Annual Workshop Italian NRL-AR, 19/11/2026

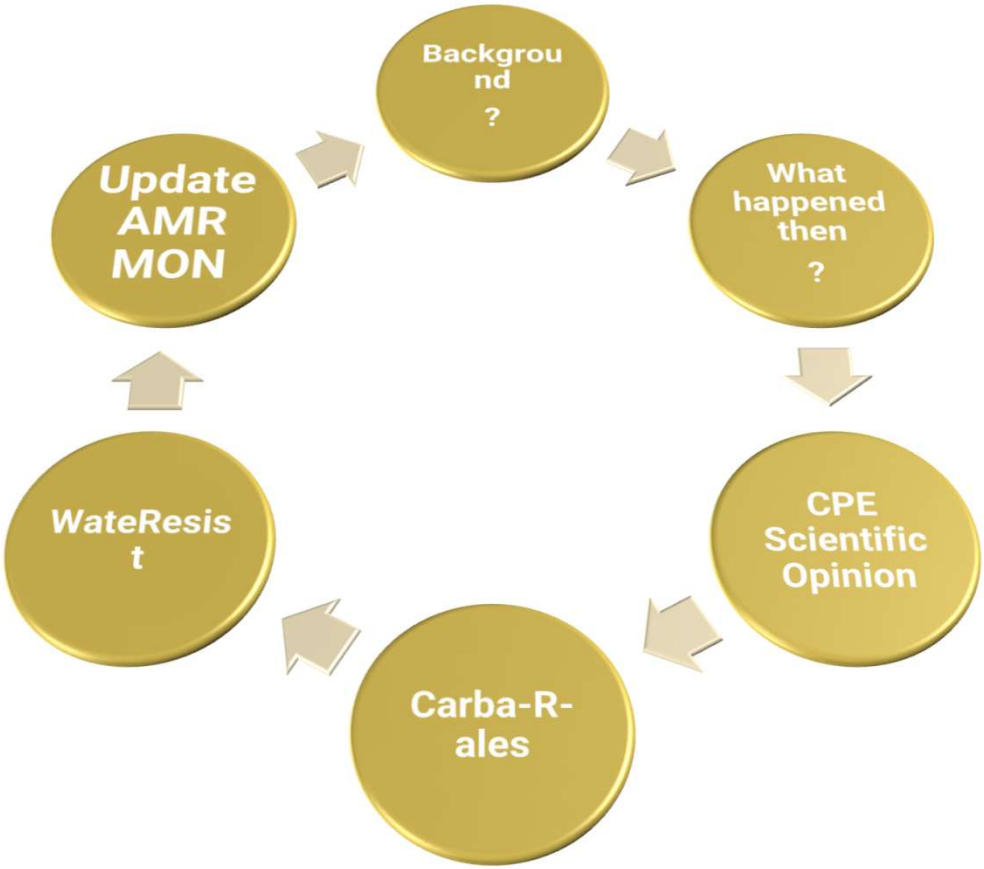


Carbapenemase-producing Enterobacteriales in the food Chain, EU/EFTA

Beatriz Guerra *et al.*

efsa
EUROPEAN FOOD SAFETY AUTHORITY

OUTLINE


Backgrou
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What
happened
then
?
CPE
Scientific
Opinion
Carba-R-
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WateResis
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Update
AMR
MON

Background:
Once upon a time…

CPE EU LIVESTOCK, FROM 2011 ON….

J Antimicrob Chemother 2012
doi:10.1093/jac/dks108
Advance Access publication 27 March 2012

Escherichia coli producing VIM-1 carbapenemase isolated on a pig farm

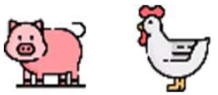
Jennie Fischer[1], Irene Rodríguez[1], Silvia Schmoger[1], Anika Friese[2], Uwe Roesler[2], Reiner Helmuth[1] and Beatriz Guerra[1]*



J Antimicrob Chemother 2013
doi:10.1093/jac/dks393
Advance Access publication 2 October 2012

Salmonella enterica subsp. *enterica* producing VIM-1 carbapenemase isolated from livestock farms

Jennie Fischer[1], Irene Rodríguez[1], Silvia Schmoger[1], Anika Friese[2], Uwe Roesler[2], Reiner Helmuth[1] and Beatriz Guerra[1]*



efsa
European Food Safety Authority

EFSA Journal 2013;11(12):3501

SCIENTIFIC OPINION

Scientific Opinion on Carbapenem resistance in food animal ecosystems[1]

EFSA Panel on Biological Hazards (BIOHAZ)[2, 3]

European Food Safety Authority (EFSA), Parma, Italy

AQUACULTURE, COMPANION ANIMALS, WILDLIFE….

An overview of carbapenem-resistant organisms from food-producing animals, seafood, aquaculture, companion animals, and wildlife

Flor Y. Ramírez-Castillo[1], Alma L. Guerrero-Barrera[1]* and Francisco J. Avelar-González[2]

Table 2. Occurrence of carbapenemase-encoding genes in seafood and aquaculture.

https://www.frontiersin.org/articles/10.3389/fvets.2023.1158588/full

Year	Animal origen	Country	Bacteria	Carbapenemase-encoding genes	References
2013	Fish	Algeria	*A. baumannii*	bla_{OXA-23}	(34)
2014	Squid	Canada	*Pseudomonas fluorescens*-like	bla_{VIM-2}	(37)
2015	Squid, sea squirt, seafood medley, clam	Canada	*Stenotrophomonas maltophilia, Myroides odoratimimus, Stenotrophomonas* spp., and *P. putida*	bla_{OXA-48}	(36)
	Retail seafood	Originated from Korea and China			
2015	Shrimp	Canada	*E. cloacae*	bla_{IMI-1}	(38)
	Retail seafood			bla_{NDM-1}	
				bla_{OXA-1}	
2015	Shrimp	Canada	*E. aerogenes*	bla_{IMI-2}	(38)
	Retail seafood				
2016	Shrimp	Canada	*V. cholerae*	bla_{VCC-1}	(39)
	Retail seafood				
2016	Venus clam	Italy	*E. coli* ST10	bla_{VIM-1}	(40)
2016	Oyster	Tunisia	*A. baumannii*	bla_{OXA-23}	(47)
2016	Fish	Algeria	*A. baumannii*	bla_{OXA-23}	(34)
2016	Bivalves (oyster)	Tunisia	*A. baumannii*	bla_{OXA-23}	(46)
2018	Fish	India	*Enterobacteriacae (K. pneumoniae, E. coli)*	bla_{NDM-1}	(40)
	Retail seafood			bla_{NDM-2}	
				bla_{NDM-5}	
2018	Shirmp	France	*V. parahaemolyticus*	bla_{NDM-1}	(48)
2018	Abalone	Taiwan	*S. algae*	bla_{OXA-55}	(51)
2019	Hard clam	Taiwan	*S. algae*	bla_{OXA-55}	(52)
2019	White shrimp	The Netherlands	*E. cloacae* complex	bla_{IMI-2}	(33)
	Retail seafood	Originated in India		bla_{FLC-2}	
2019	Shrimp	China	*V. alginolyticus*	bla_{VIM-1}	(31)
	Retail seafood		*V. parahaemolyticus*	bla_{NDM-1}	
			V. vulnificus	bla_{NDM-1}	
2019	Hard-shelled mussel	Korea	*Vibrio* spp.	bla_{OXA}	(43)
	Retail seafood				
2020	Tilapia fish	Egypt	*E. coli*	bla_{OXA-48}	(50)
	Fish farm		*E. cloacae* complex	bla_{NDM}	
			K. pneumoniae	bla_{KPC}	
2020	Fish	Italy	*S. algae*	bla_{OXA-55}	(53)
	Aquaculture farms				
2020	Shrimp	China	*V. alginolyticus*	bla_{VMB-1}	(15)
	Retail seafood				
2021	Shrimp	China	*V. diabolicus*	bla_{VMB-2}	(32)
	Retail seafood				
2021	Shrimp	China	*V. alginolyticus*	bla_{VAM-1}	(17)



Antimicrobial Agents and Chemotherapy

LETTER TO THE EDITOR

Enterobacter cloacae Complex Isolated from Shrimps from Vietnam Carrying bla_{IMI-1} Resistant to Carbapenems but Not Cephalosporins

Michael S. M. Brouwer,[a] Michel Rapallini,[b] Yvon Geurts,[a] Frank Harders,[a] Alex Bossers,[a] Dik J. Mevius,[a,c] Ben Wit,[b] Kees T. Veldman[a]

Veterinary Microbiology 256 (2021) 109045

Contents lists available at ScienceDirect

Veterinary Microbiology

journal homepage: www.elsevier.com/locate/vetmic

ELSEVIER

Short communication

Carbapenemase IncF-borne bla_{NDM-5} gene in the *E. coli* ST167 high-risk clone from canine clinical infection, Italy

