

Annex A – Antimicrobial resistance in *Salmonella* spp.

Annex to:

EFSA (European Food Safety Authority) and ECDC (European Centre for Disease Prevention and Control), 2024. The European Union Summary Report on Antimicrobial Resistance in zoonotic and indicator bacteria from humans, animals and food in 2021/2022. EFSA Journal 2024; <https://doi.org/10.2903/j.efsa.2024.8583>

© 2024 European Food Safety Authority and European Centre for Disease Prevention and Control. EFSA Journal published by Wiley-VCH GmbH on behalf of European Food Safety Authority.

Table of Contents

Annex A – Antimicrobial resistance in <i>Salmonella</i> spp.....	1
A.1. Antimicrobial resistance in <i>Salmonella</i> spp. from humans	2
A.2. Antimicrobial resistance in <i>Salmonella</i> spp. from food-producing animals	24

A.1. Antimicrobial resistance in *Salmonella* spp. from humans

Table 1. Antimicrobial resistance in *Salmonella* spp. (all non-typhoidal serovars) from humans per country in 2022

Country	Gentamicin		Chloramphenicol		Ampicillin		Cefotaxime		Ceftazidime		Meropenem		Tigecycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	%
Austria	1,157	1.6	1,157	4.8	1,157	16.9	1,157	0.5	1,157	0.5	1,157	0	1,157	0.4
Belgium	961	4.8	963	8.9	963	34.3	961	1.5	913	1.3	961	0	915	19.2
Bulgaria ^(a)	77	15.6	77	5.2	77	54.5	77	2.6	77	0	77	1.3	-	-
Croatia	253	7.5	252	6.3	653	16.4	253	2.0	654	0.9	253	0	-	-
Cyprus	94	0	-	-	94	11.7	34	2.9	93	0	94	0	-	-
Czechia	229	2.6	205	3.9	229	24.0	229	1.3	229	0.9	229	0	229	3.5
Denmark	292	0.7	292	3.8	292	27.1	292	0.3	292	0.3	292	0	292	2.4
Estonia	130	0.8	130	6.9	130	24.6	130	0	130	0	130	0	130	2.3
Finland	94	0	94	0	94	21.3	94	1.1	-	-	94	0	-	-
France	1,098	3.7	1,099	4.2	1,099	24.1	1,099	0.9	1,099	0.7	1,099	0.1	1,099	3.5
Germany	3,616	2.7	3,617	5.7	3,616	24.7	3,615	1.5	3,615	1.4	3,613	0	-	-
Greece	160	5.0	160	2.5	160	5.6	160	1.9	160	1.3	160	0	-	-
Hungary ^(a)	1,080	2.3	1,085	12.9	1,085	36.1	1,082	2.3	1,086	1.4	1,085	0	-	-
Ireland ^(d)	325	6.5	325	8.6	325	22.5	325	1.2	325	1.2	325	0	325	0
Italy	1,030	5.3	1,030	9.7	1,030	44.3	1,030	4.3	1,030	4.2	1,029	0	907	2.1
Latvia ^(a)	-	-	-	-	1	NA	-	-	-	-	-	-	-	-
Lithuania ^(a)	173	2.3	157	3.8	209	21.5	190	0	155	0	158	0	-	-
Luxembourg	125	2.4	125	7.2	125	22.4	125	0	125	0	125	0	-	-
Malta	161	2.5	-	-	161	40.4	161	3.1	161	1.2	161	1.9	3	NA
Netherlands	572	2.6	572	7.9	572	27.3	572	1.6	572	1.0	572	0	572	4.4
Poland	152	0.7	152	4.6	152	21.1	152	1.3	152	0.7	152	0	152	2.0
Portugal	375	4.3	375	4.3	375	26.4	375	0.8	375	1.1	375	0	375	0.3
Romania	90	0	90	0	90	2.2	90	0	90	0	90	0	-	-
Slovakia ^(a)	-	-	2	NA	821	13.5	570	0.7	340	1.2	336	0	-	-
Slovenia	369	0.3	370	2.7	369	8.1	370	0.8	370	0.3	368	0	-	-
Spain	1,591	1.4	1,591	6.5	1,589	29.0	1,589	0.6	1,591	0.6	1,591	0	-	-
Sweden ^(d)	591	1.7	591	3.9	591	10.2	591	1.7	591	1.7	591	0	591	0
Total (27 MSs)	14,795	2.9	14,511	6.4	16,059	25.2	15,323	1.4	15,382	1.2	15,117	<0.1	6,747	4.2
Iceland	20	0	20	0	27	14.8	-	-	20	0	20	0	-	-
Norway	-	-	257	3.9	257	16.7	257	0.8	257	0.8	257	0	-	-

Table 1. continued *Salmonella* spp.

Country	Nalidixic acid		Ciprofloxacin ^(b)		Azithromycin		Colistin		Sulfamethoxazole ^(c)		Trimethoprim		Co-trimoxazole		Tetracycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res
Austria	1,157	21.1	1,157	21.7	1,157	0.3	-	-	1,157	17.7	1,157	3.1	-	-	1,157	21.0
Belgium	-	-	963	18.6	915	0.8	-	-	963	32.3	961	10.6	-	-	963	32.5
Bulgaria ^(a)	-	-	77	16.9	-	-	-	-	-	-	-	-	77	7.8	-	-
Croatia	-	-	654	31.3	-	-	-	-	-	-	-	-	654	18	-	-
Cyprus	-	-	94	12.8	-	-	63	1.6	-	-	-	-	93	5.4	-	-
Czechia	-	-	229	21.0	183	1.1	229	2.6	-	-	229	4.4	229	4.4	186	19.9
Denmark	292	4.8	292	5.8	292	0.7	292	2.1	292	27.7	292	6.2	-	-	292	28.8
Estonia	130	13.8	130	14.6	-	-	130	13.8	130	23.8	130	1.5	-	-	130	25.4
Finland	94	9.6	94	9.6	-	-	-	-	-	-	94	1.1	-	-	94	18.1
France	1,099	15.4	1,099	15.7	1,099	1.0	1,099	2.9	1,099	24.3	1,099	5.7	-	-	1,099	25.4
Germany	3,617	13.0	3,615	10.6	-	-	-	-	-	-	3,614	6.4	3,616	34.7	3,617	22.7
Greece	160	5.0	160	9.4	160	0	63	0	160	20.6	160	7.5	-	-	160	8.8
Hungary ^(a)	-	-	1,083	38.8	-	-	-	-	-	-	1,085	5.6	1,069	24.0	1,086	32.5
Ireland ^(d)	325	10.8	325	14.5	325	0.6	325	0.3	325	24.3	325	9.2	-	-	325	23.7
Italy	1,030	13.9	1,030	15.3	892	0.3	892	16.8	976	42.0	1,030	10.9	-	-	1,030	42.2
Latvia ^(a)	-	-	1	NA	-	-	-	-	-	-	1	NA	1	NA	-	-
Lithuania ^(a)	-	-	201	30.8	-	-	-	-	-	-	158	5.1	210	3.8	-	-
Luxembourg	-	-	125	19.2	-	-	-	-	-	-	-	-	125	8.0	125	22.4
Malta	-	-	161	13.7	-	-	-	-	-	-	-	-	2	100	-	-
Netherlands	572	22.9	572	22.4	572	1.2	572	14.9	572	21.2	572	6.1	-	-	572	20.5
Poland	152	69.7	152	68.4	152	1.3	152	61.2	-	-	152	3.3	152	3.9	152	18.4
Portugal	375	8.0	375	15.5	375	0.8	-	-	375	43.2	370	3.8	-	-	375	25.1
Romania	2	NA	90	38.9	-	-	-	-	-	-	87	4.6	90	1.1	2	NA
Slovakia ^(a)	-	-	597	19.8	-	-	-	-	-	-	-	-	401	4.0	388	15.2
Slovenia	-	-	366	16.1	-	-	-	-	369	8.9	369	3.8	370	3.8	370	6.8
Spain	1,591	20.1	1,591	20.9	-	-	-	-	1,587	25.9	1,590	5.0	-	-	1,591	29.5
Sweden ^(d)	591	9.6	591	11.8	591	0	591	0	591	9.3	591	3.9	-	-	591	10.5
Total (27 MSs)	11,187	15.7	15,824	18.7	6,713	0.6	4,408	8.9	8,596	25.6	14,066	6.1	7,089	24.1	14,305	25.1
Iceland	-	-	27	22.2	20	0	-	-	-	-	21	4.8	27	3.7	20	10.0
Norway	-	-	257	10.5	-	-	-	-	-	-	-	-	-	-	257	14.8

N: number of isolates tested; % Res: percentage of microbiologically resistant isolates (either interpreted as non-wild type by ECOFFs or clinically non-susceptible by combining resistant and intermediate categories); -: no data reported; NA: not applicable – if fewer than 10 isolates were tested, the percentage of resistance was not calculated; MS: Member State.

(a): Data interpreted with clinical breakpoints.

(b): In most countries doing disk diffusion, pefloxacin is used for screening for fluoroquinolone resistance, as recommended by EUCAST.

(c): Combined data on the class of sulfonamides and the substance sulfamethoxazole within this group.

(d): Microbiological resistance predicted from Whole Genome Sequencing.

Table 2. Antimicrobial resistance in *S. Enteritidis* from humans per country in 2022

Country	Gentamicin		Chloramphenicol		Ampicillin		Cefotaxime		Ceftazidime		Meropenem		Tigecycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	%
Austria	483	0	483	0	483	5.0	483	0	483	0	483	0	483	0
Belgium	333	0.6	334	1.8	334	8.1	333	0.9	319	0.6	333	0	320	20.0
Bulgaria ^(a)	19	15.8	19	0	19	31.6	19	0	19	0	19	5.3	-	-
Croatia	3	NA	2	NA	134	3.7	3	NA	135	0.7	3	NA	-	-
Cyprus	40	0	-	-	40	2.5	12	0	40	0	40	0	-	-
Czechia	33	0	30	0	33	0	33	0	33	0	33	0	33	3.0
Denmark	3	NA	3	NA	3	NA	3	NA	3	NA	3	NA	3	NA
Estonia	50	0	50	0	50	4.0	50	0	50	0.0	50	0	50	0
Finland	22	0	22	0	22	4.5	22	0	-	-	22	0	-	-
France	374	0.3	374	0	374	1.6	374	0.3	374	0.3	374	0	374	1.1
Germany	624	0	624	0.3	624	4.5	624	0.2	624	0.2	623	0	-	-
Greece	51	3.9	51	0	51	3.9	51	0	51	0	51	0	-	-
Hungary ^(a)	64	0	63	11.1	64	17.2	63	3.2	64	0	64	0	-	-
Ireland ^(d)	80	0	80	0	80	7.5	80	2.5	80	2.5	80	0	80	0
Italy	190	0.5	190	0.5	190	8.4	190	0.5	190	0.5	189	0	177	0
Lithuania ^(a)	74	0	70	0	98	6.1	78	0	68	0	71	0	-	-
Luxembourg	48	0	48	2.1	48	8.3	48	0	48	0	48	0	-	-
Malta	43	0	-	-	43	2.3	43	0	43	0	43	0	-	-
Netherlands	160	0	160	1.3	160	16.3	160	0	160	0	160	0	160	1.9
Poland	117	0.9	117	0.9	117	6.8	117	0.9	117	0.9	117	0	117	1.7
Portugal	165	0.6	165	0.6	165	1.8	165	0.6	165	0	165	0	165	0
Romania	63	0	63	0	63	0	63	0	63	0	63	0	-	-
Slovakia ^(a)	-	-	2	NA	673	4.6	451	0.7	271	0.7	267	0	-	-
Slovenia	179	0	180	0	180	3.9	180	0	180	0	179	0	-	-
Spain	482	0.2	482	0.2	481	2.9	481	0.4	482	0.4	482	0	-	-
Sweden ^(d)	100	0	100	0	100	2.0	100	0	100	0	100	0	100	0
Total (27 MSs)	3,800	0.3	3,712	0.6	4,629	5.1	4,226	0.4	4,162	0.3	4,062	<0.1	2,062	3.6
Iceland	2	NA	2	NA	5	NA	-	-	2	NA	2	NA	-	-
Norway	-	-	71	0	71	5.6	71	0	71	0	71	0	-	-

N: number of isolates tested; % Res: percentage of microbiologically resistant isolates (either interpreted as non-wild type by ECOFFs or clinically non-susceptible by combining resistant and intermediate categories); -: no data reported; NA: not applicable – if fewer than 10 isolates were tested, the percentage of resistance was not calculated; MS: Member State.

(a): Data interpreted with clinical breakpoints.

(b): In most countries doing disk diffusion, pefloxacin is used for screening for fluoroquinolone resistance, as recommended by EUCAST.

(c): Combined data on the class of sulfonamides and the substance sulfamethoxazole within this group.

(d): Microbiological resistance predicted from Whole Genome Sequencing.

