ZOONOSES MONITORING

Finland

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 2020

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 Finland during the year 2020.

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)	10,075	835,847	260,874	
	Cattle (bovine animals) - calves (under 1 year)	9,215	288,255		
	Cattle (bovine animals) - dairy cows and heifers	6,420	354,484		
	Cattle (bovine animals) - meat production animals	5,928	189,272		
	Cattle (bovine animals) - mixed herds	2,535	166,383		
Deer	Deer - farmed	37	760	34	
	Deer - wild			1,811	
Ducks	Ducks	1,121	1,030,619	8,075	
Gallus gallus (fowl)	Gallus gallus (fowl)	1,201	13,576,880	80,767,458	5,805
	Gallus gallus (fowl) - breeding flocks for broiler production line	23	396,097	566,558	
	Gallus gallus (fowl) - broilers	141	8,507,327	80,198,253	4,117
	Gallus gallus (fowl) - laying hens	973	3,811,547	2,647	1,414
Geese	Geese	256	101,828	5,977	
Moose	Moose - wild			223	
Pheasants	Pheasants	426	120,313		
Pigs	Pigs	992	1,087,411	1,918,442	
	Pigs - breeding animals	508	100,559	32,656	
	Pigs - fattening pigs	865	496,258	1,885,786	
Reindeers	Reindeers	4,354	186,226	41,963	
Small ruminants	Goats	1,004	8,803	612	
	Sheep	4,031	142,488	62,724	
Solipeds, domestic	Solipeds, domestic - horses	16,000	74,300	817	
Turkeys	Turkeys	53	267,986	906,696	315
Wild boars	Wild boars - farmed	19	255	164	
	Wild boars - wild			1	

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 animals serologically tested under investigations of suspect cases	Number of suspended herds under investigations of suspect cases	Number of seropositive animals under investigations of suspect cases	Number of animals positive to BST under investigations of suspect cases	Number of herds with status officially free	Number of infected herds	Total number of animals	Number of herds tested under surveillance	Number of animals tested under surveillance	Total number of herds	Number of animals or pools tested under surveillance by bulk milk	Number of notified abortions whatever cause under investigations of suspect cases	Number of isolations of Brucella abortus under investigations of suspect cases	Number of abortions due to Brucella infection under investigations of suspect cases	Number of animals tested in microbiological and/or molecular-biology testing under investigations of suspect cases
FINLAND	Brucella	111	0	0	0	10,075	0	835,847	0	0	10,075	1,335	208	0	0	97

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

Region	Zoonotic agent	Number of animals serologically tested under investigations of suspect cases	Number of suspended herds under investigations of suspect cases	Number of seropositive animals under investigations of suspect cases	Number of animals positive in microbiological testing under investigations of suspect cases	Number of herds with status officially free	Number of infected herds	Total number of animals	Number of herds tested under surveillance	Number of animals tested under surveillance	Total number of herds	Number of animals tested in microbiological and/or molecular-biology testing under investigations of suspect cases
FINLAND	Brucella	0	0	0	0	5,035	0	151,291	132	3,449	5,035	19

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 animals	Interval between routine tuberculin tests	Number of animals tested with tuberculin routine testing	Number of tuberculin tests carried out before the introduction into the herds	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological and/or molecular-biology examinations	Number of animals detected positive in bacteriological and/or molecular-biology examination	Total number of herds
FINLAND	Mycobacterium bovis	10,075	0	835,847	0	0	0	6	0	10,075

Table Tuberculosis in farmed deer

Region	Zoonotic agent	Number of infected herds	Number of herds with status free	Total number of animals	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological and/or molecular-biology examinations	Number of animals detected positive in bacteriological and/or molecular-biology examination	Total number of herds
FINLAND	Mycobacterium bovis	0	37	760	0	0	37

PREVALENCE TABLES

Table Brucella:BRUCELLA 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	Alpacas - farmed - Farm - Finland - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	N_A	Rose Bengal plate test (RBT)/Buffered Brucella antigen test (BBAT)	animal	16	0	Brucella	0
	Alpacas - farmed - Farm - Finland - animal sample - Clinical investigations - Official sampling - Suspect sampling	N_A	Microbiological tests	animal	1	0	Brucella	0
	Alpacas - farmed - Farm - Sweden - animal sample - blood - Monitoring - Official sampling - Selective sampling	N_A	Rose Bengal plate test (RBT)/Buffered Brucella antigen test (BBAT)	animal	11	0	Brucella	0
	Deer - wild - Natural habitat - Unknown - animal sample - Clinical investigations - Official sampling - Suspect sampling	N_A	Microbiological tests	animal	1	0	Brucella	0
	Deer - zoo animals - Zoo - Finland - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	N_A	Rose Bengal plate test (RBT)/Buffered Brucella antigen test (BBAT)	animal	2	0	Brucella	0
	Deer - zoo animals - Zoo - Finland - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Microbiological tests	animal	1	0	Brucella	0
	Dogs - pet animals - Veterinary clinics - Finland - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	N_A	Serum agglutination test (SAT)	animal	2	0	Brucella	0
	Dogs - pet animals - Veterinary clinics - Finland - animal sample - blood - Monitoring - Official sampling - Selective sampling	N_A	Serum agglutination test (SAT)	animal	3	0	Brucella	0
	Dogs - pet animals - Veterinary clinics - Finland - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Microbiological tests	animal	10	0	Brucella	0
	Dogs - pet animals - Veterinary clinics - Unknown - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	5	5	Brucella canis	5
	Hares - wild - Natural habitat - Unknown - animal sample - Clinical investigations - Official sampling - Suspect sampling	N_A	Microbiological tests	animal	2	0	Brucella	0
	Llamas - farmed - Farm - Czechia - animal sample - blood - Monitoring - Official sampling - Selective sampling	N_A	Rose Bengal plate test (RBT)/Buffered Brucella antigen test (BBAT)	animal	7	0	Brucella	0
	Llamas - farmed - Farm - Finland - animal sample - Clinical investigations - Official sampling - Suspect sampling	N_A	Microbiological tests	animal	1	0	Brucella	0
	Pigs - Farm - Finland - animal sample - blood - Monitoring - Official sampling - Selective sampling	N_A	Indirect ELISA (I-ELISA)	animal	262	0	Brucella	0
	Pigs - Farm - Finland - animal sample - Clinical investigations - Official sampling - Suspect sampling	N_A	Microbiological tests	animal	14	0	Brucella	0
	Pigs - Slaughterhouse - Finland - animal sample - blood - Surveillance - Official sampling - Selective sampling	N_A	Rose Bengal plate test (RBT)/Buffered Brucella antigen test (BBAT)	animal	1375	0	Brucella	0
	Reindeers - farmed - Farm - Finland - animal sample - Monitoring - Official sampling - Selective sampling	N_A	Microbiological tests	animal	4	0	Brucella	0
	Seals - wild - Natural habitat - Unknown - animal sample - Clinical investigations - Official sampling - Suspect sampling	N_A	Microbiological tests	animal	3	0	Brucella	0
	Seals - zoo animals - Zoo - Finland - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	N_A	Rose Bengal plate test (RBT)/Buffered Brucella antigen test (BBAT)	animal	1	0	Brucella	0

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	Zoo animals, all - Zoo - Finland - animal sample - Monitoring - Official sampling - Selective sampling	Musk ox	Microbiological tests	animal	1	0	Brucella	0

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 - Slaughterhouse - Finland - animal sample - caecum - Control and eradication programmes - Industry sampling - Census	Sampling in June-October	Not Available	slaughter animal batch	1713	85	Campylobacter coli	2
							Campylobacter jejuni	82
							Campylobacter lari	1
	Gallus gallus (fowl) - broilers - Slaughterhouse - Finland - animal sample - caecum - Control and eradication programmes - Industry sampling - Objective sampling	Sampling in January-May and in November-December	Not Available	slaughter animal batch	331	5	Campylobacter jejuni	5

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 - Finland - food sample - neck skin - Surveillance - based on Regulation 2073 - Industry sampling - Objective sampling	single (food/feed)	26	Gram	N_A	Enumeration method	595	1	Campylobacter, unspecified sp.	1

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 - Farm - Finland - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	herd/flock	N_A	Enzyme-linked immunosorbent assay (ELISA)	11	0	0	Coxiella	0
	Cattle (bovine animals) - meat production animals - Farm - Finland - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	herd/flock	N_A	Enzyme-linked immunosorbent assay (ELISA)	1	0	0	Coxiella	0
	Sheep - Farm - Finland - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	herd/flock	N_A	Enzyme-linked immunosorbent assay (ELISA)	1	0	0	Coxiella	0

Table Cysticercus:CYSTICERCUS 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	Cattle (bovine animals) - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	All carcasses arriving to meat inspection	Visual inspection	animal	260874	0	Cysticercus	0
	Cattle (bovine animals) - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Objective sampling	Samples from carcasses after meat inspection	Visual inspection	animal	363	0	Cysticercus	0
	Cattle (bovine animals) - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Suspect sampling	Samples from suspect carcasses after meat inspection	Histology	animal	2	0	Cysticercus	0
	Pigs - breeding animals - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Visual inspection	animal	32656	0	Cysticercus	0
	Pigs - fattening pigs - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Visual inspection	animal	1885786	0	Cysticercus	0
	Wild boars - farmed - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Visual inspection	animal	164	0	Cysticercus	0
	Wild boars - wild - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Visual inspection	animal	1	0	Cysticercus	0

Table Echinococcus:ECHINOCOCCUS 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
FINLAND	Cattle (bovine animals) - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	260874	0	Echinococcus	0
	Deer - farmed - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	34	0	Echinococcus	0
	Deer - wild - Game handling establishment - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: only meat inspected animals, not all hunted animals	Visual inspection	animal	1811	0	Echinococcus	0
	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	216	0	Echinococcus multilocularis	0
	Goats - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	612	0	Echinococcus	0
	Moose - wild - Game handling establishment - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: only meat inspected animals, not all hunted animals	Visual inspection	animal	223	0	Echinococcus	0
	Moose - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	11	1	Echinococcus canadensis – G10	1
	Pigs - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	1918442	0	Echinococcus	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	310	0	Echinococcus multilocularis	0
	Reindeers - farmed - Unspecified - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	2	0	Echinococcus	0
	Reindeers - semi-domesticated - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	13	0	Echinococcus	0
	Reindeers - semi-domesticated - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	41959	0	Echinococcus	0
	Reindeers - semi-domesticated - Slaughterhouse - Finland - animal sample - Surveillance - Official sampling - Suspect sampling		Morphological identification	animal	4	3	Echinococcus canadensis – G10	3
	Sheep - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	62724	0	Echinococcus	0
	Solipeds, domestic - horses - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	817	0	Echinococcus	0
	Voles - wild - Natural habitat - Finland - animal sample - Survey - Official sampling - Objective sampling	N_A	Not Available	animal	1390	0	Echinococcus	0
	Wild boars - farmed - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	164	0	Echinococcus	0
	Wild boars - wild - Game handling establishment - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: only meat inspected animals, not all hunted animals	Visual inspection	animal	1	0	Echinococcus	0
	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Real-Time PCR (qualitative or quantitative)	animal	30	11	Echinococcus canadensis – G10	11
Länsi-Suomi	Moose - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	3	0	Echinococcus	0
	Reindeers - farmed - Unspecified - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	2	0	Echinococcus	0
	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Real-Time PCR (qualitative or quantitative)	animal	2	1	Echinococcus canadensis – G10	1
Keski-Suomi	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	1	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	1	0	Echinococcus multilocularis	0
Etelä-Pohjanmaa	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	1	0	Echinococcus multilocularis	0
Pohjanmaa	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	1	0	Echinococcus multilocularis	0
Satakunta	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	5	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	13	0	Echinococcus multilocularis	0
Pirkanmaa	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	2	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	1	0	Echinococcus multilocularis	0

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
Åland (NUTS level 2)	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Real-Time PCR (qualitative or quantitative)	animal	1	0	Echinococcus canadensis – G10	0
Helsinki-Uusimaa (NUTS level 2)	Moose - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	2	0	Echinococcus	0
	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Real-Time PCR (qualitative or quantitative)	animal	1	0	Echinococcus canadensis – G10	0
Helsinki-Uusimaa (NUTS level 3)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	5	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	11	0	Echinococcus multilocularis	0
Etelä-Suomi (NUTS 2010-2013)	Moose - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	4	0	Echinococcus	0
	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Real-Time PCR (qualitative or quantitative)	animal	5	1	Echinococcus canadensis – G10	1
Varsinais-Suomi (NUTS 2010-2013)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	4	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	8	0	Echinococcus multilocularis	0
Kanta-Häme (NUTS 2010-2013)	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	12	0	Echinococcus multilocularis	0
Kymenlaakso (NUTS 2010-2013)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	25	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	147	0	Echinococcus multilocularis	0
Etelä-Karjala (NUTS 2010-2013)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	5	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	72	0	Echinococcus multilocularis	0
Pohjois- ja Itä-Suomi	Moose - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	2	1	Echinococcus canadensis – G10	1
	Reindeers - semi-domesticated - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Morphological identification	animal	13	0	Echinococcus	0
	Reindeers - semi-domesticated - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	population: meat inspected animals	Visual inspection	animal	41959	0	Echinococcus	0
	Reindeers - semi-domesticated - Slaughterhouse - Finland - animal sample - Surveillance - Official sampling - Suspect sampling		Morphological identification	animal	4	3	Echinococcus canadensis – G10	3
	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling		Real-Time PCR (qualitative or quantitative)	animal	21	9	Echinococcus canadensis – G10	9
Etelä-Savo (NUTS 2010-2013)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	2	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	4	0	Echinococcus multilocularis	0
Pohjois-Savo (NUTS 2010-2013)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	1	0	Echinococcus multilocularis	0
Pohjois-Karjala (NUTS 2010-2013)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	20	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	37	0	Echinococcus multilocularis	0
Lappi (NUTS 2010-2013)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	143	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	2	0	Echinococcus multilocularis	0
Pohjois-Pohjanmaa (NUTS 2016)	Foxes - wild - red fox - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	1	0	Echinococcus multilocularis	0
	Raccoon dogs - wild - Hunting - Not Available - animal sample - intestinal content - Surveillance - Official sampling - Objective sampling		PCR 12S rRNA	animal	2	0	Echinococcus multilocularis	0

Table Escherichia coli:ESCHERICHIA COLI 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	Cattle (bovine animals) - unspecified - Farm - Finland - animal sample - faeces - Control and eradication programmes - Official sampling - Suspect sampling	N_A	Other methods based on PCR detection of stx genes	herd/flock	7	7	STEC O111	1
							STEC O145	1
							STEC O157	3
							STEC O26	1
							STEC O84	1
	Cattle (bovine animals) - unspecified - Slaughterhouse - Finland - animal sample - faeces - Control and eradication programmes - Industry sampling - Objective sampling	N_A	OIE method for E.coli O157 in animal faecal samples	animal	574	16	STEC O157	16
	Cattle (bovine animals) - unspecified - Slaughterhouse - Finland - animal sample - faeces - Survey - Industry sampling - Objective sampling	N_A	In house real time PCR methods based on ISO/TS 13136:2012	animal	70	10	STEC O109	1
							STEC O145	1
							STEC O150	3
							STEC O168	1
							STEC O182	1
							STEC O2	1
							STEC O26	1
							STEC O5	1
							STEC O84	1
							STEC O91	1
							STEC, unspecified	1
	Gallus gallus (fowl) - broilers - Slaughterhouse - Finland - animal sample - caecum - Survey - Official sampling - Objective sampling	N_A	In house real time PCR methods based on ISO/TS 13136:2012	slaughter animal batch	301	0	Shiga toxin-producing Escherichia coli (STEC)	0

Table Escherichia coli:ESCHERICHIA COLI 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 bovine animals - carcase - Slaughterhouse - Finland - food sample - carcase swabs - Survey - Industry sampling - Objective sampling	single (food/feed)	1400	Square centimetre	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	85	9	STEC O136	1
									STEC O15	1
									STEC O168	2
									STEC O171	1
									STEC O2	1
									STEC O6	1
									STEC O84	1
									STEC O91	1
	Meat from bovine animals - fresh - Cutting plant - Finland - food sample - meat - Survey - Industry sampling - Objective sampling	single (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	17	0	Shiga toxin-producing Escherichia coli (STEC)	0

Table Francisella:FRANCISELLA 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	Hares - wild - Natural habitat - Not Available - animal sample - Monitoring - passive - Official sampling - Convenient sampling	N_A	Indirect Immunofluorescent Antibody test (IFAT)	animal	49	27	Francisella tularensis	27

Table Lyssavirus:LYSSAVIRUS 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
FINLAND	Badgers - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	7	0	Lyssavirus	0
	Bats - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	6	0	Lyssavirus	0
	Bats - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	72	0	Lyssavirus	0
	Bears - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Bears - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	3	0	Lyssavirus	0
	Bears - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	6	0	Lyssavirus	0
	Cats - pet animals - Unspecified - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	5	0	Lyssavirus	0
	Cattle (bovine animals) - Unspecified - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	3	0	Lyssavirus	0
	Dogs - pet animals - Unspecified - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	11	0	Lyssavirus	0
	Foxes - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	48	0	Lyssavirus	0
	Foxes - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	3	0	Lyssavirus	0
	Foxes - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	9	0	Lyssavirus	0
	Lynx - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	7	0	Lyssavirus	0
	Lynx - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	2	0	Lyssavirus	0
	Lynx - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	37	0	Lyssavirus	0
	Martens - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	2	0	Lyssavirus	0
	Martens - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Martens - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Otter - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	6	0	Lyssavirus	0
	Otter - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	3	0	Lyssavirus	0
	Otter - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	20	0	Lyssavirus	0
	Polecats - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	2	0	Lyssavirus	0
	Raccoon dogs - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	238	0	Lyssavirus	0

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
FINLAND	Raccoon dogs - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	6	0	Lyssavirus	0
	Raccoon dogs - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Raccoon dogs - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	5	0	Lyssavirus	0
	Sheep - Unspecified - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Wild boars - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Wolverine - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	2	0	Lyssavirus	0
	Wolves - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Wolves - wild - Natural habitat - Not Available - animal sample - Monitoring - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Wolves - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Objective sampling		Immunofluorescence assay tests (IFA)	animal	4	0	Lyssavirus	0
	Wolves - wild - Natural habitat - Not Available - animal sample - Surveillance - Official sampling - Suspect sampling		Immunofluorescence assay tests (IFA)	animal	12	0	Lyssavirus	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	Cattle (bovine animals) - breeding bulls - Farm - Finland - animal sample - faeces - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	Herds of origin of AI-bulls	Not Available	92	0	Salmonella	0
	Cattle (bovine animals) - unspecified - Farm - Finland - animal sample - faeces - Control and eradication programmes - Official sampling - Suspect sampling	herd/flock		N_A	Both faecal samples and environmental swab samples are taken	Not Available	75	5	Salmonella Enteritidis	1
									Salmonella Infantis	1
									Salmonella Typhimurium	3
									Salmonella Typhimurium, monophasic	1
	Cattle (bovine animals) - unspecified - Farm - Finland - animal sample - faeces - Monitoring - Industry sampling - Not specified	herd/flock		N_A	N_A	Not Available	3074	14	Salmonella Bispebjerg	1
									Salmonella Enteritidis	1
									Salmonella IIIb	1
									Salmonella Infantis	1
									Salmonella Kedougou	1
									Salmonella Konstanz	2
									Salmonella Nuorikkala	1
									Salmonella Typhimurium	7
	Cattle (bovine animals) - unspecified - Slaughterhouse - Finland - animal sample - lymph nodes - Control and eradication programmes - Industry sampling - Objective sampling	animal		N_A	N_A	Not Available	3229	1	Salmonella Enteritidis	1
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock		N	N_A	Not Available	3472	0	Salmonella	0
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	4117	1	Salmonella Infantis	1
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Official sampling - Census	herd/flock		N	N_A	Not Available	645	1	Salmonella Infantis	1
	Gallus gallus (fowl) - grandparent breeding flocks for egg production line - adult - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	2	0	Salmonella	0
	Gallus gallus (fowl) - grandparent breeding flocks for egg production line - day-old chicks - Farm - European Union - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	1	0	Salmonella	0
	Gallus gallus (fowl) - grandparent breeding flocks for egg production line - during rearing period - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		N_A	N_A	Not Available	1	0	Salmonella	0
	Gallus gallus (fowl) - laying hens - adult - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	875	1	Salmonella Enteritidis	1
	Gallus gallus (fowl) - laying hens - day-old chicks - Farm - Finland - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	150	0	Salmonella	0
	Gallus gallus (fowl) - laying hens - during rearing period - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		N_A	N_A	Not Available	155	1	Salmonella Typhimurium	1
	Gallus gallus (fowl) - laying hens - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		N_A	Small holdings outside the scope of Regulation 2160/2003, selling eggs only directly to final consumers	Not Available	234	2	Salmonella IIIb	1
									Salmonella Typhimurium	1
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	123	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - day-old chicks - Farm - European Union - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	26	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - during rearing period - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		N_A	N_A	Not Available	74	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for egg production line - adult - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	20	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for egg production line - day-old chicks - Farm - European Union - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	13	0	Salmonella	0
	Gallus gallus (fowl) - parent breeding flocks for egg production line - during rearing period - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		N_A	N_A	Not Available	14	0	Salmonella	0
	Pigs - breeding animals - Farm - Finland - animal sample - faeces - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	Nucleus and multipler herds	Not Available	31	0	Salmonella	0
	Pigs - breeding animals - Slaughterhouse - Finland - animal sample - lymph nodes - Control and eradication programmes - Industry sampling - Objective sampling	animal		N_A	N_A	Not Available	3225	2	Salmonella Derby	1
									Salmonella Montevideo	1
	Pigs - breeding animals - unspecified - boars - Farm - Finland - animal sample - faeces - Control and eradication programmes - Industry sampling - Census	animal		N_A	Quarantine of boar	Not Available	373	0	Salmonella	0
	Pigs - fattening pigs - Slaughterhouse - Finland - animal sample - lymph nodes - Control and eradication programmes - Industry sampling - Objective sampling	animal		N_A	N_A	Not Available	3328	2	Salmonella Derby	1
									Salmonella Enteritidis	1
	Pigs - unspecified - Farm - Finland - animal sample - faeces - Control and eradication programmes - Official sampling - Suspect sampling	herd/flock		N_A	Both faecal samples and environmental swab samples are taken	Not Available	41	2	Salmonella Derby	1
									Salmonella Montevideo	1

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	Pigs - unspecified - Farm - Finland - animal sample - faeces - Monitoring - Industry sampling - Not specified	herd/flock		N_A	Breeding herds (other than nucleus and multiplier), mixed herds, fattening pig herds	Not Available	426	3	Salmonella Enteritidis	1
									Salmonella Mbandaka	1
									Salmonella Typhimurium	1
									Salmonella Typhimurium, monophasic	1
	Turkeys - fattening flocks - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock		N	N_A	Not Available	242	0	Salmonella	0
	Turkeys - fattening flocks - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	298	0	Salmonella	0
	Turkeys - fattening flocks - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Official sampling - Census	herd/flock		N	N_A	Not Available	56	0	Salmonella	0
	Turkeys - parent breeding flocks - adult - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	N_A	Not Available	7	0	Salmonella	0
	Turkeys - parent breeding flocks - day-old chicks - Farm - European Union - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	N_A	Not Available	4	0	Salmonella	0
	Turkeys - parent breeding flocks - during rearing period - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		N_A	N_A	Not Available	6	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	Meat from bovine animals - carcase - Slaughterhouse - Finland - food sample - carcase swabs - Control and eradication programmes - Industry sampling - Objective sampling	single (food/feed)	1400	Square centimetre	N_A	Not Available	3268	0	Salmonella	0
	Meat from bovine animals - fresh - Cutting plant - Finland - food sample - meat - Control and eradication programmes - Industry sampling - Objective sampling	single (food/feed)	25	Gram	N_A	Not Available	1277	0	Salmonella	0
	Meat from broilers (Gallus gallus) - carcase - Slaughterhouse - Finland - food sample - neck skin - Control and eradication programmes - Industry sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	255	0	Salmonella	0
	Meat from broilers (Gallus gallus) - fresh - Cutting plant - Finland - food sample - meat - Control and eradication programmes - Industry sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	13	0	Salmonella	0
	Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - Processing plant - Finland - food sample - meat - Surveillance - HACCP and own check - Not specified	batch (food/feed)	25	Gram	N_A	Not Available	93	0	Salmonella	0
	Meat from broilers (Gallus gallus) - minced meat - intended to be eaten cooked - Processing plant - Finland - food sample - meat - Surveillance - HACCP and own check - Not specified	batch (food/feed)	25	Gram	N_A	Not Available	124	0	Salmonella	0
	Meat from pig - carcase - Slaughterhouse - Finland - food sample - carcase swabs - Control and eradication programmes - Industry sampling - Objective sampling	single (food/feed)	1400	Square centimetre	N_A	Not Available	6197	0	Salmonella	0
	Meat from pig - fresh - Cutting plant - Finland - food sample - meat - Control and eradication programmes - Industry sampling - Objective sampling	single (food/feed)	25	Gram	N_A	Not Available	1378	0	Salmonella	0
	Meat from turkey - carcase - Slaughterhouse - Finland - food sample - neck skin - Control and eradication programmes - Industry sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	55	0	Salmonella	0
	Meat from turkey - fresh - Cutting plant - Finland - food sample - meat - Control and eradication programmes - Industry sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	12	0	Salmonella	0
	Meat from turkey - meat preparation - intended to be eaten cooked - Processing plant - Finland - food sample - meat - Surveillance - HACCP and own check - Not specified	batch (food/feed)	25	Gram	N_A	Not Available	22	0	Salmonella	0
	Meat from turkey - minced meat - intended to be eaten cooked - Processing plant - Finland - food sample - meat - Surveillance - HACCP and own check - Not specified	batch (food/feed)	25	Gram	N_A	Not Available	20	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 cattle - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	48	0	Salmonella	0
	Compound feedingstuffs for cattle - final product - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	6	0	Salmonella	0
	Compound feedingstuffs for fish - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	3	0	Salmonella	0
	Compound feedingstuffs for fur animal - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	10	0	Salmonella	0
	Compound feedingstuffs for horses - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	2	0	Salmonella	0
	Compound feedingstuffs for horses - final product - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0
	Compound feedingstuffs for pigs - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	35	0	Salmonella	0
	Compound feedingstuffs for poultry (non specified) - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	33	0	Salmonella	0
	Compound feedingstuffs for poultry (non specified) - final product - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	3	0	Salmonella	0
	Compound feedingstuffs for sheep - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Compound feedingstuffs, not specified - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	11	0	Salmonella	0
	Feed material of cereal grain origin - barley derived - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of cereal grain origin - maize derived - Border Control Posts - Russia - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	4	1	Salmonella Infantis	1
	Feed material of cereal grain origin - maize derived - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of cereal grain origin - oat derived - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	4	0	Salmonella	0
	Feed material of cereal grain origin - oat derived - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	2	0	Salmonella	0
	Feed material of cereal grain origin - other cereal grain derived - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of cereal grain origin - wheat derived - Border Control Posts - Kazakhstan - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of cereal grain origin - wheat derived - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	6	0	Salmonella	0
	Feed material of land animal origin - dairy products - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	2	0	Salmonella	0
	Feed material of land animal origin - meat and bone meal - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of land animal origin - offal - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	9	0	Salmonella	0

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	Feed material of land animal origin - protein meal - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	4	0	Salmonella	0
	Feed material of marine animal origin - fish meal - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	2	0	Salmonella	0
	Feed material of oil seed or fruit origin - groundnut derived - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	3	0	Salmonella	0
	Feed material of oil seed or fruit origin - linseed derived - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of oil seed or fruit origin - linseed derived - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of oil seed or fruit origin - rape seed derived - Border Control Posts - Russia - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	19	3	Salmonella Muenster	2
									Salmonella Tennessee	1
	Feed material of oil seed or fruit origin - rape seed derived - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	2	0	Salmonella	0
	Feed material of oil seed or fruit origin - rape seed derived - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	10	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Border Control Posts - Brazil - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	2	1	Salmonella Minnesota	1
	Feed material of oil seed or fruit origin - soya (bean) derived - Border Control Posts - India - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	4	1	Salmonella Tennessee	1
	Feed material of oil seed or fruit origin - soya (bean) derived - Border Control Posts - Kazakhstan - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	2	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Border Control Posts - Russia - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	17	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of oil seed or fruit origin - sunflower seed derived - Border Control Posts - Russia - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	2	0	Salmonella	0
	Feed material of oil seed or fruit origin - sunflower seed derived - Border Control Posts - Ukraine - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Feed material of oil seed or fruit origin - sunflower seed derived - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	23	0	Salmonella	0
	Other feed material - legume seeds and similar products - Border Control Posts - India - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	N_A	Not Available	3	0	Salmonella	0
	Other feed material - other plants - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella	0
	Other feed material - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	27	1	Salmonella Infantis	1
	Other feed material - tubers, roots and similar products - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	2	0	Salmonella	0
	Other feed material - yeast - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	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	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Pet food - final product - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	35	0	Salmonella	0
	Pet food - final product - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	69	0	Salmonella	0
	Premixtures - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	Not Available	8	0	Salmonella	0

