ZOONOSES MONITORING

Iceland

TRENDS AND SOURCES OF ZOONOSES AND ZOONOTIC AGENTS IN FOODSTUFFS, ANIMALS AND FEEDINGSTUFFS

including information on foodborne outbreaks, antimicrobial resistance in zoonotic and indicator bacteria and some pathogenic microbiological agents

IN 2021

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/99/EC*. The information has also been forwarded to the European Food Safety Authority (EFSA).

The report contains information on trends and sources of zoonoses and zoonotic agents in Iceland during the year 2021.

The information covers the occurrence of these diseases and agents in animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and indicator bacteria as well as information on epidemiological investigations of foodborne outbreaks.
Complementary data on susceptible animal populations in the country is also given. The information given covers both zoonoses that are important for the public health in the whole European Union as well as zoonoses, which are relevant on the basis of the national epidemiological situation.
The report describes the monitoring systems in place and the prevention and control strategies applied in the country. For some zoonoses this monitoring is based on legal requirements laid down by the European Union legislation, while for the other zoonoses national approaches are applied.

The report presents the results of the examinations carried out in the reporting year. A national evaluation of the epidemiological situation, with special reference to trends and sources of zoonotic infections, is given. Whenever possible, the relevance of findings in foodstuffs and animals to zoonoses cases in humans is evaluated.
The information covered by this report is used in the annual European Union Summary Reports on zoonoses and antimicrobial resistance that are published each year by EFSA.

The national report contains two parts: tables summarising data reported in the Data Collection Framework and the related text forms. The text forms were sent by email as pdf files and they are incorporated at the end of the report.

---

* Directive 2003/ 99/ EC of the European Parliament and of the Council of 12 December 2003 on the monitoring of zoonoses and zoonotic agents, amending Decision 90/ 424/ EEC and repealing Council Directive 92/ 117/ EEC, OJ L 325, 17.11.2003, p. 31

List of Contents

ANIMAL POPULATION TABLES

Table Susceptible animal population

		Population			
Animal species	**Category of animals**	**holding**	**animal**	**slaughter animal (heads)**	**herd/flock**
Cattle (bovine animals)	Cattle (bovine animals) - calves (under 1 year) - dairy calves	615	11,595		615
	Cattle (bovine animals) - calves (under 1 year) - for slaughter	628	10,628		628
	Cattle (bovine animals) - dairy cows - adult	547	25,772		547
	Cattle (bovine animals) - dairy cows - young cattle (1-2 years)	536	6,580		536
	Cattle (bovine animals) - meat production animals - suckler cows	145	3,572		145
	Cattle (bovine animals) - unspecified			22,949	
	Cattle (bovine animals) - young cattle (1-2 years)	708	22,146		708
Gallus gallus (fowl)	Gallus gallus (fowl) - broilers	26	804,617	5,465,656	86
	Gallus gallus (fowl) - laying hens - adult	12	278,001		37
	Gallus gallus (fowl) - laying hens - during rearing period	6	93,875		11
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult	4	63,400	26,267	19
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - during rearing period	6	52,717		14
	Gallus gallus (fowl) - parent breeding flocks for egg production line - adult	2	8,720		3
	Gallus gallus (fowl) - parent breeding flocks for egg production line - during rearing period	1	5,092		1
Pigs	Pigs - breeding animals - raised under controlled housing conditions - boars	12	40	5	12
	Pigs - breeding animals - raised under controlled housing conditions - sows	13	2,954	1,138	13
	Pigs - fattening pigs - raised under controlled housing conditions	14	24,157	76,673	14
	Pigs - fattening pigs - raised under controlled housing conditions - piglets	11	8,292		11
Small ruminants	Goats	119	1,672	530	119
	Sheep - animals over 1 year	2,109	315,613	49,244	2,109
	Sheep - animals under 1 year (lambs)	1,883	73,768	465,230	1,883
Solipeds, domestic	Solipeds, domestic - horses		69,500	7,469	
Turkeys	Turkeys - meat production flocks	5	15,305	44,518	9
	Turkeys - parent breeding flocks - adult	1	830		4
	Turkeys - parent breeding flocks - during rearing period	2	1,447		3

DISEASE STATUS TABLES

Table Bovine brucellosis in countries and regions that do not receive Community co-financing for eradication programme

Region	Zoonotic agent	Number of herds with status officially free	Number of infected herds	Total number of herds
ISLAND	Brucella	735	0	735

Table Ovine or Caprine brucellosis in countries and regions that do not receive Community co-financing for eradication programme

Region	Zoonotic agent	Number of herds with status officially free	Number of infected herds	Total number of herds
ISLAND	Brucella	2,053	0	2,053

DISEASE STATUS TABLES

Table Bovine tuberculosis in countries and regions that do not receive Community co-financing for eradication programme

Region	Zoonotic agent	Number of herds with status officially free	Number of infected herds	Total number of herds
ISLAND	Mycobacterium bovis	735	0	735

PREVALENCE TABLES

Table Campylobacter:CAMPYLOBACTER in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling Details	Method	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Gallus gallus (fowl) - broilers - before slaughter - Farm - Iceland - animal sample - faeces - Control and eradication programmes - Industry sampling - Objective sampling	N_A	Not Available	herd/flock	680	7	Campylobacter, unspecified sp.	7
	Pigs - fattening pigs - raised under controlled housing conditions - Slaughterhouse - Iceland - animal sample - caecum - Monitoring - Official sampling - Objective sampling	N_A	Not Available	slaughter animal batch	152	144	Campylobacter coli	144
	Turkeys - meat production flocks - before slaughter - Farm - Iceland - animal sample - faeces - Control and eradication programmes - Industry sampling - Objective sampling	N_A	Not Available	herd/flock	32	1	Campylobacter, unspecified sp.	1

Table Campylobacter:CAMPYLOBACTER in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Meat from broilers (Gallus gallus) - carcase - chilled - Slaughterhouse - Iceland - food sample - neck skin - Surveillance - based on Regulation 2073 - Industry sampling - Objective sampling	slaughter animal batch	10	Gram	N_A	ISO 10272-2:2017 Campylobacter	773	6	Campylobacter, unspecified sp.	6

Table COXIELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sampling Details	Method	Total units tested	Total units positive	N of clinical affected herds	Zoonoses	N of units positive
Not Available	Cattle (bovine animals) - dairy cows - adult - Farm - Iceland - animal sample - milk - Monitoring - Official sampling - Objective sampling	herd/flock	N_A	Enzyme-linked immunosorbent assay (ELISA)	74	0	0	Coxiella burnetii	0

Table Escherichia coli:ESCHERICHIA COLI in feed

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Compound feedingstuffs for fish - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	20	Gram	N_A	Not Available	5	0	Escherichia coli	0
	Pet food - final product - Border Control Posts - Canada - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	20	Gram	N_A	Not Available	5	0	Escherichia coli	0

