

Annex D – Data on presumptive ESBL-,AmpC- and/or carbapenemaseproducing microorganisms and their resistance occurrence (routine and specific monitoring)

Annex to:

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D.1. ESBL-, AmpC-, ESBL +AmpC and CP- Phenotypes

According to Commission Implementing Decision 2020/1729/EU¹, MSs determined the susceptibility of Salmonella spp., and indicator commensal E. coli to selected antimicrobials belonging to different classes (Panel 1). All Salmonella spp. and indicator E. coli isolates, that after testing with Panel 1 were found to be resistant to cefotaxime, ceftazidime or meropenem, were further tested with a second panel of different beta-lactams that included among others, third generation cephalosporins and carbapenems (Panel 2) in order to phenotypically detect presumptive ESBL- AmpC- and/or carbapenemase producers. All isolates collected within the specific monitoring for ESBL/AMPC/CP- producing E. coli and/or CP-producing microorganisms, were tested for their susceptibility to both Panel 1 and Panel 2. More information is provided in Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867.

For this report, the categorisation of isolates resistant to third-generation cephalosporins and/or carbapenems in presumptive ESBL, AmpC or CP- producers was carried out primarily based on the EUCAST guidelines for detection of resistance mechanisms and specific resistances of clinical and/or epidemiological importance (EUCAST, 2017) and consulted experts' knowledge. In total, for the third generation cephalosporin- and/or carbapenem-resistant isolates, five main categorizations are made: 1. ESBL phenotype; 2. AmpC phenotype; 3. ESBL + AmpC phenotype; 4. CP-phenotype; and 5. Other phenotypes.

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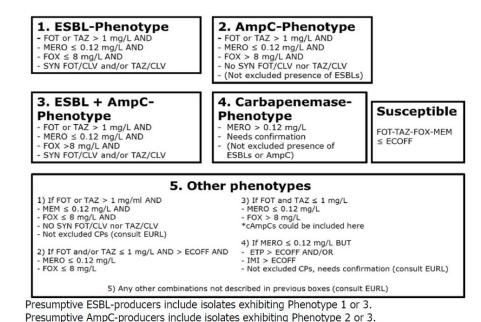


Figure 1: Phenotypes inferred based on the resistance to the β -lactams included in Panel 2.

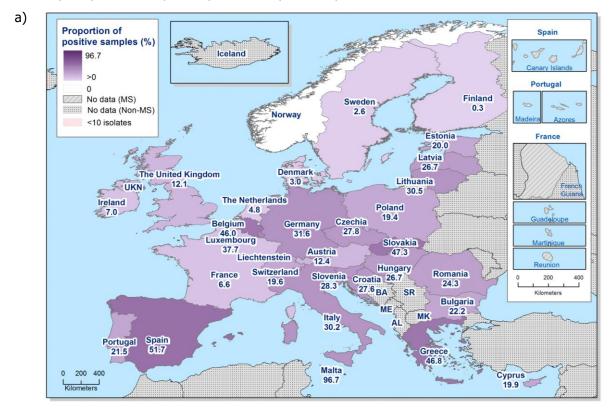


D.2. ESBL-, AmpC-producers prevalence maps

Marked variations among MSs in the prevalence of presumptive *E. coli* ESBL and/or AmpC-producers (*E. coli* showing an ESBL, AmpC or ESBL+AmpC phenotype) in samples from healthy animals and meat derived thereof are demonstrated by data presented in chapter 5 of this report. These variations withstand also when assessing the occurrence of isolates with ESBL or AmpC phenotypes separately in the different matrices (Tables 6, 8, 15, and 19).

More precisely, the prevalence of presumptive *E. coli* ESBL-producers (*E. coli* showing an ESBL phenotype) ranges from 1% (Sweden) to 85.3% (Malta) in fattening pigs; from 1% (Denmark) to 49.8% (Belgium) in calves under 1 year of age; from 0.3% (Finland) to 100% (Malta) in broilers; and from 0% (Sweden) to 63.9% (Spain) in fattening turkeys. Likewise, the prevalence of presumptive *E. coli* AmpC-producers (*E. coli* showing an AmpC phenotype) ranges from 0% (Bulgaria, Malta) to 33.3% (Slovenia) in fattening pigs; from 0% (Sweden) to 5.3% (France and Spain) in calves under 1 year of age; from 0% (Finland, Luxembourg, and Malta) to 26.7% (Lithuania) in broilers; and from 0% (Sweden and Romania) to 6% (Belgium) in fattening turkeys.

Furthermore, the prevalence of presumptive *E. coli* ESBL-producers (*E. coli* showing an ESBL phenotype) ranges from 0% (Cyprus, Finland and Sweden) to 15.4% (Slovakia) in meat from pigs (retail); from 0% (Cyprus, Finland, and France) to 83.3% (Malta) in meat from bovine animals (retail); from 0.3% (Finland) to 93.3% (Malta) in meat from broilers. Likewise, the prevalence of presumptive *E. coli* AmpC-producers (*E. coli* showing an AmpC phenotype) ranges from 0% (Belgium, Croatia, Cyprus, Finland, Greece and Sweden) to 9.5% (Malta) in meat from pigs (retail); from 0% (Belgium, Finland, Cyprus, Greece, Lithuania, Luxembourg, Portugal, Romania and Sweden) to 5.6% (Malta) in meat from bovine animals (retail); from 0% (Finland) to 24.5% (Lithuania) in meat from broilers.





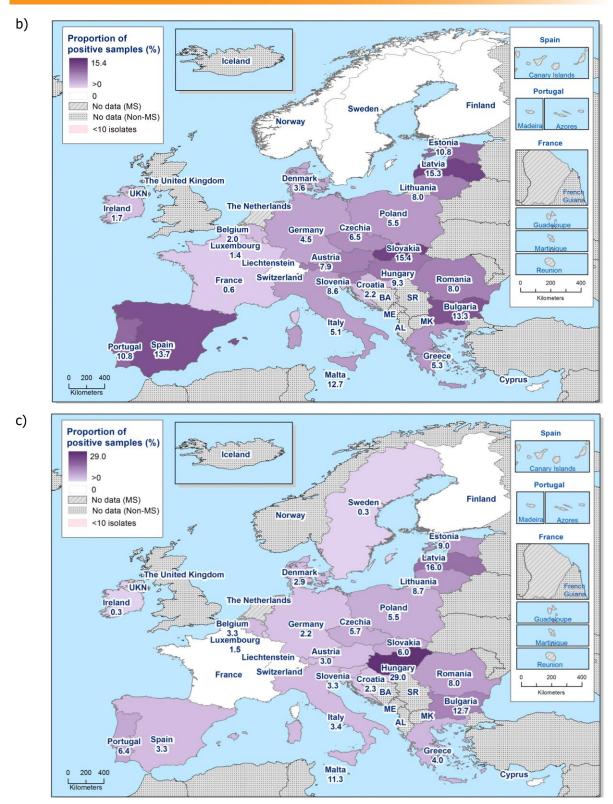
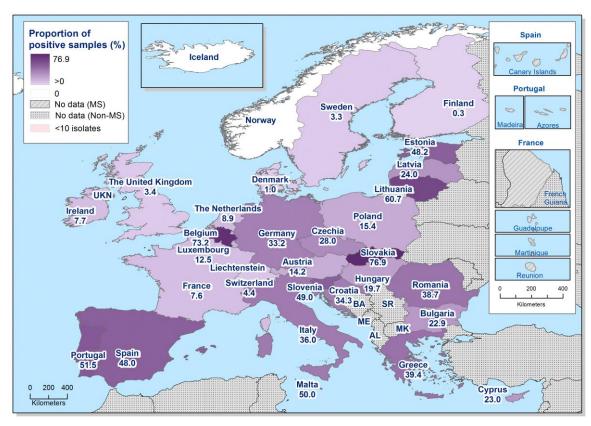


Figure 1. Spatial distribution of the prevalence of presumptive ESBL-producing *E. coli* from a) meat from broilers in 2020, b) meat from pigs and c) meat from bovine animals under one year of age in 2021

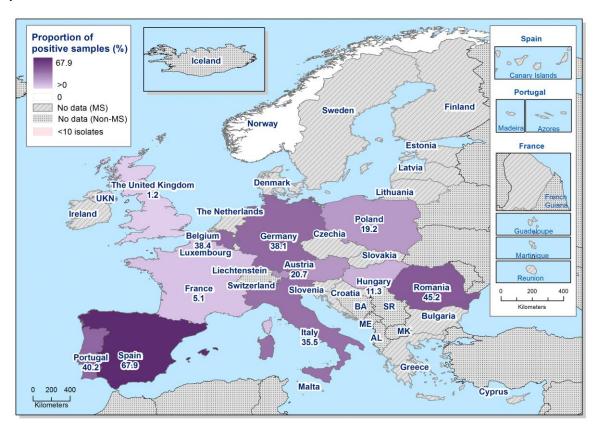




a)



b)





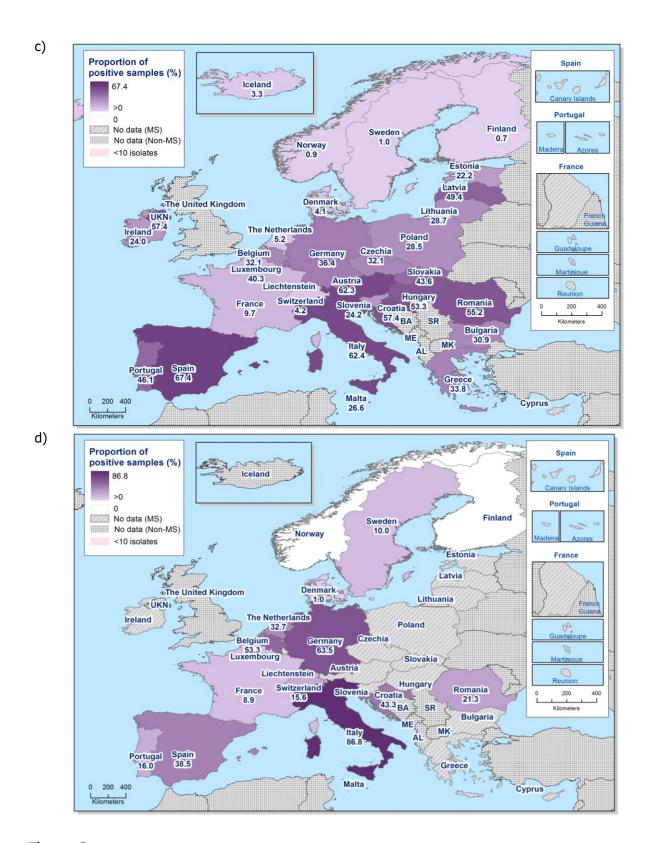
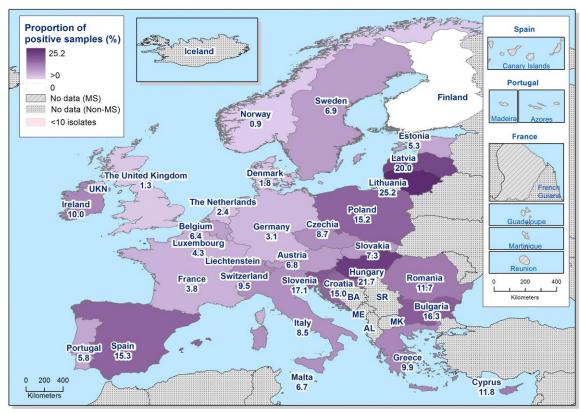
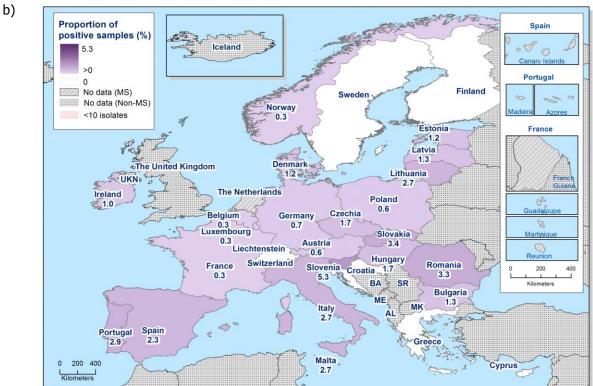


Figure 2. Spatial distribution of the prevalence of presumptive ESBL-producing *E. coli* from a) broilers in 2020, b) fattening turkeys in 2020, c) fattening pigs in 2021 and d) bovine animals under one year of age in 2021, EU MSs and non-MSs



a)