Table Staphylococcus:STAPHYLOCOCCUS AUREUS METICILLIN RESISTANT (MRSA) in animal

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 Attribute	Total Units Positive Attribute	Zoonoses	CC	Spa type	ML	Units positive
Not Available	Foxes - farmed - Unspecified - Finland - animal sample - Survey - Official sampling - Convenient sampling	herd/flock		Not Available	In order to verify if a herd is MRSA positive, two types of animal samples (nasopharyngeal and paw swab samples) were collected from the same animals. Nasopharyngeal samples: from the herd, one or two nasopharyngeal swab samples were taken. Individual nasopharyngeal swab sample represented one to four individual animals from whom the sampling was performed by the same swab stick. Paw swab samples: from the herd one or two paw swab samples were taken. Individual paw swab sample represented one to four individual animals from whom the sampling was performed by the same swab stick (one front paw/animal). The MRSA status of the herd was evaluated based on the results of both sample types. Animal samples were taken at autopsy from animals sent for pathological-anatomical diagnosis or for corona virus screening.	MRSA 1-step isolation method-excluding the selective enrichment step (similar but not identical to the EURL-AR protocol 2018)	11	0	Methicillin resistant Staphylococcus aureus (MRSA)				0

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 Attribute	Total Units Positive Attribute	Zoonoses	CC	Spa type	ML	Units positive
Not Available	Minks - farmed - Unspecified - Finland - animal sample - Survey - Official sampling - Convenient sampling	herd/flock		Not Available	In order to verify if a herd is MRSA positive, two types of animal samples (pharyngeal and paw samples) were collected from the same animals. Pharyngeal samples: from the herd, one or two pharyngeal swab samples were taken. Individual pharyngeal swab sample represented two to five individual animals from whom the sampling was performed by the same swab stick. Paw samples: from the herd one or two pooled paw samples were taken. A pooled paw sample consisted of paws taken from two to five individual animals (one front paw/animal). The MRSA status of the herd was evaluated based on the results of both sample types. Animal samples were taken at autopsy from animals sent for pathological-anatomical diagnosis or for corona virus screening.	MRSA 1-step isolation method-excluding the selective enrichment step (similar but not identical to the EURL-AR protocol 2018)	15	0	Methicillin resistant Staphylococcus aureus (MRSA)				0
	Raccoon dogs - Unspecified - Finland - animal sample - Survey - Official sampling - Convenient sampling	herd/flock		Not Available	In order to verify if a herd is MRSA positive, two types of animal samples (nasopharyngeal and paw swab samples) were collected from the same animals. Nasopharyngeal samples: from the herd, one nasopharyngeal swab sample was taken. Individual nasopharyngeal swab sample represented three animals from whom the sampling was performed by the same swab stick. Paw swab samples: from the herd, one paw swab sample was taken. Individual paw swab sample represented three animals from whom the sampling was performed by the same swab stick (one front paw/animal). The MRSA status of the herd was evaluated based on the results of both sample types. The sample was taken at autopsy from animals sent for pathological-anatomical diagnosis.	MRSA 1-step isolation method-excluding the selective enrichment step (similar but not identical to the EURL-AR protocol 2018)	1	0	Methicillin resistant Staphylococcus aureus (MRSA)				0

Table Toxoplasma:TOXOPLASMA 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	Cats - pet animals - Veterinary activities - Finland - Not Available - Clinical investigations - Official sampling - Convenient sampling	N_A	Histology	animal	268	0	Toxoplasma	0
	Dogs - pet animals - Veterinary activities - Finland - Not Available - Clinical investigations - Official sampling - Convenient sampling	N_A	Histology	animal	856	0	Toxoplasma	0
	Hares - wild - Natural habitat - Not Available - Not Available - Monitoring - passive - Official sampling - Convenient sampling	N_A	Histology	animal	177	3	Toxoplasma gondii	3
	Sheep - Farm - Finland - Not Available - Clinical investigations - Official sampling - Convenient sampling	N_A	Histology	animal	125	0	Toxoplasma	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	Bears - wild - Hunting - Finland - animal sample - organ/tissue - Surveillance - HACCP and own check - Not specified	Testing is done for hunter's own interest, but if meat is sold directly to consumers testing is mandatory	Not Available	animal	215	3	Trichinella nativa	3
	Bears - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - Official sampling - Convenient sampling	N_A	Not Available	animal	10	1	Trichinella, unspecified sp.	1
	Bears - wild - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Not Available	animal	69	4	Trichinella nativa	3
							Trichinella, unspecified sp.	1
	Pigs - breeding animals - not raised under controlled housing conditions - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Not Available	animal	32549	0	Trichinella	0
	Pigs - breeding animals - raised under controlled housing conditions - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Not Available	animal	93	0	Trichinella	0
	Pigs - fattening pigs - not raised under controlled housing conditions - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Not Available	animal	1884655	0	Trichinella	0
	Pigs - fattening pigs - raised under controlled housing conditions - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Not Available	animal	581	0	Trichinella	0
	Solipeds, domestic - horses - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Not Available	animal	817	0	Trichinella	0
	Wild boars - farmed - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Not Available	animal	164	0	Trichinella	0
	Wild boars - farmed - Unspecified - Finland - animal sample - organ/tissue - Surveillance - HACCP and own check - Not specified	N_A	Not Available	animal	72	0	Trichinella	0
	Wild boars - wild - Hunting - Finland - animal sample - organ/tissue - Surveillance - HACCP and own check - Not specified	Testing is done for hunter's own interest, but if meat is sold directly to consumers testing is mandatory	Not Available	animal	1152	1	Trichinella nativa	1
	Wild boars - wild - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	N_A	Not Available	animal	1	0	Trichinella	0
FINLAND	Badgers - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	9	3	Trichinella, unspecified sp.	3
	Beavers - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Crows - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Dogs - pet animals - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Eagle - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	6	0	Trichinella	0
	Foxes - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	210	35	Trichinella, unspecified sp.	35

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
FINLAND	Goshawk - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	12	1	Trichinella, unspecified sp.	1
	Hares - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	15	0	Trichinella	0
	Lynx - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	55	26	Trichinella, unspecified sp.	26
	Martens - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	7	3	Trichinella, unspecified sp.	3
	Mice - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Minks - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Otter - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	38	0	Trichinella	0
	Owls - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	17	0	Trichinella	0
	Polecats - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Raccoon dogs - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	195	62	Trichinella, unspecified sp.	62
	Seals - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0

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
FINLAND	White-tailed eagle - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	15	1	Trichinella, unspecified sp.	1
	Wolverine - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Wolves - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	29	11	Trichinella, unspecified sp.	11
Länsi-Suomi	Badgers - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Foxes - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	10	6	Trichinella, unspecified sp.	6
						0	Trichinella	0
	Goshawk - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Hares - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Lynx - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	7	3	Trichinella, unspecified sp.	3
	Martens - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	1	Trichinella, unspecified sp.	1
	Otter - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	9	0	Trichinella	0
	Owls - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	3	0	Trichinella	0

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
Länsi-Suomi	Raccoon dogs - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	14	4	Trichinella, unspecified sp.	4
	White-tailed eagle - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	7	1	Trichinella, unspecified sp.	1
	Wolves - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	2	Trichinella, unspecified sp.	2
Åland (NUTS level 2)	Wolves - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	1	Trichinella, unspecified sp.	1
Helsinki-Uusimaa (NUTS level 2)	Crows - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Foxes - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	5	1	Trichinella, unspecified sp.	1
						0	Trichinella	0
	Goshawk - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	4	1	Trichinella, unspecified sp.	1
	Hares - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	4	0	Trichinella	0
	Lynx - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	11	5	Trichinella, unspecified sp.	5
	Otter - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	4	0	Trichinella	0
	Owls - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0

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
Helsinki-Uusimaa (NUTS level 2)	Raccoon dogs - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	10	2	Trichinella, unspecified sp.	2
	White-tailed eagle - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	3	0	Trichinella	0
	Wolves - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
Etelä-Suomi (NUTS 2010-2013)	Badgers - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	7	3	Trichinella, unspecified sp.	3
	Foxes - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	28	13	Trichinella, unspecified sp.	13
						0	Trichinella	0
	Goshawk - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Hares - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Lynx - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	16	11	Trichinella, unspecified sp.	11
	Martens - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	5	2	Trichinella, unspecified sp.	2
	Mice - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Otter - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	4	0	Trichinella	0

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
Etelä-Suomi (NUTS 2010-2013)	Owls - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Raccoon dogs - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	135	47	Trichinella, unspecified sp.	47
	White-tailed eagle - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	4	0	Trichinella	0
	Wolves - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	5	5	Trichinella, unspecified sp.	5
Pohjois- ja Itä-Suomi	Badgers - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Beavers - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Dogs - pet animals - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Eagle - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	6	0	Trichinella	0
	Foxes - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	167	15	Trichinella, unspecified sp.	15
						0	Trichinella	0
	Goshawk - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	5	0	Trichinella	0
	Hares - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	8	0	Trichinella	0

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
Pohjois- ja Itä-Suomi	Lynx - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	21	7	Trichinella, unspecified sp.	7
	Minks - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Otter - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	21	0	Trichinella	0
	Owls - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	11	0	Trichinella	0
	Polecats - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Raccoon dogs - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	36	9	Trichinella, unspecified sp.	9
	Seals - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	White-tailed eagle - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	1	0	Trichinella	0
	Wolverine - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	2	0	Trichinella	0
	Wolves - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling		Mechanically assisted pooled sample digestion method/sedimentation technique	animal	20	3	Trichinella, unspecified sp.	3

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	Strong				Weak			
Causative agent	Food vehicle		N outbreaks	N human cases	N hospitalized	N deaths	N outbreaks	N human cases	N hospitalized	N deaths
Bacillus cereus	Mixed food						1	8	0	0
Bacterial toxins	Buffet meals						1	17	0	0
	Unknown						1	12	0	0
Campylobacter jejuni	Tap water, including well water		1	43	0	0				
Campylobacter, unspecified sp.	Mixed food						2	12	0	0
	Unknown						1	9	0	0
Clostridium perfringens	Soups		1	42	0	0				
Listeria monocytogenes	Meat, mixed meat - meat products - ready-to-eat		2	37	14	6				
Norovirus	Tap water, including well water		1	8	1	0				
	Mixed food		2	25	0	0	4	52	1	0
	Bakery products - cakes		1	7	0	0				
	Live bivalve molluscs - oysters						2	12	0	0
Salmonella Agona	Unknown						1	4	0	0
Salmonella Kedougou	Vegetables - pre-cut		1	7	2	0				
Salmonella Saintpaul	Mixed food						1	10	0	0
Sapporo virus	Buffet meals		1	124	0	0				
Shiga toxin-producing Escherichia coli (STEC)	Cheeses made from cows' milk		1	10	0	0				
Staphylococcal enterotoxins	Meat from bovine animals - meat products - ready-to-eat		1	5	1	0				
Unknown	Fish and fish products		1	80	0	0				
	Fruit, berries and juices and other products thereof						2	10	0	0
	Mixed food						5	37	0	0
	Unknown						2	23	0	0

Strong 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
Campylobacter jejuni	unk	Not Available	Not Available	Not Available	993	General	Tap water, including well water	N_A	Descriptive environmental evidence;Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans;Descriptive epidemiological evidence	Household	Water source	Unknown	Water treatment failure	N_A	1	43	0	0
Clostridium perfringens	unk	Not Available	Not Available	Not Available	969	General	Soups	pea soup with moose meat	Descriptive environmental evidence;Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent;Descriptive epidemiological evidence	Others	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Finland	Storage time/temperature abuse	N_A	1	42	0	0
Listeria monocytogenes	unk	Not Available	Not Available	Not Available	968	General	Meat, mixed meat - meat products - ready-to-eat	meat jelly and sausages	Product-tracing investigations;Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans;Descriptive epidemiological evidence	Multiple places of exposure in one country	Processing plant	Finland	Cross-contamination	N_A	1	23	0	4
					985	General	Meat, mixed meat - meat products - ready-to-eat	meat jelly	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans;Descriptive epidemiological evidence	Multiple places of exposure in one country	Processing plant	Finland	Unprocessed contaminated ingredient;Cross-contamination	N_A	1	14	14	2

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	unk	Not Available	Not Available	Not Available	918	General	Bakery products - cakes	the icing on the cake	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent;Descriptive epidemiological evidence	Household	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Finland	Infected food handler	N_A	1	7	0	0
					931	General	Mixed food	N_A	Descriptive epidemiological evidence	Others	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Infected food handler	N_A	1	18	0	0
					957	General	Mixed food	N_A	Descriptive environmental evidence;Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans;Descriptive epidemiological 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	Other contributory factor;Infected food handler	N_A	1	7	0	0
					979	General	Tap water, including well water	N_A	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans;Descriptive epidemiological evidence	Household	Water source	Finland	Untreated drinking water	N_A	1	8	1	0
Salmonella Kedougou	unk	Not Available	Not Available	Not Available	984	General	Vegetables - pre-cut	zucchini	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans;Descriptive epidemiological evidence	Residential institution (nursing home or prison or boarding school)	Farm	Spain	Unprocessed contaminated ingredient	N_A	1	7	2	0
Sapporo virus	unk	Not Available	Not Available	Not Available	925	General	Buffet meals	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	N_A	1	124	0	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
Shiga toxin-producing Escherichia coli (STEC)	unk	Adhesion genes investigation not reported	VT2, gene identified, subtype unspecified	Cryptosporidium	962	General	Cheeses made from cows' milk	cheese from unpasteurized milk	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Processing plant	France	Unprocessed contaminated ingredient;Inadequate heat treatment	N_A	1	10	0	0
Staphylococcal enterotoxins	unk	Not Available	Not Available	Not Available	961	General	Meat from bovine animals - meat products - ready-to-eat	kebab	Descriptive environmental evidence;Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent;Descriptive epidemiological evidence	Take-away or fast-food outlet	Take-away or fast-food outlet	Unknown	Storage time/temperature abuse;Other contributory factor	N_A	1	5	1	0
Unknown	unk	Not Available	Not Available	Not Available	974	General	Fish and fish products	fish terrine	Descriptive epidemiological evidence;Analytical epidemiological evidence	School or kindergarten	Unknown	Unknown	Unknown	N_A	1	80	0	0

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
Bacillus cereus	unk	Not Available	Not Available	Clostridium perfringens	933	General	Mixed food	minced meat and macaroni casserole	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent;Descriptive epidemiological evidence	School or kindergarten	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Storage time/temperature abuse	N_A	1	8	0	0
Bacterial toxins	unk	Not Available	Not Available	Not Available	975	General	Unknown	N_A	Descriptive epidemiological evidence	Unknown	Unknown	Unknown	Unknown	N_A	1	12	0	0
					994	General	Buffet meals	N_A	Descriptive environmental evidence; Descriptive epidemiological 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	Other contributory factor;Inadequate chilling	N_A	1	17	0	0
Campylobacter, unspecified sp.	unk	Not Available	Not Available	Not Available	965	General	Mixed food	N_A	Descriptive epidemiological evidence	Others	Unknown	Unknown	Unknown	N_A	1	7	0	0
					966	General	Mixed food	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	N_A	1	5	0	0
					970	General	Unknown	N_A	Descriptive epidemiological evidence	Unknown	Unknown	Unknown	Unknown	N_A	1	9	0	0
Norovirus	unk	Not Available	Not Available	Not Available	920	General	Mixed food	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	N_A	1	6	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
Norovirus	unk	Not Available	Not Available	Not Available	922	General	Mixed food	N_A	Descriptive environmental evidence; Descriptive epidemiological 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	Other contributory factor;Infected food handler	N_A	1	25	0	0
					935	General	Live bivalve molluscs - oysters	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Farm	France	Unprocessed contaminated ingredient	N_A	1	8	0	0
					941	General	Live bivalve molluscs - oysters	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Farm	France	Unprocessed contaminated ingredient	N_A	1	4	0	0
					950	General	Mixed food	N_A	Descriptive epidemiological evidence	Others	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Infected food handler	N_A	1	6	0	0
					977	General	Mixed food	N_A	Descriptive epidemiological evidence	Canteen or workplace catering	Unknown	Unknown	Unknown	N_A	1	15	0	0
Salmonella Agona	unk	Not Available	Not Available	Not Available	990	General	Unknown	N_A	Descriptive epidemiological evidence	Residential institution (nursing home or prison or boarding school)	Unknown	Unknown	Unknown	N_A	1	4	0	0
Salmonella Saintpaul	unk	Not Available	Not Available	Not Available	996	General	Mixed food	N_A	Descriptive epidemiological evidence	School or kindergarten	Unknown	Unknown	Unknown	N_A	1	10	0	0
Unknown	unk	Not Available	Not Available	Not Available	927	General	Mixed food	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	N_A	1	7	0	0
					952	General	Mixed food	N_A	Descriptive epidemiological evidence	Camp or picnic	Unknown	Unknown	Unknown	N_A	1	10	0	0
					953	General	Unknown	N_A	Descriptive epidemiological evidence	School or kindergarten	Unknown	Unknown	Unknown	N_A	1	6	0	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
Unknown	unk	Not Available	Not Available	Not Available	954	General	Mixed food	N_A	Descriptive environmental evidence; Descriptive epidemiological evidence	Household	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Other contributory factor	N_A	1	6	0	0
					971	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	N_A	1	17	0	0
					973	General	Fruit, berries and juices and other products thereof	frozen blueberries	Descriptive epidemiological evidence	Household	Unknown	Finland	Unknown	N_A	1	8	0	0
					976	General	Fruit, berries and juices and other products thereof	frozen blueberries	Descriptive epidemiological evidence	Household	Unknown	Finland	Unknown	N_A	1	2	0	0
					991	General	Mixed food	N_A	Descriptive environmental evidence; Descriptive epidemiological 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	Other contributory factor	N_A	1	4	0	0
					992	General	Mixed food	N_A	Descriptive environmental evidence; Descriptive epidemiological 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	Other contributory factor	N_A	1	10	0	0

ANTIMICROBIAL RESISTANCE TABLES FOR CAMPYLOBACTER

Table Antimicrobial susceptibility testing of Campylobacter jejuni in Cattle (bovine animals) - unspecified

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

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

Analytical Method:

Country of Origin: Finland

Sampling details:

	AM substance	Ciprofloxacin	Erythromycin	Gentamicin	Nalidixic acid	Streptomycin	Tetracycline
	ECOFF	**0.5**	**4**	**2**	**16**	**4**	**1**
	Lowest limit	**0.12**	**1**	**0.12**	**1**	**0.25**	**0.5**
	Highest limit	**16**	**128**	**16**	**64**	**16**	**64**
	N of tested isolates	**100**	**100**	**100**	**100**	**100**	**100**
MIC	**N of resistant isolates**	**29**	**0**	**0**	**29**	**1**	**12**
<=0.125		65					
0.25		6		10			
<=0.5							87
0.5				66		4	
<=1			100				
1				24		23	1
2					14	68	
4					35	4	
8		24			21		1
16		4			1		4
>16		1				1	
32							1
64					1		3
>64					28		3

Table Antimicrobial susceptibility testing of Campylobacter jejuni in Gallus gallus (fowl) - broilers

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Finland

Sampling details:

	AM substance	Ciprofloxacin	Erythromycin	Gentamicin	Nalidixic acid	Streptomycin	Tetracycline
	ECOFF	**0.5**	**4**	**2**	**16**	**4**	**1**
	Lowest limit	**0.12**	**1**	**0.12**	**1**	**0.25**	**0.5**
	Highest limit	**16**	**128**	**16**	**64**	**16**	**64**
	N of tested isolates	**5**	**5**	**5**	**5**	**5**	**5**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.125		5					
<=0.5							5
<=1			5				
1				5		3	
2						2	
4					5		

Table Antimicrobial susceptibility testing of Campylobacter jejuni in Gallus gallus (fowl) - broilers

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Finland

Sampling details:

	AM substance	Ciprofloxacin	Erythromycin	Gentamicin	Nalidixic acid	Streptomycin	Tetracycline
	ECOFF	**0.5**	**4**	**2**	**16**	**4**	**1**
	Lowest limit	**0.12**	**1**	**0.12**	**1**	**0.25**	**0.5**
	Highest limit	**16**	**128**	**16**	**64**	**16**	**64**
	N of tested isolates	**82**	**82**	**82**	**82**	**82**	**82**
MIC	**N of resistant isolates**	**3**	**0**	**0**	**3**	**0**	**2**
<=0.125		78					
0.25		1					
<=0.5							80
0.5				13		1	
<=1			82				
1				69		6	
2					1	65	
4					77	10	
8		3			1		
16							1
64					2		
>64					1		1

ANTIMICROBIAL RESISTANCE TABLES FOR SALMONELLA

Table Antimicrobial susceptibility testing of Salmonella Bispebjerg in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										1					
0.03							1								
<=0.25				1											1
<=0.5					1				1						
0.5														1	
<=2													1		
2		1													
<=4											1				
4			1					1							
<=8						1									
32												1			

Table Antimicrobial susceptibility testing of Salmonella Derby in Pigs - breeding animals

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - lymph nodes

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064										1					
<=0.25				1											
<=0.5					1				1						
0.5														1	1
2		1						1							
<=4											1				
4													1		
8			1												
16						1									
64												1			

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

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - lymph nodes

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							1								
<=0.03										1					
<=0.25				1										1	1
<=0.5					1				1						
<=1		1													
<=2													1		
2								1							
<=4											1				
4			1												
<=8						1									
16												1			

Table Antimicrobial susceptibility testing of Salmonella Derby in Pigs - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064										1					
<=0.25				1											
0.5														1	1
1					1				1						
<=2													1		
2		1						1							
<=4											1				
<=8												1			
8			1												
16						1									

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.064							1			1					
<=0.25				1										1	
<=0.5					1				1						
0.5															1
<=2													1		
2		1						1							
8			1								1				
16						1						1			

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.064							1			1					
<=0.25				1											
<=0.5					1				1						
0.5														1	1
<=1								1							
<=2													1		
2		1													
8			1								1				
16						1						1			

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Cattle (bovine animals) - unspecified

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - lymph nodes

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										1					
0.03							1								
<=0.25				1										1	1
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
4			1												
<=8						1									
16												1			

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

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - lymph nodes

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
<=0.03										1					
<=0.25				1											
0.25							1								
<=0.5					1				1						
0.5														1	1
<=1		1													
<=2													1		
4			1												
<=8						1									
8								1							
32												1			
>128											1				

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Pigs - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.064							1			1					
<=0.25														1	
<=0.5					1										
0.5				1											1
1									1						
<=2													1		
2		1						1							
8											1				
16			1			1						1			

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Gallus gallus (fowl) - laying hens - adult

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										1					
0.03							1								
<=0.25				1											
<=0.5					1				1						
0.5														1	1
<=1		1						1							
<=2													1		
<=4											1				
4			1												
<=8						1									
16												1			

Table Antimicrobial susceptibility testing of Salmonella IIIb in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.064							1			1					
<=0.25				1											
<=0.5					1				1						
0.5														1	1
<=2													1		
2		1						1							
<=8						1									
8											1				
16			1									1			

Table Antimicrobial susceptibility testing of Salmonella IIIb in Gallus gallus (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Census

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064										1					
<=0.25				1										1	1
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
<=8						1						1			
16			1												

Table Antimicrobial susceptibility testing of Salmonella Infantis in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: environmental sample

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							1								
<=0.03										1					
<=0.25				1										1	1
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
<=8						1									
8			1												
32												1			

Table Antimicrobial susceptibility testing of Salmonella Infantis in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064										1					
<=0.25				1											1
<=0.5					1										
0.5														1	
1									1						
<=2													1		
2		1						1							
<=4											1				
<=8						1									
8			1												
16												1			

Table Antimicrobial susceptibility testing of Salmonella Infantis in Gallus gallus (fowl) - broilers - before slaughter

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.064							1			1					
<=0.25				1											
<=0.5									1						
0.5														1	1
<=1								1							
1					1										
2		1													
4													1		
8											1				
16			1			1						1			

Table Antimicrobial susceptibility testing of Salmonella Kedougou in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: environmental sample

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064										1					
<=0.25				1											
<=0.5					1										
0.5														1	1
1									1						
<=2													1		
2		1						1							
8			1								1				
16						1						1			

Table Antimicrobial susceptibility testing of Salmonella Konstanz in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064							1			2					
<=0.25				2											
0.5														2	2
<=1		1						1							
1					2				2						
<=2													1		
2		1													
4								1					1		
8											2				
16			2			2									
32												2			

Table Antimicrobial susceptibility testing of Salmonella Mbandaka in Pigs - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064										1					
0.5				1										1	1
1					1				1						
<=2													1		
2		1						1							
<=4											1				
16			1			1									
32												1			

Table Antimicrobial susceptibility testing of Salmonella Montevideo in Pigs - breeding animals

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - lymph nodes

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064										1					
<=0.25				1											
<=0.5					1										
0.5														1	1
<=1								1							
<=2													1		
2		1							1						
<=4											1				
<=8						1									
8			1												
16												1			

Table Antimicrobial susceptibility testing of Salmonella Montevideo in Pigs - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.064										1					
<=0.25				1											
<=0.5					1										
0.5														1	1
<=1		1						1							
<=2													1		
2									1						
<=4											1				
<=8						1									
8			1												
16												1			

Table Antimicrobial susceptibility testing of Salmonella Nuorikkala in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.064							1			1					
<=0.25				1											
0.5														1	1
1					1				1						
2		1						1							
4													1		
8											1				
16			1			1						1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: environmental sample

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							1								
<=0.03										1					
<=0.25				1										1	1
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
4			1												
<=8						1									
16												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							2								
0.064										2					
<=0.25				2											
<=0.5					2										
0.5														2	2
<=1		1						1							
1									2						
<=2													2		
2		1						1							
<=4											2				
<=8						2									
8			2												
16												1			
32												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							1								
<=0.03										4					
0.03							6								
0.064										3					
<=0.25				7										3	3
<=0.5					7				6						
0.5														4	3
<=1		2						1							
1															1
<=2													7		
2		5						5	1						
<=4											5				
4			4					1							
<=8						7									
8			3								2				
16												4			
32												2			
64												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Pigs - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										1					
0.03							1								
<=0.25				1										1	1
<=0.5					1				1						
<=1		1													
<=2													1		
2								1							
<=4											1				
4			1												
<=8						1									
16												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Gallus gallus (fowl) - laying hens - during rearing period

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										1					
0.03							1								
<=0.25				1										1	1
<=0.5					1										
<=1		1						1							
1									1						
<=2													1		
<=4											1				
4			1												
<=8						1									
32												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Gallus gallus (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										1					
0.03							1								
<=0.25				1										1	
<=0.5					1				1						
0.5															1
<=1		1													
<=2													1		
<=4											1				
4			1					1							
<=8						1									
32												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium, monophasic in Cattle (bovine animals) - unspecified

Sampling Stage: Farm

Sampling Type: environmental sample

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										1					
0.03							1								
<=0.25				1										1	1
<=0.5					1				1						
<=1		1													
<=2													1		
2								1							
<=4											1				
<=8						1						1			
8			1												

Table Antimicrobial susceptibility testing of Salmonella Typhimurium, monophasic in Pigs - unspecified

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**
0.064							1			1					
<=0.5					1										
0.5				1										1	1
1									1						
2								1							
<=8						1									
8			1								1				
>64		1											1		
>1024												1			

ANTIMICROBIAL RESISTANCE TABLES FOR INDICATOR ESCHERICHIA COLI

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Minks - farmed

Sampling Stage: Unspecified

Sampling Type: animal sample - faeces

Sampling Context: Survey

Sampler: Official sampling

Sampling Strategy: Convenient sampling

Programme Code: OTHER ESBL MON pnl2

Analytical Method:

Country of Origin: Finland

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**	**0.064**	**0.5**	**0.125**	**32**
		Lowest limit	**0.06**	**0.25**	**0.06**	**0.5**	**0.25**	**0.12**	**0.015**	**0.12**	**0.03**	**0.5**
		Highest limit	**32**	**64**	**64**	**64**	**128**	**128**	**2**	**16**	**16**	**128**
		N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Ceftazidime synergy test	**Cefotaxime synergy test**	**MIC**	**N of resistant isolates**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**
Not Available	Not Available	<=0.03									1	
		0.03							1			
		0.12	1									
		0.25								1		
		2		1	1							
		4						1				
		8					1					
		16				1						1

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Minks - farmed

Sampling Stage: Unspecified

Sampling Type: animal sample - faeces

Sampling Context: Survey

Sampler: Official sampling

Sampling Strategy: Convenient sampling

Programme Code: OTHER ESBL MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							1								
<=0.03										1					
<=0.25														1	1
<=0.5									1						
<=2													1		
2				1				1							
<=4											1				
<=8						1						1			
8			1		1										
>64		1													

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Cattle (bovine animals) - unspecified

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON pnl2

Analytical Method:

Country of Origin: Finland

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**	**0.064**	**0.5**	**0.125**	**32**
			Lowest limit	**0.06**	**0.25**	**0.06**	**0.5**	**0.25**	**0.12**	**0.015**	**0.12**	**0.03**	**0.5**
			Highest limit	**32**	**64**	**64**	**64**	**128**	**128**	**2**	**16**	**16**	**128**
			N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
			N of resistant isolates	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**
Not Available	Not Available	<=0.015								1			
		<=0.03										1	
		0.12		1									
		0.25									1		
		1			1	1							
		4						1	1				
		8											1
		32					1						

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Cattle (bovine animals) - unspecified

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**189**	**189**	**189**	**189**	**189**	**189**	**189**	**189**	**189**	**189**	**189**	**189**	**189**	**189**
MIC	**N of resistant isolates**	**2**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**4**	**0**	**0**
<=0.015							170								
<=0.03										189					
0.03							19								
<=0.25				188										189	122
<=0.5					188				154						
0.5															62
<=1		8						155							
1									34						4
<=2			4										184		
2		52		1				34	1						1
<=4											186				
4		107	62		1								1		
<=8						185						159			
8		20	113								3				
16			10			4						26			
32												1			
>64		2											4		
>1024												3			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Cattle (bovine animals) - unspecified