Table HISTAMINE in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Total units tested	Total units positive	Method	Zoonoses	N of units tested	N of units positive
Not Available	Fish - Fishery products from fish species associated with a high amount of histidine - not enzyme maturated - Border Control Posts - Thailand - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	5	Gram	N_A	2	0	<=100	Histamine	0	0
								>100 TO <=200	Histamine	0	0
								>200	Histamine	0	0
	Fish - Fishery products from fish species associated with a high amount of histidine - not enzyme maturated - Wholesale - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	5	Gram	N_A	7	0	<=100	Histamine	0	7
								>100 TO <=200	Histamine	0	0
								>200	Histamine	0	0
	Fish - sauce produced by fermentation of fishery products - Border Control Posts - Thailand - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	5	Gram	N_A	1	0	<=400	Histamine	0	1
								>400	Histamine	0	0

Table LISTERIA in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Total units tested	Total units positive	Method	Zoonoses	N of units tested	N of units positive
Not Available	Fish - raw - frozen - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	5	0	detection	Listeria monocytogenes	5	0
	Fish - smoked - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	25	0	detection	Listeria monocytogenes	25	0
	Fishery products, unspecified - seafood pâté - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	5	5	detection	Listeria monocytogenes	5	5

Table Salmonella:SALMONELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cattle (bovine animals) - dairy cows - adult - Farm - Iceland - animal sample - milk - Monitoring - Official sampling - Objective sampling	herd/flock		N_A	N_A	Enzyme-linked immunosorbent assay (ELISA)	74	0	Salmonella Dublin	0
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock	687	N_A	N_A	Not Available	687	9	Salmonella Agona	4
									Salmonella Kentucky	1
									Salmonella Typhimurium, monophasic	4
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	687	Y	N_A	Not Available	687	9	Salmonella Agona	4
									Salmonella Kentucky	1
									Salmonella Typhimurium, monophasic	4
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official sampling - Census	herd/flock	687	N_A	N_A	Not Available	4	4	Salmonella Agona	1
									Salmonella spp., unspecified	3
	Gallus gallus (fowl) - laying hens - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock	55	N_A	From some flocks, feces (animal samples) are taken	Not Available	55	0	Salmonella	0
	Gallus gallus (fowl) - laying hens - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	55	Y	From some flocks, feces (animal samples) are taken	Not Available	55	0	Salmonella	0
	Gallus gallus (fowl) - laying hens - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official sampling - Census	herd/flock	55	N_A	From some flocks, feces (animal samples) are taken	Not Available	6	0	Salmonella	0
	Gallus gallus (fowl) - laying hens - day-old chicks - Farm - Iceland - environmental sample - delivery box liner - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	36	0	Salmonella	0
	Gallus gallus (fowl) - laying hens - during rearing period - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	From some flocks, feces (animal samples) are taken	Not Available	22	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock	36	N_A	From some flocks, boot swabs and dust samples are taken	Not Available	36	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	36	Y	From some flocks, boot swabs and dust samples are taken	Not Available	36	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official sampling - Census	herd/flock	36	N_A	From some flocks, boot swabs and dust samples are taken	Not Available	16	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - day-old chicks - Farm - Iceland - animal sample - eggshells - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	2	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - during rearing period - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	16	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for egg production line - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock	7	N_A	N_A	Not Available	7	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for egg production line - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	7	Y	N_A	Not Available	7	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for egg production line - day-old chicks - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	1	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for egg production line - during rearing period - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	2	0	Salmonella	0
	Pigs - fattening pigs - raised under controlled housing conditions - Slaughterhouse - Iceland - animal sample - caecum - Monitoring - Official sampling - Objective sampling	slaughter animal batch		N_A	N_A	Not Available	152	3	Salmonella Brandenburg	2
									Salmonella Kedougou	1
	Pigs - fattening pigs - raised under controlled housing conditions - Slaughterhouse - Iceland - animal sample - meat juice - Control and eradication programmes - Official sampling - Objective sampling	slaughter animal batch		N_A	N_A	Indirect ELISA (I-ELISA)	1065	135	Salmonella spp., unspecified	135
	Turkeys - fattening flocks - before slaughter - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock	31	N_A	N_A	Not Available	31	0	Salmonella	0
	Turkeys - fattening flocks - before slaughter - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	31	Y	N_A	Not Available	31	0	Salmonella	0
	Turkeys - parent breeding flocks - adult - Farm - Iceland - environmental sample - boot swabs and dust - Control and eradication programmes - Industry sampling - Census	herd/flock	5	N_A	N_A	Not Available	5	0	Salmonella	0
	Turkeys - parent breeding flocks - adult - Farm - Iceland - environmental sample - boot swabs and dust - Control and eradication programmes - Official and industry sampling - Census	herd/flock	5	Y	N_A	Not Available	5	0	Salmonella	0
	Turkeys - parent breeding flocks - adult - Farm - Iceland - environmental sample - boot swabs and dust - Control and eradication programmes - Official sampling - Census	herd/flock	5	N_A	N_A	Not Available	1	0	Salmonella	0

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Turkeys - parent breeding flocks - day-old chicks - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	3	0	Salmonella	0
	Turkeys - parent breeding flocks - during rearing period - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	5	0	Salmonella	0

Table Salmonella:SALMONELLA in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cheeses, made from unspecified milk or other animal milk - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	20	0	Salmonella	0
	Crustaceans - shrimps - cooked - Border Control Posts - India - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0
	Dairy products (excluding cheeses) - cream - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0
	Meat from bovine animals - carcase - Slaughterhouse - Iceland - food sample - carcase swabs - Surveillance - based on Regulation 2073 - Industry sampling - Objective sampling	single (food/feed)	400	Square centimetre	N_A	Alternative method validated against the reference method ISO 6579-1:2017 Salmonella	300	0	Salmonella	0
	Meat from bovine animals - meat products - cooked, ready-to-eat - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0
	Meat from broilers (Gallus gallus) - carcase - Slaughterhouse - Iceland - food sample - neck skin - Control and eradication programmes - Industry sampling - Objective sampling	single (food/feed)	25	Gram	N_A	Not Available	778	5	Salmonella Agona	2
									Salmonella Infantis	3
	Meat from broilers (Gallus gallus) - meat products - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0
	Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - Border Control Posts - Thailand - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0
	Meat from pig - carcase - Slaughterhouse - Iceland - food sample - carcase swabs - Control and eradication programmes - Official sampling - Objective sampling	single (food/feed)	300	Square centimetre	As all pig slaughterbatches are tested by officials, the FBOs are exempted from the sampling descriped in Regulation (EC) No 2073/2005	Not Available	1862	21	Salmonella Brandenburg	16
									Salmonella Kedougou	5
	Meat from pig - meat products - cooked ham - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	10	0	Salmonella	0
	Meat from sheep - carcase - Slaughterhouse - Iceland - food sample - carcase swabs - Surveillance - based on Regulation 2073 - Industry sampling - Objective sampling	single (food/feed)	400	Square centimetre	N_A	Alternative method validated against the reference method ISO 6579-1:2017 Salmonella	132	0	Salmonella	0
	Meat from sheep - carcase - Slaughterhouse - Iceland - food sample - carcase swabs - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	400	Square centimetre	N_A	Alternative method validated against the reference method ISO 6579-1:2017 Salmonella	35	0	Salmonella	0
	Meat from turkey - carcase - Slaughterhouse - Iceland - food sample - neck skin - Control and eradication programmes - Industry sampling - Objective sampling	single (food/feed)	25	Gram	N_A	Not Available	69	0	Salmonella	0
	Other processed food products and prepared dishes - pizza and pizza-like dishes - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0