Table 2. continued *S. Enteritidis*

Country	Nalidixic acid		Ciprofloxacin ^(b)		Azithromycin		Colistin		Sulfamethoxazole ^(c)		Trimethoprim		Co-trimoxazole		Tetracycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res
Austria	483	29.4	483	29.6	483	0	-	-	483	0.2	483	0.4	-	-	483	4.8
Belgium	-	-	334	18.0	320	0.3	-	-	334	3.0	333	0.9	-	-	334	3.6
Bulgaria ^(a)	-	-	19	36.8	-	-	-	-	-	-	-	-	19	0	-	-
Croatia	-	-	135	3.7	-	-	-	-	-	-	-	-	135	14.8	-	-
Cyprus	-	-	40	7.5	-	-	29	3.4	-	-	-	-	39	0	-	-
Czechia	-	-	33	30.3	30	0	33	12.1	-	-	33	0	33	0	30	0
Denmark	3	NA	3	NA	3	NA	3	NA	3	NA	3	NA	-	-	3	NA
Estonia	50	20	50	22.0	-	-	50	36.0	50	0	50	0	-	-	50	2.0
Finland	22	27.3	22	27.3	-	-	-	-	-	-	22	0	-	-	22	9.1
France	374	16.3	374	16.3	374	0	374	6.7	374	0.3	374	0	-	-	374	1.1
Germany	624	20.8	624	15.2	-	-	-	-	-	-	623	0.6	624	17.8	624	4.2
Greece	51	7.8	51	9.8	51	0	20	0	51	15.7	51	0	-	-	51	3.9
Hungary ^(a)	-	-	64	48.4	-	-	-	-	-	-	64	0	63	1.6	64	6.3
Ireland ^(d)	80	35.0	80	35	80	0	80	0	80	1.3	80	0	-	-	80	3.8
Italy	190	17.9	190	17.9	177	0	177	71.8	176	2.8	190	1.1	-	-	190	17.4
Lithuania ^(a)	-	-	95	31.6	-	-	-	-	-	-	69	2.9	98	2.0	-	-
Luxembourg	-	-	48	27.1	-	-	-	-	-	-	-	-	48	0	48	8.3
Malta	-	-	43	7.0	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	160	33.1	160	33.8	160	0.6	160	45	160	8.8	160	1.3	-	-	160	5.0
Poland	117	76.1	117	75.2	117	0	117	76.9	-	-	117	3.4	117	3.4	117	0.9
Portugal	165	6.7	165	12.1	165	0	-	-	165	18.2	162	1.2	-	-	165	3.6
Romania	2	NA	63	42.9	-	-	-	-	-	-	60	3.3	63	0	2	NA
Slovakia ^(a)	-	-	478	17.6	-	-	-	-	-	-	-	-	312	1.9	308	9.1
Slovenia	-	-	178	6.7	-	-	-	-	179	1.7	179	1.1	180	1.1	180	1.7
Spain	482	31.1	482	30.1	-	-	-	-	482	1.7	482	0.8	-	-	482	1.2
Sweden ^(d)	100	35.0	100	35.0	100	0	100	0	100	1.0	100	1.0	-	-	100	1.0
Total (27 MSs)	2,903	26.0	4,431	22.8	2,060	0.1	1,143	29.7	2,637	3.1	3,635	0.8	1,731	8.4	3,867	4.3
Iceland	-	-	5	NA	2	NA	-	-	-	-	3	NA	5	NA	2	NA
Norway	-	-	71	23.9	-	-	-	-	-	-	-	-	-	-	71	5.6

N: number of isolates tested; % Res: percentage of microbiologically resistant isolates (either interpreted as non-wild type by ECOFFs or clinically non-susceptible by combining resistant and intermediate categories); -: no data reported; NA: not applicable – if fewer than 10 isolates were tested, the percentage of resistance was not calculated; MS: Member State.

(a): Data interpreted with clinical breakpoints.

(b): In most countries doing disk diffusion, pefloxacin is used for screening for fluoroquinolone resistance, as recommended by EUCAST.

(c): Combined data on the class of sulfonamides and the substance sulfamethoxazole within this group.

(d): Microbiological resistance predicted from Whole Genome Sequencing.

Table 3. Antimicrobial resistance in *S. Typhimurium* from humans per country in 2022

Country	Gentamicin		Chloramphenicol		Ampicillin		Cefotaxime		Ceftazidime		Meropenem		Tigecycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	%
Austria	136	1.5	136	22.1	136	38.2	136	0.7	136	0.7	136	0	136	0
Belgium	91	2.2	91	18.7	91	54.9	91	1.1	84	1.2	91	0	84	15.5
Bulgaria ^(a)	33	12.1	33	9.1	33	90.9	33	3.0	33	0	33	0	-	-
Croatia	86	0	86	1.2	193	13.0	86	1.2	193	0	86	0	-	-
Cyprus	25	0	-	-	25	32.0	7	14.3	24	0	25	0	-	-
Czechia	31	3.2	31	6.5	31	25.8	31	0	31	0	31	0	31	3.2
Denmark	69	0	69	13	69	17.4	69	0	69	0	69	0	69	4.3
Estonia	7	NA	7	NA	7	NA	7	NA	7	NA	7	NA	7	NA
Finland	34	0	34	0	34	2.9	34	0	-	-	34	0	-	-
France	113	0	113	15.0	113	19.5	113	0	113	0	113	0	113	6.2
Germany	416	0.7	416	15.6	416	38.2	416	1.7	416	1.4	416	0	-	-
Greece	15	0	15	6.7	15	13.3	15	0	15	0	15	0	-	-
Hungary ^(a)	173	0.6	173	20.8	172	26.2	172	2.3	173	1.2	172	0	-	-
Ireland ^(d)	69	0	69	8.7	69	24.6	69	0	69	0	69	0	69	0
Italy	51	5.9	51	19.6	51	58.8	51	2	51	0	51	0	41	12.2
Latvia ^(a)	-	-	-	-	1	NA	-	-	-	-	-	-	-	-
Lithuania ^(a)	31	3.2	30	20.0	31	61.3	32	0	30	0	30	0	-	-
Luxembourg	15	0	15	33.3	15	40.0	15	0	15	0	15	0	-	-
Malta	11	0	-	-	11	90.9	11	0	11	0	11	0	-	-
Netherlands	66	0	66	12.1	66	48.5	66	1.5	66	0	66	0	66	3.0
Poland	9	NA	9	NA	9	NA	9	NA	9	NA	9	NA	9	NA
Portugal	48	6.3	48	18.8	48	31.3	48	0	48	2.1	48	0	48	0
Romania	13	0	13	0	13	15.4	13	0	13	0	13	0	-	-
Slovakia ^(a)	-	-	-	-	43	69.8	36	0	21	0	21	0	-	-
Slovenia	61	0	61	9.8	61	9.8	61	0	61	0	61	0	-	-
Spain	43	0	43	37.2	43	62.8	43	0	43	0	43	0	-	-
Sweden ^(d)	175	0	175	3.4	175	6.3	175	0	175	0	175	0	175	0
Total (27 MSs)	1,821	1.1	1,784	14.5	1,971	32.1	1,839	1.0	1,906	0.6	1,840	0	848	3.8
Iceland	2	NA	2	NA	3	NA	-	-	2	NA	2	NA	-	-
Norway	-	-	38	10.5	38	15.8	38	0	38	0	38	0	-	-

Table 3. continued *S. Typhimurium*

Country	Nalidixic acid		Ciprofloxacin ^(b)		Azithromycin		Colistin		Sulfamethoxazole ^(c)		Trimethoprim		Co-trimoxazole		Tetracycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res
Austria	136	7.4	136	7.4	136	0	-	-	136	44.1	136	3.7	-	-	136	42.6
Belgium	-	-	91	15.4	84	0	-	-	91	38.5	91	18.7	-	-	91	37.4
Bulgaria ^(a)	-	-	33	9.1	-	-	-	-	-	-	-	-	33	15.2	-	-
Croatia	-	-	193	68.9	-	-	-	-	-	-	-	-	193	22.8	-	-
Cyprus	-	-	25	0	-	-	19	0	-	-	-	-	25	16.0	-	-
Czechia	-	-	31	29.0	27	0	31	0	-	-	31	3.2	31	3.2	30	20.0
Denmark	69	4.3	69	5.8	69	0	69	1.4	69	23.2	69	5.8	-	-	69	17.4
Estonia	7	NA	7	NA	-	-	7	NA	7	NA	7	NA	-	-	7	NA
Finland	34	0	34	0	-	-	-	-	-	-	34	0	-	-	34	0
France	113	8.8	113	8.8	113	0	113	0	113	25.7	113	4.4	-	-	113	23.9
Germany	416	7.2	416	4.8	-	-	-	-	-	-	416	9.1	416	40.1	416	27.6
Greece	15	6.7	15	6.7	15	0	3	0	15	46.7	15	13.3	-	-	15	40.0
Hungary ^(a)	-	-	173	50.3	-	-	-	-	-	-	172	1.7	164	13.4	173	21.4
Ireland ^(d)	69	4.3	69	5.8	69	0	69	0	69	34.8	69	4.3	-	-	69	27.5
Italy	51	13.7	51	15.7	41	0	41	0	48	47.9	51	19.6	-	-	51	56.9
Latvia ^(a)	-	-	1	NA	-	-	-	-	-	-	1	NA	1	NA	-	-
Lithuania ^(a)	-	-	31	25.8	-	-	-	-	-	-	30	10	32	9.4	-	-
Luxembourg	-	-	15	26.7	-	-	-	-	-	-	-	-	15	13.3	15	33.3
Malta	-	-	11	63.6	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	66	4.5	66	4.5	66	1.5	66	0	66	27.3	66	3	-	-	66	28.8
Poland	9	NA	9	NA	9	NA	9	NA	-	-	9	NA	9	NA	9	NA
Portugal	48	8.3	48	27.1	48	0	-	-	48	52.1	48	0	-	-	48	27.1
Romania	-	-	13	7.7	-	-	-	-	-	-	13	0	13	0	-	-
Slovakia ^(a)	-	-	35	8.6	-	-	-	-	-	-	-	-	14	0	12	41.7
Slovenia	-	-	60	56.7	-	-	-	-	61	9.8	61	9.8	61	6.6	61	9.8
Spain	43	4.7	43	4.7	-	-	-	-	43	62.8	43	4.7	-	-	43	60.5
Sweden ^(d)	175	0.6	175	2.3	175	0	175	0	175	5.7	175	1.7	-	-	175	5.1
Total (27 MSs)	1,251	6.2	1,963	19.6	852	0.1	602	0.3	941	30.2	1,650	6.4	1,007	25.0	1,633	26.8
Iceland	-	-	3	NA	2	NA	-	-	-	-	2	NA	3	NA	2	NA
Norway	-	-	38	7.9	-	-	-	-	-	-	-	-	-	-	38	13.2

N: number of isolates tested; % Res: percentage of microbiologically resistant isolates (either interpreted as non-wild type by ECOFFs or clinically non-susceptible by combining resistant and intermediate categories); -: no data reported; NA: not applicable – if fewer than 10 isolates were tested, the percentage of resistance was not calculated; MS: Member State.

(a): Data interpreted with clinical breakpoints.

(b): In most countries doing disk diffusion, pefloxacin is used for screening for fluoroquinolone resistance, as recommended by EUCAST.

(c): Combined data on the class of sulfonamides and the substance sulfamethoxazole within this group.

(d): Microbiological resistance predicted from Whole Genome Sequencing.

Table 4. Antimicrobial resistance in monophasic *S. Typhimurium* 1,4,[5],12:i:-from humans per country in 2022

Country	Gentamicin		Chloramphenicol		Ampicillin		Cefotaxime		Ceftazidime		Meropenem		Tigecycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	%
Austria	131	6.9	131	11.5	131	67.2	131	0.8	131	0.8	131	0	131	0.0
Belgium	236	10.6	237	16.0	237	87.3	236	0	226	0.4	236	0	227	18.1
Czechia	32	3.1	31	9.7	32	87.5	32	0	32	0	32	0	32	6.3
Denmark	71	1.4	71	0	71	84.5	71	1.4	71	1.4	71	0	71	0
Estonia	29	3.4	29	27.6	29	86.2	29	0	29	0	29	0	29	0
France	204	3.9	204	8.8	204	84.3	204	1.5	204	0.5	204	0	204	2.0
Germany	619	8.9	620	11.9	620	87.4	620	2.3	618	2.6	619	0	-	-
Greece	2	NA	2	NA	2	NA	2	NA	2	NA	2	NA	-	-
Hungary ^(a)	171	2.9	171	13.5	171	93.0	171	1.8	171	0.6	171	0	-	-
Ireland ^(d)	50	40	50	38.0	50	90	50	2.0	50	2.0	50	0	50	0
Italy	350	12.0	350	15.4	350	91.4	350	4.0	350	4.0	350	0	304	1.0
Luxembourg	16	12.5	16	18.8	16	93.8	16	0	16	0	16	0	-	-
Malta	42	0	-	-	42	83.3	42	0	42	0	42	0	-	-
Netherlands	76	6.6	76	19.7	76	92.1	76	2.6	76	0	76	0	76	5.3
Poland	12	0	12	8.3	12	83.3	12	0	12	0	12	0	12	0
Portugal	82	11.0	82	7.3	82	90.2	82	2.4	82	2.4	82	0	82	0
Slovenia	11	9.1	11	9.1	11	81.8	11	27.3	11	9.1	11	0	-	-
Spain	417	3.4	417	10.8	415	84.1	417	0.5	417	0.5	417	0	-	-
Sweden ^(d)	36	16.7	36	16.7	36	91.7	36	0	36	0	36	0	36	0
Total (19 MSs)	2,587	7.9	2,546	12.9	2,587	86.7	2,588	1.8	2,576	1.6	2,587	0	1,254	4.3
Norway	-	-	32	9.4	32	75.0	32	3.1	32	3.1	32	0	-	-

Table 4. continued monophasic *S. Typhimurium* 1,4,[5],12:i:-

Country	Nalidixic acid		Ciprofloxacin ^(b)		Azithromycin		Colistin		Sulfamethoxazole ^(c)		Trimethoprim		Co-trimoxazole		Tetracycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res
Austria	131	6.9	131	8.4	131	0	-	-	131	64.1	131	10.7	-	-	131	73.3
Belgium	-	-	237	11.0	227	0	-	-	237	84.4	236	22.0	-	-	237	83.1
Czechia	-	-	32	12.5	13	7.7	32	3.1	-	-	32	9.4	32	9.4	13	92.3
Denmark	71	2.8	71	1.4	71	0	71	0	71	84.5	71	15.5	-	-	71	91.5
Estonia	29	6.9	29	6.9	-	-	29	0	29	86.2	29	3.4	-	-	29	89.7
France	204	3.4	204	4.9	204	0.5	204	0	204	79.9	204	10.8	-	-	204	78.4
Germany	620	8.4	619	6.3	-	-	-	-	-	-	620	11.9	620	85.2	620	78.1
Greece	2	NA	2	NA	2	NA	2	NA	2	NA	2	NA	-	-	2	NA
Hungary ^(a)	-	-	171	24.0	-	-	-	-	-	-	171	11.1	168	66.1	171	57.9
Ireland ^(d)	50	0	50	4.0	50	0	50	2.0	50	90	50	38.0	-	-	50	90
Italy	350	7.4	350	7.7	294	1.0	294	4.1	329	85.1	350	11.4	-	-	350	71.7
Luxembourg	-	-	16	0	-	-	-	-	-	-	-	-	16	25.0	16	87.5
Malta	-	-	42	7.1	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	76	19.7	76	19.7	76	1.3	76	3.9	76	81.6	76	14.5	-	-	76	80.3
Poland	12	33.3	12	25.0	12	0	12	8.3	-	-	12	8.3	12	8.3	12	66.7
Portugal	82	14.6	82	19.5	82	2.4	-	-	82	85.4	80	7.5	-	-	82	80.5
Slovenia	-	-	11	18.2	-	-	-	-	11	90.9	11	27.3	11	36.4	11	54.5
Spain	417	10.1	417	10.6	-	-	-	-	415	68.7	417	6.0	-	-	417	79.9
Sweden ^(d)	36	2.8	36	8.3	36	0	36	0	36	77.8	36	16.7	-	-	36	88.9
Total (19 MSs)	2,080	8.3	2,588	9.6	1,198	0.7	806	2.2	1,673	78.5	2,528	12.1	859	75.8	2,528	77.3
Norway	-	-	32	6.3	-	-	-	-	-	-	-	-	-	-	32	78.1

N: number of isolates tested; % Res: percentage of microbiologically resistant isolates (either interpreted as non-wild type by ECOFFs or clinically non-susceptible by combining resistant and intermediate categories); -: no data reported; NA: not applicable – if fewer than 10 isolates were tested, the percentage of resistance was not calculated; MS: Member State.