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER ESBL MON pnl2

Analytical Method:

Country of Origin: Finland

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**	**0.064**	**0.5**	**0.125**	**32**
			Lowest limit	**0.06**	**0.25**	**0.064**	**0.5**	**0.25**	**0.12**	**0.015**	**0.12**	**0.03**	**0.5**
			Highest limit	**32**	**64**	**64**	**64**	**128**	**128**	**2**	**16**	**16**	**128**
			N of tested isolates	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
			N of resistant isolates	**7**	**9**	**5**	**5**	**9**	**5**	**0**	**0**	**0**	**0**
Not Available	Not Available	<=0.015								4			
		<=0.03										8	
		0.03								2			
		<=0.064				3							
		0.064								3		1	
		<=0.125							3		5		
		0.12		2		1							
		0.25		3					1		4		
		1				4		1					
		2		1	4		1						
		4			1	1		2	5				2
		8		2			3	5					6
		16						1					1
		32			1		4						
		>32		1									
		64			2		1						
		>64			1								

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Cattle (bovine animals) - unspecified

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER ESBL MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
MIC	**N of resistant isolates**	**9**	**1**	**9**	**9**	**1**	**2**	**0**	**0**	**0**	**0**	**3**	**3**	**0**	**1**
<=0.015							7								
<=0.03										9					
<=0.25														9	5
<=0.5									4						
0.5							2								3
<=1								9							
1					1				5						
<=2													5		
2				4	1										
<=4											8				
4			2		1								1		
>4				5											
<=8						8						6			
8			6		5						1				
>8					1										
>32															1
64		1	1												
>64		8											3		
>128						1									
>1024												3			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from broilers (Gallus gallus) - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method:

Country of Origin: Finland

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**	**0.064**	**0.5**	**0.125**	**32**
			Lowest limit	**0.06**	**0.25**	**0.06**	**0.5**	**0.25**	**0.12**	**0.015**	**0.12**	**0.03**	**0.5**
			Highest limit	**32**	**64**	**64**	**64**	**128**	**128**	**2**	**16**	**16**	**128**
			N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
			N of resistant isolates	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
Not Available	Not Available	<=0.03										1	
		0.064								1			
		<=0.125									1		
		0.12				1							
		0.5							1				
		2											1
		8					1	1					
		32		1									
		>64			1								

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from broilers (Gallus gallus) - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							1								
0.064										1					
<=0.25														1	1
<=0.5									1						
<=1								1							
<=2													1		
<=4											1				
4			1												
>4				1											
<=8						1						1			
8					1										
>64		1													

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Gallus gallus (fowl) - broilers

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**
MIC	**N of resistant isolates**	**7**	**0**	**0**	**0**	**0**	**8**	**0**	**1**	**0**	**8**	**6**	**16**	**0**	**3**
<=0.015							153								
<=0.03										170					
0.03							9								
0.12							3								
<=0.25				170										167	95
0.25							4								
<=0.5					170				123						
0.5														3	70
<=1		3						129							
1							1		45						1
<=2			1										150		
2		68						41	1						1
<=4											162				
4		83	79										4		
<=8						168						119			
8		9	79												
16			11			2						39			
32									1			6			
>32															3
64											5		9		
>64		7											7		

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**
MIC	**N of resistant isolates**	**7**	**0**	**0**	**0**	**0**	**8**	**0**	**1**	**0**	**8**	**6**	**16**	**0**	**3**
128											1				
>128											2				
>1024												6			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Gallus gallus (fowl) - broilers

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method:

Country of Origin: Finland

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	0.064	0.5	0.125	32
			Lowest limit	0.06	0.25	0.06	0.5	0.25	0.12	0.015	0.12	0.03	0.5
			Highest limit	32	64	64	64	128	128	2	16	16	128
			N of tested isolates	1	1	1	1	1	1	1	1	1	1
			N of resistant isolates	1	1	0	0	1	0	0	0	0	0
Not Available	Not Available	<=0.03										1	
		0.03								1			
		0.12				1							
		0.25							1		1		
		2						1					
		8					1						1
		>32		1									
		>64			1								

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Gallus gallus (fowl) - broilers

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Finland

Sampling Details:

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							1								
<=0.03										1					
<=0.25														1	1
<=0.5									1						
<=1								1							
<=2			1										1		
2					1										
<=4											1				
>4				1											
<=8						1						1			
>64		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

Programme Code	Matrix Detailed	Zoonotic Agent Detailed	Sampling Strategy	Sampling Stage	Sampling Details	Sampling Context	Sampler	Sample Type	Sampling Unit Type	Sample Origin	Comment	Total Units Tested	Total Units Positive
CARBAMON	Gallus gallus (fowl) - broilers	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Slaughterhouse	N_A	Monitoring - EFSA specifications	Official sampling	animal sample - caecum	slaughter animal batch	Finland	N_A	309	0
	Meat from broilers (Gallus gallus) - fresh - chilled	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Retail	N_A	Monitoring - EFSA specifications	Official sampling	food sample - meat	batch (food/feed)	Finland	N_A	296	0
OTHER CARBAMON	Cattle (bovine animals) - unspecified	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Slaughterhouse	N_A	Monitoring	Official sampling	animal sample - faeces	slaughter animal batch	Finland	N_A	295	0

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

Programme Code	Matrix Detailed	Zoonotic Agent Detailed	Sampling Strategy	Sampling Stage	Sampling Details	Sampling Context	Sampler	Sample Type	Sampling Unit Type	Sample Origin	Comment	Total Units Tested	Total Units Positive
OTHER CARBA MON	Foxes - farmed	Escherichia coli, non-pathogenic, unspecified	Convenient sampling	Unspecified	One or two faecal samples were taken from animals originating from the same herd. With one swab stick, sample was taken from one to four individual animals. Animal samples were taken at autopsy from animals sent for pathological-anatomical diagnosis or for corona virus screening.	Survey	Official sampling	animal sample - faeces	herd/flock	Finland	N_A	11	0

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

Programme Code	Matrix Detailed	Zoonotic Agent Detailed	Sampling Strategy	Sampling Stage	Sampling Details	Sampling Context	Sampler	Sample Type	Sampling Unit Type	Sample Origin	Comment	Total Units Tested	Total Units Positive
OTHER CARBA MON	Minks - farmed	Escherichia coli, non-pathogenic, unspecified	Convenient sampling	Unspecified	One or two faecal samples were taken from animals originating from the same herd. With one swab stick, sample was taken from two to five individual animals. Animal samples were taken at autopsy from animals sent for pathological-anatomical diagnosis or for corona virus screening.	Survey	Official sampling	animal sample - faeces	herd/flock	Finland	N_A	15	0

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

Programme Code	Matrix Detailed	Zoonotic Agent Detailed	Sampling Strategy	Sampling Stage	Sampling Details	Sampling Context	Sampler	Sample Type	Sampling Unit Type	Sample Origin	Comment	Total Units Tested	Total Units Positive
OTHER CARBA MON	Raccoon dogs	Escherichia coli, non-pathogenic, unspecified	Convenient sampling	Unspecified	One faecal sample was taken with one swab stick from three animals originating from the same herd. The sample was taken at autopsy from animals sent for pathological-anatomical diagnosis.	Survey	Official sampling	animal sample - faeces	herd/flock	Finland	N_A	1	0

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

Programme Code	Matrix Detailed	Zoonotic Agent Detailed	Sampling Strategy	Sampling Stage	Sampling Details	Sampling Context	Sampler	Sample Type	Sampling Unit Type	Sample Origin	Comment	Total Units Tested	Total Units Positive
OTHER ESBL MON	Foxes - farmed	Escherichia coli, non-pathogenic, unspecified	Convenient sampling	Unspecified	One or two faecal samples were taken from animals originating from the same herd. With one swab stick, sample was taken from one to four individual animals. Animal samples were taken at autopsy from animals sent for pathological-anatomical diagnosis or for corona virus screening.	Survey	Official sampling	animal sample - faeces	herd/flock	Finland	N_A	11	0

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

Programme Code	Matrix Detailed	Zoonotic Agent Detailed	Sampling Strategy	Sampling Stage	Sampling Details	Sampling Context	Sampler	Sample Type	Sampling Unit Type	Sample Origin	Comment	Total Units Tested	Total Units Positive
OTHER ESBL MON	Raccoon dogs	Escherichia coli, non-pathogenic, unspecified	Convenient sampling	Unspecified	One faecal sample was taken with one swab stick from three animals originating from the same herd. The sample was taken at autopsy from animals sent for pathological-anatomical diagnosis.	Survey	Official sampling	animal sample - faeces	herd/flock	Finland	N_A	1	0

Latest Transmission set

Table Name	Last submitted dataset transmission date
Animal Population	21-Jul-2022
Disease Status	21-Jul-2022
Food Borne Outbreaks	21-Jul-2022
Prevalence	05-Nov-2022

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1. Institutions and Laboratories involved in zoonoses monitoring and reporting

Finnish Zoonosis Centre
Finnish Zoonosis Centre forms a cooperation body between the Finnish Food Authority and the National Institute for Health and Welfare (THL). The Centre ensures a close cooperation between relevant experts in the field of animal health, human health, and food and feed safety. The Centre is responsible for the general coordination and officering of the report.

The Finnish Food Authority
The operation of the Finnish Food Authority focuses on ensuring the safety of food, promoting the health and welfare of animals and providing the required preconditions for plant and animal production as well as plant health. It is the central competent authority for food and feed control as well as for animal health and welfare control. Its duties also include surveillance activity, scientific research and risk assessment on food safety and animal diseases. It operates also as the national reference laboratory at its own field. It was responsible for the texts and tables of the report concerning animals, foodstuffs, feedstuffs, antimicrobial resistance, foodborne outbreaks and data on animal population and slaughtered animals.

Certified food laboratories and animal diagnostic laboratories
Laboratories analysing official samples, statutory own-check samples and samples taken for national control programmes are designated by the Finnish Food Authority. The competence assessments, i.e., accreditation of the laboratories are carried out by the Finnish Accreditation Service FINAS according to the international criteria EN ISO/IEC 17025.

2. Animal population

1. Sources of information and the date(s) (months, years) the information relates to

Data on holdings and live animals:
Bovines, sheep, goats, pigs, farmed wild boar: Finnish Food Authority Animal register, Situation as of 1.4.2020.
Pheasant, geese, mallard, ducks, deer: Animal keeping and holding place register, Situation as of 25.3.2021.
Poultry: Natural Resources Institute Finland: Statistics, Number of livestock 1.4.2020
Horses: Suomen Hippos, the Finnish Trotting and Breeding Association, year 2019.
Reindeers: Statistics of the Reindeer Herders' Association situation as of 31.5.2020, representing 2019/2020 reindeer herding year: 1 June-31 May.

Data on slaughtered animals: Meat inspection statistics of Finnish Food Authority and Regional State Administrative Agency of Lapland for the year 2020.

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

Bison are included in the total bovine population, but not in dairy cows and heifers or meat production animals. Mixed herds are counted as herds with both dairy and meat production animals on the same holding, animals in this category are also included in the other bovine population numbers. Holdings are counted as the number of locations housing animals. Wild boar, or pigs kept as a hobby (micropigs or minipigs) are not included in the pig categories. Breeding pigs includes sows, boar and young breeding pigs. Fattening pigs does not include piglets.

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

The number of bovine animal holdings has still decreased. In 2009 there were in average 54 bovine animals in a holding, whereas ten years later the number was 80, so the number of animals in a typical bovine holding has increased notably.

4. Geographical distribution and size distribution of the herds, flocks and holdings

Livestock production is concentrated in certain areas and, thus, there are large differences in livestock numbers between different parts of the country. Main areas for professional animal production especially for poultry and pigs are southern and western parts of the country. Dairy production is concentrated in Central Finland. Sheep farms are common also in northern Finland.

3. General evaluation: Brucellosis

1. History of the disease and/or infection in the country

Brucellosis in human is rare in Finland. In the 2000s, the annual number of reported human infections has varied between 0 - 2 (Finnish National Infectious Diseases Register), Two cases were reported only once in 2007. The origin of the infections remained unknown.

The last case of *Brucella abortus* in cattle was recorded in 1960. Ovine and caprine brucellosis (*B. melitensis*) has never been detected in Finland. Porcine brucellosis (*B. suis*) has never been detected in domestic pigs in Finland.

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

Finland has been granted the officially brucellosis free status of bovine herds according to the Council Directive 64/432/EEC. The disease-free status was established by Commission Decision 94/960/EC of 28 December 1994, confirmed by Commission Decision 2003/467/EC.

Finland has also been granted the officially brucellosis (*B. melitensis*) free status of sheep and goat herds, established by Commission Decision 94/965/EC of 28 December 1994.

Porcine brucellosis (*B. suis*) has never been detected in domestic pigs in Finland. In 2015 *B. suis* biovar 2 was isolated from wild boars.

Brucellosis has no relevance in public health in Finland. In 2020, no human cases were detected. The national situation remains favourable.

3. Additional information

Vaccination against brucellosis is prohibited in Finland.

Influence of special situation do to Covid-19 pandemic on Brucella testing:
During the year 2020 the sample collection from the Finnish bovine and small ruminant slaughterhouses was partly hindered due to the special situation. However, there was no significant difference in the number of samples collected at slaughter in 2020 compared to previous year. In addition, during the year 2020 sampling at sheep and goat farms for voluntary health monitoring programme for Maedi-Visna was partly hindered which might have had an impact on Brucella testing as well. However, there was no significant difference in the number of samples collected at farms in 2020 compared to previous year.

3.1. Description of Monitoring/Surveillance/Control programmes system: Brucella in bovine animals

1. Monitoring/Surveillance/Control programmes system

Testing strategy

The surveillance of *Brucella abortus* in Finland is based on active and syndromic surveillance targeted monitoring and investigation of suspect cases. Syndromic surveillance is conducted every second year.

For active surveillance, samples are collected from 10% of all dairy herds, the herds are selected randomly. For syndromic surveillance dairy herds with an increased number of abortions during the previous year are selected. The most recent survey of this type was performed during the year 2020.

Targeted monitoring of animals used for artificial insemination is performed annually. The monitoring is based on Decree No 1026/2013 of the Ministry of Agriculture and Forestry.

Investigation of suspect cases is targeted towards all bovine herds.

Methods of sampling

Bulk milk samples are taken from the herds of active surveillance of dairy herds and from the herds that are monitored for sending bulls to AI centers.

Blood samples are taken from the AI bulls before entering the quarantine accommodation of the semen collection centre, during the quarantine period and at the collection centre.

In suspect cases aborted foetus, placental tissue, vaginal mucus and/ or blood samples are collected from the cows that have aborted**.**

Diagnostic methods used

For serological investigation, the Rose Bengal test (RBT) on individual serum samples and the indirect ELISA test on bulk milk samples were used for the detection of antibodies against *Brucella*.

In case of positive result for blood in the Rose Bengal test, confirmation of the result by complement fixation test (CFT) was performed. If the indirect ELISA test of a bulk milk was positive, a new bulk milk sample was collected and retested by indirect ELISA test. If the new bulk milk sample was still positive, blood samples from 20 animals of the farm preferring animals with abortions or from animals in close contact with them, were collected and tested by RBT and the positive result obtained in RBT was confirmed by CFT. If the CFT test would be positive, the tissue samples from seropositive animals would have been cultured and investigated by bacteriological methods for the presence of *Brucella* bacteria. In 2020 there was no seropositive cases.

For bacteriological investigation tissue samples are cultured (and if *Brucella* bacteria would have been isolated the strain would be identified by a PCR method).

Case definition

The animal/herd is considered as seropositive when the confirmation test is positive. And the animal/herd is considered as infected when *Brucella* bacteria are isolated from tissue (culture and confirmation by PCR method).

2. Measures in place

Measures for *B. abortus*, *B. melitensis* and *B. suis* are defined in the Animal Disease Act No 441/2013 and the Decree No 19/2013 of the Ministry of Agriculture and Forestry. The measures include investigation of all suspected cases by the veterinary authority, notification procedures and movement restrictions of suspected animals and culling or slaughtering of the positive animals or herd in case of confirmed disease.

3. Notification system in place to the national competent authority

Brucellosis caused by *B. abortus, B. melitensis* and *B. suis* in cloven-hoofed animals is classified as a dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry, and as an immediately notifiable disease according to Degree 1010/2013 of the MAF.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

In 2020 the active surveillance program was performed for 1298 bulk milk samples from dairy farms. 37 bulk milk samples and 107 serum samples were tested related to targeted monitoring of AI bulls.

97 bacteriological examinations of animals from 72 farms, 108 blood samples of animals from 16 farms and 5 bulk milk samples from 3 farms, were tested by serological methods due to abortion or neonatal death.

All the result for *Brucella* bacteria or antibodies were negative.

No brucellosis cases in bovine animal were recorded in 2020.

3.2. Description of Monitoring/Surveillance/Control programmes system: Brucella in Sheep and Goat

1. Monitoring/Surveillance/Control programmes system

Testing strategy

An active surveillance program is performed and 25% of those sheep and goat farms, that keep over 10 ewes or nanny goats, are randomly selected, and samples are taken from the animals originating from those farms that send animals for slaughter. Blood samples, which are collected at the slaughterhouses aas part of the voluntary Maedi Visna/CAE health monitoring program, are tested for antibodies for *Brucella*.

In addition, targeted monitoring is performed on animals used for artificial insemination. The animal health requirements for semen of sheep and goats are in the Decree No 1032/2013 of the Ministry of Agriculture and Forestry.

In suspect cases, aborted foetus, placental tissue, vaginal mucus and/ or blood samples are collected from the ewes or female goats that have aborted.

Methods of sampling

From herds belonging to the voluntary Maedi Visna/CAE health monitoring program, blood samples are collected from live animals at farms, by a municipal veterinary officer. Additionally, blood samples are collected at slaughterhouses in the active surveillance program.

Monitoring of AI animals includes blood samples taken from live animals at the quarantine of the semen collection centre and at the semen collection centre.

In suspect cases blood or aborted foetus, placental tissue and vaginal mucus are collected from the aborted animals. Individual blood samples are taken by an official veterinarian.

Diagnostic methods used

For serological investigation, the Rose Bengal test (RBT) on individual serum sample is used for the detection of antibodies against *Brucella*. A positive RBT result is confirmed by a CFT test.
For bacteriological investigation, tissue samples are cultured (and if *Brucella* bacteria would have been isolated the strain would be identified by PCR method).

Case definition

An animal is considered seropositive when the confirmation test (CTF) is positive. The animal/herd is considered as infected when *Brucella* bacteria is isolated from tissue (culture and confirmation by PCR method).

2. Measures in place

Measures for *B. abortus*, *B. melitensis* and *B. suis* are defined in the Animal Disease Act No 441/2013 and the Decree No 19/2013 of the Ministry of Agriculture and Forestry, including investigation of all suspected cases by the veterinary authority, notification procedures and movement restrictions of suspected animals, and culling or slaughtering of the positive herd in case of confirmed disease.
The animal health requirements for semen of sheep and goats are in the Decree No 1032/2013 of the Ministry of Agriculture and Forestry.

3. Notification system in place to the national competent authority

Brucellosis caused by *B. abortus, B. melitensis* and *B. suis* in cloven-hoofed animals is classified as a dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry, and as an immediately notifiable disease according to Degree 1010/2013 of the MAF.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

In 2020 altogether 3449 animals were tested for *Brucella* antibodies in active surveillance program from slaughterhouses and Maedi-Visna/CAE health monitoring program, all with negative results.
In addition, bacteriological examination on organ samples of 13 animals from five sheep farms and 6 animals from one goat farm was performed due to abortion or neonatal death. All examined samples were negative for presence of *Brucella* bacteria.

No brucellosis cases in sheep and goat were recorded in 2020.

3.3. Description of Monitoring/Surveillance/Control programmes system: Brucella in pigs

1. Monitoring/Surveillance/Control programmes system

Testing strategy

For surveillance of porcine brucellosis, a targeted monitoring is performed on animals used for artificial insemination and farms that belong to the special level in the health classification register of swine herds. Also, animals that are imported or intended for export are tested. For farmed wild boar, there is a health monitoring program for African swine fever and those samples are also tested for brucellosis.

Passive surveillance is based on animals sampled due to abortion.

Methods of sampling

Boars used for artificial insemination are tested according to Decree No 1029/2013 of the Ministry of Agriculture and Forestry.

Farms that belong or are aiming to the special health status system of pigs send blood samples from slaughtered pigs according to the rules of Animal Health Association ETT. Those samples are also used for surveillance of brucellosis.

Blood samples from animals that are imported or exported are sampled on farms before export or after import.

In suspect cases, blood or aborted foetuses, placental tissue and vaginal mucus are collected from animals that have aborted. Individual blood samples from suspect animals are taken by an official veterinarian.

Diagnostic methods used

For serological testing, Rose Bengal test (RBT) or iELISA test on individual serum samples are used. Seropositive sample is always retested and confirmed by both serological tests.

For bacteriological investigation, tissue samples were cultured (and if *Brucella* bacteria would have been isolated the strain would be identified by PCR method).

Case definition

An animal is considered seropositive, if one of the serological confirmation tests is positive, and the animal is considered infected when *Brucella* bacteria is isolated from tissue (culture and confirmation by PCR method).

2. Measures in place

Control measures of *B. abortus*, *B. melitensis* and *B. suis* are defined in the Animal Disease Act No 441/2013 and in the Decree No 19/2013 of the Ministry of Agriculture and Forestry, including investigation of all suspected cases by the veterinary authority, notification procedures and movement restrictions of suspected animals and culling or slaughtering of the positive herd in case of confirmed disease.
The animal health requirements of semen of boars are in the Decree No 1029/2013 of the Ministry of Agriculture and Forestry.

3. Notification system in place to the national competent authority

Brucellosis caused by *B. abortus, B. melitensis* and *B. suis* in cloven-hoofed animals is classified as a dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry and as an immediately notifiable disease according to Degree 1010/2013 of the Ministry of Agriculture and Forestry .

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

In 2020 altogether 1637 blood samples collected from live animals or from slaughterhouses were tested for the presence of *Brucella* antibodies, all with negative results. This includes targeted

monitoring of AI boars and special health status level farms and also samples that are tested related to export and import. In addition, bacteriological examinations on organ samples of 12 animals from 4 farms due to abortion or neonatal death was performed, all with negative results.

No brucellosis cases in pigs were recorded in 2020.

4. General evaluation: Bovine Tuberculosis

1. History of the disease and/or infection in the country

In the 2000s, no human *Mycobacterium bovis* infections have been reported in Finland (National Infectious Disease registry).

Mycobacterium bovis was eradicated to a large extent during the 1960's. The last case of M. bovis infection in cattle in Finland was detected in one herd in 1982. Finland has been granted the officially tuberculosis free status of bovine herds according to Council Directive 64/432/EEC. The disease status was established by Commission Decision 94/959/EC of 28 December 1994, confirmed by Commission Decision 2003/467/EC in 2003.

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

Status as officially free of bovine tuberculosis during the reporting year. The entire country is free of the disease.

The national situation remains favourable. The risk of introducing infection from animals, feedingstuffs or foodstuffs to humans remains negligible.

4.1. Description of Monitoring/Surveillance/Control programmes system: Bovine tuberculosis in bovine animals and farmed deer

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Post mortem inspection is performed on all slaughtered animals and if there is a suspicion of tuberculosis, samples from organs with typical lesions are taken and sent for examination at the Finnish Food Authority by the competent authority (official veterinarian).

In case of a clinical suspicion, animals are tested by the intradermal tuberculin test or investigated by the pathological and bacteriological examination of suspect lymph nodes or lesions.

All AI-bulls are tested by intradermal tuberculin test within 28 days before entering the quarantine accommodation of a semen collection centre. The bulls are tested annually at the semen collection centre thereafter. In addition, samples are taken from all suspected cases.

Deer: In the voluntary control program the intradermal comparative testing is initially done three times (the minimum time between the first and the third testing is 12 months), then repeated at 24 to 30 months interval. An official veterinarian is responsible for performing the tests. At meat inspection, lymph nodes are collected from suspected animals. When tuberculosis is suspected at farm, a whole animal or its head and organs including lymph nodes from chest, abdomen and groin are sent for examination.

Type of specimen taken and diagnostical/analytical methods used
From a living animal biopsy of a lymph node or a whole lymph node can be taken.

From a dead animal one or more tuberculotic lesions are collected. These samples are divided into two parts, one of which is sent without preservatives and the other part in 10% buffered formalin solution.

Organ samples are investigated by histology, Ziehl-Neelsen staining and culture. If histology and Ziehl-Neelsen staining are negative, it is possible to omit to cultivate the sample.

Case definition
Bovine animals: The interpretation of official intradermal tuberculin tests (single intradermal test and intradermal comparative test) is performed according to 64/432/EEC, Annex B 2.2.5.2.
An animal is considered positive if *M*. *bovis* (or *M. caprae* or *M. tuberculosis* complex) is isolated.
In case of a suspicion in one animal, all the animals in the herd are investigated with intradermal testing, as defined above.

Deer: The interpretation of official intradermal tuberculin tests (single intradermal test and intradermal comparative test) in deer is performed as in bovine animals, according to 64/432/EEC, Annex B 2.2.5.2.
An animal is considered positive if *M. bovis* (or *M. caprae* or *M*. *tuberculosis complex*) is isolated.
In case of a suspicion in one animal, all the animals in the herd are investigated with intradermal testing, as defined above.

2. Measures in place

The control program/strategies in place
The measures for control of Mycobacterium bovis are in the Animal Diseases Act No 441/2013 and, in the Decree, No 27/2013 of the Ministry of Agriculture and Forestry, including investigation of all suspected cases by the veterinary authorities, notification procedures and movement restrictions of suspected animals and culling or slaughtering of the positive animals in case of confirmed disease.

The animal health requirements of semen of bulls are in the Decree No 1026/2013 of the Ministry of Agriculture and Forestry.

Deer: The voluntary control programme with regular intradermal testing of deer herds is described in the Government Decree No 838/2013, and in the Decree No 1005/2013 of the Ministry of Agriculture and Forestry.

Measures in case of the positive findings or single cases
Official restrictions: no trade of live animals, or reproductive cells, milk can be delivered only to an approved establishment for pasteurization. The culling or slaughtering of the positive animals, or all the animals in the herd, will be conducted. Epidemiological investigation is conducted, and contact herds investigated. Restrictions can be lifted after eradication; repopulation is permitted after the premises have been empty for 6 months. Alternatively, if all the animals in the herd are not culled, restrictions are lifted after all the remaining animals are tested twice with intradermal test.

Vaccination policy
Vaccination of animals against tuberculosis is prohibited in Finland.

3. Notification system in place to the national competent authority

Notification is mandatory. *Mycobacterium tuberculosis* complex -infections in cloven-hoofed animals are classified as dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry, and as an immediately notifiable disease according to Degree 1010/2013 of the Ministry of Agriculture and Forestry.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
No *Mycobacterium bovis* (or *M. caprae* or *M. tuberculosis* complex) were detected in cattle or farmed deer in 2020.

Altogether 260874 bovine animals were slaughtered and subjected to a routine post mortem examination. Samples were collected from two suspicious animals during meat inspection and from four animals during autopsy. All the samples were examined at the Finnish Food Authority with negative results.
In total**,** 46 intradermal tuberculin tests were performed on young bulls prior to their movement to a semen collection centre in another Member State, all with negative results.

No samples from farmed deer were sent to the Finnish Food Authority for bacteriological examination in 2020.

National evaluation of the recent situation, the trends and sources of infection
The situation remains favourable.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
The relevance seems to be negligible.

5. General evaluation: Campylobacteriosis

1. History of the disease and/or infection in the country

The annual number of human cases has shown a rising overall trend from 1995 to 2008. Since 2008 the annual number of reported human campylobacteriosis cases has varied between 3954 and 5099 and was lower than usual at 2074 in 2020[1]. Since 1998 campylobacters have been a more commonly reported cause of enteritis than salmonella. All Finnish broiler slaughterhouses have voluntarily monitored the prevalence of campylobacter in broilers at slaughter as a part of the own-check program since the 1990's. The national campylobacter monitoring program has been ongoing since 2004. The program consists of compulsory monitoring of broiler slaughter batches, interventions at slaughter and voluntary measures at the holdings.

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

National evaluation of the recent situation, the trends and sources of infection
Thermophilic campylobacters, especially Campylobacter jejuni, are the most common bacterial cause of human enteric infections in Finland. [2] A strong seasonal variation is typical for the incidence of campylobacteriosis, which is consistently highest in July. A high percentage of human campylobacter infections reported in Finland originate from travel abroad. However, the proportion of domestically acquired infections peaks in the summer season. [3] The prevalence of campylobacters in broiler slaughter batches peaks in July-August. Since the implementation of a national campylobacter monitoring program for broilers in 2004, the average prevalence of campylobacters in broiler slaughter batches has been around 5% during June-October and 1% during the rest of the year.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)
According to one study in the late summer, thermophilic campylobacters were detected in 20 to 30% of retail poultry meat of domestic origin. Poultry meat is considered as a source of campylobacters in a small proportion of the sporadic cases. Unpasteurized milk, poultry and contaminated drinking water have been suspected as sources of outbreaks in recent years. Campylobacters are an occasional finding in broiler cecum samples. It is therefore important to maintain a high level of hygienic practices when handling poultry at slaughter, and other stages in production as well as informing consumers about hygienic handling of meat in the kitchen.