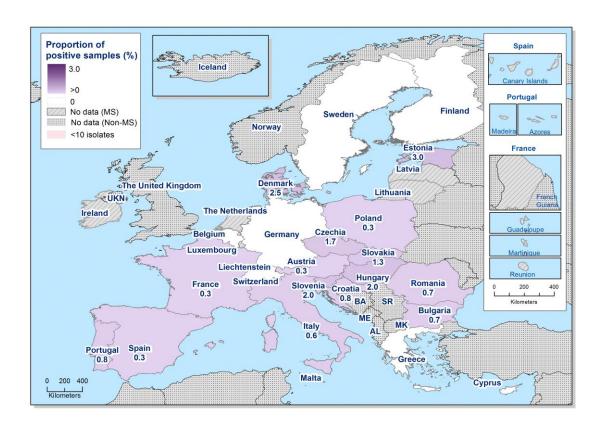
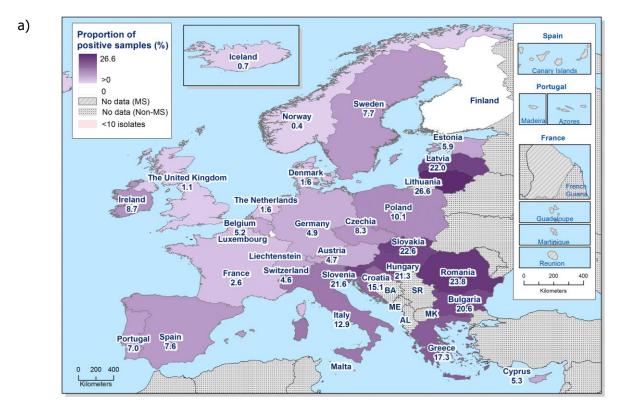
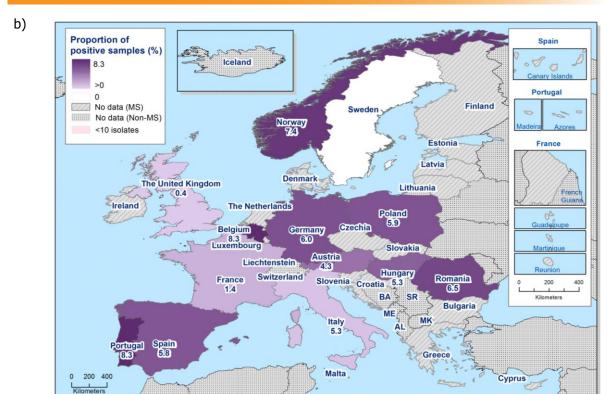
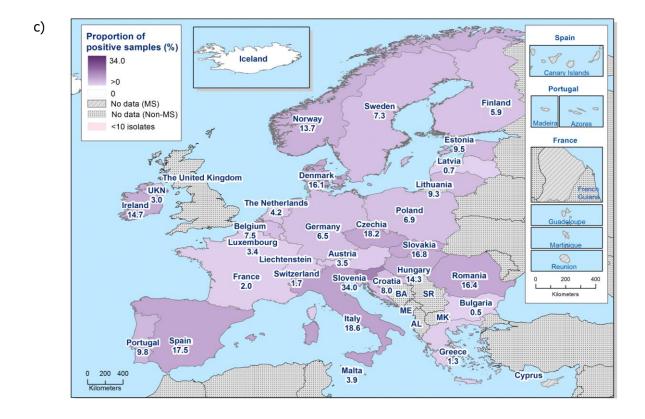


Figure 3. Spatial distribution of prevalence of presumptive AmpC-producing *E. coli* from a) meat from broilers in 2020, b) meat from pigs and c) meat from bovine animals in 2021, EU MSs and non-MSs











d)

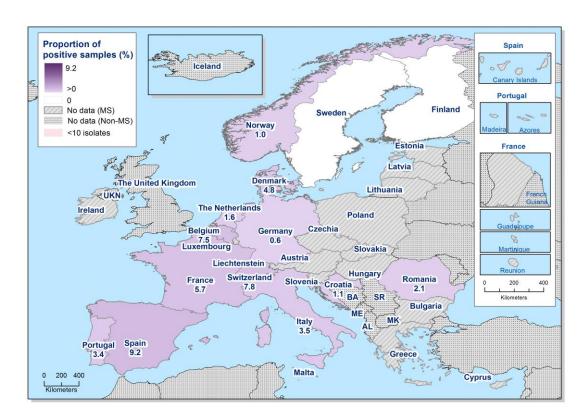


Figure 4. Spatial distribution of prevalence of presumptive AmpC-producing *E. coli* from a) broilers in 2020, b) fattening turkeys in 2020, c) fattening pigs in 2021, and d) calves under 1 year of age in 2021, EU MSs and non-MSs, 2020/2021.

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D.3. ESBL-, AmpC-, carbapenemase-producers prevalence and occurrence tables – poultry 2020

Table 1. Presumptive ESBL- and AmpC-producing *Salmonella* spp. isolates from meat from broilers (carcases), broilers, fattening turkeys and laying hens collected within the routine monitoring and subjected to supplementary testing (panel 2) in 2020

Country	NP1	NP2 ^(a)		L and/or AmpC	ES	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	Aı	npC ^(e)	ESBL	+ AmpC ^(f)	C	Ps ^(g)
•			n	0/o ^(h)	n	o/o ^(h)	n	o/o ^(h)	n	% ^(h)	n	% ^(h)	n	%(h)	n	% ^(h)
Meat from broilers	(Gallus gallı	us) - carc	ase													
France	106	1	1	0.9	0	0	0	0	0	0	1	0.9	0	0	0	0
Italy ⁽ⁱ⁾	14	1	1	7.1	1	7.1	0	0	0	0	0	0	0	0	0	0
Total (2 MSs)	120	2	2	1.7	1	0.8	0	0	0	0	1	0.8	0	0	0	0
Iceland	10	1	1	10	1	10	0	0	0	0	0	0	0	0	0	0
Gallus gallus (fowl)	- broilers															
Austria	170	2	2	1.2	2	1.2	0	0	0	0	0	0	0	0	0	0
Hungary	170	3	3	1.8	0	0	0	0	0	0	3	1.8	0	0	0	0
Italy ⁽ⁱ⁾	214	29	29	13.6	29	13.6	4	1.9	0	0	0	0	0	0	0	0
Malta	52	7	7	13.5	7	13.5	0	0	0	0	0	0	0	0	0	0
Slovenia	164	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (5 MSs)	770	42	41	5.3	38	4.9	4	0.5	0	0	3	0.4	0	0	0	0
Turkeys - fattening	flocks												·			
Italy ⁽ⁱ⁾	170	2	2	1.2	2	1.2	0	0	0	0	0	0	0	0	0	0
Poland	22	1	1	4.5	1	4.5	0	0	0	0	0	0	0	0	0	0
Total (2 MSs)	192	3	3	1.6	3	1.6	0	0	0	0	0	0	0	0	0	0
Gallus gallus (fowl)	- laying he	ns								'				'		
Hungary	30	2	2	6.7	0	0	0	0	0	0	2	6.7	0	0	0	0
Italy ⁽ⁱ⁾	172	2	2	1.2	2	1.2	0	0	0	0	0	0	0	0	0	0



Country	NP1	NP2 ^(a)		L and/or \mpC	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	Aı	mpC ^(e)	ESBL	+ AmpC ^(f)	C	(Ps ^(g)
			n	% ^(h)	n	% (h)	n	% ^(h)	n	% (h)	n	%(h)	n	% ^(h)	n	%(h)
Total (2 MSs)	202	4	4	2	2	1	0	0	0	0	2	1	0	0	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates with this phenotype from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate. MSs: Member States. NP1 and NP2: total number of isolates tested in Panel 1 and 2, respectively.

(a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867https://doi.org/10.2903/j.efsa.2023.7867). Thus, some of the isolates tested in Panel 2 do not show presumptive resistance phenotypes

compatible with those defined for the present report.

- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.
- (h): Percentage of the total number of Salmonella spp. isolates tested (with panel 1).
- (i): Molecular data were provided by Italy; meat from broilers: 1 CTX-M, broilers: 27 CTX-M, and fattening turkey: 2 CTX-M.



Table 2. Presumptive ESBL and AmpC-producing indicator *E. coli* isolates from broiler flocks collected within the routine monitoring and subjected to supplementary testing (panel 2) in 2020

Country	NP1	NP2 ^(a)		L and/or \mpC	ES	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	Ar	npC ^(e)	ESBL +	- AmpC ^(f)	CI	Ps ^(g)
•			n	0/0 ^(h)	n	0/0 ^(h)	n	0/ ₀ (h)	n	%	n	n	0/ ₀ (h)	n	%(h)	n
Belgium	165	11	9	5.5	9	5.5	0	0	3	1.8	0	0	2	1.2	0	0
Bulgaria	100	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Cyprus	99	7	6	6.1	5	5.1	1	1	0	0	1	1	1	1	0	0
France	222	2	1	0.5	1	0.5	0	0	1	0.5	0	0	0	0	0	0
Germany	214	5	5	2.3	5	2.3	0	0	3	1.4	0	0	0	0	0	0
Greece	170	1	1	0.6	1	0.6	1	0.6	0	0	0	0	0	0	0	0
Hungary	170	2	2	1.2	0	0	0	0	0	0	2	1.2	0	0	0	0
Italy ⁽ⁱ⁾	170	2	2	1.2	2	1.2	0	0	1	0.6	0	0	0	0	0	0
Latvia	150	1	1	0.7	0	0	0	0	0	0	1	0.7	0	0	0	0
Lithuania	100	5	4	4	1	1	0	0	0	0	3	3	0	0	0	0
Malta	3	1	1	33.3	1	33.3	0	0	0	0	0	0	0	0	0	0
Netherlands	305	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	175	4	2	1.1	2	1.1	2	1.1	0	0	0	0	1	0.6	0	0
Portugal	156	5	3	1.9	3	1.9	1	0.6	0	0	0	0	2	1.3	0	0
Romania	168	6	6	3.6	4	2.4	2	1.2	0	0	2	1.2	0	0	0	0
Slovenia	85	1	1	1.2	1	1.2	0	0	0	0	0	0	0	0	0	0
Spain	170	3	1	0.6	1	0.6	0	0	0	0	0	0	1	0.6	0	0
Total (17 MSs)	2,622	58	46	1.8	37	1.4	8	0.3	8	0.3	9	0.3	7	0.3	0	0
United Kingdom	250	1	1	0.4	1	0.4	0	0	0	0	0	0	0	0	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States; NP1: Total number of isolates tested by panel 1; NP2: Total number of isolates tested by panel 2.

resistance phenotypes compatible with those defined for the present report.

- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.
- (h): Percentage of the total number of E. coli isolates tested (with panel 1).
- (i): Molecular data were provided by:

Italy (1 CTX-M, and 1 SHV); Latvia (1 ESBL-phenotype/genotype).

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867https://doi.org/10.2903/j.efsa.2023.7867). Thus, some of the isolates tested in Panel 2 do not show presumptive



Table 3. Presumptive ESBL and AmpC-producing indicator *E. coli* isolates from fattening turkeys collected within the routine monitoring and subjected to supplementary testing (Panel 2) in 2020

Country	NP1	NP2	an	SBL d/or mpC	ES	BL ^(b)	ESBL	only CLA/CTX SYN ^(c)		only CLA/CAZ SYN ^(d)	An	npC ^(e)	Aı E	mpC + SBL ^(f)	С	Ps ^(g)
,		(a)	n	%(h)	n	%(h)	n	0/0 ^(h)	n	0/0 ^(h)	n	%(h)	n	0/o ^(h)	n	% ^{(h}
Belgium	94	6	4	4.2	3	3.2	0	0	1	1.1	1	1.1	2	2.1	0	0
France	171	1	1	0.6	1	0.6	0	0	0	0	0	0	0	0	0	0
Germany	213	3	2	0.9	1	0.5	0	0	0	0	1	0.5	0	0	0	0
Italy ⁽ⁱ⁾	170	3	3	1.8	3	1.8	1	0.6	0	0	0	0	0	0	0	0
Poland	182	4	3	1.6	3	1.6	1	0.5	1	0.5	0	0	0	0	0	0
Portugal	142	5	4	2.8	3	2.1	1	0.7	0	0	1	0.7	1	0.7	0	0
Spain	170	6	6	3.5	6	3.5	0	0	0	0	0	0	0	0	0	0
Total (8 MSs)	1,142	28	23	2.3	20	1.7	3	0.3	2	0.2	3	0.3	3	0.3	0	0
Norway	120	2	2	1.7	0	0	0	0	0	0	2	1.7	0	0	0	0
United Kingdom	197	2	2	1.0	2	1.0	0	0	0	0	0	0	0	0	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States.

resistance phenotypes compatible with those defined for the present report.

- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.
- (h): Percentage of the total number of E. coli isolates tested (with panel 1).
- (i): Molecular data were provided by Italy (3 CTX-M).

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867https://doi.org/10.2903/j.efsa.2023.7867). Thus, some of the isolates tested in Panel 2 do not show presumptive



Table 4. Prevalence of presumptive ESBL- and AmpC-producing *E. coli* isolates from broiler meat collected within the specific ESBLs-/AmpC-/carbapenemase producing monitoring and subjected to supplementary testing (panel 2) in 2020