(a): Data interpreted with clinical breakpoints.

(b): In most countries doing disk diffusion, pefloxacin is used for screening for fluoroquinolone resistance, as recommended by EUCAST.

(c): Combined data on the class of sulfonamides and the substance sulfamethoxazole within this group.

(d): Microbiological resistance predicted from Whole Genome Sequencing.

Table 5. Antimicrobial resistance in *S. Infantis* from humans per country in 2022

Country	Gentamicin		Chloramphenicol		Ampicillin		Cefotaxime		Ceftazidime		Meropenem		Tigecycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	%
Austria	66	1.5	66	6.1	66	12.1	66	3.0	66	3.0	66	0	66	4.5
Belgium	32	21.9	32	18.8	32	34.4	32	15.6	31	16.1	32	0	31	61.3
Bulgaria ^(a)	3	NA	3	NA	3	NA	3	NA	3	NA	3	NA	-	-
Croatia	7	NA	7	NA	7	NA	7	NA	7	NA	7	NA	-	-
Cyprus	9	NA	-	-	9	NA	6	NA	9	NA	9	NA	-	-
Czechia	10	NA	10	0	10	20.0	10	0	10	0	10	0	10	0
Denmark	17	5.9	17	0	17	5.9	17	0	17	0	17	0	17	5.9
Estonia	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA
Finland	1	NA	1	NA	1	NA	1	NA	-	-	1	NA	-	-
France	16	0	16	0	16	0	16	0	16	0	16	0	16	18.8
Germany	238	0.4	238	0.8	238	5.5	238	1.3	238	1.3	238	0	-	-
Greece	7	NA	7	NA	7	NA	7	NA	7	NA	7	NA	-	-
Hungary ^(a)	81	0	82	4.9	82	14.6	82	2.4	82	1.2	82	0	-	-
Ireland ^(d)	5	NA	5	NA	5	NA	5	NA	5	NA	5	NA	5	NA
Italy	70	1.4	70	21.4	70	42.9	70	30.0	70	30.0	70	0	64	7.8
Lithuania ^(a)	12	0	12	0	12	8.3	12	0	12	0	12	0	-	-
Luxembourg	4	NA	4	NA	4	NA	4	NA	4	NA	4	NA	-	-
Malta	5	NA	-	-	5	NA	5	NA	5	NA	5	NA	-	-
Netherlands	13	30.8	13	30.8	13	30.8	13	30.8	13	30.8	13	0	13	38.5
Poland	7	NA	7	NA	7	NA	7	NA	7	NA	7	NA	7	NA
Portugal	5	NA	5	NA	5	NA	5	NA	5	NA	5	NA	5	NA
Romania	4	NA	4	NA	4	NA	4	NA	4	NA	4	NA	-	-
Slovakia ^(a)	-	-	-	-	13	69.2	9	NA	7	NA	7	NA	-	-
Slovenia	12	0	12	8.3	12	25.0	12	0	12	0	11	0	-	-
Spain	54	1.9	54	5.6	54	7.4	54	3.7	54	1.9	54	0	-	-
Sweden ^(d)	12	8.3	12	8.3	12	8.3	12	0	12	0	12	0	12	0
Total (26 MSs)	691	2.7	678	6.5	705	14.9	698	6.0	697	5.9	698	0	247	15.4
Norway	-	-	7	NA	7	NA	7	NA	7	NA	7	NA	-	-

Table 5. continued *S. Infantis*

Country	Nalidixic acid		Ciprofloxacin ^(b)		Azithromycin		Colistin		Sulfamethoxazole ^(c)		Trimethoprim		Co-trimoxazole		Tetracycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res
Austria	66	69.7	66	69.7	66	0	-	-	66	60.6	66	3	-	-	66	65.2
Belgium	-	-	32	62.5	31	0	-	-	32	65.6	32	31.3	-	-	32	62.5
Bulgaria ^(a)	-	-	3	NA	-	-	-	-	-	-	-	-	3	NA	-	-
Croatia	-	-	7	NA	-	-	-	-	-	-	-	-	7	NA	-	-
Cyprus	-	-	9	NA	-	-	3	NA	-	-	-	-	9	NA	-	-
Czechia	-	-	10	40.0	10	0	10	0	-	-	10	10.0	10	10.0	10	40.0
Denmark	17	11.8	17	11.8	17	0	17	0	17	11.8	17	0	-	-	17	11.8
Estonia	1	NA	1	NA	-	-	1	NA	1	NA	1	NA	-	-	1	NA
Finland	1	NA	1	NA	-	-	-	-	-	-	1	NA	-	-	1	NA
France	16	18.8	16	18.8	16	6.3	16	0	16	18.8	16	12.5	-	-	16	18.8
Germany	238	15.1	238	13.0	-	-	-	-	-	-	238	7.1	238	18.5	238	12.6
Greece	7	NA	7	NA	7	NA	3	NA	7	NA	7	NA	-	-	7	NA
Hungary ^(a)	-	-	82	72.0	-	-	-	-	-	-	82	2.4	82	15.9	82	59.8
Ireland ^(d)	5	NA	5	NA	5	NA	5	NA	5	NA	5	NA	-	-	5	NA
Italy	70	55.7	70	58.6	63	0	63	0	66	57.6	70	55.7	-	-	70	61.4
Lithuania ^(a)	-	-	12	16.7	-	-	-	-	-	-	12	8.3	12	8.3	-	-
Luxembourg	-	-	4	NA	-	-	-	-	-	-	-	-	4	NA	4	NA
Malta	-	-	5	NA	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	13	46.2	13	46.2	13	0	13	0	13	38.5	13	30.8	-	-	13	38.5
Poland	7	NA	7	NA	7	NA	7	NA	-	-	7	NA	7	14.3	7	NA
Portugal	5	NA	5	NA	5	NA	-	-	5	NA	5	NA	-	-	5	NA
Romania	-	-	4	NA	-	-	-	-	-	-	4	NA	4	NA	-	-
Slovakia ^(a)	-	-	9	NA	-	-	-	-	-	-	-	-	6	16.7	4	NA
Slovenia	-	-	12	75.0	-	-	-	-	12	75.0	12	8.3	12	8.3	12	75.0
Spain	54	48.1	54	50.0	-	-	-	-	53	49.1	53	18.9	-	-	54	48.1
Sweden ^(d)	12	8.3	12	8.3	12	0	12	0	12	8.3	12	8.3	-	-	12	8.3
Total (26 MSs)	512	33.2	701	40.1	252	0.8	150	0	305	50.5	663	14.2	394	15.7	656	38.1
Norway	-	-	7	NA	-	-	-	-	-	-	-	-	-	-	7	NA

N: number of isolates tested; % Res: percentage of microbiologically resistant isolates (either interpreted as non-wild type by ECOFFs or clinically non-susceptible by combining resistant and intermediate categories); -: no data reported; NA: not applicable – if fewer than 10 isolates were tested, the percentage of resistance was not calculated; MS: Member State.

(a): Data interpreted with clinical breakpoints.

(b): In most countries doing disk diffusion, pefloxacin is used for screening for fluoroquinolone resistance, as recommended by EUCAST.

(c): Combined data on the class of sulfonamides and the substance sulfamethoxazole within this group.

(d): Microbiological resistance predicted from Whole Genome Sequencing.

Table 6. Antimicrobial resistance in *S. Kentucky* from humans per country in 2022

Country	Gentamicin		Chloramphenicol		Ampicillin		Cefotaxime		Ceftazidime		Meropenem		Tigecycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	%
Austria	12	33.3	12	8.3	12	75.0	12	8.3	12	8.3	12	0	12	0
Belgium	23	26.1	23	4.3	23	39.1	23	17.4	22	9.1	23	0	22	22.7
Bulgaria ^(a)	2	NA	2	NA	2	NA	2	NA	2	NA	2	NA	-	-
Croatia	2	NA	2	NA	2	NA	2	NA	2	NA	2	NA	-	-
Czechia	6	NA	5	NA	6	NA	6	NA	6	NA	6	NA	6	NA
Denmark	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA
France	89	34.8	90	6.7	90	58.9	90	6.7	90	6.7	90	0	90	17.8
Germany	34	52.9	34	17.6	34	58.8	34	8.8	34	5.9	34	0	-	-
Hungary ^(a)	2	NA	2	NA	2	NA	2	NA	2	NA	2	NA	-	-
Ireland ^(d)	3	NA	3	NA	3	NA	3	NA	3	NA	3	NA	3	NA
Italy	5	NA	5	NA	5	NA	5	NA	5	NA	5	NA	4	NA
Luxembourg	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	-	-
Malta	9	NA	-	-	9	NA	9	NA	9	NA	9	NA	-	-
Netherlands	4	NA	4	NA	4	NA	4	NA	4	NA	4	NA	4	NA
Portugal	4	NA	4	NA	4	NA	4	NA	4	NA	4	NA	4	NA
Slovakia ^(a)	-	-	-	-	2	NA	1	NA	-	-	-	-	-	-
Spain	13	15.4	13	53.8	13	61.5	13	0	13	0	13	0	-	-
Sweden ^(d)	15	20.0	15	66.7	15	73.3	15	66.7	15	66.7	15	0	15	0
Total (18 MSs)	225	34.7	216	15.3	228	59.2	227	12.3	225	11.6	226	0	161	15.5
Norway	-	-	1	NA	1	NA	1	NA	1	NA	1	NA	-	-

Table 6. continued S. Kentucky

Country	Nalidixic acid		Ciprofloxacin ^(b)		Azithromycin		Colistin		Sulfamethoxazole ^(c)		Trimethoprim		Co-trimoxazole		Tetracycline	
	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res	N	% Res
Austria	12	91.7	12	91.7	12	0	-	-	12	41.7	12	8.3	-	-	12	58.3
Belgium	-	-	23	73.9	22	9.1	-	-	23	52.2	23	21.7	-	-	23	56.5
Bulgaria ^(a)	-	-	2	NA	-	-	-	-	-	-	-	-	2	NA	-	-
Croatia	-	-	2	NA	-	-	-	-	-	-	-	-	2	NA	-	-
Czechia	-	-	6	NA	5	NA	6	NA	-	-	6	NA	6	NA	5	NA
Denmark	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	-	-	1	NA
France	90	72.2	90	72.2	90	7.8	90	0	90	63.3	90	26.7	-	-	90	71.1
Germany	34	79.4	34	79.4	-	-	-	-	-	-	34	17.6	34	70.6	34	70.6
Hungary ^(a)	-	-	2	NA	-	-	-	-	-	-	2	NA	2	NA	2	NA
Ireland ^(d)	3	NA	3	NA	3	NA	3	NA	3	NA	3	NA	-	-	3	NA
Italy	5	NA	5	NA	4	NA	4	NA	5	NA	5	NA	-	-	5	NA
Luxembourg	-	-	1	NA	-	-	-	-	-	-	-	-	1	NA	1	NA
Malta	-	-	9	NA	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	4	NA	4	NA	4	NA	4	NA	4	NA	4	NA	-	-	4	NA
Portugal	4	NA	4	NA	4	NA	-	-	4	NA	4	NA	-	-	4	NA
Slovakia ^(a)	-	-	1	NA	-	-	-	-	-	-	-	-	1	NA	1	NA
Spain	13	23.1	13	23.1	-	-	-	-	12	66.7	13	0	-	-	13	69.2
Sweden ^(d)	15	93.3	15	93.3	15	0	15	0	15	80.0	15	60.0	-	-	15	93.3
Total (18 MSs)	181	72.4	227	72.7	160	6.3	123	0.8	169	60.9	212	22.2	48	54.2	213	67.1
Norway	-	-	1	NA	-	-	-	-	-	-	-	-	-	-	1	NA

N: number of isolates tested; % Res: percentage of microbiologically resistant isolates (either interpreted as non-wild type by ECOFFs or clinically non-susceptible by combining resistant and intermediate categories); -: no data reported; NA: not applicable – if fewer than 10 isolates were tested, the percentage of resistance was not calculated; MS: Member State.

