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 2015

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 2015.

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.

---

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

List of Contents

1 ANIMAL POPULATIONS

The relevance of the findings on zoonoses and zoonotic agents has to be related to the size and nature of the animal population in the country

1.1 Populations

1.1.1 Information on susceptible animal population

Sources of information

Data on holdings and live animals:Animal keeping and holding place register (pheasant, turkey, geese, mallard, ducks etc), Evira Animal register (sheep, goats, pigs), EviraBovine register (bovine inc. Bison Bison), EviraPoultry (Gallus gallus), Natural Resources Institute Finland, Structure of agricultural and horticultural enterprises Horses, Suomen Hippos, the Finnish Trotting and Breeding AssociationReindeers, Statistics of the Reindeer Herders' AssociationFarmed deer, Provincial veterinary officesData on slaughtered animals:Meat inspection statistics of Finnish Food Safety Authority Evira

Dates the figures relate to and the content of the figures

Data on holdings and live animals:Final data, situation as of 1.12.2015 (pigs, sheep, goat, bovine). Data on reindeers: Final data, 2014/2015, reindeer herding year: 1 June-31 May.

Definitions used for different types of animals, herds, flocks and holdings as well as the types covered by the information

Fattening pigs contains all pigs except boars and sows. Bisons are included in Bovine population.

National evaluation of the numbers of susceptible population and trends in these figures

Number of bovine animal holdings has still decreased. In 2009 there were in average 54 bovine animals in a holding, whereas now six years later the number is 72, so the number of animals in a typical bovine holding has increased notably.

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

Livestock production is concentrated in certain areas and, thus, there are large differencies 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 on Central Finland. Sheep farms are common also in the northern Finland.

2 DISEASE STATUS

2.1 TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.1.1 General evaluation of the national situation

2.1.1.1 Mycobacterium - general evaluation

History of the disease and/or infection in the country

M. 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.

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

The national situation remains favourable.

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

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

2.1.2 Mycobacterium in animals

2.1.2.1 complex in animal - Deer - farmed

Monitoring system

Sampling strategy

Post mortem examination is performed on all slaughtered animals and samples are sent for examination if there is a suspicion of tuberculosis. Deer in the farms that are in the voluntary control program are tested regularly with intradermal comparative test. An official veterinarian is responsible for performing these tests. Imported deer are tested before import. Clinically ill deer are killed and tested if tuberculosis is suspected.

Frequency of the sampling

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.

Type of specimen taken

Intradermal comparative test. In suspect cases and post mortem examination lymph nodes.

Methods of sampling (description of sampling techniques)

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.

Case definition

The intradermal test is considered positive if the bovine tuberculin injection site is more than 2,5 mm thicker than the first measure or at least the size of the avian tuberculin injection site or there are other clinical signs of positive reaction. Case is also considered positive if M. bovis is isolated.

Diagnostic/analytical methods used

Histology, Ziehl-Neelsen stain, cultivation.

Vaccination policy

Vaccination against tuberculosis is prohibited.

Control program/mechanisms

The control program/strategies in place

The voluntary control programme with regular intradermal testing of herds is described in the Government Decree No 838/2013 and in the Decree No 843/2013 of the Ministry of Agriculture and Forestry. 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.

Measures in case of the positive findings or single cases

The investigation of all suspected cases by the veterinary authorities, epidemiological investigation and movement restrictions of suspected animals and culling or slaughtering of the positive animals or herd in case of confirmed disease.

Notification system in place

Mycobacterium tuberculosis complex -infections in cloven-hoofed animals are immediately notifiable and classified as dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry.

Results of the investigation including the origin of the positive animals

No cases of M. bovis were detected in farmed deer in 2015. No samples from farmed deer were sent to Finnish Food Safety Authority Evira for bacteriological examination.

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.

2.1.2.2 complex in animal - Cattle (bovine animals)

Status as officially free of bovine tuberculosis during the reporting year

The entire country free

Finland has been granted the officially tuberculosis free status of bovine herds by a Commission Decision 94/959/EC of 28 December 1994, confirmed by Commission Decision 2003/467/EC.

Monitoring system

Sampling strategy

All AI-bulls are tested by intradermal tuberculin test not more than 28 days before entering the quarantine accommodation of a semen collection center. The bulls are tested annually in the semen collection center thereafter. Clinical suspect cases are investigated by pathological examination of suspect lymph nodes or lesions. All slaughtered animals are inspected for tuberculotic lesions.

Frequency of the sampling

AI-bulls are tested annually. In addition, samples are taken from all suspected cases.

Type of specimen taken

Lymph nodes or tuberculotic lesions.

Methods of sampling (description of sampling techniques)

Testing in live animals is done by intradermal tuberculin testing.In suspect cases, biopsy of a lymph node or a whole lymph node is taken from a living animal. One or more tuberculotic lesions are collected from a dead animal. These samples are divided into two parts, one of which is sent without preservatives and the other part in 10 % buffered formalin solution.

Case definition

Confirmation of an inconclusive or positive intradermal testing is done by comparative intradermal tuberculin testing. Comparative testing is considered positive if bovine tuberculin injection site reaction is more than 4 mm thicker than avian tuberculin injection site when skin fold is measured or if there are clinical symptoms related to bovine tuberculin injection. Case is also considered positive if M. bovis is isolated. The whole herd is investigated as defined above in case of a suspicion in one animal.

Diagnostic/analytical methods used

Histology, Ziehl-Neelsen staining, cultivation.

Vaccination policy

Vaccination of animals against tuberculosis is prohibited in Finland.

Control program/mechanisms

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.

Measures in case of the positive findings or single cases

The investigation of all suspected cases by the veterinary authorities, epidemiological investigation and movement restriction of suspected animals and culling or slaughtering of the positive animals or herd in case of confirmed disease.

Notification system in place

Mycobacterium tuberculosis complex -infections in cloven-hoofed animals are immediately notifiable and classified as dangerous animal diseases according to Decree No 843/2013 of the Ministry of Agriculture and Forestry.

Results of the investigation

No cases of M. bovis were detected in cattle in 2015. 277427 bovine animals were slaughtered and subject to a routine post mortem examination. Samples were collected from three suspicious animals during meat inspection and from one animal during autopsy and sent to the Finnish Food Safety Authority Evira for examination. All results were negative. A total of 315 intradermal tuberculin tests were performed on AI-bulls.

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 relation between human cases of tuberculosis and Finnish cattle population seems to be close to zero.

2.2 BRUCELLOSIS

2.2.1 General evaluation of the national situation

2.2.1.1 Brucella - general evaluation

History of the disease and/or infection in the country

The last case of Brucella abortus in Finland was recorded in 1960. Ovine and caprine brucellosis or porcine brucellosis have never been detected. Finland is officially free from bovine, ovine and caprine brucellosis.

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

The situation remains favourable.

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

Brucellosis has no relevance to public health in Finland.

2.2.2 Brucella in animals

2.2.2.1 B. suis in animal - Pigs

Monitoring system

Sampling strategy

All AI-boars are tested not more than 30 days before entering the quarantine accommodation of a semen collection center and in the quarantine accommodation before entering the semen collection center. The boars are tested annually at the semen collection center thereafter and at the time of slaughter. The herds of the origin sending boars to the semen collection center are tested annually. All suspected animals sampled due to abortion are tested also for brucellosis. Herds belonging to the Finnish SPF (specific pathogen free) system for breeding herds and multiplying herds were monitored.

Frequency of the sampling

Continuous sampling at semen collection centers. Periodical or continuous sampling of the SPF herds. On suspicion due to abortion.

Type of specimen taken

Blood and/or tissue samples due to abortion.