Country	Na		L and/or mpC ^(a)		ESBL ^(b)	C	ESBL only	(c) C	ESBL only AZ/CLA SYN ^(d)	A	mpC ^(e)	Amp	C + ESBL ^(f)	С	Ps ^(g)
Country	Ns	%P	95% CI	%P	95% CI	%P	95% CI	% P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI
Austria	307	18.9	14.7-23.7	12.4	8.9-16.6	3.6	1.8-6.3	0.6	0.1-2.3	6.8	4.3-10.3	0.3	0-1.8	0	0-1.2
Belgium	250	49.2	42.8-55.6	49.2	42.8-55.6	49.2	42.8-55.6	0	0-1.5	0	0-1.5	0	0-1.5	0	0-1.5
Bulgaria	153	37.9	30.2-46.1	22.2	15.9-29.6	6.5	3.2-11.7	0	0-2.4	16.3	10.9-23.2	0.6	0-3.6	0	0-2.4
Croatia	127	42.5	33.8-51.6	27.6	20-36.2	15.7	9.9-23.3	0	0-2.9	15	9.3-22.4	0	0-2.9	0	0-2.9
Cyprus	136	27.2	19.9-35.5	19.9	13.5-27.6	4.4	1.6-9.4	0	0-2.7	11.8	6.9-18.4	4.4	1.6-9.4	0	0-2.7
Czechia	299	36.5	31-42.2	27.7	22.8-33.2	13.7	10-18.1	0	0-1.2	8.7	5.8-12.5	0	0-1.2	0	0-1.2
Denmark	336	4.8	2.7-7.6	3	1.4-5.4	0	0-1.1	0	0-1.1	1.8	0.7-3.8	0	0-1.1	0	0-1.1
Estonia	75	24	14.9-35.3	20	11.6-30.8	4	0.8-11.2	1.3	0-7.2	5.3	1.5-13.1	1.3	0-7.2	0	0-4.8
Finland	296	0.3	0-1.9	0.3	0-1.9	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2
France	316	10.1	7-14	6.6	4.2-10	1.6	0.5-3.7	0	0-1.2	3.8	2-6.5	0.3	0-1.8	0	0-1.2
Germany	449	33.2	28.4-37.3	32	27.3-36.1	2.5	1.2-4.3	0.4	0.1-1.6	3.2	1.7-5.2	2	0.9-3.8	0	0-0.8
Greece	222	55	48.2-61.6	46.8	40.1-53.6	14.8	10.5-20.2	0	0-1.6	9.9	6.3-14.6	1.8	0.5-4.5	0	0-1.6
Hungary	300	47.4	41.6-53.2	26.7	21.7-32.1	7.7	4.9-11.3	0.3	0-1.8	21.7	17.1-26.8	1	0.2-2.9	0	0-1.2
Ireland	300	17	12.9-21.7	7	4.4-10.5	1.3	0.4-3.4	1.3	0.4-3.4	10	6.8-14	0	0-1.2	0	0-1.2
Italy	281	38.4	32.7-44.4	30.2	24.9-36	9.6	6.4-13.7	0.7	0.1-2.5	8.5	5.5-12.4	0.3	0-2	0	0-1.3
Latvia	150	46.7	38.5-55	26.6	19.8-34.5	3.3	1.1-7.6	0	0-2.4	20	13.9-27.3	0	0-2.4	0	0-2.4
Lithuania	151	55.6	47.3-63.7	31.2	23.8-39.2	11.2	6.7-17.4	0.7	0-3.6	25.1	18.5-32.9	0.7	0-3.6	0	0-2.4
Luxembourg	138	43.5	30.9-47.8	41.9	29.6-46.3	5.7	2.1-10.2	4	1.2-8.3	4.8	1.6-9.2	3.2	0.8-7.3	0	0-2.6
Malta	60	100	94-100	96.7	88.5-99.6	5	1-13.9	0	0-6	6.7	1.8-16.2	3.3	0.4-11.5	0	0-6
Netherlands	252	6.3	3.4-9.6	5.1	2.5-8.2	0.4	0-2.2	0	0-1.5	2.5	0.9-5.1	1.3	0.2-3.4	0	0-1.5
Poland	315	33	27.8-38.5	19.4	15.1-24.2	4.8	2.7-7.7	0.3	0-1.8	15.2	11.5-19.7	1.6	0.5-3.7	0	0-1.2
Portugal	121	25.6	18.1-34.4	21.5	14.5-29.9	4.1	1.4-9.4	0	0-3	5.8	2.4-11.6	1.7	0.2-5.8	0	0-3
Romania	300	35.3	29.9-41	24.3	19.6-29.6	3.7	1.8-6.5	0	0-1.2	11.7	8.3-15.9	0.7	0.1-2.4	0	0-1.2
Slovakia	150	54	45.7-62.2	47.3	39.1-55.6	25.3	18.6-33.1	1.3	0.2-4.7	7.3	3.7-12.7	0.7	0-3.7	0	0-2.4
Slovenia	152	44.7	36.7-53	28.3	21.3-36.2	11.2	6.7-17.3	2	0.4-5.7	17.1	11.5-24	0	0-2.4	0.7	0-3.6
Spain	300	60.7	54.9-66.2	51.7	45.9-57.4	13	9.4-17.3	0.3	0-1.8	15.3	11.4-19.9	6.3	3.9-9.7	0	0-1.2
Sweden	306	9.5	6.4-13.3	2.6	1.1-5.1	1	0.2-2.8	0	0-1.2	6.9	4.3-10.3	0	0-1.2	0	0-1.2
EU Total (28 MSs)	6,242	31.5	30.2-32.6	23.6	22.4-24.5	7.7	7-8.3	0.4	0.3-0.6	9	8.3-9.7	1	0.8-1.3	0	0-0.1
Iceland	140	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6
Norway	321	0.9	0.2-2.7	0	0-1.1	0	0-1.1	0	0-1.1	0.9	0.2-2.7	0	0-1.1	0	0-1.1
United Kingdom	315	12.7	9.2-16.9	12.1	8.7-16.2	2.5	1.1-4.9	0.3	0-1.8	1.3	0.3-3.2	0.6	0.1-2.3	0	0-1.2

 $ESBL: \ extended-spectrum \ \beta-lactamase; \ SYN: \ synergy; \ CTX: \ cefotaxime; \ CAZ: \ ceftazidime; \ CLA: \ clavulanate; \ MSs: \ Member \ States; \ Ns: \ total \ number \ of \ samples \ tested.$

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⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification



(see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867) Thus, some of the isolates tested in Panel 2 do not show presumptive resistance phenotypes compatible with those defined for the present report.

- (b): All isolates showing clavulanate synergy with CTX or CAZ or synergy with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with CTX only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with CAZ only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to FOX, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with CTX or CAZ and microbiological resistance to FOX, suggesting ESBL and AmpC enzymes in the same isolate. ESBL and AmpC columns include those isolates.
- (g): Isolates with microbiological meropenem resistance.



Table 5. Occurrence of presumptive ESBL- and AmpC-producing *E. coli* isolates from broiler meat collected within the specific ESBLs-/AmpC-/carbapenemase producing monitoring and subjected to supplementary testing (panel 2) in 2020

Country	N _{P2}		and/or pC ^(a)	ESE	BL ^(b)		BL only CTX SYN ^(c)		SBL only CAZ SYN ^(d)	Am	pC ^(e)		npC + SBL ^(f)	(Ps ^(g)
		n	% ^(h)	n	%(h)	n	% (h)	n	% ^(h)	n	% ^(h)	n	%(h)	n	% ^(h)
Austria	58	57	98.3	37	63.8	11	19	2	3.4	20	34.5	1	1.7	0	0
Belgium	123	105	85.4	102	82.9	123	100	0	0	3	2.4	0	0	0	0
Bulgaria	58	57	98.3	33	56.9	10	17.2	0	0	24	41.4	1	1.7	0	0
Croatia	54	54	100	35	64.8	20	37	0	0	19	35.2	0	0	0	0
Cyprus	37	31	83.8	21	56.8	6	16.2	0	0	10	27	6	16.2	0	0
Czechia	109	109	100	83	76.1	41	37.6	0	0	26	23.9	0	0	0	0
Denmark ⁽ⁱ⁾	16	16	100	10	62.5	0	0	0	0	6	37.5	0	0	0	0
Estonia	18	17	94.4	14	77.8	3	16.7	1	5.6	3	16.7	1	5.6	0	0
Finland	1	1	100	1	100	0	0	0	0	0	0	0	0	0	0
France	35	31	88.6	20	57.1	5	14.3	0	0	11	31.4	1	2.9	0	0
Germany	149	138	92.6	133	89.3	11	7.4	2	1.3	5	3.4	9	6	0	0
Greece	122	118	96.7	100	82	33	27	0	0	18	14.8	4	3.3	0	0
Hungary	146	139	95.2	77	52.7	23	15.8	1	0.7	62	42.5	3	2.1	0	0
Ireland	51	51	100	21	41.2	4	7.8	4	7.8	30	58.8	0	0	0	0
Italy ⁽ⁱ⁾	108	107	99.1	84	77.8	27	25	2	1.9	23	21.3	1	0.9	0	0
Latvia ⁽ⁱ⁾	70	70	100	40	57.1	5	7.1	0	0	30	42.9	0	0	0	0
Lithuania	83	82	98.8	45	54.2	17	20.2	1	1.2	37	44.6	1	1.2	0	0
Luxembourg	54	50	92.6	48	88.9	7	13	5	9.3	2	3.7	4	7.4	0	0
Malta	60	58	96.7	56	93.3	3	5	0	0	2	3.3	2	3.3	0	0
Netherlands ⁽ⁱ⁾	15	12	80	9	60	1	6.7	0	0	3	20	3	20	0	0
Poland	105	99	94.3	56	53.3	15	14.3	1	1	43	41	5	4.8	0	0
Portugal	31	29	93.5	24	77.4	5	16.1	0	0	5	16.1	2	6.5	0	0
Romania	107	104	97.2	71	66.4	11	10.3	0	0	33	30.8	2	1.9	0	0
Slovakia	84	80	95.2	70	83.3	38	45.2	2	2.4	10	11.9	1	1.2	0	0
Slovenia	71	69	97.2	43	60.6	17	23.9	3	4.2	26	36.6	0	0	1	1.41
Spain	182	163	89.6	136	74.7	39	21.4	1	0.5	27	14.8	19	10.4	0	0
Sweden ⁽ⁱ⁾	29	29	100	8	27.6	3	10.3	0	0	21	72.4	0	0	0	0
Total (27 MSs)	1,976	1876	94.9	1377	69.7	478	24.2	25	1.3	499	25.3	66	3.3	1	0.05
Norway ⁽ⁱ⁾	3	3	100	0	0	0	0	0	0	3	100	0	0	0	0
Switzerland	87	86	98.9	58	66.7	19	21.8	3	3.4	28	32.2	0	0	0	0
United Kingdom	41	38	92.7	36	87.8	8	19.5	1	2.4	2	4.9	2	4.9	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs:



Member States.

- (a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). Thus, some of the isolates tested in Panel 2 do not show presumptive resistance phenotypes compatible with those defined for the present report. This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)
- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.
- (h): Percentage of the total number of E. coli isolates tested (with panel 2).
- (i): Molecular data were provided by:

Denmark (3 CTX-M-1, 1 CTX-M-32, 1 CTX-M-55+TEM-1, 1 SHV-12, 1 SHV-12+TEM-1, 3 TEM-52, 3 CMY-2, 1 CMY-2+TEM-1, 1 AmpC mutation or insertion, and 1 AmpC mutation or insertion+TEM-1).

Italy (39 CTX-M-1, 4 CTX-M-14, 3 CTX-M-15, 1 CTX-M-2, 3 CTX-M-32, 6 CTX-M-55, 5 CTX-M-65, 22 SHV-12, 19 CMY-2, 1 SHV-12+CMY-2, 1 CTX-M-1+ AmpC-phenotype/genotype and 4 AmpC-phenotype/genotype),

Latvia (40 ESBL-genotype/phenotype, and 30 AmpC-phenotype/genotype),

The Netherlands (1 CTX-M-1, 1 CTX-M-1+TEM-1, 1 CTX-M-55, 1 SHV-12, 1 SHV-2+TEM-1, 1 SHV-52, 3 SHV-52+AmpC mutation or insertion, 1 TEM-52, 1 TEM-52+TEM-1+AmpC mutation or insertion, 1 CMY-2, 2 CMY-2+TEM-1, and 1 AmpC mutation or insertion), Norway (3 CMY-2),

Sweden (6 CTX-M-1, 2 SHV-12, 1 SHV-12+CMY-2, 5 CMY-2, and 15 AmpC-phenotype/genotype with C-42T mutation).



Table 6. Prevalence of presumptive ESBL- and AmpC-producing *E. coli* isolates from broilers collected within the specific ESBLs/AmpC/Carbapenemase producing monitoring and subjected to supplementary testing (panel 2) in 2020