(a): Data interpreted with clinical breakpoints.

(b): In most countries doing disk diffusion, pefloxacin is used for screening for fluoroquinolone resistance, as recommended by EUCAST.

(c): Combined data on the class of sulfonamides and the substance sulfamethoxazole within this group.

(d): Microbiological resistance predicted from Whole Genome Sequencing.

Table 7. Combined 'microbiological' and 'clinical' resistance to ciprofloxacin and cefotaxime among *Salmonella* spp. isolates from human cases in 2022

Country	N	Microbiologically resistant to CIP and CTX(%)	Clinically resistant to CIP and CTX(%)
Austria	1,157	0.4	0.4
Belgium	961	1.4	1.2
Bulgaria	77	0	0
Croatia	253	0	0
Cyprus	34	0	0
Czechia	229	1.3	0.9
Denmark	292	0.3	0.3
Estonia	130	0	0
Finland	94	1.1	1.1
France	1,099	0.7	0.5
Germany	3,613	1.1	1.1
Greece	160	1.3	1.3
Hungary	1,079	0.9	0.9
Ireland	325	0.9	ND
Italy	1,030	2.6	2.6
Lithuania	178	0	0
Luxembourg	125	0	0
Malta	161	1.2	1.2
Netherlands	572	1.4	1.2
Poland	152	0	0
Portugal	375	0.3	0.3
Romania	90	0	0
Slovakia	532	0.4	0.4
Slovenia	366	0.5	0.5
Spain	1,589	0.4	0.4
Sweden	591	1.7	ND
Total (26 MSs)	15,264	0.9	0.9
Norway	257	0	0

N: number of isolates; CIP: ciprofloxacin; CTX: cefotaxime; NA: not applicable – fewer than 10 isolates tested; ND: not determined as resistance predicted from whole genome sequencing

Table 8. Combined 'microbiological' and 'clinical' resistance to ciprofloxacin and cefotaxime among *S. Enteritidis* isolates from human cases in 2022

Country	N	Microbiologically resistant to CIP and CTX(%)	Clinically resistant to CIP and CTX(%)
Austria	483	0	0
Belgium	333	0.6	0.6
Bulgaria	19	0	0
Croatia	3	NA	NA
Cyprus	12	0	0
Czechia	33	0	0
Denmark	3	NA	NA
Estonia	50	0	0
Finland	22	0	0
France	374	0	0
Germany	624	0.2	0.2
Greece	51	0	0
Hungary	63	0	0
Ireland	80	2.5	0
Italy	190	0	ND
Lithuania	74	0	0
Luxembourg	48	0	0
Malta	43	0	0
Netherlands	160	0	0
Poland	117	0	0
Portugal	165	0	0
Romania	63	0	0
Slovakia	422	0.5	0.5
Slovenia	178	0	0
Spain	481	0.2	0.2
Sweden	100	0	ND
Total (26 MSs)	4,191	0.2	0.1
Norway	71	0	0

N: number of isolates; CIP: ciprofloxacin; CTX: cefotaxime; NA: not applicable – fewer than 10 isolates tested; ND: not determined as resistance predicted from whole genome sequencing

Table 9. Combined 'microbiological' and 'clinical' resistance to ciprofloxacin and cefotaxime among *S. Typhimurium* isolates from human cases in 2022

Country	N	Microbiologically resistant to CIP and CTX(%)	Clinically resistant to CIP and CTX(%)
Austria	136	0	0
Belgium	91	1.1	1.1
Bulgaria	33	0	0
Croatia	86	0	0
Cyprus	7	NA	NA
Czechia	31	0	0
Denmark	69	0	0
Estonia	7	NA	NA
Finland	34	0	0
France	113	0	0
Germany	416	1.2	1.2
Greece	15	0	0
Hungary	172	0.6	0.6
Ireland	69	0	ND
Italy	51	2.0	2.0
Lithuania	31	0	0
Luxembourg	15	0	0
Malta	11	0	0
Netherlands	66	0	0
Poland	9	NA	NA
Portugal	48	0	0
Romania	13	0	0
Slovakia	32	0	0
Slovenia	60	0	0
Spain	43	0	0
Sweden	175	0	ND
Total (26 MSs)	1,833	0.4	0.5
Norway	38	0	0

N: number of isolates; CIP: ciprofloxacin; CTX: cefotaxime; NA: not applicable – fewer than 10 isolates tested; ND: not determined as resistance predicted from whole genome sequencing

Table 10. Combined 'microbiological' and 'clinical' resistance to ciprofloxacin and cefotaxime among monophasic *S. Typhimurium* 1,4,[5],12:i:- isolates from human cases in 2022

Country	N	Microbiologically resistant to CIP and CTX(%)	Clinically resistant to CIP and CTX(%)
Austria	131	0.8	0.8
Belgium	236	0	0
Czechia	32	0	0
Denmark	71	1.4	1.4
Estonia	29	0	0
France	204	1.0	0.5
Germany	619	2.3	2.3
Greece	2	NA	NA
Hungary	171	0.6	0.6
Ireland	50	0	0
Italy	350	0	ND
Luxembourg	16	0	0
Malta	42	0	0
Netherlands	76	2.6	1.3
Poland	12	0	0
Portugal	82	1.2	1.2
Slovenia	11	18.2	18.2
Spain	417	0.2	0.2
Sweden	36	0	ND
Total (19 MSs)	2,587	1.0	0.9
Norway	32	0	0

N: number of isolates; CIP: ciprofloxacin; CTX: cefotaxime; NA: not applicable – fewer than 10 isolates tested; ND: not determined as resistance predicted from whole genome sequencing

Table 11. Combined 'microbiological' and 'clinical' resistance to ciprofloxacin and cefotaxime among *S. Infantis* isolates from human cases in 2022

Country	N	Microbiologically resistant to CIP and CTX(%)	Clinically resistant to CIP and CTX(%)
Austria	66	3.0	3.0
Belgium	32	15.6	15.6
Bulgaria	3	NA	NA
Croatia	7	NA	NA
Cyprus	6	NA	NA
Czechia	10	NA	NA
Denmark	17	NA	NA
Estonia	1	NA	NA
Finland	1	NA	NA
France	16	0	0
Germany	238	0.8	0.8
Greece	7	NA	NA
Hungary	82	2.4	2.4
Ireland	5	NA	NA
Italy	71	31.0	31.0
Lithuania	12	0	0
Luxembourg	4	NA	NA
Malta	5	NA	NA
Netherlands	13	30.8	30.8
Poland	7	NA	NA
Portugal	5	NA	NA
Romania	4	NA	NA
Slovakia	8	NA	NA
Slovenia	12	0	0
Spain	54	1.9	1.9
Sweden	12	0	ND
Total (26 MSs)	698	5.9	6.0
Norway	7	NA	NA

N: number of isolates; CIP: ciprofloxacin; CTX: cefotaxime; NA: not applicable – fewer than 10 isolates tested; ND: not determined as resistance predicted from whole genome sequencing

Table 12. Combined 'microbiological' and 'clinical' resistance to ciprofloxacin and cefotaxime among *S. Kentucky* isolates from human cases in 2022

Country	N	Microbiologically resistant to CIP and CTX(%)	Clinically resistant to CIP and CTX(%)
Austria	12	8.3	8.3
Belgium	23	17.4	13.0
Bulgaria	2	NA	NA
Croatia	2	NA	NA
Czechia	6	NA	NA
Denmark	1	NA	NA
France	90	6.7	4.4
Germany	34	8.8	8.8
Hungary	2	NA	NA
Ireland	3	NA	NA
Italy	5	NA	NA
Luxembourg	1	NA	NA
Malta	9	NA	NA
Netherlands	4	NA	NA
Portugal	4	NA	NA
Slovakia	1	NA	NA
Spain	13	0	0
Sweden	15	66.7	ND
Total (18 MSs)	227	12.3	6.7
Norway	1	NA	NA

N: number of isolates; CIP: ciprofloxacin; CTX: cefotaxime; NA: not applicable – fewer than 10 isolates tested; ND: not determined as resistance predicted from whole genome sequencing

Table 13. ESBL, AmpC and carbapenemase phenotypes in *Salmonella* spp. isolates from humans by country, 2022

Country	Total <i>Salmonella</i> tested for CTX and/or CAZ	Res to CTX and/or CAZ	Resistance Phenotype								Tested negative for ESBL, AmpC, CP		Serovars
			ESBL		AmpC		AmpC + ESBL*		Carba-penemase		N	%	
			N	%	N	%	N	%	N	%			
Austria	1,155	4	4	0.3									Infantis (1), Muenster (1), monophasic S. Typhimurium (1), Typhimurium (1)
Belgium	961	13	10	1.0	1	0.1					3	0.3	Infantis (5), Kentucky (4), Typhimurium (1), Virchow (1)
Croatia	654	7	3	0.5									Group M (3)
Cyprus	94	1											
Czechia	229	3	2	0.9	1	0.4							Bareilly (1), Kentucky (2)
Denmark	292	1	1	0.3									Monophasic S. Typhimurium (1)
Estonia	130	1	1	0.8									Kentucky (1)
Finland	94	1	1	1.1									Virchow (1)
France	1099	11	6	0.5									Enteritidis (1), Kentucky (4), monophasic S. Typhimurium (1)
Germany	3616	53	29	0.8	3	0.1			1.0	0.03	2	0.1	Durham (1), Enteritidis (1), Goldcoast (1), Infantis (3), Kentucky (1), Mishmarhaemek (1), monophasic S. Typhimurium (13), Schwarzengrund (2), Typhimurium (6), Virchow (4)
Greece	160	2	2	1.3									Infantis (2)
Ireland	325	4	1	0.3							3	0.9	Schwarzengrund (1)
Italy	1030	44	32	3.1	12	1.2							Enteritidis (1), Goldcoast (3), Infantis (22), monophasic S. Typhimurium (14), Napoli (1), Typhimurium (3)
Lithuania	192	0											
Luxembourg	125	0											
Malta	161	5	2	1.2	1	0.6	3	1.9	3	1.9			Haifa (3), Infantis (1), Kentucky (1)
Netherlands	572	9	6	1.0	1	0.2					2	0.3	Heidelberg (1), Infantis (4), Kentucky (1), monophasic Typhimurium (1)
Poland	152	2	1								1	0.7	Enteritidis (1)
Portugal	375	3	1	0.3	1	0.3					1	0.3	Kentucky (1), monophasic S. Typhimurium (1)
Romania	90	0											
Slovenia	370	2	2	0.5									Monophasic S. Typhimurium (2)
Spain	1,591	11	8	0.5	4	0.3	1	0.1					Enteritidis (2), Infantis (2), London (1), Mikawasima (1), Minnesota (1), monophasic S. Typhimurium (2), Ohio (1), Stanley (1)
Sweden	591	10	10	1.7									Kentucky (10)
Total (23 MSs)	14,058	187	122	0.9	24	0.2	4	0.03	4	0.03	12	0.09	
Iceland	20	0											
Norway	257	2	1	0.4	1	0.4							Infantis (1), monophasic Typhimurium (1)

ESBL: extended-spectrum beta-lactamase; N: isolates with this phenotype; %: percentage of isolates with this phenotype from the total tested; CTX: cefotaxime; CAZ: ceftazidime; MSs: Member States. * isolates with both ESBL and AmpC are a subset of those with ESBL and with AmpC.

Table 14. Complete susceptibility and multiresistance in *Salmonella* spp. from humans in 2022

Country	Susceptible to all (%)	Multiresistant (%)
Austria (N=1157)	61.8	17.0
Belgium (N=961)	49.8	29.7
Denmark (N=292)	64.4	23.6
Estonia (N=130)	61.5	23.8
France (N=1098)	64.8	21.9
Greece (N=160)	68.1	5.6
Ireland (N=325)	63.1	20.9
Italy (N=975)	41.2	35.7
Netherlands (N=572)	57.0	20.5
Portugal (N=370)	46.8	23.2
Slovenia (N=362)	75.4	6.9
Spain (N=1583)	51.5	23.4
Sweden (N=591)	80.2	8.3
Total (MS=13) (N=8576)	57.7	22.1

MS: Member States; N number of isolates tested; NA: not applicable – fewer than 10 isolates tested

Table 15. Complete susceptibility and multiresistance in *S. Enteritidis* from humans in 2022

Country	Susceptible to all (%)	Multiresistant (%)
Austria (N=483)	67.1	1.4
Belgium (N=333)	75.1	4.2
Denmark (N=3)	NA	NA
Estonia (N=50)	74.0	0.0
France (N=374)	83.2	0.5
Greece (N=51)	72.5	2.0
Ireland (N=80)	62.5	5.0
Italy (N=175)	64.0	3.4
Netherlands (N=160)	61.3	10.6
Portugal (N=162)	74.1	2.5
Slovenia (N=176)	88.1	0.6
Spain (N=481)	67.2	1.2
Sweden (N=100)	65.0	2.0
Total (MS=13) (N=2628)	71.7	2.4

MS: Member States; N number of isolates tested; NA: not applicable – fewer than 10 isolates tested

Table 16. Complete susceptibility and multiresistance in *S. Typhimurium* from humans in 2022

Country	Susceptible to all (%)	Multiresistant (%)
Austria (N=136)	43.4	36.0
Belgium (N=91)	30.8	34.1
Denmark (N=69)	75.4	14.5
Estonia (N=7)	NA	NA
France (N=113)	71.7	22.1
Greece (N=15)	46.7	13.3
Ireland (N=69)	63.8	18.8
Italy (N=48)	31.3	41.7
Netherlands (N=66)	43.9	22.7
Portugal (N=48)	35.4	31.3
Slovenia (N=60)	35.0	11.7
Spain (N=43)	32.6	58.1
Sweden (N=175)	92.0	4.6
Total (MS=13) (N=940)	56.4	23.8

MS: Member States; N number of isolates tested; NA: not applicable – fewer than 10 isolates tested

Table 17. Complete susceptibility and multiresistance in monophasic *S. Typhimurium* 1,4,[5],12:i:- from humans in 2022