Patricia Alba [a], Roberta Taddei [b], Gessica Cordaro [a], Maria Cristina Fontana [b], Elena Toschi [b], Paolo Gaibani [c], Ilaria Marani [a], Angelo Giacomi [a], Elena L. Diaconu [a], Manuela Iurescia [a], Virginia Carfora [a], Alessia Franco [a,*]

J Antimicrob Chemother 2022; **77**: 1263–1271
https://doi.org/10.1093/jac/dkac041 Advance Access publication 28 February 2022

Journal of Antimicrobial Chemotherapy

Comparative phylogenomics of ESBL-, AmpC- and carbapenemase-producing *Klebsiella pneumoniae* originating from companion animals and humans

Raquel Garcia-Fierro [1], Antoine Drapeau[1], Melody Dazas[1], Estelle Saras[1], Carla Rodrigues [2], Sylvain Brisse [2], Jean-Yves Madec[1] and Marisa Haenni [1*]

Eur J Clin Microbiol Infect Dis (2018) 37:587–604
https://doi.org/10.1007/s10096-017-3112-7

REVIEW

OXA-48-like carbapenemases producing *Enterobacteriaceae* in different niches

Assia Mairi[1,2] · Alix Pantel[2,3] · Albert Sotto[2] · Jean-Philippe Lavigne[2,3] · Aziz Touati[1]

What was done? Surveillance, isolation/detection methods

REGULATORY BACKGROUND

COMMISSION IMPLEMENTING DECISION (EU) 2020/1729

of 17 November 2020

on the monitoring and reporting of antimicrobial resistance in zoonotic and commensal bacteria and repealing Implementing Decision 2013/652/EU

Commission Implementing Decision (EU) 2013/652 (12 November 2013-December 2020)

Commission Implementing Decision (EU) 2020/1729 (1 January 2021-December 2027)

Monitoring of ESBLs, AmpC, Carbapenemase-producing microorganisms:

- Routine Monitoring in *Salmonella*, *E. coli* (AMR MON)
- Specific Monitoring ESBL/AmpC/Carbapenemase-producing *E.coli* (ESBL MON)
- Specific Monitoring Carbapenemase-producing *E. coli* (CARBA MON)

In 2024/26/



In 2025/27



Icons: https://www.flaticon.com/

REGULATORY BACKGROUND

COMMISSION IMPLEMENTING DECISION (EU) 2020/1729

of 17 November 2020

on the monitoring and reporting of antimicrobial resistance in zoonotic and commensal bacteria and repealing Implementing Decision 2013/652/EU

Table 5

Panel of antimicrobial substances, EUCAST epidemiological cut-off values (ECOFFs) and clinical resistance breakpoints and concentrations ranges to be used for testing only *Salmonella* spp. and *E. coli* isolates resistant to cefotaxime or ceftazidime or meropenem – (Second panel)

Antimicrobial	Class of antimicrobial	Species	Interpretative thresholds of AMR (mg/L)		Range of concentrations (mg/L) (No of wells in brackets)
			ECOFF	Clinical breakpoint	
Cefepime	Cephalosporin	*Salmonella*	NA	> 4	0,06-32 (10)
		E. coli	> 0,125	> 4	
Cefotaxime	Cephalosporin	*Salmonella*	> 0,5	> 2	0,25-64 (9)
		E. coli	> 0,25	> 2	
Cefotaxime + clavulanic acid	Cephalosporin/ beta-lactamase inhibitor combination	*Salmonella*	NA	NA	0,06-64 (11)
		E. coli	> 0,25	NA	
Cefoxitin	Cephamycin	*Salmonella*	> 8	NA	0,5-64 (8)
		E. coli	> 8	NA	
Ceftazidime	Cephalosporin	*Salmonella*	> 2	> 4	0,25-128 (10)
		E. coli	> 0,5	> 4	
Ceftazidime+clavulanic acid	Cephalosporin// beta-lactamase inhibitor combination	*Salmonella*	NA	NA	0,125-128 (11)
		E. coli	> 0,5	NA	
Ertapenem	Carbapenem	*Salmonella*	NA	> 0,5	0,015-2 (8)
		E. coli	NA	> 0,5	
Imipenem	Carbapenem	*Salmonella*	> 1	> 4	0,12-16 (8)
		E. coli	> 0,5	> 4	
Meropenem	Carbapenem	*Salmonella*	> 0,125	> 8	0,03-16 (10)
		E. coli	> 0,125	> 8	
Temocillin	Penicillin	*Salmonella*	> NA	NA	0,5-128 (9)
		E. coli	> 16	NA	

NA: not available

MEM-R ≥ 0.25

Categorisation as presumptive ESBL-, AmpC- or CP-producers



Phenotype

OR



WGS (from 2021)

Table 1. Clinical breakpoints and screening cut-off values for carbapenemase-producing Enterobacteriaceae (according to EUCAST methodology).

Carbapenem	MIC (mg/L)		Disk diffusion zone diameter (mm) with 10 µg disks	
	S/I breakpoint	Screening cut-off	S/I breakpoint	Screening cut-off
Meropenem[1]	≤2	>0.125	≥22	<28[2]
Ertapenem[3]	≤0.5	>0.125	≥25	<25

ResFinder

Version

EFSA_2

Icons: https://www.flaticon.com/

EURL-AR ISOLATION METHOD

ESBL-, ampC- and carbapenemase-producing E. coli

- Isolation of ESBL, ampC and carbapenemase-producing E. coli from caecal samples (Version 9, December 2024) (PDF document, 350 KB)
- Isolation of ESBL, ampC and carbapenemase-producing E. coli from fresh meat (version 9, December 2024) (PDF document, 350 KB)
- Validation of selective and indicative agar plates for monitoring of carbapenemase-producing E. coli (PDF document, 50 KB)

https://www.food.dtu.dk/english/topics/antimicrobial-resistance/eurl-ar/protocols

frontiers | Frontiers in Microbiology
TYPE Methods
PUBLISHED 09 August 2023
DOI 10.3389/fmicb.2023.1229542

Evaluation and validation of laboratory procedures for the surveillance of ESBL-, AmpC-, and carbapenemase-producing *Escherichia coli* from fresh meat and caecal samples

Rene S. Hendriksen[1]*, Lina M. Cavaco[2], Beatriz Guerra[3], Valeria Bortolaia[2], Yvonne Agersø[4], Christina Aaby Svendsen[1], Hanne Nørgaard Nielsen[1], Jette Sejer Kjeldgaard[1], Susanne Karlsmose Pedersen[1], Mette Fertner[1] and Henrik Hasman[2]

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10445139/pdf/fmicb-14-1229542.pdf

Pre-enrichment
Peptone water
37°C
→ Selective chromogenic agar with carbapenems



Member States/EFTA

Approved: 9 January 2026

DOI: 10.2903/j.efsa.2026.9887

SCIENTIFIC REPORT

The European Union Summary Report on Antimicrobial Resistance in zoonotic and indicator bacteria from humans, animals and food in 2023–2024

European Food Safety Authority (EFSA) | European Centre for Disease Prevention and Control (ECDC)