Table Salmonella:SALMONELLA in feed

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Compound feedingstuffs for fish - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	15	0	Salmonella	0
	Pet food - dog snacks (pig ears, chewing bones) - Border Control Posts - United Kingdom - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	26	Gram	N_A	Not Available	5	0	Salmonella	0
	Pet food - final product - Border Control Posts - Canada - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0
	Pet food - final product - Border Control Posts - United States - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0

Table Trichinella:TRICHINELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling Details	Method	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Pigs - fattening pigs - raised under controlled housing conditions - Slaughterhouse - Iceland - animal sample - organ/tissue - Monitoring - Official sampling - Census	N_A	Not Available	animal	78267	0	Trichinella	0
	Solipeds, domestic - horses - Slaughterhouse - Iceland - animal sample - organ/tissue - Monitoring - Official sampling - Census	N_A	Not Available	animal	7158	0	Trichinella	0

FOODBORNE OUTBREAKS TABLES

Foodborne Outbreaks: summarized data

when numbers referring to cases, hospitalized people and deaths are reported as unknown, they will be not included in the sum calculation

		Outbreak strenght	Weak		
Causative agent	**Food vehicle**	**N outbreaks**	**N human cases**	**N hospitalized**	**N deaths**
Salmonella Chester	Unknown	1	3	3	0
Salmonella Napoli	Unknown	1	3	1	0
Salmonella Typhimurium	Unknown	1	13	0	0
Unknown	Unknown	3	28	0	0

Strong Foodborne Outbreaks: detailed data

No data returned for this view. This might be because the applied filter excludes all data.

Weak Foodborne Outbreaks: detailed data

Causative agent	H	AG	VT	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Salmonella Chester	unk	Not Available	Not Available	Not Available	N_A	General	Unknown	N_A	Descriptive epidemiological evidence	Unknown	Unknown	Unknown	Unknown	Three cases with severe illness during the time period 23rd February to 11th April with a rare Salmonella serotype. First human cases with this Salomonella serotype reported in Iceland. No relations between individual cases. All individual cases used antacids continually. Interviews identified Pink Lady apples as a common food vehicle but Salmonella was never confirmed in apples. WGS performed in Statens Serum Institut (SSI), Denmark, that showed that all three cases had the same source, moreover, they had the same source as two cases in Denmark, one from 2020 and another from 2021.	1	3	3	0
Salmonella Napoli	unk	Not Available	Not Available	Not Available	N_A	General	Unknown	N_A	Unknown	Unknown	Unknown	Unknown	Unknown	Three cases in April and May. Relatively rare Salmonella serotype in Iceland. No further investigation performed.	1	3	1	0

Causative agent	H	AG	VT	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Salmonella Typhimurium	unk	Not Available	Not Available	Not Available	N_A	Part of multicountry outbreak	Unknown	N_A	Descriptive epidemiological evidence	Multiple places of exposure in more than one country	Unknown	Unknown	Unknown	Provisional information from ECDC and has not been made public: ECDC EpiPulse notification nr. 2021-FWD-00074 - This is a multi-country outbreak of Salmonella Typhimurium with rare MLVA type 2-17-NA-NA-213 with at least 48 confirmed and 38 probable cases in nine EU/EEA countries over summer and autumn 2021. Latest cases have been reported in Sweden with date of onset on 25 November 2021. Suspected vehicle of infection has not been identified yet.	1	13	0	0
Unknown	unk	Not Available	Not Available	Not Available	N_A	General	Unknown	N_A	Unknown	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	Three unrelated incidents at three different restaurants where an outbreak was suspected. In two of the incidents 12 individuals became ill and in the third incidents 4 individuals became ill, a total of 28 individuals. All groups had a meal together at a restaurant. Investigations led to no conclusions.	3	28	0	0

ANTIMICROBIAL RESISTANCE TABLES FOR CAMPYLOBACTER

Table Antimicrobial susceptibility testing of Campylobacter coli in Pigs - fattening pigs

Sampling Stage: Slaughterhouse | Sampling Type: animal sample - caecum | Sampling Context: Monitoring

Sampler: Official sampling | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method:

Country of Origin: Iceland

Sampling details:

	AM substance	Chloramphenicol	Ciprofloxacin	Ertapenem	Erythromycin	Gentamicin	Tetracycline
	ECOFF	**16**	**0.5**	**0.5**	**8**	**2**	**2**
	Lowest limit	**2**	**0.125**	**0.125**	**1**	**0.25**	**0.5**
	Highest limit	**64**	**32**	**4**	**512**	**16**	**64**
	N of tested isolates						
MIC	**N of resistant isolates**						
<=0.125			33	72			
<=0.25						1	
0.25			1	51			
<=0.5							113
0.5			1	22		56	
<=1					135		
1						87	28
<=2		51					
2					9	1	4
4		79	22		1		
8		15	78				
16			9				
32			1				

ANTIMICROBIAL RESISTANCE TABLES FOR SALMONELLA

Table Antimicrobial susceptibility testing of Salmonella Brandenburg in Meat from pig - carcase

Sampling Stage: Slaughterhouse

Sampling Type: food sample - carcase swabs

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Census

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Iceland

Sampling Details:

	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**4**	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
	Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**	**16**	**16**	**64**	**512**	**32**	**8**	**16**
	N of tested isolates															
MIC	**N of resistant isolates**															
<=0.015								8								
<=0.03											8					
<=0.25					8	7									4	3
<=0.5										8						
0.5						1									4	5
<=1			7						8							
<=2														8		
2			1													
<=4		8										4				
4				6												
<=8							8									
8				2								4				
32													1			
128													7			

Table Antimicrobial susceptibility testing of Salmonella Brandenburg in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Iceland

Sampling Details:

	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**4**	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
	Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**	**16**	**16**	**64**	**512**	**32**	**8**	**16**
	N of tested isolates															
MIC	**N of resistant isolates**															
<=0.015								1								
<=0.03											2					
0.03								1								
<=0.25					2	2									1	1
<=0.5										2						
0.5															1	1
<=1			2						2							
<=2														2		
<=4		2										2				
4				1												
<=8							2									
8				1												
128													2			

Table Antimicrobial susceptibility testing of Salmonella Kedougou in Meat from pig - carcase

Sampling Stage: Slaughterhouse

Sampling Type: food sample - carcase swabs

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Census

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Iceland

Sampling Details:

	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**4**	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
	Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**	**16**	**16**	**64**	**512**	**32**	**8**	**16**
	N of tested isolates															
MIC	**N of resistant isolates**															
<=0.015								3								
<=0.03											4					
0.03								1								
<=0.25					4	4									4	
<=0.5										4						
<=1			1						4							
<=2				1										1		
<=4		4										1				
4				2												
<=8							4									
8				1								3				
>16																4
>32			3											3		
>512													4			

Table Antimicrobial susceptibility testing of Salmonella Kedougou in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Iceland

Sampling Details:

	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**4**	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
	Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**	**16**	**16**	**64**	**512**	**32**	**8**	**16**
	N of tested isolates															
MIC	**N of resistant isolates**															
<=0.03											1					
0.03								1								
<=0.25						1										
<=0.5										1						
0.5					1										1	
<=1									1							
<=4		1														
4				1												
<=8							1									
8												1				
>16																1
>32			1											1		
>512													1			

