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 2023

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 2023.

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.

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* 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

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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)	670			
	Cattle (bovine animals) - calves (under 1 year) - dairy calves	563	11,513		563
	Cattle (bovine animals) - calves (under 1 year) - for slaughter	561	9,667		561
	Cattle (bovine animals) - dairy cows - adult	487	25,202		487
	Cattle (bovine animals) - dairy cows - young cattle (1-2 years)	482	5,849		482
	Cattle (bovine animals) - meat production animals - suckler cows	151	3,400		151
	Cattle (bovine animals) - unspecified			178	
	Cattle (bovine animals) - young cattle (1-2 years)	642	21,004		642
Gallus gallus (fowl)	Gallus gallus (fowl) - broilers	24	766,457	5,723,106	82
	Gallus gallus (fowl) - laying hens - adult	11	266,462		32
	Gallus gallus (fowl) - laying hens - during rearing period	7	94,003		10
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult	4	63,400	25,468	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 - unspecified - boars	8	28	5	8
	Pigs - breeding animals - unspecified - sows	10	2,381	1,129	10
	Pigs - fattening pigs - unspecified - piglets	9	9,115		9
	Pigs - fattening pigs - unspecified - weaners to growers	12	24,121	72,218	12
Small ruminants	Goats	117	1,835	0	117
	Sheep	1,830			
	Sheep - animals over 1 year	1,825	276,048	45,708	1,825
	Sheep - animals under 1 year (lambs)	1,710	68,784	418,045	1,710
Solipeds, domestic	Solipeds, domestic - horses		70,000	8,074	
Turkeys	Turkeys - meat production flocks	4	11,564	56,842	8
	Turkeys - parent breeding flocks - adult	1	896		4
	Turkeys - parent breeding flocks - during rearing period	2	1,780		3

DISEASE STATUS TABLES

TABLE NAME	REGION	Zoonotic Agent	DISEASE STATUS UNIT	Number of herds with status officially free	Number of infected herds	Total number of herds
Bovine brucellosis in countries and regions that do not receive Community co-financing for eradication programme	ISLAND	Brucella		670	0	670

TABLE NAME	REGION	Zoonotic Agent	DISEASE STATUS UNIT	Number of herds with status officially free	Number of infected herds	Total number of herds
Ovine or Caprine brucellosis in countries and regions that do not receive Community co-financing for eradication programme	ISLAND	Brucella		1,830	0	1,830

DISEASE STATUS TABLES

TABLE NAME	REGION	Zoonotic Agent	DISEASE STATUS UNIT	Number of herds with status officially free	Number of infected herds	Total number of herds
Bovine tuberculosis in countries and regions that do not receive Community co-financing for eradication programme	ISLAND	Mycobacterium bovis		670	0	670

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 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	678	17	Campylobacter, unspecified sp.	17
	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	33	0	Campylobacter	0

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 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	single (food/feed)	10	Gram	N_A	ISO 10272-2:2017 Campylobacter	467	29	Campylobacter, unspecified sp.	29

Table COXIELLA: in animal

Area of sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Method	total units tested	total units positive	Number of Clinical Affected Herds	Zoonoses	N units positive
Not Available	Cattle (bovine animals) - dairy cows - adult - Farm - Iceland - animal sample - milk - Monitoring - Official sampling - Objective sampling	herd/flock	Enzyme-linked immunosorbent assay (ELISA)	82	0	0	Coxiella burnetii	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 units tested	N units positive
Not Available	Fish - smoked - 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
	Meat from pig - meat products - cooked ham - sliced - 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
	Roe - frozen - Border Control Posts - Peru - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	5	0	detection	Listeria monocytogenes	5	0

Table SALMONELLA:Salmonella in animal

Area of sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Number of Flocks Under Control Programme	Target Verification	Sampling Details	Method	total units tested	total units positive	Zoonoses	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)	82	0	Salmonella spp., unspecified	0
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	676	11	Salmonella Agona	8
									Salmonella Infantis	3
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	676	11	Salmonella Agona	8
									Salmonella Infantis	3
	Gallus gallus (fowl) - laying hens - adult - 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	46	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		Y	From some flocks, feces (animal samples) are taken	Not Available	50	0	Salmonella	0
	Gallus gallus (fowl) - laying hens - adult - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official sampling - Objective sampling	herd/flock		N_A	From some flocks, feces (animal samples) are taken	Not Available	8	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	39	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		N_A	From some flocks, boot swabs and dust samples are taken	Not Available	39	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		Y	From some flocks, boot swabs and dust samples are taken	Not Available	39	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 - Objective sampling	herd/flock		N_A	From some flocks, boot swabs and dust samples are taken	Not Available	15	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	12	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	18	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		N_A	From some flocks, boot swabs and dust samples are taken	Not Available	5	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		Y	From some flocks, boot swabs and dust samples are taken	Not Available	6	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 sampling - Objective sampling	herd/flock		N_A	From some flocks, boot swabs and dust samples are taken	Not Available	3	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	1	0	Salmonella	0
	Pigs - fattening pigs - Slaughterhouse - Iceland - animal sample - caecum - Monitoring - Official sampling - Objective sampling	slaughter animal batch		N_A	N_A	Not Available	143	1	Salmonella Kedougou	1
	Pigs - fattening pigs - 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)	975	214	Salmonella spp., unspecified	214
	Turkeys - fattening flocks - before slaughter - Farm - Iceland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock		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		N_A	N_A	Not Available	6	0	Salmonella	0