3. Any recent specific action in the Member State or suggested for the European Union

The process hygiene criterion (Regulation (EC) No 2073/2005, Regulation (EU) No 2017/1495) for campylobacter was implemented in 2018. Slaughterhouses take neck skin samples for campylobacter analysis as part of the own-check programs.

[1] National Institute of Health and Welfare, 2021, Infectious disease register
[2] National Institute of Health and Welfare, 2021. Kampylobakteerin esiintyvyys. Available at: https://thl.fi/fi/web/infektiotaudit/seuranta-ja-epidemiat/tartuntatautirekisteri/tartuntataudit-suomessa-vuosiraportit/tautien-esiintyvyys/kampylobakteerin-esiintyvyys. Accessed 19 May 2021.
[3] National Institute of Health and Welfare, Report: Infectious diseases in Finland 2017, http://urn.fi/URN:ISBN:978-952-343-243-7

5.1. Description of Monitoring/Surveillance/Control programmes system: Campylobacter in animals- Gallus gallus (fowl) - broilers –animal sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Compulsory active monitoring of broiler slaughter batches. From June to October, when the prevalence is known to be highest, all broiler slaughter batches are sampled at slaughter. From January to May and from November to December, when the prevalence has consistently been low, random sampling of slaughter batches is performed according to a particular sampling scheme. Slaughterhouses are allocated the number of samples that should be taken during these months. The number of samples is proportional to the number of slaughtered broilers.

Frequency of the sampling
Census sampling of all broiler slaughter batches between June and October; random sampling (expected prevalence 1%, accuracy 1%, confidence level 95%) of broiler slaughter batches between January and May, and between November and December.

Type of specimen taken
Caecum samples taken at slaughter by the slaughterhouse staff as a mandatory part of the own check program.

Methods of sampling (description of sampling techniques)
Intact caeca from ten birds are taken. Caecal contents are pooled into one sample in the laboratory.

Case definition
The samples are analysed by private approved laboratories and suspected campylobacter isolates are sent to the national reference laboratory for confirmation. A slaughter batch is defined as positive after confirmation of isolation of Campylobacter jejuni or C. coli at the NRL.

Diagnostic/analytical methods used
EN ISO 10272-1

2. Measures in place

Vaccination policy
There is no vaccination against campylobacter in Finland.

Other preventive measures than vaccination in place
Strict biosecurity measures and production hygiene in holdings.

The control program/strategies in place
The Finnish campylobacter program is compulsory for all broiler slaughterhouses that slaughter more than 150 000 broilers per year.

Measures in case of the positive findings
If campylobacters are detected in two consecutive growing batches from the same holding, all the flocks from the holding will be slaughtered at the end of the day until slaughter batches from two consecutive growing batches are negative. Special attention to the production hygiene in the holding will be paid in cooperation with the local municipal veterinarian.

3. Notification system in place to the national competent authority

All positive flocks in the programme must be reported to the authorities according to MAF (Ministry of Agriculture and Forestry) Decree on Campylobacter Control of Broilers (10/EEO/2007). All suspected campylobacter isolates are sent to the national reference laboratory for confirmation.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
In 2020, a total of 1713 slaughter batches were sampled between June and October. Thermophilic campylobacters were detected in 85 (5 %) of these slaughter batches. Campylobacter jejuni was detected in 82, C. coli in two and C. lari in one slaughter batches. Between January-May and November-December, 331 slaughter batches were sampled in total and thermophilic campylobacters, C. jejuni, were detected in five (1,5 %) of these slaughter batches. These values are comparable to those in previous years.

National evaluation of the recent situation, the trends and sources of infection
The prevalence of campylobacter in Finnish broiler slaughter batches has been consistently low. Since the implementation of a national campylobacter monitoring programme for broilers in 2004, the average prevalence of campylobacters in broiler slaughter batches has been on average 5% during June-October and 1% during the rest of the year.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Consumption of poultry meat is considered as a source of campylobacter in part of the sporadic domestic human cases during the seasonal peak in summer.

5.2. Description of Monitoring/Surveillance/Control programmes system: Campylobacter in food- Gallus gallus (fowl) - broilers –food sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Slaughterhouses take neck skin samples according to Regulation (EC) No 2073/2005 (Regulation (EU) No 2017/1495) process hygiene criterion for campylobacter.

Frequency of the sampling
Sampling is included in the own-check program of the establishment and is done monthly in January to May and November to December and once a week in June to October.

Type of specimen taken
Neck skin samples taken by the slaughterhouse staff as a mandatory part of their own check program after slaughter.

Methods of sampling (description of sampling techniques)
Sampling is done according to Regulation (EC) No 2073/2005.

Case definition
A case is defined as a slaughter batch, from which Campylobacter jejuni or C. coli is found over the limit of 1000 cfu/g. Samples are analyzed by private approved laboratories.

Diagnostic/analytical methods used
EN ISO 10272-2

2. Measures in place

Vaccination policy
There is no vaccination against campylobacter in Finland.

Other preventive measures than vaccination in place
Strict biosecurity measures and production hygiene in holdings. Hygienic slaughter practices.

Control program/mechanisms
The Finnish campylobacter programme was introduced in June 2004. It is compulsory for all broiler slaughterhouses. High level of production hygiene at all stages of production and advice to consumers about hygienic practices in the kitchen.

Measures in case of the positive findings or single cases
Review of the slaughter process and improvements in slaughter hygiene.

3. Notification system in place to the national competent authority

All positive flocks in the monitoring programme are reported to the authorities.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
In 2020 a total of 595 neck skin samples were analysed. One of the samples was found to have campylobacters over the process hygiene criterion of 1000 cfu/g.

National evaluation of the recent situation, the trends and sources of infection
The prevalence of campylobacter in Finnish broiler slaughter batches has been consistently low. Since the implementation of a national campylobacter monitoring programme for broilers in 2004, the average prevalence of campylobacters in cecum samples of broiler slaughter batches has been on average 5% during June-October and 1% during the rest of the year. For neck skin samples data has been collected for only a few years so a trend cannot yet be seen. In the EU-baseline study in 2008, only one sample of broiler neck skin samples out of 369 was found to have campylobacter over 1000 cfu/g.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Consumption of poultry meat is considered as a source of campylobacter in part of the sporadic domestic human cases during the seasonal peak in summer.

6. General evaluation: *Coxiella burnetii* (Q fever)

1. History of the disease and/or infection in the country

Human Q-fever cases are rare in Finland. In the 2000s, the annual number of human cases have varied between 0-5 (Finnish National Infectious Diseases Register), and no human cases were reported in 2020. The origin of the infections remained unknown.

The first infection of *C. burnetii* in bovines in Finland was reported in 2008. The sample was collected at an artificial insemination center in connection to export investigations. Following this finding, several national surveys have been conducted to investigate *C. burnetii* antibodies in bovines, sheep and goats. In 2009 and 2018, the prevalence of *C. burnetii* antibodies in dairy herds, was investigated. In both years, antibodies were detected in less than 1% of the dairy herds tested by bulk milk samples. In 2018 also healthy meat cattle were tested in surveillance program. Seropositive blood samples were related to approximately 1% of the tested herds.

In 2010 and 2018 Q fever in sheep and goats was surveyed serologically. In 2010 all the samples from both sheep and goats were negative. In 2018 antibodies were detected in two sheep from the same farm which represents about 1% of the tested farms. All the samples from dairy goats were negative.

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

According to the results of the serological surveillance in 2018, the prevalence of Q fever in Finnish bovine, sheep and goat populations is very low.

No human cases were reported in 2020. The national situation remains favourable.

6.1. Description of Monitoring/Surveillance/Control programmes system: *Coxiella burnetii* (Q fever)

1. Monitoring/Surveillance/Control programmes system

Sampling strategy

Annual surveillance of Q fever in ruminants is targeted to holdings with abortions. Samples tested for antibodies against *Coxiella burnetii,* are taken passively in case of abortions from the aborted ruminants. Serological analyses are also performed as part of export investigation of healthy animals.

Type of specimen taken and diagnostical/analytical methods used
The blood samples taken from live animals at farm.

For serological investigations ELISA test is used.

Case definition
An animal is considered seropositive when the blood sample is positive in ELISA test.

2. Measures in place

No measures in place.

3. Notification system in place to the national competent authority
Q fever is classified as an immediately notifiable disease according to Decree 1010/2013 (amended 605/2016) of the Ministry of Agriculture and Forestry.
4. Results of investigations and national evaluation of the situation, the trends and sources of infection
In 2020, blood samples from 59 dairy cows representing 11 farms with increased number of abortions and 18 meat production animals representing one farm with increased number of abortions were collected and tested for the presence of antibodies to *C. burnetii.* All samples were negative**.** Also, one sample from sheep with unspecific symptoms was tested for the presence of antibodies to *C. burnetii* with negative result. The prevalence of *C. burnetii* in Finland is very low and the situation remains favourable.

7. General evaluation: Cysticercus

1. History of the disease and/or infection in the country

Taenia solium cysts (Cysticercus cellulosae) have never been found in Finland. Bovine cysticercosis caused by ***Taenia saginata*** (Cysticercus bovis) is very rare. Single cases have been reported in cattle in 1996 and 2002 (case was not confirmed). *Taenia solium* and *Taenia saginata* infections in humans are rare. Single cases may be travel related.

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

There is no indication of infection in Finland, therefor domestic bovine and pig meat are not considered a source of infection for humans.

3. Recent specific action in the Member State

Ongoing intensified meat inspection project to verify the rarity of Cysticercus cellulosae and cysticercus bovis in domestic cattle and investigating more closely the presence of *T. saginata* infection in bovines. The project started in 2020 and will continue in 2021.

7.1. Description of Monitoring/Surveillance/Control programmes system: Cysticercus in bovine animals, pigs and wild boar

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Meat inspection: All slaughtered pigs and cattle are inspected at meat inspection for cysticercus. All bovine masseter and heart muscles are examined as part of routine meat inspection at slaughter. If suspicious carcasses are found, samples are sent by the competent authority for histological examination and confirmation at the National Reference laboratory.

Additionally in 2020, meat inspection was intensified by a project, where inspection staff at slaughterhouses were actively collecting additional samples sent for confirmation at the National Reference laboratory.

Frequency of the sampling
Meat inspection: census of all slaughtered bovines and pigs. Additional samples were collected during November 2020 from randomly selected bovine animals at slaughter. The number of additional samples was allocated beforehand between slaughterhouses taking into consideration the capacity of the slaughterhouse. Additional samples were taken after meat inspection from slaughtered cattle (mainly dairy cows) over the age of four. A smaller proportion of samples were collected from Highland cattle over the age of 8 months.

Type of specimen taken
In case of suspicion and additional sampling the sample consists of a sample of masseter (2 cm x 3cm x 1cm) and heart (50-100g, right ventricle wall)) muscles.

Sampling stage
Sampling was done at the slaughterhouse after meat inspection.

Sampler
Samples were taken by the competent authority at the slaughterhouse.

Diagnostic methods used and case definition:
The samples are examined by a pathologist's visual inspection after making further incisions to the muscle samples. Diagnosis is confirmed by histological examination.

2. Measures in place

Control measures in place
Compulsory meat inspection for bovines, pigs and wild boar. Carcasses with findings are either frozen or condemned.

3. Notification system in place to the national competent authority

Infections in humans are not notifiable to health authorities. *Taenia solium* (Cysticercus cellulosae) in pigs is a notifiable disease according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. A suspicious finding in bovines or pigs at meat inspection must be confirmed at the National Reference Laboratory.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Cysticerci were not found in 2020 in either pigs or bovines by either routine meat inspection or by the enhanced meat inspection project. Domestic bovine and pig meat are not considered a source of infection for humans in Finland.

8. General evaluation: Echinococcosis

1. History of the disease and/or infection in the country

Echinococcus granulosus sensu lato was endemic in reindeer husbandry (reindeer - reindeer herding dog -cycle) but disappeared after the 1970's mainly because of the changes in reindeer husbandry rendering herding dogs redundant. In the early 1990's, echinococcosis started to re-emerge, then in the southeastern part of the Finnish reindeer husbandry area. The cycle now involves reindeer, elk (moose) and wolves, and the parasite has been recognised as *E. canadensis* G10 (syn. *E. granulosus* G10). Hitherto, no other definitive hosts have been identified. In Finland, *E. granulosus* does not occur in domestic production animals.

Echinococcus multilocularis has never been diagnosed in Finland. Finland is regarded as officially free from. *E. multilocularis* according to Commission Implementing Regulation (EU) 2018/878.

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

National evaluation of the recent situation, the trends and sources of infection

The low endemic *E. granulosus* strain in Finland has been described as genotype G10 (Fennoscandian cervid strain) which is nowadays considered to belong to the species *E. canadensis*. Known intermediate hosts in Finland are moose *Alces alces*, semi-domesticated reindeer *Rangifer tarandus* and wild forest reindeer *Rangifer tarandus fennicus*, while the wolf *Canis lupus* is the only definitive host in the wild. The occurrence of *E. canadensis* used to be restricted to the eastern part of the country. In the last decade, the wolf has steadily expanded its range to the west. The total number of wolves, however, has not increased markedly due to a decrease of wolves in the east. It seems that *E. canadensis* has followed its hosts. Positive moose from western Finland have been found since 2017. In the western wolf management district, one positive wolf was found both in 2018 and in 2019, but in 2020, almost half of the cases (5/11) were found there. New possible intermediate hosts, mainly the white-tailed deer *Odocoileus virginianus*, are abundant in Southwest Finland. So far, the zoonotic infection risk is characterized as very low and no new cases have emerged since 2015 when an autochthonous case of cystic echinococcosis caused by *E. canadensis* G10 was diagnosed in a child living in the endemic area. This was the first case of its kind in more than 50 years. The infection was most probably transmitted from a dog. Active monitoring is needed as well as information and education of the public. Monitoring is also needed for *E. multilocularis*, which is known to occur in neighbouring Estonia and was diagnosed in southern Sweden in 2010.

The rodent scientists at Natural Resources Institute Finland (LUKE) have performed long-term surveys to detect fluctuations of small mammal populations. In the survey, all animals are dissected, and their gross parasitological condition, including the presence of *E. multilocularis* cysts in liver, is checked. In addition, other researchers send liver samples from small mammals if they find something suspicious (usually Taeniid cysts) to the LUKE rodent scientists. In the LUKE survey in 2020, 1390 small mammals (voles) were studied. There were no findings.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Human infection risk from wildlife (wolf faeces) is regarded as very low due to low density of the wolf population. Infected domestic dogs would pose a more serious risk to humans. Therefore, it is recommended to treat hunting dogs with anticestodal drugs both prior to and after the moose hunting season. Moreover, it is recommended that cervid offal (especially lungs) is not given to dogs or that offal is only fed to dogs after thorough cooking.

8.1. Description of Monitoring/Surveillance/Control programmes system: Echinococcus in animals

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Mandatory meat inspection covers all known potential intermediate hosts of *E. granulosus* sensu lato slaughtered. In post-mortem inspection, lungs are palpated and incised to discover hydatid cysts. The cysts are sent to the Finnish Food Authority (FFA) for confirmation. In addition to samples from meat inspection, samples of the intermediate hosts of *E. canadensis* (moose, reindeer) are submitted by hunters or reindeer herders to examine the cause of death or disease. Most reindeer are slaughtered in a slaughterhouse and subject to meat inspection.

FFA performs surveillance of possible definitive wild hosts (foxes and raccoon dogs for *E. multilocularis*, wolves for *E. canadensis*) as part of targeted and general wildlife disease surveillance. These animals are either hunted or found dead or diseased in the nature.

The rodent scientists at Natural Resources Institute Finland (LUKE) perform long-term surveys twice a year at least on 50 locations to detect fluctuations of small mammal populations. All animals are dissected, and their gross parasitological condition, including the presence of *E. multilocularis* cysts in liver, is checked. In addition, other researchers send liver samples from small mammals if they find something suspicious (usually Taeniid cysts) to the LUKE rodent scientists. In the LUKE survey in 2020, 1390 small mammals (voles) were studied. Generally, small mammals are sampled from high-density habitat patches, preferred by foxes as hunting grounds. Species include bank vole *Myodes glareolus* (whole Finland), red and grey-sided voles *M. rutilus* and *M. rufocanus* (Lapland), field vole *Microtus agrestis* (whole Finland), sibling vole *M. rossiaemeridionalis* (*M. levis*) (south-central Finland), root vole *M. oeconomus* (Lapland), Norway lemming *Lemmus lemmus* (Lapland) and water vole *Arvicola amphibius*.

Frequency of the sampling
Continuous sampling.

Type of specimen taken
Definitive hosts: Faeces/ rectal content and intestine. Intermediate hosts: lungs, liver.

Methods of sampling (description of sampling techniques)
Definitive hosts: In connection of post-mortem examination, a piece of rectum containing faeces is taken for sample. Intestine is saved in freezer for possible confirmation of infection. Samples are frozen at -80 ˚C for a week to inactivate possible *Echinococcus* eggs.
Intermediate hosts: organs are inspected during meat inspection or pathological examination; voles are dissected, and livers inspected.

Case definition
Definitive host: Faeces/rectal contents positive by specific PCR or adult worms found in intestine.
Intermediate host: positive protoscolex finding in microscopic examination of cyst fluid or typical histology of cysts.

Diagnostic/analytical methods used
Definitive hosts: Species-specific PCR (12S rRNA) for the detection of *Echinococcus multilocularis* (fox and raccoon dog) or *E. canadensis* G10 (wolf) egg DNA in faeces or sedimentation and counting method.
Intermediate hosts: microscopy of cyst fluid and histology; PCR if deemed necessary.

2. Measures in place

The control strategies in place
Mandatory official meat inspection for surveillance of the disease and to remove infected tissues from the food chain. Examination of wild mammals for the monitoring of *E. multilocularis* and *E. canadensis*.

Other preventive measures in place
In accordance with the Commission Delegated Regulation (EU) 2018/772, imported dogs must be treated against echinococcosis 1-5 days before entering Finland. Alternatively, dogs can be treated regularly every 28 days. Dogs must have a microchip for identification and a pet passport in which treatments are marked. It is recommended to treat hunting dogs with anticestodal drugs both prior to and after the hunting season. Moreover, it is recommended that cervid offal (especially lungs) is not given to dogs or that offal is only fed to dogs after thorough cooking.

Measures in case of the positive findings or single cases
Organs with cystic echinococcosis are condemned at meat inspection and are so excluded from the food chain.

3. Notification system in place to the national competent authority

Echinococcosis is a notifiable disease in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. *Echinococcus multilocularis* is classified as an animal disease to be controlled according to Decree No 843/2013 of the Ministry of Agriculture and Forestry.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation including the origin of the positive animals
In 2020, hydatid cysts of *E. canadensis* were found in three reindeer at meat inspection and in one moose examined as part of wildlife disease monitoring. Eleven wolves out of 30 examined in wildlife disease monitoring were found positive for *E. canadensis*. The wolves were found dead or put down by special permissions. No *E. multilocularis* infections were found in foxes or raccoon dogs.

National evaluation of the recent situation, the trends and sources of infection
Echinococcus canadensis persists in the wolves and cervids of eastern Finland and has now established itself in the west. *Echinococcus multilocularis* has not been found in regular, national monitoring of definitive and intermediate hosts.
Human infection risk from wildlife (wolf faeces) is regarded as very low. Proper disposal of hunting offal from wild cervids is the key measure to reduce the transmission of *E. canadensis*.

9. General evaluation: Verotoxigenic E. coli (VTEC)

1. History of the disease and/or infection in the country

In 1996, an enhanced microbiological surveillance of VTEC infections was initialized in Finland and since then the reporting has been mandatory. There has been an upward trend in the incidence, and in the last five years it has varied from 2,25-5,6/100.000 inhabitants. About 40-80% of VTEC infections are considered domestically acquired and most of them are caused by VTEC nonO157.[4] Most human cases are sporadic or family-related infection and some of them have been associated with consumption of unpasteurized milk or with a contact to cattle farms. A compulsory control programme for all bovine slaughterhouses started in 2004 for VTEC O157. Since 2004, the prevalence of VTEC O157 in slaughtered bovines has been on between 0,2-3.2% of cattle examined. While the prevalence of VTEC O157 in slaughter cattle was clearly below 1.5% until 2012, in 2019 it exceeded 3%. A foodborne outbreak with STEC as a demonstrated causative agent was detected in 2016 (rucola used as garnishing for food servings, serotype ONT:H11 and O166:H28). In 2017 there was a small outbreak caused by VTEC O157 from homemade ground beef steaks made from domestic bovine meat. In 2012, unpasteurized milk and animal contact was associated with an outbreak caused by sorbitol-fermenting VTEC O157:H7. Cattle farm-associated small outbreaks have also occurred in Finland.

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

National evaluation of the recent situation, the trends, and sources of infection
The number of human infections caused by VTEC was stable during the first decade of the 21st century (yearly incidence 0.2-0,6 / 100 000). From 2013 onwards, the incidence has increased to between 1.2-5.6/ 100000.[5] The increase was partly due to changes in VTEC diagnostics and partly due to the development of laboratory methods (PCR). In 2020 the incidence in humans was 3.2/100000 and highest in young children (0-4 years, 7/100000).[6] 71 % of cases were classified as being of domestic origin.[7] Most human infections are sporadic, and their source remains unknown. Visiting farms and contacts with cattle are the major risk factors for infection, especially of young children.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)
An increase in the prevalence of VTEC O157 in slaughter cattle indicates an increasing risk in cattle production. The change has taken place since 2011, and it is statistically significant and the trend is still upward. The number of VTEC human cases is relatively low but the disease caused can be severe and lead to death. Cattle seem to be the major reservoir of VTEC. Same PFGE and cgMLST subtypes are detected among strains isolated from human infections and cattle, indicating that cattle might be a common source of human infections in Finland.

3. Any recent specific action in the Member State or suggested for the European Union

The national control programme on VTEC in cattle is renewed starting in May 2021.
More information is needed on potential control options especially on farms.

[4] National Institute of Health and Welfare, 2021, Infectious disease register
[5] National Institute of Health and Welfare, 2021, Infectious disease register
[6] National Institute of Health and Welfare, 2021. Enterohemorraginen Escherichia Colin (EHEC) esiintyvyys. Available at: https://thl.fi/fi/web/infektiotaudit/seuranta-ja-epidemiat/tartuntatautirekisteri/tartuntataudit-suomessa-vuosiraportit/tautien-esiintyvyys/enterohemorraginen-escherichia-colin-ehec-esiintyvyys. Accessed 19 May 2021.
[7] National Institute of Health and Welfare, 2021, Infectious disease register

4. Additional information

Surveys of STEC in broilers and cattle carcases were conducted in 2020. The coronavirus pandemic had an impact on the number of samples taken and farms investigated in the VTEC national control programme of cattle. The impacts are described in more detail in chapter 9.1 under results of the investigation.

9.1. Description of Monitoring/Surveillance/Control programmes system: Verotoxigenic E. coli (VTEC) in animal - Cattle (bovine animals) - animal sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Compulsory active monitoring of E. coli serotype O15 in slaughter bovines, since 2004.
Starting from 2015, at least 600 slaughtered bovines are sampled yearly by the industry. Samples are divided between all bovine slaughterhouses in relation to their slaughter capacity in the previous year. Sampling is evenly distributed throughout the year. Sampling at slaughter has an animal based approach, where the tested animals are randomly selected.

Cattle herds are tested passively as part of the epidemiological investigation of human infections with a known contact to animal farm, and as part of the cattle EHEC control program where the original herds of the bovines revealed E. coli O157 positive at slaughter. In these cases, a sufficient number of animals of the herd is tested to indicate if 5% of the herd carriers the bacteria or not. Sampling at the farm is carried out by the official municipal veterinarian.

Frequency of the sampling
Animals at farm: Case based
Animals at slaughter: Sampling distributed evenly throughout the year

Type of specimen taken
Animals at farm: Faeces and/or environmental swabs
Animals at slaughter: Faeces

Methods of sampling (description of sampling techniques)
Animals at farm: If possible, 50 g of faeces is taken from the rectum and placed in a plastic container and cooled to a temperature of 4 (+/-2)°C. The sample is sent to the Finnish Food Authority laboratory for analysis.
Animals at slaughter: 50 g of faeces is taken from the rectum and placed in a plastic container and cooled to a temperature of 4 (+/-2)°C. The sample is sent to an approved local laboratory for analysis. If VTEC is isolated at the local laboratory, the isolate is sent for confirmation and further typing to the Finnish Food Authority.

Case definition
Animals at farm: A herd is considered to be positive when VTEC O157 strain with the shigatoxin (stx1 and/or stx2) and adhesion genes (eae) or another VTEC-strain which has been connected to human cases is isolated from a sample.
Animals at slaughter: An animal is considered to be positive when VTEC O157 strain with the shigatoxin (stx1 and/or stx2) and adhesion genes (eae) is isolated from a sample.

Diagnostic/analytical methods used

Animals at farm: VTEC O157 was isolated according to ISO 16654:2001. Other VTEC were analysed using PCR based method detecting O serogroup specific genes, or the stx1, stx2 and eae genes.
Animals at slaughter: NMKL 164:2005 (ISO 16654:2001)

2. Measures in place

The control program/strategies in place
Compulsory monitoring of slaughter bovines, interventions at holdings of origin of positive slaughter animals, and voluntary measures at the farms and slaughterhouses. Interventions at farms are related to slaughter animal findings; the farm of origin of the positive slaughter bovine is traced and sampled. In addition, all bovine holdings which are suspected to be connected to human VTEC cases are sampled. In 2003, common guidelines were established by the authorities and by the industry. The guidelines were updated in 2006 and partly in 2014. They give recommendations of how to prevent spreading of VTEC at bovine holdings and slaughterhouses. According to the recommendations, a special risk management plan is designed by the official municipal veterinarian and the animal health care veterinarian for holdings that VTEC was confirmed on. The purpose of the plan is to minimize spread of infection to other animals, to neighbouring holdings and to people. If the farm does not follow the plan, the animals from the holding are slaughtered at the end of the working day with special attention to slaughter hygiene. Milk can be delivered only to establishments for pasteurization. The access of visitors to the farm is restricted (especially children).

Recent actions taken to control the zoonoses
The national control programme on VTEC in cattle is renewed starting in May 2021.

3. Notification system in place to the national competent authority

According to MAF (Ministry of Agriculture and Forestry) Decree on EHEC-sampling from bovines in slaughterhouses and on farms (24/EEO/2006) the national reference laboratory notifies all positive results to the competent authorities. EHEC infections in humans associated with farm animal contact must be notified to the competent veterinary authority.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
In 2020, 16 out of 574 samples (2.8%) from slaughtered cattle were detected to be positive for VTEC O157. The number of samples obtained was less than the usual 600, because sampling was halted in the spring of 2020 due to the special situation caused by coronavirus pandemic. In 7 out of 13 cases, investigation of the herd confirmed the source of the human infection. Investigations at farms were halted during the spring to avoid visits at farms. Due to this, some farms associated with human infections were not investigated. Also, since November, due to a lack of resources, human infections have not been traced to farm level, so some farms that may have been associated with human illness may not have been identified.

National evaluation of the recent situation, the trends and sources of infection
The general trend of positive findings in slaughtered animals has been increasing during the last few years.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Cattle seems to be the major reservoir of VTEC. Same PFGE and cgMLST subtypes are detected among strains isolated from human infections and cattle which could indicate that cattle might be a common source of human infections in Finland.

9.2. Description of Monitoring/Surveillance/Control programmes system: Shiga-toxin producing Escherichia coli – Broilers (Gallus gallus)

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
The samples were collected as part of the AMR *Escherichia coli* testing of broilers (described in chapter 29. General Description of Antimicrobial Resistance Monitoring; Escherichia coli – non-pathogenic – Gallus gallus of this report). The same samples were also used to screen STEC in broiler caeca. Caecal samples were collected from the four biggest slaughterhouses that account for >99% of all broilers slaughtered in Finland. The number of selected samples taken from each slaughterhouse was proportional to the annual slaughter volume. At the slaughterhouses samples were collected randomly so that each sample represented a different epidemiological unit (flock). One animal was sampled to represent the original flock of the animal (one epidemiological unit).

Frequency of the sampling
Altogether, 301 caecal samples were collected at slaughter from healthy animals between February and December in 2020. Due to COVID-19 pandemic, sampling was suspended from the beginning of April until the end of May. Sampling was originally planned to be evenly distributed throughout the study period, but adjustments were made to the sampling plan in autumn 2020, so that the target number of 300 samples was achieved. Samples were collected between Monday and Thursday and sent to the National Reference Laboratory for testing.

Type of specimen taken
The samples were taken aseptically and transported refrigerated to the laboratory within 2 days.

Sampling stage
Sampling was done at the slaughterhouse.

Sampler
Samples were taken by the competent authority at the slaughterhouse as official sampling.

Diagnostic methods used and case definition:
For the monitoring of STEC bacteria, the samples were screened by PCR according to ISO/TS 13136:2012 method. A sample was considered positive if *E. coli* strain harboring *stx*-gene was isolated.

2. Measures in place

No specific measures in place, proper slaughter hygiene measures to reduce faecal contamination of carcasses.

3. Notification system in place to the national competent authority

Findings that indicate a STEC-infection in an animal are notifiable to the competent authority according to Degree 1010/2013 of the Ministry of Agriculture and Forestry, providing that the finding can be reliably linked to the animal in question.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

All the studied 301 samples were negative for the presence of STEC. The presence of STEC in broilers has not previously been studied in Finland. STEC does not appear to be a common finding in broiler caeca.