Country	Ns		L and/or mpC ^(a)	E	SBL ^(b)		BL only CLA SYN ^(c)		BL only CLA SYN ^(d)	A	mpC ^(e)	Amp(C + ESBL ^(f)	(CPs ^(g)
,		%P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI
Austria	360	18.1	14.5-22.7	14	10.7-18.2	3.6	1.9-6.1	0	0-1	4.7	2.8-7.5	0.6	0.1-2	0.3	0-1.5
Belgium	257	76.6	69.3-80.3	74.6	67.3-78.5	6	3.3-9.4	3.6	1.6-6.5	5.2	2.7-8.5	3.2	1.4-6	0	0-1.4
Bulgaria	411	53.3	31.8-58.2	33.4	18.9-38.1	14.5	7.3-18.4	0.4	0-1.3	20.6	10.9-24.9	0.7	0.1-1.7	0	0-0.9
Croatia	175	51.4	41-56.2	36.3	27.3-41.8	23.6	16.4-29.2	0.6	0-3.1	15.1	9.5-20.4	0	0-2.1	0	0-2.1
Cyprus	152	27	20.1-34.8	23	16.6-30.5	9.2	5.1-15	0	0-2.4	5.3	2.3-10.1	1.3	0.2-4.7	0	0-2.4
Czechia	300	36	30.6-41.7	28	23-33.4	16.3	12.3-21	0	0-1.2	8.3	5.5-12.1	0.3	0-1.8	0	0-1.2
Denmark	308	2.6	1.1-5.1	1	0.2-2.8	0	0-1.2	0	0-1.2	1.6	0.5-3.7	0	0-1.2	0	0-1.2
Estonia	85	49.4	38.4-60.5	48.2	37.3-59.3	7.1	2.6-14.7	2.4	0.3-8.2	5.9	1.9-13.2	4.7	1.3-11.6	0	0-4.2
Finland	309	0.3	0-1.8	0.3	0-1.8	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2
France	342	9.1	6.2-12.6	7.6	5-10.9	0.3	0-1.6	0.3	0-1.6	2.6	1.2-4.9	1.2	0.3-3	0	0-1.1
Germany	422	36	30.3-39.6	34.3	28.7-37.9	2.4	1.1-4.3	0.5	0.1-1.7	4.9	2.9-7.2	3.2	1.7-5.2	0	0-0.9
Greece	312	53.2	47.5-58.8	39.4	34-45.1	16	12.1-20.6	0	0-1.2	17.3	13.3-22	3.5	1.8-6.2	0	0-1.2
Hungary	300	40.3	34.7-46.1	19.7	15.3-24.6	6.7	4.1-10.1	0	0-1.2	21.3	16.8-26.4	0.7	0.1-2.4	0	0-1.2
Ireland	300	16	12-20.6	7.7	4.9-11.3	2.3	0.9-4.7	1	0.2-2.9	8.7	5.7-12.4	0.3	0-1.8	0	0-1.2
Italy	464	47.6	43-52.3	36	31.6-40.5	11	8.3-14.2	0.9	0.2-2.2	12.9	10-16.3	1.3	0.5-2.8	0	0-0.8
Latvia	150	45.3	37.2-53.7	24	17.4-31.6	0	0-2.4	0	0-2.4	22	15.7-29.5	0.7	0-3.7	0	0-2.4
Lithuania	150	87.3	80.9-92.2	60.7	52.4-68.5	8	4.2-13.6	0	0-2.4	26.6	19.8-34.5	0	0-2.4	0	0-2.4
Luxembourg	8	25	0.3-52.7	25	0.3-52.7	25	0.3-52.7	0	0-36.9	0	0-36.9	0	0-36.9	0	0-36.9
Malta	2	100	1.3-100	100	1.3-100	0	0-84.2	0	0-84.2	0	0-84.2	0	0-84.2	0	0-84.2
Netherlands	305	9.5	6.7-13.7	8.6	5.9-12.6	1	0.2-2.8	0	0-1.2	1.6	0.5-3.8	0.6	0.1-2.3	0	0-1.2
Poland	306	24.8	20.1-30.1	15.4	11.5-19.9	3.9	2-6.7	0	0-1.2	10.1	7-14.1	0.7	0.1-2.3	0	0-1.2
Portugal	262	53.4	46.1-58.5	52.6	45.3-57.7	7	4.1-10.6	0.4	0-2.1	7	4.1-10.6	6.3	3.5-9.7	0	0-1.4
Romania	813	61.7	56.6-63.4	39.8	35.4-42.2	9.5	7.3-11.4	0.5	0.1-1.3	23.8	20.3-26.2	1.9	1-3	0	0-0.5
Slovakia	147	98.6	94.2-99.6	77.4	69.2-83.4	49.3	40.7-57.3	2.1	0.4-5.8	22.6	16-30.1	1.4	0.2-4.8	0	0-2.5
Slovenia	153	70.6	62.7-77.7	49	40.9-57.2	19.6	13.6-26.8	0.6	0-3.6	21.6	15.3-28.9	0	0-2.4	0	0-2.4
Spain	444	53.4	48.6-58.1	48	43.2-52.7	8.5	6.1-11.6	0	0-0.8	7.6	5.4-10.5	2.2	1.1-4.1	0	0-0.8
Sweden	300	11	7.7-15.1	3.3	1.6-6	3	1.4-5.6	0	0-1.2	7.7	4.9-11.3	0	0-1.2	0	0-1.2
Total (28 MSs)	7,537	39.6	37.1-40.7	29.7	27.6-29.7	8	7.2-8.4	0.4	0.3-0.6	11.4	10.3-11.7	1.4	1.1-1.7	0	0-0.1
Iceland	149	0.7	0-3.7	0	0-2.4	0	0-2.4	0	0-2.4	0.7	0-3.7	0	0-2.4	0	0-2.4
Norway	242	0.4	0-2.3	0	0-1.5	0	0-1.5	0	0-1.5	0.4	0-2.3	0	0-1.5	0	0-1.5
Switzerland	612	9	6.8-11.5	4.4	2.9-6.4	1.5	0.7-2.8	0.7	0.2-1.7	4.6	3.1-6.5	0	0-0.6	0	0-0.6
United Kingdom	350	4.6	2.6-7.3	3.4	1.8-5.9	0	0-1	0.3	0-1.6	1.1	0.3-2.9	0	0-1	0	0-1

ESBL: extended-spectrum β-lactamase; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; P: prevalence; CI: confidence interval; MSs: Member States; Ns: total number of



samples tested.

- (a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). Thus, some of the isolates tested in Panel 2 do not show presumptive resistance phenotypes compatible with those defined for the present report.
- (b): All isolates showing clavulanate synergy with CTX or CAZ or synergy with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to FOX, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with CTX or CAZ and microbiological resistance to FOX, suggesting ESBL and AmpC enzymes in the same isolate. ESBL and AmpC columns include those isolates.
- (g): Isolates with microbiological meropenem resistance.



Table 7. Occurrence of presumptive ESBL- and AmpC-producing *E. coli* isolates from broilers collected within the specific ESBLs-/AmpC-/carbapenemase producing monitoring and subjected to supplementary testing (panel 2) in 2020

Country	N _{P2}	ESBL a Amp		ESB	L (b)	CLA	only /CTX N ^(c)		BL only CAZ SYN ^(d)	An	ıpC ^(e)	Amp	C +ESBL ^(f)	C	Ps ^(g)
		n	0/o ^(h)	n	% ^(h)	n	% ^(h)	n	% ^(h)	n	% ^(h)	n	% (h)	n	% ^(h)
Austria	67	65	97	50	74.6	13	19.4	0	0	15	22.4	2	3	1	1.49
Belgium	201	185	92	180	89.6	15	7.5	9	4.5	5	2.5	8	4	0	0
Bulgaria	150	148	98.7	92	61.3	41	27.3	1	0.7	56	37.3	2	1.3	0	0
Croatia	85	85	100	60	70.6	39	45.9	1	1.2	25	29.4	0	0	0	0
Cyprus	41	39	95.1	33	80.5	14	34.1	0	0	6	14.6	2	4.9	0	0
Czechia	108	107	99.1	83	76.9	49	45.4	0	0	24	22.2	1	0.9	0	0
Denmark ⁽ⁱ⁾	8	8	100	3	37.5	0	0	0	0	5	62.5	0	0	0	0
Estonia	42	38	90.5	37	88.1	6	14.3	2	4.8	1	2.4	4	9.5	0	0
Finland	1	1	100	1	100	0	0	0	0	0	0	0	0	0	0
France	33	27	81.8	22	66.7	1	3	1	3	5	15.2	4	12.1	0	0
Germany	149	134	89.9	127	85.2	10	6.7	2	1.3	7	4.7	13	8.7	0	0
Greece	166	155	93.4	112	67.5	50	30.1	0	0	43	25.9	11	6.6	0	0
Hungary	121	119	98.3	57	47.1	20	16.5	0	0	62	51.2	2	1.7	0	0
Ireland	49	47	95.9	22	44.9	7	14.3	3	6.1	25	51	1	2	0	0
Italy ⁽ⁱ⁾	221	215	97.3	161	72.9	51	23.1	4	1.8	54	24.4	6	2.7	0	0
Latvia ⁽ⁱ⁾	68	67	98.5	35	51.5	0	0	0	0	32	47.1	1	1.5	0	0
Lithuania	131	131	100	91	69.5	12	9.2	0	0	40	30.5	0	0	0	0
Luxembourg	1	1	100	1	100	1	100	0	0	0	0	0	0	0	0
Malta	1	1	100	1	100	0	0	0	0	0	0	0	0	0	0
Netherlands(i)	31	28	90.3	25	80.6	3	9.7	0	0	3	9.7	2	6.5	0	0
Poland	80	74	92.5	45	56.2	12	15	0	0	29	36.2	2	2.5	0	0
Portugal	137	121	88.3	119	86.9	18	13.1	1	0.7	2	1.5	16	11.7	0	0
Romania	496	472	95.2	300	60.5	75	15.1	4	0.8	172	34.7	15	3	0	0
Slovakia	146	142	97.3	111	76	72	49.3	3	2.1	31	21.2	2	1.4	0	0
Slovenia	110	108	98.2	75	68.2	30	27.3	1	0.9	33	30	0	0	0	0
Spain	237	227	95.8	203	85.7	38	16	0	0	24	10.1	10	4.2	0	0
Sweden ⁽ⁱ⁾	34	33	97.1	10	29.4	9	26.5	0	0	23	67.6	0	0	0	0
Total (27 MSs)	2,914	2778	95.3	2056	70.6	586	20.1	32	1.1	722	24.8	104	3.6	1	0.03
Iceland ⁽ⁱ⁾	1	1	100	0	0	0	0	0	0	1	100	0	0	0	0
Norway ⁽ⁱ⁾	1	1	100	0	0	0	0	0	0	1	100	0	0	0	0
Switzerland	61	55	90.2	27	44.3	44.3	9	14.8	4	28	45.9	45.9	0	0	0
United Kingdom	17	16	94.1	12	70.6	70.6	0	0	1	4	23.5	23.5	0	0	0



ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States.

- (a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). Thus, some of the isolates tested in Panel 2 do not show presumptive resistance phenotypes compatible with those defined for the present report. This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)
- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.
- (h): Percentage of the total number of E. coli isolates tested (with panel 2).
- (i): Molecular data were provided by:

Denmark (1 CTX-M-1, 1 CTX-M-14, 1 SHV-12, 1 DHA-1, 2 AmpC mutation or insertion+TEM-1, and 2 AmpC mutation or insertion), Iceland (1 CMY-2).

Italy (1 CTX-M, 63 CTX-M-1, 1 CTX-M-1+AmpC-phenotype/genotype, 7 CTX-M-14, 24 CTX-M-15, 6 CTX-M-32, 11 CTX-M-55, 6 CTX-M-65, 1 CTX-M-8, 2 SHV, 48 SHV-12, 44 CMY-2, and 9 AmpC-genotype/phenotype);

Latvia (35 ESBL-phenotype/genotype and 34 AmpC-phenotype/genotype);

The Netherlands (11 CTX-M-1, 2 CTX-M-14, 1 CTX-M-15+TEM-135, 1 CTX-M-32, 8 SHV-12, 1 SHV-12+TEM-1, 1 SHV-12+TEM-135, 2 TEM-52, 1 TEM-52+TEM-1, 2 CMY-2+TEM-1, and 1 AmpC-phenotype/genotype);

Norway (1 CMY-2); Sweden (10 CTX-M-1, 1 TEM-1, 22 AmpC-phenotype/genotype with C-42T mutation, and 1 AmpC-phenotype/genotype with T-32A mutation).



Table 8. Prevalence of presumptive ESBL- and AmpC-producing *E. coli* isolates from fattening turkeys collected within the specific ESBLs-/AmpC-/carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) in 2020

Country	Ns		and/or pC(a)	ESI	BL(b)		L only A SYN(c)		L only A SYN(d)	Am	ıpC(e)	AmpC	+ ESBL(f)	С	Ps(g)
		%P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI	%P	95% CI
Austria	276	24.3	19.7-30.2	20.4	16-25.9	2.9	1.3-5.6	0	0-1.3	4.3	2.3-7.5	0.3	0-2	0	0-1.3
Belgium	151	46.4	36.3-52.7	40.1	30.6-46.7	0.7	0-3.6	2.8	0.7-6.6	8.3	4.2-13.5	2.1	0.4-5.7	0	0-2.4
France	295	5.8	3.4-9.1	5.1	2.9-8.2	0.3	0-1.9	0	0-1.2	1.4	0.4-3.4	0.7	0.1-2.4	0	0-1.2
Germany	433	43.9	36-45.4	41.2	33.5-42.9	2	0.8-3.6	0	0-0.8	6	3.6-8.1	3.2	1.6-5.1	0	0-0.8
Hungary	300	16.7	12.6-21.4	11.3	8-15.5	4.7	2.6-7.7	0	0-1.2	5.3	3.1-8.5	0	0-1.2	0	0-1.2
Italy	453	40.2	35.6-44.9	35.6	31.1-40.1	10.6	7.9-13.8	0.4	0.1-1.6	5.3	3.4-7.8	0.6	0.1-1.9	0	0-0.8
Poland	307	22.8	18.2-27.9	19.2	15-24.1	2.3	0.9-4.6	0	0-1.2	5.9	3.5-9.1	2.3	0.9-4.6	0	0-1.2
Portugal	189	46.6	37.2-51.8	42.1	33.2-47.6	9.4	5.3-14	0	0-1.9	8.3	4.5-12.8	3.9	1.5-7.5	0	0-1.9
Romania	31	45.2	27.3-64	45.2	27.3-64	45.2	27.3-64	0	0-11.2	6.5	0.8-21.4	6.5	0.8-21.4	0	0-11.2
Spain	277	70.4	63.9-75	68.6	62-73.3	0.7	0.1-2.6	0	0-1.3	5.8	3.3-9.2	4	2-7	0	0-1.3
Sweden	45	0	0-7.9	0	0-7.9	0	0-7.9	0	0-7.9	0	0-7.9	0	0-7.9	0	0-7.9
Total (11 MSs)	2,757	34.2	31.6-35.2	30.7	28.3-31.7	4.5	3.6-5.2	0.2	0.1-0.5	5.3	4.4-6.1	1.8	1.3-2.3	0	0-0.1
Norway	121	7.4	3.5-13.7	0	0-3	0	0-3	0	0-3	7.4	3.5-13.7	0	0-3	0	0-3
United Kingdom	334	1.8	0.5-3.5	1.4	033	0.4	0-1.7	0	0-1.1	0.4	0-1.7	0	0.1-1	0	0-1.1

ESBL: extended-spectrum β-lactamase; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; P: prevalence; CI: confidence interval; MSs: Member States; Ns: total number of samples tested.

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). Thus, some of the isolates tested in Panel 2 do not show presumptive resistance phenotypes compatible with those defined for the present report.

⁽b): All isolates showing clavulanate synergy with CTX or CAZ or synergy with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).

⁽c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.

⁽d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.

⁽e): Isolates with microbiological resistance to FOX, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).

⁽f): Isolates showing synergy with CTX or CAZ and microbiological resistance to FOX, suggesting ESBL and AmpC enzymes in the same isolate. ESBL and AmpC columns include those isolates.

⁽g): Isolates with microbiological meropenem resistance.