Categorisation as presumptive ESBL-, AmpC- or CP-producers



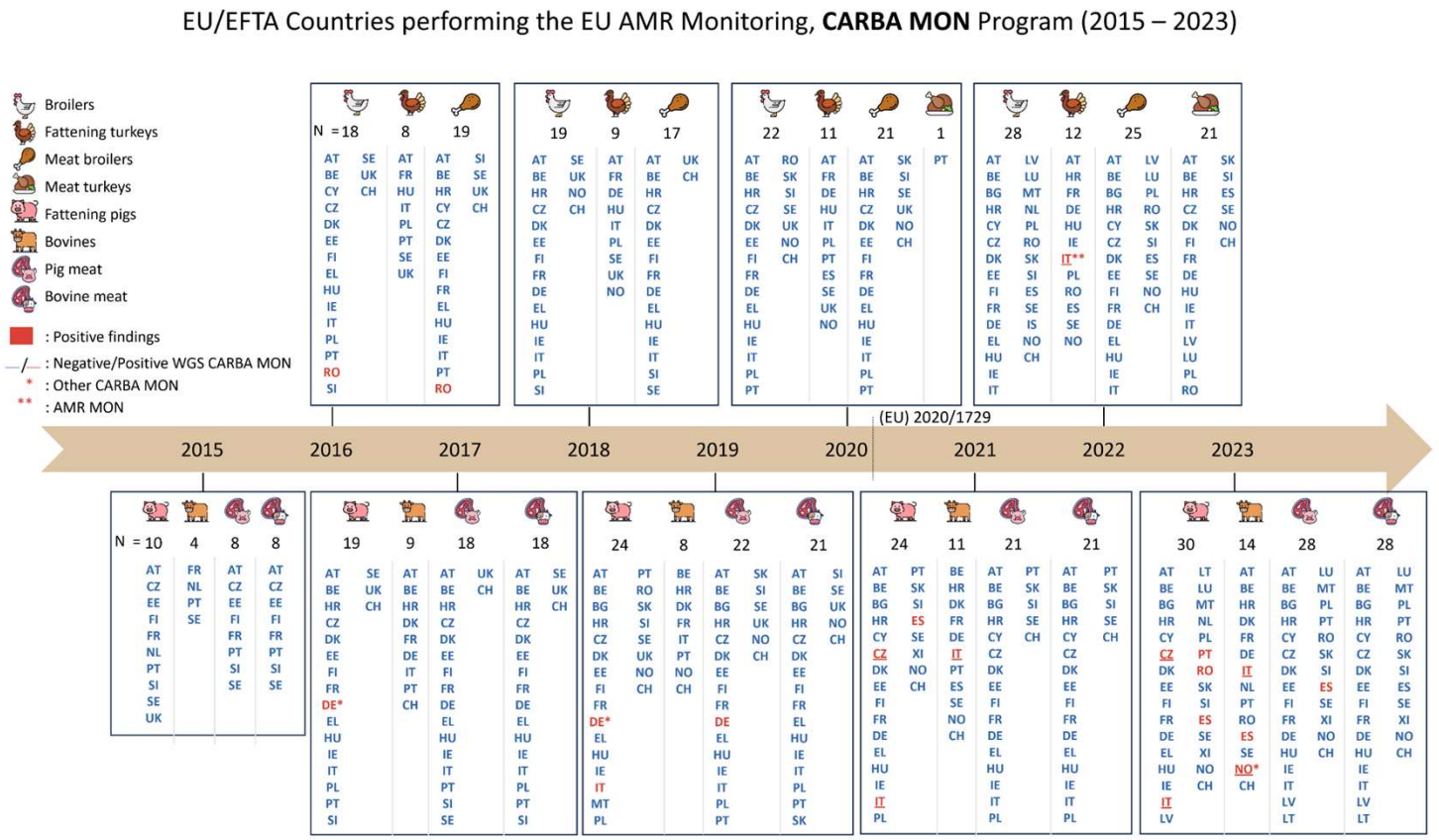
Phenotype

OR



WGS (from 2021)

EU/EFTA COUNTRIES PERFORMING SPECIFIC CARBA MON



AT: Austria, BE: Belgium, BG: Bulgaria, HR: Croatia, CY: Cyprus, CZ: Czechia, DK: Denmark, EE: Estonia, FI: Finland, FR: France, DE: Germany, EL: Greece, HU: Hungary, IE: Ireland, IT: Italy, LV: Latvia, LT: Lithuania, LU: Luxembourg, MT: Malta, NL: The Netherlands, PL: Poland, PT: Portugal, RO: Romania, SK: Slovakia, SI: Slovenia, ES: Spain, SE: Sweden, UK/XI: United kingdom/Northern Ireland[24], IS: Iceland, NO: Norway, CH: Switzerland

*The positives isolates were found in the Other CARBA MON. The positive from DE 2019 was isolated from a pig farm and the positive from NO was isolated from a dairy cow.

** The positive isolate was from WGS CARBA MON and WGS AMR MON for IT 2022.

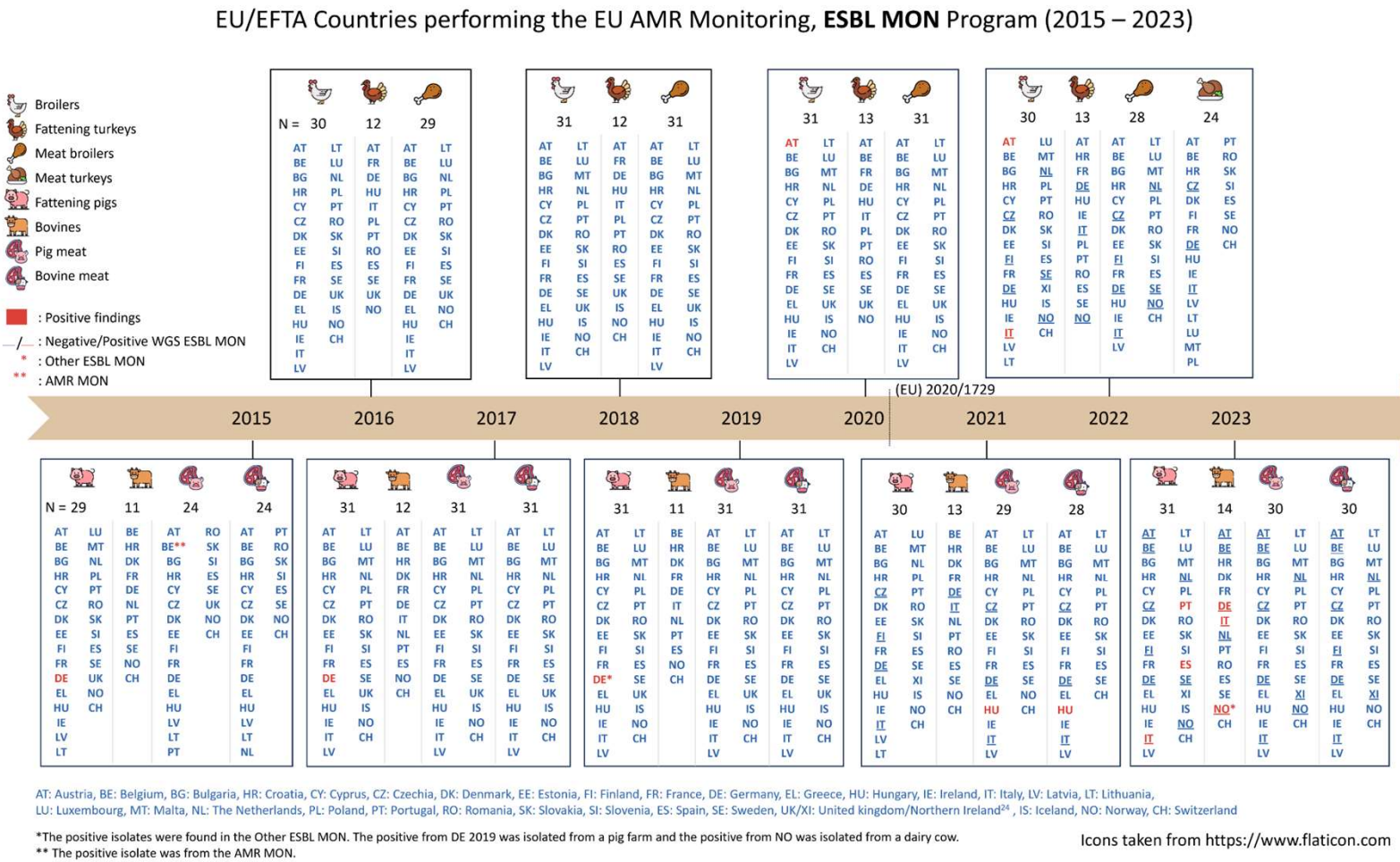
Icons taken from https://www.flaticon.com

Commission Implementing Decision (EU) 2013/652

Commission Implementing Decision (EU) 2020/1729

Selective plates with carbapenem

EU/EFTA COUNTRIES PERFORMING SPECIFIC ESBL MON



Commission Implementing Decision (EU) 2013/652

Commission Implementing Decision (EU) 2020/1729

Selective plates with cefotaxime

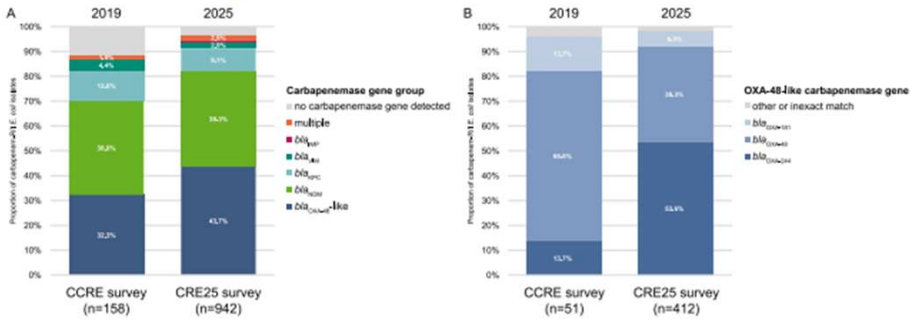
CPE PUBLIC HEALTH IMPORTANCE IN EU/EEA…



https://www.ecdc.europa.eu/en/publications-data/rapid-risk-assessment-carbapenem-resistant-enterobacterales-fourth-update