Area of sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Number of Flocks Under Control Programme	Target Verification	Sampling Details	Method	total units tested	total units positive	Zoonoses	Units positive
Not Available	Turkeys - parent breeding flocks - adult - Farm - Iceland - environmental sample - boot swabs and dust - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	6	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		N_A	N_A	Not Available	2	0	Salmonella	0
	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	3	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 units positive
Not Available	Meat from bovine animals and pig - meat products - 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 - chilled - Slaughterhouse - Iceland - food sample - neck skin - Control and eradication programmes - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	Not Available	759	7	Salmonella Agona	1
									Salmonella Infantis	3
									Salmonella spp., unspecified	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 pig - carcase - Slaughterhouse - Iceland - food sample - carcase swabs - Control and eradication programmes - Official sampling - Objective sampling	single (food/feed)	400	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	2020	13	Salmonella Brandenburg	4
									Salmonella Infantis	3
									Salmonella Kedougou	2
									Salmonella Muenchen	3
									Salmonella Worthington	1
	Meat from pig - meat products - cooked ham - sliced - 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 turkey - carcase - Slaughterhouse - Iceland - food sample - neck skin - Control and eradication programmes - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	Not Available	72	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 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	5	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)	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 units positive
Not Available	Pigs - fattening pigs - others - raised under controlled housing conditions, not recognised by the competent authorities - Slaughterhouse - Iceland - animal sample - organ/tissue - Monitoring - Official sampling - Census	N_A	Not Available	animal	74292	0	Trichinella	0
	Solipeds, domestic - horses - Slaughterhouse - Iceland - animal sample - organ/tissue - Monitoring - Official sampling - Census	N_A	Not Available	animal	8966	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**
Norovirus	Unknown	3	210	4	1
Salmonella Enteritidis	Mixed food	1	10	1	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
Norovirus	Not Available	Not Available	Not Available	Not Available	IS-FBO-2023-Noro1	Household	Unknown	N_A	Descriptive environmental evidence	Domestic premises	Unknown	Unknown	Unknown	A dinner party. One of the kids had shown symptoms before.	1	8	0	0
					IS-FBO-2023-Noro2	General	Unknown	N_A	Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	All patients had eaten at a popular hamburger place during the same period (a couple of days). The total number of human cases is an estimate/registered, and probably there were many more.	1	190	0	0
					IS-FBO-2023-Noro3	General	Unknown	N_A	Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Associated with a meal at a hotel. Two groups of customers: senior citizens who stayed at the hotel and tourists who were passing by.	1	12	4	1
Salmonella Enteritidis	Not Available	Not Available	Not Available	Not Available	IS-FBO-2023-SalmEnteritidis	General	Mixed food	Food trays from one company were sent to several small companies. Not everyone had eaten the same dish.	Descriptive environmental evidence	Canteen or workplace catering	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Sequencing of six strains showed S. Enteritidis ST11 to be of the same origin.	1	10	1	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: Dilution - sensititre

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	**100**	**100**	**100**	**100**	**100**	**100**
MIC	**N of resistant isolates**	**0**	**79**	**0**	**0**	**0**	**0**
<=0.125			21	22			
<=0.25						59	
0.25				44			
<=0.5							92
0.5				34		40	
<=1					75		
1						1	8
<=2		13					
2					12		
4		44	23		13		
8		40	48				
16		3	8				

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: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin
				ECOFF	**4**	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**
				Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**
				Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**
				N of tested isolates	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
				N of resistant isolates	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Not Available	Not Available	Not Available	0.03								2	
			<=0.25					2				
			0.5						2			
			<=1									2
			2			2						
			<=4		2							
			<=8							2		
			8				2					

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
				ECOFF	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
				Lowest limit	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
				Highest limit	**16**	**16**	**64**	**512**	**32**	**8**	**16**
				N of tested isolates	**2**	**2**	**2**	**2**	**2**	**2**	**2**
			MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Not Available	Not Available	Not Available	0.064			2					
			<=0.25							1	1
			<=0.5		2						
			0.5							1	1
			<=2						1		
			<=4				2				
			4						1		
			32					2			

Table Antimicrobial susceptibility testing of Salmonella Infantis 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: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin
				ECOFF	4	8	16	0.5	2	16	0.064	2
				Lowest limit	4	1	2	0.25	0.25	8	0.015	1
				Highest limit	128	32	64	4	8	64	8	16
				N of tested isolates	1	1	1	1	1	1	1	1
				N of resistant isolates	0	0	0	0	0	0	0	0
Not Available	Not Available	Not Available	0.03								1	
			<=0.25					1				
			0.5						1			
			<=1									1
			2			1						
			<=4		1							
			<=8							1		
			8				1					