Country	Susceptible to all (%)	Multiresistant (%)
Austria (N=131)	19.8	60.3
Belgium (N=236)	4.7	74.6
Denmark (N=71)	2.8	76.1
Estonia (N=29)	10.3	86.2
France (N=204)	7.8	68.1
Greece (N=2)	NA	NA
Ireland (N=50)	4.0	86.0
Italy (N=329)	4.0	70.5
Netherlands (N=76)	2.6	69.7
Portugal (N=80)	3.8	76.3
Slovenia (N=11)	0.0	63.6
Spain (N=413)	6.8	59.6
Sweden (N=36)	0.0	63.9
Total (MS=13) (N=1668)	6.4	68.2

MS: Member States; N number of isolates tested; NA: not applicable – fewer than 10 isolates tested

Table 18. Complete susceptibility and multiresistance in *S. Infantis* from humans in 2022

Country	Susceptible to all (%)	Multiresistant (%)
Austria (N=66)	28.8	62.1
Belgium (N=32)	31.3	62.5
Denmark (N=17)	82.4	11.8
Estonia (N=1)	NA	NA
France (N=16)	81.3	18.8
Greece (N=7)	NA	NA
Ireland (N=5)	NA	NA
Italy (N=67)	34.3	62.7
Netherlands (N=13)	53.8	38.5
Portugal (N=5)	NA	NA
Slovenia (N=11)	27.3	72.7
Spain (N=52)	46.2	48.1
Sweden (N=12)	91.7	8.3
Total (MS=13) (N=304)	43.4	49.7

MS: Member States; N number of isolates tested; NA: not applicable – fewer than 10 isolates tested

Table 19. Complete susceptibility and multiresistance in *S. Kentucky* from humans in 2022

Country	Susceptible to all (%)	Multiresistant (%)
Austria (N=12)	8.3	58.3
Belgium (N=23)	21.7	56.5
Denmark (N=1)	NA	NA
France (N=89)	23.6	67.4
Ireland (N=3)	NA	NA
Italy (N=5)	NA	NA
Netherlands (N=4)	NA	NA
Portugal (N=4)	NA	NA
Spain (N=12)	25.0	66.7
Sweden (N=15)	6.7	80.0
Total (MS=10) (N=168)	20.8	63.7

MS: Member States; N number of isolates tested; NA: not applicable – fewer than 10 isolates tested

Annex A - EUSR on AMR in zoonotic and indicator bacteria from humans, animals and food 2021/2022

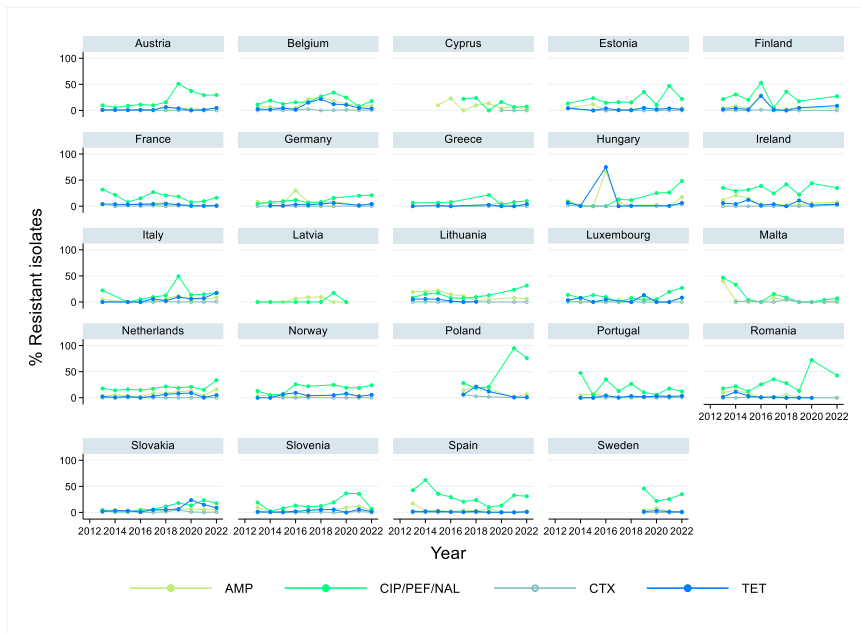


Figure 1. Trends in resistance to ampicillin, ciprofloxacin/pefloxacin/nalidixic acid, cefotaxime and tetracycline in *S. Enteritidis* from humans in 24 reporting countries, 2013–2022

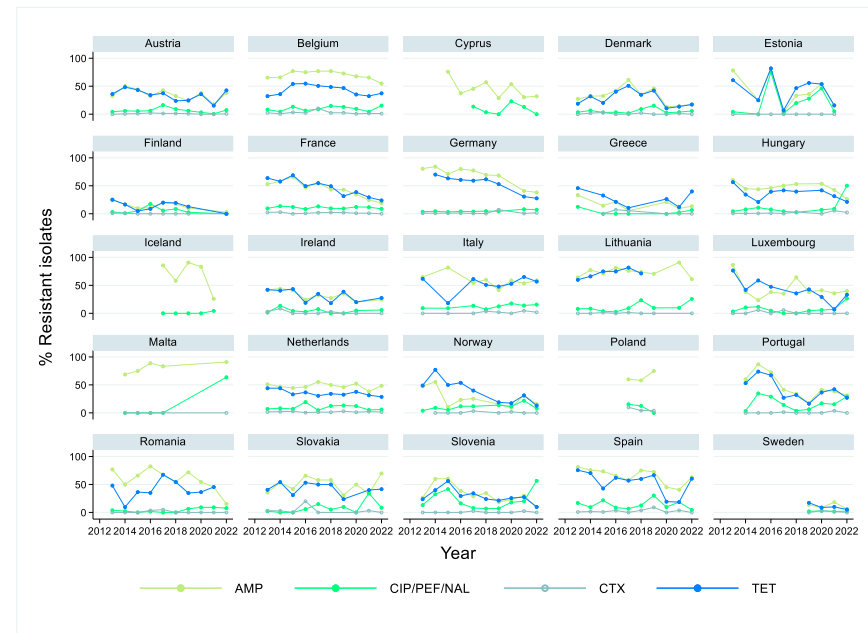


Figure 2. Trends in resistance to ampicillin, ciprofloxacin/pefloxacin/nalidixic acid, cefotaxime and tetracycline in *S. Typhimurium* from humans in 25 reporting countries, 2013–2022

Annex A - EUSR on AMR in zoonotic and indicator bacteria from humans, animals and food 2021/2022

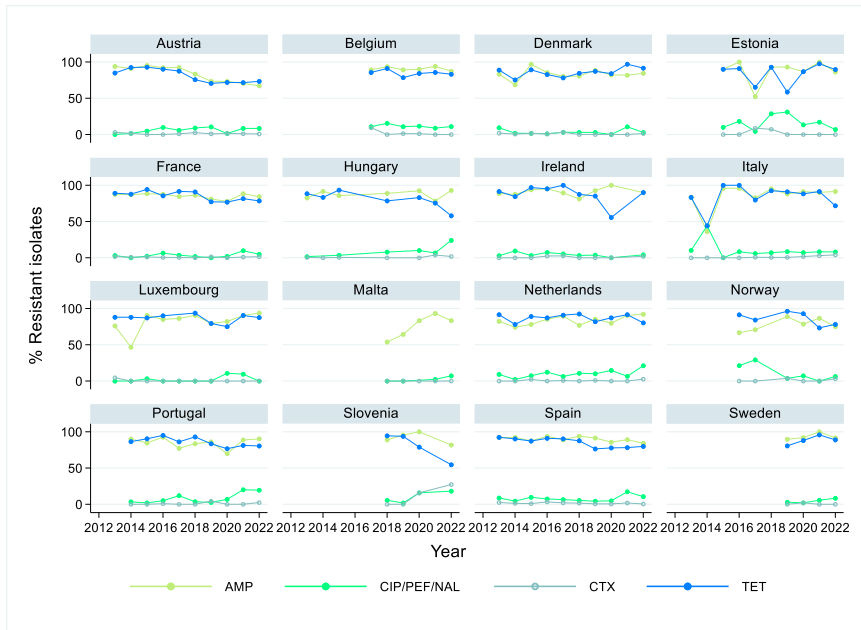


Figure 3. Trends in resistance to ampicillin, ciprofloxacin/pefloxacin/nalidixic acid, cefotaxime and tetracycline in monophasic *S. Typhimurium* 1,4,[5],12:i:- from humans in 16 reporting countries, 2013–2022



Figure 4. Trends in resistance to ampicillin, ciprofloxacin/pefloxacin/nalidixic acid, cefotaxime and tetracycline in *S. Infantis* from humans in 12 reporting countries, 2013–2022

Annex A - EUSR on AMR in zoonotic and indicator bacteria from humans, animals and food 2021/2022

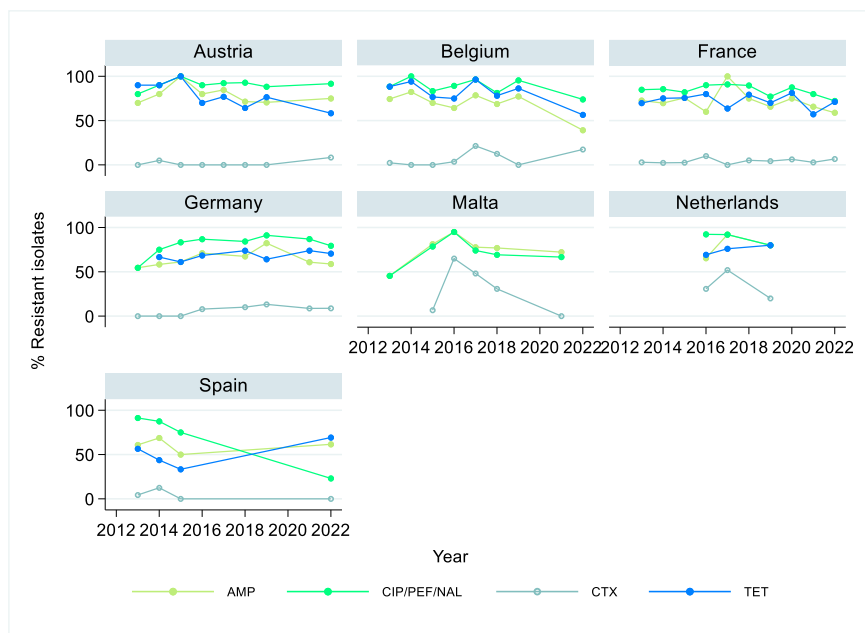


Figure 5. Trends in resistance to ampicillin, ciprofloxacin/pefloxacin/nalidixic acid, cefotaxime and tetracycline in *S. Kentucky* from humans in 7 reporting countries, 2013–2022

A.2. Antimicrobial resistance in *Salmonella* spp. from food-producing animals

Table 20 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility (CS), multidrug resistance (MDR), and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* spp. from **broiler flocks**, 24 MSs, United Kingdom (Northern Ireland) and 2 non-MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria	170	0	5.3	0	4.7	0	0	0	8.8	77.7	77.7	0	0	72.9	2.9	74.7	16.5	72.9	0
Belgium	169	4.1	0	6.5	55.6	0	0	0	33.7	58.0	59.8	0.6	1.8	66.3	69.8	47.3	16.6	68.6	0
Bulgaria	15	0	0	0	0	0	0	0	0	6.7	6.7	0	26.7	33.3	0	0	60.0	0	0
Croatia	80	0	0	1.3	3.8	0	0	0	0	77.5	77.5	0	0	3.8	0	8.8	18.8	2.5	0
Cyprus	14	14.3	0	0	35.7	0	0	0	35.7	50.0	50.0	0	0	92.9	78.6	92.9	0	92.9	0
Czechia	78	0	0	0	1.3	0	0	0	0	42.3	46.2	0	2.6	7.7	0	9.0	53.9	7.7	0
Denmark ^(a)	6	0	0	0	33.3	0	0	0	0	16.7	16.7	0	0	33.3	16.7	16.7	50	33.3	0
Finland ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
France	168	0	0	0	4.2	0	0	0	0	1.8	1.8	0	0	4.2	1.8	3.6	93.5	3.0	0
Germany ^(a)	8	0	0	25.0	50.0	0	0	0	25.0	75.0	62.5	25.0	25.0	25.0	50.0	25.0	25.0	50.0	0
Hungary	170	0	0.6	1.8	22.4	0	0	0	54.1	94.1	94.1	2.4	0	51.2	1.2	56.5	5.3	61.8	0
Ireland	13	0	0	0	7.7	0	0	0	0	7.7	7.7	0	0	15.4	15.4	15.4	76.9	15.4	0
Italy	190	1.6	0	2.1	26.3	11.1	9.5	0	33.7	61.6	61.1	0	7.9	65.3	49.0	63.2	29.0	65.3	11.1
Latvia	13	0	0	0	0	0	0	0	0	23.1	23.1	0	0	0	0	0	76.9	0	0
Luxembourg ^(a)	4	0	0	25.0	0	0	0	0	0	25.0	25.0	0	25.0	25.0	0	0	75.0	25.0	0
Malta	21	14.3	0	14.3	52.4	19.1	19.1	0	9.5	33.3	33.3	0	0	14.3	4.8	33.3	47.6	38.1	19.1
Netherlands	123	0.8	0.8	3.3	12.2	0.8	0.8	0	24.4	32.5	30.1	0	6.5	35.0	27.6	24.4	52.0	33.3	0.8
Poland	167	0.6	0	3.6	30.5	0.6	0.6	0	46.7	80.8	80.8	1.2	19.2	44.9	2.4	46.1	18.0	47.3	0.6
Portugal	20	0	10.0	10.0	30.0	0	0	0	0	20.0	20.0	0	0	20.0	0	20.0	60.0	20.0	0
Romania	170	0.6	0	3.5	12.9	0	0	0	40.6	66.5	66.5	0	0	52.9	1.2	49.4	24.7	52.9	0
Slovakia	38	2.6	0	0	10.5	0	0	0	39.5	89.5	86.8	0	0	63.2	0	63.2	10.5	63.2	0
Slovenia	88	1.1	0	3.4	25.0	0	0	0	50.0	54.5	54.5	0	0	55.7	0	54.5	35.2	53.4	0
Spain	170	1.2	0	4.7	12.4	0	0	0	0.6	28.2	29.4	0	0	18.8	14.7	17.1	58.8	19.4	0
Sweden ^(a)	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0