- **Carbapenem resistance in Enterobacterales** *-Klebsiella pneumoniae* and *Escherichia coli* - **significant threat to patients and healthcare systems**

Figure 3. Distribution of carbapenemase gene groups (A) and OXA-48-like carbapenemase gene variants (B) in carbapenem-R/I *Escherichia coli* isolates in 29 countries that submitted data for the CCRE and the CRE25 surveys



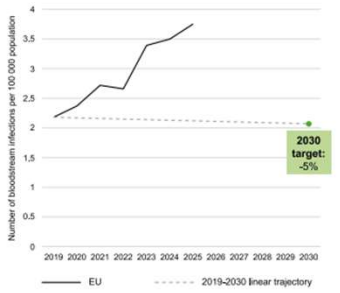


https://www.ecdc.europa.eu/sites/default/files/documents/OXA-244-producing-E-coli-in-EU-EEA-since-2013-first-update.pdf



https://www.ecdc.europa.eu/sites/default/files/documents/Increase-E-coli-isolates-blaNDM-5-EU-EEA-may2023.pdf

Figure 2. Estimated incidence of bloodstream infections with carbapenem-resistant *Klebsiella pneumoniae*, EU, 2019–2025



https://www.ecdc.europa.eu/en/publications-data/rapid-risk-assessment-carbapenem-resistant-enterobacterales-fourth-update

EFSA’s CPE Scientific Opinion

CPE ASSESSMENT (BIOHAZ PANEL MANDATE 3 YEARS) – PART 1

Adopted: 12 March 2025
DOI: 10.2903/j.efsa.2025.9336

SCIENTIFIC OPINION

efsa JOURNAL

Occurrence and spread of carbapenemase-producing Enterobacterales (CPE) in the food chain in the EU/EFTA. Part 1: 2025 update

EFSA BIOHAZ Panel (EFSA Panel on Biological Hazards) | Ana Allende | Avelino Álvarez-Ordóñez | Valeria Bortolaia | Sara Bover-Cid | Alessandra De Cesare | Wietske Dohmen | Laurent Guillier | Lieve Herman | Liesbeth Jacxsens | Lapo Mughini-Gras | Maarten Nauta | Jakob Ottoson | Fernando Pérez-Rodríguez | Panagiotis Skandamis | Elisabetta Suffredini | Hector Argüello | Johan Bengtsson-Palme | Alessandra Carattoli | Anke Kohlenberg | Dominique L. Monnet | Laurent Poirel | Beatriz Guerra | Raquel García-Fierro | Ernesto Liébana | Sonagnon Martin Goudjihounde | Núria Ferrer-Bustins | Hanne Rabbås | Luisa Peixe

https://doi.org/10.2903/j.efsa.2025.9336

To address ToR1 and part of ToR3...

AQ1: Current status?

- *Occurrence, temporal distribution, geographical distribution, sources, genes, bacteria, clones, mobile genetic elements*

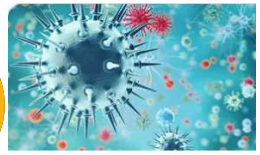
AQ2: Transmission dynamics?

- *Documented transmission routes, risk factors*

AQ3: Methods in use?

- *Detection and characterization*

AQ4: Contingency/mitigation/control plans?



Biological Hazards



CPE WG

ecdc EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

In collaboration with:

European Commission

EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH



Member States/EFTA

DATA AND METHODOLOGY

EUSurvey :



Member States/EFTA





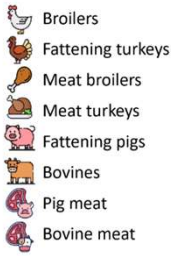




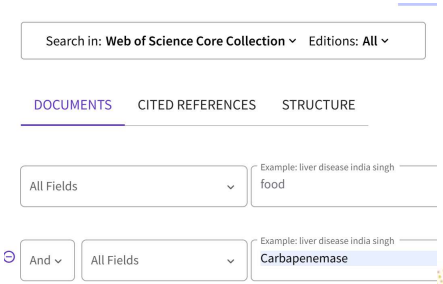
EUSR-AMR and EFSA data:



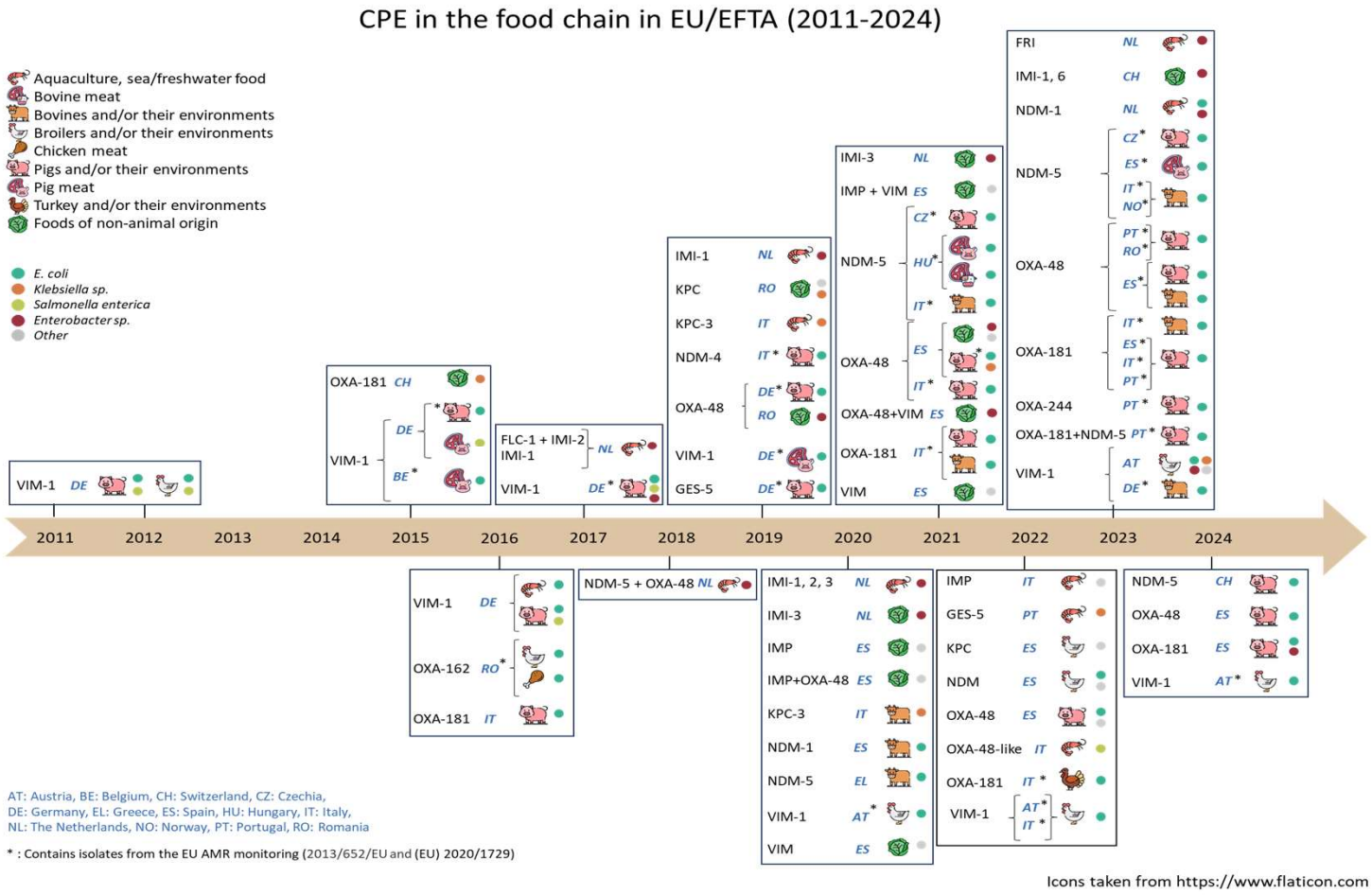




Lit. searches 2011-Febr. 2025:

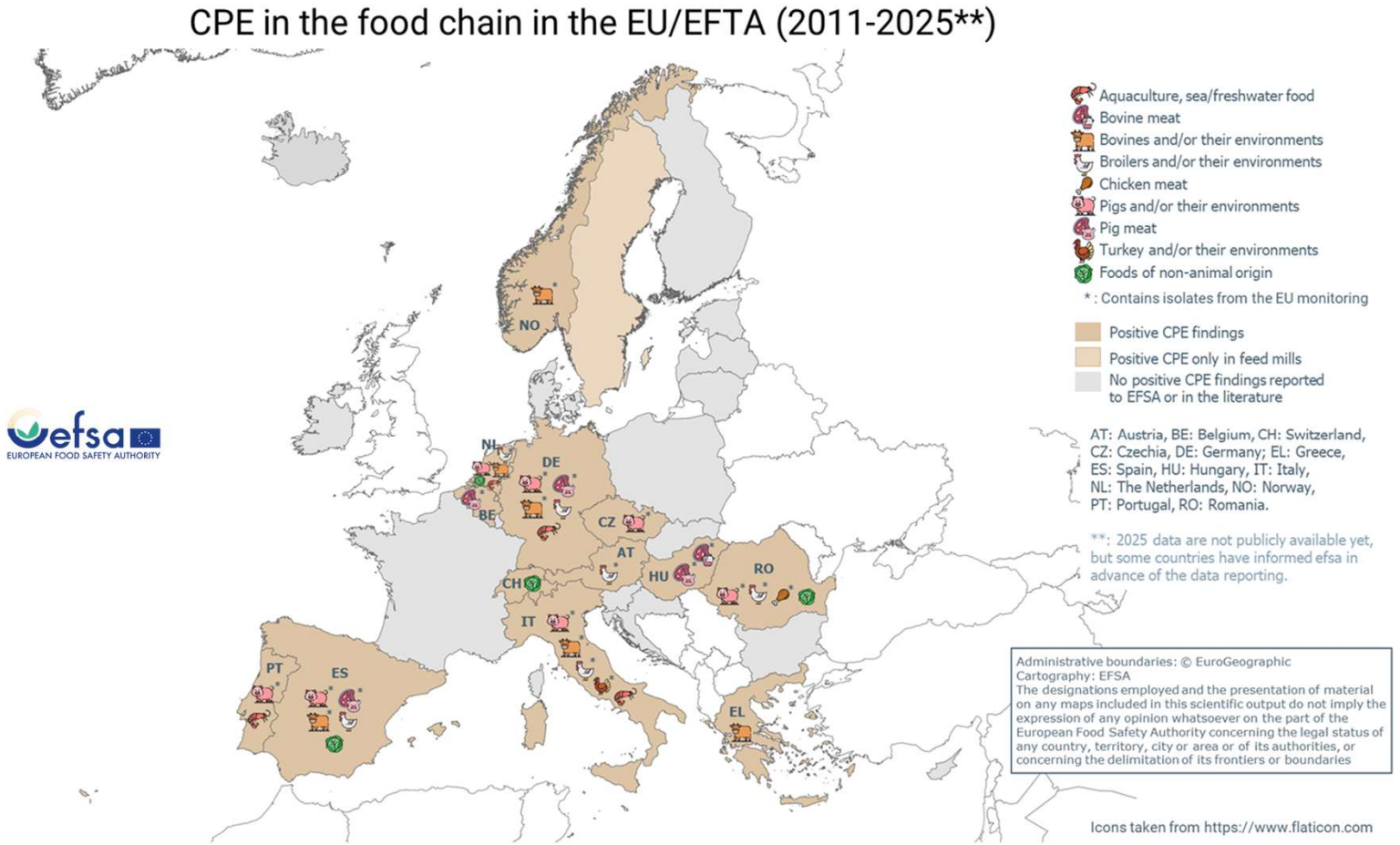


TEMPORAL DISTRIBUTION (AQ1)



- Increase in number of reports, mainly from pigs, with a surge in 2021 (*bla*$_{OXA-181}$, Italy) and 2023 (*bla*$_{OXA-48}$, Spain; *bla*$_{OXA-181}$, *bla*$_{OXA-48}$, *bla*$_{OXA-244}$ and *bla*$_{NDM-5}$, Portugal).

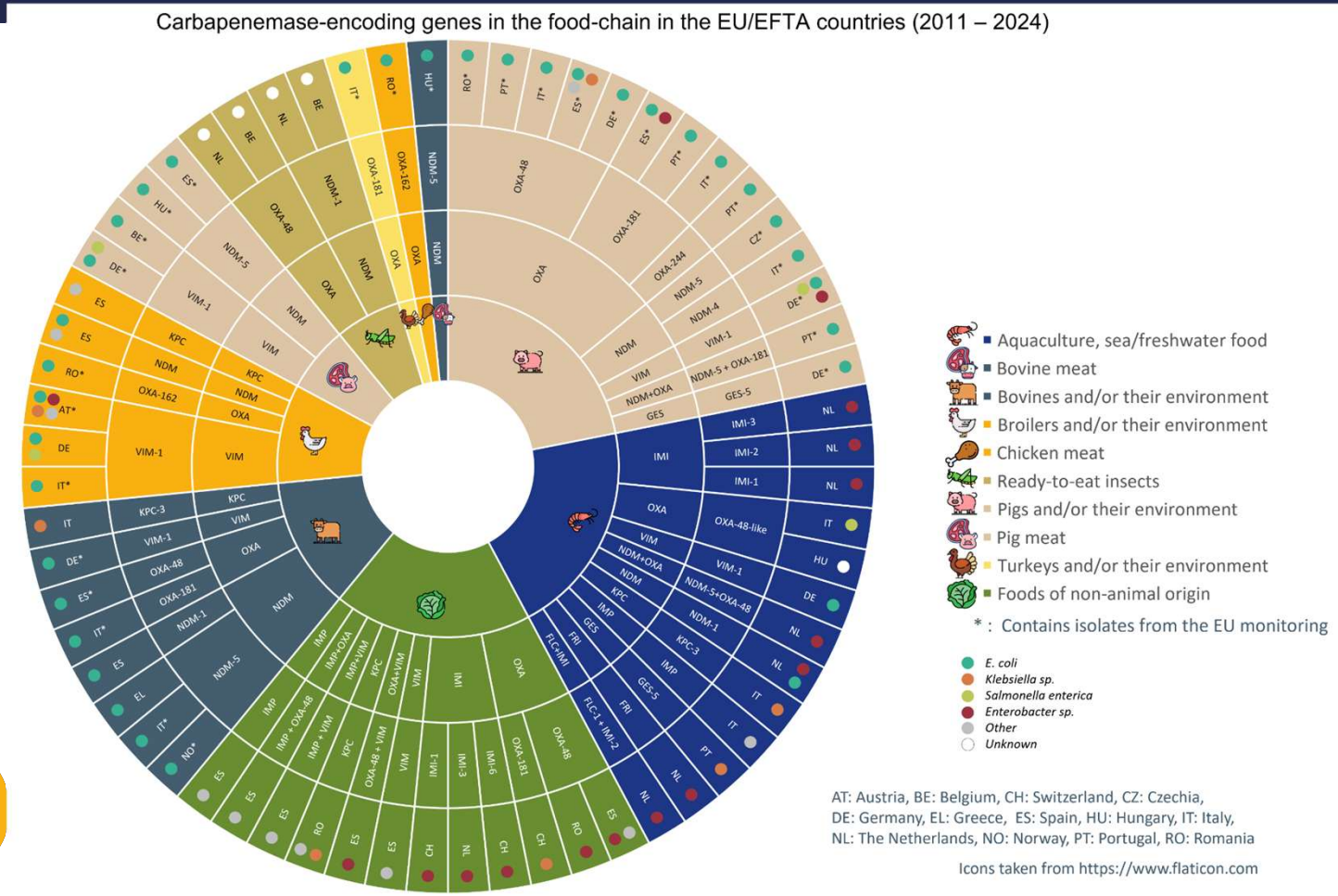
GEOGRAPHICAL DISTRIBUTION (AQ1, UPDATED WITH FEW 2025 DATA)