Table 9.Occurrence of presumptive ESBL- and AmpC-producing *E. coli* isolates from fattening turkeys collected within the specific ESBLs/AmpC/Carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) in 2020

Country	N _{P2}		and/or pC ^(a)	ES	BL ^(b)	CLA	L only \/CTX \/N ^(c)	CI	BL only LA/CAZ SYN ^(d)	Aı	mpC ^(e)		AmpC + SBL ^(f)	C	CPs ^(g)
		n	% ^(h)	n	% ^(h)	n	% ^(h)	n	% ^(h)	n	% ^(h)	n	%(h)	n	% ^(h)
Austria	69	67	97.1	56	81.2	8	11.6	0	0	11	15.9	1	1.4	0	0
Belgium	67	64	95.5	55	82.1	1	1.5	4	6	9	13.4	3	4.5	0	0
France	17	15	88.2	13	76.5	1	5.9	0	0	2	11.8	2	11.8	0	0
Germany	176	163	92.6	152	86.4	8	4.5	0	0	11	6.2	13	7.4	0	0
Hungary	51	50	98	34	66.7	14	27.5	0	0	16	31.4	0	0	0	0
Italy ⁽ⁱ⁾	182	179	98.4	158	86.8	48	26.4	2	1.1	21	11.5	3	1.6	0	0
Poland	71	63	88.7	52	73.2	7	9.9	0	0	11	15.5	7	9.9	0	0
Portugal	84	77	91.7	69	82.1	17	20.2	0	0	8	9.5	7	8.3	0	0
Romania	14	12	85.7	12	85.7	14	100	0	0	0	0	2	14.3	0	0
Spain	193	182	94.3	177	91.7	2	1	0	0	5	2.6	11	5.7	0	0
Total (10 MSs)	924	872	94.4	778	84.2	120	13	6	0.6	94	10.2	49	5.3	0	0
Norway ⁽ⁱ⁾	9	9	100	0	0	0	0	0	0	9	100	0	0	0	0
United Kingdom	5	5	100	4	80	1	20	0	0	1	20	0	0	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States.

(a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered for further classification (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). Thus, some of the isolates tested in Panel 2 do not show presumptive resistance phenotypes compatible with those defined for the present report. This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)

- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.
- (h): Percentage of the total number of E. coli isolates tested (with panel 2).
- (i): Molecular data were provided by Italy (5 CTX-M, 67 CTX-M-1, 5 CTX-M-14, 35 CTX-M-15, 2 CTX-M-32, 5 CTX-M-55, 7 CTX-M-65, 1 CTX-M-8, 1 SHV, 35 SHV-12, 1 OXA-1, 17 CMY-2, 1 CMY-2+OXA-1, and 3 isolates with AmpC



D.4. ESBL-, AmpC-producers prevalence and occurrence tables – pigs and cattle and meat thereof, 2021

Table 10. Presumptive ESBL- and AmpC-producing Salmonella spp. isolates from meat from pigs, fattening pigs and calves under 1 year of age collected within the routine monitoring and subjected to supplementary testing (panel 2) in 2021

Country	NP1	NP2		_ and/or npC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	An	npC ^(e)	ESBL	+ AmpC ^(f)	С	Ps ^(g)
•			n	%(h)	n	% (h)	n	0/o ^(h)	n	n	%(h)	n	%(h)	n	%(h)	n
Cattle (bovine anim	als) - calves	under 1	year)			_	_	_		_			_	-		
Spain	20	1	1	5	0	0	1	5	0	0	0	0	1	5	0	0
Total (1 MSs)	20	1	1	5	0	0	1	5	0	0	0	0	1	5	0	0
Meat from pig - card	case															
Italy	91	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Total (1 MSs)	91	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Pigs - fattening pigs	5															
Hungary	80	4	3	3.8	3	3.8	1	1.2	0	0	0	0	1	1.2	0	0
Luxembourg	37	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Romania	104	6	5	4.8	5	4.8	0	0	0	0	0	0	1	1	0	0
Total (3 MSs)	221	14	8	3.6	8	3.6	1	0.5	0	0	0	0	2	0.9	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates with this phenotype from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States; NP1 and NP2: Total number of isolates tested with panel 1 and panel 2, respectively.

- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.
- (h): Percentage of the total number of Salmonella spp. isolates tested (with panel 1).

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)



Table 11. Presumptive ESBL- and AmpC-producing indicator *E. coli* isolates from fattening pigs collected within the routine monitoring and subjected to supplementary testing (panel 2) in 2021

Country	NP1	NP2		_ and/or npC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	An	ıpC ^(e)	ESBL -	+ AmpC ^(f)	CI	OS ^(g)
•			n	%(h)	n	%(h)	n	%(h)	n	n	%(h)	n	%(h)	n	%(h)	n
Pigs - fattening pigs		_	_		-	_	-	-	_	-						
Austria	175	2	2	1.1	2	1.1	0	0	0	0	0	0	0	0	0	0
Bulgaria	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyprus	22	1	1	4.5	1	4.5	0	0	0	0	0	0	0	0	0	0
Czechia	178	4	4	2.8	1	0.6	0	0	0	0	3	1.6	0	0	0	0
Denmark	65	1	1	1.5	0	0	0	0	0	0	1	1.5	0	0	0	0
Estonia	143	2	1	0.7	1	0.7	0	0	0	0	0	0	0	0	0	0
France	232	2	2	0.9	1	0.4	0	0	0	0	1	0.4	0	0	0	0
Hungary	170	7	7	4.1	7	4.1	2	1.2	0	0	0	0	0	0	0	0
Latvia	152	2	2	1.3	2	1.3	2	1.3	0	0	0	0	0	0	0	0
Lithuania	100	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Poland	212	4	4	1.9	4	1.9	0	0	1	0.5	0	0	0	0	0	0
Portugal	55	3	3	5.5	3	5.5	0	0	0	0	0	0	0	0	0	0
Romania	169	8	8	4.7	4	2.4	1	0.6	0	0	4	2.4	0	0	0	0
Slovenia	85	2	2	2.4	1	1.2	0	0	0	0	1	1.2	0	0	0	0
Spain	170	2	2	1.2	2	1.2	0	0	0	0	0	0	0	0	0	0
Sweden	173	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Total (16 MSs)	2201	44	41	1.9	30	1.4	5	0.2	1	0	11	0.5	0	0	0	0
Iceland	85	1	1	1.2	1	1.2	0	0	1	1.2	0	0	0	0	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States; NP1 and NP2: Total number of isolates tested with panel 1 and panel 2, respectively.

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were (see Appendix F. Materials and



Methods available at https://doi.org/10.2903/ji.efsa.2023.7867). This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)

- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.



Table 12. Presumptive ESBL and AmpC-producing indicator *E. coli* isolates from bovine animals and calves under 1 year of age collected within the routine monitoring and subjected to supplementary testing (panel 2) in 2021

Country	NP1	NP2		_ and/or npC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	An	npC ^(e)	ESBL	+ AmpC ^(f)	C	O S ^(g)
-			n	% (h)	n	%(h)	n	%(h)	n	n	%(h)	n	%(h)	n	%(h)	n
Cattle (bovine anima	ls) - calves	under 1	year)			_		_		-			_	-		
Belgium	173	3	2	1.2	2	1.2	1	0.6	0	0	0	0	0	0	0	0
France	181	2	2	1.1	1	0.5	1	0.5	0	0	1	0.5	1	0.5	0	0
Germany	203	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	306	2	2	0.7	2	0.7	1	0.3	0	0	0	0	0	0	0	0
Portugal	53	1	1	1.9	1	1.9	0	0	0	0	0	0	0	0	0	0
Romania	129	1	1	0.8	1	0.8	0	0	0	0	0	0	0	0	0	0
Total (6 MSs)	1045	11	8	0.8	7	0.7	3	0.3	0	0	1	0.1	1	0.1	0	0
Norway	288	6	4	1.4	0	0	0	0	0	0	4	1.4	0	0	0	0
Switzerland	180	2	2	1.1	1	0.6	0	0	0	0	1	0.6	0	0	0	0
Meat from bovine an	imals - fresl	h														
Netherlands	79	1	1	1.3	1	1.3	0	0	0	0	0	0	0	0	0	0
Total (1 MSs)	79	1	1	1.3	1	1.3	0	0	0	0	0	0	0	0	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States. NP1 and NP2: Total number of isolates tested with panel 1 and panel 2, respectively.

- (a): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (b): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (c): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (d): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (e): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (f): Isolates with microbiological meropenem resistance.
- (g): Percentage of the total number of E. coli. isolates tested (with panel 1).

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)



Table 13. Prevalence of presumptive ESBL- and/or AmpC-producing *E. coli* isolates in meat from pigs collected within the specific ESBLs-/AmpC-/carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) in 2021

Country	N		L and/or mpC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	An	ıpC ^(e)	ESBL -	+ AmpC ^(f)	С	Ps ^(g)
Country	Ns	%P	95% CI	%P	95% CI	%P	95% CI	%P	%P	95% CI	%P	95% CI	%P	95% CI	%P
Meat from pig - f	resh - BC	P	-	-	-		=		-						
Germany	7	0	0-37.2	0	0-37.2	0	0-37.2	0	0-37.2	0	0-37.2	0	0-37.2	0	0-37.2
Ireland	3	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6
Denmark	3	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6
Italy	3	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6
Sweden	3	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6
Total (4 MSs)	19	0	0-16.7	0	0-16.7	0	0-16.7	0	0-16.7	0	0-16.7	0	0-16.7	0	0-16.7
Meat from pig - f	resh - ret	tail													
Austria	318	8.5	5.7-12.1	7.9	5.2-11.4	1.3	0.4-3.4	0	0-1.1	0.6	0.1-2.3	0	0-1.2	0	0-1.2
Belgium	300	2	0.7-4.3	2	0.7-4.3	0.3	0-2.1	0	0-1.2	0.3	0-1.8	0.3	0-1.8	0	0-1.2
Bulgaria	150	14.7	9.4-21.4	13.3	8.3-19.8	6	3-11.4	0.7	0-4.2	1.3	0.2-4.7	0	0-2.4	0	0-2.4
Croatia	139	2.2	0.4-6.2	2.2	0.4-6.2	0.7	0-4.5	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6
Czechia*	294	8.2	5.3-11.9	6.5	3.9-9.9	0	0-2.5	0	0-2.5	1.7	0.6-3.9	0	0-1.2	0	0-1.2
Denmark	337	4.7	2.7-7.6	3.6	1.9-6.1	1.2	0.4-3.2	0	0-1.1	1.2	0.3-3	0	0-1.1	0	0-1.1
Estonia	150	12	3.2-18.3	10.8	2.8-11.1	2	0.5-6.2	0	0-2.4	1.2	0-3.7	0	0-2.4	0	0-2.4
France	321	0.9	0.2-2.7	0.6	0.1-2.2	0	0-1.1	0	0-1.1	0.3	0-1.7	0	0-1.1	0	0-1.1
Finland	313	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2
Germany*	466	4.9	3.2-7.3	4.3	2.6-6.6					0.6	0.1-1.9	0	0-0.8	0	0-0.8
Greece	76	5.3	1.5-12.9	5.3	1.5-12.9	1.3	0.1-8.1	0	0-4.6	0	0-4.7	0	0-4.7	0	0-4.7
Hungary	300	11	7.7-15.1	9.3	6.3-13.2	5	2.9-8.3	0.7	0.1-2.7	1.7	0.5-3.8	0	0-1.2	0.3	0-1.8
Ireland	300	2.7	1.2-5.2	1.7	0.5-3.8	0.3	0-2.1	0	0-1.2	1	0.2-2.9	0	0-1.2	0	0-1.2
Italy*	305	7.5	4.8-11.1	4.9	2.8-8					2.6	1.1-5.1	0	0-1.2	0	0-1.2
Latvia	150	16	10.5-22.9	15.3	10-22.1	7.3	3.9-13.1	0	0-2.4	1.3	0.2-4.7	0.7	0-3.7	0	0-2.4
Lithuania	150	10.7	6.2-16.7	8	4.2-13.6	2	0.5-6.2	0	0-2.4	2.7	0.7-6.7	0	0-2.4	0	0-2.4
Luxembourg	120	5	1.9-10.6	4.2	1.4-9.5	0.8	0-5.2	0	0-3	0.8	0-4.6	0	0-3	0	0-3



Country	N.		L and/or mpC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	Ar	npC ^(e)	ESBL -	+ AmpC ^(f)	C	Ps ^(g)
Country	Ns	%P	95% CI	%P	95% CI	%P	95% CI	%P	%P	95% CI	%P	95% CI	%P	95% CI	%P
Malta	150	14	8.9-20.6	12.7	7.8-19.1	19	6.3-42.6	0	0-15.3	2.7	0.7-6.7	1.3	0.2-4.7	0	0-2.4
Poland	310	6.1	3.7-9.4	5.5	3.2-8.6	1.3	0.4-3.5	0	0-1.2	0.6	0.1-2.3	0	0-1.2	0	0-1.2
Portugal	102	11.8	6.2-19.6	10.8	5.5-18.5	2	0.3-7.6	0	0-3.5	2.9	0.6-8.4	2	0.2-6.9	0	0-3.6
Romania	300	11.3	8-15.5	8	5.2-11.7	1.3	0.4-3.6	0	0-1.2	3.3	1.6-6	0	0-1.2	0	0-1.2
Slovakia	149	18.8	12.9-26	15.4	10-22.3	6.7	3.4-12.3	0	0-2.4	3.4	1.1-7.7	0	0-2.4	0	0-2.4
Slovenia	152	13.8	8.8-20.3	8.6	4.6-14.2	4.6	2-9.6	0	0-2.3	5.3	2.3-10.1	0	0-2.4	0	0-2.4
Spain	300	15.7	11.7-20.3	13.7	10-18.1	2.3	1-5	0	0-1.2	2.3	0.9-4.7	0.3	0-1.8	0	0-1.2
Total (23 MSs)	5,339	9.8	7.3-10.6	8.1	6-8.9	1.9	1.5-2.3	0.1	0-0.2	1.8	1.2-1.9	0.2	0.1-0.3	0	0-0.1
Norway	311	0.3	0-1.8	0	0-1.2	0	0-1.2	0	0-1.2	0.3	0-1.8	0	0-1.2	0	0-1.2

ESBL: extended-spectrum β-lactamase; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States; Ns: total number of samples tested. *Countries that used WGS to identify ESBL-, AmpC-, and CP- producers

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for CTX and/or CAZ (screening breakpoint) were considered (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)

⁽b): All isolates showing clavulanate synergy with CTX or CAZ or synergy with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).