Annex A - EUSR on AMR in zoonotic and indicator bacteria from humans, animals and food 2021/2022



Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
United Kingdom (Northern Ireland) ^(a)	7	0	0	0	0	0	0	0	57.1	57.1	57.1	0	0	57.1	57.1	57.1	42.9	57.1	0
Total (24 MSs + XI)	1,911	1.2	0.7	2.8	19.1	1.4	1.3	0	25.0	55.3	55.5	0.5	3.5	42.5	16.2	40.2	35.4	43.6	1.4
Median		0	0	1.3	12.2	0	0	0	8.8	42.3	46.2	0	0	33.3	1.8	24.4	47.6	33.3	0
Iceland	12	0	0	0	8.3	0	0	0	0	0	0	0	0	8.3	0	8.3	91.7	8.3	0
Switzerland ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Total (24 MSs, XI and 2 non-MSs)	1,924	1.2	0.7	2.8	19.2	1.4	1.3	0	25.0	56.3	55.5	0.5	3.5	42.5	16.2	40.2	35.8	43.4	1.4
Median		0	0	0	10.5	0	0	0	0.6	33.3	33.3	0	0	25.0	1.2	20.0	50.0	33.3	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline; NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 21 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and combined resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* spp. from **laying hen flocks**, 23 MSs, United Kingdom (Northern Ireland) and 1 non-MS, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria	45	0	4.4	0	0	0	0	0	0	4.4	4.4	0	0	2.2	0	2.2	91.1	2.2	0
Belgium	16	12.5	0	12.5	6.3	0	0	0	0	12.5	18.8	0	6.3	50.0	37.5	18.8	37.5	31.3	0
Bulgaria	16	0	0	0	0	0	0	0	0	0	0	0	6.3	18.8	0	0	81.3	0	0
Croatia	35	0	0	0	0	0	0	0	0	37.1	37.1	0	0	0	0	25.7	62.9	0	0
Cyprus	21	0	4.8	0	0	0	0	0	0	4.8	4.8	0	23.8	0	0	4.8	85.7	0	0
Czechia	12	33.3	0	0	0	0	0	0	0	0	0	0	16.7	33.3	0	33.3	66.7	33.3	0
Denmark ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Estonia ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
France	125	0	0	0.8	4.0	0	0	0	0	0	0.8	0	2.4	3.2	0.8	2.4	95.2	3.2	0
Germany	58	0	1.7	3.5	13.8	0	0	0	0	5.2	5.2	0	6.9	17.2	1.7	12.1	75.9	13.8	0
Hungary	23	0	0	0	8.7	0	0	0	4.4	21.7	26.1	0	4.4	0	0	4.4	73.9	4.4	0
Ireland ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Italy	174	1.2	0.6	0.6	8.1	1.2	1.2	0	7.5	67.2	68.4	0	5.8	12.6	10.9	14.4	28.7	13.8	1.2
Luxembourg ^(a)	2	0	0	50.0	0	0	0	0	0	50.0	50.0	0	50.0	50.0	0	0	50.0	50.0	0
Malta	25	4.0	4.0	0	4.0	0	0	0	0	8.0	4.0	0	0	4.0	0	4.0	84.0	4.0	0
Netherlands	26	0	0	0	3.9	0	0	0	0	0	0	0	26.9	0	0	3.9	96.2	0	0
Poland	81	0	0	1.2	6.2	0	0	0	3.7	38.3	38.3	0	17.3	3.7	0	4.9	56.8	3.7	0
Portugal	15	0	6.7	0	0	0	0	0	6.7	6.7	6.7	0	0	6.7	6.7	6.7	86.7	6.7	0
Romania	44	0	0	0	4.6	0	0	0	9.1	34.1	36.4	0	0	6.8	0	25.0	63.6	11.4	0
Slovakia ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Slovenia ^(a)	9	0	0	0	0	0	0	0	22.2	0	0	0	0	0	0	0	77.8	0	0
Spain	170	0	0	2.4	5.9	0	0	0	1.2	12.9	15.3	0	0	6.5	2.9	6.5	80.6	5.9	0
Sweden ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
United Kingdom (Northern Ireland) ^(a)	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0

Annex A - EUSR on AMR in zoonotic and indicator bacteria from humans, animals and food 2021/2022



Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Total (23 MSs + XI)	908	1.0	0.8	1.3	5.4	0.2	0.2	0	2.9	23.7	24.7	0	5.4	7.9	3.6	9.1	69.1	7.5	0.2
Median		0	0	0	0	0	0	0	0	4.6	4.2	0	0	2.7	0	3.9	82.6	2.7	0
Switzerland ^(a)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Total (23 MSs, XI and 1 non-MS)	914	1.0	0.8	1.3	5.4	0.2	0.2	0	2.9	23.5	24.5	0	5.4	7.9	3.6	9.1	69.3	7.4	0.2
Median		0	0	0	0	0	0	0	0	4.4	4.0	0	0	2.2	0	3.8	81.3	2.2	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 22 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* spp. from **fattening turkey flocks**, 19 MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria ^(a)	4	0	25.0	0	0	0	0	0	0	25.0	25.0	0	0	25.0	0	25.0	50.0	25.0	0
Belgium ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Croatia	15	0	0	0	0	0	0	0	0	66.7	66.7	0	0	0	0	73.3	26.7	0	0
Cyprus ^(a)	1	100	0	0	100	0	0	0	100	100	100	0	0	100	0	100	0	100	0
Czechia ^(a)	2	50.0	0	0	100	0	0	0	0	50.0	50.0	0	0	100	0	50.0	0	50.0	0
Denmark ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Estonia ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
France	66	0	1.5	0	21.2	0	0	0	3.0	3.0	4.6	1.5	0	16.7	6.1	19.7	77.3	21.2	0
Germany ^(a)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Hungary	170	2.9	0.6	0.6	53.5	0	0	0	42.9	84.7	85.3	1.2	0.6	29.4	14.1	79.4	10	69.4	0
Ireland	17	0	0	0	0	0	0	0	0	35.3	35.3	0	0	23.5	0	23.5	41.2	0	0
Italy	184	6.5	0.5	8.2	57.1	8.2	8.2	0	21.2	27.2	48.4	0	0.5	42.4	32.6	42.9	30.4	51.1	8.2
Netherlands ^(a)	6	0	0	0	0	0	0	0	0	33.3	33.3	0	0	0	0	0	66.7	0	0
Poland ^(a)	6	33.3	0	16.7	66.7	0	0	0	33.3	50.0	50.0	0	0	66.7	0	66.7	33.3	66.7	0
Portugal	23	0	0	0	56.5	0	0	0	13.0	13.0	34.8	0	0	21.7	0	34.8	43.5	30.4	0
Romania ^(a)	7	0	0	0	0	0	0	0	0	71.4	71.4	0	0	57.1	0	71.4	28.6	57.1	0
Slovakia ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Slovenia ^(a)	7	0	0	0	71.4	0	0	0	42.9	14.3	57.1	0	0	0	0	28.6	0	42.9	0
Spain	170	1.2	0	2.4	64.1	0	0	0	1.8	63.5	70.0	0	0	13.5	7.1	11.8	22.9	13.5	0
Total (19 MSs)	686	3.4	0.6	3.1	50.2	2.2	2.2	0	18.4	49.1	57.9	0.4	0.3	26.7	14.6	41.4	29.4	39.4	2.2
Median		0	0	0	0	0	0	0	0	27.2	35.3	0	0	16.7	0	25.0	41.2	21.2	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 23 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* spp. from **fattening pigs**, 25 MSs, United Kingdom (Northern Ireland), and 1 non-MS, 2021

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria ^(a)	7	0	14.3	14.3	71.4	0	0	0	14.3	14.3	14.3	0	0	71.4	14.3	85.7	14.3	71.4	0
Belgium	45	2.2	0	13.3	46.7	0	0	0	4.4	2.2	4.4	0	0	42.2	11.1	31.1	46.7	31.1	0
Bulgaria	14	0	0	14.3	28.6	0	0	0	7.1	7.1	14.3	0	7.1	42.9	0	35.7	35.7	21.4	0
Croatia	31	9.7	0	38.7	77.4	0	0	0	0	12.9	6.5	0	0	74.2	19.4	77.4	16.1	74.2	0
Cyprus ^(a)	3	0	0	0	33.3	0	0	0	0	33.3	33.3	0	0	33.3	0	33.3	66.7	33.3	0
Czechia	21	0	0	14.3	38.1	0	0	0	0	0	0	0	0	42.9	0	38.1	57.1	38.1	0
Denmark	92	2.2	0	5.4	33.7	0	0	0	3.3	0	0	4.3	1.1	40.2	14.1	40.2	48.9	34.8	0
Estonia	11	0	0	0	54.5	0	0	0	27.3	0	0	0	0	54.5	45.5	54.5	45.5	54.6	0
France	95	1.1	0	3.2	29.5	0	0	0	6.3	0	0	0	0	50.5	5.3	50.5	40	28.4	0
Germany	30	0	3.3	6.7	60	0	0	0	0	3.3	3.3	0	0	60	6.7	56.7	33.3	53.3	0
Greece	10	10	0	0	30	0	0	0	0	0	0	0	0	30	0	30	70	30	0
Hungary	80	7.5	0	5.0	28.8	5.0	5.0	0	2.5	3.8	3.8	0	3.8	23.8	3.8	30	57.5	23.8	2.5
Ireland	123	14.6	0	18.7	56.1	0	0	0	14.6	3.3	3.3	0.8	0.8	58.5	21.1	56.9	32.5	52.9	0
Italy	91	4.4	0	11.0	28.6	1.1	1.1	0	4.4	4.4	3.3	0	1.1	39.6	7.7	40.7	50.5	28.6	0
Latvia	42	4.8	0	0	2.4	0	0	0	0	0	0	0	2.4	7.1	2.4	2.4	92.9	2.4	0
Lithuania	17	5.9	0	17.6	82.4	0	0	0	11.8	23.5	23.5	5.9	5.9	58.8	52.9	23.5	5.9	41.2	0
Luxembourg	37	0	0	2.7	13.5	0	0	0	0	0	0	0	0	21.6	2.7	8.1	75.7	8.1	0
Malta	59	0	0	3.4	22.0	0	0	0	1.7	1.7	1.7	0	0	16.9	3.4	23.7	61.0	11.9	0
Netherlands	63	0	4.8	6.3	23.8	0	0	0	0	0	0	0	0	23.8	7.9	22.2	61.9	17.5	0
Poland	48	0	0	4.2	37.5	0	0	0	16.7	16.7	18.8	0	6.3	35.4	12.5	41.7	35.4	35.4	0
Portugal	19	0	0	15.8	84.2	0	0	0	21.1	21.1	21.1	21.1	0	78.9	36.8	73.7	10.5	78.9	0
Romania	104	1.0	1.0	20.2	42.3	5.8	5.8	0	13.5	26.9	28.8	9.6	0	39.4	24.0	37.5	33.7	34.6	4.8
Slovakia	12	0	0	8.3	41.7	0	0	0	8.3	16.7	16.7	0	0	41.7	0	41.7	50	41.7	0
Slovenia	18	44.4	0	33.3	72.2	0	0	0	0	22.2	22.2	22.2	0	66.7	22.2	50	27.8	72.2	0
Spain	170	8.8	0.6	21.8	72.9	0	0	0	10	29.4	30.6	0	0	71.8	27.6	75.3	11.2	68.8	0
United Kingdom (Northern Ireland)	16	25.0	0	18.8	68.8	0	0	0	6.3	12.5	12.5	0	0	75.0	37.5	87.5	0	75.0	0
Total (25 MSs + XI)	1,258	5.3	0.6	12.2	43.4	0.9	0.9	0	7.0	9.8	10.1	1.9	1.0	45.5	14.8	44.9	40.5	39.1	0.6
Median		1.0	0	9.7	39.9	0	0	0	4.4	4.1	4.1	0	0	42.5	9.5	40.4	42.7	35.1	0
Iceland ^(a)	3	0	0	0	33.3	0	0	0	0	0	0	0	0	33.3	33.3	33.3	66.7	33.3	0
Total (25 MSs, XI and 1 non-MS)	1,261	5.3	0.6	12.2	43.4	0.9	0.9	0	7.0	9.8	10.1	1.9	1.0	45.5	14.8	44.9	40.6	39.1	0.6

Annex A - EUSR on AMR in zoonotic and indicator bacteria from humans, animals and food 2021/2022



Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Median		1.0	0	8.3	38.1	0	0	0	4.4	3.8	3.8	0	0	42.2	11.1	40.2	45.5	34.8	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFS: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 24 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* spp. from **cattle under one year of age** (calves), 10 MSs, 2021