ESBL Genes	AMPC Genes	CARBA Genes	AM substance	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
			ECOFF	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
			Lowest limit	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
			Highest limit	**16**	**16**	**64**	**512**	**32**	**8**	**16**
			N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**
			MIC / **N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Not Available	Not Available	Not Available	<=0.03		1					
			<=0.5	1						
			0.5						1	1
			<=4			1				
			4					1		
			64				1			

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: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin
				ECOFF	4	8	16	0.5	2	16	0.064	2
				Lowest limit	4	1	2	0.25	0.25	8	0.015	1
				Highest limit	128	32	64	4	8	64	8	16
				N of tested isolates	2	2	2	2	2	2	2	2
				N of resistant isolates	0	2	0	0	0	0	0	0
Not Available	Not Available	Not Available	0.03								2	
			<=0.25					2				
			0.5						2			
			<=1									2
			<=4	2								
			<=8							1		
			8				2					
			16							1		
			>32			2						

ESBL Genes	AMPC Genes	CARBA Genes	AM substance	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
			ECOFF	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
			Lowest limit	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
			Highest limit	**16**	**16**	**64**	**512**	**32**	**8**	**16**
			N of tested isolates	**2**	**2**	**2**	**2**	**2**	**2**	**2**
			MIC / **N of resistant isolates**	**0**	**0**	**0**	**2**	**2**	**0**	**2**
Not Available	Not Available	Not Available	0.064		2					
			<=0.5	2						
			0.5						2	
			<=4			2				
			>16							2
			>32					2		
			>512				2			

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: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin
				ECOFF	4	8	16	0.5	2	16	0.064	2
				Lowest limit	4	1	2	0.25	0.25	8	0.015	1
				Highest limit	128	32	64	4	8	64	8	16
				N of tested isolates	1	1	1	1	1	1	1	1
				N of resistant isolates	0	1	0	0	0	0	0	0
Not Available	Not Available	Not Available	0.03								1	
			<=0.25					1				
			0.5						1			
			<=1									1
			<=4		1							
			<=8							1		
			8				1					
			>32			1						

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
				ECOFF	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
				Lowest limit	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
				Highest limit	**16**	**16**	**64**	**512**	**32**	**8**	**16**
				N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**
				N of resistant isolates	**0**	**0**	**0**	**0**	**1**	**0**	**0**
Not Available	Not Available	Not Available	<=0.03			1					
			<=0.25							1	
			<=0.5		1						
			0.5								1
			<=4				1				
			16					1			
			>32						1		

Table Antimicrobial susceptibility testing of Salmonella Muenchen 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: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin
				ECOFF	**4**	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**
				Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**
				Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**
				N of tested isolates	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
				N of resistant isolates	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
Not Available	Not Available	Not Available	<=0.25					3	1			
			0.5						2		3	
			<=1									3
			2			3						
			<=4		3							
			4				2					
			<=8							3		
			8				1					

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
				ECOFF	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
				Lowest limit	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
				Highest limit	**16**	**16**	**64**	**512**	**32**	**8**	**16**
				N of tested isolates	**3**	**3**	**3**	**3**	**3**	**3**	**3**
				N of resistant isolates	**0**	**0**	**2**	**1**	**0**	**0**	**1**
Not Available	Not Available	Not Available	<=0.03			1					
			0.064			2					
			<=0.25							1	
			<=0.5		3						
			0.5							2	2
			<=2						2		
			<=4				1				
			4						1		
			>16								1
			32				2	2			
			>512					1			

Table Antimicrobial susceptibility testing of Salmonella Worthington 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: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin
				ECOFF	4	8	16	0.5	2	16	0.064	2
				Lowest limit	4	1	2	0.25	0.25	8	0.015	1
				Highest limit	128	32	64	4	8	64	8	16
				N of tested isolates	1	1	1	1	1	1	1	1
				N of resistant isolates	0	0	0	0	0	0	0	0
Not Available	Not Available	Not Available	0.03								1	
			<=0.25					1				
			0.5						1			
			<=1			1						1
			<=4		1							
			<=8							1		
			8				1					

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
				ECOFF	**2**	**0.125**	**8**	**256**	**8**	**0.5**	**2**
				Lowest limit	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
				Highest limit	**16**	**16**	**64**	**512**	**32**	**8**	**16**
				N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**
				N of resistant isolates	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Not Available	Not Available	Not Available	0.064			1					
			<=0.25							1	1
			<=0.5		1						
			<=2						1		
			<=4				1				
			<=8					1			

ANTIMICROBIAL RESISTANCE TABLES FOR 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