Methods of sampling (description of sampling techniques)

Blood samples are collected for prevalence studies and in suspect cases. In suspect cases aborted foetuses, placental tissue and vaginal mucus are collected from sows that have aborted. Also whole piglets with skeletal or joint problems should be sent for laboratory examination if possible.

Case definition

The animal is considered seropositive, if one of the confirmation tests is positive. The bacteriological investigation (culture): the animal is positive, if brucella bacteria is isolated.

Diagnostic/analytical methods used

Screening: Rose Bengal test (RB). Confirmation: RB or CF or ELISA or culture

Vaccination policy

Vaccination against brucellosis is prohibited in Finland.

Control program/mechanisms

The control program/strategies in place

The measures for control of Brucella suis are in the Animal Diseases 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 authorities, notification procedures and movement restrictions of suspected animals and culling or slaughtering of the positive animals or herd in case of confirmed disease.

Measures in case of the positive findings or single cases

The investigation of all suspected cases by the veterinary authorities, serological testing of blood samples and microbiological testing in case of abortions, epidemiological investigation and movement restriction of suspected animals and culling or slaughtering of the positive animals or herd in case of confirmed disease.

Notification system in place

Brucella suis is classified as an immediately notifiable and dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry.

Results of the investigation including the origin of the positive animals

No cases of brucellosis were recorded in swine in 2015. Altogether 1297 serological samples were tested for Brucella antibody in 2015, all with negative results. In addition 50 animals from 13 herds were tested microbiologically and 87 animals from 7 herds were tested serologically, due to abortions, all with negative results. In addition samples from 171 hunted wild boars were analyzed for presence of antibody to Brucella and/or presence of Brucella bacteria. Four animals were found positive by serology only, one by bacteriology only and two by both serology and bacteriology. Two of the isolated Brucella strains were B. suis biovar 2 and one Brucella strain was not typed further. Also blood samples from 114 farmed wild boars from 25 farms were tested serologically, all with negative results.

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.

2.2.2.2 B. abortus in animal - Cattle (bovine animals)

Status as officially free of bovine brucellosis during the reporting year

The entire country free

Finland has been granted the officially brucellosis free status of bovine herds according to 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.

Monitoring system

Sampling strategy

1. Breeding animals; all AI-bulls are tested not more than 28 days before entering the quarantine accommodation of a semen collection center and in the quarantine accommodation before entering the semen collection center. The bulls are tested annually at the semen collection center thereafter. The herds of the origin sending bulls to the semen collection center are tested annually. 2. Dairy heards with increased number of abortions are targeted and the bulk milk samples are tested under surveillance program. 3. Suspicious animals due to abortions.

Sampling strategy

1. Breeding animals; all AI-bulls are tested not more than 28 days before entering the quarantine accommodation of a semen collection center and in the quarantine accommodation before entering the semen collection center. The bulls are tested annually at the semen collection center thereafter. The herds of the origin sending bulls to the semen collection center are tested annually. 2. Dairy heards with increased number of abortions are targeted and the bulk milk samples are tested under surveillance program. 3. Suspicious animals due to abortions.

Frequency of the sampling

Continuous On suspicion

Type of specimen taken

Other: blood, milk and/or tissue samples due to abortions

Methods of sampling (description of sampling techniques)

Samples are taken from living animals at the semen collection center or at the farm.

Case definition

The animal is seropositive, if confirmation test is positive. The bacteriological investigation (culture): the animal is positive, if brucella bacteria is isolated.

Diagnostic/analytical methods used

Screening: RBT (serum), ELISA (milk). Confirmation: CFT (serum). Culture of tissue samples due to abortions.

Vaccination policy

Vaccination against brucellosis is prohibited.

Control program/mechanisms

The control program/strategies in place

The measures for control of Brucellosis are in the Animal Diseases 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 authorities, notification procedures and movement restrictions of suspected animals and culling or slaughtering of the positive animals or herd in case of confirmed disease.

Measures in case of the positive findings or single cases

The investigation of all suspected cases by the veterinary authorities, serological testing of blood samples and microbiological testing in case of abortions, epidemiological investigation and movement restriction of suspected animals and culling or slaughtering of the positive animals or herd in case of confirmed disease.

Notification system in place

Brucella abortus is classified as an immediately notifiable and dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry.

Results of the investigation

No cases of brucellosis were recorded in 2015. 517 blood samples from AI bulls and 941 bulk milk samples from herds with increased number of abortions and from farms selling animals to AI were tested for brucellosis, all with negative results. In addition, 29 bacteriological examinations of animals from 26 farms and 148 blood samples of animals from 33 farms were tested by serological methods due to abortion or neonatal death; all also with negative results.

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)

There is no relevance to human cases.

2.2.2.3 B. melitensis in animal - Goats

Status as officially free of caprine brucellosis during the reporting year

The entire country free

Finland has been granted the officially brucellosis free status of caprine herds established by Commission Decision 94/965/EC of 28 December 1994.

Monitoring system

Sampling strategy

1. Individual blood samples are collected from caprine herds according to the Council Directive 91/68/EEC, which provides for random checks to be carried out on goat holdings in order to maintain the officially brucellosis free status with regard to B. melitensis. The target is to test at least 5 % of the ovine and caprine animals over six months of age. 2. Suspicious animals due to abortion

Frequency of the sampling

1. Continuous 2. On suspicious

Type of specimen taken

Blood and/or tissue samples due to abortion

Methods of sampling (description of sampling techniques)

Blood samples are taken from living animals at the farm. In suspect cases aborted foetuses, placental tissue and vaginal mucus is collected from animals that have aborted.

Case definition

The animal is seropositive, if the confirmation test is positive. The bacteriological investigation (culture): the animal is positive, if brucella bacteria is isolated.

Diagnostic/analytical methods used

Screening: Rose Bengal test, Confirmation: CF/culture of tissue samples due to abortion

Vaccination policy

Vaccination is prohibited.

Control program/mechanisms

The control program/strategies in place

The measures for control of Brucella melitensis are in the Animal Diseases 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 authorities, notification procedures and movement restrictions of suspected animals and culling or slaughtering of the positive herd in case of confirmed disease.

Measures in case of the positive findings or single cases

The investigation of all suspected cases by the veterinary authorities, serological testing of blood samples and microbiological testing in case of abortions, epidemiological investigation and movement restriction of suspected animals and culling or slaughtering of the positive herd in case of confirmed disease.

Notification system in place

Brucella melitensis is classified as an immediately notifiable and dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry.

Results of the investigation

No cases of brucellosis were recorded in 2015. In 2015 6 random blood samples from healthy animals from 1 farm were tested, all with negative results.

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)

There is no relevance to human cases.

2.2.2.4 B. melitensis in animal - Sheep

Status as officially free of ovine brucellosis during the reporting year

The entire country free

Finland has been granted the officially brucellosis free status of ovine herds established by Commission Decision 94/965/EC of 28 December 1994.

Monitoring system

Sampling strategy

1. Individual blood samples from ovine herds are taken according to Council Directive 91/68/EEC, which provides for random checks to be carried out on sheep and goat holdings in order to maintain the officially brucellosis free status with regard to B. melitensis. An official veterinarian takes the blood samples. The target is to test at least 5 % of the ovine and caprine animals over six months of age. 2. Suspicious animals due to abortion.

Frequency of the sampling

1. Continuous 2. On suspicion

Type of specimen taken

Blood and/or tissue samples due to abortion

Methods of sampling (description of sampling techniques)

Blood samples are taken from living animals at the farm. In suspect cases aborted foetuses, placental tissue and vaginal mucus are collected from animals that have aborted.