⁽c): Isolates showing synergy with CTX only, suggesting the presence of an ESBL with cefotaximase activity.

⁽d): Isolates showing synergy with CAZ only, suggesting the presence of an ESBL with ceftazidimase activity.

⁽e): Isolates with microbiological resistance to FOX, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).

⁽f): Isolates showing synergy with CTX or CAZ and microbiological resistance to FOX, suggesting ESBL and AmpC enzymes in the same isolate. ESBL and AmpC columns include those isolates.

⁽g): Isolates with microbiological meropenem resistance.



Table 14. Occurrence of presumptive ESBL- and/or AmpC-producing *E. coli* isolates in meat from pigs (retail) collected within the specific ESBLs-/AmpC-/carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) in 2021

Country	NP2		L and/or npC ^(a)	ES	SBL ^(b)		BL only CTX SYN ^(c)		BL only AZ SYN ^(d)	An	npC ^(e)	ESBL -	+ AmpC ^(f)	CF	S (g)
-		n	%(h)	n	% ^(h)	n	%(h)	n	n	%(h)	n	%(h)	n	% ^(h)	n
Austria	27	27	100	25	92.6	4	14.8	0	0	2	7.4	0	0	0	0
Belgium	6	5	83.3	5	83.3	1	16.7	0	0	0	0	1	16.7	0	0
Bulgaria	22	22	100	20	90.9	9	40.9	1	4.5	2	9.1	0	0	0	0
Croatia	3	3	100	3	100	1	33.3	0	0	0	0	0	0	0	0
Czechia*	24	24	100	19	79.2					5	20.8	0	0	0	0
Denmark	16	16	100	12	75	4	25	0	0	4	25	0	0	0	0
Estonia	10	10	100	9	90	3	30	0	0	1	10	0	0	0	0
France	3	3	100	2	66.7	0	0	0	0	1	33.3	0	0	0	0
Germany*	23	23	100	20	87					3	13	0	0	0	0
Greece	4	4	100	4	100	1	25	0	0	0	0	0	0	0	0
Hungary	34	33	97.1	28	82.4	15	44.1	2	5.9	5	14.7	0	0	1	2.9
Ireland	8	8	100	5	62.5	1	12.5	0	0	3	37.5	0	0	0	0
Italy*	23	23	100	15	65.2					8	34.8	0	0	0	0
Latvia	24	23	95.8	22	91.7	11	45.8	0	0	1	4.2	1	4.2	0	0
Lithuania	16	16	100	12	75	3	18.8	0	0	4	25	0	0	0	0
Luxembourg	6	6	100	5	83.3	1	16.7	0	0	1	16.7	0	0	0	0
Malta	21	19	90.5	17	81	4	19	0	0	2	9.5	2	9.5	0	0
Poland	20	19	95	17	85	4	20	0	0	2	10	0	0	0	0
Portugal	12	10	83.3	9	75	2	16.7	0	0	1	8.3	2	16.7	0	0
Romania	34	34	100	24	70.6	4	11.8	0	0	10	29.4	0	0	0	0
Slovakia	28	28	100	23	82.1	10	35.7	0	0	5	17.9	0	0	0	0



Country	NP2		_ and/or npC ^(a)	ES	SBL ^(b)		BL only CTX SYN ^(c)		BL only AZ SYN ^(d)	Am	ıpC ^(e)	ESBL -	+ AmpC ^(f)	С	Ps ^(g)
-		n	% ^(h)	n	% ^(h)	n	%(h)	n	n	% ^(h)	n	%(h)	n	% (h)	n
Slovenia	21	21	100	13	61.9	7	33.3	0	0	8	38.1	0	0	0	0
Spain	47	46	97.9	40	85.1	7	14.9	0	0	6	12.8	1	2.1	0	0
Total (21 MSs)	362	353	97.5	295	81.5	92	25.4	3	0.8	58	16	7	1.9	1	0.3
Norway	1	1	100	0	0	0	0	0	0	1	100	0	0	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States. NP2: Total number of isolates tested with panel 2.

- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance.
- (h): Percentage of the total number of E. coli isolates tested (with panel 2).

^{*}Countries that used WGS to identify ESBL-, AmpC-, and CP- producers

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)



Table 15. Prevalence of presumptive ESBL- and/or AmpC-producing *E. coli* isolates from fattening pigs collected within the specific ESBLs-/AmpC-/carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) and or whole genome sequencing in 2021

Country	No		L and/or mpC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	Aı	mpC ^(e)	ESBL	+ AmpC ^(f)	С	Ps ^(g)
Country	Ns	%P	95% CI	%P	95% CI	%P	95% CI	%P	%P	95% CI	%P	95% CI	%P	95% CI	%P
Austria	301	65.8	57.1-68.3	62.3	53.7-65.1	10.3	7.2-14.4	0.3	0-2.1	3.5	1.6-6	0	0-1.2	0	0-1.2
Belgium	300	39.6	31.8-43.1	32.2	25.2-35.9	8.7	5.8-12.6	0.3	0-2.1	7.4	4.4-10.5	0	0-1.2	0	0-1.2
Bulgaria	191	30.9	24.4-38	30.9	24.4-38	12.6	8.4-18.3	0	0-1.9	0.5	0-2.9	0.5	0-2.9	0	0-1.9
Croatia	261	65.4	25.8-71.3	57.4	22.3-63.5	11.5	8-16.2	0	0-1.4	8	1.9-12	0	0-1.4	0	0-1.4
Czechia*	302	50.3	44.5-56.1	32.1	26.9-37.7					18.2	14-23	0	0-1.2		0-1.2
Denmark	272	20.2	15.3-25.1	4.1	2-7.1	1.5	0.5-4	0	0-1.3	16.1	11.7-20.7	0	0-1.3	0	0-1.3
Estonia	158	31.6	24.5-39.5	22.2	15.9-29.4	0	0-2.3	0	0-2.3	9.5	5.4-15.2	0	0-2.3	0	0-2.3
Finland*	307	6.5	4-9.9	0.7	0.1-2.3					5.9	3.5-9.1	0	0-1.2		0-1.2
France	350	10.9	7.8-14.6	9.7	6.8-13.3	1.4	0.5-3.5	0.9	0.2-2.7	2	0.8-4.1	0.9	0.2-2.5	0	0-1
Germany*	382	42.9	37.9-48.1	36.4	31.6-41.4					6.5	4.3-9.5	0	0-1		0-1
Greece	74	35.1	24.4-47.1	33.8	23.2-45.7	0	0-4.7	0	0-4.7	1.3	0-7.3	0	0-4.9	0	0-4.9
Hungary	300	67	61.4-72.3	53.3	47.5-59.1	16.7	12.7-21.5	0.3	0-2.1	14.3	10.6-18.8	0.7	0.1-2.4	0	0-1.2
Ireland	300	37.7	32.2-43.4	24	19.3-29.2	13.3	9.8-17.8	0	0-1.2	14.7	10.9-19.2	1	0.2-2.9	0	0-1.2
Italy*	301	80.7	75.8-85	62.4	56.7-67.9					18.6	14.4-23.5	0.3	0-1.8		0-1.2
Latvia	152	50	41.8-58.2	49.4	41.1-57.6	19.1	13.3-26.4	0	0-2.3	0.7	0-3.6	0	0-2.4	0	0-2.4
Lithuania	150	38	30.2-46.3	28.7	21.6-36.6	6.7	3.4-12.2	0	0-2.4	9.3	5.2-15.2	0	0-2.4	0	0-2.4
Luxembourg	206	42.7	35.9-49.8	40.3	33.5-47.3	14.1	9.8-19.8	0	0-1.7	3.4	1.4-6.9	1	0.1-3.5	0	0-1.8
Malta	128	26.6	19.1-35.1	26.6	19.1-35.1	2.9	0.2-17.1	8.8	2.3-24.8	3.9	1.3-8.9	3.9	1.3-8.9	0	0-2.8
Netherlands	300	9.3	11.7-20.3	8.7	5.7-12.4	1.7	0.6-4.1	0	0-1.2	7	4.4-10.5	0	0-1.2	0	0-1.2
Poland	302	35.1	29.7-40.8	28.5	23.5-33.9	3.3	1.7-6.2	0.3	0-2.1	6.9	4.4-10.4	0.3	0-1.8	0	0-1.2
Portugal	99	51.5	38.3-58.7	46.2	33.5-53.8	6.1	2.5-13.2	1	0.1-6.3	9.7	4.2-16.6	4.3	1.1-10	0	0-3.7
Romania	239	69.5	63.2-75.2	55.2	48.7-61.6	10.5	7-15.2	0.8	0.1-3.3	16.4	11.9-21.6	2.1	0.7-4.8	0	0-1.5
Slovakia	149	58.4	50-66.4	43.6	35.5-52	19.5	13.6-26.9	0.7	0-4.2	16.8	11.2-23.8	2	0.4-5.8	0	0-2.4
Slovenia	153	57.5	49.3-65.5	24.2	17.6-31.8	8.5	4.8-14.4	0	0-2.3	34	26.5-42.1	0.6	0-3.6	0	0-2.4



Country	Ns		L and/or npC ^(a)	E	SBL ^(b)	_	BL only CTX SYN ^(c)		BL only CAZ SYN ^(d)	Aı	mpC ^(e)	ESBL	+ AmpC ^(f)	С	Ps ^(g)
Country	NS	%P	95% CI	%P	95% CI	% P	95% CI	% P	%P	95% CI	%Р	95% CI	%P	95% CI	%Р
Spain	423	77.1	72.8-81	67.4	62.7-71.8	13.2	10.2-16.9	0.2	0-1.5	17.5	14-21.5	7.8	5.4-10.8	0	0-0.9
Sweden	300	8.3	5.5-12.1	1	0.2-2.9	0	0-1.2	0	0-1.2	7.3	4.7-10.9	0	0-1.2	0	0-1.2
Total (26 MSs)	6,400	54.7	40.2-	42.8	31.3-44	8.6	7.9-9.4	0.3	0.2-0.5	13.2	9.3-14.1	1.3	0.8-1.3	0	0-0.1
Iceland	152	3.3	1.1-7.5	3.3	1.1-7.5	0	0-2.3	3.3	1.2-7.9	0	0-2.4	0	0-2.4	0	0-2.4
Norway	321	14.6	11-19	0.9	0.2-2.7	0	0-1.1	0	0-1.1	13.7	10.1-18	0	0-1.1	0	0-1.1
Switzerland	289	5.9	3.5-9.3	4.2	2.2-7.1	2.1	0.8-4.7	0.3	0-2.2	1.7	0.6-4	0	0-1.3	0	0-1.3
United Kingdom	68	60.3	47.7-72	57.4	44.8-69.3	22.1	13.3-34.1	0	0-5.1	3	0.4-10.2	0	0-5.3	0	0-5.3

ESBL: extended-spectrum β-lactamase; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; P: prevalence; CI: confidence interval; MSs: Member States; Ns: total number of samples tested.

^{*}Countries that used WGS to identify ESBL-, AmpC-, and CP- producers

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for FOX and/or CAZ (screening breakpoint) were considered (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867).

⁽b): All isolates showing clavulanate synergy with CTX or CAZ or synergy with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).

⁽c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.

⁽d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.

⁽e): Isolates with microbiological resistance to FOX, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).

⁽f): Isolates showing synergy with CTX or CAZ and microbiological resistance to FOX, suggesting ESBL and AmpC enzymes in the same isolate. ESBL and AmpC columns include those isolates.

⁽g): Isolates with microbiological meropenem resistance.



Table 16. Occurrence of presumptive ESBL- and/or AmpC-producing *E. coli* isolates from fattening pigs collected within the specific ESBLs-/AmpC-/carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) in 2021

Country	NP2		L and/or npC ^(a)	ES	SBL ^(b)		BL only CTX SYN ^(c)		BL only AZ SYN ^(d)	An	npC ^(e)	ESBL ·	+ AmpC ^(f)	СР	s (g)
•		n	% ^(h)	n	% ^(h)	n	%(h)	n	n	% (h)	n	%(h)	n	0/ ₀ (h)	n
Austria	189	189	100	179	94.7	31	16.4	1	0.5	10	5.3	0	0	0	0
Belgium	113	112	98.2	91	79.8	26	22.8	1	0.9	21	18.4	0	0	0	0
Bulgaria	59	58	98.3	58	98.3	24	40.7	0	0	0	0	1	1.7	0	0
Croatia	85	82	96.5	72	84.7	30	35.3	0	0	10	11.8	0	0	0	0
Czechia*	152	152	100	97	63.8					55	36.2	0	0	0	0
Denmark	57	54	94.7	11	19.3	4	7	0	0	43	75.4	0	0	0	0
Estonia	50	50	100	35	70	0	0	0	0	15	30	0	0	0	0
France	40	35	87.5	31	77.5	5	12.5	3	7.5	4	10	3	7.5	0	0
Finland*	20	20	100	2	10					18	90	0	0	0	0
Germany*	164	164	100	139	84.8					25	15.24	0	0	0	0
Greece	26	26	100	25	96.2	0	0	0	0	1	3.8	0	0	0	0
Hungary	203	199	98	158	77.8	50	24.6	1	0.5	41	20.2	2	1	0	0
Ireland	117	110	94	69	59	40	34.2	0	0	41	35	3	2.6	0	0
Italy*	243	243	100	188	77.4					56	23	1	0.4	0	0
Latvia	76	76	100	75	98.7	29	38.2	0	0	1	1.3	0	0	0	0
Lithuania	57	57	100	43	75.4	10	17.5	0	0	14	24.6	0	0	0	0
Luxembourg	92	86	93.5	81	88	29	31.5	0	0	5	5.4	2	2.2	0	0
Malta	34	29	85.3	29	85.3	1	2.9	3	8.8	0	0	5	14.7	0	0
Netherlands	47	47	100	26	55.3	5	10.6	0	0	21	44.7	0	0	0	0
Poland	106	105	99.1	85	80.2	10	9.4	1	0.9	20	18.9	1	0.9	0	0
Portugal	47	43	91.5	38	80.9	6	12.5	1	2.1	5	10.4	4	8.3	0	0



Country	NP2		. and/or npC ^(a)	ES	SBL ^(b)		BL only CTX SYN ^(c)		BL only AZ SYN ^(d)	Am	ıpC ^(e)	ESBL -	⊦ AmpC ^(f)	Ci	Os ^(g)
-		n	% ^(h)	n	% ^(h)	n	%(h)	n	n	% ^(h)	n	%(h)	n	%(h)	n
Romania	167	161	96.4	127	76	25	15	2	1.2	34	20.4	5	3	0	0
Slovakia	87	84	96.6	62	71.3	29	33.3	1	1.1	22	25.3	3	3.4	0	0
Slovenia	88	87	98.9	36	40.9	13	14.8	0	0	51	58	1	1.1	0	0
Spain	327	293	89.6	252	77.1	56	17.1	1	0.3	41	12.5	33	10.1	0	0
Sweden	25	25	100	3	12	0	0	0	0	22	88	0	0	0	0
Total (24 MSs)	2135	2049	95.9	1625	76.1	438	20.5	15	0.7	424	19.8	63	2.9	0	0
United Kingdom (Northern Ireland)	43	41	95.3	39	90.7	15	34.9	0	0	2	4.7	0	0	0	0
Iceland	14	5	35.7	5	35.7	0	0	5	35.7	0	0	0	0	0	0
Norway	47	47	100	3	6.4	0	0	0	0	44	93.6	0	0	0	0
Switzerland	17	17	100	12	70.6	6	35.3	1	5.9	5	29.4	0	0	0	0

ESBL: extended-spectrum β-lactamase; n: isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States. NP2: Total number of isolates tested with panel 2.