Analytical Method: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin
				ECOFF	**8**	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**
				Lowest limit	**4**	**1**	**2**	**0.25**	**0.25**	**8**	**0.015**	**1**
				Highest limit	**128**	**32**	**64**	**4**	**8**	**64**	**8**	**16**
				N of tested isolates	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**
				N of resistant isolates	**0**	**20**	**1**	**0**	**0**	**1**	**1**	**0**
Not Available	Not Available	Not Available	<=0.015								77	
			0.03								7	
			<=0.25					85	80			
			0.25								1	
			0.5						5			
			<=1			2						85
			<=2				11					
			2			26						
			<=4		83							
			4			31	42					
			<=8							84		
			8		2	6	30					
			16				1					
			32				1					
			>32			20						
			64							1		

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
				ECOFF	**2**	**0.125**	**8**	**64**	**8**	**0.5**	**2**
				Lowest limit	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
				Highest limit	**16**	**16**	**64**	**512**	**32**	**8**	**16**
				N of tested isolates	**85**	**85**	**85**	**85**	**85**	**85**	**85**
				N of resistant isolates	**0**	**0**	**1**	**17**	**17**	**0**	**13**
Not Available	Not Available	Not Available		<=0.03		85					
				<=0.25						82	49
				<=0.5	60						
				0.5						3	23
				1	24						
				<=2					64		
				2	1						
				<=4			84				
				4					4		
				<=8				28			
				16				33			
				>16							13
				32				6	6		
				>32					11		
				64				1			
				>64			1				
				>512				17			

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: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	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	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
			N of resistant isolates	**2**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
CTX-M-15	Not Available	Not Available	**MIC**										
			<=0.015							2			
			<=0.03									2	
			<=0.064			2							
			<=0.125						2		2		
			2	2				2					
			4				1						2
			8				1						
			16		1								
			32		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: ESBL MON

Analytical Method: Dilution - sensititre

Country Of Origin:Iceland

Sampling Details:

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Amikacin	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin
				ECOFF	8	8	16	0.25	0.5	16	0.064	2
				Lowest limit	4	1	2	0.25	0.25	8	0.015	1
				Highest limit	128	32	64	4	8	64	8	16
				N of tested isolates	2	2	2	2	2	2	2	2
				N of resistant isolates	0	2	1	2	2	0	2	0
CTX-M-15	Not Available	Not Available	0.25								2	
			<=1									2
			<=2				1					
			2						2			
			<=4	2								
			>4					2				
			<=8							2		
			>32		2							
			64				1					

ESBL Genes	AMPC Genes	CARBA Genes	MIC	AM substance	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
				ECOFF	**2**	**0.125**	**8**	**64**	**8**	**0.5**	**2**
				Lowest limit	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
				Highest limit	**16**	**16**	**64**	**512**	**32**	**8**	**16**
				N of tested isolates	**2**	**2**	**2**	**2**	**2**	**2**	**2**
				N of resistant isolates	**0**	**0**	**0**	**1**	**0**	**0**	**1**
CTX-M-15	Not Available	Not Available	<=0.03			2					
			<=0.25							2	
			<=0.5		1						
			1		1						1
			<=2						1		
			<=4				1				
			4						1		
			8				1				
			>16								1
			32					1			
			>512					1			

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	17-Jul-2024
Animal Population	17-Jul-2024
Disease Status	17-Jul-2024
Food Borne Outbreaks	17-Jul-2024
Prevalence	17-Jul-2024

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 2023

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 Food, Agriculture and Fisheries (MAR). MAST's 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, food business operators and consumers. All reporting on zoonoses monitoring is carried out by MAST.

The Institute for Experimental Pathology at Keldur (Keldur) is a university institution affiliated with the Medical Faculty of the University of Iceland. Keldur conducts research and supplies research based advisory support to MAST concerning animal health, zoonoses and antimicrobial resistance (AMR) in feed, food and animals. 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 is a testing laboratory for food and feed.

Stjörnugrís Starlab is a testing laboratory for *Trichinella* testing in pigs.

Rannsóknarstofa Sláturfélags Suðurlands is a testing laboratory for *Trichinella* testing in pigs.

Department of Clinical Microbiology at Landspitali – National University Hospital (LSH) is the official laboratory for *Salmonella* serotyping.

The list of official laboratories for testing different zoonotic agents in different matrixes is published on MAST's website.

2. Animal population

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

Livestock population data, with the exception of poultry data, is collected in the livestock database BUSTOFN through annual reporting from the livestock owners. MAR is responsible for the database. The information for reporting year 2023 represents the animal population in December 2022. Poultry population data is based on MAST‘s own database.

Information regarding slaughtered animals is based on data from the slaughterhouses. MAR 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

Icelandic poultry population consist of parent flocks for broilers, laying hens and turkeys and rearing flocks of broilers and turkeys, and laying hens.

A holding is defined as the same as a herd of cattle, pigs, horses, sheep and goats.

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

There have been no major changes to the susceptible populations.

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

All livestock is evenly spread around the agricultural lowland coastal areas. The highlands, which cover over 80 % of the island, are not permanently populated. During summer, some herds of sheep and horses graze in the highlands.

2.5. Additional information

3. General evaluation*: *Salmonella*

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

For the last decade, the incidence in humans has been relatively steady, or less than 20 cases per 100.000 inhabitants.