Case definition

The animal is seropositive, if the confirmation test is positive. The bacteriological investigation (culture): the animal is positive, if brucella bacteria is isolated.

Diagnostic/analytical methods used

Screening: Rose Bengal test, Confirmation: CFT/culture of tissue samples due to abortion.

Vaccination policy

Vaccination is prohibited.

Control program/mechanisms

The control program/strategies in place

The measures for control of Brucella Melitensis are in the Animal Diseases 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 authorities, notification procedures and movement restrictions of suspected animals and culling or slaughtering of the positive herd in case of confirmed disease.

Measures in case of the positive findings or single cases

The investigation of all suspected cases by the veterinary authorities, serological testing of blood samples and microbiological testing in case of abortions, epidemiological investigation and movement restriction of suspected animals and culling or slaughtering of the positive herd in case of confirmed disease.

Notification system in place

Brucella melitensis is classified as an immediately notifiable and dangerous animal disease according to Decree No 843/2013 of the Ministry of Agriculture and Forestry.

Results of the investigation

No cases of brucellosis were recorded in 2015. 4416 random blood samples from healthy sheep from 107 farms and 62 samples from AI farm were tested, all with negative results. The target for sampling in order to maintain the officially brucellosis free status was achieved. In addition samples from 2 farms in clinically suspect cases due to abortion was investigated bacteriologically and 23 blood samples from two farms were tested by serological methods, all with negative results.

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)

There is no relevance to human cases.

3 INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

Zoonoses are diseases or infections, which are naturally transmissible directly or indirectly between animals and humans. Foodstuffs serve often as vehicles of zoonotic infections. Zoonotic agents cover viruses, bacteria, fungi, parasites or other biological entities that are likely to cause zoonoses.

3.1 SALMONELLOSIS

3.1.1 General evaluation of the national situation

3.1.1.1 Salmonella - general evaluation

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. Majority of human salmonellosis cases have been acquired aboard.

3.2 CAMPYLOBACTERIOSIS

3.2.1 General evaluation of the national situation

3.2.1.1 Thermophilic Campylobacter spp., unspecified - general evaluation

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. After 2008 the number of reported human campylobacteriosis cases has been around 4000 per year but increased in 2014 up to 4887 cases. In 2015, 4589 cases were reported. Since 1998 campylobacters have been 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 programme since the 1990's. From 1999 to 2002 the flock prevalence was on average 7.9% between June and September and 1.1% during the other months.

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. 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.The prevalence of campylobacters in broiler slaughter batches peaks in July-August. 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 5.6% during June-October and 1.2% during the rest of the year.

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

In late summer thermophilic campylobacters are 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. Contaminated drinking water has caused six large outbreaks in the years 1999 - 2007. Unpasteurized milk, imported turkey meat, chicken and strawberries have been suspected as sources of few small outbreaks. Consumption of raw milk caused a campylobacteriosis outbreak in 2012 and 2015, and in another farm outbreak in 2012 raw milk or contact with cattle was suspected as the origin of infection. In a wide raw-milk mediated outbreak in 2014 , Campylobacter jejuni was one of the causative agents.

Recent actions taken to control the zoonoses

The Finnish campylobacter programme for broilers was introduced in 2004. The program consist of compulsory monitoring of broiler slaughter batches, interventions at slaughter and voluntary measures at the holdings.

3.2.2 Campylobacter in animals

3.2.2.1 Thermophilic Campylobacter spp., unspecified in animal - Gallus gallus (fowl)

Monitoring system

Sampling strategy

Compulsory active monitoring of broiler slaughter batches, since 2004. 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.

Frequency of the sampling

At slaughter

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.

Type of specimen taken

At slaughter

Caecum samples

Methods of sampling (description of sampling techniques)

At slaughter

Intact caeca from ten birds are taken. Caecal contents are pooled into one sample in the laboratory.

Case definition

At slaughter

A case is defined as a slaughter batch, from which confirmed isolate of Campylobacter jejuni or C. coli is detected.

Diagnostic/analytical methods used

At slaughter

NMKL No 119 with modifications (direct culture without enrichment)

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.

Control program/mechanisms

The control program/strategies in place

The Finnish campylobacter monitoring programme was introduced in June 2004. It is compulsory for all broiler slaughterhouses.

Measures in case of the positive findings or single cases

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.

Notification system in place

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

Results of the investigation

In 2015, a total of 1547 slaughter batches were sampled between June and October, thermophilic campylobacters (C. jejuni) were detected in 59 (3,8 %) of these slaughter batches. Between January-May and November-December, in total, 335 slaughter batches were sampled, thermophilic campylobacters (C. jejuni) were detected in 3 (0,9%) of these slaughter batches.

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 5.8% during June-October and 1.2% 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.

3.3 LISTERIOSIS

3.3.1 General evaluation of the national situation

3.3.1.1 L. monocytogenes - general evaluation

History of the disease and/or infection in the country

Since 1995 18-70 human listeriosis cases have been recorded annually.

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

The annual incidence in humans has been 0,2 -1,2 per 100 000. 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. Food business operators monitor Listeria according to the Regulation 2073/2005, supplemented by sampling dune by the municipal food control authorities. National surveys on listeria in food are carried out, but not annually.

3.3.2 Listeria in foodstuffs

3.3.2.1 L. monocytogenes in food - Survey - national survey

Monitoring system

Sampling strategy

Research project 2014-2015. Final fish products of 21 Finnish fish processing factories were sampled by local food control authorities. Sampling was carried out in total of 18 plants that were sampled with two to three-month intervals (15 seven times, 2 six times and one four times). At each sampling, three retail packaged product samples from the same lot were taken.

Type of specimen taken

At the production plant

Vacuum packed retail packages of cold-salted and/or cold-smoked, and sliced or cut ready-to-eat fish products.

Methods of sampling (description of sampling techniques)

At the production plant

Each sampling contained three retail packages from the same lot that were analyzed separately.

Definition of positive finding

At the production plant

Listeria monocytogenes detected in 25 g.For quantitive analysis the limit of quantification was 10 cfu/g.

Diagnostic/analytical methods used

At the production plant

Qualitative analysis: ISO 11290-1:1996, Amd 1:2004, modified or NMKL 136:2010, 5th ed. Quantitative analysis: ISO 11290-2:1998, Amd 1:2004, modified

Results of the investigation

Altogether, 239 cold-smoked, 168 cold-salted, and 18 cold-salted (gravad) and cold-smoked fish samples were analyzed for L. monocytogenes. Respectively, 3, 15, and 0 samples were detected to be positive for L. monocytogenes. Positive samples originated from seven different processing plants and from ten lots. In one L. monocytogenes positive cold-salted fish sample the concentration of the bacterium was 20 cfu/g whereas in the rest positive samples the concentration was less than 10 cfu/g.

3.4 YERSINIOSIS

3.4.1 General evaluation of the national situation

3.4.1.1 Yersinia - general evaluation

History of the disease and/or infection in the country

The number of reported cases of human yersiniosis has been between 400 -600 per year, most of which are caused by Yersinia enterocolitica.

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 number of cases caused by Yersinia enterocolitica has 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.

3.5 TRICHINELLOSIS

3.5.1 General evaluation of the national situation

3.5.1.1 Trichinella - general evaluation

History of the disease and/or infection in the country

In Finland, domestic pork examination for Trichinella was initiated during the 1860s. In 1923, meat inspection including Trichinella examination of swine carcasses became mandatory in municipalities with more than 4000 inhabitants, and later in the entire country. Three cases of human trichinellosis originating from imported pork were diagnosed around 1890. 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.