ANTIMICROBIAL RESISTANCE TABLES FOR INDICATOR ESCHERICHIA COLI

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON pnl2

Analytical Method:

Country of Origin: Iceland

Sampling Details:

Ceftazidime synergy test	Cefotaxime synergy test	MIC	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
			ECOFF	**0.125**	**0.25**	**0.25**	**8**	**0.5**	**0.5**	**0.06**	**0.5**	**0.125**	**16**
			Lowest limit	**0.064**	**0.25**	**0.064**	**0.5**	**0.25**	**0.125**	**0.015**	**0.125**	**0.03**	**0.5**
			Highest limit	**32**	**64**	**64**	**64**	**128**	**128**	**2**	**8**	**16**	**128**
			N of tested isolates										
			N of resistant isolates										
Not Available	Not Available	<=0.03										1	
		0.03								1			
		<=0.125									1		
		0.125		1									
		1			1								
		2							1				
		4											1
		16						1					
	Negative/Absent	1				1							
Negative/Absent	Not Available	2					1						

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Iceland

Sampling Details:

	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**8**	**64**	**8**	**0.5**	**2**
	Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**	**16**	**16**	**64**	**512**	**32**	**8**	**16**
	N of tested isolates															
MIC	**N of resistant isolates**															
<=0.015								82								
<=0.03											85					
0.03								3								
<=0.25					84	80									72	16
<=0.5										80						
0.5						4									12	41
<=1			2						85							
1					1					4					1	8
<=2				44										47		
2			19			1				1						
<=4		83										84				
4			34	31										5		
<=8							73						13			
8		2	8	10								1				
16							4						29			
>16																20
32							6						14	3		
>32			22											30		
64							2						1			
>512													28			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method:

Country of Origin: Iceland

Sampling Details:

		AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
		ECOFF	0.125	0.25	0.25	8	0.5	0.5	0.06	0.5	0.125	16
		Lowest limit	0.064	0.25	0.064	0.5	0.25	0.125	0.015	0.125	0.03	0.5
		Highest limit	32	64	64	64	128	128	2	8	16	128
		N of tested isolates										
Ceftazidime synergy test	Cefotaxime synergy test	MIC	N of resistant isolates									
Not Available	Not Available	<=0.015							3			
		<=0.03									14	
		0.03							9			
		<=0.064	2									
		0.064							1			
		<=0.125								7		
		0.125	9						1			
		0.25	2							7		
		0.5	1									
		2		5								
		4		8				4				3
		8		1				6				8
		16					2	4				3
		32					7					
		64					5					
	Negative/Absent	1			5							
		2			7							
		4			1							
		8			1							

Ceftazidime synergy test	Cefotaxime synergy test	MIC	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
			ECOFF	**0.125**	**0.25**	**0.25**	**8**	**0.5**	**0.5**	**0.06**	**0.5**	**0.125**	**16**
			Lowest limit	**0.064**	**0.25**	**0.064**	**0.5**	**0.25**	**0.125**	**0.015**	**0.125**	**0.03**	**0.5**
			Highest limit	**32**	**64**	**64**	**64**	**128**	**128**	**2**	**8**	**16**	**128**
			N of tested isolates										
			N of resistant isolates										
Negative/Absent	Not Available	2					4						
		4					6						
		8					4						

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Iceland

Sampling Details:

MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**8**	**64**	**8**	**0.5**	**2**
	Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**	**16**	**16**	**64**	**512**	**32**	**8**	**16**
	N of tested isolates															
	N of resistant isolates															
<=0.015								13								
<=0.03											14					
0.125								1								
<=0.25															13	2
<=0.5										14						
0.5															1	10
<=1									14							
1																1
<=2				5										2		
2					8											
<=4		14										12				
4				8	5	5										
>4					1											
<=8							14						2			
8				1		8						1		1		
>8						1										
16													5			
>16																1
32													1	1		
>32			14											10		
64												1				
>512													6			

OTHER ANTIMICROBIAL RESISTANCE TABLES

Specific monitoring of ESBL-/AmpC-/carbapenemase-producing bacteria and specific monitoring of carbapenemase-producing bacteria, in the absence of isolate detected

No data returned for this view. This might be because the applied filter excludes all data.

Specific monitoring of ESBL-/AmpC-/carbapenemase-producing bacteria and specific monitoring of carbapenemase-producing bacteria, in the absence of isolate detected

Latest Transmission set

Table Name	Last submitted dataset transmission date
Antimicrobial Resistance	20-Jul-2022
Animal Population	20-Jul-2022
Disease Status	20-Jul-2022
Food Borne Outbreaks	20-Jul-2022
Prevalence	31-Oct-2022

ZOONOSES MONITORING

ICELAND

TEXT FORMS FOR THE TRENDS AND SOURCES OF ZOONOSES AND ZOONOTIC AGENTS IN FOODSTUFFS, ANIMALS AND FEEDINGSTUFFS

including information on foodborne outbreaks, antimicrobial resistance in zoonotic and indicator bacteria and some pathogenic microbiological agents

IN 2021

Table of contents

Iceland

1. Institutions and Laboratories involved in zoonoses monitoring and reporting

The Icelandic Food and Veterinary Authority MAST is the competent authority for the official control of food safety and animal health and operates under the auspices of the Ministry of Industry and Innovation. Its role is to promote the health and welfare of animals, plant health and the safety and quality of food by enforcing legislation and providing education and services to the fisheries and agricultural sectors, businesses and consumers.

The Institute for Experimental Pathology, Keldur conducts research and supplies research based advisory support to the Icelandic authorities concerning animal health. They provide diagnostic and analytical services and cover all disciplines relating to infectious diseases in animals: Pathology, bacteriology, virology, parasitology, immunology vaccinology, serology and AMR. Keldur has been nominated as a national reference laboratory for Campylobacter, Trichinella, TSE and AMR.

Matís is an independent research institute on food and Biotechnology. Matís serves as a testing laboratory for food and feed. Matís has been nominated as a national reference laboratory in 14 fields, including the zoonotic agents Salmonella and Listeria.

Sýni Laboratory Service Ltd. is a privately owned company with a testing laboratory for food and feed.

ProMat Laboratory service Ltd is a privately owned testing laboratory for food and feed.

Stjörnugrís Starlab is a privately owned laboratory run within the slaughterhouse Stjörnugrís. They run Trichinella testing on swine.

On the **Ic**elandic Food and Veterinary Authorities website information can be found on designation of these official laboratories for testing of different zoonotic agents in different matrixes

Short description of the institutions and laboratories involved in data collection and reporting

2. Animal population

2.1. Sources of information and the date(s) (months, years) the information relates to [(a)]

Information on farm animal population are from the livestock database BUSTOFN, collected through annual reporting from the livestock owners to MAST according to law. The Ministry of Industry and Innovation is responsible for the database. The information for reporting season 2020 represents the animal population in December 2020.

Information regarding slaughtered animals is based on data from the slaughterhouses. The Ministry of Industry and Innovation is responsible for the database.