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

In the last decade, there has been no evidence of domestically produced eggs, poultry meat, pork or beef 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

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 infection through the consumption of pork 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 by regional MAST officers at the slaughterhouses by continuous serologic testing of meat juice in slaughter batches. The sampling is objective, and random meat samples are collected from carcasses after cooling. The number of individual samples per year depends on the herd size. 60, 75 or 100 samples shall be taken from herds slaughtering less than 2000 pigs per year, 2001 – 5000 pigs per year and over 5001 pigs per year, respectively.

A *Salmonella* index is calculated for each herd based on the weighted average of positive meat juice samples from the previous 13 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 slaughter pig herds are classified into categories 1-3 according to their *Salmonella* index.

From herds in categories 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.

From herds in category 1, swab samples are taken during slaughter from 10 randomly selected carcases for every 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, which means actions must still be taken.

4.2. Measures in place(b)

Depending on the *Salmonella* index and/or results from swab samples from previous slaughter days from the same herd, carcasses can be kept separately after slaughter until test results are available. Carcasses from a pooled sample with positive results are 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. 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)]

Salmonella is considered persistent on most farms. However, it is rare that farms have a high *Salmonella* index and are therefore categorised in category 2 or 3, and if they are, it is usually for a short period.

In the last decade, positive *Salmonella* swab samples from carcasses have ranged from 0,4%-3,4%. The most common serotypes are *S.* Kedougou and *S.* Brandenburg.

4.5. Additional information

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 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 Regulation (EC) no. 2130/2003, Regulation (EU) No 200/2010, and Regulation (EU) No 1190/2012.

Boot swab samples and/or boot swab and dust samples are taken both during rearing and in adult flocks by the food business operator (FBO) and by MAST.

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 weeks.

Vaccination against *Salmonella* in poultry production is not allowed.

5.2. Measures in place(b)

Measures to prevent the 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 legislation. Epidemiological investigation is performed**,** and necessary steps taken to prevent further spread. Official samples are taken from all flocks on the infected 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 *Salmonella* is not 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 Animal Disease Act No. 25/1993 and the Zoonosis Regulation No. 1048/2011 (implementing EU Directive No. 99/2003), based on Food Act No. 93/1995. MAST receives all results, both positive and negative, 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)]

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 the 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

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

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

The aim of the National Control Programme (NCP) in Poultry 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 for laying hens is in accordance with Regulation (EC) No. 2130/2003 and Regulation (EU) No. 517/2011.

Sampling takes place both during rearing and in adult flocks. Transport basket liners are taken from day-old chicks, and boot swab samples and/or boot swab and dust samples are taken both during rearing and in adult flocks by the food business operator (FBO) and by MAST.

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

Vaccination against *Salmonella* in poultry production is not allowed.

6.2. Measures in place(b)

Measures to prevent the 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 food legislation. Epidemiological investigation is performed**,** and necessary steps taken to prevent further spread. Official samples are taken from all flocks on the infected 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 *Salmonella* is not 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 Animal Disease Act No. 25/1993 and the zoonosis Regulation No. 1048/2011 (implementing EU Directive No. 99/2003), based on Food Act No. 93/1995. MAST receives all results, both positive and negative, 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)]

In 2015, *S.* Worthington was detected in transport basket liners from a flock of day-old chicks but never confirmed in the flock.

In 2010, *S.* Rissen was detected in one flock of adult laying hens; confirmatory samples were negative, and restrictions were lifted.

6.5. Additional information

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 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 Regulation (EC) No. 2130/2003, Regulation (EU) No. 200/2012 and Regulation (EU) No. 1190/2012.

Samples are taken from all rearing flocks within three weeks before slaughter. Boot swab samples are taken by the food business operator (FBO), and boot swab and dust samples are taken by MAST.

Vaccination against *Salmonella* in poultry production is not allowed.

7.2. Measures in place(b)

Measures to prevent the 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. However, flocks may be transported to the slaughterhouse and used for human consumption if they are treated in a way that ensures the elimination of *Salmonella* according to food legislation. Epidemiological investigation is performed**,** and necessary steps are taken to prevent further spread. Official samples are taken from all flocks on the infected 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 *Salmonella* is not 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 Animal Disease Act No. 25/1993 and the Zoonosis Regulation No. 1048/2011 (implementing EU Directive No. 99/2003), based on Food Act No. 93/1995. MAST receives all results, both positive and negative, 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)

From 2008 to 2012, different serovars were detected on many broiler and fattening turkey farms, and investigations pointed toward contamination from feed. *S.* Infantis and *S.* Agona have been persistent on two farms until now. From 2012 to 2016 *S.* Worthington was regularly detected in different farms and was traced back to a feed mill and as a result stopped producing broiler feed.

7.5. Additional information

8. General evaluation*: *Campylobacter*

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

In the years 1998-2000 there was a *Campylobacter* outbreak in humans and is linked to when it was allowed to put unfrozen poultry meat on the market 1996. With this change the poultry meat consumption increased significantly. Before 1996 poultry meat could only be distributed frozen.