Reported in 14 EU/EFTA countries (12 of them through the EU monitoring)…

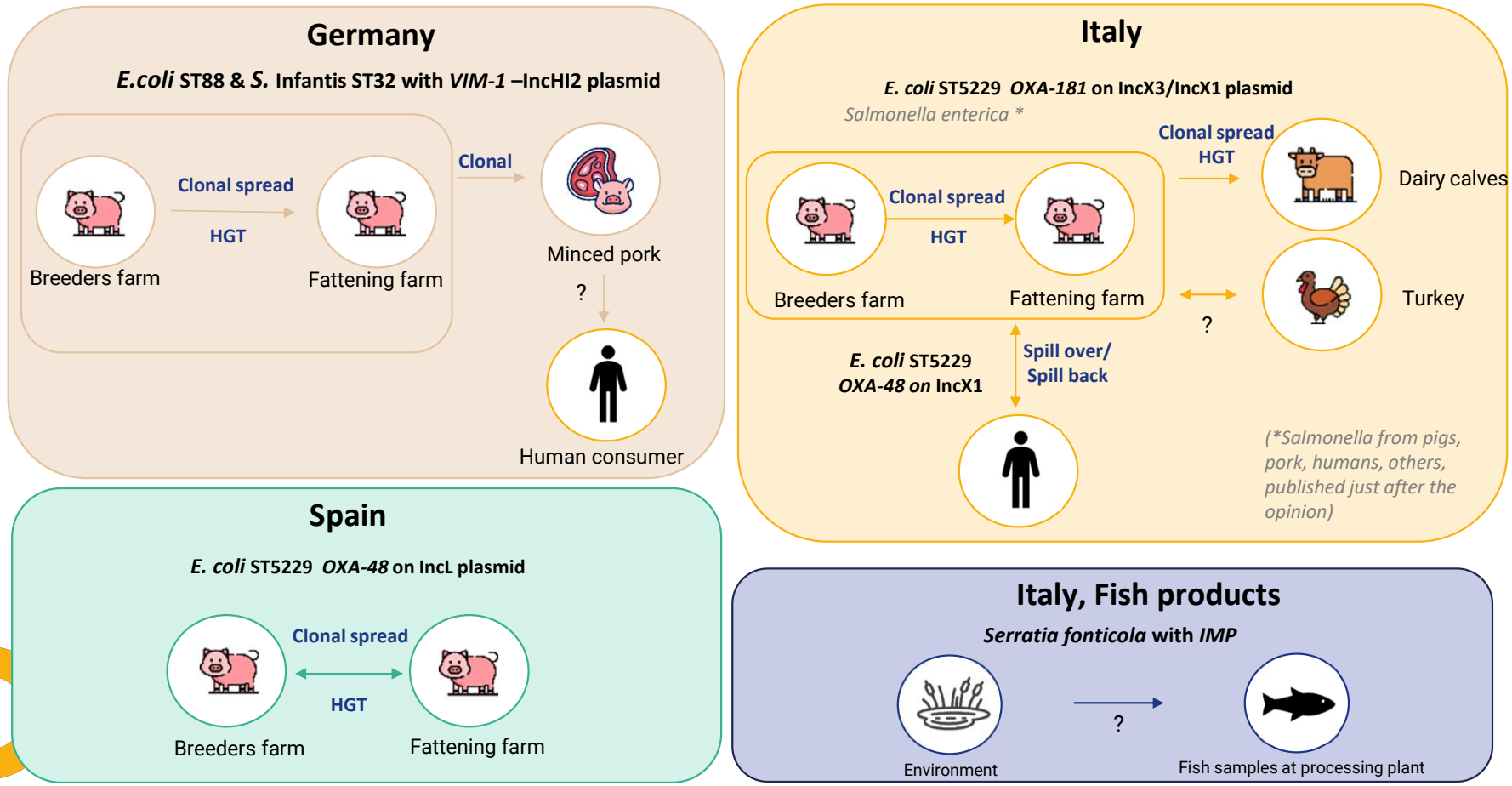
New findings after the EFSA opinion include Salmonella isolates, **and two new countries**/matrices

GENES, BACTERIA, SOURCES, CLONES, PLASMIDS (AQ1)



- At least **22 gene variants** belonging to 9 carbapenemase families.
- **Most commonly** reported: ***bla*$_{\text{VIM-1}}$**, ***bla*$_{\text{OXA-48}}$** and ***bla*$_{\text{OXA-181}}$**, followed by ***bla*$_{\text{NDM-5}}$**, and ***bla*$_{\text{IMI-1}}$**
- **Ubiquitous STs**: *E. coli* ST23-Complex (ST88, ST410), ST101-Complex (ST5229, ST101), ST10-Complex (**ST10**, ST48, ST744) and ST542; *Salmonella* Infantis ST32; *K. pneumoniae* ST307 and ST525
- Most frequent **plasmids:** IncHI2 (*bla*$_{\text{VIM-1}}$ and *bla*$_{\text{OXA-162}}$), IncC (*bla*$_{\text{VIM-1}}$ and *bla*$_{\text{NDM-1}}$), IncX3 (*bla*$_{\text{NDM-5}}$ and *bla*$_{\text{OXA-181}}$), IncI and IncL (*bla*$_{\text{OXA-48}}$).

TRANSMISSION DYNAMICS IN THE FOOD CHAIN (AQ2)



Risk factors:

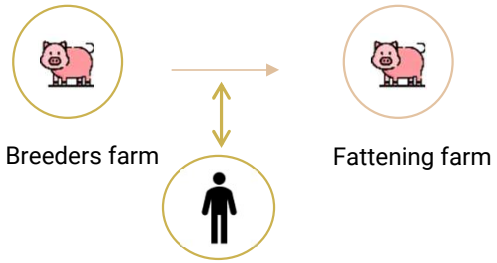
Movement, trade of animals and foods.

Human carriers

HGT: Horizontal gene transfer

TRANSMISSION – PLASMIDS (AQ2)

IncX3/IncX1-*bla*$_{OXA-181}$



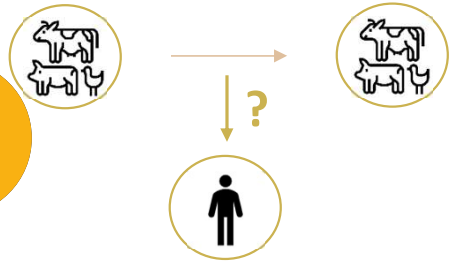
- Transmission from breeding to fattening pings, spill over/back to humans
- Epidemiological link to dairy calves
- Same **IncX1-*bla*$_{OXA-181}$** in Salm from pigs, and later from humans*

IncL-*bla*$_{OXA-48}$



- Spread in bacteria from **humans** for a long time
  - Now common (previously) in livestock
  - Spread of carbapenemase though the pig pyramid production system in Spain

IncHI2-*bla*$_{VIM-1}$/*bla*$_{OXA-162}$



- *E. coli* and *Salmonella enterica* carrying *bla*$_{VIM-1}$ and *bla*$_{OXA-162}$
- Found in animals, not common in bacteria of human origin

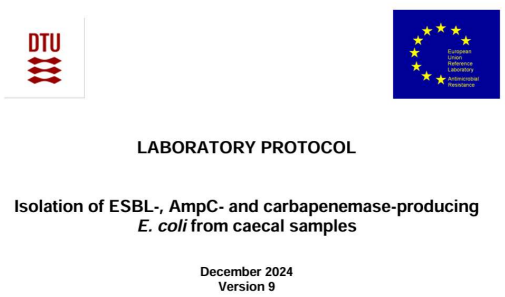
Risk factor for plasmids spread:

Co-resistance to antimicrobials/metals

* Kindly communicated by A. Battisti after the publication of the scientific opinion, Bolzoni et al., 2025.
Eurosurveillance | Emergence of Salmonella enterica carrying blaOXA-181 carbapenemase gene, Italy, 2021 to 2024

Icons: https://www.flaticon.com/

DETECTION AND CHARACTERIZATION METHODS (AQ3)



LABORATORY PROTOCOL

Isolation of ESBL-, AmpC- and carbapenemase-producing *E. coli* from caecal samples