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Belgium ^(a)	3	0	0	0	0	0	0	0	0	0	0	0	33.3	66.7	0	66.7	33.3	0	0
Croatia	16	6.3	0	18.8	18.8	0	0	0	0	0	0	0	0	18.8	0	12.5	81.3	18.8	0
Denmark ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	100	0	0
France ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Germany ^(a)	6	0	0	0	66.7	0	0	0	0	0	0	0	33.3	66.7	0	66.7	33.3	66.7	0
Italy	20	5.0	0	25.0	35.0	5.0	5.0	0	20	15.0	25.0	0	5.0	60	25.0	60	40	50	5.0
Netherlands ^(a)	1	0	0	0	100	0	0	0	0	0	0	0	0	100	0	100	0	100	0
Portugal ^(a)	6	0	0	0	16.7	0	0	0	0	33.3	33.3	0	33.3	16.7	0	16.7	50	16.7	0
Romania ^(a)	4	0	0	0	0	0	0	0	50	25.0	25.0	0	0	50	0	50	50	50	0
Spain	20	5.0	0	10	10	5.0	0	0	10	10	10	0	10	30	20	25.0	60	15.0	5.0
Total (10 MSs)	79	3.8	0	12.7	22.8	2.5	1.3	0	10.1	10.1	12.7	0	11.4	39.2	11.4	36.7	55.7	30.4	2.5
Median		0	0	0	13.3	0	0	0	0	0	0	0	7.5	40	0	37.5	50.0	17.7	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Salmonella Infantis

Table 25 -Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Infantis* from **broiler flocks** from 15 MSs, United Kingdom (Northern Ireland), and 1 non-MS, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria	129	0	3.9	0	2.3	0	0	0	11.6	98.4	98.4	0	0	91.5	2.3	95.3	0.8	91.5	0
Belgium	66	3.0	0	4.5	68.2	0	0	0	69.7	89.4	89.4	1.5	1.5	93.9	86.4	80.3	3.0	89.4	0
Croatia	38	0	0	2.6	5.3	0	0	0	0	94.7	94.7	0	0	5.3	0	5.3	5.3	5.3	0
Cyprus ^(a)	6	33.3	0	0	66.7	0	0	0	83.3	100	100	0	0	100	66.7	100	0	100	0
Czechia ^(a)	6	0	0	0	16.7	0	0	0	0	83.3	83.3	0	0	83.3	0	83.3	16.7	83.3	0
France ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Germany ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Hungary	143	0	0.7	2.1	22.4	0	0	0	60.1	99.3	99.3	2.8	0	55.2	1.4	60.8	0.7	67.8	0
Ireland ^(a)	3	0	0	0	0	0	0	0	0	33.3	33.3	0	0	33.3	33.3	66.7	33.3	33.3	0
Italy	103	0	0	2.9	29.1	17.5	15.5	0	55.3	97.1	96.1	0	1.0	96.1	81.6	94.2	1.0	97.1	17.5
Netherlands	41	0	0	0	7.3	2.4	2.4	0	51.2	61.0	56.1	0	0	61.0	34.2	58.5	39.0	58.5	2.4
Poland	43	2.3	0	4.7	23.3	0	0	0	97.7	100	100	2.3	0	97.7	9.3	97.7	0	100	0
Romania	80	0	0	0	0	0	0	0	77.5	100	100	0	0	95.0	0	96.3	0	96.3	0
Slovakia	30	3.3	0	0	13.3	0	0	0	50	100	100	0	0	76.7	0	76.7	0	76.7	0
Slovenia	48	0	0	2.1	39.6	0	0	0	83.3	97.9	97.9	0	0	95.8	0	95.8	2.1	95.8	0
Spain	24	0	0	0	0	0	0	0	4.2	83.3	83.3	0	0	70.8	58.3	70.8	16.7	70.8	0
United Kingdom (Northern Ireland) ^(a)	4	0	0	0	0	0	0	0	100	100	100	0	0	100	100	100	0	100	0
Total (16 MSs + XI)	768	0.8	0.8	1.7	19.9	2.5	2.2	0	51.2	94.4	94.0	0.8	0.3	78.8	24.4	79.2	4.4	81.0	2.5
Median		0	0	0	7.3	0	0	0	51.2	97.1	96.1	0	0	83.3	2.3	80.3	2.1	83.3	0
Iceland ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Total (16 MSs, XI & 1non-MS)	769	0.8	0.8	1.7	19.9	2.5	2.2	0	51.2	94.3	93.9	0.8	0.3	78.8	24.3	79.2	4.6	80.9	2.5
Median		0	0	0	6.3	0	0	0	50.6	95.9	95.4	0	0	80.0	1.9	78.5	2.6	80.0	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp. MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs

Table 26- Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Infantis* from **laying hen flocks** from 12 MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria ^(a)	1	0	0	0	0	0	0	0	0	100	100	0	0	100	0	100	0	100	0
Belgium ^(a)	5	40.0	0	40.0	0	0	0	0	0	0	20.0	0	0	60.0	60.0	20.0	20.0	40.0	0
Bulgaria ^(a)	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Cyprus ^(a)	2	0	50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.0	0	0
France ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Hungary ^(a)	2	0	0	0	50.0	0	0	0	0	50.0	50.0	0	0	0	0	0	50.0	0	0
Italy	20	5.0	0	0	35.0	10.0	10.0	0	50.0	80.0	80.0	0	0	70.0	60.0	75.0	20.0	70.0	10.0
Malta ^(a)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Netherlands ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Poland	12	0	0	0	8.3	0	0	0	8.3	8.3	8.3	0	0	8.3	0	8.3	91.7	8.3	0
Romania ^(a)	8	0	0	0	0	0	0	0	50.0	37.5	50.0	0	0	37.5	0	37.5	50.0	37.5	0
Spain	14	0	0	0	7.1	0	0	0	0	14.3	14.3	0	0	7.1	7.1	7.1	85.7	7.1	0
Total (12 MSs)	78	3.9	1.3	2.6	12.8	2.6	2.6	0	19.2	30.8	33.3	0	0	29.5	20.5	28.2	61.5	28.2	2.6
Median		0	0	0	0	0	0	0	0	4.2	11.3	0	0	3.6	0	3.6	67.9	3.6	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.
MSs: Member States; ECOFFs: epidemiological cut-off values.
(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 27- Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Infantis* from **fattening turkey flocks** from 5 MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria ^(a)	1	0	0	0	0	0	0	0	0	100	100	0	0	100	0	100	0	100	0
Hungary	37	0	0	2.7	10.8	0	0	0	78.4	100	100	0	0	91.9	0	97.3	0	94.6	0
Italy	43	0	0	7.0	65.1	34.9	34.9	0	69.8	100	100	0	0	97.7	86.0	90.7	0	97.7	34.9
Romania ^(a)	5	0	0	0	0	0	0	0	0	100	100	0	0	80	0	100	0	80	0
Spain ^(a)	3	0	0	0	0	0	0	0	66.7	100	100	0	0	100	66.7	100	0	100	0
Total (5 MSs)	89	0	0	4.5	36.0	16.9	16.9	0	68.5	100	100	0	0	94.4	43.8	94.4	0	95.5	16.9
Median		0	0	0	0	0	0	0	66.7	100	100	0	0	97.7	0	100	0	97.7	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Salmonella Kentucky

Table 28- Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Kentucky* from broiler flocks from 5 MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs	
Cyprus ^(a)	1	0	0	0	100	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0
Hungary ^(a)	4	0	0	0	100	0	0	0	0	100	100	0	0	25.0	0	25.0	0	25.0	0	0
Italy ^(a)	1	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0
Malta	10	30	0	30	70	40	40	0	10	70	70	0	0	30	10	30	30	70	40	40
Romania ^(a)	3	0	0	0	100	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0
Total (5 MSs)	19	15.8	0	15.8	78.9	21.1	21.1	0	5.3	84.2	84.2	0	0	21.1	5.3	21.1	15.8	42.1	21.1	21.1
Median		0	0	0	100	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin; CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline; NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 29 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Kentucky* from **laying hen flocks** from 5 MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Cyprus ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
France ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Italy	79	1.3	0	1.3	5.1	0	0	0	3.8	94.9	97.5	0	0	3.8	2.5	6.3	1.3	5.1	0
Malta ^(a)	8	12.5	0	0	12.5	0	0	0	0	25.0	12.5	0	0	12.5	0	0	75.0	12.5	0
Spain ^(a)	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Total (5 MSs)	95	2.1	0	1.1	5.3	0	0	0	3.2	81.1	82.1	0	0	4.2	2.1	5.3	15.8	5.3	0
Median		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 30 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* Kentucky from **fattening turkey flocks** from 5 MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Cyprus ^(a)	1	100	0	0	100	0	0	0	100	100	100	0	0	100	0	100	0	100	0
Czechia ^(a)	1	100	0	0	100	0	0	0	0	100	100	0	0	100	0	100	0	100	0
Hungary ^(a)	7	71.4	0	0	100	0	0	0	0	100	100	0	0	100	0	100	0	100	0
Poland ^(a)	2	100	0	0	100	0	0	0	50	100	100	0	0	100	0	100	0	100	0
Spain ^(a)	2	100	0	0	50	0	0	0	0	100	100	0	0	100	0	100	0	100	0
Total (5 MSs)	13	84.6	0	0	92.3	0	0	0	15.4	100	100	0	0	100	0	100	0	100	0
Median		100	0	0	100	0	0	0	0	100	100	0	0	100	0	100	0	100	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin; CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline; NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Salmonella Enteritidis

Table 31 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Enteritidis* from **broiler flocks** from 15 MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MD R	Resistance to both CIP/CTX, applying ECOFFs	
Austria ^(a)	2	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0
Belgium ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	50	50	50	50	50	0	0
Bulgaria ^(a)	4	0	0	0	0	0	0	0	0	0	0	0	75.0	0	0	0	100	0	0	0
Croatia ^(a)	5	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	80	0	0	0
Czechia	45	0	0	0	0	0	0	0	0	35.6	37.8	0	4.4	0	0	2.2	62.2	0	0	0
France	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
Germany ^(a)	2	0	0	0	0	0	0	0	0	100	100	0	100	0	0	0	0	0	0	0
Hungary ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
Ireland ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
Italy	19	0	0	0	0	0	0	0	15.8	21.1	21.1	0	73.7	15.8	10.5	15.8	78.9	15.8	0	0
Latvia ^(a)	1	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0
Netherlands	12	0	0	0	0	0	0	0	8.3	50.0	50.0	0	58.3	0	0	8.3	50.0	8.3	0	0
Poland	72	0	0	0	8.3	0	0	0	5.6	70.8	70.8	0	41.7	1.4	0	2.8	29.2	1.4	0	0
Romania	10	0	0	0	0	0	0	0	0	80	80	0	0	0	0	0	20	0	0	0
Slovakia ^(a)	6	0	0	0	0	0	0	0	0	33.3	16.7	0	0	16.7	0	16.7	66.7	16.7	0	0
Spain ^(a)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
Total (15 MSs)	219	0	0	0	2.7	0	0	0	3.7	42.0	42.0	0	26.5	3.2	1.4	4.1	56.6	3.2	0	0
Median		0	0	0	0	0	0	0	0	27.2	18.9	0	0	0	0	0	64.4	0	0	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin; CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline; NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 32 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Enteritidis* from **laying hen flocks** from 18 MSs and 1 non-MS, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria ^(a)	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Belgium ^(a)	4	0	0	0	0	0	0	0	0	50	50	0	25.0	50	25.0	50	25.0	50	0
Croatia ^(a)	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Cyprus	10	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	100	0	0
Czechia ^(a)	6	0	0	0	0	0	0	0	0	0	0	0	33.3	0	0	0	100	0	0
France	56	0	0	0	1.8	0	0	0	0	0	0	0	1.8	1.8	1.8	0	98.2	1.8	0
Germany	18	0	0	0	0	0	0	0	0	11.1	11.1	0	22.2	0	0	0	88.9	0	0
Hungary ^(a)	6	0	0	0	0	0	0	0	0	0	0	0	16.7	0	0	0	100	0	0
Italy	30	0	3.3	0	3.3	0	0	0	0	56.7	56.7	0	30	0	0	3.3	40	3.3	0
Luxembourg ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Malta ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Netherlands	15	0	0	0	6.7	0	0	0	0	0	0	0	46.7	0	0	6.7	93.3	0	0
Poland	45	0	0	0	2.2	0	0	0	4.4	42.2	42.2	0	28.9	0	0	2.2	51.1	0	0
Portugal ^(a)	4	0	0	0	0	0	0	0	25.0	25.0	25.0	0	0	25.0	25.0	25.0	75.0	25.0	0
Romania	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Slovakia ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Spain	27	0	0	0	0	0	0	0	0	40.7	44.4	0	0	0	0	0	55.6	0	0
Sweden ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Total (18 MSs)	254	0	0.4	0	1.6	0	0	0	1.2	20.5	20.9	0	16.9	1.6	1.2	2.4	76.4	2.0	0
Median		0	0	0	0	0	0	0	0	0	0	0	0.9	0	0	0	99.1	0	0
Switzerland ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Total (18 MSs and 1 non-MS)		0	0.4	0	1.6	0	0	0	1.2	20.4	20.8	0	16.9	1.6	1.2	2.4	76.2	2.0	0
Median		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 33 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* Enteritidis from **fattening turkey flocks** from 7 MSs, 2022

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Croatia ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Estonia ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
France ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Germany ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Hungary ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Ireland ^(a)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Netherlands	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Poland ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Total (7 MSs)	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Median		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp. MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Salmonella Derby

Table 34 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Derby* from **fattening pigs** from 22 MSs and United Kingdom (Northern Ireland), 2021