9.3. Description of Monitoring/Surveillance/Control programmes system: Shiga-toxin producing Escherichia coli in bovines at slaughter

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
In 2020 a survey like pilot study was conducted by the Finnish Food Authority and two slaughterhouses in Finland to study the presence of STEC in different sample matrices (fecal, carcass swabs, meat) from bovines at slaughter. Samples were collected randomly.

Frequency of the sampling
Samples were taken between May and November 2020. Samples were collected on 17 sampling occasions, of which on 14 occasions, both fecal material and carcass swabs of the same animal were collected, so that the results could be paired. The samples were taken aseptically and transported refrigerated to the laboratory within 2 days.

Type of specimen taken.
Altogether 172 samples were taken, consisting of 85 swab samples of beef carcasses, 70 fecal and 17 meat samples. Two surface swab samples were taken from carcasses from a total area of 1400 cm^2 on one carcass and combined into a single sample. Fecal sample consisted of 10 g fecal material from one animal. Meat samples (25g) were collected from crushed meat taken from a cleaning tool of a conveyer belt, from tables or from a similar point at the cutting plant.

Sampling stage
Sampling was done at the slaughterhouse.

Sampler
Samples were taken by the slaughterhouse staff.

Diagnostic methods used and case definition
The samples were examined for STEC by enrichment in BPW at 37 °C either for 18-24 h (carcass and meat samples) or at 41,5 °C for 6 h (fecal samples) and following ISO/TS 13136:2012. The culture confirmation was done by plating on TBX, SHIBAM, CT-HAL and CHROM-STEC agars according to ISO/TS 13136:2012. A sample was considered positive if *E. coli* strain harboring *stx*-gene was isolated.

2. Measures in place

No specific measures in place, proper slaughter hygiene measures to reduce fecal contamination of carcasses.

3. Notification system in place to the national competent authority

Findings that indicate a STEC-infection in an animal are notifiable to the competent authority according to Degree 1010/2013 of the Ministry of Agriculture and Forestry, providing that the finding can be reliably linked to the animal in question. According to MAF (Ministry of Agriculture and Forestry) Decree on EHEC-sampling from bovines in slaughterhouses and on farms (24/EEO/2006) the national reference laboratory notifies all positive EHEC O157 results in bovines to the competent authorities.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Culture confirmed STEC was detected in 9/85 (11%), 10/70 (14%) and 0/17 (0%) of carcasses, fecal and meat samples, respectively. STEC was simultaneously detected in feces and carcass of the same animal in 3/14 sampling occasions. However, the genotypes of the strains isolated from feces and carcass of the same animal diverged. STEC was not detected in meat samples. This survey was a pilot study in preparation for a future national control program. The variety of the genotypes detected supported their potential of causing illnesses in humans.

5. Additional information

From May 2021 onward slaughterhouses will take STEC surface swab samples of carcasses as part of their own check programs.

10. General evaluation: Listeriosis (L. monocytogenes)

1. History of the disease and/or infection in the country

Since 2000 a total of 18-93 human listeriosis cases have been recorded annually. The annual incidence in humans has been 0,35 -1,68 per 100 000[8].

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

The number of human cases has increased significantly since 2009[9]. The actual source of infection is usually not identified but most cases are believed to be food-borne. Cold-smoked and gravad fishery products are considered to be risk foodstuffs.

3. Monitoring/Surveillance/Control programmes system

Sampling strategy
Food business operators monitor L. monocytogenes according to the Regulation 2073/2005, supplemented by sampling done by the municipal food control authorities. Additionally, national surveys on L. monocytogenes in food are carried out, but not annually. There was no data collection on listeria nationally for monitoring in 2020.

4. Measures in place

Implementation of the microbiological criteria for listeria of Regulation 2073/2005.

5. Notification system in place to the national competent authority

Infections in humans are reported to the national infection diseases register. Findings in food are sent to the national reference laboratory for confirmation.

6. Results of investigations and national evaluation of the situation, the trends and sources of infection

Infections and foodborne outbreaks caused by listeria are reported and investigated on a yearly basis.

[8] The National Institute of Health and Welfare, 2021. Infectious disease register.
[9] National Institute of Health and Welfare, 2021. Listerian esiintyvyys Suomessa. Available at: https://thl.fi/fi/web/infektiotaudit-ja-rokotukset/taudit-ja-torjunta/taudit-ja-taudinaiheuttajat-a-o/listeria/listerian-esiintyvyys-suomessa

11. General evaluation: Rabies

1. History of the disease and/or infection in the country

Human Rabies cases are rare in Finland. In the 2000s, only one human case of foreign origin in 2007 has been reported (National Infectious Disease Registry).

Rabies was common in the Finnish dog population at the beginning of the 20th century but the disease was eradicated from the country by vaccinating local dog populations during the 1950's. In April 1988, a local spot of essentially sylvatic rabies was discovered in south-eastern Finland. Between April 1988 and February 1989, a total of 66 virologically verified cases were recorded within a geographical area of 1 700 km^2. As a first measure the local dog population in the area, some 8 000 animals, were vaccinated against rabies at the expense of the state. At the same time, it was also highly recommended to vaccinate all other dogs. In co-operation with the WHO surveillance centre in Tübingen, Germany, a field campaign of oral vaccination of raccoon dogs and foxes was started in September 1988. During four distribution operations, the last one in the autumn 1990, a total of 200 000 Tübingen baits were distributed. In accordance with the WHO standards, Finland was declared rabies free in March 1991 after two years with no cases of rabies. Oral rabies vaccination is carried out annually in South East part of Finland.

Rabies in bats was suspected for the first time in 1985 when a bat researcher died. He had handled bats in several countries during the previous year and it could not be concluded where the researcher had become infected. Despite an epidemiological study in bats 1986 and subsequent rabies surveillance, bat rabies was not detected until 2009. The European Bat Lyssavirus-2 (EBLV-2) was isolated from the Daubenton's bat. Second case of EBLV-2 in a bat was detected in 2016. In 2017, a novel lyssavirus was detected in Brandt's bat and was designated as Kotalahti bat lyssavirus (KBLV).

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

Finland is free from rabies since 1991 in accordance with the OIE Terrestrial Animal Health Code. The present control of wildlife rabies appears successful and important. Rabies in bats and the import of animals from endemic areas, however, remains a risk, which can be reduced by increasing public awareness of the disease. As no sylvatic rabies cases were detected, the risk for humans is very low at this moment. Even though lyssaviruses in bats are present in Finland, the health risk to the public, which has little contact with bats, is very low, and in 2020 no human cases were reported

3. Any recent specific action in the Member State or suggested for the European Union

Oral vaccination campaigns and control program should be continued annually. Dogs imported from rabies endemic countries should be tested for rabies antibodies.

11.1. Description of Monitoring/Surveillance/Control programmes system: Rabies

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
The surveillance of rabies in pets is based on the detection of clinical signs, background information, and laboratory testing. Sampling of wildlife is a part of a permanent monitoring scheme to control the success of vaccination. Wild animals that are found dead in the nature or have shown signs that could be related to rabies are part of passive surveillance.

Indicator animals are animals that have been found dead or have exhibited symptoms that could be related to rabies. The hunting bag consist of animals hunted as healthy animals. Farm animals include animals kept for production. Natural habitat is wildlife.

Samples (whole animals) are sent by local veterinarians, hunters etc. and are sent to the Finnish Food Authority. Sample animals for the monitoring of the success of the vaccination campaign are collected in cooperation with the Finnish Wildlife Agency and local hunters and hunters' associations.

Type of specimen taken and diagnostical/analytical methods used
The tests carried out include an examination for rabies from the brains sample of the animals. The efficacy of rabies oral vaccination campaigns is evaluated by measuring the antibody response from a blood sample and bait uptake by detection of tetracycline from the teeth/jaw after vaccination in small carnivores (foxes and raccoon dogs), which are sent from the vaccination area.

Animal brain samples are analysed using the fluorescent antibody test (FAT). In cases of inconclusive results from FAT, or in all cases of human exposure, further tests (cell culture or polymerase chain reaction (PCR) tests) are performed.

Case definition
An animal is considered rabies positive when FAT and virus isolation / RT-PCR are positive. The identification of the agent will be supplemented by identifying any variant virus strains through sequencing of genomic areas.

The control program is approved by the European Commission and co-financed under the Regulation (EU) No 652/2014.

2. Measures in place

The control program/strategies in place
The competent authority for implementing the programme in Finland is the Finnish Food Authority. Tests included are performed at the national reference laboratory for rabies within the Finnish Food Authority. Implementation of the programme is controlled by information exchange, e.g. via e-mails and meetings with Ministry of Agriculture and Forestry. Locally the control/monitoring of rabies is carried out by regional veterinary officers and municipal veterinary officers in Finland.
The measures for control of rabies are in the Animal Diseases Act No 441/2013 and in the Decree No 724/2014 of the Ministry of Agriculture and Forestry (16.9.2014) including investigation of all suspected cases by the veterinary authorities, notification procedures and vaccination. In case of suspicion the animal must be isolated for two weeks or euthanized and sent to the Finnish Food Authority for laboratory analysis.

Vaccination policy
Vaccination against rabies is recommended for all dogs and cats. Dogs that are used in hunting, guide dogs, sniffer dogs, and dogs that are used by the police, the frontier guard and the army must be vaccinated against rabies (Decree No 724/2014, 16.9.2014). Dogs, cats and ferrets entering Finland shall be vaccinated against rabies in accordance with the Regulation (EC) No 576/2013 of the European Parliament and of the Council.
An annual programme for the immunisation of wild carnivores is carried out since 1989 in the South East border area. Since 2014 the vaccination campaign is carried out once in a year, in the autumn. 180 000 bait vaccines are distributed aerially in September-October over a 20-40 km wide and 350 km long zone along the south eastern border against Russia. The oral rabies vaccination programme is co-financed by the EU, based on Regulation (EU) No 652/2014 of the European Parliament and of the Council.

Measures in case of the positive findings or single cases

Public health authorities are notified in all cases where a human exposure is possible. If a positive case of rabies is found, the competent authority will take the necessary measures to destroy the carcass and carry out an epidemiological investigation to find other animals and people who might have come in contact with the infected animal. The measures taken in regard of those animals depend on the nature of the contact and on whether the animal had been vaccinated against rabies or not. The Finnish Food Authority, who is responsible for carrying out the oral vaccination campaign in wild animals, will decide on whether there is a need to enlarge the area or increase the frequency of the vaccination campaign.

3. Notification system in place to the national competent authority

According to the Finnish legislation rabies has been notifiable and controlled since 1922 (Act 338/22, 29 Dec 1922). Rabies is a notifiable disease in all animals and classified as a dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry (2.12.2013).

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
20 domestic animals were tested for rabies with negative results. 429 wild animals were tested, out of which 121 were indicator animals and 308 hunted animals. Also, 78 bats were analysed. Rabies was not detected.

From the oral rabies vaccination area, 288 foxes and raccoon dogs were analysed for biomarker, 208 were positive. Rabies vaccination antibodies were analysed from 234 foxes and raccoon dogs, 110 were positive.

National evaluation of the recent situation, the trends and sources of infection
Indigenous rabies has not been detected since 1989.
As no sylvatic rabies cases were detected, the risk for humans is very low at this moment. Illegal import of pet animals could pose a risk for the introduction of rabies Currently the infection pressure in wild carnivores species in Russia is, however, relevant and it poses a continuous risk for the reintroduction of the disease. The health risk to the general public, which has little contact with bats, is low.

12. General evaluation: Salmonellosis

1. History of the disease and/or infection in the country

The Finnish situation regarding Salmonella in feedingstuffs, animals and food of animal origin has been very favourable for years. When Finland joined the EU, the salmonella situation in Finland was markedly different from that of the rest of the EU (with the exception of the other Nordic countries). It was important to uphold the favourable Salmonella situation upon entering the EU. The program describes the ways in which the salmonella situation in animals and foodstuffs is monitored and the measures to be taken when Salmonella is isolated. It was approved by the commission in 1994.

The number of Salmonella cases in humans has decreased in the last 10 years. During the year 2020, there were 522 human cases (1182 in 2019). The incidence in Finland was 9/100000. 40 % of cases were domestically acquired. The incidence of domestically acquired cases was 3,8/100000 and the incidence for cases of foreign origin was 3.6/100000. [10]

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

Domestic foodstuffs of animal origin are not considered a significant source of salmonellosis in humans, as indicated by several source attribution studies[11], [12],[13] . A source attribution model of the reported human salmonellosis cases from 2008 to 2015 estimated that annually, about two thirds of the human cases represented the same salmonella subtypes as isolates found in some of the studied sources. The rest of the cases were attributed to unknown sources. The proportion of the total salmonella disease burden of domestic meat was estimated to be the highest for domestic beef at 14.4%, while domestic pork, turkey and broiler meat were at 9.3%, 5.2% and 2.2%, respectively. The total proportion of imported meat was higher than of domestic meat (9.8% imported turkey meat, 10.4% imported pork, 9.9% imported broiler meat, 5.7% imported beef). All other sources represented 33.1%.[14]

12.1. Description of Monitoring/Surveillance/Control programmes system: Salmonella in animals - Cattle (bovine animals) - animal sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
The Finnish Salmonella Control Programme: Cattle

[10] The National Institute of Health and Welfare, Infectious disease register.
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Slaughterhouse: At least 3000 animals are sampled each year randomly from the cattle population at the slaughterhouses. Sampling is carried out by the food business operator under supervision of the official veterinarian. All sampling at slaughterhouses has an animal based approach, not herd based.

Farm:
Targets of sampling: All animals that are sent to semen collection centres and the herds of origin of AI - bulls and heifers are sampled by the food business operator. All bovine holdings, which deliver over 2500 kg/year raw milk directly to the final consumers, as well as herds delivering raw milk to establishments from which milk is delivered to final consumers without any heat treatment, are sampled by the food business operator. All suspected herds (clinical symptoms or positive finding at slaughterhouse or other suspicion) are sampled at the farm by the official veterinarian. After a Salmonella finding positive herds are sampled several times by the food business operator during the sanitation and eradication process and at least once by the official veterinarian before the restrictions are lifted.

Frequency of the sampling

Animals at farm:
The animals sent to semen collection centres are sampled not more than one month before entering the quarantine accommodation of a semen collection centre and in the quarantine accommodation, before entering the semen collection centre.
The herds of origin of animals that are sent to semen collection centres are sampled not more than 12 months before the animal is sent to quarantine.
Bovine holdings, which deliver over 2500 kg/year raw milk directly to the final consumers or to establishments from which milk is delivered to final consumers without any heat treatment, are sampled annually (between July and November).

Animals at slaughter:
Sampling is distributed evenly throughout the year

Type of specimen taken

Animals at farm:
Routine sampling: faeces
Suspect sampling and sampling before restrictions are lifted: faeces and environmental swab samples

Animals at slaughter:
Lymph nodes

Methods of sampling

Animals at farm:
Sampling of herds sending animals to semen collection centers and holdings, which deliver raw milk: The number of faecal samples is dependent on the number of animals in the herd. In the herds with less than 40 animals all the animals are sampled. In the herds with 40-200 animals, the youngest or the most recently calved 40 animals are sampled and from the rest of the animals every second is sampled. In herds with over 200 animals, the youngest or the most recently calved 40 animals are sampled, from the next youngest 160 animals every second is sampled, and from the remaining animals every fifth is sampled. If there are animals suffering from diarrhoea, they are preferred in sampling. The samples of a maximum of 20 animals are pooled for analysis.
For herds sending animals to the semen collection center, a maximum of five pooled samples are taken in the regular sampling.
Sampling of suspected herds: Faecal sampling is carried out as described above. In addition, 5-50 environmental swab samples are taken from different areas of the premises, and a maximum of five samples from the same area or subject can be pooled for analysis. If feedstuffs are suspected to be

contaminated with Salmonella, they are analysed, and swab samples from the feeding systems are also taken.
Sampling of salmonella positive herds for lifting the restrictions: a faecal sample is collected from each animal, and a maximum of 20 samples may be pooled together for analysis. In addition, 10-100 environmental swab samples are taken from different areas of the premises, and a maximum of five samples from the same area or subject can be pooled for analysis.

Animals at slaughter:
From each carcass five ileo-caecal lymphnodes are taken. Lymph nodes are divided into two equal parts. Lymph node parts from five animals are pooled together for analyse. If the sample is positive, each of the five individual samples are analysed separately.

Case definition

Animals at farm:
A herd is positive if Salmonella spp. has been isolated from one or more faecal or environmental samples.

Animals at slaughter:
Animal is positive if Salmonella spp. has been isolated from a sample.

Diagnostic/analytical methods used

Animals at farm:
Bacteriological method: ISO 6579:2002/Amd 1:2007

Animals at slaughter:
ISO 6579:2002 or NMKL No 71:1999 or ISO 6579:2002 / Amendment 1:2007

2. Measures in place

Vaccination policy
Vaccination against Salmonella is not allowed in Finland.

Other preventive measures than vaccination in place
Biosecurity and production hygiene measures at holdings. Salmonella control of feedstuffs.

The control program/strategies in place
The Finnish Salmonella Control Programme approved by Commission Decision 94/968/EC of 28 December 1994.

Measures in case of the positive findings or single cases

At slaughterhouse: If a positive lymph node sample is detected in the slaughterhouse, the herd of origin is sampled by the official veterinarian.

At farm: Official restrictions: no trade of live animals except to a slaughterhouse (the meat is heat treated), or with special permission form the authorities, if the movement of animals is considered to cause no risk for transmission of Salmonella. In addition, milk can be delivered only to an approved establishment for pasteurization. Sanitation and eradication is carried out according to the holding specific plan. Restrictions are lifted after the herd has been negative in one environmental swab sampling and two consecutive fecal sampling sessions with an interval of 3-4 weeks. In certain situations, e.g. if just one faecal sample from a single animal, or just one environmental sample was positive for salmonella, faecal samples are taken only once. Epidemiological investigation is carried out

by the official veterinarian. Contact herds are sampled. Feedingstuffs and feeding systems are analysed for Salmonella if they are considered to be a possible source of the infection.

3. Notification system in place to the national competent authority

Salmonella is notifiable in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. Salmonella in cattle is classified as an animal disease to be controlled according to Decree No 843/2013 of the Ministry of Agriculture and Forestry. In accordance with the Animal Diseases Act (441/2013) laboratories must notify the positive results to the competent authority and to the food business operator. Laboratories must also notify positive results to the competent authority and to the food business operator according to MAF Decree on Salmonella Control in Meat Establishments (134/2012).

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Lymph node sampling at slaughterhouses: One positive sample (0,03%) was found (S. Enteritidis).

Herds: Salmonella was detected in 18 herds (11 x S. Typhimurium (of which one monophasic), 2 x S. Enteritidis, 2 x S. Konstanz, 2 x S.Infantis, 1 x Salmonella enterica ssp. diarizonae (S. ssp. IIIb), 1 x S. Bispebjerk, , 1 x S. Nuorikkala and 1 x S. Kedougou**.** One of these herds was positive already in 2019 (monophasic S. Typhimurium). In three herds two different serotypes were found: in one herd S. Enteritidis and S. Typhimurium, on one herd S. Enteritidis and S. Infantis and in one herd S. Infantis and S. Kedougou .

National evaluation of the recent situation, the trends and sources of infection
Salmonella situation in cattle has been favourable for years, as in the 2010s Salmonella has been detected in around 5-15 herds per year, In 2018 there was however an unusually high number of cases, and this trend continued in 2019, but in 2020, the number of salmonella cases in cattle decreased markedly, towards the normal level of occurrence. Out of the 17 positive new herds three were sampled due to clinical symptoms, one was a contact herd to another positive case, one was sampled after salmonella was cultured from samples of dead calves that were sent for obduction, and one after a positive lymph node finding in the slaughter house sampling. The remaining herds were found in other samplings (e.g. for selling of animals) done by the food business operator.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Despite the increase in cases of Salmonella in 2018-2019, the prevalence in slaughter animals has remained low, and cattle are not considered to be an important source of human salmonellosis cases in Finland.

12.2. Description of Monitoring/Surveillance/Control programmes system: Salmonella in animals - Gallus gallus (fowl) - broilers - animal sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
The Finnish Salmonella Control Programme: Broiler flocks

All broiler flocks are sampled at the holdings within three weeks before slaughter.
Sampling is carried out by the official veterinarian once a year at each holding otherwise the sampling is carried out by the food business operator. In addition, the flock is sampled by the official veterinarian every time when there is a reason to suspect that the flock is positive for Salmonella spp. There are also specific national rules for farms which deliver only small amount of broiler meat to the final consumer or to local retail establishments directly supplying the final consumer. At these farms, the flocks are sampled 1-4 times a year by the operator and every second or third year by the official veterinarian.

Frequency of the sampling
Broiler flocks: Before slaughter at farm
Within three weeks before slaughter

Type of specimen taken
Broiler flocks: Before slaughter at farm
Samples taken by the food business operator: boot swabs. Samples taken by the official veterinarian: boot swabs and dust or dust swab sample

Methods of sampling (description of sampling techniques)
Broiler flocks: Before slaughter at farm
Sampling by the food business operator: two pairs of boot swabs are taken. Both pairs are analysed separately.
Sampling by the official veterinarian: one pair of boot swabs and one dust sample or one dust swab sample are taken. Both samples are analysed separately. The sampling is in accordance with the Annex of Commission Regulation (EU) No 200/2012.

Case definition
Broiler flocks: Before slaughter at farm
A flock is considered to be positive when Salmonella spp. is isolated from any sample.

Diagnostic/analytical methods used
Broiler flocks: Before slaughter at farm
Bacteriological method: ISO 6579, latest version

2. Measures in place

Vaccination policy
Broiler flocks: Vaccination against Salmonella is not allowed in Finland.

Other preventive measures than vaccination in place
Broiler flocks: Strict biosecurity and production hygiene at holdings. Salmonella control of feedstuffs. 90% of flocks are treated with a competitive exclusion product as day-old chicks.

The control program/strategies in place
Broiler flocks: The Finnish Salmonella Control Programme, approved by Commission Decision 2008/815/EC

Measures in case of the positive findings or single cases
Broiler flocks: Before slaughter at farm
In the case of a positive finding the flock is destructed or slaughtered and the meat heat treated. The holding is cleaned and disinfected, official environmental samples are taken, negative results are required before restocking. Official epidemiological investigation is carried out.
Feedingstuffs are analysed for Salmonella, unless feed can unambiguously be ruled out as the cause of the infection, or if the role of feed in the infection has already been confirmed. The measures are the same for all salmonella serovars.

3. Notification system in place to the national competent authority

Salmonella has been notifiable since 1995. Salmonella is notifiable in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. Salmonella in *Gallus gallus* and in turkeys is classified as an animal disease to be controlled according to Decree No 843/2013 of the Ministry of Agriculture and Forestry. In accordance with the Animal Diseases Act (441/2013) the laboratory must notify the positive result to the competent authority and to the food business operator.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Salmonella was detected in one broiler flock in 2020 (0,02%). The serovar was *S*. Infantis.

National evaluation of the recent situation, the trends and sources of infection
The Salmonella situation has been very favourable in broiler flocks for years.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Domestic broiler meat is not considered to be an important source of human salmonellosis cases in Finland.

12.3. Description of Monitoring/Surveillance/Control programmes system: Salmonella in animals - Pigs - animal sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
The Finnish Salmonella Control Programme: Pigs
Targets of sampling:

Breeding herds:

At farm:
All nucleus and multiplier herds are sampled at the holding by the operators.
Suspected herds (clinical symptoms or a positive finding at the slaughterhouse or other suspicion) are sampled at the holding by the official veterinarian. After a Salmonella finding positive herds are sampled several times by the operator during the sanitation and eradication process and at least once by the official veterinarian before restrictions are lifted.

At slaughterhouse:
At least 3000 sows are sampled each year randomly from the sow population at the slaughterhouses. Sampling is carried out by the food business operator under supervision of the official veterinarian. Note! All sampling at slaughterhouses has an animal-based approach, not herd based.

Fattening herds:

At farm:
Suspected herds (clinical symptoms or a positive finding at the slaughterhouse or other suspicion) are

sampled at the holding by the official veterinarian. After a Salmonella finding herds are sampled several times by the operator during the sanitation and eradication process and at least twice by the official veterinarian before restrictions are lifted.

At slaughterhouse:
Alltogether 3000 fattening pigs are sampled each year randomly from the population at the slaughterhouses. Sampling is carried out by the food business operator under supervision of the official veterinarian. Note! All sampling at slaughterhouses has an animal-based approach, not herd based.

Frequency of the sampling

Breeding herds
At slaughterhouses: sampling distributed evenly throughout the year.
At farm: nucleus and multiplier herds once a year

Fattening herds at slaughterhouse:
Sampling at slaughterhouses distributed evenly throughout the year

Type of specimen taken

Breeding herds
At farm:
Routine sampling: faeces
Suspect sampling and sampling before restrictions are lifted: faeces and environmental swab samples
At slaughterhouse: lymph nodes

Fattening herds
At farm:
Suspect sampling and sampling before restrictions are lifted: faeces and environmental swab samples
At slaughterhouse: lymph nodes

M**ethods of sampling**

Breeding herds at farm: Routine sampling of nucleus and multiplier herds: Sows: One pooled sample is taken from every 100 sows or part of 100 sows. However, the maximum number of required pooled samples per holding is ten. Samples are preferably taken from nursing sows. Faecal samples of maximum of 20 animals may be pooled to one pooled sample for analysis. Growers, young breeding animals or weaned piglets (if present): Two faecal samples are taken from a group of 10-15 animals. A maximum of 20 samples from 5-15 pens may be pooled to one composite sample. The number of composite samples required from young animals is dependent on the number of sows at the holding, and the maximum number of composite samples is 15.
Suspected herds: Adult animals: Faecal sample is taken from every second nursing sow. The faecal samples of a maximum of 20 animals are pooled for analysis. From other adult animals one composite sample is taken from every 100 animals or part of 100 animals. Faecal samples of maximum of 20 animals may be pooled for analysis. Young animals (weaned piglets, growers, young breeding animals): One faecal sample is taken from each group of 10-15 animals. A maximum of 20 samples may be pooled for analysis. In addition, 5-50 environmental swab samples are taken from different areas of the premises, and a maximum of five samples from the same area or subject can be pooled for analysis. If feedstuffs are suspected to be contaminated with Salmonella, they are analysed, and swab samples from the feeding systems are also taken.
Sampling of salmonella positive herds for lifting the restrictions: Adult animals: Faecal sample is collected from every animal. A maximum of 20 samples may be pooled for analysis. Young animals: Two faecal samples are collected from each group of 10-15 animals. A maximum of 20 samples may be pooled for analysis. In addition, 10-100 environmental swab samples are taken from different areas

of the premises, and a maximum of five samples from the same area or subject can be pooled for analysis.
Slaughterhouse: From each carcass five ileo-caecal lymph nodes are taken. Lymph nodes are divided into two equal parts. Lymph node parts from five animals are pooled together for analysis. If the sample is positive each of the five individual samples are analysed separately.

Fattening herds at farm:
Suspected herds: One faecal sample is collected from each group of 10-15 animals. A maximum of 20 samples may be pooled for analysis. In addition, 5-50 environmental swab samples are taken from different areas of the premises, and a maximum of five samples from the same area or subject can be pooled for analysis. If feedstuffs are considered to be contaminated with Salmonella, they are analysed, and swab samples from the feeding systems are also taken.
Sampling of salmonella positive herds for releasing the restrictions: Two faecal samples are collected from each group of 10-15 animals, and a maximum of 20 samples may be pooled for analysis. In addition, 10-100 environmental swab samples are taken from different areas of the premises, and a maximum of five samples from the same area or subject can be pooled for analysis.

Fattening herds at slaughterhouse
From each carcass five ileo-caecal lymph nodes are taken. Lymph nodes are divided into two equal parts. Lymph node parts from five animals are pooled together for analysis. If the sample is positive each of the five individual samples are analysed separately.

Case definition
Breeding herds
A herd is positive if Salmonella spp. has been isolated from one or more faecal or environmental samples.

Fattening herds at farm
A herd is positive if Salmonella spp. has been isolated from one or more faecal or environmental samples.

Fattening herds at slaughterhouse
An animal is positive if Salmonella spp. has been isolated from a sample.

Diagnostic/analytical methods used
Breeding herds
Bacteriological method: ISO 6579:2002/Amd 1:2007

Fattening herds at farm
Bacteriological method: ISO 6579:2002/Amd 1:2007

Fattening herds at slaughterhouse ISO 6579:2002 or NMKL No 71:1999 or ISO 6579:2002 / Amendment 1:2007

2. Measures in place

Vaccination policy
Breeding herds: Vaccination against salmonella is not allowed in Finland.
Fattening herds: Vaccination against salmonella is not allowed in Finland.

Other preventive measures than vaccination in place
Breeding herds: Strict biosecurity and production hygiene at holdings. Salmonella control of feedstuffs.
Fattening herds: Strict biosecurity and production hygiene at holdings. Salmonella control of feedstuffs.

The control program/strategies in place
Breeding herds: The Finnish Salmonella Control Programme, approved by Commission Decision 94/968/EC of 28 December 1994.
Fattening herds: The Finnish Salmonella Control Programme, approved by Commission Decision 94/968/EC of 28 December 1994.

Measures in case of positive findings or single cases
At slaughterhouse: If a positive lymph node sample is detected in the slaughterhouse, the herd of origin is sampled by the official veterinarian. At farm: Official restrictions: no trade of live animals except to slaughterhouse (meat is heat treated), or with special permission form the authorities, if the movement of animals is considered to cause no risk for transmission of Salmonella. Sanitation and eradication is carried out according to the holding specific plan. Restrictions are released after herd has been negative in one environmental swab sampling and two consecutive fecal sampling sessions with 3-4 weeks intervals. In certain situations, e.g. if just one faecal sample from a single animal, or just one environmental sample was positive for salmonella, faecal samples are taken only once. Epidemiological investigation is carried out by the official veterinarian. Contact herds are sampled. Feedingstuffs and feeding systems are analysed for Salmonella if they are considered to be a possible source of the infection.