From 2000 all broiler flocks are tested for *Campylobacter* at farm level and at processing. From 2002, the freezing policy was implemented, where all poultry meat products must be frozen from flocks positive for *Campylobacter* in samples taken within 5 days before slaughter.

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

Campy-On-Ice project 2000-2004:

- The epidemiological investigation of human campylobacteriosis in Iceland showed a link to domestic poultry meat.
- Source attribution investigation on *Campylobacter* contamination to poultry flocks and risk reducing interventions.

In 2011, an increase in campylobacteriosis in humans of domestic origin was observed. An epidemiological investigation showed that domestically produced poultry meat was not the source. No link to a source was found to the human cluster.

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

In the last decade, the incidence has been around 35 cases per 100.000, excluding 2020 and 2021, where the incidence has been 25 cases and 15 cases per 100.000, respectively. This decrease is likely due to less travel during the Covid-19 pandemic.

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

8.4. Additional information

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 and legislation, it is allowed to distribute poultry meat unfrozen and un heat treated only if a negative test result for *Campylobacter* is available. The sample can be taken either at the farm 2 to 5 days prior to slaughter orat slaughter or from a batch of poultry meat. Samples are taken by the FBO.

In 2020, the process hygiene criterion for *Campylobacter* in broilers at slaughter was implemented (EU regulation No. 1495/2017), with testing of all broiler and turkey slaughter flocks. After more than 52 weeks of testing, the results showed contamination levels in all poultry slaughterhouses far below the limits set in the Icelandic Campylobacter NCP. Therefore, the requirements were updated in 2022 by reducing testing of slaughter flocks from all year round to the summer months (15 May – 15 October). Food business operators are also allowed to reduce testing to fortnightly if results in their slaughterhouse have been satisfying.

9.2. Measures in place(b)

According to the requirements in EU reg. No. 1495/2017, if the process hygiene criterion shows results above the set limits, the food business operator shall make improvements in slaughter hygiene, review process controls, of poultry origin and of the biosecurity measures in the farms of origin.

Carcasses from flocks that test positive for thermophilic *Campylobacter* during rearing or at slaughter cannot be distributed unfrozen (for minimum 14 days) or unheat treated.

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

The food business operators are obliged to report monthly to the competent authority all test results for *Campylobacter* from samples taken during rearing before slaughter, during slaughter and from poultry meat. The obligation of reporting can also be fulfilled by allowing the official laboratories to report all test results directly to MAST.Results of investigations and national evaluation of the situation, the trends (d) and sources of infection(e)

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, around 3% or below both in rearing flocks and in slaughter flocks, due to the development of a high level of biosecurity on broiler farms. In 2020, when slaughter flocks were for the first time tested for Campylobacter by enumeration, very low contamination levels were observed and far below the limits of the PHC, continuing with similar low levels in 2021.

9.5. Additional information

10. Food-borne Outbreaks

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

Investigation of foodborne outbreaks (FBO) is a collaborative effort involving the Chief Epidemiologist (CE) based at the Directorate of Health, Icelandic Food and Veterinary Authority (MAST) and Local Competent Authorities (LCAs). Representatives from those authorities form a steering committee. When a suspected foodborne outbreak arises, the CE convenes the steering committee to organise and oversee the investigation. The process adheres to a specific guideline designed to achieve the following objectives:

- Define communication channels, responsibilities, and roles of the different authorities involved.
- Describe the procedures for conducting FBO investigations.
- Ensure coordination of actions, promote targeted analysis and moderate costs.
- Ensure adherence to professional practices.
- Ensure the appropriate flow of information to the public.
-

The CE, MAST, and a subset of the nine LCAs receive notifications of suspected FBOs from the public, food business operators, or healthcare providers. The notifications are documented and evaluated using a shared document. If a suspicion is confirmed, the steering committee is immediately convened.
The CE, MAST and the nine LCAs meet monthly to discuss the notifications received in the previous month and provide updates on ongoing investigations, if any.
The CE monitors the number of confirmed patient pathogen analyses. If the number of confirmed cases increases, the steering committee is called together to investigate the outbreak.

Guideline to foodborne outbreak investigations (only available in Icelandic)

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

All outbreaks where a food vehicle was suspected and led to a further investigation by the parties mentioned in 2.1.

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

10.4. Descriptions of single outbreaks of special interest

IS-FBO-2023-SalmEnteritidis:
Food trays from one company were sent to several small companies. Not everyone had eaten the same dish. Sequencing of six strains showed S. Enteritidis ST11 to be of the same origin.
IS-FBO-2023-Noro1:
A dinner party. Norovirus was confirmed in patients. One of the kids had shown symptoms before.
IS-FBO-2023-Noro2:
All patients had eaten at a popular hamburger place during the same period (a couple of days). The total number of human cases is an estimate/registered, and there were probably many more. Norovirus was confirmed in multiple patients.
IS-FBO-2023-Noro3:
Associated with a meal at a hotel. Two groups of customers: senior citizens who stayed at the hotel and tourists who were passing by. Norovirus was confirmed in multiple patients.