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

It appears that the Trichinella situation in Finland has been changing with decreasing incidence in swine. However, no sign of decrease in incidence in wildlife has been seen. The apparent change in swine may be due to the pig production becoming more intensive with bigger and 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 examination is mandatory to all commercial pork production except for swine originating from officially recognized controlled housing conditions (one holding in 2015). 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.

Recent actions taken to control the zoonoses

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 .

3.5.2 Trichinella in animals

3.5.2.1 Trichinella in animal - Solipeds, domestic - horses

Monitoring system

Sampling strategy

Every single slaughtered horse is examined for Trichinella at meat inspection.

Frequency of the sampling

Trichinella examination is mandatory for horses at meat inspection. All slaughtered horses are introduced to official meat inspection.

Type of specimen taken

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

Methods of sampling (description of sampling techniques)

Sampling and analysing is done according to 2015/1375 EU.

Case definition

Positive result from examination 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.

Control program/mechanisms

The control program/strategies in place

Trichinella examination at meat inspection is mandatory.

Notification system in place

Positive result in Trichinella examination at meat inspection has to be notified and confirmed at National Reference Laboratory in Evira. The trichinella testing has been included in meat inspection of horses since 1990.

Results of the investigation including the origin of the positive animals

Equine trichinellosis has never been found in Finland.

3.5.2.2 Trichinella in animal - Pigs

Number of officially recognised Trichinella-free holdings

During the year 2015, one holding recognized officially as a holding applying controlled housing conditions according to regulation 2015/1375.

Categories of holdings officially recognised Trichinella-free

None in 2015.

Officially recognised regions with negligible Trichinella risk

No

Monitoring system

Sampling strategy

General

Trichinella examination 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 2015). In 2015, in total 567 pigs originating from officially recognized controlled housing conditions were not examined for trichinellosis. All other pigs are examined for trichinellosis at obligatory, official meat inspection in slaughterhouse.

Frequency of the sampling

General

Trichinella examination 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 2015). In 2015, in total 567 pigs originating from officially recognized controlled housing conditions were not examined for trichinellosis. All other pigs are examined for trichinellosis at meat inspection.

Type of specimen taken

General

The sample for Trichinella test from pigs is taken primarily from diaphragm muscle and secondarily from tongue, masseter or abdominal muscles.

Methods of sampling (description of sampling techniques)

General

Muscle sample is taken according to 2015/1375 at meat inspection.

Case definition

General

Positive case is a pig from which the Trichinella test (2015/1375) is positive i.e. Trichinella larva has been detected at test from a pooled muscle sample and/or a single sample. All positive results have to be sent to national reference laboratory Evira for confirmation and identification of the species.

Diagnostic/analytical methods used

General

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).

Control program/mechanisms

Recent actions taken to control the zoonoses

No recent action has been taken. Current routine meat inspection eliminates infected carcasses from human consumption.

Measures in case of the positive findings or single cases

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.

Notification system in place

No Trichinella infections were found in pigs in 2015.

Results of the investigation including description of the positive cases and the verification of the Trichinella species

Fattening pigs not raised under controlled housing conditions in integrated production system

No Trichinella infections were found in fattening pigs in 2015.

Breeding sows and boars

No Trichinella infections were found in breeding sows and boars in 2015.

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

It appears that Trichinella infection incidence and prevalence in swine in Finland is negligible in spite of its persisting abundance in wildlife. This may be caused by the change in swine husbandry, which has become more industrialized. Therefore, small family farms with old pighouses have disappeared.

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.

Additional information

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. Finnish Food Safety Authority Evira is the competent authority that officially recognizes holdings and compartments applying controlled housing conditions. System for official recognition of controlled housing conditions was ready by the end of year 2014. During year 2015, one holding was recognized officially as a holding applying controlled housing conditions.

3.6 ECHINOCOCCOSIS

3.6.1 General evaluation of the national situation

3.6.1.1 Echinococcus - general evaluation

History of the disease and/or infection in the country

Echinococcus granulosus was endemic in reindeer husbandry (reindeer -reindeer herding dog -cycle) but disappeared because of control action by authorities, and 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 involves reindeer, elk (moose) and wolves. Hitherto, no other definitive hosts have been identified.Echinococcus multilocularis has never been diagnosed in Finland.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. Longest data sets cover more than 50 years. All animals are dissected, and their gross parasitological conditions checked. In addition, other researches send liver samples from small mammals if they find something suspicious (usually Taenid cysts) to the LUKE rodent scientists. In the LUKE survey in 2015, about 1100 small mammals 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 (south-central Finland), root vole M. oeconomus (Lapland), Norway lemming Lemmus lemmus (Lapland) and water vole Arvicola amphibius. Also common shrews Sorex araneus (whole Finland), masked shrews S. caecutiens (Northern Finland) and pygmy shrews S. minutus were studied.

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

The low endemic E. granulosus strain in Finland has been described as 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. It can be assumed that if the wolf population in Finland grows and expands its distribution, the parasite will benefit. New intermediate hosts may be identified in new biotopes. So far the zoonotic infection risk is characterized as very low, but in 2015 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 surveillance is needed as well as information and education of the general public. Surveillance is also needed for E. multilocularis, which is known to occur in neighbouring Estonia and was diagnosed in southern Sweden in 2010.

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. In any case, not much can be done to reduce the prevalence in wildlife. However, it is recommended to treat hunting dogs with anticestodal drugs both prior to and after hunting season. Moreover, it is recommended that cervid offals (especially lungs) are not given to dogs or that offals are only fed to dogs after thorough cooking.

3.6.2 Echinococcus in animals

3.6.2.1 Echinococcus spp., unspecified in animal

Monitoring system

Sampling strategy

Mandatory meat inspection covers all known potential intermediate hosts slaughtered. In post mortem inspection, lungs are palpated and incised to discover hydatid cysts. The cysts are sent to Evira for confirmation.- LUKE performs long-term surveys of small mammal populations (see text in general evaluation chapter)- Evira performs surveillance of possible definitive hosts (foxes, wolves, raccoon dogs)

Frequency of the sampling

Continuous sampling

Type of specimen taken

Definitive hosts: Faeces 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 in -80 degrees for a week to inactivate possible Echinococcus eggs.Intermediate hosts: lungs are inspected during meat inspection, voles are dissected and livers inspected.

Case definition

Definitive host: Adult worms found in intestine (E. granulosus) or faeces/rectal contents positive by specific PCR (E. multilocularis).Intermediate host: positive protoscolex finding in microscopic examination of cyst fluid or typical histology of cysts.

Diagnostic/analytical methods used

Definitive hosts: Sedimentation and counting method or PCR for the detection of E. multilocularis egg DNA in faeces.Intermediate hosts: microscopy of cyst fluid, histology, PCR

Other preventive measures than vaccination in place

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.

Control program/mechanisms

The control program/strategies in place

Mandatory official meat inspection.

Measures in case of the positive findings or single cases

Organs with cystic echinococcosis are condemned in meat inspection.

Notification system in place

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.

Results of the investigation including the origin of the positive animals

In 2015, hydatid cysts of Echinococcus granulosus (E. canadensis) were found in four slaughtered reindeer (Rangifer tarandus). Ten wolves out of 41 examined were found positive for Echinococcus granulosus (E. canadensis). No echinococcus infections were found in foxes or raccoon dogs. One case of cystic echinococcosis caused by Echinococcus equinus was found in an imported horse at slaughterhouse. No autochthonous cases of E. equinus have been found in Finland .

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

Echinococcus granulosus (E. canadensis) persists in the wolves and cervids of eastern Finland. The geographical distribution has apparently not changed during the last decades.