3. Notification system in place to the national competent authority

Salmonella in swine is classified as an animal disease to be controlled according to Decree No 843/2013 of the Ministry of Agriculture and Forestry. Salmonella is notifiable in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. In accordance with the Animal Diseases Act (441/2013) laboratory must notify the positive result to the competent authority and to the food business operator. The laboratory must also notify the positive result to the competent authority and to the food business operator according to MAF Decree on Salmonella Control in Meat Establishments (134/2012)

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Lymph node sampling at slaughterhouses: Two fattening pigs were positive (0,06%), one for serotype S. Enteritidis and the other for serovar S. Derby. One of these (positive for S. Enteritidis) originated from a fattening unit and the other (positive for S. Derby) from a holding with both breeding and fattening pigs. Two breeding pigs were positive (0,06%), one for serovar S. Derby and the other for serovar S. Montevideo.

Herds: Salmonella was detected in five herds. The serovars were 2 x S. Typhimurium, of which one was a monophasic strain, 1 x S. Derby, 1 x S. Montevideo, 1 x S. Enteritidis, and 1 x S. Mbandaka. In one herd two different serotypes were found: S. Mbandaka and monophasic Typhimurium. Two of these herds were positive already in 2019, one for S. Enteritidis and the other for two different serotypes, namely monophasic S. Typhimurium and S. Mbandaka.

National evaluation of the recent situation, the trends and sources of infection
The Salmonella situation in pigs has been very favourable for years and findings are rare. In the 2010s Salmonella has been detected in around 0-10 swine herds per year, although in 2019 there was a slight increase in Salmonella findings. Out of the 3 new positive herds in 2020, one was a contact herd to another positive case, one was sampled because of a positive lymph node finding at the slaughter house and one after salmonella was cultured from samples of dead piglets that were sent for obduction .

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source

of infection)
Pigs are not considered to be an important source of human salmonellosis cases in Finland.

12.4. Description of Monitoring/Surveillance/Control programmes system: Salmonella in animals - Gallus gallus (fowl) - flocks of laying hens

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Laying hens flocks:
Day-old chicks are sampled at the holding after arriving by the food business operator. Rearing flocks are sampled at the holding two weeks before the laying period by the food business operator. Production flocks are sampled at the holdings every 15 weeks by the food business operator. Sampling is carried out by the official veterinarian once a year at each rearing and laying holding. In addition, the flock is sampled by the official veterinarian every time when there is a reason to suspect that the flock is positive for Salmonella spp. There are specific national rules also for farms which deliver only small amount of eggs directly to the final consumers. At these farms, the flocks are sampled once or twice a year by the operator and every second or third year by the official veterinarian.

Frequency of the sampling
Laying hens: Day-old chicks
Every flock is sampled

Laying hens: Rearing period
Every flock is sampled two weeks before laying period

Laying hens: Production period
Every 15 weeks, first sampling at the age of 22-26 weeks

Type of specimen taken
Laying hens: Day-old chicks
linings of delivery boxes

Laying hens: Rearing period
faeces or boot swabs or faecal fabric swabs

Laying hens: Production period
faeces or boot swabs or faecal fabric swabs, dust or dust swab sample

Methods of sampling (description of sampling techniques)
Laying hens: Day-old chicks
Five internal lining papers are collected from delivery baskets and pooled together. If papers are not used five swab samples are taken.

Laying hens: Rearing period
Two pairs of boot swabs are taken and pooled to one. Alternative in non-cage multi-tier houses with manure belts between each tier: one pair of boot swabs and at least two faecal fabric swabs are taken and pooled to one. In cage flocks: two samples of 150 g of naturally mixed faeces or at least four faecal fabric swabs are collected and pooled to one.

Laying hens: Production period

Two pairs of boot swabs are taken and pooled to one. Alternative in non-cage multi-tier houses with manure belts between each tier: one pair of boot swabs and at least two faecal fabric swabs are taken and pooled to one. In cage flocks: two samples of 150 g of naturally mixed faeces or at least four faecal fabric swabs are collected and pooled to one. In official sampling also a dust sample (250 ml, 100 g) or a dust swab sample is taken. The sampling is in accordance with the Annex of Commission Regulation (EU) No 517/2011.

Case definition
Laying hens: Day-old chicks
Flock is considered to be positive if Salmonella spp. is isolated from any sample.

Laying hens: Rearing period
Flock is considered to be positive if Salmonella spp. is isolated from any sample.

Laying hens: Production period
Flock is considered to be positive if Salmonella spp. is isolated from any sample.

Diagnostic/analytical methods used
Laying hens: Day-old chicks
Bacteriological method: ISO 6579, latest version

Laying hens: Rearing period
Bacteriological method: ISO 6579, latest version

Laying hens: Production period
Bacteriological method: ISO 6579, latest version

2. Measures in place

Vaccination policy
Laying hens flocks:
Vaccination against Salmonella is not allowed in Finland.

Other preventive measures than vaccination in place
Laying hens flocks:
Strict biosecurity and production hygiene at holdings. Salmonella control of feedstuffs.

Control program/mechanisms
Laying hens flocks:
The Finnish Salmonella Control Programme approved by Commission Decision 2007/849/EC

Measures in case of the positive findings or single cases
Laying hens flocks:
In the case of a positive finding the flock is destructed or slaughtered and the meat heat treated. Eggs are destructed or heat treated. All the other flocks at the holding are sampled by the official veterinarian. The holding is cleaned and disinfected, official environmental samples are taken, negative results are required before restocking. Official epidemiological investigation is carried out. Feedingstuffs are analysed for Salmonella, unless feed can unambiguously be ruled out as the cause of the infection, or if the role of feed in the infection has already been confirmed. The measures are the same for all Salmonella serovars.

3. Notification system in place to the national competent authority

Salmonella has been notifiable since 1995. Salmonella is notifiable in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. Salmonella in *Gallus gallus* and in turkeys is classified as an animal disease to be controlled according to Decree No 843/2013 of the Ministry of Agriculture and Forestry. In accordance with the Animal Diseases Act (441/2013) the laboratory must notify the positive result to the competent authority and to the food business operator.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Salmonella was detected in one commercial flock of adult laying hens in 2020 (0,11%). The serovar was S. Enteritidis. In addition, Salmonella was detected in one rearing flock (0,65%) of laying hens. The serovar was S. Typhimurium. Salmonella was also detected in two holdings delivering eggs only directly to the final consumers. The serovars were S. Typhimurium and S. ssp. IIIb (*diarizonae*).

National evaluation of the recent situation, the trends and sources of infection
The Salmonella situation has been very favourable in flocks of laying hens for years. Usually 0-3 positive flocks have been detected yearly. S. Typhimurium has been the most common serovar.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Flocks of laying hens or eggs are not considered to be an important source of human salmonellosis cases in Finland.

12.5. Description of Monitoring/Surveillance/Control programmes system: Salmonella in animals - Gallus gallus (fowl) - breeding flocks, animal sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
The Finnish Salmonella Control Programme: Breeding flocks

Day-old chicks are sampled by the food business operator after arriving to the holding. Rearing flocks are sampled at the holding by the food business operator at four weeks old and two weeks before moving to laying unit or phase. Once a year samples are taken by the official veterinarian at each holding.
Adult breeding flocks – egg production line: Flocks are sampled every third week at the holdings by the food business operator and twice during the production cycle by the official veterinarian.
Adult breeding flocks - broiler production line: Flocks are sampled every second week at the holdings by the food business operator and twice during the production cycle by the official veterinarian.
In addition, a rearing and adult flock is always sampled by the official veterinarian if there is any reason to suspect that the flock is positive for Salmonella spp.

Frequency of the sampling
Breeding flocks: Day-old chicks: Every flock is sampled

Breeding flocks: Rearing period: Every flock is sampled at age of four weeks and two weeks before moving to laying unit

Breeding flocks: Production period:

Egg production line: Every flock is sampled at the holding every third week
Broiler production line: Every flock is sampled at the holding every second week

Type of specimen taken
Breeding flocks: Day-old chicks
Internal linings of delivery boxes

Breeding flocks: Rearing period
Boot swabs or faecal fabric swabs, in cage flocks: faeces or faecal fabric swabs

Breeding flocks: Production period
Boot swabs and dust swab sample or faecal fabric swabs, in cage flocks: faeces or faecal fabric swabs

Methods of sampling (description of sampling techniques)
Breeding flocks: Day-old chicks
Internal linings are collected from ten delivery boxes. Five papers are pooled together. If papers are not used swab samples from ten delivery boxes are taken. Five swab samples are pooled together.

Breeding flocks: Rearing period
Two pairs of boot swabs are taken. Both pairs are analysed separately. Alternative in non-cage multi-tier houses with manure belts between each tier: one pair of boot swabs and at least two faecal fabric swabs. The boot swab pair is analysed individually and the faecal fabric swabs are analysed as one pooled sample. In cage flocks: two samples of 150 g faeces (analysed separately) or at least four faecal fabric swabs (analysed as two pooled samples).

Breeding flocks: Production period
One pair of boot swabs and one dust sample collected by swab are taken. Both samples are analysed separately. Alternative in non-cage multi-tier houses with manure belts between each tier: one pair of boot swabs and at least two faecal fabric swabs. The boot swab pair is analysed individually and the faecal fabric swabs are analysed as one pooled sample). In cage flocks: two samples of 150 g faeces (analysed separately) or at least four faecal fabric swabs (analysed as two pooled samples). The sampling is in accordance with the Annex of Commission Regulation (EU) No 200/2010.

Case definition
Breeding flocks: Day-old chicks
Flock is considered to be positive when Salmonella spp. is isolated from any sample.

Breeding flocks: Rearing period
Flock is considered to be positive when Salmonella spp. is isolated from any sample.

Breeding flocks: Production period
Flock is considered to be positive when Salmonella spp. is isolated from any sample.

Diagnostic/analytical methods used
Breeding flocks: Day-old chicks
Bacteriological method: ISO 6579:2002, latest version

Breeding flocks: Rearing period
Bacteriological method: ISO 6579:2002, latest version

Breeding flocks: Production period
Bacteriological method: ISO 6579:2002, latest version

2. Measures in place

Vaccination policy
Breeding flocks:
Vaccination against Salmonella is not allowed in Finland.

Other preventive measures than vaccination in place
Breeding flocks:
Strict biosecurity and production hygiene at holdings. Salmonella control of feedstuffs.

The control program/strategies in place
Breeding flocks:
The Finnish Salmonella Control Programme approved by Commission Decision 2007/849/EC.

Measures in case of positive findings or single cases
Breeding flocks:
A positive flock is destructed or slaughtered and the meat heat treated. Hatching eggs are destructed or heat treated. All the other flocks at the holding are sampled by the official veterinarian. The holding is cleaned and disinfected, official environmental samples are taken, negative results are required before restocking. Official epidemiological investigation is carried out. Feedingstuffs are analysed for Salmonella, unless feed can unambiguously be ruled out as the cause of the infection, or if the role of feed in the infection has already been confirmed. The measures are the same for all Salmonella serovars.

3. Notification system in place to the national competent authority

Salmonella has been notifiable since 1995. Salmonella is notifiable in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. Salmonella in *Gallus gallus* and in turkeys is classified as an animal disease to be controlled according to Decree No 843/2013 of the Ministry of Agriculture and Forestry. In accordance with the Animal Diseases Act (441/2013) the laboratory must notify positive result to the competent authority and to the food business operator.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Salmonella spp. was not detected in *Gallus gallus* breeding flocks in 2020.

National evaluation of the recent situation, the trends and sources of infection
Salmonella situation has been very favourable in *Gallus gallus* breeding flocks for years.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Breeding flocks are not considered to be an important source of human salmonellosis cases in Finland

12.6. Description of Monitoring/Surveillance/Control programmes system: Salmonella in animals - Turkeys - breeding flocks and meat production flocks

1. Monitoring/Surveillance/Control programmes system

Sampling strategy

The Finnish Salmonella Control Programme: Breeding flocks and meat production flocks

Breedings flocks:
Day-old chicks are sampled by the food business operator after arrival to the holding. Rearing flocks are sampled at the holding by the food business operator at four weeks old and two weeks before moving to the laying unit or phase. Once a year samples are taken by the official veterinarian at each holding. Adult breeding flocks are sampled at the holding every second week by the food business operator and once during the production cycle by the official veterinarian. In addition, the rearing and adult breeding flock are always sampled by the official veterinarian if there is any reason to suspect that the flock is positive for Salmonella spp.

Meat production flocks:
The Finnish Salmonella Control Programme: All meat production flocks are sampled at the holding within three weeks before slaughter. The sampling result is valid for three weeks except for small producers the result is valid for six weeks. At each holding sampling is carried out by the official veterinarian once a year, otherwise sampling is carried out by the food business operator. In addition, the flock is always sampled by the official veterinarian if there is any reason to suspect that the flock is positive for Salmonella spp. There are also specific national rules for farms which deliver only small amount of turkey meat to the final consumer or to local retail establishments directly supplying the final consumer. At these farms, the flocks are sampled 1-4 times a year by the operator and every second or third year by the official veterinarian.

Frequency of the sampling
Breeding flocks: Day-old chicks: Every flock is sampled

Breeding flocks: Rearing period**:** Every flock is sampled at age of 4 weeks and 2 weeks before moving to the laying unit

Breeding flocks: Production period: Every flock is sampled at the holding every second week.

Meat production flocks:
Before slaughter at farm. Every flock is sampled within three weeks before slaughter.

Type of specimen taken
Breeding flocks: Day-old chicks: Internal linings of delivery boxes

Breeding flocks: Rearing period: boot swabs

Breeding flocks: Production period: boot swabs and dust swab sample

Meat production flocks:
Before slaughter at farm. Samples taken by the food business operator: boot swabs, Samples taken by the official veterinarian: boot swabs and dust or dust swab sample

Methods of sampling
Breeding flocks: Day-old chicks:
Internal linings are collected from ten delivery boxes. Five papers are pooled together. If papers are not used swab samples from ten delivery boxes are taken. Five swab samples are pooled together.

Breeding flocks: Rearing period:
Two pairs of boot swabs are taken. Both pairs are analysed separately.

Breeding flocks: Production period:

One pair of boot swabs and one dust sample collected by swab are taken. Both samples are analysed separately. The sampling is in accordance with the Annex of Commission Regulation (EU) No 1190/2012.

Meat production flocks:
Before slaughter at farm. Sampling by the food business operator: two pairs of boot swabs are taken. Both pairs are analysed separately. Sampling by the official veterinarian: one pair of boot swabs and one dust or one dust swab sample are taken. Both samples are analysed separately. The sampling is in accordance with the Annex of Commission Regulation (EU) No 1190/2012.

Case definition
Breeding flocks: Day-old chicks
A flock is considered to be positive when Salmonella spp. is isolated from any sample.

Breeding flocks: Rearing period
A flock is considered to be positive when Salmonella spp. is isolated from any sample.

Breeding flocks: Production period
Flock is considered to be positive when Salmonella spp. is isolated from any sample.

Meat production flocks: Before slaughter at farm
Flock is considered to be positive when Salmonella spp. is isolated from any sample.

Diagnostic/analytical methods used
Breeding flocks: Day-old chicks
Bacteriological method: ISO 6579:2002. latest version

Breeding flocks: Rearing period
Bacteriological method: ISO 6579:2002, latest version

Breeding flocks: Production period
Bacteriological method: ISO 6579:2002, latest version

Meat production flocks: Before slaughter at farm
Bacteriological method: ISO 6579:2002, latest version

2. Measures in place

Vaccination policy
Breeding flocks:
Vaccination against salmonella is not allowed in Finland.

Meat production flocks:
Vaccination against salmonella is not allowed in Finland.

Other preventive measures than vaccination in place
Breeding flocks:
Strict biosecurity and production hygiene in holdings. Competitive exclusion. Feedstuff control.

Meat production flocks:
Strict biosecurity and production hygiene in holdings. Competitive exclusion. Feedstuff control.

Control program/mechanisms
Breeding flocks:
The Finnish Salmonella Control Programme approved by Commission Decision 2009/771/EC.

Meat production flocks:
The Finnish Salmonella Control Programme approved by Commission Decision 2009/771/EC.

Measures in case of positive findings or single cases
Breeding flocks:
In case of a positive finding the flock is destructed or slaughtered and the meat heat treated. Hatching eggs are destructed or heat treated. All the other flocks at the holding are sampled by the official veterinarian. The holding is cleaned and disinfected, official environmental samples are taken, negative results are required before restocking. Official epidemiological investigation is carried out. Feedingstuffs are analysed for Salmonella, unless feed can unambiguously be ruled out as the cause of the infection, or if the role of feed in the infection has already been confirmed. The measures are the same for all Salmonella serovars.

Meat Production flocks:
In case of positive finding the flock is destructed or slaughtered and meat heat treated. All the other flocks at the holding are sampled by the official veterinarian. The holding is cleaned and disinfected, official environmental samples are taken, negative results are required before restocking. Official epidemiological investigation is carried out. Feedingstuffs are analysed for Salmonella. The measures are the same for all Salmonella serovars.

3. Notification system in place to the national competent authority

Salmonella has been notifiable since 1995. Salmonella is notifiable in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. Salmonella in Gallus gallus and in turkeys is classified as an animal disease to be controlled according to Decree No 843/2013 of the Ministry of Agriculture and Forestry. In accordance with the Animal Diseases Act (441/2013) laboratory must notify the positive result to the competent authority and to the food business operator.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Salmonella spp. was not detected in breeding or fattening flocks of turkeys in 2020.

National evaluation of the recent situation, the trends and sources of infection
The Salmonella situation in turkey flocks has been favourable for years.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Domestic turkey meat is not considered to be an important source of human salmonellosis cases in Finland.

12.7. Description of Monitoring/Surveillance/Control programmes system: Salmonella in food - Meat from bovine animals - food sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
The Finnish Salmonella Control Programme:

At slaughterhouses: together at least 3000 carcasses are sampled each year randomly from the cattle population. Sampling is carried out by food business operator under supervision of the official veterinarian.
At cutting plants: Sampling is compulsory for all cutting plants. Sampling is done as random sampling, the frequency is depended on the production capacity of the cutting plant. Sampling is carried out by the food business operator under the supervision of the official veterinarian.

Frequency of the sampling
Sampling is distributed evenly throughout the year so that the required number of samples based on the production capacity is reached.

Type of specimen taken
At slaughterhouse: surface swab of the carcass
At cutting plant: fresh meat

Methods of sampling
At slaughterhouse: 2 surface swab samples are taken from a carcass before chilling. A total area of 1400 cm2 is swabbed. Sampling sites: the upper inner part of hind legs including the pelvic entrance and the cut surface area of the abdomen and the chest.
Cutting plants: A sample consists of at least 25 grams of crushed meat taken from a cleaning tool of a conveyer belt, from tables or from a similar point.

Definition of a positive finding
Foodstuff is considered to be positive when Salmonella spp. is isolated from a sample.

Diagnostic/analytical methods used
ISO 6579:2002 or NMKL No 71:1999 or NMKL N:o 187:2007

2. Measures in place

The control program/strategies in place
The Finnish Salmonella Control Programme, approved by Commission Decision 94/968/EC of 28 December 1994.

Measures in case of positive findings or single cases
After a positive salmonella result increased sampling is carried out at the slaughterhouse or at the cutting plant. The origin of contamination must be traced back, if possible. Effective cleaning and disinfection of the premises and equipment.

3. Notification system in place to the national competent authority

The laboratory must notify the positive result to the competent authority and to the food business operator according to MAF Decree on Salmonella Control in Meat Establishments (134/2012).

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Salmonella spp. was not detected in slaughterhouse carcass swab samples or bovine meat samples from cutting plants in 2020. Findings of salmonella spp. in bovine meat are rare.

National evaluation of the recent situation, the trends and sources of infection
The Salmonella situation in domestic bovine meat is very favourable and findings are rare.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Domestic bovine meat is not considered to be an important source of human salmonellosis cases in Finland.

12.8. Description of Monitoring/Surveillance/Control programmes system: Salmonella in food - Meat from broilers (Gallus gallus) - food sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
At slaughterhouses: carcases are sampled according to the requirements of the Regulation 2073/2005.
Cutting plants not connected to the slaughterhouses: meat batches are sampled according to the requirements of the Regulation 2073/2005.
At meat processing plant: Minced meat, meat preparations and meat products; according to the Regulation 2073/2005.

Frequency of the sampling
At slaughterhouses: at least one sampling session (neck skin of 15 birds) must be carried out each week. Small slaughterhouses (less than 150 000 birds slaughtered annually) may reduce sampling frequency.
At cutting plants: according to the Regulation 2073/2005.
At meat processing plant: Minced meat, meat preparations and meat products; according to the Regulation 2073/2005.

Type of specimen taken
At slaughterhouse: neck skin
At cutting plant: fresh meat
At meat processing plant: According to the Regulation 2073/2005

Methods of sampling
At slaughterhouse: neck skins from 15 poultry carcases are sampled at random during each sampling session. A piece of approximately 10 g from neck skin shall be obtained from each poultry carcase. The neck skin samples from three poultry carcases from the same flock of origin shall be pooled before examination in order to form 5 x 25 g final samples.
At cutting plants: five samples of at least 25 g of the same batch are collected and analysed separately.
Meat processing plant: according to the Regulation 2073/2005.

Definition of a positive finding
At slaughterhouse, cutting plant and at meat processing plant:
Batch is considered to be positive when Salmonella spp is isolated from a sample.

Diagnostic/analytical methods used
Bacteriological method: ISO 6579:2002 or NMKL No 71:1999 or NMKL No 187/2007

2. Measures in place

Preventive measures in place
All flocks must be tested for Salmonella before slaughter. If the flock is Salmonella positive, meat must be heat treated in an approved establishment.

The control program/strategies in place
The Finnish Salmonella Control Programme, approved by Commission Decision 94/968/EC of 28 December 1994.

Recent actions taken to control the zoonoses
In 2012, the sampling system at slaughterhouses and cutting plants was amended. Before 2012, sampling was not compulsory at slaughterhouses, and at cutting plants the samples taken were single crushed meat samples instead of batch based sampling. The reason for this amendment was the amendment of the Regulation 2073/2005. Earlier the Salmonella criterion for broiler meat was a process hygiene criterion, and crushed meat sampling at the cutting plants was assessed to be equivalent to the sampling of neck skin samples at the slaughterhouses. When a food safety criterion based on neck skin samples was introduced, the sampling of crushed meat was not any more considered to be equivalent. In 2012, also the data collection from the samplings by food business operators of batches of minced meat and meat preparations started at the central level.

Measures in case of the positive findings or single cases
The positive batch is rejected/withdrawn from the market. In addition, after a positive salmonella result increased sampling is carried out in the establishment. The origin of contamination must be traced back, if possible. Effective cleaning and disinfection of the premises and equipment. The measures are the same for all Salmonella serovars.

3. Notification system in place to the national competent authority

Laboratory must notify the positive result to the competent authority and to the food business operator according to MAF Decree on Salmonella Control in Meat Establishments (134/2012).

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Salmonella spp. was not detected in domestic broiler meat in 2020.

National evaluation of the recent situation, the trends and sources of infection
Salmonella situation in domestic broiler meat has been favourable for years.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Domestic broiler meat is not considered to be an important source of human salmonellosis cases in Finland.

12.9. Description of Monitoring/Surveillance/Control programmes system: Salmonella in food - Meat from pig - food sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
The Finnish Salmonella Control Programme:

At slaughterhouses: at least 3000 carcasses of both fattening pigs and sows are sampled each year randomly from the populations. Sampling is carried out by the food business operator under supervision of the official veterinarian.
At cutting plants: Sampling is compulsory for all cutting plants. The sampling is done as random sampling, the frequency depending on the production capacity of the cutting plant. Sampling is carried out by the food business operator under the supervision of the official veterinarian.

Frequency of the sampling
Sampling is distributed evenly throughout the year so that the required number of samples base on the production capacity is reached.

Type of specimen taken
At slaughterhouse: surface swab of the carcass
At cutting plant: fresh meat

Methods of sampling
At slaughterhouse: 3 surface swab samples are taken from a carcass before chilling. A total area of 1400 cm2 is swabbed. Sampling sites: the upper inner part of hind legs including the pelvic entrance; the cut surface area of the abdomen and the chest; and the cheek.
Cutting plants: A sample consists of at least 25 grams of crushed meat taken from a cleaning tool of a conveyer belt, from tables or from a similar point.

Definition of a positive finding
Foodstuff is considered to be positive when Salmonella spp. is isolated from a sample.

Diagnostic/analytical methods used
ISO 6579:2002 or NMKL No 71:1999 or NMKL No 187:2007

2. Measures in place

The control program/strategies in place
The Finnish Salmonella Control Programme, approved by Commission Decision 94/968/EC of 28 December 1994.

Measures in case of the positive findings or single cases
After a positive salmonella result, increased sampling is carried out at the slaughterhouse or at the cutting plant. The origin of contamination must be traced back, if possible. Effective cleaning and disinfection of the premises and equipment.

3. Notification system in place to the national competent authority

The laboratory must notify the positive result to the competent authority and to the food business operator according to MAF Decree on Salmonella Control in Meat Establishments (134/2012).

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Salmonella spp. was not detected in slaughterhouse carcass swab samples or pork meat samples from cutting plants in 2020. Findings of salmonella spp. in pork are rare.

National evaluation of the recent situation, the trends and sources of infection
The Salmonella situation in domestic pig meat is very favourable.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Domestic pig meat is not considered to be an important source of human salmonellosis cases in Finland.

12.10. Description of Monitoring/Surveillance/Control programmes system: Salmonella in food - Meat from turkey - food sample

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
At slaughterhouses: carcases are sampled according to the requirements of the Regulation 2073/2005.
Cutting plants not connected to the slaughterhouses: meat batches are sampled according to the requirements of the Regulation 2073/2005.
At meat processing plant: Minced meat, meat preparations and meat products; according to the Regulation 2073/2005

Frequency of the sampling
At slaughterhouses: at least one sampling session (neck skin of 15 birds) must be carried out each week. Small slaughterhouses (less than 150 000 birds slaughtered annually) may reduce sampling frequency.
At cutting plants: according to the Regulation 2073/2005.
Meat processing plant: according to the Regulation 2073/2005.

Type of specimen taken
At slaughterhouse: neck skin
At cutting plant: fresh meat
At meat processing plant: According to the Regulation 2073/2005

Methods of sampling (description of sampling techniques)
At slaughterhouse: neck skins from 15 poultry carcases are sampled at random during each sampling session. A piece of approximately 10 g from neck skin shall be obtained from each poultry carcase. The neck skin samples from three poultry carcases from the same flock of origin shall be pooled before examination in order to form 5 x 25 g final samples.
At cutting plants: five samples of at least 25 g of the same batch are collected and analysed separately.

Definition of positive finding
At slaughterhouse, cutting plant and meat processing plant:
Batch is considered to be positive when Salmonella spp. is isolated from a sample.

Diagnostic/analytical methods used
ISO 6579:2002 or NMKL No 71:1999 or NMKL No 187/2007

2. Measures in place

Preventive measures in place
All flocks must be tested for Salmonella before slaughter. If the flock is Salmonella positive, meat must be heat treated in an approved establishment.

The control program/strategies in place

The Finnish Salmonella Control Programme, approved by Commission Decision 94/968/EC of 28 December 1994.

Recent actions taken to control the zoonoses
In 2012, the sampling system at slaughterhouses and cutting plants was totally amended. Before 2012, sampling was not compulsory at slaughterhouses, and at the cutting plants samples taken were single crushed meat samples instead of batch-based sampling. The reason for this amendment was the amendment of the Regulation 2073/2005. Earlier the Salmonella criterion for turkey meat was a process hygiene criterion, and crushed meat sampling at the cutting plants was assessed to be equivalent to the sampling of neck skin samples at the slaughterhouses. When a food safety criterion based on neck skin samples was introduced, the sampling of crushed meat was not any more considered to be equivalent. In 2012, also the data collection from the samplings by food business operators of batches of minced meat and meat preparations started at the central level.

Measures in case of the positive findings or single cases
The positive batch is rejected/withdrawn from the market. In addition, after a positive salmonella result increased sampling is carried out in the establishment. The origin of contamination must be traced back, if possible. Effective cleaning and disinfection of the premises and equipment. The measures are the same for all Salmonella serovars.

3. Notification system in place to the national competent authority

Laboratory must notify the positive results to the competent authority and to the food business operator according to MAF Decree on Salmonella Control in Meat Establishments (134/2012).

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
Salmonella spp. was not detected in domestic turkey meat in 2020.

National evaluation of the recent situation, the trends and sources of infection
The Salmonella situation in domestic turkey meat has been favourable for years.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Domestic turkey meat is not considered to be an important source of human salmonellosis in Finland.

13. General evaluation: Salmonella in feeds

1. History of the disease and/or infection in the country

The incidence of salmonella in feeds has been monitored since 1960's and salmonella outbreaks originating from feed have been very rare on Finnish livestock farms. There has been two major feed-borne outbreaks in 1995 and 2009. In 1995, the outbreak caused by Salmonella Infantis was related to cattle farms and in 2009, the outbreak caused by Salmonella Tennessee spread to poultry and pig farms.

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

Salmonella bacteria may not be present in the feed (Feed Act 1263/2020, 6 §). No salmonella food outbreaks with a connection to feed contamination has been detected for decades in Finland.

