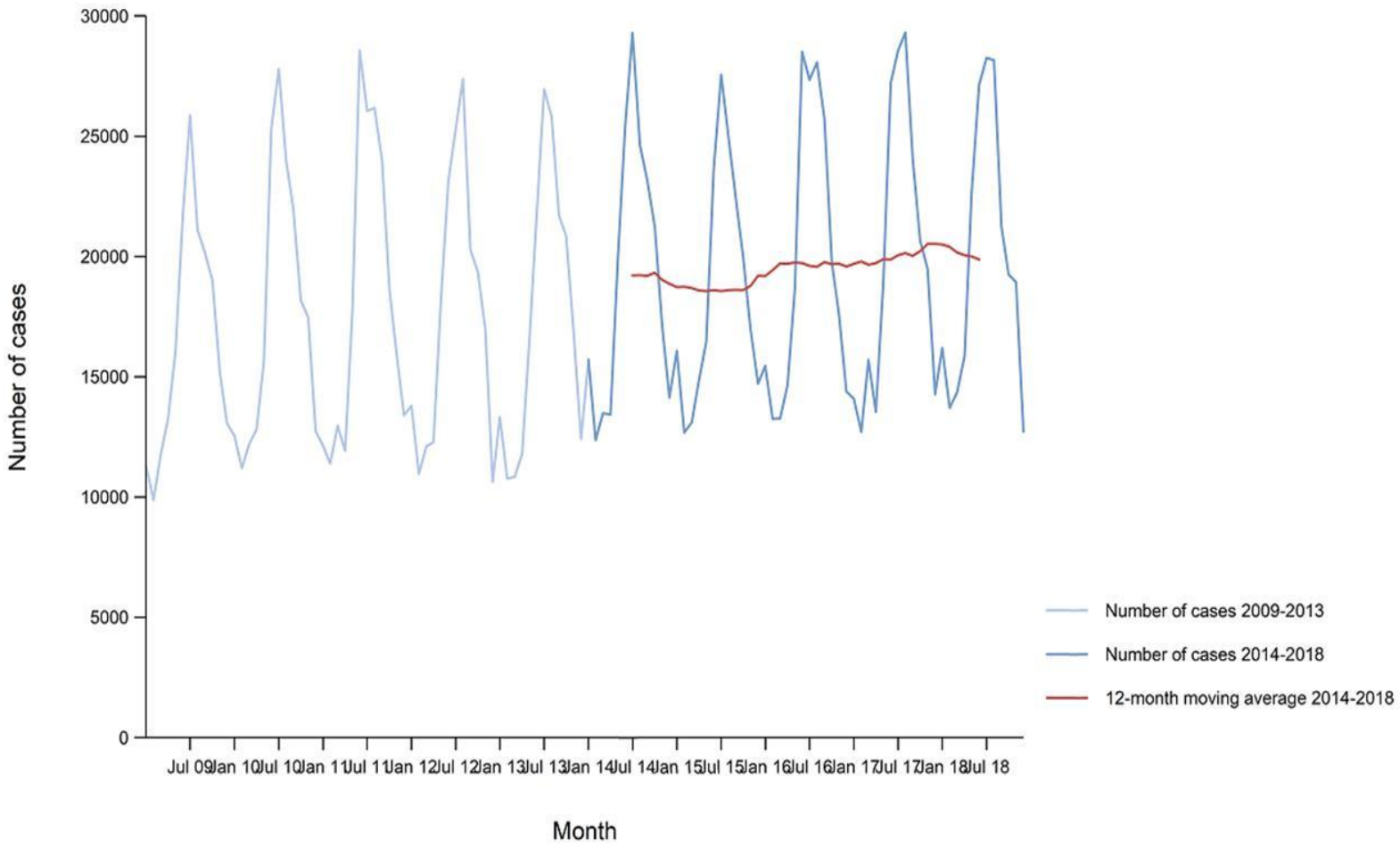


Categorisation of the zoonoses monitoring data and possible analyses as evaluated by EFSA. The data obtained in the EFSA Data Collection Framework can vary according the level of data quality and harmonisation. EFSA consistently proposed and analysed well-designed EU-wide baseline surveys on the occurrence of zoonotic agents and contributed to improved harmonisation of monitoring in the MS. Data can be divided into three main categories according the sampling stage, the matrices collected and the zoonotic agent monitored. The types of data analyses suggested by EFSA strongly depend on this level of harmonisation and can either be a descriptive summary, or trend-watching, or a full trend analysis of the monitoring data.

Current Opinion in Food Science 2016, **12**:52–62 www.sciencedirect.com

Campylobacteriosis in humans, EU, 2008-2018

Over the period from 2009 to 2018, a significant increasing trend was observed in EU/ EEA ($p < 0.05$), however, the trend was stable during 2014–2018