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

In all of the mentioned outbreaks in 2.4. the local authority investigated on site and some food vehicles were sent for testing.

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

10.7. Additional information

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

The Icelandic Food and Veterinary Authority (MAST) is responsible for antimicrobial resistance monitoring (planning, sampling, etc.).

Depending on the sample type, samples are collected by the regional MAST officers or the local authorities.

Samples are processed at official laboratories.

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

MAST carries out all reporting on antimicrobial resistance monitoring.

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

12. General Description of Antimicrobial Resistance Monitoring*; *Salmonella* in pigs – caecal and swab samples

12.1. General description of sampling design and strategy

Regional MAST officers collected caecal samples at all pig slaughterhouses throughout the year. The sampling design was in accordance with the technical requirements in Decision 2020/1729/EU and followed the EFSA monitoring specification.

12.2. Stratification procedure per animal population and food category

Caecal sampling was stratified per slaughterhouse by allocating the number of samples proportionally to the slaughterhouse's annual throughput.

12.3. 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 the selection of herds. Caecal samples were collected from two slaughter pigs per epidemiological unit.

12.4. Analytical method used for detection and confirmation

Isolation of *Salmonella spp.* from caecal samples was conducted by Keldur. The method used was NMKL method no. 187, 2007, *Salmonella* detection in foods, faeces, and materials from primary animal production using MSRV. Keldur has obtained accreditation for this method.

12.5. Laboratory methodology used for detection of antimicrobial resistance

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. The method used for broth micro-dilution for antimicrobial susceptibility testing was modified EN/ISO 20776-1 (second edition 2019-06) and CLSI M07 (11th edition 2018-01). The method modification is according to recommendations of Thermo scientific i.e. producers of the Thermo Scientific Sensititre System. Keldur have obtained accreditation for this method.

12.6. Library preparation used

12.7. Version of the predictive tool

12.8. Results of investigation

143 caecal samples were tested, and 1 was found positive, *Salmonella* Kedougou

13 isolates from 10 epidemiological units were obtained from swab samples from the National Control Program in 2023. Only 9 isolates were susceptibility tested as it failed to revive one isolate from the freezer.

12.9. Additional information

All *Salmonella* isolates from positive swab samples from the National Control Programme for Salmonella in Pigs are susceptibility tested.

As all pig slaughterbatches are tested by official veterinarians, the FBOs are exempted from the sampling described in Regulation (EC) No 2073/2005.

No importation of fresh pork or beef meat from third countries.

Iceland

13. General Description of Antimicrobial Resistance Monitoring*; *Campylobacter coli* in pigs - caecal

13.1. General description of sampling design and strategy

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

13.2. Stratification procedure per animal population and food category

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

13.3. Randomisation procedure per animal population and food category

Objective sampling - The caecal sampling at each slaughterhouse was planned in order to randomise the days of sampling (Mondays to Thursdays only) as well as the selection of herds. Caecal samples were collected from two slaughter pigs per epidemiological unit.

13.4. Analytical method used for detection and confirmation

Isolation of *Campylobacter coli* from caecal samples was conducted by Keldur, and the current EURL-AR laboratory protocol was applied. The method used for *Campylobacter* detection, enumeration and identification in feed, food, and material from primary animal production was according to EN/ISO 10272-1, Part 1: Detection method, Second edition 2017-06 and EN/ISO 10272-2, Part 2: Colony-count technique, Second edition 2017-06. Keldur has obtained accreditation for this method.

13.5. Laboratory methodology used for detection of antimicrobial resistance

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. The method used for broth micro-dilution for antimicrobial susceptibility testing was modified EN/ISO 20776-1 (second edition 2019-06) and CLSI M07 (11th edition 2018-01). The method modification is according to recommendations of Thermo scientific i.e. producers of the Thermo Scientific Sensititre System. Keldur has obtained accreditation for this method.

13.6. Library preparation used

13.7. Version of the predictive tool

13.8. Results of investigation

143 samples were tested for *Campylobacter* and 141 were found positive, all *Campylobacter coli.* No *Campylobacter jejuni* was detected.

100 samples were randomly selected and susceptibility tested.

13.9. Additional information

Iceland has a national annual production of less than 100 000 tonnes of pig meat.

14. General Description of Antimicrobial Resistance Monitoring*; ESBL/AmpC/carbapenemase producing *E. coli* in pigs – caecal samples (and meat at retail)

14.1. General description of sampling design and strategy

Regional MAST officers collected faecal samples at all pig slaughterhouses throughout the year. 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

Caecal 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 caecal sampling at each slaughterhouse was planned in order to randomise the days of sampling (Mondays to Thursdays only) as well as the selection of herds. Caecal samples were collected from two slaughter pigs per epidemiological unit.