3.7 RABIES

3.7.1 General evaluation of the national situation

3.7.1.1 Lyssavirus (rabies) - general evaluation

History of the disease and/or infection in the country

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 km2. 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 the other dogs. In co-operation with the WHO surveillance centre in Tbingen, 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 Tbingen 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. 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 bat.

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

Finland is rabies-free country since 1991, except two import cases (a horse from Estonia in 2003 and a dog from India in 2007) and rabies in bats, but those cases do not affect to the rabies-free status of Finland. However, the infection pressure in wild carnivores species in Russia is high and it poses a continuous risk for the reintroduction of the disease. 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.

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

Two cases of EBLV-2 infection in humans have been confirmed, one in Finland and one in the UK, both were bat researchers. However, the health risk to the general public, which has little contact with bats, is low. As no sylvatic rabies cases were detected, the risk for humans is very low at this moment. Currently the infection pressure in wild carnivores species in Russia is, however, high and it poses a continuous risk for the reintroduction of the disease. There might be a risk for the introduction of rabies through imported animals which could also pose a risk for humans.

Recent actions taken to control the zoonoses

Rabies bait vaccination campaigns for wildlife have been continued along the south eastern border against Russia. Since 2004 distribution is carried out biannually, in spring and in autumn. Since 2014, the campaign is carried out once per year in the autumn. Continuous surveillance and monitoring for rabies is carried out by Evira in Finland. 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.

Suggestions to the European Union for the actions to be taken

Oral vaccination campaigns and control program should be continued annually.

3.7.2 Lyssavirus (rabies) in animals

3.7.2.1 Lyssavirus (rabies) in animal - Dogs

Monitoring system

Sampling strategy

The monitoring of rabies in pets is based on the detection of clinical signs, background information, and laboratory testing.

Frequency of the sampling

On suspicion

Type of specimen taken

brains

Methods of sampling (description of sampling techniques)

Thalamus, pons and medulla

Case definition

When the cell culture (and/or RT-PCR test) is positive.

Diagnostic/analytical methods used

FAT, cell culture (and RT-PCR, sequencing)

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.

Other preventive measures than vaccination in place

Infected animals will be destroyed.

Control program/mechanisms

The control program/strategies in place

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 killed and sent to Evira for laboratory analysis.

Measures in case of the positive findings or single cases

Epidemiological investigation and information campaigns will be started. Infected animals will be destroyed and measures taken to prevent further cases.

Notification system in place

According to the Finnish legislation rabies has been notifiable and controlled since 1922 (Act 338/22, 29 Dec 1922). Rabies is a notifiable diseases 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).

Results of the investigation including the origin of the positive animals

In 2015, 18 dogs were investigated, all with negative results.

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

Indigenous rabies has not been detected in dogs since 1988. Illegal import of pet animals could pose a risk for the introduction of rabies.

3.7.2.2 Rabies virus (RABV) in animal - Wild animals

Monitoring system

Sampling strategy

Sampling is a part of permanent monitoring scheme. Wild animals that are found dead in the nature and suspected animals are sent to the Finnish Food Safety Authority Evira for examination free of charge. The tests carried out include an examination for rabies. Samples are send by local veterinarians, hunters etc. The efficacy of rabies oral vaccination campaigns are evaluated by measuring the antibody response and bait uptake after vaccination in small carnivores, which are sent to Evira from the vaccination area.

Frequency of the sampling

Random, about 500 animals per year.

Type of specimen taken

brains, blood, teeth / bone of the jaw

Case definition

Samples are considered positive if the cell culture (and/or RT-PCR) test is positive.

Diagnostic/analytical methods used

FAT. Cell culture (and RT-PCR) if the animal has bitten a human or other animal or is suspected.

Vaccination policy

An annual programme for the immunisation of wild carnivores is carried out since 1989 in the south eastern 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.

Control program/mechanisms

The control program/strategies in place

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 post mortem examination of wildlife found dead in the nature and investigations of all suspected cases in Evira.

Measures in case of the positive findings or single cases

Epidemiological investigation and information campaigns will be started. Infected animals will be destroyed and measures taken to prevent further cases.

Notification system in place

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).

Results of the investigation including the origin of the positive animals

In 2015 a total of 525 wild animals were examined for rabies, rabies was not detected in these samples.

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

No indigenous sylvatic rabies cases (genotype 1) have been found after February 1989. The infection pressure in wild carnivores in Russia is however high and it poses a risk for the reintroduction of the disease.

Additional information

Bat rabies surveillance: passive surveillance is ongoing. In 2015, 26 bats were examined for lyssaviruses, all with negative results. In Finland, one EBLV-2 positive Daubenton's bat has been detected in 2009.

3.8 STAPHYLOCOCCUS AUREUS METICILLIN RESISTANT (MRSA) INFECTION

3.8.1 Staphylococcus in foodstuffs

3.8.1.1 S. aureus, meticillin resistant (MRSA) in food - Meat from pig - fresh - Retail - food sample - meat - Survey - national survey - Official sampling - Objective sampling

Monitoring system

Sampling strategy

At retail

Altogether, 303 samples of packed fresh meat were collected at retail to represent the target population of pig meat batches. Sampling was evenly distributed throughout the year and samples were randomly selected. Selection of samples was stratified as follow: fresh pig meat, domestic and non-domestic origin, collected from retail shops in three different NUTS-3 areas, NUTS areas covering approximately 45% of the Finnish population.

Frequency of the sampling

At retail

The collected samples were evenly distributed throughout the year 2015.

Type of specimen taken

At retail

Fresh (and chilled, not frozen) meat from pigs. The meat samples could be sliced or diced and wrapped in vacuum or in a controlled atmosphere.

Methods of sampling (description of sampling techniques)

At retail

Samples were collected at retail shops and transported refridgerated to the laboratory within one day. The temperature of the meat was measured in the laboratory at arrival.

Diagnostic/analytical methods used

At retail

MRSA was screened using selective enrichment broths and solid media. The method used was adapted from the EURL protocol for dust samples. Briefly, 25 g of fresh pork meat was diluted in 225 ml of Mueller Hinton broth with 6.5 % NaCl and incubated at 37 C for 16-20 h, 1 ml of the pre-enrichment broth was subsequently mixed with 9 ml of TSB broth with 75 mg/l aztreonam and 3.5 mg/l cefoxitin, and incubated at 37 C for 16-20 h. Finally, 10 ul of the enrichment broth was spread on MRSA Select2 agar plates (BioRad) and incubated at 37 C for 20-28 h. Typical pink colonies were confirmed to Staphylococcus aureus using MALDI-TOF (Bruker, Germany). The presence of a mec gene was confirmed with PCR.

Results of the investigation

Of the total of 303 meat samples tested, nine (3 %) were found positive for MRSA. Seven of these meat samples were of domestic origin. Three of the isolates were of spa type t2741 and six of type t034, both types belonging typically to a clonal complex (CC) 398.

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

Year 2015 was the first survey of MRSA in meat in Finland. Our current situation is favourable as the apparent prevalence of MRSA on porcine meat sold at retail was only 3 %. Same spa types have also been found in pigs in Finland.

3.9 Q-FEVER

3.9.1 General evaluation of the national situation

3.9.1.1 Coxiella (Q-fever) - general evaluation

History of the disease and/or infection in the country

No domestic human cases have ever been detected in Finland. Testing of farm animals for Q-fever has taken place earlier only in connection with export. Related to export, C. burnetii antibodies were found in Finland for the first time, in 2008, in bovine animals at one dairy farm. No clinical cases were detected at this farm. After that surveys have been conducted to study the prevalence of C. burnetii antibodies in dairy cattle, as well as in the goat and sheep population. There has never been reported suspicion for Q-fever in animals based on disease symptoms. After 2008 passive surveillance has been in place by testing of sheep, goats and bovine animals due to abortion.