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Belgium	11	9.1	0	9.1	9.1	0	0	0	0	0	9.1	0	0	9.1	9.1	9.1	81.8	9.1	0
Bulgaria ^(a)	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.0	75.0	0	0
Croatia ^(a)	2	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	50	0	0
Czechia ^(a)	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Denmark	55	1.8	0	3.6	9.1	0	0	0	0	0	0	1.8	1.8	18.2	12.7	14.5	72.7	12.7	0
Estonia ^(a)	8	0	0	0	62.5	0	0	0	37.5	0	0	0	0	62.5	62.5	62.5	37.5	62.5	0
France	43	0	0	0	0	0	0	0	4.7	0	0	0	0	32.6	0	30.2	67.4	4.7	0
Germany ^(a)	7	0	0	0	14.3	0	0	0	0	0	0	0	0	14.3	14.3	14.3	85.7	14.3	0
Greece ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Hungary	22	4.5	0	4.5	18.2	4.5	4.5	0	4.5	9.1	9.1	0	0	13.6	4.5	4.5	72.7	13.6	4.5
Ireland	27	3.7	0	3.7	3.7	0	0	0	7.4	0	0	0	0	14.8	11.1	22.2	70.4	11.1	0
Italy	43	2.3	0	11.6	14.0	0	0	0	4.7	2.3	2.3	0	2.3	39.5	7.0	32.6	55.8	16.3	0
Latvia	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Lithuania ^(a)	7	0	0	0	71.4	0	0	0	0	0	0	0	0	14.3	42.9	14.3	14.3	0	0
Luxembourg	20	0	0	0	0	0	0	0	0	0	0	0	0	5.0	0	0	95.0	0	0
Malta ^(a)	9	0	0	11.1	11.1	0	0	0	0	0	0	0	0	44.4	11.1	33.3	55.6	11.1	0
Netherlands	21	0	4.8	4.8	0	0	0	0	0	0	0	0	0	0	0	0	90.5	0	0
Poland	19	0	0	0	5.3	0	0	0	5.3	15.8	15.8	0	0	15.8	5.3	21.1	57.9	5.3	0
Romania	17	0	0	5.9	17.6	5.9	5.9	0	0	11.8	17.6	0	0	29.4	17.6	17.6	47.1	17.6	5.9
Slovakia ^(a)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Slovenia ^(a)	8	0	0	0	37.5	0	0	0	0	0	0	0	0	25.0	37.5	37.5	62.5	37.5	0
Spain	12	0	0	0	8.3	0	0	0	0	25.0	25.0	0	0	8.3	0	58.3	33.3	8.3	0
United Kingdom (Northern Ireland) ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0
Total (22 MSs + XI)	371	1.3	0.3	3.5	10.2	0.5	0.5	0	3.0	3.0	3.5	0.3	0.5	19.4	8.6	19.7	69.0	10.2	0.5

Annex A - EUSR on AMR in zoonotic and indicator bacteria from humans, animals and food 2021/2022



Median		0	0	0	8.3	0	0	0	0	0	0	0	0	13.6	4.5	14.5	70.4	5.3	0
---------------	--	----------	----------	----------	------------	----------	----------	----------	----------	----------	----------	----------	----------	-------------	------------	-------------	-------------	------------	----------

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for Salmonella spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for Salmonella spp.

MSs: Member States; ECOFFS: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 35 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* Derby from **cattle under one year of age (calves)** from 2 MSs, 2021

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Italy ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Spain ^(a)	1	100	0	100	100	100	0	0	0	100	100	0	0	100	100	100	0	100	100
Total (2 MSs)	2	50.0	0	50.0	50.0	50.0	0	0	0	50.0	50.0	0	0	50.0	50.0	50.0	50.0	50.0	50.0
Median		50.0	0	50.0	50.0	50.0	0	0	0	50.0	50.0	0	0	50.0	50.0	50.0	50.0	50.0	50.0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin; CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Salmonella Typhimurium

Table 36 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Typhimurium* from **fattening pigs** from 23 MSs and United Kingdom (Northern Ireland), 2021

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria ^(a)	2	0	0	50	50	0	0	0	50	0	0	0	0	50	0	100	0	50	0
Belgium	10	0	0	10	60	0	0	0	20	0	0	0	10	30	20	40	30	30	0
Bulgaria ^(a)	2	0	0	50	50	0	0	0	0	50	50	0	0	100	0	50	0	50	0
Croatia	12	16.7	0	41.7	75.0	0	0	0	0	25.0	8.3	0	0	75.0	16.7	66.7	25.0	75.0	0
Czechia	10	0	0	30	60	0	0	0	0	0	0	0	0	70	0	60	30	60	0
Denmark ^(a)	7	0	0	14.3	57.1	0	0	0	28.6	0	0	0	0	85.7	14.3	57.1	0	57.1	0
France	16	0	0	12.5	50	0	0	0	6.2	0	0	0	0	62.5	0	75.0	12.5	50	0
Germany ^(a)	7	0	14.3	14.3	42.9	0	0	0	0	14.3	14.3	0	28.6	42.9	0	42.9	28.6	28.6	0
Greece ^(a)	1	100	0	0	100	0	0	0	0	0	0	0	0	100	0	100	0	100	0
Hungary ^(a)	22	22.7	0	13.6	72.7	0	0	0	0	0	0	0	0	63.6	4.6	90.9	16.7	63.6	0
Ireland	24	12.5	0	45.8	75.0	0	0	0	12.5	12.5	12.5	4.2	0	70.8	20.8	54.2	4.8	50.0	0
Italy ^(a)	1	0	0	100	100	0	0	0	0	0	0	0	0	100	100	0	0	100	0
Latvia ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Lithuania ^(a)	4	25.0	0	50	75.0	0	0	0	0	25.0	25.0	0	0	100	75.0	0	0	75.0	0
Luxembourg ^(a)	4	0	0	25.0	50	0	0	0	0	0	0	0	0	100	0	25.0	0	25.0	0
Malta ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Netherlands ^(a)	7	0	0	14.3	57.1	0	0	0	0	0	0	0	0	28.6	28.6	42.9	28.6	28.6	0
Poland ^(a)	3	0	0	0	33.3	0	0	0	33.3	0	0	0	0	33.3	0	33.3	66.7	33.3	0
Portugal ^(a)	1	0	0	100	100	0	0	0	0	0	0	0	0	0	0	100	0	100	0
Romania	18	0	0	22.2	72.2	0	0	0	0	16.7	16.7	0	0	44.4	22.2	38.9	22.2	33.3	0
Slovakia ^(a)	4	0	0	25.0	100	0	0	0	0	25.0	25.0	0	0	100	0	100	0	100	0
Slovenia ^(a)	4	100	0	100	100	0	0	0	0	100	100	0	0	100	0	100	0	100	0
Spain	20	0	0	45.0	85.0	0	0	0	15.0	40	45.0	0	0	85.0	25.0	70	5.0	80	0
United Kingdom (Northern Ireland) ^(a)	1	0	0	100	100	0	0	0	0	0	0	0	0	100	100	0	0	100	0
Total (23 MSs + XI)	182	8.8	0.6	29.7	68.1	0	0	0	7.1	13.7	13.2	0.6	1.8	65.4	14.8	60.0	15.9	55.5	0

Annex A - EUSR on AMR in zoonotic and indicator bacteria from humans, animals and food 2021/2022



Median	-	0	0	25.0	63.1	0	0	0	0	0	0	0	0	0	702.5	0	53.6	4.9	57.1	0
---------------	---	---	---	------	------	---	---	---	---	---	---	---	---	---	-------	---	------	-----	------	---

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp. MSs: Member States; ECOFFS: epidemiological cut-off values. (a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 37 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Typhimurium* from **cattle under one year of age (calves)** from 4 MSs, 2021

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Croatia ^(a)	5	20.0	0	20.0	20.0	0	0	0	0	0	0	0	0	20.0	0	0	80.0	20.0	0
Denmark ^(a)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0
Italy ^(a)	3	0	0	66.7	66.7	0	0	0	66.7	0	33.3	0	0	100	66.7	100	0	100	0
Romania ^(a)	1	0	0	0	0	0	0	0	100	0	0	0	0	100	0	100	0	100	0
Total (4 MSs)	10	10.0	0	30.0	30.0	0	0	0	30.0	0	10.0	0	0	50.0	20.0	40.0	50.0	50.0	0
Median	-	0	0	10.0	10.0	0	0	0	33.3	0	0	0	0	60.0	0	50.0	40.0	60.0	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin; CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline; NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline.

CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 38 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella* Typhimurium, monophasic from **fattening pigs** from 23 MSs and United Kingdom (Northern Ireland), 2021

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Austria ^(a)	4	0	25.0	0	100	0	0	0	0	25.0	25.0	0	0	100	25.0	100	0	100	0
Belgium	14	0	0	14.3	92.9	0	0	0	0	7.1	7.1	0	0	92.9	7.1	50	7.1	57.1	0
Bulgaria ^(a)	3	0	0	0	66.7	0	0	0	0	0	0	0	0	66.7	0	33.3	0	33.3	0
Croatia	17	5.9	0	41.2	82.3	0	0	0	0	5.9	5.9	0	0	82.3	23.5	94.1	5.9	82.3	0
Cyprus ^(a)	1	0	0	0	100	0	0	0	0	100	100	0	0	100	0	100	0	100	0
Czechia ^(a)	2	0	0	0	100	0	0	0	0	0	0	0	0	100	0	100	0	100	0
Denmark	26	3.9	0	7.7	84.6	0	0	0	3.9	0	0	11.5	0	80.8	19.2	96.2	3.9	80.8	0
Estonia ^(a)	1	0	0	0	100	0	0	0	0	0	0	0	0	100	0	100	0	100	0
France	19	5.3	0	5.3	79.0	0	0	0	5.3	0	0	0	0	84.2	10.5	79.0	5.3	68.4	0
Germany	13	0	0	0	100	0	0	0	0	0	0	0	0	100	0	92.3	0	92.3	0
Greece ^(a)	2	0	0	0	100	0	0	0	0	0	0	0	0	100	0	100	0	100	0
Ireland	50	28.0	0	18.0	90.0	0	0	0	20	2.0	2.0	0	0	92.0	28.0	98.0	2.0	90.0	0
Italy	20	10	0	10.0	85.0	5.0	5.0	0	5.0	5.0	5.0	0	0	80.0	5.0	80.0	10.0	75.0	0
Lithuania ^(a)	2	0	0	50.0	100	0	0	0	50.0	0	0	0	0	100	50.0	50.0	0	50.0	0
Luxembourg ^(a)	2	0	0	0	100	0	0	0	0	0	0	0	0	100	0	50.0	0	50.0	0
Malta ^(a)	7	0	0	0	100	0	0	0	0	0	0	0	0	71.4	0	85.7	0	71.4	0
Netherlands	13	0	7.7	0	76.9	0	0	0	0	0	0	0	0	76.9	7.7	69.2	7.7	53.9	0
Poland	16	0	0	12.5	87.5	0	0	0	18.8	12.5	18.8	0	0	68.8	18.8	87.5	0	81.2	0
Portugal	10	0	0	10.0	90.0	0	0	0	0	30.0	30.0	0	0	90.0	10.0	80.0	10.0	80.0	0
Romania	13	7.7	0	7.7	92.3	0	0	0	7.7	7.7	7.7	7.7	0	84.6	7.7	61.5	7.7	61.5	0
Slovakia ^(a)	1	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slovenia ^(a)	2	0	0	100	100	0	0	0	0	0	0	0	0	100	50.0	100	0	100	0
Spain	81	9.9	0	13.6	95.1	0	0	0	4.9	24.7	24.7	0	0	90.1	13.6	86.4	2.5	84.0	0
United Kingdom (Northern Ireland) ^(a)	10	40	0	20	100	0	0	0	0	0	0	0	0	100	40	100	0	100	0
Total (23 MSs + XI)	329	9.7	0.6	13.1	90.3	0.3	0.3	0	6.7	9.7	10.0	1.2	0	86.9	15.5	85.1	3.6	79.6	0
Median	-	0	0	6.5	97.5	0	0	0	0	0	0	0	0	91.1	7.7	87.0	0	81.0	0

Annex A - EUSR on AMR in zoonotic and indicator bacteria
from humans, animals and food 2021/2022



N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline, NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.
MSs: Member States; ECOFFS: epidemiological cut-off values.
(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.

Table 39 - Occurrence of resistance (%) to selected antimicrobials, using harmonised ECOFFs, complete susceptibility and multidrug resistance, and co-resistance to (fluoro)quinolones and third-generation cephalosporins in *Salmonella Typhimurium*, monophasic from **cattle under one year of age (calves)** from 6 MSs, 2021

Country	N	GEN (%)	AMK (%)	CHL (%)	AMP (%)	CTX (%)	CAZ (%)	MEM (%)	TGC (%)	NAL (%)	CIP (%)	AZM (%)	COL (%)	SMX (%)	TMP (%)	TET (%)	CS	MDR	Resistance to both CIP/CTX, applying ECOFFs
Belgium ^(a)	2	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0
Croatia ^(a)	3	0	0	66.7	66.7	0	0	0	0	0	0	0	0	66.7	0	66.7	33.3	66.7	0
Germany ^(a)	4	0	0	0	100	0	0	0	0	0	0	0	0	100	0	100	0	100	0
Italy ^(a)	2	0	0	50.0	100	0	0	0	0	0	0	0	0	100	50.0	100	0	100	0
Netherlands ^(a)	1	0	0	0	100	0	0	0	0	0	0	0	0	100	0	100	0	100	0
Portugal ^(a)	1	0	0	0	1000	0	0	0	0	0	0	0	0	100	0	100	0	100	0
Total (6 MSs)	13	0	0	23.1	76.9	0	0	0	0	0	0	0	0	92.3	7.7	92.3	7.7	76.9	0
Median	-	0	0	0	100	0	0	0	0	0	0	0	0	100	0	100	0	100	0

N: total number of isolates tested; %: percentage of isolates with this phenotype from the total tested; GEN: gentamicin; CHL: chloramphenicol; AMP: ampicillin; AMK: amikacin; CTX: cefotaxime; CAZ: ceftazidime; MEM: meropenem; TGC: tigecycline; NAL: nalidixic acid; CIP: ciprofloxacin; AZM: azithromycin; COL: colistin; SMX: sulfamethoxazole; TMP: trimethoprim; TET: tetracycline. CS: percentage of isolates showing complete susceptibility to all antimicrobial classes of the harmonised panel for *Salmonella* spp; MDR: percentage of isolates showing resistance to at least three antimicrobial classes of the harmonised panel for *Salmonella* spp.

MSs: Member States; ECOFFs: epidemiological cut-off values.

(a): The occurrence of resistance is assessed on less than 10 isolates and should only be considered as part of the total of MSs data and/or the total of MSs and non-MSs.