2.2. Definitions used for different types of animals, herds, flocks and holdings as well as the production types covered

The number of poultry flocks is given by the number of rearing houses. The number of holdings and herds are the same for cattle, pigs, horses, sheep and goats.

2.3. National changes of the numbers of susceptible population and trends

2.4. Geographical distribution and size distribution of the herds, flocks and holdings[(b)]

All existing animal groups in Iceland are relatively evenly spread around the agricultural lowland areas. There are no herds or holdings in the highlands, which cover over 80 % of the island. In the summer, from June to September, the herds of sheep and of horses are grazing in the highlands.

2.5. Additional information

(a): National identification and registration system(s), source of reported statistics (Eurostat, others)
(b): Link to website with density maps if available, tables with number of herds and flocks according to geographical area

3. General evaluation*: *Salmonella*

3.1. History of the disease and/or infection in the country[(a)]

The largest outbreaks of human Salmonella infections in Iceland were in 1996 with S. Enteritidis in cream bakery from domestic production and in 2000 with S. Typhimurium DT204b in imported iceberg salat.

For the last ten years the incidence has been relatively steady or less than 20 cases per 100.000 inhabitants. The majority of human cases have been linked to travelling abroad.

3.2. Evaluation of status, trends and relevance as a source for humans

In the last decade, there has been no evidence on domestically produced eggs, poultry meat or pig meat to be the cause of foodborne outbreaks with Salmonella.

In 2019, epidemiological investigations with WGS of all pig and human isolates of the same serotype from the years 2014-2018 did not show any correlation between Salmonella in pigs and human salmonellosis.

3.3. Any recent specific action in the Member State or suggested for the European Union[(b)]

3.4. Additional information

* **For each zoonotic agent**

(a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official "disease status" to be specified for the whole country and/or specific regions within the country

(b): If applicable

4. Description of Monitoring/Surveillance/Control programmes system*: Pigs - *Salmonella*

4.1. Monitoring/Surveillance/Control programmes system[(a)]

The objective of the National control programme for Salmonella in pigs is to reduce the risk of Salmonella contamination in pig meat on the market by monitoring Salmonella in slaughter pig herds and therefore to be able to take risk reducing actions on carcases before distribution. The surveillance programme was implemented in October 2006.

Surveillance of all slaughter pig herds is carried out at the slaughterhouses by continuous serologic testing of meat juice from all herds. The sampling is objective and random meat samples are collected from carcasses after cooling. Number of samples per year depend on the herd size. Sixty, seventy-five or one hundred samples shall be taken from herds slaughtering for less than 2000 pigs pr. year, 2001 – 5000 pigs pr. year and over 5001 pigs pr. year respectively.

A Salmonella index is calculated for each herd based on the weighted average of positive meat juice samples from the previous thirteen weeks, where the results of the last five weeks weigh three times as much as the results from the weeks before. Approximately twice a month finisher herds are classified into levels 1-3 according to their Salmonella index.

From herds with level 2 and 3 swab samples are taken during slaughter from all carcases and tested in pools of 5 samples and the carcases are stored separately until results are available. Carcases from pooled samples with positive results are heat treated before further processing.

From herds with level 1 swab samples are taken during slaughter from 10 randomly selected carcases for each 40 carcases and pooled together into 1 sample, up to 3 pooled samples per slaughter batch.

Salmonella is isolated from positive swab samples for serotyping and AMR testing. If it is not possible to isolate Salmonella the sample is still considered positive, that is actions are still to be taken.

4.2. Measures in place(b)

Depending on Salmonella index and/or results from swab samples from previous slaughter days from the same herd, carcases can be kept separately after slaughter until test results are available. Carcases from pools with positive results can be heat treated before distribution.

4.3. Notification system in place to the national competent authority(c)

Salmonella is a notifiable disease, according to national legislation on animal diseases No. 25/1993. The Competent Authority MAST receives all results for samples taken according to the Salmonella National control programme in pigs from the respective laboratories (including serotyping and antimicrobial resistance).

4.4. Results of investigations and national evaluation of the situation, the trends [(d)] and sources of infection[(e)]

4.5. Additional information

* **For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent**

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, limit of detection of the method, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No.

(d): Minimum five years.

(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

Iceland

5. Description of Monitoring/Surveillance/Control programmes system*:
Poultry breeder flocks of Gallus gallus,turkey breeder flocks - *Salmonella*

5.1. Monitoring/Surveillance/Control programmes system[a]

The aim of the National control programme (NCP) in poultry and poultry products is to keep the annual prevalence of all serovars of Salmonella under 1% in flocks of breeder for broilers, laying hens and turkeys, in flocks of laying hens and in broilers and turkeys.

The sampling programme in poultry breeder flocks is in accordance with reg. (EC) no. 2130/2003, reg. (EU) No 200/2010 and reg. (EU) No 1190/2012.

Sampling takes place both during rearing and in adult flocks. Boot swab samples and/or boot swab and dust samples are taken by the food business operator (FBO) and by the competent authority (CA).

Every adult breeding flock of Gallus gallus consisting of 250 animals or more is sampled at farm level every three weeks.

Every adult turkey breeding flock consisting of 250 animals or more is sampled at farm level every four week.

Vaccination against Salmonella in poultry production is not allowed.

5.2. Measures in place(b)

Measures to prevent distribution of Salmonella are applied to poultry flocks for all serovars of Salmonella.

MAST prohibits all transport of birds, eggs and waste from the positive flock except for destruction. MAST can allow slaughter of infected poultry flocks with certain provisions.Eggs may be transported and used for human consumption if they are treated in a way that ensures the elimination of Salmonella according to food laws.

MAST assesses the potential spread of infection in a hatchery and can prohibit the distribution of day-old chicks to prevent further spread of the infection. MAST takes samples from all other flocks of adult breeders on the farm.

MAST prohibits the use of poultry houses where Salmonella has been detected. The ban on the use of the poultry house is lifted once the minimum requirements have been met regarding biosecurity, cleaning and disinfection and if no Salmonella is detected in the samples that have been taken.

From each positive flock, at least one isolate is serotyped.

5.3. Notification system in place to the national competent authority(c)

Salmonella is a notifiable disease, according to national legislation on animal diseases No. 25/1993. The Competent Authority MAST receives all results for samples taken according to the NCP from the official laboratories (including serotyping and antimicrobial resistance).

5.4. Results of investigations and national evaluation of the situation, the trends [d] and sources of infection[e]

Iceland

In 2019, *S.* Brandenburg was detected in one flock of breeding turkeys. However, the detection could never be confirmed in repeated sampling, and restrictions were lifted. For calculation of prevalence, in line with the NCP, the flock was considered positive.

Besides this detection, *Salmonella* had only once been confirmed in poultry breeding flocks since 2000, where *S.* Agona was found in one flock of broiler breeders in 2013

5.5. Additional information

* **For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent**

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, limit of detection of the method, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No.

(d): Minimum five years.

(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

6. Description of Monitoring/Surveillance/Control programmes system*: Laying hens - *Salmonella*

Iceland

6.1. Monitoring/Surveillance/Control programmes system[(a)]

The aim of the National control programme (NCP) in poultry and poultry products is to keep the annual prevalence of all serovars of Salmonella under 1 % in flocks of breeder for broilers, laying hens and turkeys, in flocks of laying hens and in broilers and turkeys.