December 2024
Version 9

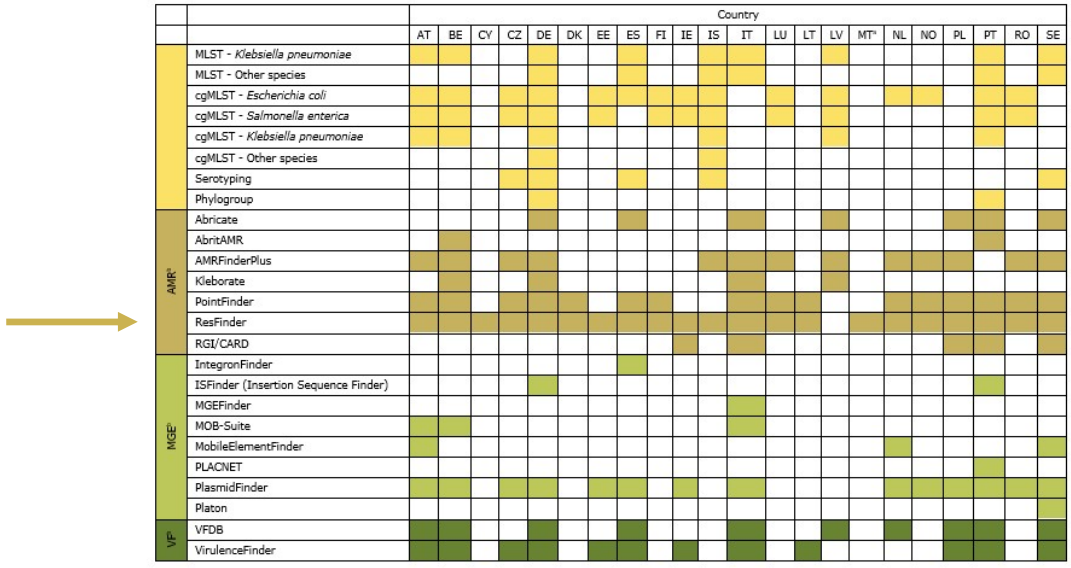


LABORATORY PROTOCOL

Isolation of ESBL-, AmpC- and carbapenemase-producing *E. coli* from fresh meat

December 2024
Version 9

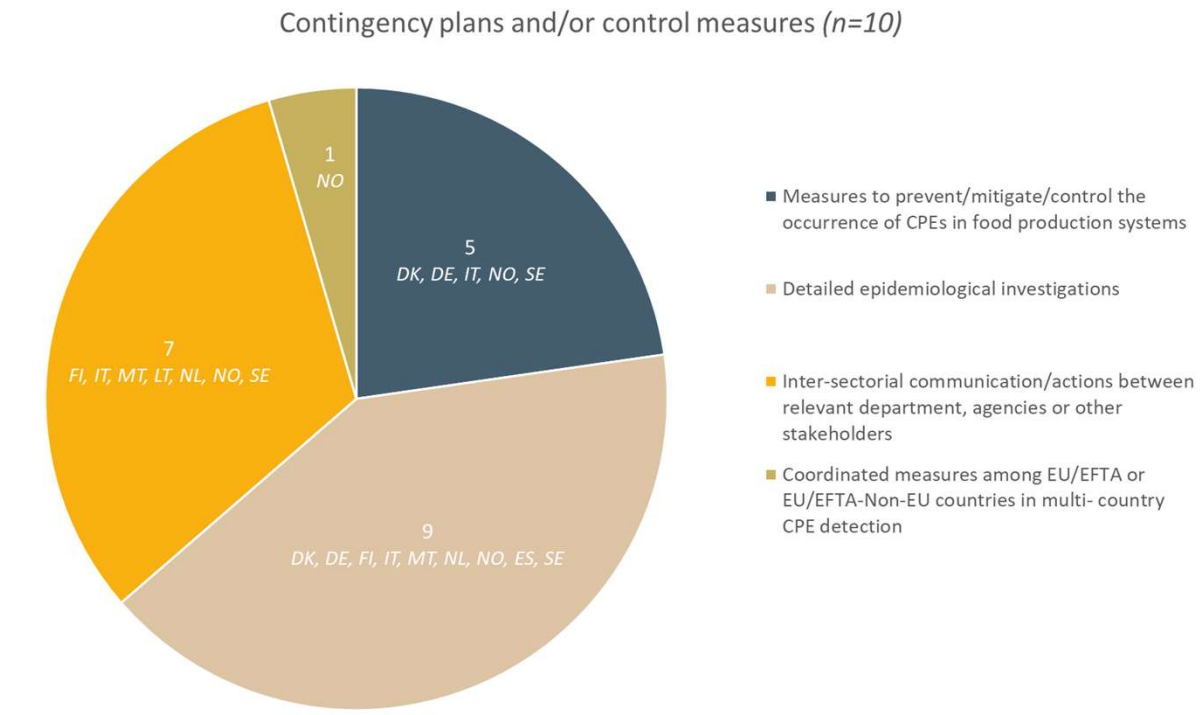
https://www.food.dtu.dk/english/topics/antimicrobial-resistance/eurl-ar/protocols



		Country																			
		AT	BE	CV	CZ	DE	DK	EE	ES	FI	IE	IS	IT	LU	LT	LV	MT[a]	NL	NO	PL	PT	RO	SE
	MLST - *Klebsiella pneumoniae*																						
	MLST - Other species																						
	cgMLST - *Escherichia coli*																						
	cgMLST - *Salmonella enterica*																						
	cgMLST - *Klebsiella pneumoniae*																						
	cgMLST - Other species																						
	Serotyping																						
	Phylogroup																						
AMR[b]	Abricate																						
AMR[b]	AbritAMR																						
AMR[b]	AMRFinderPlus																						
AMR[b]	Kleborate																						
AMR[b]	PointFinder																						
AMR[b]	ResFinder																						
AMR[b]	RGI/CARD																						
MGE[c]	IntegronFinder																						
MGE[c]	ISFinder (Insertion Sequence Finder)																						
MGE[c]	MGEFinder																						
MGE[c]	MOB-Suite																						
MGE[c]	MobileElementFinder																						
MGE[c]	PLACNET																						
MGE[c]	PlasmidFinder																						
MGE[c]	Platon																						
VF	VFDB																						
VF	VirulenceFinder																						

- The methods used EU monitoring useful to isolate CPE and detect an increase of CPE occurrence in food-producing animals in some EU/EFTA countries. However, sensitivity can be improved.
- The specific methods target only *E. coli*
- At least 24 EU/EFTA countries, the official laboratories have capacity for WGS.

CONTINGENCY PLANS, CONTROL MEASURES (AQ4)



DK: Denmark, DE: Germany, ES: Spain, FI: Finland, IT: Italy, LT: Lithuania, MT: Malta, NL: The Netherlands, NO: Norway, SE: Sweden

- 10/30 EU/EFTA countries have specific contingency plans for CPE control:

  Germany, Italy, The Netherlands, Norway, Sweden and Spain already had CPE findings

  Denmark, Finland, Lithuania, and Malta have not yet reported the occurrence of any CPE.

WHAT COMES NEXT

Recommendations Part 1

- Monitoring
  - Matrices and species *(not covered by legislation)*
- Clarify transmission – epi and molecular (clones/plasmids) data *(trace-back-forward investigations)*
- Increase sensitivity, characterization of MGE *(detection methods, WGS)*
- Several type of studies were proposed

ToR 2: New data generation

Frame Partnership grant Agreement

WP0: Coordination
WP1: Protocols
WP2: Epidemiological studies
WP3: In depth (WGS) analysis
WP4: Genomics comparison analyses

15 countries, 18 partners, 2025-2027

EURL-AR/NRLs-AR Network labs, Art. 36
https://www.eurl-ar.eu/participants.aspx

(ECDC and their Networks, to collaborate in ToR2d)

2027 - Update

Review all new data/evidence

New opinion **Part 2**

Deadline December 2027

Carba-R-ales

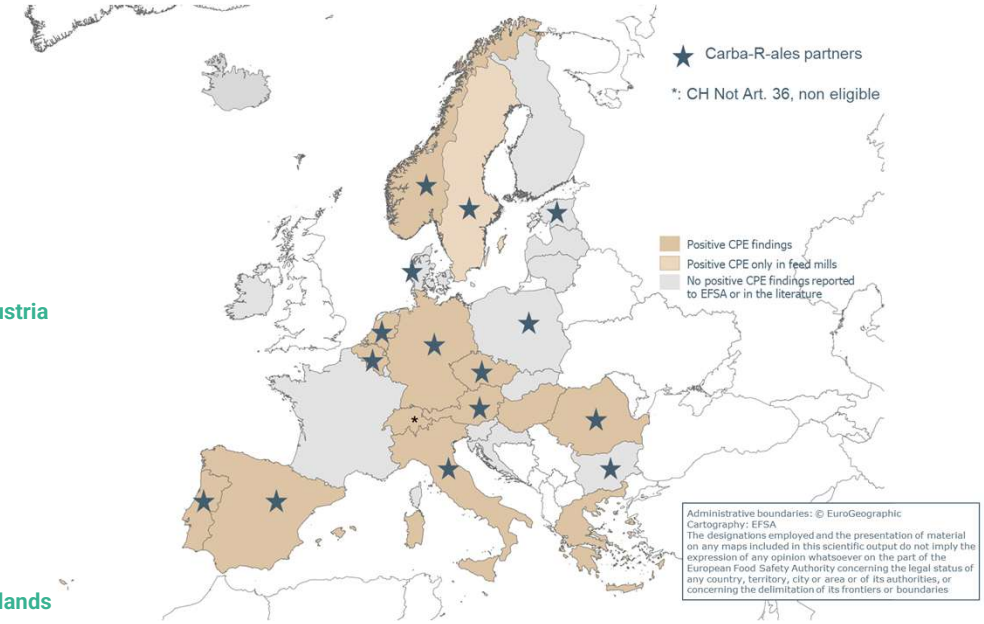
EFSA FPA GRANT: CARBA-R-ALES PROJECT

Data Generation on Carbapenemase-producing Enterobacterales (CPEs) in the food chain in the EU/EFTA.