Campylobacteriosis FBO, by incriminated food vehicle

	2018				2017–2010	
Food vehicle	**Reporting MS**	**N strong-evidence FBO**	**% of total**	**Food vehicle**	**N strong-evidence FBO**	**% of total**
Milk	Germany (9), Sweden (1)	10	35.7	Broiler meat (*Gallus gallus*) and products thereof	106	44.4
Broiler meat (*Gallus gallus*) and products thereof	Austria (1), Belgium (1), Czech Republic (1), Germany (1), Italy (1), Spain (3), Sweden (1) and United Kingdom (1)	10	35.7	Milk	61	25.5
Mixed food	Austria, Finland and Italy	3	10.7	Other, mixed or unspecified poultry meat and products thereof	19	7.9
Other, mixed or unspecified poultry meat and products thereof	Finland and United Kingdom	2	7.1	Mixed food	11	4.6
Bovine meat and products thereof	France	1	3.6	Dairy products (other than cheeses)	5	2.1
Buffet meals	Finland	1	3.6	Other or mixed red meat and products thereof	5	2.1
Other or mixed red meat and products thereof	France	1	3.6	Pig meat and products thereof	5	2.1
Dairy products (other than cheeses)	–	–	–	Bovine meat and products thereof	4	1.7
Other or mixed red meat and products thereof	–	–	–	Other foods	4	1.7
Pig meat and products thereof	–	–	–	Meat and meat products	4	1.7
Other foods	–	–	–	Buffet meals	3	1.3
Meat and meat products	–	–	–	Cheese	3	1.3
Cheese	–	–	–	Turkey meat and products thereof	2	0.8
Turkey meat and products thereof	–	–	–	Unknown	2	0.8
Unknown	–	–	–	Eggs and egg products	1	0.4
Eggs and egg products	–	–	–	Fish and fish products	1	0.4
Fish and fish products	–	–	–	Fruit, berries and juices and other products thereof	1	0.4
Fruit, berries and juices and other products thereof	–	–	–	Sheep meat and products thereof	1	0.4
Sheep meat and products thereof	–	–	–	Vegetables and juices and other products thereof	1	0.4
Vegetables and juices and other products thereof	–	–	–	Other or mixed red meat and products thereof	–	–
Total		28	100	**Total**	239	100

Campylobacter, key facts 2018

- Campylobacteriosis is the **most commonly** reported gastrointestinal disease in humans in the EU and has been so since 2005.
- In 2018, the number of confirmed cases of human campylobacteriosis was 246,571 corresponding to an EU notification rate of 64.1 per 100,000 population.
- The trend for **campylobacteriosis** in humans **remained stable during 2014-2018**.
- Most cases (93.8%) with known origin of infection were of EU origin.
- In total, 524 **food-borne (N=522) and waterborne (N=2) campylobacteriosis outbreaks** with 2,335 human cases were reported at the EU level in 2018. The most common sources for the FBOs were **milk** and **broiler meat**, as in previous years.
- *Campylobacter* process hygiene criterion : see further.
- Twenty-five MS reported 2018 general monitoring data on *Campylobacter* in food with the highest proportion of test-positive units observed in **fresh meat from broilers (37.5%)**, as during previous 4 year.
- Nineteen MS reported 2018 data on *Campylobacter* in animals, mainly from broilers (14 MS), turkeys (4 MS) and from bovine animals (9 MS): the highest overall occurrence was observed in **turkeys (71.6%)**.

Campylobacter PHC monitoring results, 2017 and 2018

Datasets that are summarised at EU- and MS-level for trend watching over time are the proportion (%) of positive single samples, taken by the Competent Authorities (Sampler = 'Official sampling').

For the year 2017 : **Spain** was the only MS that already reported quantitative monitoring data collected according to the PHC. Of the **150 neck skin samples** from chilled broiler carcasses, 66 **(44%) exceeded the limit and tested ≥1,000 CFU/g** of which 53 (84%) ranged between 1,000 and 10,000 CFU/g and 13 tested >10,000 CFU/g. Overall, 56 samples out of the 66 that exceeded the limit of 1,000 CFU/g were reported as *C. jejuni*.

For the year 2018 : **ten MS** reported 2018 food data collected in the context of the *Campylobacter* PHC. Of the 3,746 neck skin samples from chilled broiler carcasses, 34.6% tested positive. Eight of the 10 MS (Bulgaria, Cyprus, Denmark, Estonia, France, Poland, Romania and Spain) provided quantified results and overall **18.4% of 2,403 tested samples exceeded the limit of 1,000 CFU/g**. However, the MS-specific percentage of quantified results exceeding that limit varied widely and ranged from absence to 100%.

>>> Harmonised data from official controls on *Campylobacter* from year 2020 (data) onward.

For info : further published EFSA outputs

- Scientific opinion Update and review of control options for *Campylobacter* in broilers at primary production
  https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2020.6090

- Modelling approach for control options affecting the *Campylobacter* concentration in the caecal content of broilers
  https://zenodo.org/record/4024362#.X23D72gzbD4

- APHA/FSA monitoring programme for *Campylobacter* in broiler flocks and broiler carcases in the UK (2012-2017) (FS241051, FS101126)
  https://zenodo.org/record/3742190#.X23EX2gzbD4

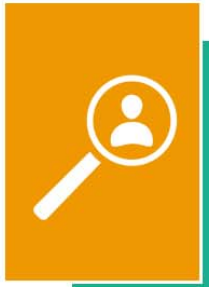
Outline

Thank you for your attention !

Stay connected

Subscribe to

efsa.europa.eu/en/news/newsletters
efsa.europa.eu/en/rss



Receive job alerts

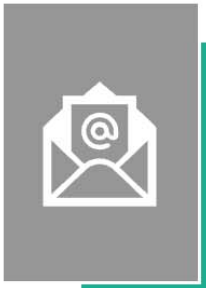
careers.efsa.europa.eu – job alerts

Follow us on Twitter

@efsa_eu
@plants_efsa
@methods_efsa
@animals_efsa

Follow us Linked in

Linkedin.com/company/efsa



Contact us

efsa.europa.eu/en/contact/askefsa