13.1. Description of Monitoring/Surveillance/Control programmes system: Salmonella in feeds

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Sampling for official control is carried out according to the written directions of Finnish Food Authority, which are aligned with the Commission Regulation (EU) No 691/2013 of July 2013 laying down the methods of sampling and analysis for the official control of feed.

Frequency of sampling
Sampling of feeds from domestic manufacturing is risk-based and targeted to specified feeds. The number of samples taken is based on the amount of production, type of operation, hygienic risk and type of feed.

A feed business operator that imports high-risk feeds of plant origin from the internal market for feeding food-producing animals, fur animals or pets shall take samples of the arriving feed batches or lots in accordance with operator's risk-based own quality control plan. Imports from the internal market can also be subject to official control.

For the official salmonella control of feeds imported from third countries, samples are taken from high-risk feeds of plant origin.

Sampling of feeds on the market for salmonella control is also risk-based and targeted to specified feeds with a hygienic risk.

See also Additional information.

Type of specimen taken
Samples of feed materials are taken both from domestic and imported feed materials of animal and plant origin.

Samples of compound feeds are taken both from domestic compound feeds and imported compound feeds.

Methods of sampling (description of sampling techniques)
An aggregate sample taken from the inspected feed lot consists of incremental samples. The size of aggregate sample and the number of incremental samples depends on the size of the feed lot.

In marketing control one sample is taken from one type of feed.

Diagnostic/analytical methods used
In Finnish Food Authority salmonella is mainly analysed by real time-PCR method and VIDAS method according to ISO 6579 – 1:2017 standard with slight modifications. Analysis methods for salmonella in approved laboratories are based on ISO 6579 – 1:2017 and/or NMKL 71:1999 standards with slight modifications and using real time-PCR or VIDAS equipment. Serotyping is performed when salmonella is detected in a sample.

Data collection and trend watching
Reported salmonella results are based on the results of official samples stored in the information system of Finnish Food Authority. As a result of the change in legislation, from the beginning of 2013, a significant proportion of the control of salmonella was transferred to operators for own control. The data of the own control samples (sample counts, results) is not included in the reported data. As a result, the results reported before 2013 and the results from 2013 onwards are not comparable.

2. Measures in place

The control program/strategies in place
Decree of the Ministry of Agricultural and Forestry on feed business operating (No 1263/2020) demands official control and feed business operators to take samples for salmonella testing. A feed business operator that produces compound feeds for food-producing animals for placing on the market shall take a sample for salmonella testing from the production environment at least once a week and from every production lines separately, where feed materials are received or compound feeds are produced from high-risk feed materials (cereal grains, seeds and fruits of oil plants, legume seeds, other seeds and fruits and products and by-products obtained from them; fish, other aquatic animals and products and by-products obtained from them).

Measures in case of the positive findings
If salmonella bacteria are found in imported feed lots, prohibition of taking into use and placing on the market, is immediately issued. Finnish Food Authority grants upon request permission to decontaminate the lots of feed materials containing salmonella. The decontamination must be carried out according to instructions of Finnish Food Authority. After decontamination, Finnish Food Authority does sampling to verify that lots are free from salmonella, after which Finnish Food Authority gives permission to use the lots as feed.

If salmonella bacteria is found in a sample from the production environment taken in connection with the reception of lots, production, storage or loading of feed, or from feed produced, the feed business operator shall ensure that the following measures are taken, as applicable: 1) tracing the source of the salmonella bacteria in the feed raw materials; 2) tracing the source of the salmonella bacteria in the establishment; 3) enhanced sampling from the production environment to establish the extent of salmonella infection; 4) enhanced sampling from feed; 5) enhanced cleaning and disinfection; 6) enhanced sampling from the production environment to assess the success of the cleaning and disinfection; 7) suspending feed production and distribution. A feed business operator shall cooperate with Finnish Food Authority.

3. Notification system in place to the national competent authority

Notification system is mandatory and feed operators must inform Finnish Food Authority immediately of salmonella suspicions or findings (Feed Act 1263/2020, 22 §).

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

The number of official feed samples from which salmonella results are reported decreased by approximately 31 % from 2019 to 2020. The decrease in the number of samples was mainly due to a decrease in official sampling in the control of salmonella in imports of high-risk feed. The number of samples is directly proportional to the actual imports of high-risk feed materials of plant origin. Overall, official sampling for feed product control was largely as planned, although sampling was halted for some time due to the special situation caused by the coronavirus pandemic.

In official control salmonella was detected in 6 lots of imported feed material of plant origin and in one sample of feed intended for wild birds taken from the market.

In addition to official control salmonella was detected in the own control of feed operators in 11 lots of imported feed material of plant origin and in one lot of imported pet food.

During the last few years imported feed materials of plant origin have been the most risky in terms of salmonella contamination. Instead, salmonella findings have been relatively rare in feed materials and compound feeds manufactured in Finland. Compound feeds that have been salmonella positive have been almost without exception compound feeds intended for fur animals. Salmonella has not been found in samples taken in connection with manufacturing of pet food.

5. Additional information

[1)] Feeds of animal origin from third countries are imported via designated BIPs, where they are submitted for veterinary border inspection. The border control veterinarians carry out official controls of feeds of animal origin from third countries to verify compliance with aspects of the Finnish Feed Act in accordance with Regulation (EC) 882/2004.

[2)] In Finland, Animal Health Association ETT keeps a ‘positive list’ of feed operators that are committed to take salmonella samples of each batch of imported feed materials and compound feeds for farmed animals in Finland, and to start using the feed only after a negative salmonella result. The samples are taken by an inspector authorised by Finnish Food Authority or by a sampler with sufficient expertise and analysed for salmonella at a laboratory approved by Finnish Food Authority or at a laboratory that uses an accredited method to test feed for salmonella. Feed companies also have quality contracts related to transporting and storing animal feed or a regular auditing procedure for transportation and storage. The positive list is published online on ETT web pages: https://www.ett.fi/rehu/positiivilista.

14. General evaluation: Methicillin resistant Staphylococcus aureus (MRSA)

1. History of the disease and/or infection in the country

Livestock-associated Methicillin resistant *Staphylococcus aureus* (LA-MRSA) was first detected from a holding with breeding pigs during the EU baseline study in 2008, indicating a prevalence of 0.1–2.8% on Finnish piglet farms (95% probability). MRSA was not found in top pig breeding holdings with a specific-pathogen-free status in 2012-2013. Since then MRSA prevalence has increased significantly and nowadays is considered to be commonly found in Finnish pig population. In 2016-2017, MRSA was found in 77% of the tested pig slaughter batches. The prevalence of MRSA has also increased in fresh pork at retail, being still at low level (6% in 2017). Moreover, MRSA has been detected in raw pet food products in 2018.

In 2020, MRSA was studied from fur animals for the first time but MRSA was not found.

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

The proportion of livestock-associated MRSA CC398 among all MRSA isolates found in humans has been increasing in the past few years. In 2019, 6.8% of all new MRSA cases found in humans belonged to CC398. The *spa* type t034 has been the most common finding of MRSA CC398 in humans.

People who are constantly in contact with pigs, have an increased risk of becoming MRSA carriers. On the other hand, MRSA is not considered as a major threat via food.

Uncooked raw pet food may also pose a risk to humans without proper hygienic measures but the role of raw pet food as a source of MRSA to humans and animals has not been studied.

14.1. Description of Monitoring/Surveillance/Control programmes system: Methicillin resistant Staphylococcus aureus (MRSA) in animals – Fur animals

1. Monitoring/Surveillance/Control programmes system

In 2020, MRSA was screened from domestic fur animals. A convenience sampling was performed from fur animals sent for pathological-anatomical diagnosis or for corona virus screening to the Finnish Food Authority laboratories. Altogether, 31 pharyngeal/nasopharyngeal swab samples originating from 27 different holdings (15 holdings with minks, 11 holdings with blue foxes and one holding with raccoon dogs) were screened between March and December 2020. In addition, paw or paw swab samples were taken from the same animals.

From minks, one or two pharyngeal swab samples and one front paw/animal were taken. From animals originating from the same herd, one pharyngeal swab was taken with one swab stick from two to five individual animals. From each animal, one front paw was cut at the carpal joint and paws from two to five animals were treated as one sample.

From blue foxes, one or two nasopharyngeal swab samples and one or two paw swab samples were taken from animals originating from the same herd. One pharyngeal and one paw swab were both taken with one swab stick from one to four individual animals.

In addition, one nasopharyngeal swab sample and one paw swab sample were taken from three raccoon dogs originating from the same herd. Both samples were taken with one swab stick.

Samples were transported to the laboratory within 4 days and the analysis was started within 10 days from the sampling. MRSA was screened using selective enrichment broth and solid media. Briefly, each swab sample was suspended in 3 ml of Mueller Hinton broth with 6.5% NaCl. The amount of Mueller Hinton broth used for the pooled paw samples from minks varied from 40 to 280 ml depending on the weight of the paws. After an incubation at 37°C for 16-20 h, 10 µl of the enrichment broth was spread on MRSA Select2™ (BioRad) and Brilliance MRSA 2 (Oxoid) agar plates and incubated at 37°C for 18-28 h. From each sample, the species determination of at least one suspective colony/sample was done with MALDI-TOF (Bruker, Germany).

2. Measures in place

No

3. Notification system in place to the national competent authority

Yes

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

MRSA was not found in any of the samples.

15. General evaluation: Toxoplasma

1. History of the disease and/or infection in the country

Toxoplasmosis caused by *Toxoplasma gondii* is endemic in Finland. In the 2000s, the annual number of reported human infections has fluctuated between 15 and 50 (Finnish National Infectious Diseases Register). Serological surveys indicate that infections in wild animals and domestic ungulates are more common in the southern than in the northern parts of the country. The result is explicable by the parasites main host, more specifically the domestic cat population, which is denser in the south where also most of Finland's inhabitants are living.

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

Probably the best indicator species of *T. gondii* in the nature are wild hares (European brown and mountain hares) due to their distinct pathology. During the period ranging from the year 2000 to 2020 among the hares submitted to necropsy, about 2 – 25 % have been identified as infected. In 2020, *Toxoplasma gondii* was rarely reported in cats, dogs, goats, sheep and wild hares.

In 2020, 15 human cases were reported. The source of human infections is not known, but it is supposed that humans get infected similarly as elsewhere in the world.

15.1. Description of Monitoring/Surveillance/Control programmes system: Toxoplasma

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Monitoring of wild animals is passive and is a part of the general Finnish wildlife disease surveillance. It is based on voluntary submission of animals found dead or euthanised by hunters, veterinary officials, and private citizens. Moreover, T*oxoplasma gondii* are passively monitored in domestic animals sent for necroscopy to the Finnish Food Authority either by veterinarians or by pet or production animal owners.

Type of specimen taken and diagnostical/analytical methods used
Sample material from wild, production and pet animals are taken in case of clinical suspicion, but often just to elucidate the unknown cause of death. Histological tissue samples are taken whether the animal was showing any clinical signs of infection or not. Some animals, especially wild hares, due to their high susceptibility to toxoplasmosis, have typical lesions visible in necropsy, but in many cases in other species, the infection is subclinical, and will only be discovered by chance. Histological tissue (brain, liver, kidney, lung, spleen) samples are H-E stained and examined by microscopy. No sensitive specific methods, such as immunohistochemistry, are used for screening, but might be used for confirmation.

Case definition
An animal, where typical tissue cysts were found, is defined as a case.

2. Measures in place

No control measures. No vaccination program in small ruminants. However, pregnant women are instructed by the Finnish Food Authority and the National Institute for Health and Welfare to avoid eating raw meat, including salami and dried reindeer meat because of the risk of *T. gondii* infection.

3. Notification system in place to the national competent authority

Toxoplasmosis is classified as a monthly reported animal disease in swine, sheep, goats, dogs, cats and ferrets according to Decree No 1010/2013 of the Ministry of Agriculture and Forestry.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigations
In 2020, 138 European brown hares and 29 mountain hares were subject to necropsy, whereof three European brown hares were *T. gondii* positive (1.8 %).

National evaluation of the situation, the trends and sources of infection
Although *Toxoplasma gondii* is endemic in Finland, clinical human infections are quite rare, or are seldom reported.

16. General evaluation: Trichinellosis

1. History of the disease and/or infection in the country

The last autochthonous human cases (three) originated from eating bear meat in 1977. The first diagnosis in domestic swine was made in 1954. There were very few pig cases until 1981 when the number of Trichinella positive pigs started to increase reaching even over one hundred of infected swine a year. In the 2000's, however, the number of diagnosed cases in pigs decreased again to a couple of animals a year, and in 2005-2009 no cases were found. In 2010, only one positive pig was found. Since 2011, no positive pigs have been found. The infection was known in the brown bear and other wildlife during the 1950s, but since the 1980s trichinellosis has been found to be prevalent among wild carnivores especially in the southern part of the country, where all the four European species (*Trichinella spiralis*, *T. nativa*, *T. britovi* and *T. pseudospiralis*) have been reported. The raccoon dog *Nyctereutes procyonoides* has been recognised as the central host species harbouring all four Trichinella species.

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

National evaluation of the recent situation, the trends and sources of infection
Trichinellosis has not re-emerged in domestic swine during the past five years. However, no sign of decrease in incidence in wildlife has been seen. The apparent change in swine during past decades may be due to the pig production becoming more intensive with bigger and more modern industrialized units. In wildlife, a big proportion of infections are caused by *T. nativa*, the arctic species, which does not readily infect swine.
Analysis of *Trichinella* species in wildlife in 2014 revealed a marked decrease in the occurrence of *T. spiralis*, the most important species in swine. In an earlier Finnish study (material from 1999-2005), the proportion of *T. spiralis* was 12.8% in infected wildlife, but in 2014 it was only 0.7%. *T. nativa* infected 80% and 93% of Trichinella positive wildlife in 1999-2005 and 2014, respectively. If this finding reflects a true change in Trichinella species distribution in nature it would mean decreased infection pressure on domestic swine.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)
Trichinella testing is mandatory to all commercial pork production except for swine originating from officially recognized controlled housing conditions (one holding in 2020). Hunters need to be continuously informed about the risks of eating not tested, undercooked bear, badger, lynx, wild boar or other carnivore or omnivore meat.

3. Any recent specific action in the Member State or suggested for the European Union

The Trichinella species present in Finland have been identified and the study on the epidemiology of different Trichinella species will continue. Understanding the epidemiology of the various Trichinella species will help in controlling of the risk.

16.1. Description of Monitoring/Surveillance/Control programmes system: Trichinella in animals – horses

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Every single slaughtered horse is tested for Trichinella at the slaughterhouse as part of meat inspection. Trichinella testing is mandatory for horses at meat inspection.

Frequency of the sampling
All slaughtered horses are introduced to official meat inspection and trichinella testing.

Type of specimen taken
Muscle sample of 10 grams from tongue, masseters or diaphragm.

Methods of sampling (description of sampling techniques)
Sampling and analysing are done according to 2015/1375 EU.

Case definition
Positive result from testing according to 2015/1375 EU.

Diagnostic/analytical methods used
Methods in use are the magnetic stirrer method for pooled sample digestion and mechanically assisted pooled sample digestion method, accordant with regulation 2015/1375.

2. Measures in place

The control strategies in place
Trichinella testing at meat inspection is mandatory. Routine meat inspection eliminates infected carcasses from human consumption.

Measures in case of the positive findings
Positive animals are removed from the food chain. If a horse is found infected with Trichinella, the carcass will be destroyed. The competent authority will investigate the farm of origin, source and possible spread of infection and decide about further action.

3. Notification system in place to the national competent authority

Trichinellosis is a notifiable disease in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. Positive result in Trichinella testing at meat inspection must be notified and confirmed at National Reference Laboratory in the Finnish Food Authority.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation
No horses were found to be positive for trichinellosis. Equine trichinellosis has never been found in Finland.

National evaluation of the recent situation, the trends and sources of infection
Trichinella incidence and prevalence in domestic horses in Finland seem to be negligible despite its persisting abundance in wildlife.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection
The risk of obtaining trichinellosis from horse meat is negligible.

16.2. Description of Monitoring/Surveillance/Control programmes system: Trichinella in animals - Pigs

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Pigs: Trichinella testing is mandatory to all commercial pork production except for swine originating from officially recognized controlled housing conditions according to regulation 2015/1375. During the year 2020, one holding had the status of being officially recognized for controlled housing conditions. In total 564 pigs originating from this holding were not examined for trichinellosis in the year 2020. All other pigs are examined for trichinellosis at obligatory, official meat inspection at the slaughterhouse. Finland implemented the possibility provided in Article 3 paragraph 3 b of Regulation (EU) No 2015/1375 to cease testing for Trichinella of pigs originating in holdings or compartments applying controlled housing conditions. The Finnish Food Authority is the competent authority that officially recognizes holdings and compartments applying controlled housing conditions. Some pigs originating from controlled housing conditions are slaughtered at a slaughterhouse which tests all slaughtered pigs for trichinella. Therefore, some pigs from controlled housing conditions are tested for trichinella.

Farmed wild boar: all animals slaughtered in a slaughterhouse must be tested for Trichinella. Trichinella testing is not mandatory when the meat is not meant for general consumption, but the owner may voluntarily test the meat used for his own consumption.

Frequency of the sampling
Trichinella testing is mandatory to all commercial pork production except for swine originating from officially recognized controlled housing conditions according to regulation 2015/1375 (one holding in 2020). All other pigs and wild boar are examined for trichinellosis at meat inspection.

Type of specimen taken
The sample for Trichinella test from pigs and wild boar is taken primarily from the diaphragm muscle and secondarily from tongue, masseter or abdominal muscles.

Methods of sampling (description of sampling techniques)
Muscle sample is taken according to 2015/1375 at meat inspection.

Case definition
A positive case is a pig from which the Trichinella test (2015/1375) is positive i.e. Trichinella larva have been detected in the test from a pooled muscle sample and/or a single sample. All positive results must be sent to the national reference laboratory in the Finnish Food Authority for confirmation and identification of the species.

Diagnostic/analytical methods used
Diagnostic methods used are in accordance with 2015/1375. In Finland, the methods used are the magnetic stirrer method with pooled samples and mechanically assisted pooled sample digestion method (Stomacher).

2. Measures in place

The control strategies in place
Routine meat inspection eliminates infected carcasses from human consumption.

Measures in case of the positive findings

If a pig is found infected with Trichinella, the carcass will be destroyed. The competent authority will investigate the farm of origin, source and possible spread of infection and decide about further action.

3. Notification system in place to the national competent authority

Notification system in place
Trichinellosis is a notifiable disease in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry. A positive result in Trichinella testing at meat inspection must be notified and confirmed at National Reference Laboratory in the Finnish Food Authority.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation including description of the positive cases and the verification of the Trichinella species
Trichinella was not found in either pigs or farmed wild boar in 2020.

National evaluation of the recent situation, the trends and sources of infection
The risk of obtaining trichinellosis from pig meat is negligible. The last positive *Trichinella* case in a domestic pig was found in 2010. Now, *Trichinella* incidence and prevalence in domestic swine in Finland seem to be negligible despite of its persisting abundance in wildlife. This may be caused by the change in swine husbandry, which has become more industrialized during the 2000's. Therefore, small family farms with old pighouses have disappeared. In addition, the infection pressure caused by wildlife toward pigs has probably decreased because of the changes in distribution of *Trichinella* species prevalent in wildlife. However, wild boar meat can still pose a risk although infections have been rather rare (positive cases found ca. every other year in the last 10 years). Free-ranging wild boar can have contacts with *Trichinella* infected wild mammals and birds.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
The risk of obtaining trichinellosis from pig meat is negligible. The positive findings in farmed wild boar during the last five years indicate the importance of Trichinella examination and thorough cooking of the meat even when the meat is intended for farmer's personal use only.

5. Additional information

Number of officially recognised Trichinella-free holdings
During the year 2020, one holding was recognized officially as a holding applying controlled housing conditions according to regulation 2015/1375.

Categories of holdings officially recognised Trichinella-free
None

Officially recognised regions with negligible Trichinella risk
None

16.3. Description of Monitoring/Surveillance/Control programmes system: Trichinella in animals - wild animals

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
Hunted wild game including wild boar and bears (and other carnivorous species):
If the meat is meant for general consumption it must be sent to a game handling establishment for meat inspection and it is tested for *Trichinella* spp. as a part of the meat inspection. If the meat is sold directly to a private consumer, testing it is mandatory according to national regulation. If the meat is intended for private consumption in the hunter's own household, testing is not mandatory, but many hunters choose to voluntarily test the meat (samples taken as part of HACCP and own checks).

Wild animals not meant for consumption:
Samples (official sampling by the competent authority) are taken from wild animals that are submitted for targeted or general wildlife disease surveillance (passive monitoring). These animals may be hunted, euthanized (due to injury or disease) or found dead. Samples for *Trichinella* examination are taken e.g. from wild boar, brown bears, foxes, lynx, wolves, raccoon dogs, American minks, pine martens, wolverines, badgers, otters, beavers and seals as well as some raptors and scavenging birds.

Frequency of the sampling
Continuous sampling

Type of specimen taken
Sample includes muscle from the diaphragm, the masseter, the tongue and/or the hind leg. From birds, pectoral muscles are sampled.

Methods of sampling (description of sampling techniques)
Samples are taken in connection with post mortem examination and sampling for other diseases.

Case definition
A case is considered positive when *Trichinella* larvae have been detected in a test from a pooled muscle sample and/or a single sample.

Diagnostic/analytical methods used
Mechanically assisted digestion method (Stomacher).

2. Measures in place

The control strategies in place
No control programs or mechanisms in place. Hunters are advised to have trichinella testing done to the carcass if they wish to eat it and to cook the meat thoroughly.

Measures in case of the positive findings
No specific measures are in place for findings in wild animals.

3. Notification system in place to the national competent authority

Positive results in *Trichinella* testing must be confirmed at National Reference Laboratory in the Finnish Food Authority.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigation including description of the positive cases
Prevalence of Trichinella spp. was high in carnivores: 38% in wolves, 47% in lynx, 32% in raccoon dogs and 17% in foxes. Two *Trichinella* species, *T. nativa* in carnivores and *T. pseudospiralis* in birds, were mainly found when the species was determined in positive cases. Only two *T. pseudospiralis* infections

were found (in the white-tailed eagle and northern goshawk). All other samples were identified as *T. nativa*. One wolf had a mixed infection with *T. nativa, T. britovi* and *T. spiralis*. The sample size i.e. effort did not change essentially from previous year.

National evaluation of the recent situation, the trends and sources of infection
The prevalence of *Trichinella* spp. has remained high in wild carnivores. In wildlife, a big proportion of infections are caused by *T. nativa*, the arctic species, which does not readily infect swine. Analysis of *Trichinella* species in wildlife in 2014 revealed a marked decrease in the occurrence of *T. spiralis*, the most important species in swine. In 2020, about 12% of positive wildlife samples were analysed for *Trichinella* species. Samples were derived from wild boar, bears, lynx, a wolf, a fox, a badger, a white-tailed eagle and a northern goshawk. The arctic *T. nativa* remains the dominant *Trichinella* species in the wild.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)
Trichinella incidence and prevalence in domestic swine in Finland seem to be negligible despite its persisting abundance in wildlife. This may be caused by the change in swine husbandry, which has become more industrialized during the 2000's. Therefore, small family farms with old pighouses have disappeared. In addition, the infection pressure caused by wildlife toward pigs has probably decreased because of the changes in distribution of *Trichinella* species prevalent in wildlife. However, wild boar meat can still pose a risk although infections have been rather rare (positive cases found ca. every other year in the last 10 years). Free-ranging wild boar can have contacts with *Trichinella* infected wild mammals and birds.

17. General evaluation: Tularaemia

1. History of the disease and/or infection in the country

Human cases of tularaemia were already diagnosed in the 1930's but the disease seemed to be rather rare in Finland compared to neighbouring Sweden. Human outbreaks have been more often observed since the 1960's. In animals (mainly hares *Lepus* sp.), tularaemia has been diagnosed since the 1980's.

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

Tularaemia is considered endemic in Finland and cases occur regularly in the same areas of western and southern Finland. The occurrence varies considerably between years but typically both human and animal cases peak every third or fourth year. Since 1995, the annual number of human cases has varied between 7-926 (Finnish National Infectious Diseases Register), being 143 cases in 2020.

In the 2000's, ca. 70-150 hares have been examined annually of which 0-35 per year have been diagnosed with tularaemia. The mountain hare (*Lepus timidus*) and the European brown hare (*L. europaeus*) are the animal species most often affected. Voles (Arvicolinae) are considered the reservoir of *F. tularensis* and their cyclic population fluctuations are reflected on human and other animal cases. Humans are mostly infected by blood-feeding mosquitoes. Other notable routes are inhalation of aerosols and careless handling of infected animals. The disease is most common in late summer and autumn (July – September).

17.1. Description of Monitoring/Surveillance/Control programmes system: Tulareamia

1. Monitoring/Surveillance/Control programmes system

Sampling strategy

Monitoring in animals is passive and is a part of the general Finnish wildlife disease surveillance. It is based on voluntary submission of animals found dead or euthanised by hunters, veterinary officials, and private citizens.

Type of specimen taken and diagnostical/analytical methods used

Organ samples of suspected cases are taken during necropsy. Detection of *F. tularensis* is based on indirect immunofluorescence anti-body test (IFAT) of the tissue sample.

Case definition

Typical pathological lesions and positive IFAT test.

2. Measures in place

No control measures.

3. Notification system in place to the national competent authority

Tularaemia is a notifiable disease in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry**.**

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigations
In 2020, a total of 188 hares (154 European brown hares and 34 mountain hares) were necropsied. Based on pathological findings, 40 European brown hares and 9 mountain hares were further tested for *F. tularensis*, out of which 22 and 5 were diagnosed with tularaemia, respectively.

National evaluation of the situation, the trends and sources of infection

The case numbers in hares were high in 2020 compared to three previous years. Cases were found from geographical areas previously known to be endemic.

18. General evaluation: Yersiniosis

1. History of the disease and/or infection in the country

The number of reported cases of human yersiniosis has been between around 550 per year, most of which are caused by Yersinia enterocolitica.[15]

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

National evaluation of the recent situation, the trends and sources of infection
Most of the reported human cases are presumed to be of domestic origin. The number of cases is higher than the number of domestic salmonella infections. A decreasing trend in the number of cases caused by Yersinia enterocolitica have been detected.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)
In Finland the most common bio/serotype is 4/O:3, which is found in human cases as well as in pigs and pork. Pathogenic Y. enterocolitica biotypes have also been detected in faeces of cats and dogs in Finland.

National surveys on Yersinia in food are carried out occasionally, but not in 2020**.**

[15] The National Institute of Health and Welfare, 2021. Infectious disease register.

19. General evaluation: West Nile Virus

1. History of the disease and/or infection in the country

WNV infection has never been detected in animals, and according to the Finnish National Infectious Diseases Register, no human WNV cases have been detected in period of 1980-2020 in Finland.

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

As there is no indication for the WNV in Finland, the risk for humans is considered very low. The national situation remains favourable.

19.1. Description of Monitoring/Surveillance/Control programmes system: West Nile Virus

1. Monitoring/Surveillance/Control programmes system

Sampling strategy
There is no official monitoring or surveillance programme. Birds and horses with neurological symptoms are tested. A survey of imported horses was done in 2012 - 2013. A total of 193 horses from intra EU trade and 8 horses imported from outside EU were tested negative for IgM WNV antibodies (acute infection). IgG antibodies were found in 29 horses from intra EU trade and 6 horses imported from outside EU (from US). The vaccination status for WNV was known only in one horse in intra EU trade.

Type of specimen taken and diagnostical/analytical methods used
Serum samples are tested by ELISA (IgM and IgG) and organ samples are tested by PCR (real time RT-PCR).

Case definition
The animal is seropositive if the ELISA test is positive.
The animal is acutely infected if the IgM ELISA test is positive and/or if the PCR is positive.

2. Measures in place

There are no official control measures in place.

3. Notification system in place to the national competent authority

West Nile Fever is a notifiable disease in all animals according to the Decree No 1010/2013 of the Ministry of Agriculture and Forestry.

4. Results of investigations and national evaluation of the situation, the trends and sources of infection

Results of the investigations
No samples were tested in 2020.

National evaluation of the situation, the trends and sources of infection

The national situation remains favourable.

20. Food-borne Outbreaks

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

Systematic collection of information about foodborne outbreaks in Finland began in 1975. The local food control and health officials are responsible for investigating and reporting foodborne outbreaks in their area. Collection of information takes place on the basis of the Food Act (23/2006), the Health Protection Act (763/1994), the Communicable Disease Act (1227/2016), the Decree (1365/2011) concerning the follow-up and reporting of food- and waterborne outbreaks and the Communicable Diseases Decree (146/2017). Physicians notify all cases of communicable diseases to the National Institute for Health and Welfare (THL). The data is recorded in the National Infectious Diseases Register in Finland. The local outbreak investigation group notify without delay THL in case an outbreak is suspected. The local outbreak investigation groups investigate suspected food- and waterborne outbreaks in their area and report it to the Finnish Food Authority. The notification and investigation reports are submitted by an electronic reporting system, which provides the data simultaneously to all relevant authorities involved in or supporting the outbreak investigation, including the National Supervisory Authority for Welfare and Health (Valvira) which is the central coordinating authority in waterborne outbreaks. The system also stores the data in the National Food Borne Outbreaks Register (NFWDR). The system has been in use since 2010. The Finnish Food Authority evaluates each municipal report in co-operation with THL to classify the outbreaks based on the strength of evidence. The data is recorded in the NFWDR and a national summary report on outbreaks is published every third year. By the introduction of the electronic reporting system, the pick lists used for the collection of data into the NFWDR have been harmonized with EFSA data collection on EU level.