^{*}Countries that used WGS to identify ESBL-, AmpC-, and CP- producers

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)

⁽b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).

⁽c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.

⁽d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.

⁽e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).

⁽f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.

⁽g): Isolates with microbiological meropenem resistance.

⁽h): Percentage of the total number of E. coli isolates tested (with panel 2).



Table 17. Prevalence of presumptive ESBL- and/or AmpC-producing *E. coli* isolates from bovine meat collected within the specific ESBLs/AmpC/Carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) and or whole genome sequencing in 2021

Country	N.		L and/or mpC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only AZ SYN ^(d)	An	npC ^(e)	ESBL -	+ AmpC ^(f)	C	(Ps ^(g)
Country	Ns	%P	95% CI	%P	95% CI	%P	95% CI	%Р	%P	95% CI	%P	95% CI	%P	95% CI	%P
Meat from bovine	e animals	- fresh	- BCP			_									
Italy	62	0	0-5.6	0	0-5.6	0	0-5.6	0	0-5.6	0	0-5.6	0	0-5.6	0	0-5.6
Portugal	21	0	0-15.3	0	0-15.3	0	0-15.3	0	0-15.3	0	0-15.3	0	0-15.3	0	0-15.3
Sweden	18	0	0-17.5	0	0-17.5	0	0-17.5	0	0-17.5	0	0-17.5	0	0-17.5	0	0-17.5
Belgium	3	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6
Denmark	3	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6	0	0-62.6
Finland	1	0	0-92.7	0	0-92.7	0	0-92.7	0	0-92.7	0	0-92.7	0	0-92.7	0	0-92.7
Germany	86	0	0-4.1	0	0-4.1	0	0-4.1	0	0-4.1	0	0-4.1	0	0-4.1	0	0-4.1
Poland	2	0	0-75.2	0	0-75.2	0	0-75.2	0	0-75.2	0	0-75.2	0	0-75.2	0	0-75.2
Spain	36	2.8	0.1-16.2	2.8	0.1-16.2	0	0-9.4	0	0-9.4	0	0-9.4	0	0-9.4	0	0-9.4
Total (8 MSs)	232	0.4	0-2.8	0.4	0-2.8	0	0-1.5	0	0-1.5	0	0-1.5	0	0-1.5	0	0-1.5
Meat from bovine	e animals	- fresh	- retail												
Austria	336	3.3	1.6-5.8	3	1.4-5.4	0.9	0.2-2.8	0	0-1.1	0.3	0-1.6	0	0-1.1	0	0-1.1
Belgium	300	3.3	1.6-6	3.3	1.6-6	0.3	0-2.1	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2
Bulgaria	150	13.3	8.3-19.8	12.7	7.8-19.1	2.7	0.9-7.1	0	0-2.4	0.7	0-3.7	0	0-2.4	0	0-2.4
Croatia	130	3.1	0.8-7.7	2.3	0.5-6.6	1.5	0.3-6	0	0-2.7	0.8	0-4.2	0	0-2.8	0	0-2.8
Cyprus	139	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6	0	0-2.6
Czechia*	298	7.4	4.7-11	5.7	3.4-9					1.7	0.5-3.9	0	0-1.2	0	0-1.2
Denmark	280	5.4	3-8.7	2.9	1.2-5.6	0.4	0-2.3	0	0-1.3	2.5	1-5.1	0	0-1.3	0	0-1.3
Estonia	150	12	2.3-18.3	9	1.5-15.2	0.7	0-4.2	0	0-2.4	3	0.2-4.7	0	0-2.4	0	0-2.4
France	312	0.3	0-1.8	0	0-1.2	0	0-1.2	0	0-1.2	0.3	0-1.8	0	0-1.2	0	0-1.2
Finland	308	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2
Germany*	418	2.2	1-4	2.2	1-4					0	0-0.9	0	0-0.9	0	0-0.9
Greece	75	4	0.8-11.2	4	0.8-11.2	0	0-4.7	0	0-4.7	0	0-4.8	0	0-4.8	0	0-4.8
Hungary	300	30.7	25.5-36.2	29	23.9-34.5	12.7	9.2-17.1	0	0-1.2	2	0.7-4.3	0.3	0-1.8	0.7	0.1-2.



Ct	N 1-		L and/or mpC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		BL only AZ SYN ^(d)	An	npC ^(e)	ESBL ·	+ AmpC ^(f)	С	Ps ^(g)
Country	Ns	%P	95% CI	%P	95% CI	%P	95% CI	%Р	%P	95% CI	%P	95% CI	%P	95% CI	%P
Ireland	300	1.7	0.5-3.8	0.3	0-1.8	0	0-1.2	0	0-1.2	1.3	0.4-3.4	0	0-1.2	0	0-1.2
Italy*	301	4.3	2.3-7.3	3.7	1.8-6.4					0.7	0.1-2.4	0	0-1.2	0	0-1.2
Latvia	150	16.7	11.1-23.6	16	10.5-22.9	8.7	4.9-14.7	0.7	0-4.2	0.7	0-3.7	0	0-2.4	0	0-2.4
Lithuania	150	8.7	4.7-14.4	8.7	4.7-14.4	2	0.5-6.2	0	0-2.4	0	0-2.4	0	0-2.4	0	0-2.4
Luxembourg	67	7.5	2.5-16.6	7.5	2.5-16.6	0	0-5.2	0	0-5.2	0	0-5.4	0	0-5.4	0	0-5.4
Malta	150	12	7.3-18.3	11.3	6.7-17.5	0	0-17.5	0	0-17.5	2	0.4-5.7	1.3	0.2-4.7	0	0-2.4
Poland	307	5.9	3.5-9.1	5.5	3.3-8.7	1.9	0.8-4.4	0.3	0-2.1	0.3	0-1.8	0	0-1.2	0	0-1.2
Portugal	125	6.4	2.8-12.2	6.4	2.8-12.2	0.8	0-5	0	0-2.8	0.8	0-4.4	0.8	0-4.4	0	0-2.9
Romania	150	8	4.2-13.6	8	4.2-13.6	0.7	0-4.2	0	0-2.4	0.7	0-3.7	0.7	0-3.7	0	0-2.4
Slovakia	150	7.3	3.7-12.7	6	2.8-11.1	2	0.5-6.2	0	0-2.4	1.3	0.2-4.7	0	0-2.4	0	0-2.4
Slovenia	152	5.3	2.3-10.1	3.3	1.1-7.5	2	0.5-6.1	0	0-2.3	2	0.4-5.7	0	0-2.4	0	0-2.4
Spain	300	3.7	1.8-6.5	3.3	1.6-6	0.7	0.1-2.7	0	0-1.2	0.3	0-1.8	0	0-1.2	0	0-1.2
Sweden	303	0.3	0-1.8	0.3	0-1.8	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2	0	0-1.2
Total (25 MSs)	5493	7.4	5.6-8.1	6.6	5-7.3	1.8	1.4-2.2	0	0-0.2	0.9	0.6-1.1	0.1	0-0.2	0	0-0.1
Switzerland	307	0	0-33.6	0	0-33.6	0	0-0.6	0	0-0.6	0	0-33.6	0	0-33.6	0	0-33.6

 $ESBL:\ extended-spectrum\ \beta-lactamase;\ SYN:\ synergy;\ CTX:\ cefotaxime;\ CAZ:\ ceftazidime;\ CLA:\ clavulanate;\ P:\ prevalence;\ CI:\ confidence\ interval;\ Ns:\ total\ number\ of\ samples.$

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing MIC > 1 mg/L for CTX and/or CAZ (screening breakpoint) were considered (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867).

^{*}Countries that used WGS to identify ESBL-, AmpC-, and CP- producers

⁽b): All isolates showing clavulanate synergy with CTX or CAZ or synergy with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).

⁽c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.

⁽d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.

⁽e): Isolates with microbiological resistance to FOX, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).

⁽f): Isolates showing synergy with FOX or CAZ and microbiological resistance to FOX, suggesting ESBL and AmpC enzymes in the same isolate. ESBL and AmpC columns include those isolates.

⁽g): Isolates with microbiological MEM resistance.



Table 18. Occurrence of presumptive ESBL- and/or AmpC-producing *E. coli* isolates from bovine meat (retail) collected within the specific ESBLs/AmpC/Carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) in 2021

Country	NP2		L and/or npC ^(a)	E	SBL ^(b)		BL only CTX SYN ^(c)		SL only AZ SYN ^(d)	Am	ıpC ^(e)	ESBL -	+ AmpC ^(f)	CPs ^(g)	
-		n	0/o ^(h)	n	% ^(h)	n	% ^(h)	n	n	%(h)	n	%(h)	n	%(h)	n
Austria	11	11	100	10	90.9	3	27.3	0	0	1	9.1	0	0	0	0
Belgium	10	10	100	10	100	1	10	0	0	0	0	0	0	0	0
Bulgaria	20	20	100	19	95	4	20	0	0	1	5	0	0	0	0
Croatia	4	4	100	3	75	2	50	0	0	1	25	0	0	0	0
Czechia*	22	22	100	17	77.3					5	22.7	0	0	0	0
Denmark	15	15	100	8	53.3	1	6.7	0	0	7	46.7	0	0	0	0
Estonia	8	8	100	6	75	1	12.5	0	0	2	25	0	0	0	0
France	1	1	100	0	0	0	0	0	0	1	100	0	0	0	0
Greece	3	3	100	3	100	0	0	0	0	0	0	0	0	0	0
Germany*	10	9	90	9	90					0	0	0	0	0	0
Hungary	94	91	96.8	86	91.5	38	40.4	0	0	5	5.3	1	1.1	2	2.1
Ireland	5	5	100	1	20	0	0	0	0	4	80	0	0	0	0
Italy*	13	13	100	11	84.6					2	15.4	0	0	0	0
Latvia	25	25	100	24	96	13	52	1	4	1	4	0	0	0	0
Lithuania	14	13	92.9	13	92.9	3	21.4	0	0	0	0	0	0	0	0
Luxembourg	5	5	100	5	100	0	0	0	0	0	0	0	0	0	0
Malta	18	16	88.9	15	83.3	0	0	0	0	1	5.6	2	11.1	0	0
Poland	18	18	100	17	94.4	6	33.3	1	5.6	1	5.6	0	0	0	0
Portugal	8	7	87.5	7	87.5	1	12.5	0	0	0	0	1	12.5	0	0
Romania	12	11	91.7	11	91.7	1	8.3	0	0	0	0	1	8.3	0	0
Slovakia	11	11	100	9	81.8	3	27.3	0	0	2	18.2	0	0	0	0



Country	NP2	ESBL and/or AmpC ^(a)		ESBL(b)		ESBL only CLA/CTX SYN(c)		ESBL only CLA/CAZ SYN(d)		AmpC ^(e)		ESBL + AmpC ^(f)		CPs ^(g)	
		n	% (h)	n	%(h)	n	0/o ^(h)	n	n	% ^(h)	n	% ^(h)	n	%(h)	n
Austria	11	11	100	10	90.9	3	27.3	0	0	1	9.1	0	0	0	0
Slovenia	8	8	100	5	62.5	3	37.5	0	0	3	37.5	0	0	0	0
Spain	11	11	100	10	90.9	2	18.2	0	0	1	9.1	0	0	0	0
Sweden	1	1	100	1	100	0	0	0	0	0	0	0	0	0	0
Total (22 MSs)	302	294	97.4	263	87.1	82	27.2	2	0.7	31	10.3	5	1.7	2	0.7

ESBL: extended-spectrum β -lactamase; n = isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; MSs: Member States. NP2: Total number of isolates tested with panel 2.

^{*}Countries that used WGS to identify ESBL-, AmpC-, and CP- producers

⁽a): Several countries reported only a few isolates. For countries reporting less than 10 isolates, occurrence data should be carefully considered. This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)

⁽a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867).

⁽b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).

⁽c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.

⁽d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.

⁽e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).

⁽f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.

⁽g): Percentage of the total number of E. coli isolates tested (with panel 2).