The sampling programme in laying hens is in accordance with reg. (EC) no. 2130/2003 and reg. (EU) No 517/2011.

Sampling takes place both during rearing and in adult flocks that requires authorisation for primary production of eggs. Boot swab samples and/or boot swab and dust samples are taken by the food business operator (FBO) and by the competent authority (CA).

Every adult flock of laying hens is sampled every fifteen weeks. In flocks with less than 100 hens, samples are taken once a year.

Vaccination against Salmonella in poultry production is not allowed.

6.2. Measures in place(b)

Measures to prevent distribution of Salmonella are applied to poultry flocks for all serovars of Salmonella.

MAST prohibits all transport of birds, eggs and waste from the positive flock except for destruction. However, eggs may be transported and used for human consumption if they are treated in a way that ensures the elimination of Salmonella according to laws on food safety.

MAST takes samples from all other flocks on the farm.

MAST prohibits the use of poultry houses where Salmonella has been detected. The ban on the use of the poultry house is lifted once the minimum requirements have been met regarding biosecurity, cleaning and disinfection and if no Salmonella is detected in the samples that have been taken.

6.3. Notification system in place to the national competent authority(c)

Salmonella is a notifiable disease, according to national legislation on animal diseases No. 25/1993. The Competent Authority MAST receives all results for samples taken according to the NCP from the official laboratories (including serotyping and antimicrobial resistance).

6.4. Results of investigations and national evaluation of the situation, the trends [(d)] and sources of infection[(e)]

Write text here please

6.5. Additional information

Write text here please

*** For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent**

Iceland

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, limit of detection of the method, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.
(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.
(c): Mandatory: Yes/No.
(d): Minimum five years.
(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

Iceland

7. Description of Monitoring/Surveillance/Control programmes system*: Broilers and fattening turkeys - *Salmonella*

7.1. Monitoring/Surveillance/Control programmes system[(a)]

The aim of the National control programme (NCP) in poultry and poultry products is to keep the annual prevalence of all serovars of Salmonella under 1 % in flocks of breeder for broilers, laying hens and turkeys, in flocks of laying hens and in broilers and turkeys.

The sampling programme in broilers and fattening turkeys is in accordance with reg. (EC) no. 2130/2003, reg. (EU) No 200/2012 and reg. (EU) No 1190/2012.

Sampling takes place in rearing flocks within three weeks before slaughter. Boot swab samples and/or boot swab and dust samples are taken by the food business operator (FBO) and by the competent authority (CA).

7.2. Measures in place(b)

Measures to prevent distribution of Salmonella are applied to poultry flocks for all serovars of Salmonella.

MAST prohibits all transport of birds and waste from the positive flock except for destruction. Therefore, positive rearing flocks are killed on the farm.

MAST prohibits all transport of birds, eggs and waste from the positive flock except for destruction. MAST can allow slaughter of infected poultry flocks with certain provisions.

MAST prohibits the use of poultry houses where Salmonella has been detected. The ban on the use of the poultry house is lifted once the minimum requirements have been met regarding biosecurity, cleaning and disinfection and if no Salmonella is detected in the samples that have been taken.

7.3. Notification system in place to the national competent authority(c)

Salmonella is a notifiable disease, according to national legislation on animal diseases No. 25/1993. The Competent Authority MAST receives all results for samples taken according to the NCP from the official laboratories (including serotyping and antimicrobial resistance).

7.4. Results of investigations and national evaluation of the situation, the trends (d) and sources of infection(e)

7.5. Additional information

* **For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent**

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, limit of detection of the method, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No.

(d): Minimum five years.
(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

8. General evaluation*: *Campylobacter*

8.1. History of the disease and/or infection in the country[(a)]

1998-2000 Human Campylobacter epidemic:

- Characterized as a ”sporadic case”-epidemic
- Specific seasonal distribution (flat curve)
- Prompt decree se when interventions in broiler production put in place (Feb. 2000)
- Domestic origin due to consumption of unfrozen chickens

2000: all broiler flocks are tested for Campylobacter at farm level and at processing

2000 – 2004: Campy-On-Ice project: The epidemiology of human campylobacteriosis in Iceland

2002: Freezing policy implemented. All poultry meat products must be frozen from flocks positive for Camp. in samples taken within 5 days before slaughter.

A decrease of human campylobacteriosis was observed after improvements of biosecurity on poultry farms and after implementation of freezing policy in spite of increase of consumption of unfrozen unheated poultry meat.

8.2. Evaluation of status, trends and relevance as a source for humans

8.3. Any recent specific action in the Member State or suggested for the European Union[(b)]

8.4. Additional information

* **For each zoonotic agent**
(a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official “disease status” to be specified for the whole country and/or specific regions within the country
(b): If applicable

9. Description of Monitoring/Surveillance/Control programmes system*: Poultry - *Campylobacter*

9.1. Monitoring/Surveillance/Control programmes system[(a)]

According to the Icelandic Campylobacter National Surveillance Programme every poultry flock for meat production is sampled at the farm 2 to 5 days prior to slaughter, if it is intended to distribute meat from the flock unfrozen and unheattreated (fresh). Samples are taken by the food business operator (FBO).

For surveillance, neck skin samples are also taken by the FBO from poultry flock at slaughter all year round.

9.2. Measures in place(b)

Carcasses from flocks that test positive for thermophilic Campylobacter spp. in the pre-slaughter sampling are either subjected to freezing for at least 14 days or to heat-treatment.

9.3. Notification system in place to the national competent authority(c)

The official laboratories report all results from samples taken from broiler flocks as a part of the surveillance programme directly to MAST.

9.4. Results of investigations and national evaluation of the situation, the trends (d) and sources of infection(e)

The prevalence of Campylobacter spp. in broiler flocks has been very low in the past decade, due to the development of a high level of biosecurity on broiler farms. In 2020, when for the first time slaughter flocks were tested for Campylobacter by enumeration, very low contamination levels were observed, and continued in 2021.

9.5. Additional information

* **For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent**

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, limit of detection of the method, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No.

(d): Minimum five years.

(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

10. Food-borne Outbreaks

10.1. System in place for identification, epidemiological investigations and reporting of food-borne outbreaks

Write text here please

10.2. Description of the types of outbreaks covered by the reporting

Write text here please

10.3. National evaluation of the reported outbreaks in the country(a)

Write text here please

10.4. Descriptions of single outbreaks of special interest

Write text here please

10.5. Control measures or other actions taken to improve the situation

Write text here please

10.6. Any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation

Write text here please

10.7. Additional information

Write text here please

(a): Trends in numbers of outbreaks and numbers of human cases involved, relevance of the different causative agents, food categories and the agent/food category combinations, relevance of the different type of places of food production and preparation in outbreaks, evaluation of the severity of the human cases.

11. Institutions and laboratories involved in antimicrobial resistance monitoring and reporting

The responsibilities for antimicrobial resistance monitoring (planning, sampling etc.) lies with The Icelandic Food and Veterinary Authority (MAST).

Samples are collected either by the regional MAST officers or by the local authorities depending on the type of sample.

Samples are processed at official laboratories.