14.4. Analytical method used for detection and confirmation

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

14.5. Laboratory methodology used for detection of antimicrobial resistance

Susceptibility testing of presumptive ESBL/AmpC/carbapenemase 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. The method used for broth micro-dilution for antimicrobial susceptibility testing was modified EN/ISO 20776-1 (second edition 2019-06) and CLSI M07 (11th edition 2018-01). The method modification is according to recommendations of Thermo scientific i.e. producers of the Thermo Scientific Sensititre System. Keldur has obtained accreditation for this method.

14.6. Library preparation used

14.7. Version of the predictive tool

14.8. Results of investigation

143 samples were tested for ESBL/AmpC/carbapenemase producing *E. coli*, and two were found positive.

14.9. Additional information

Iceland has a national annual production of less than 100 000 tonnes of pig meat.

No meat samples were taken at retail in 2023. The sampling did not take place because insufficient funds were received to carry out sampling due to Decision 2020/1729/EC, and senior management of MAST had to prioritize sampling. It was decided to prioritize caecal sampling and susceptibility testing of those samples.

No importation of fresh pork or beef meat from third countries.

15. General Description of Antimicrobial Resistance Monitoring*; Indicator *E. coli* in pigs – caecal samples

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

Regional MAST officers collected faecal samples at all pig slaughterhouses throughout the year. The sampling design was in accordance with the technical requirements in Decision 2020/1729/EU and followed the EFSA monitoring specification.

15.2. Stratification procedure per animal population and food category

Caecal 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 the selection of herds. Caecal samples were collected from two slaughter pigs per epidemiological unit for a total of 143 samples.
Furthermore, Keldur randomly selected isolate per epidemiological unit for susceptibility testing, 85 isolates in total.

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

Isolation of indicator *E. coli* from caecal samples was conducted by Keldur. The method used was according to the methodology used in the SWEDRES-SWARM program in 2019.

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

Susceptibility testing of presumptive ESBL/AmpC/carbapenemase 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. The method used for broth micro-dilution for antimicrobial susceptibility testing was modified EN/ISO 20776-1 (second edition 2019-06) and CLSI M07 (11th edition 2018-01). The method modification is according to recommendations of Thermo scientific i.e. producers of the Thermo Scientific Sensititre System. Keldur has obtained accreditation for this method.

15.6. Library preparation used

15.7. Version of the predictive tool

15.8. Results of investigation

143 isolates of *E. coli* from 143 caecal samples were isolated.

85 samples were randomly selected and susceptibility tested.

15.9. Additional information

Iceland has a national annual production of less than 100 000 tonnes of pig meat.

No importation of fresh pork or beef meat from third countries.

16. General Description of Antimicrobial Resistance Monitoring*; *Salmonella* in bovine animals under one year of age – caecal samples

16.1.	**General description of sampling design and strategy[(a)]**
16.2.	**Stratification procedure per animal population and food category**
16.3.	**Randomisation procedure per animal population and food category**
16.4.	**Analytical method used for detection and confirmation(b)**
16.5.	**Laboratory methodology used for detection of antimicrobial resistance(C)**
16.6.	**Library preparation used**
16.7.	**Version of the predictive tool**
16.8.	**Results of investigation**
16.9.	**Additional information**

Iceland's national annual production of meat from bovine animals under one year of age is less than 10,000 tonnes.

17. General Description of Antimicrobial Resistance Monitoring*; *Campylobacter* in bovine animals under one year of age – caecal samples

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

17.2. Stratification procedure per animal population and food category

17.3. Randomisation procedure per animal population and food category

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

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

17.6. Library preparation used

17.7. Version of the predictive tool

17.8. Results of investigation

17.9. Additional information

Iceland's national annual production of meat from bovine animals under one year of age is less than 10,000 tonnes.

18. General Description of Antimicrobial Resistance Monitoring*; ESBL/AmpC/carbapenemase producing *E. coli* in bovine animals under one year of age - caecal samples (and meat at retail)

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

18.2. Stratification procedure per animal population and food category

18.3. Randomisation procedure per animal population and food category

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

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

18.6. Library preparation used

18.7. Version of the predictive tool

18.8. Results of investigation

18.9. Additional information

Iceland's national annual production of meat from bovine animals under one year of age is less than 10,000 tonnes.

No meat samples were taken at retail in 2023. The sampling did not take place because insufficient funds were received to carry out sampling due to Decision 2020/1729/EC, and senior management of MAST had to prioritize sampling. It was decided to prioritize the required caecal sampling and susceptibility testing of those samples.

19. General Description of Antimicrobial Resistance Monitoring*; Indicator *E. coli* in bovine animals under one year of age - caecal samples

19.1.	General description of sampling design and strategy[(a)]
19.2.	Stratification procedure per animal population and food category
19.3.	Randomisation procedure per animal population and food category
19.4.	Analytical method used for detection and confirmation(b)
19.5.	Laboratory methodology used for detection of antimicrobial resistance(C)
19.6.	Library preparation used
19.7.	Version of the predictive tool
19.8.	Results of investigation
19.9.	Additional information

Iceland's national annual production of meat from bovine animals under one year of age is less than 10,000 tonnes.