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

The relevance seems to be negligible both to humans and animals.

3.9.2 Coxiella (Q-fever) in animals

3.9.2.1 C. burnetii in animal

Monitoring system

Sampling strategy

1. Clinical suspicion due to abortions: bovine, sheep and goats 2. Export purposes

Frequency of the sampling

1. and 2. Continuous

Type of specimen taken

serum

Methods of sampling (description of sampling techniques)

1. and 2. Samples are taken from living animals at farm

Case definition

The animal is seropositive if ELISA test is positive

Diagnostic/analytical methods used

ELISA-test

Control program/mechanisms

The control program/strategies in place

Q-fever is an immediately notifiable animal disease according to Decree No 1010/2013 of the Ministry of Agriculture and Forestry.

Notification system in place

Immediately notifiable since 1995.

Results of the investigation including the origin of the positive animals

During year 2015 131 cattle from 22 farms and 15 sheep from 2 farms were tested due to abortion, all with negative results. And two AI-bulls were tested due to export, both with negative results.

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

There is low prevalence (0,2% in 2010) of Q-fever antibodies in bulk milk of dairy cattle, and Q-fever antibodies have never been detected in sheep and goats. In 2011 a survey for antibodies in sheep and goats was conducted. Around 6,6% of all the sheep and 16,7% of all goat herds in Finland was included in the survey and all tested samples were negative.

3.10 TOXOPLASMA

3.10.1 General evaluation of the national situation

3.10.1.1 Toxoplasma - general evaluation

History of the disease and/or infection in the country

From 30 to 50 human cases have been reported yearly.

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

Toxoplasma gondii is endemic in Finland, although the prevalence seems to be lower than in central Europe.

Additional information

Toxoplasma gondii can cause a severe disease in children whose mother has been infected during pregnancy. Also immunocompromised persons, like AIDS patients, may develop a severe disease. Screening of pregnant women is currently not done in Finland.

3.10.2 Toxoplasma in animals

3.10.2.1 T. gondii in animal

Monitoring system

Sampling strategy

The occurence of toxoplasmosis is based on diagnosis at necropsy on animals sent to the Finnish Food Safety Authority Evira for determination of cause of death and/or illness.There is no active monitoring programme at present.

Type of specimen taken

Organs/tissues: brain, muscle, heart, liver, lung, kidneys, spleen, adrenal glands, thyroid glands, placenta.

Case definition

Laboratory diagnosis is based on demonstration of typical cysts in tissues examined histologically after necropsy, when necessary other methods are used for confirmation (immunohistochemistry, PCR).

Diagnostic/analytical methods used

Laboratory diagnosis is based on demonstration of typical cysts in tissues examined, when necessary other methods are used for confirmation (immunohistochemistry, PCR).

Measures in case of the positive findings or single cases

None

Notification system in place

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

3.11 VTEC

3.11.1 General evaluation of the national situation

3.11.1.1 Verotoxigenic E. coli (VTEC) - general evaluation

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. The first Finnish outbreak caused by VTEC serotype O157 occurred in 1997. The outbreak was associated with swimming in a shallow lake. The annual incidence of VTEC infections in humans rose from 0.06 (1990) to 1.0 (1997). Since then the incidence has been 0.4/100.000 inhabitants or lower in the 2000's. About 70-80% of VTEC infections are considered domestically acquired and most of them are caused by VTEC O157. Most human cases are sporadic or family-related infection and some of them have been associated with consumption of unpasteurized milk or with a cattle farm contact. The prevalence of VTEC O157 in cattle faeces was 1.3% in 1997, and in a latter study, in 2003, 0.4%. In 2003, VTEC O157 and non-O157 serotypes were found on 0.07% 11% and of bovine carcass surfaces, respectively. The prevalence of VTEC non-O157 serotypes in cattle faeces was 30%, in 2003. A compulsory control programme for all bovine slaughterhouses started in 2004 for VTEC O157. In addition, a new control progamme for bovine holdings delivering raw milk over 2500 kg/year directly to final consumers, started in 2014.

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). In 2013, the incidence increased to 1.8/ 100000. The increase was partly due to changes in the VTEC diagnostics and in particular the number of non-O157 serotypes increased partly due to the development of laboratory methods. Visiting farms and cattle contact are major risk factors for infection, especially of young children. Most human infections are sporadic and their source remain unknown. Farm-associated small outbreaks have occurred in Finland. The first Finnish outbreak in 1997 was associated with swimming in a lake. In 2001, imported minced meat used in kebab was verified as the source of a small outbreak. In 2012, unpasteurized milk and animal contact was associated with an outbreak caused by VTEC O157. In 2013, a nationwide outbreak caused by sorbitol-positive, non-motile variant of VTEC O157 (with 10 microbiologically confirmed cases) was detected but the source remained unknown. In 2014, contaminated dwell was source of an outbreak caused by VTEC O103. In 2015, one human case with VTEC O157 led to investigation at the farm level. A 10-year old girl had visited the cattle shed and also consumed unpasteurized milk from the farm. VTEC O157 isolates with identical virotype (vtx1, vtx2, eae, hlyA) and indistinguishable PFGE profiles were isolated from the patient and the farm. In addition, one human case with VTEC O26 and one human case with VTEC O145 led to the sampling the farm (in latter case the investigation included two farms). These VTEC types could not be isolated from the samples taken and the origin of these infections remained unknown.

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

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 subtypes are detected among strains isolated from human infections and cattle indicating that cattle might be a common source of human infections in Finland.

Recent actions taken to control the zoonoses

Compulsory control programme for all bovine slaughterhouses started in 2004. The program consist of compulsory monitoring of slaughter bovines, interventions the holding of origin of the animals and voluntary measures at the slaughterhouse. Since the beginning of 2014, bovine holdings which deliver over 2500 kg/year raw milk directly to the final consumer were obligated to sample the herd and the raw milk for VTEC, at least once a year. Sampling is carried out by the producer. However, data is not available for reporting of the results for the years 2014 and 2015. Discussions have been started on how to renew the VTEC program for bovine slaughterhouses. More information is needed on potential control options especially on farms.

3.11.2 Escherichia coli in animals

3.11.2.1 Verotoxigenic E. coli (VTEC) in animal - Cattle (bovine animals)

Monitoring system

Sampling strategy

Compulsory active monitoring of slaughter bovines, since 2004. A compulsory control programme for all bovine slaughterhouses started in January 2004 for serotype O157. Starting from 2015, at least 600 bovines are sampled in a year. Samples are taken from slaughtered bovines by the industry. The total number is divided between the different slaughterhouses depending on their slaughter capacity. The sampling is evenly distributed throughout the year. Note! Sampling at slaughter has an animal based approach, not herd based. Besides, cattle herds are tested as part of the epidemiological investigations related to human infections in case of suspected contact to the farm. Sampling is carried out by the official municipal veterinarian.

Frequency of the sampling

Animals at farm

Case based

Animals at slaughter (herd based approach)

Sampling distributed evenly throughout the year

Type of specimen taken

Animals at farm

Faeces

Animals at slaughter (herd based approach)

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 Evira laboratory for analysis.

Animals at slaughter (herd based approach)

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 Evira.

Case definition

Animals at farm

Animal/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 (herd based approach)

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 (herd based approach)

NMKL 164:2005 (ISO 16654:2001)

Other preventive measures than vaccination in place

Evira has published a guideline for the prevention of VTEC on farms and in slaughterhouses.

Control program/mechanisms

The control program/strategies in place

Compulsory monitoring of slaughter bovines, interventions at holding 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 neighboring holdings and to people.