Susceptibility testing is performed at The Institute for Experimental Pathology at Keldur (Keldur).

MAST reports all data to EFSA.

Short description of the institutions and laboratories involved in data collection and reporting

12. General Antimicrobial Resistance Evaluation

12.1. Situation and epidemiological evolution (trends and sources) regarding AMR to critically important antimicrobials[(a)] (CIAs) over time until recent situation

Write text here please

12.2. Public health relevance of the findings on food-borne AMR in animals and foodstuffs

Write text here please

12.3. Recent actions taken to control AMR in food producing animals and food

Write text here please

12.4. Any specific action decided in the Member State or suggestions to the European Union for actions to be taken against food-borne AMR threat

Write text here please

12.5. Additional information

Write text here please

(a): The CIAs depends on the bacterial species considered and the harmonised set of substances tested within the framework of the harmonised monitoring:

- For *Campylobacter* spp., macrolides (erythromycin) and fluoroquinolones (ciprofloxacin);

- For *Salmonella* and *E. coli*, 3rd and 4th generation cephalosporins (cefotaxime) and fluoroquinolones (ciprofloxacin) and colistin (polymyxin);

Iceland

Iceland

13. General Description of Antimicrobial Resistance Monitoring*; *Salmonella* in meat from fattening pigs - carcase

Iceland

13.1. General description of sampling design and strategy[(a)]

The *Salmonella* isolates originate from the national *Salmonella* control programme at the slaughterhouses, comprising swab samples of carcasses. Sampling was conducted in all pig slaughterhouses

13.2. Stratification procedure per animal population and food category

Census - Every slaughter batch was sampled.

13.3. Randomisation procedure per animal population and food category

Census - Every slaughter batch was sampled.

13.4. Analytical method used for detection and confirmation[(b)]

All samples were processed at official laboratories. Isolates from Salmonella positive samples were send to Landspitali- The National University Hospital of Iceland (LSH) for serotyping.

Salmonella was isolated with equivalent methods as the methods given in Commision Regulation (EC) No 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs. Serotyping of *Salmonella* isolates by slide agglutination according to the White-Kauffmann-Le Minor scheme.

13.5. Laboratory methodology used for detection of antimicrobial resistance[(C)]

Susceptibility testing of *Salmonella* were conducted by Keldur according to Decision 2020/1729/EU (Annex A, table 2 and 5). Keldur applied epidemiological cut-offs as listed in the current EFSA manual for reporting AMR.

13.6. Library preparation used

13.7. Version of the predictive tool

13.8. Results of investigation

1862 swab samples tested for *Salmonella* and 21 found positive.
Susceptibility testing performed on 12 isolates (one per epidemiological unit):

Year	Isolates tested	Isolates positive	Resistance pattern (no. isolates)	Serotypes (no. isolates)
2021	12	4	AMP, SMX, TET, TMP (3) SMX, TMP (1)	S. Kedougou (4)

13.9. Additional information

The *Salmonella* control programme is mandatory and detection of *Salmonella* spp. is notifiable to MAST.

Actions according to the *Salmonella* control programme

Iceland

*** to be filled in per combination of bacterial species/matrix**

(a): Method of sampling (description of sampling technique: stage of sampling, type of sample, sampler), Frequency of sampling, Procedure of selection of isolates for susceptibility testing, Method used for collecting data.

(b): Analytical method used for detection and confirmation: according to the legislation, the protocols developed by the EURL-AR should be used and reported here. In the case of the voluntary specific monitoring on Carbapenemase-producers, the selective media used (commercial plates, 'in house' media) should be also reported here. In general, any variation with regard to the EURL-AR protocols should be stated here, number of isolates isolated per sample, in particular for *Campylobacter* spp..

(c): Antimicrobials included, Cut-off values

Iceland

14. General Description of Antimicrobial Resistance Monitoring*; *Salmonella* in fattening pigs - ceacal

14.1. General description of sampling design and strategy[(a)]

Ceacal samples were collected at all pig slaughterhouses throughout the year by regional MAST officers. The sampling design was in accordance with the technical requirements in Decision 2020/1729/EU, following the EFSA monitoring specification.

14.2. Stratification procedure per animal population and food category

Sampling was stratified per slaughterhouse by allocating the number of samples proportionally to the annual throughput of the slaughterhouse.

14.3. Randomisation procedure per animal population and food category

Objective sampling - The sampling at each slaughterhouse was planned in order to randomise the days of sampling (Mondays to Thursdays only) as well as selection of herds. Caecal sample collected from at least two animals per herd.

14.4. Analytical method used for detection and confirmation[(b)]

Isolation of *Salmonella spp.* from ceacal samples was conducted by Keldur, the current EURL-AR laboratory protocol was applied.

14.5. Laboratory methodology used for detection of antimicrobial resistance[(C)]

Susceptibility testing of *Salmonella spp.* was conducted by Keldur according to Decision 2020/1729/EU (Annex A, table 2 and 5). Keldur applied epidemiological cut-offs as listed in the current EFSA manual for reporting AMR

14.6. Library preparation used

14.7. Version of the predictive tool

14.8. Results of investigation

152 samples tested and 3 found positive, two *Salmonella* Brandenburg and one *Salmonella* Kedougou

Year	Isolates tested	Isolates positive	Resistance pattern (no. isolates)	Serotypes (no. isolates)
2021	**3**	1	AMP, SMX, TET, TMP (1)	S. Kedougou (1)

14.9. Additional information

*** to be filled in per combination of bacterial species/matrix**

(a): Method of sampling (description of sampling technique: stage of sampling, type of sample, sampler), Frequency of sampling, Procedure of selection of isolates for susceptibility testing, Method used for collecting data.

Iceland

(b): Analytical method used for detection and confirmation: according to the legislation, the protocols developed by the EURL-AR should be used and reported here. In the case of the voluntary specific monitoring on Carbapenemase-producers, the selective media used (commercial plates, 'in house' media) should be also reported here. In general, any variation with regard to the EURL-AR protocols should be stated here, number of isolates isolated per sample, in particular for *Campylobacter* spp..
(c): Antimicrobials included, Cut-off values

Iceland

15. General Description of Antimicrobial Resistance Monitoring*; *Campylobacter coli* in fattening pigs - ceacal

15.1. General description of sampling design and strategy[(a)]

Ceacal samples were collected at all pig slaughterhouses throughout the year by regional MAST officers. The sampling design was in accordance with the technical requirements in Decision 2020/1729/EU, following the EFSA monitoring specification.

15.2. Stratification procedure per animal population and food category

Sampling was stratified per slaughterhouse by allocating the number of samples proportionally to the annual throughput of the slaughterhouse.

15.3. Randomisation procedure per animal population and food category

Objective sampling - The sampling at each slaughterhouse was planned in order to randomise the days of sampling (Mondays to Thursdays only) as well as selection of herds. Caecal sample collected from at least two animals per herd.

15.4. Analytical method used for detection and confirmation[(b)]

Isolation of *Campylobacter coli* from ceacal samples was conducted by Keldur, the current EURL-AR laboratory protocol was applied.