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

All general domestic food- and waterborne outbreaks must be reported in Finland. Illness of at least two persons with similar symptoms from a single source is considered a cluster and a suspected outbreak. Sporadic cases and infections acquired abroad are not included in the NFWDR, whereas they are included in the infectious disease register. Family outbreaks are reported if commercial foodstuffs are suspected of being the source of illness or several persons are at risk. Obligatory reporting includes all foodborne agents, also those caused by chemical agents and toxins. Foodborne outbreaks caused by chemical agents other than toxins and biological amines produced by microorganisms are included in the national register though they are not reported to EFSA.

3. National evaluation of the reported outbreaks in the country

Trends in numbers of outbreaks and numbers of human cases involved:
In 2020, the municipal food control authorities notified 36 food- and waterborne outbreaks, of which 34 (94%) were associated with food and two (6%) with drinking water. The total number of outbreaks was lower than last year and the year before. Since 2001, most of the annually reported outbreaks have been foodborne. The number of reported outbreaks has fluctuated between 32 and 75 with a few year intervals. The lowest number, 32 outbreaks, was recorded in 2007.

The number of human cases involved in foodborne outbreaks typically varies between 800 and 2000 annually and follows the number of outbreaks. In 2020, the number of human cases (594) was lower than usually. Previously about 50% of the reported outbreaks annually have been medium size when evaluated by the number of cases per outbreak (11-100 persons falling ill). In 2020, like in 2019, most (24 outbreaks; 67%) were small, 11 outbreaks (31%) were medium sized and one outbreak was large (over 100 persons falling ill).

The relevance of the different causative agents, food categories and the agent/food category combinations:
During the last ten years the most common causative agent identified has been norovirus. In 2020 norovirus caused 9 (26%) foodborne and 1 waterborne outbreak. Sapovirus caused 1 large foodborne outbreak. Campylobacter sp. (3 foodborne and 1 waterborne), Salmonella (3) and Listeria monocytogenes (2) caused a total of 9 outbreaks. Other causative agents identified in 2020, were Bacillus cereus, Clostridium perfringens, Staphylococcal enterotoxins and VTEC, each causing 1 outbreak. In 12 (35%) of the foodborne outbreaks the causative agent remained unknown. However, in most of these cases the investigations showed descriptive epidemiological association between eating a certain food or meal and becoming ill. The most common vehicle (53%) reported in 2020 was a buffet meal or mixed food with no specific food item determined as the cause of the outbreak. The investigations revealed a specific food to be the vehicle of the outbreak in 11 (32 %) outbreaks.

The relevance of the different type of places of food production and preparation in outbreaks:
In 13 (38%) outbreaks in 2020, the place of exposure was a restaurant. In 11 (32%) outbreaks the place of origin of problem was in a restaurant. Three (9%) of the food borne outbreaks were related to contamination at primary production (oysters and vegetables) and three (9%) in processing plants (RTE meat products and cheese). The place of origin of problem remained unknown in 16 (47%) of the outbreaks.

Evaluation of the severity and clinical picture of the human cases:
Altogether 594 persons were reported to have fallen ill in food- and waterborne outbreaks in 2020. The number of patients afflicted by food poisoning was 543 (94%), while 51 persons (6%) were infected through contaminated drinking water. According to the reports, a total of 19 persons were hospitalized in five outbreaks. Six deaths were reported in the two Listeria monocytogenes outbreaks.

4. Descriptions of single outbreaks of special interest

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

In general, all food- and waterborne outbreaks are investigated by local food control and health officials. In widespread outbreaks, the central administration coordinates the investigations. An investigation comprises an epidemiological investigation, detection of contributing factors, sampling and revision of the in-house control system. Information received about foodborne outbreaks, contributory factors and causative agents are analysed and actively used in the education and training of food control officials and food business operators. Since January 2005, all food handlers whose work entails special risks related to food hygiene or who handle unpacked, perishable foodstuffs must demonstrate their proficiency either by obtaining a hygiene proficiency certificate or a certificate of vocational qualification. Independent Proficiency Examiners accredited by the Finnish Food Authority organize hygiene proficiency examinations in different parts of the country. Information and recommendations about identified causative agents, risk foods or raw material are given to entrepreneurs, producers and consumers. The Finnish Salmonella control program and the special salmonella guarantees have successfully ensured salmonella free foodstuffs on the market and only a small number of human salmonellosis infections are domestically acquired. Other control programs have been established and other measures taken to control outbreaks caused by the most important zoonoses. The prevailing national system for monitoring and surveillance of zoonoses covers Campylobacter and the STEC bacterium in production animals or foodstuffs. The Finnish Strategy on Zoonoses highlights Campylobacter, Yersinia, Listeria, the EHEC bacterium and norovirus as the main foodborne agents that the key actions are targeted on. The strategy is under revision. The network-like Finnish Zoonosis Centre between the national organizations; the Finnish Food Authority and the National Institute for Health and Welfare, have ensured the collaborative efforts of both the veterinary

and the health sector for monitoring and prevention of diseases transmitted between animals and people, since 2007.

6. Additional information

The special situation caused by the COVID-19 pandemic had no impact on the reporting of food-borne outbreaks for year 2020. It is possible that interventions set to limit the spread of COVID-19, e.g. improved hygiene practices, temporary restrictions in physical meetings and the closure of most restaurants decreased the number of outbreaks. This is supported by the low number of ordinary norovirus cases in 2020, that the trend of the outbreaks typically follows. Although Finland's FBO figures for 2020 are lower than in the previous two years, for example in 2017 there was almost the same figures as in 2020. Thus, the estimation is that the numbers for 2020 are within the normal range.

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

Finnish Food Authority (Ruokavirasto)

Finnish Food Authority is a central competent authority and is responsible for the implementation of antimicrobial resistance monitoring programme in food-producing animals. It operates also as a national reference laboratory in the field of antimicrobial resistance. The susceptibility testing of zoonotic and indicator bacteria as well as the specific monitoring of extended-spectrum beta-lactamase producing *E. coli* are done in the national reference laboratory located in Helsinki. The campylobacter from broilers and salmonella from food-producing animals are isolated within their own national programmes and the isolates are confirmed at the Finnish Food Authority laboratories. National reference laboratory is also responsible for the texts and tables of the report concerning antimicrobial resistance.

22. General Antimicrobial Resistance Evaluation

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

According to the results from FINRES-Vet monitoring programme, starting from 2002, resistance was only occasionally detected in *Campylobacter* spp. isolated from food-producing animals. However, during the last decade, resistance levels have slightly changed as resistance to especially fluoroquinolones has been variably detected in campylobacter isolated from pigs, broilers and cattle. Macrolide resistance in campylobacter has been rare.

In addition to a very low prevalence of salmonella in food-producing animals in Finland, antimicrobial resistance in salmonella is not common. Multidrug resistance or resistance to critically important antimicrobials in *Salmonella enterica* has been very rare. Decreased susceptibility to colistin has mainly been detected in *S.* Enteritidis but also in other serotypes. However, no *mcr* genes have been detected.

Resistance situation in indicator *E. coli* in food-producing animals has in overall been favourable. Resistance is most commonly found in isolates from pigs and the least in cattle. ESBL or AmpC producing *E. coli* were quite commonly found in broilers and broiler meat in 2016 and 2018 in Finland but the prevalence of these bacteria decreased significantly in 2020 when only one isolate (<1%) was found both in broilers and broiler meat. The prevalence of ESBL/AmpC *E. coli* is very low in Finnish pigs and cattle as well as in beef and pork at retail.

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

As resistance situation is favorable in domestic food-producing animals and meat thereof, Finnish food of animal origin is likely not an important source for AMR in the human population.

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

Finland's National Action Plan on Antimicrobial Resistance for 2017–2021 was published on 12 May 2017. The current AMR-NAP is extended by one year until the end of 2022 due to COVID-19 epidemic.

The new NAP is scheduled to be prepared by the end of 2022. The current NAP highlights the prudent use of antimicrobial drugs as well as the prevention of infections and the spread of drug-resistant microbes. Prevention efforts take into account people, animals, food and the environment. Antimicrobials must be used correctly and responsibly when treating people and animals. One major action is the building up of an information system to collect animal species-specific usage data on antimicrobials. Guidance for protection against dust and microbes in piggeries and while handling pigs was produced by Finnish Institute of Occupational Health (in Finnish, English, Russian) in order to protect employees from MRSA.

4. Additional information

In 2020, the COVID-19 pandemic altered the sampling plans to some extent. Some parts of the resistance monitoring program were suspended for approximately two months during spring 2020. Those cases where sampling was suspended, are described in more detail in the respective chapters (see below). Furthermore, adjustments to the sampling plans of the EFSA mandatory resistance monitoring were made in the autumn 2020 so that the target number of 300 samples would be achieved in the specific monitoring of extended-spectrum beta-lactamase producing *E. coli*. The influence on the results and the comparability of results with the previous years are difficult to assess.

Turkeys were not included in the resistance monitoring in 2020 because the production of turkey meat in Finland has been below 10 000 tonnes. In 2020, the volume of domestically produced turkey meat was 8 494 222 kg.

23. General Description of Antimicrobial Resistance Monitoring; *Campylobacter jejuni* - Broilers

1. General description of sampling design and strategy

Samples originate from a national *Campylobacter* monitoring programme. For details, see text for Thermophilic *Campylobacter* in animals - *Gallus gallus* (fowl) - broilers.

2. Stratification procedure per animal population and food category

Between June and October, every slaughtered broiler production batch was sampled and between November and May, the frequency is set annually depending on production volume.

3. Randomisation procedure per animal population and food category

Census sampling of all broiler slaughter batches between June and October; random sampling (expected prevalence 1%, accuracy 1%, confidence level 95%, since 2008) of broiler slaughter batches between January and May, and between November and December.

All isolates (one isolate per epidemiological unit) were included in the antimicrobial susceptibility testing.

4. Analytical method used for detection and confirmation

Details of the laboratory methodology for isolation and confirmation are described in the text Thermophilic *Campylobacter* in *Gallus gallus*.

5. Laboratory methodology used for detection of antimicrobial resistance

The susceptibility testing was performed with broth microdilution method according to CLSI using *Campylobacter jejuni* ATCC 33560 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU.

6. Results of investigation

Of the 87 *C. jejuni* isolates studied in 2020, three (3.4%) were resistant to ciprofloxacin and nalidixic acid. In addition, two isolates were resistant to tetracycline. As in 2018 and 2019, no resistance was detected against the other studied antimicrobials (erythromycin, gentamicin and streptomycin).

Quinolone resistance further decreased from the previous year approximately 11 percentage points from moderate to low level. Overall, resistance levels to quinolones have fluctuated between 2014 and 2020 from none to 25.5%. The reasons for increased quinolone resistance in certain years are not known as antimicrobials are rarely used in the broiler production chain in Finland and not at all in the production-level flocks (Animal Health ETT ry).

24. General Description of Antimicrobial Resistance Monitoring; *Campylobacter jejuni* - Cattle

1. General description of sampling design and strategy

Faecal samples were collected from slaughtered animals from the five biggest slaughterhouses that accounted for approximately 92% of all cattle slaughtered in Finland. Altogether, 295 caecal samples originating from different epidemiological units were collected at slaughter from healthy animals between February and December in 2020. Due to COVID-19 pandemic, sampling was suspended from the beginning of April until the end of May. From each epidemiological unit (slaughter batch), sample was taken from one animal. The samples were taken aseptically and transported refrigerated to the laboratory within 2 days. Samples were collected between Monday and Thursday.

2. Stratification procedure per animal population and food category

The number of randomly taken samples from each slaughterhouse was proportional to the annual slaughter volume.

3. Randomisation procedure per animal population and food category

Samples were collected randomly at slaughterhouses and in total, each sample represented a different epidemiological unit. If several samples from the same epidemiological unit was taken, only one sample was taken for further analysis.

One isolate from each epidemiological unit (if available) was selected for susceptibility testing.

4. Analytical method used for detection and confirmation

Campylobacter spp. were isolated according to modified ISO 10272-1/2017. Faecal (10 g) samples were enriched either in Bolton broth or both in Bolton and Preston broths (90 ml) for 24 h at 41.5°C. Subsequently, samples were cultured on mCCD or both on mCCD and Preston agar plates, and

incubated for 44–72 h at 41.5°C. Species identification was done with MALDI-TOF (Bruker, Germany) from pure cultures on blood agar plates.

5. Laboratory methodology used for detection of antimicrobial resistance

The susceptibility testing was performed with broth microdilution method according to CLSI using *Campylobacter jejuni* ATCC 33560 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU.

6. Results of investigation

Of the 100 *C. jejuni* isolates studied in 2020, 29% were resistant to ciprofloxacin and nalidixic acid. In addition, 12% were resistant to tetracycline and one isolate to streptomycin. The majority (65%) of the isolates was susceptibility to all six antimicrobials. One multidrug resistant isolate was detected, showing resistance to ciprofloxacin, nalidixic acid, tetracycline and streptomycin.

The proportions of quinolone and tetracycline resistant isolates increased from the last time *C. jejuni* from bovines were studied in 2016: resistance to ciprofloxacin increased 19 percentage points and resistance to nalidixic acid 12 percentage points. In addition, tetracycline resistance was detected in 2% of the isolates in 2016 which means 10 percentage point increase in 2020. On the other hand, one isolate of the 48 tested was resistant to erythromycin in 2016 while no macrolide resistance was detected in 2020.

The reasons for the increase in quinolone and tetracycline resistance are unknown.

25. General Description of Antimicrobial Resistance Monitoring; *Salmonella* spp. Cattle

1. General description of sampling design and strategy

The isolates originate from the Finnish *Salmonella* control programme. For details in sampling, see text for *Salmonella* spp. in animal – Cattle (bovine animals) and *Salmonella* spp. in food – meat from bovine animals.

2. Stratification procedure per animal population and food category

Sampling is performed as described in the text for *Salmonella* spp. in animal – Cattle (bovine animals) and *Salmonella* spp. in food – Meat from bovine animals.

3. Randomisation procedure per animal population and food category

Sampling details are described in the text for *Salmonella* spp. in animal – Cattle (bovine animals) and *Salmonella* spp. in food – Meat from bovine animals.

All isolates (one serotype per epidemiological unit) are included in the antimicrobial susceptibility testing.

4. Analytical method used for detection and confirmation

Details of the laboratory methodology are described in the text *Salmonella* spp. in bovine animals.

5. Laboratory methodology used for detection of antimicrobial resistance

The susceptibility testing was performed with broth microdilution method according to CLSI using *Escherichia coli* ATCC 25922 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU.

6. Results of investigation

In 2020, 22 salmonella isolates from cattle were tested for susceptibility. Isolates were sensitive to the tested antimicrobials except for three isolates (*S*. Bispebjerg, *S*. Konstanz, *S*. Typhimurium) that had decreased susceptibility to colistin (MIC value 4). *S*. Bispebjerg, *S*. Konstanz, *S*. Typhimurium isolates were also subjected to whole-genome sequencing but no known resistance mechanism for colistin was found. Within the Finnish *Salmonella* control programme, the number of *Salmonella* spp. isolated from bovine animals has been low each year. Taken account of the low salmonella prevalence and the overall low resistance levels, the antimicrobial susceptibility situation continues to be favourable.

26. General Description of Antimicrobial Resistance Monitoring; *Salmonella* spp. - Pigs

1. General description of sampling design and strategy

The isolates originate from the Finnish *Salmonella* control programme. For details in sampling, see text for *Salmonella* spp. in animals – Pigs and *Salmonella* spp. in food – Meat from pig.

2. Stratification procedure per animal population and food category

Sampling is performed as described in the text for *Salmonella* spp. in animals – Pigs and *Salmonella* spp. in food – Meat from pig.

3. Randomisation procedure per animal population and food category

Sampling details are described in the text for *Salmonella* spp. in animal – Pigs and *Salmonella* spp. in food – Meat from pig.

All isolates (one serotype per epidemiological unit) are included in the antimicrobial susceptibility testing.

4. Analytical method used for detection and confirmation

Details of the laboratory methodology are described in the text *Salmonella* spp. in pigs.

5. Laboratory methodology used for detection of antimicrobial resistance

The susceptibility testing was performed with broth microdilution method according to CLSI using *Escherichia coli* ATCC 25922 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU.

6. Results of investigation

In 2020, 10 salmonella isolates from pigs were tested for susceptibility. Resistance was found in one monophasic *S*. Typhimurium (resistant to ampicillin, sulfamethoxazole and tetracycline) and in one *S*. Enteritidis (resistant to ciprofloxacin, nalidixic acid and colistin). Other salmonella isolates from pigs were susceptible to the tested antimicrobials. Within the Finnish *Salmonella* control programme, the number of *Salmonella* spp. isolated from pigs has been low each year and also the resistance is not common. Therefore, the antimicrobial susceptibility situation continues to be favourable.

27. General Description of Antimicrobial Resistance Monitoring; *Salmonella* spp. -Gallus gallus

1. General description of sampling design and strategy

The isolates originate from the Finnish *Salmonella* control programme. For details in sampling, see text for *Salmonella* spp. in animals - *Gallus gallus* (fowl) broilers, laying hens and breeding flocks, and *Salmonella* spp. in food – Meat from broilers.

2. Stratification procedure per animal population and food category

Sampling is performed as described in the text for *Salmonella* spp. in animals - *Gallus gallus* (fowl) broilers, laying hens and breeding flocks, and *Salmonella* spp. in food – Meat from broilers

3. Randomisation procedure per animal population and food category

Sampling details are described in the text for *Salmonella* spp. in animals - *Gallus gallus* (fowl) broilers, laying hens and breeding flocks, and *Salmonella* spp. in food – Meat from broilers.

All isolates (one serotype per epidemiological unit) are included in the antimicrobial susceptibility testing.

4. Analytical method used for detection and confirmation

Details of the laboratory methodology are described in the text *Salmonella* spp. in *Gallus gallus*.

5. Laboratory methodology used for detection of antimicrobial resistance

The susceptibility testing was performed with broth microdilution method according to CLSI using *Escherichia coli* ATCC 25922 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU.

6. Results of investigation

In 2020, five salmonella isolates from *Gallus gallus* were tested for susceptibility and all isolates were susceptible to the tested antimicrobials except for one *S*. Typhimurium which had decreased susceptibility to colistin (MIC value 4). Within the Finnish Salmonella control programme, the number of *Salmonella* spp. isolated from *Gallus gallus* has been very low each year and also the resistance is rarely detected. Therefore, the antimicrobial susceptibility situation continues to be very favourable.

28. General Description of Antimicrobial Resistance Monitoring; *Escherichia coli* – non-pathogenic - Cattle

1. General description of sampling design and strategy

Faecal samples were collected from slaughtered animals from the five biggest slaughterhouses that accounted for approximately 92% of all cattle slaughtered in Finland. Altogether, 295 caecal samples originating from different epidemiological units were collected at slaughter from healthy animals between February and December in 2020. Due to COVID-19 pandemic, sampling was suspended from the beginning of April until the end of May. From each epidemiological unit (slaughter batch), sample was taken from one animal. The samples were taken aseptically and transported refrigerated to the laboratory within 2 days. Samples were collected between Monday and Thursday.

2. Stratification procedure per animal population and food category

The number of randomly taken samples from each slaughterhouse was proportional to the annual slaughter volume.

3. Randomisation procedure per animal population and food category

Samples were collected randomly at slaughterhouses and in total, each sample represented a different epidemiological unit. If several samples from the same epidemiological unit was taken, only one sample was taken for further analysis.

Indicator *E. coli* isolates (one per epidemiological unit) were randomly selected for susceptibility testing. All presumptive ESBL/AmpC/carbapenemase producing *E. coli* were tested for antimicrobial susceptibility.

4. Analytical method used for detection and confirmation

In addition to isolation of indicator *E. coli*, the same samples were also screened for the presence of ESBL/AmpC and carbapenemase producing *E. coli*.

For the isolation of indicator *E. coli*, caecal content was directly spread on Brilliance *E. coli*/coliform selective agar plates (Oxoid) and incubated overnight at 37°C. Typical colonies were subsequently spread on blood agar plates and stored at -80°C until susceptibility testing.

For screening of ESBL/AmpC and carbapenemase producing *E. coli*, the latest EURL protocol was used. For specific screening of carbapenemase producing *E. coli*, CARBA and OXA-48 plates (Biomerieux) were used. Presumptive *E. coli* colonies from the selective plates were confirmed with MALDI-TOF (Bruker, Germany)

5. Laboratory methodology used for detection of antimicrobial resistance

Altogether, 189 indicator *E. coli* isolates were tested for antimicrobial susceptibility. Also, all isolates from the specific monitoring of ESBL/AmpC/carbapenemase producing *E. coli* (n=9) were tested for antimicrobial susceptibility.

The susceptibility testing was performed with broth microdilution method according to CLSI using *Escherichia coli* ATCC 25922 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU. All *E. coli*

isolates were tested with panel one according to Decision 2013/652/EU. If a MIC value to cefotaxime, ceftazidime or meropenem was above the ECOFF, the isolate was further tested with panel two.

6. Results of investigation

Altogether, 97% of the indicator *E. coli* isolates was susceptible to the tested antimicrobials. Resistance was detected were against tetracycline (2.1%), sulfamethoxazole (1.6%), ampicillin (1.1%), and third-generation cephalosporins (0.5%). Overall, resistance has remained low and is quite similar compared to the situation seen in 2016. Resistance was detected at isolate-level to only one or two antimicrobial classes.

In the specific monitoring, ESBL/AmpC-producing *E. coli* were found in 3.1% of the samples (1.4% ESBL and 1.7% presumptive AmpC *E. coli*) which is higher than in 2016 (1.3%). As in 2016, presumptive AmpC phenotype was more common than ESBL phenotype in the specific monitoring.

29. General Description of Antimicrobial Resistance Monitoring; *Escherichia coli* – non-pathogenic – Gallus gallus

1. General description of sampling design and strategy

Caecal samples were collected from animals originating from the four biggest slaughterhouses that accounted for >99% of all broilers slaughtered in Finland. Altogether, 309 caecal samples were collected at slaughter from healthy animals between February and December in 2020. Due to COVID-19 pandemic, sampling was suspended from the beginning of April until the end of May. Sampling was originally planned to be evenly distributed throughout the study period, but the adjustments were made to the sampling plan in the autumn 2020 so that the target number of 300 samples would be achieved. From each epidemiological unit (flock), sample was taken from one animal. The samples were taken aseptically and transported refrigerated to the laboratory within 2 days. Samples were collected between Monday and Thursday.

2. Stratification procedure per animal population and food category

The number of randomly taken samples from each slaughterhouse was proportional to the annual slaughter volume.

3. Randomisation procedure per animal population and food category

Samples were collected randomly at slaughterhouses and in total, each sample represented a different epidemiological unit.

Indicator *E. coli* isolates (one per epidemiological unit) were otherwise randomly selected for susceptibility testing except for February and March when all obtained isolates were included due to lower number of samples achieved. All presumptive ESBL/AmpC/carbapenemase producing *E. coli* were tested for antimicrobial susceptibility.

4. Analytical method used for detection and confirmation

In addition to isolation of indicator *E. coli*, the same samples were also screened for the presence of ESBL/AmpC and carbapenemase producing *E. coli*.

For the isolation of indicator *E. coli*, caecal content was directly spread on Brilliance *E. coli*/coliform selective agar plates (Oxoid) and incubated overnight at 37°C. Typical colonies were subsequently spread on blood agar plates and stored at -80°C until susceptibility testing.

For screening of ESBL/AmpC and carbapenemase producing *E. coli*, the latest EURL protocol was used. For specific screening of carbapenemase producing *E. coli*, CARBA and OXA-48 plates (Biomerieux) were used. Presumptive *E. coli* colonies from the selective plates were confirmed with MALDI-TOF (Bruker, Germany)

5. Laboratory methodology used for detection of antimicrobial resistance

Altogether, 170 indicator *E. coli* isolates were tested for antimicrobial susceptibility. Also, all isolates from the specific monitoring of ESBL/AmpC/carbapenemase producing *E. coli* (n=1) were tested for antimicrobial susceptibility.

The susceptibility testing was performed with broth microdilution method according to CLSI using *Escherichia coli* ATCC 25922 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU. All *E. coli* isolates were tested with panel one according to Decision 2013/652/EU. If a MIC value to cefotaxime, ceftazidime or meropenem was above the ECOFF, the isolate was further tested with panel two.

6. Results of investigation

Resistance among indicator *E. coli* from broilers was overall low. Resistance was detected against tetracycline (9.4%), ciprofloxacin and nalidixic acid (4.7%), ampicillin (4.1%), sulfamethoxazole (3.5%), trimethoprim (1.8%), and gentamicin (0.6%). Resistance to tetracycline has varied during the last decade and any trends cannot be seen although the proportion of resistant isolates increased from 6% in 2018 to 9% in 2020. Resistance to other antimicrobials has decreased or stayed undetected compared to 2018. Of the isolates tested, 2% were resistant to three antimicrobial classes.

From the specific monitoring, ESBL-producing *E. coli* was found from one sample (0.3%). AmpC-producing *E. coli* was not detected in 2020. The prevalence of ESBL/AmpC-producing *E. coli* in broilers has decreased significantly compared to the previous study years in 2016 and 2018 when these bacteria were found in 14% and 13% of the samples, respectively.

30. General Description of Antimicrobial Resistance Monitoring; *Escherichia coli* – non-pathogenic – Fur animals

1. General description of sampling design and strategy

A convenience sampling was performed from fur animals sent for pathological-anatomical diagnosis or for corona virus screening to the Finnish Food Authority laboratories. Altogether, 31 rectal swab samples originating from 27 different holdings (15 holdings with minks, 11 holdings with blue fox and one holding with raccoon dogs) were screened between March and December 2020.
From minks and blue foxes, one or two faecal samples (either taken directly from the intestines upon autopsy or, from animals screened for coronavirus, as a swab sample from the rectum) were taken from animals originating from the same herd. Faecal samples from the intestines were taken by squeezing a section of the large intestine to a sampling jar and one to five samples originating from the same herd were pooled. Swab samples were taken with a swab stick from one to five individual animals. From raccoon dogs, faecal samples were taken directly from the intestines from three animals as described above.

2. Stratification procedure per animal population and food category

Convenience sampling

3. Randomisation procedure per animal population and food category

Convenience sampling.

All presumptive ESBL/AmpC *E. coli* were tested for susceptibility.

4. Analytical method used for detection and confirmation

The screening of ESBL/AmpC and carbapenemase producing *E. coli* was done following the latest EURL protocol. For specific screening of carbapenemase producing *E. coli*, CARBA and OXA-48 plates (Biomerieux) were used. Presumptive *E. coli* colonies from the selective plates were confirmed with MALDI-TOF (Bruker, Germany)

5. Laboratory methodology used for detection of antimicrobial resistance

The susceptibility testing was performed with broth microdilution method according to CLSI using *Escherichia coli* ATCC 25922 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU. All *E. coli* isolates were tested with panel one according to Decision 2013/652/EU. If a MIC value to cefotaxime, ceftazidime or meropenem was above the ECOFF, the isolate was further tested with panel two.

6. Results of investigation

One phenotypically confirmed AmpC *E. coli* was found from minks.

31. General Description of Antimicrobial Resistance Monitoring; *Escherichia coli* – non-pathogenic - Meat from broilers – fresh - chilled

1. General description of sampling design and strategy

Altogether, 296 samples of packed fresh and chilled (not frozen) meat were collected at retail between February and December to represent the pig meat on market in Finland. Sampling was originally planned to be evenly distributed throughout the study period, but the adjustments were made to the sampling plan in the autumn 2020 so that the target number of 300 samples would be achieved. Sampling was allocated according to meat batches.

The meat samples were sliced or diced and wrapped in vacuum or in a controlled atmosphere. All samples were of domestic origin. Samples were collected from Monday to Thursday except for the biggest NUTS-3 area, where samples were also collected on Fridays. The samples were transported refrigerated to the laboratory within 1 day and the temperature of the meat was measured at the laboratory at arrival.

2. Stratification procedure per animal population and food category

Samples were collected from retail shops in five different NUTS-3 areas, covering approximately 55% of the Finnish population. Because of the nature of the Finnish market (small size, only a few distributors) same batches of the product can be found throughout the country.

3. Randomisation procedure per animal population and food category

Samples were randomly selected at retail shops.

One isolate from each epidemiological unit (if available) was selected for susceptibility testing.

4. Analytical method used for detection and confirmation

For screening of ESBL/AmpC and carbapenemase producing *E. coli*, the latest EURL protocol was used. For specific screening of carbapenemase producing *E. coli*, CARBA and OXA-48 plates (Biomerieux) were used. Presumptive *E. coli* colonies from the selective plates were confirmed with MALDI-TOF (Bruker, Germany).

5. Laboratory methodology used for detection of antimicrobial resistance

The susceptibility testing was performed with broth microdilution method according to CLSI using *Escherichia coli* ATCC 25922 as a quality control strain. The antimicrobials tested and the epidemiological cut-off values (ECOFFs) used are laid down in Decision 2013/652/EU.

6. Results of investigation

From the specific monitoring, ESBL-producing *E. coli* was found from one broiler meat sample (0.3%). AmpC-producing *E. coli* was not detected in 2020. The prevalence of ESBL/AmpC-producing *E. coli* in broiler meat has decreased significantly compared to the previous study years in 2016 and 2018 when these bacteria were found in 22% and 15% of the meat samples, respectively.