Recent actions taken to control the zoonoses

Discussion is currently going on, on how to renew the current VTEC control program.

Measures in case of the positive findings or single cases

In case of a positive finding at slaughter the herd of origin of the animal is sampled by the official municipal veterinarian. In case of positive findings at the holding a voluntary risk management plan is launched. 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 is allowed to be delivered only to establishments for pasteurization. The access of visitors to the farm is restricted (especially children).

Notification system in place

National reference laboratory Evira notifies all the positive results to the competent authorities.

Results of the investigation

In 2015, 18 out of 625 samples (2.88 %) from slaughtered cattle were detected to be positive for VTEC O157. One out of four herds tested due to a human case revealed positive.

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

The amount 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 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.

4 ANTIMICROBIAL RESISTANCE INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

4.1 SALMONELLOSIS

4.1.1 Salmonella in animals

4.1.1.1 Antimicrobial resistance in Salmonella Cattle (bovine animals)

Description of sampling designs

Samples originate from the Finnish Salmonella Control Programme.

Sampling strategy used in monitoring

Frequency of the sampling

See Salmonella spp. in bovine animals.

Type of specimen taken

Details of the sampling are described in the text Salmonella spp. in bovine animals.

Methods of sampling (description of sampling techniques)

Methods of the sampling are described in the text Salmonella spp. in bovine animals.

Procedures for the selection of isolates for antimicrobial testing

One isolate per epidemiological unit is included in the antimicrobial susceptibility testing.

Laboratory methodology used for identification of the microbial isolates

Details of the laboratory methodology are described in the text Salmonella spp. in bovine animals.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The susceptibility testing was performed according to CLSI using Escherichia coli ATCC 25922 as a quality control strain. The antimicrobials tested are laid down in Decision 2013/652/EC.

Cut-off values used in testing

EUCAST ECOFFs

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

The overall resistance situation continues to be favourable.

Results of the investigation

Altogether, 16 bovine salmonella isolates were obtained: 13 S. Typhimurium, one S. Enteritidis, one S. Konstanz and one S. Coeln. Resistance was found in one S. Typhimurium isolate which was resistant against ampicillin, tetracycline, sulfamethoxazole, gentamicin and chloramphenicol.

Control program/mechanisms

The control program/strategies in place

See Salmonella spp. in bovine animals.

4.1.1.2 Antimicrobial resistance in Salmonella Pigs

Description of sampling designs

Samples originate from the Finnish Salmonella Control Programme.

Sampling strategy used in monitoring

Frequency of the sampling

See Salmonella spp. in pigs.

Type of specimen taken

Details of the sampling are described in the text Salmonella spp in pigs.

Methods of sampling (description of sampling techniques)

Methods of the sampling are described in the text Salmonella spp in pigs.

Procedures for the selection of isolates for antimicrobial testing

One isolate per epidemiological unit is included in the antimicrobial susceptibility testing.

Laboratory methodology used for identification of the microbial isolates

Details of the laboratory methodology are described in the text Salmonella spp in pigs.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The susceptibility testing was performed according to CLSI using Escherichia coli ATCC 25922 as a quality control strain. The antimicrobials tested are laid down in Decision 2013/652/EC.

Cut-off values used in testing

EUCAST ECOFFs

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

The overall resistance situation continues to be favourable.

Results of the investigation

Seven salmonella isolates were obtained: six S. Typhimurium and one S. Derby. Resistance was found in one S. Typhimurium isolate which was resistant against sulfamethoxazole and trimethoprim.

Control program/mechanisms

The control program/strategies in place

See Salmonella spp. in pigs.

4.1.1.3 Antimicrobial resistance in Salmonella Poultry, unspecified

Description of sampling designs

Samples originate from the Finnish Salmonella Control Programme.

Sampling strategy used in monitoring

Frequency of the sampling

See Salmonella spp. in Gallus gallus - breeding flocks, flocks of laying hens and broiler flocks.

Type of specimen taken

See Salmonella spp. in Gallus gallus - breeding flocks, flocks of laying hens and broiler flocks.

Methods of sampling (description of sampling techniques)

See Salmonella spp. in Gallus gallus - breeding flocks, flocks of laying hens and broiler flocks.

Procedures for the selection of isolates for antimicrobial testing

One isolate per epidemiological unit is included in the antimicrobial susceptibility testing.

Methods used for collecting data

Isolates were collected from local laboratories and tested in Evira.

Laboratory methodology used for identification of the microbial isolates

Details of the laboratory methodology are described in the text Salmonella spp in Gallus gallus.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The susceptibility testing was performed according to CLSI using Escherichia coli ATCC 25922 as a quality control strain. The antimicrobials tested are laid down in Decision 2013/652/EC.

Cut-off values used in testing

EUCAST ECOFFs

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

The overall antimicrobial resistance situation in salmonella isolates from poultry continues to be very favourable.

Results of the investigation

Four salmonella isolates were obtained from poultry: one S. Livingstone and one S. Cerro from broiler flocks, and S. Typhimurium and one S. Enteritidis from laying hen flocks. Resistance was found in S. Enteritidis isolate which had MIC above ECOFF for ampicillin, ciprofloxacin, nalidixic acid and colistin. Colistin MIC can naturally be higher in certain serotypes including S. Enteritidis and in this case the value was just above ECOFF (four).

Control program/mechanisms

The control program/strategies in place

See Salmonella spp. in Gallus gallus - breeding flocks, flocks of laying hens and broiler flocks.

4.2 CAMPYLOBACTERIOSIS

4.2.1 Campylobacter in animals

4.2.1.1 Antimicrobial resistance in C. jejuni Gallus gallus (fowl)

Description of sampling designs

Samples originate from a national Campylobacter Control Programme. For details, see Thermophilic Campylobacter in Gallus gallus.

Sampling strategy used in monitoring

Frequency of the sampling

1 Jun - 31 Oct every slaughtered broiler production batch was sampled; 1 Nov - 31 May random sampling of slaughter batches is performed according to a particular sampling scheme. Details of the sampling are described in 'Thermophilic Campylobacter spp. in Gallus gallus'.

Type of specimen taken

10 intact caeca per batch, taken at slaughterhouse

Methods of sampling (description of sampling techniques)

Caecal contents are pooled into one sample in the laboratory.

Procedures for the selection of isolates for antimicrobial testing

All isolates were tested for antimicrobial susceptibility (one per epidemiological unit). Susceptibility results were obtained for 61 C. jejuni isolates.

Laboratory methodology used for identification of the microbial isolates

Modified standard NMKL 119:2007

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The susceptibility testing was performed according to CLSI using Campylobacter jejuni ATCC 33560 as a quality control strain. The antimicrobials tested are laid down in Decision 2013/652/EC.

Cut-off values used in testing

EUCAST ECOFFs

Results of the investigation

In 2015, only one C. jejuni isolate from Finnish Gallus gallus was resistant to nalidixic acid which corresponds to 1.6 % (1/61) prevalence. Resistance against other studied antimicrobials was not detected. It is noteworthy that fluoroquinolone resistance decreased from 25% to 0% and tetracycline resistance from 17% to 0% between 2014 and 2015.

Measures in case of the positive findings or single cases

Details of the measures if campylobacters are detected are described in 'Thermophilic Campylobacter spp. in Gallus gallus'. No specific measures apply for detection of antimicrobial resistance.

4.3 ESCHERICHIA COLI, NON-PATHOGENIC

4.3.1 Escherichia coli, non-pathogenic in foodstuffs

4.3.1.1 Antimicrobial resistance in E.coli, non-pathogenic, unspecified Meat from bovine animals

Description of sampling designs

Altogether 300 samples of packed fresh meat were collected at retail to represent the target population of bovine meat batches. Sampling was evenly distributed throughout the year.