15.5. Laboratory methodology used for detection of antimicrobial resistance[(C)]

Susceptibility testing of *Campylobacter coli* was conducted by Keldur according to Decision 2020/1729/EU (Annex A, table 3). Keldur applied epidemiological cut-offs as listed in the current EFSA manual for reporting AMR

15.6. Library preparation used

15.7. Version of the predictive tool

15.8. Results of investigation

152 samples tested for *Campylobacter* and 145 found positive, all *Campylobacter coli*

Year	Isolates tested	Isolates positive	Resistance pattern (no. isolates)
2021	145	110	CIP (110)

15.9. Additional information

*** to be filled in per combination of bacterial species/matrix**

(a): Method of sampling (description of sampling technique: stage of sampling, type of sample, sampler), Frequency of sampling, Procedure of selection of isolates for susceptibility testing, Method used for collecting data.

(b): Analytical method used for detection and confirmation: according to the legislation, the protocols developed by the EURL-AR should be used and reported here. In the case of the voluntary specific monitoring on Carbapenemase-producers, the

selective media used (commercial plates, 'in house' media) should be also reported here. In general, any variation with regard to the EURL-AR protocols should be stated here, number of isolates isolated per sample, in particular for *Campylobacter* spp..

(c): Antimicrobials included, Cut-off values

Iceland

16. General Description of Antimicrobial Resistance Monitoring*; ESBL/AmpC producing *E. coli* in fattening pigs - ceacal

Iceland

16.1. General description of sampling design and strategy(a)

Ceacal samples were collected at all pig slaughterhouses throughout the year by regional MAST officers. The sampling design was in accordance with the technical requirements in Decision 2020/1729/EU, following the EFSA monitoring specification.

16.2. Stratification procedure per animal population and food category

Sampling was stratified per slaughterhouse by allocating the number of samples proportionally to the annual throughput of the slaughterhouse.

16.3. Randomisation procedure per animal population and food category

Objective sampling - The sampling at each slaughterhouse was planned in order to randomise the days of sampling (Mondays to Thursdays only) as well as selection of herds. Caecal sample collected from at least two animals per herd.

16.4. Analytical method used for detection and confirmation(b)

Isolation of ESBL/AmpC producing *E. coli* from ceacal samples was conducted by Keldur, the current EURL-AR laboratory protocol was applied.

16.5. Laboratory methodology used for detection of antimicrobial resistance(C)

Susceptibility testing of presumptive ESBL/AmpC producing *E. coli* was conducted by Keldur according to Decision 2020/1729/EU (Annex A, table 2 and 5). Keldur applied epidemiological cut-offs as listed in the current EFSA manual for reporting AMR

16.6. Library preparation used

16.7. Version of the predictive tool

16.8. Results of investigation

134 samples tested, 17 positives:

Year	No. samples	No. positive	Genotype (no. isolates)	Resistance pattern (no. isolates)

Iceland

2021	*152*	*14 (9,2%)*	*Up-regulated chromosomal AmpC (13) blaCMY-2, blaCMY-22 og blaCMY-61 (1)*	*AMP, CTX, CAZ, FEP, FOX (1)* *AMP, CTX, CAZ, FEP, FOX, CIP, NAL TET (1)* *AMP, CTX, CAZ, FEP, FOX, SMX, TET (1)* *AMP, CTX, CAZ, FOX (**2**)* *AMP, CTX, CAZ, FOX, COL, NAL, TET (**1**)* *AMP, CTX, CAZ, FOX, SMX, TET (**5**)* *AMP, CTX, CAZ, FOX, TET (**2**)* *AMP, CTX, CAZ, FOX, TET, TMP (**1**)*

16.9. Additional information

*** to be filled in per combination of bacterial species/matrix**

(a): Method of sampling (description of sampling technique: stage of sampling, type of sample, sampler), Frequency of sampling, Procedure of selection of isolates for susceptibility testing, Method used for collecting data.

(b): Analytical method used for detection and confirmation: according to the legislation, the protocols developed by the EURL-AR should be used and reported here. In the case of the voluntary specific monitoring on Carbapenemase-producers, the selective media used (commercial plates, 'in house' media) should be also reported here. In general, any variation with regard to the EURL-AR protocols should be stated here, number of isolates isolated per sample, in particular for *Campylobacter* spp..

(c): Antimicrobials included, Cut-off values

Iceland

17. General Description of Antimicrobial Resistance Monitoring*; Indicator *E. coli* in fattening pigs - ceacal

Iceland

17.1. General description of sampling design and strategy[(a)]

Ceacal samples were collected at all pig slaughterhouses throughout the year by regional MAST officers. The sampling design was in accordance with the technical requirements in Decision 2020/1729/EU, following the EFSA monitoring specification.

17.2. Stratification procedure per animal population and food category

Sampling was stratified per slaughterhouse by allocating the number of samples proportionally to the annual throughput of the slaughterhouse.

17.3. Randomisation procedure per animal population and food category

Objective sampling – The sampling at each slaughterhouse was planned in order to randomise the days of sampling (Mondays to Thursdays only) as well as selection of herds. Caecal sample collected from at least two animals per herd. 152 samples were collected in total.
Furthermore, Keldur randomly selected isolate per epidemiological unit for susceptibility testing, 85 isolates in total.

17.4. Analytical method used for detection and confirmation(b)

Isolation of indicator *E. coli* from ceacal samples was conducted by Keldur, the current EURL-AR laboratory protocol was applied.

17.5. Laboratory methodology used for detection of antimicrobial resistance(C)

Susceptibility testing of presumptive ESBL/AmpC producing *E. coli* was conducted by Keldur according to Decision 2013/652/EU (Annex A, table 2 and 5). Keldur applied epidemiological cut-offs as listed in the current EFSA manual for reporting AMR

17.6. Library preparation used

17.7. Version of the predictive tool

17.8. Results of investigation

Year	*No. samples*	*No. positive*	*Resistance pattern*
2021	85	47 (55,3%)	AMP (**2**) *AMP, CTX, CAZ, FOX, TET* (**1**) *AMP, CHL, SMX, TET* (**1**) *AMP, CHL, SMX, TET, TMP* (**1**) AMP, SMX (**2**) *AMP, SMX, TET* (**3**) AMP, SMX, TMP (**3**) AMP, TET (**1**) *AMP, SMX, TET, TMP* (**8**) CHL, SMX, TMP (**6**) SMX, TET (**3**) SMX, TMP (**1**) TET (**14**) TET, TGC, TMP (**1**)

Iceland

17.9. Additional information

In 2021 the national annual meat production from bovine animals under one year of age was 52 tons => No data reported

In 2021 the national annual meat production from fattening pigs was 6575 tons => Only 85 isolates reported

*** to be filled in per combination of bacterial species/matrix**

(a): Method of sampling (description of sampling technique: stage of sampling, type of sample, sampler), Frequency of sampling, Procedure of selection of isolates for susceptibility testing, Method used for collecting data.

(b): Analytical method used for detection and confirmation: according to the legislation, the protocols developed by the EURL-AR should be used and reported here. In the case of the voluntary specific monitoring on Carbapenemase-producers, the selective media used (commercial plates, 'in house' media) should be also reported here. In general, any variation with regard to the EURL-AR protocols should be stated here, number of isolates isolated per sample, in particular for *Campylobacter* spp..

(c): Antimicrobials included, Cut-off values