Table 19. Prevalence of presumptive ESBL- and/or AmpC-producing *E. coli* isolates from cattle under 1 year of age collected within the specific ESBLs/AmpC/Carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) and or whole genome sequencing in 2021

Country	Ns	ESBL and/or AmpC			ESBL		ESBL only CLA/CTX SYN		ESBL only CLA/CAZ SYN		AmpC	ESBL + AmpC		CPs	
•		%P	95% CI	%P	95% CI	%Р	95% CI	%Р	95% CI	%Р	95% CI	%P	95% CI	%P	95% CI
Belgium	301	59.1	51.7-62.8	53	45.7-57.3	9.6	6.7-13.7	1	0.3-3.1	7.5	4.6-10.9	1.7	0.5-3.8	0	0-1.2
Croatia	203	44.3	35-49	43.3	34.1-48	13.3	9.1-18.9	0	0-1.8	1.1	0.1-3.5	0	0-1.8	0	0-1.8
Denmark	293	5.8	3.4-9.1	1	0.2-3	0.3	0-2.2	0	0-1.2	4.8	2.6-7.9	0	0-1.3	0	0-1.3
France	281	14.2	10.4-18.9	8.9	5.8-12.9	2.1	0.9-4.8	0	0-1.3	5.7	3.3-9.1	0.4	0-2	0	0-1.3
Germany*	299	64.2	58.5-69.6	63.5	57.8-69					0.6	0.1-2.4	0	0-1.2	0	0-1.2
Italy*	310	90.3	86.5-93.4	86.8	82.5-90.3					3.5	1.8-6.3	0	0-1.2	0	0-1.2
Netherlands	306	33.3	28.1-38.9	32.7	27.5-38.2	3.6	1.9-6.5	0	0-1.2	1.6	0.5-3.8	1	0.2-2.8	0	0-1.2
Portugal	99	17.2	8.7-23.8	16	8-22.6	4	1.3-10.6	0	0-3.6	3.4	0.6-8.6	2.3	0.2-7.1	0	0-3.7
Romania	141	22.7	16.1-30.5	21.3	14.8-29	4.3	1.7-9.4	0	0-2.5	2.1	0.4-6.1	0.7	0-3.9	0	0-2.6
Spain	413	43.8	39-48.8	38.5	33.8-43.4	19.1	15.5-23.3	0	0-0.9	9.2	6.6-12.4	3.9	2.2-6.2	0	0-0.9
Sweden	20	10	1.2-31.7	10	1.2-31.7	0	0-16	0	0-16	0	0-16.8	0	0-16.8	0	0-16.8
Total (11 MSs)	2,666	73.1	40.1-74.9	67.4	36.8-	7.9	6.8-9.2	0.1	0-0.5	7.6	3.6-8.7	1.8	0.7-2.4	0	0-0.1
Norway	295	1	0.2-2.9	0	0-1.2	0	0-1.2	0	0-1.2	1	0.2-2.9	0	0-1.2	0	0-1.2
Switzerland	294	23.5	18.7-28.7	15.6	11.7-20.3	4.8	2.7-8	0	0-1.2	7.8	5-11.5	0	0-1.2	0	0-1.2

ESBL: extended-spectrum β-lactamase; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate; P: prevalence; CI: confidence interval; MSs: Member States; Ns: total number of samples.

^{*}Countries that used WGS to identify ESBL-, AmpC-, and CP- producers(a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing MIC > 1 mg/L for CTX and/or CAZ (screening breakpoint) were considered (see Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867).

⁽b): All isolates showing clavulanate synergy with CTX or CAZ or synergy with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).

⁽c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.

⁽d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.

⁽e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).

⁽f): Isolates showing synergy with CTX or CAZ and microbiological resistance to FOX, suggesting ESBL and AmpC enzymes in the same isolate. ESBL and AmpC columns include those isolates.

⁽g): Isolates with microbiological meropenem resistance.



Table 20. Occurrence of presumptive ESBL- and/or AmpC-producing *E. coli* isolates from cattle under 1 year of age collected within the specific ESBLs/AmpC/Carbapenemase-producing monitoring and subjected to supplementary testing (panel 2) in 2021

Country	NP2	ESBL and/or AmpC		ESBL		ESBL only CLA/CTX SYN			BL only CAZ SYN	A	mpC	ESBL + AmpC		CPs	
-		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Belgium	174	167	96	150	85.7	29	16.6	3	1.7	17	9.8	5	2.9	0	0
Croatia	85	85	100	83	97.6	27	31.8	0	0	2	2.4	0	0	0	0
Denmark	18	17	94.4	3	16.7	1	5.6	0	0	14	77.8	0	0	0	0
France	42	39	92.9	24	57.1	6	14.3	0	0	15	35.7	1	2.4	0	0
Germany*	193	192	99.5	190	98.5					2	1	0	0	0	0
Italy*	280	280	100	269	96.1					11	3.9	0	0	0	0
Netherlands	103	99	96.1	97	94.2	11	10.7	0	0	2	1.9	3	2.9	0	0
Portugal	15	13	86.7	12	80	4	26.7	0	0	1	6.7	2	13.3	0	0
Romania	32	31	96.9	29	90.6	6	18.8	0	0	2	6.2	1	3.1	0	0
Spain	181	165	91.2	143	79	79	43.6	0	0	22	12.2	16	8.8	0	0
Sweden	2	2	100	2	100	0	0	0	0	0	0	0	0	0	0
Total (10 MSs)	652	618	94.8	543	83.2	163	25	3	0.5	75	11.5	28	4.3	0	0
Norway	3	3	100	0	0	0	0	0	0	3	100	0	0	0	0
Switzerland	70	69	98.6	46	65.7	14	20	0	0	23	32.9	0	0	0	0

ESBL: extended-spectrum β -lactamase; n = isolates with this phenotype; %: percentage of isolates from the total tested; SYN: synergy; CTX: cefotaxime; CAZ: ceftazidime; CLA: clavulanate. MSs: Member States. NP2: Total number of isolates tested with panel 2.

Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867). This column displays the number of isolates that are assumed to be ESBL only and AmpC only producers but excludes isolates that were presumed to be both ESBL and AmpC producers (these are displayed in column f)

- (b): All isolates showing clavulanate synergy with cefotaxime, ceftazidime or with both compounds, suggesting the presence of an ESBL only (independently of the presence of other mechanisms).
- (c): Isolates showing synergy with cefotaxime only, suggesting the presence of an ESBL with cefotaximase activity.
- (d): Isolates showing synergy with ceftazidime only, suggesting the presence of an ESBL with ceftazidimase activity.
- (e): Isolates with microbiological resistance to cefoxitin, suggesting the presence of an AmpC enzyme only (independently of the presence of other mechanisms).
- (f): Isolates showing synergy with cefotaxime or ceftazidime and with microbiological resistance to cefoxitin, suggesting the presence of ESBL and AmpC enzymes in the same isolate. These isolates are also included in the ESBL and AmpC columns.
- (g): Isolates with microbiological meropenem resistance. (h): Percentage of the total number of Salmonella spp. isolates tested (with panel 2).

^{*}Countries that used WGS to identify ESBL-, AmpC-, and CP- producers(a): According to EUCAST Guidelines (EUCAST, 2019), only isolates showing an MIC > 1 mg/L for cefotaxime and/or ceftazidime (screening breakpoint) were considered (see Appendix F.



D.5. Specific carbapenemase-producing E. coli monitoring 2020-2021

This monitoring programme was performed and reported on a voluntary basis. For the specific monitoring of carbapenemase-producing microorganisms, isolation required the use of non-selective pre-enrichment and subsequent selective plating on carbapenem-containing media, in accordance with the most recent version of the detailed protocol of the EURL-AR. ³ More information is provided in Appendix F. Materials and Methods available at https://doi.org/10.2903/j.efsa.2023.7867).

Table 21. Number of samples investigated and number of presumptive carbapenemase-producing *E. coli* in the specific carbapenemase-producing monitoring in 2020-2021

		Animal population/Meat														
Country	Pig me	Pig meat, 2021		Fattening pigs, 2021		ne meat, 2021		e <1 year , 2021	Broiler meat, 2020		Broilers, 2020			tening eys, 2020		
	Ns	n _{CP}	Ns	n _{CP}	Ns	n _{CP}	Ns	n _{CP}	Ns	n _{CP}	Ns	n _{CP}	Ns	n _{CP}		
Austria	398	0	301	0	323	0	-	-	288	0	362	0	275	0		
Belgium	300	0	300	0	300	0	301	0	250	0	-	-	-	-		
Bulgaria	-	-	-	-	-	0	-	-	-	-	-	-	-	-		
Croatia	139	0	261	0	130	0	203	0	127	0	175	0	-	-		
Czechia	294	0	302	3	298	0	-	-	299	0	300	0	-	-		
Cyprus	143	0	64	0	139	0	-	-	-	-	-	-	-	-		
Denmark	337	0	269	0	280	0	291	0	337	0	308	0	-	-		
Estonia	150	0	158	0	150	0	-	-	75	0	85	0	-	-		
Finland	313	0	307	0	308	0	-	-	296	0	309	0	-	-		
France	321	0	350	0	312	0	281	0	316	0	342	0	295	0		
Germany	457	0	376	0	417	0	296	0	442	0	419	0	434	0		
Greece	76	0	74	0	75	0	-	-	222	0	312	0	-	-		
Hungary	300	1	300	0	300	3	-	-	300	0	300	0	300	0		
Ireland	300	0	300	0	300	0	-	-	300	0	300	0	-	-		
Italy	305	0	301	21	301	0	310	5	281	0	464	0	453	0		
Latvia	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	-	-		



						An	imal pop	ulation/M	1eat					
Country	Pig meat, 2021		Fattening pigs, 2021		Bovine meat, 2021		Cattle <1 year old, 2021		Broiler meat, 2020		Broilers, 2020		Fattening Turkeys, 202	
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	310	0	302	0	307	0	-	-	315	0	306	0	307	0
Portugal	102	0	99	0	125	0	99	0	-	-	246	0	164	0
Romania	-	-	-	-	-	-	-	-	-	-	813	3	-	-
Slovakia	150	0	149	0	148	0	-	-	150	0	150	0	-	-
Slovenia	152	0	153	0	152	0	-	-	152	0	153	0	-	-
Spain	-	-	423	2	-	-	413	0	-	-	444	0	277	1
Sweden	296	0	300	0	303	0	20	0	306	0	300	0	45	0
Total (20 MSs)	4,843	1	5,089	26	4,688	3	2,214	5	4,456	0	6,088	3	2,250	1
Norway	-	-	321	0	-	-	295	0	314	0	224	0	106	0
Switzerland	307	0	288	0	307	0	294	0	296	0	612	0	-	-
United Kingdom	-	-	68	0	-	-	-	-	315	0	350	0	334	0

number of samples collected at slaughterhouses (fattening pigs, broilers, fattening turkeys, and bovines<1 year old), and fresh meat samples collected at retail. n_{CP}: number of positive isolates. NL footnote: BRs: 305/0; 2021: PIGs: 300/0; CLV: 306/0 and no meat.

Ns:

³https://www.eurl-ar.eu/protocols.aspx

D.6. Key outcome indicator of prevalence of ESBL- and/or AmpC producing *E. coli*, food-producing animals, 2015-2021

			Peri	od ^(a)		
Country	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Austria	52.1	59.9	56.4	56.2	52.8	19.2
Belgium	65.8	71.9	68.2	55.6	56	78.8
Bulgaria	64.4	55.3	51.9	55.7	52.2	62.4
Croatia	38.9	46.8	48.1	60.6	58.7	51.4
Cyprus	24.6	22.1	9.4	8.5	7.5	26.9
Czechia	40.5	42.1	37.6	38	34.7	36.0
Denmark	27.3	24	23.9	26	25.2	2.9
Estonia	36.7	35.3	38.2	50.5	48.7	49.1
Finland	6.3	6.3	6.2	6.1	1.6	0.3
France	39.6	32.8	26.6	22.1	16.8	8.7
Germany	47.2	47.5	47	50.1	48	37.9
Greece	54.4	59.1	42.5	42.5	47.4	65.6
Hungary	60.6	67.5	65.8	63.4	53.7	34.6
Ireland	42.3	47.6	40.1	45.6	36.1	16.4
Italy	23.6	88.7	82.3	88.9	75	41.4
Latvia	62.4	60.6	43.6	48.8	51	72.6
Lithuania	49.7	67.9	69.3	55.8	51.8	92.3
Luxembourg	58.9	40.9	40.7	52.3	52.2	26.1
Malta	-	-	45.7	66.9	67.2	99.9
Netherlands	23.7	23.9	19.1	19.5	17.2	9.9
Poland	44.7	51.1	44.5	41.9	34	50.8
Portugal	61.3	56.5	71.4	77.6	65.4	52.6
Romania	60.8	65.6	66	69.4	66.4	80.4
Slovakia	62.1	66.7	35	38.9	72.2	99.9
Slovenia	71.6	79	72.2	75.6	67.5	71.9
Spain	86.4	85.7	85.7	79	73.1	57.1
Sweden	20.7	22	12.3	13.2	12.1	11.3
United Kingdom	27.1	24.8	14.3	13.3	10	4.7
Total (25 MSs + UK)	42.9	49.9	46.8	45.2	41.3	-
Iceland	-	5.3	4	6.4	6.6	0.7
Norway	10.9	12.8	9.5	12.7	12.4	0.4
Switzerland	30.3	25.1	21.1	19.6	14.4	10.0
Total (Mss and non-MSs)	48.7	49.3	46.2	44.7	40.8	-

a): Proportions (in percent) of samples from broilers. fattening turkeys. fattening pigs and bovines under 1 year. weighted by PCU. that are identified as positive for presumptive ESBL- and/or AmpC-producing indicator *E. coli* in the framework of the specific monitoring for ESBL-/AmpC-/carbapenemase-producing indicator *E. coli* according to Commission Implementing Decision 2020/1729/EU