GP/EFSA/BIOHAW/2024/01

- **Coordinated by : TECHNICAL UNIVERSITY OF DENMARK -DTU FOOD- Denmark**
- Austrian Agency for Health and Food Safety – Institute for Medical Microbiology and Hygiene Graz – **Austria**
- SCIENSANO, Belgian National Public Health Institute – **Belgium**
- National Diagnostic and Research Veterinary Medical Institute – **Bulgaria**
- Státní veterinární ústav Praha – **Czech Republic**
- National Centre for Laboratory Research and Risk Assessment - LABRIS – **Estonia**
- The Federal Institute for Risk Assessment. Bundesinstitut für Risikobewertung – **Germany**
- Istituto Zooprofilattico Sperimenentale del Lazio e della Toscana– **Italy**
- Norwegian Veterinary Institute – **Norway**
- Institute of Marine Research – IMR – **Norway**
- PAŃSTWOWY INSTYTUT WEERYNARYJNY – PAŃSTWOWY INSTYTUT BADAWCZY – **Poland**
- The National Institute of Agricultural and Veterinary Research – INIAV – **Portugal**
- Wageningen Bioveterinary Research, institute within the legal entity Stichting Wageningen – **The Netherlands**
- Institutul de Diagnostic și Sănătate Animală – IDSA – **Romania**
- ~~Institutul de Igiena si Sanatate Publica Veterinara - IHVPH – Romania~~
- Central Veterinary Laboratory – **Spain**
- National Food Center Spanish Agency for Food Safety and Nutrition – CAN AESAN OA – **Spain**
- Laboratory veterinarian| Dep. Animal health and antibiotic strategies - Swedish Veterinary Agency – **Sweden**

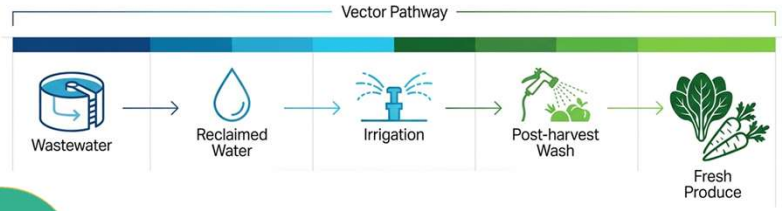
FPA-update:
France, Ireland, Malta joining



WP0: Coordination
WP1: **Protocols**. **Done**
WP2: **Epidemiological studies. Done**
WP3: In depth (WGS) analysis. **On-going**
WP4: Genomics comparison analyses

EFSA PROCUREMENT: WATERESIST (APRIL 2024- APRIL 2027)

WATERESIST: Role of water used in the growing, handling and processing of fruits vegetables and herbs on the spread of AMR



OBJECTIVE 1

Optimization of suitable sensitive and readily standardized culturomics/genomics-based detection methods for ARB/ARDs in the FVH production sector

OBJECTIVE 2

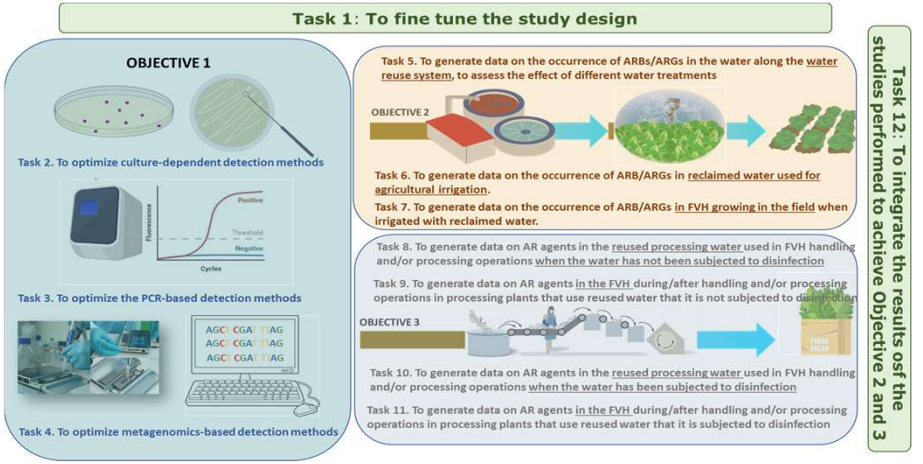
Occurrence and potential spread of ARB and ARDs in FVH as a potential result of the use of reclaimed water for irrigation in pre-harvest

OBJECTIVE 3

Occurrence and potential spread of ARB and ARDs in FVH as a potential result of the use of reused processing water in post-harvest processing activities

OBJECTIVE 4

To integrate the results of the studies performed to achieve Objective 2 and 3



EEA, ECDC, EC (observers)

And now is time for the AMR MON update...

BACKGROUND


SCIENTIFIC REPORT

APPROVED: 30 April 2019

doi: 10.2903/j.efsa.2019.5709

Technical specifications on harmonised monitoring of antimicrobial resistance in zoonotic and indicator bacteria from food-producing animals and food

European Food Safety Authority (EFSA), Marc Aerts, Antonio Battisti, René Hendriksen, Isabelle Kempf, Christopher Teale*, Bernd-Alois Tenhagen, Kees Veldman, Dariusz Wasyl, Beatriz Guerra, Ernesto Liébana, Daniel Thomas-López and Pierre-Alexandre Beloeil


SCIENTIFIC REPORT

APPROVED: 30 November 2020

doi: 10.2903/j.efsa.2020.6364

Technical specifications on a randomisation of sampling for the purpose of antimicrobial resistance monitoring from food-producing animals and food as from 2021

European Food Safety Authority (EFSA)


SCIENTIFIC REPORT

APPROVED: 29 September 2022

doi: 10.2903/j.efsa.2022.7620

Technical specifications for a baseline survey on the prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) in pigs

European Food Safety Authority (EFSA), Marc Aerts, Antonio Battisti, Rene Hendriksen, Jesper Larsen, Oskar Nilsson, José Cortiñas Abrahantes, Beatriz Guerra, Alexandra Papanikolaou and Pierre-Alexandre Beloeil


SCIENTIFIC REPORT

Technical specifications for a EU-wide baseline survey of antimicrobial resistance in bacteria from aquaculture animals

European Food Safety Authority (EFSA) | Marc Aerts | Sandrine Baron | Valeria Bortolaia | Rene Hendriksen | Beatriz Guerra | Anca Stoicescu | Pierre-Alexandre Beloeil

Before 2019 2020 2021 2022 2023 2024 2026 To come

New Legislative Act for 2028-2034


efsa

SCIENTIFIC REPORT OF EFSA

Technical specifications on the harmonised monitoring and reporting of antimicrobial resistance in methicillin resistant *Staphylococcus aureus* in food producing animals and food

European Food Safety Authority

efsa

SCIENTIFIC REPORT OF EFSA

Technical specifications on the harmonised monitoring and reporting of antimicrobial resistance in *Salmonella*, *Campylobacter* and indicator *Escherichia coli* and *Enterococcus* spp. bacteria transmitted through food

European Food Safety Authority

DECISIONS

COMMISSION IMPLEMENTING DECISION of 12 November 2013 on the monitoring and reporting of antimicrobial resistance in zoonotic and commensal bacteria

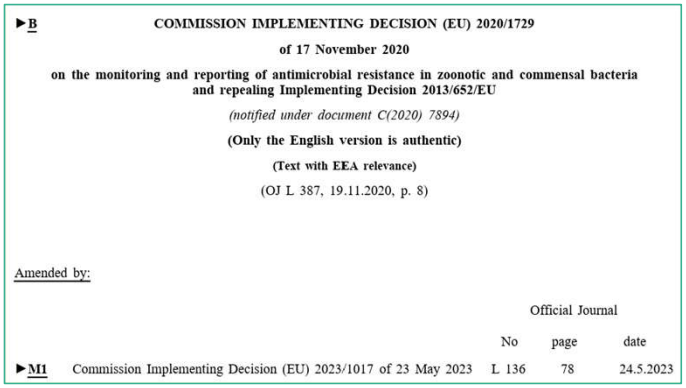
efsa

SCIENTIFIC REPORT OF EFSA

Technical specifications on randomised sampling for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria

European Food Safety Authority

2020/amended 2023


►B **COMMISSION IMPLEMENTING DECISION (EU) 2020/1729**

of 17 November 2020

on the monitoring and reporting of antimicrobial resistance in zoonotic and commensal bacteria and repealing Implementing Decision 2013/652/EU

(notified under document C(2020) 7894)

(Only the English version is authentic)

(Text with EEA relevance)

(OJ L 387, 19.11.2020, p. 8)

Amended by:

		Official Journal No	page	date
►M1	Commission Implementing Decision (EU) 2023/1017 of 23 May 2023	L 136	78	24.5.2023

Update Technical Specifications to cover 2028-2034

Thanks to *et al. colleagues*!

Biological Hazards

CPE WG

Member States/EFTA

European competent institutions:
Members of EFSA AMR Subgroup of the Scientific Network for Zoonoses Monitoring
National Reference Laboratories for Antimicrobial Resistance (NRLs-AR), and the EURL-AR (Food/Vet)



Beatriz Guerra
Lead Expert Molecular Epidemiology.
Senior Scientific Officer BIOHAW Unit (ASSESS Department)

beatriz.guerra@efsa.europa.eu

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