Stratification procedures per animal populations and food categories

Selection of samples was stratified as follow: fresh bovine meat, domestic and non-domestic origin, collected from retail shops in three different NUTS-3 areas, NUTS areas covering approximately 45% of the Finnish population.

Randomisation procedures per animal populations and food categories

Samples were randomly selected of all available meat products representing different production batches and filling the sampling criteria and regardless of the origin of the meat. The number of samples collected from each NUT was estimated according to the number of inhabitants in the area.

Sampling strategy used in monitoring

Frequency of the sampling

The collected samples were evenly distributed throughout the year 2015.

Type of specimen taken

Fresh (and chilled, not frozen) meat from bovines. The meat samples could be sliced or diced and wrapped in vacuum or in a controlled atmosphere.

Methods of sampling (description of sampling techniques)

Samples were collected at retail shops and transported refridgerated to the laboratory within one day. The temperature of the meat was measured in the laboratory at arrival.

Procedures for the selection of isolates for antimicrobial testing

One E. coli isolate from each sample, if available, was tested for antimicrobial susceptibility. Each sample represented different epidemiological units (batch).

Laboratory methodology used for identification of the microbial isolates

25 grams of meat was aseptically chopped or cut to smaller pieces and pre-enriched in 225 ml buffered peptone-water. Selective isolation of ESBL-AmpC or carbapenemase-producing E. coli was performed according to the DTU laboratory protocol Isolation of ESBL-, AmpC- and carbapenemase-producing E. coli from fresh meat. Presumptive ESBL/AmpC E.coli from MacConkey agar plates were identified using MALDI-TOF (Bruker, Germany).

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The broth microdilution method was used (Sensititre, TREK Diagnostics). The susceptibility testing was performed according to the CLSI standards; Escherichia coli ATCC 25922 was used as a quality control strain. All E. coli isolates were tested with panel one according to Decision 2013/652/EC. If a MIC value to cefotaxime, ceftazidime or meropenem were above the ECOFF, the isolate was further tested with panel two.

Cut-off values used in testing

EUCAST ECOFFs

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

Year 2015 was the first of systematic monitoring of ESBL/AmpC/carbapenemase producing E. coli in meat samples in Finland. Our current situation is favourable as no ESBL-, AmpC- nor carbapenemase producing E. coli strains were detected from bovine meat.

Results of the investigation

Of the total of 300 meat samples tested, no ESBL/AmpC/carbapenemase producing E. coli were isolated.

4.3.1.2 Antimicrobial resistance in E.coli, non-pathogenic, unspecified Meat from pig

Description of sampling designs

Altogether 303 samples of packed fresh meat were collected at retail to represent the target population of pig meat batches. Sampling was evenly distributed throughout the year and samples were randomly selected.

Stratification procedures per animal populations and food categories

Meat samples were collected in three different NUTS-3 areas, the habitants covering approximately 45% of the Finnish population.

Randomisation procedures per animal populations and food categories

Samples were randomly selected of all available meat products filling the sampling criteria and regardless of the origin of the meat.

Sampling strategy used in monitoring

Frequency of the sampling

The collected samples were evenly distributed throughout the year 2015.

Type of specimen taken

Fresh (and chilled, not frozen) meat from pigs. The meat samples could be sliced or diced and wrapped in vacuum or in a controlled atmosphere.

Methods of sampling (description of sampling techniques)

Samples were collected at retail shops and transported refridgerated to the laboratory within one day. The temperature of the meat was measured in the laboratory at arrival.

Procedures for the selection of isolates for antimicrobial testing

One E. coli isolate from each sample, if available, was tested for antimicrobial susceptibility. Each sample represented different epidemiological units (batch).

Laboratory methodology used for identification of the microbial isolates

25 grams of meat was aseptically chopped or cut to smaller pieces and pre-enriched in 225 ml buffered peptone-water. Selective isolation of ESBL-AmpC or carbapenemase-producing E. coli was performed according to the DTU laboratory protocol Isolation of ESBL-, AmpC- and carbapenemase-producing E. coli from fresh meat. Presumptive ESBL/AmpC E.coli from MacConkey agar plates were identified using MALDI-TOF (Bruker, Germany).

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The broth microdilution method was used (Sensititre, TREK Diagnostics). The susceptibility testing was performed according to the CLSI standards; Escherichia coli ATCC 25922 was used as a quality control strain. All E. coli isolates were tested with panel one according to Decision 2013/652/EC. If a MIC value to cefotaxime, ceftazidime or meropenem were above the ECOFF, the isolate was further tested with panel two.

Cut-off values used in testing

EUCAST ECOFFs

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

Year 2015 was the first of systematic monitoring of ESBL/AmpC/carbapenemase producing strains in meat samples in Finland. Our current situation is favourable as only one AmpC producing E. coli and no ESBL- or carbapenemases-producing E.coli -strains were detected from pig meat.

Results of the investigation

Of the total of 303 meat samples tested no ESBL or carbapenemase producing E. coli were isolated. One sample originating from Finland was positive for AmpC producing E. coli.

4.3.2 Escherichia coli, non-pathogenic in animals

4.3.2.1 Antimicrobial resistance in E.coli, non-pathogenic, unspecified Pigs

Description of sampling designs

Sampling was performed at slaughter from healthy animals. Altogether, 306 samples were collected of which 301 and 306 samples were screened for the presence of indicator E. coli and ESBL/AmpC/carbapenemase producing E. coli, respectively.

Stratification procedures per animal populations and food categories

The samples originated from pigs slaughtered in the four major slaughterhouses that accounted for >90 % of the domestically slaughtered pigs in Finland in 2015. The number of randomly taken samples from each slaughterhouse was proportional to the annual slaughter throughput.

Randomisation procedures per animal populations and food categories

Samples were collected randomly and each sample represented a different epidemiological unit (pig holding).

Sampling strategy used in monitoring

Frequency of the sampling

The collected samples were evenly distributed between February and December in 2015.

Type of specimen taken

Caecum

Methods of sampling (description of sampling techniques)

The samples were taken aseptically and transported refrigerated to the laboratory within 2 days. In addition to isolation of indicator E. coli, the same samples were also screened for the presence of ESBL/AmpC producing E. coli.

Procedures for the selection of isolates for antimicrobial testing

Altoghether, 217 E. coli isolates were randomly selected for the susceptibility testing. Also, all isolates from the specific monitoring of ESBL/AmpC producing E. coli were further tested for antimicrobial susceptibility.

Methods used for collecting data

The susceptibility testing was done in Evira, the national reference laboratory.

Laboratory methodology used for identification of the microbial isolates

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 and stored at -80 C until susceptibility testing. In the specific monitoring of ESBL/AmpC and carbapenemase producing E. coli, 1 g of caecal content was diluted in 10 ml of buffered peptone water (BPW). Subsequently, 10 l of the BPW broth was spread on MacConkey agar plates (Becton, Dickinson & Company) containing 1 mg/l cefotaxime for the detection of ESBL/AmpC producers, and on CARBA and OXA-48 plates (Biomerieux) for the detection of carbapenemase producers. MacConkey plates were incubated overnight at 44C, and CARBA and OXA-48 plates overnight at 37 C. Presumptive E. coli colonies from the selective plates were confirmed with MALDI-TOF (Bruker, Germany).

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The broth microdilution method was used (Sensititre, TREK Diagnostics). The susceptibility testing was performed according to the CLSI standards; Escherichia coli ATCC 25922 was used as a quality control strain. All E. coli isolates were tested with panel one according to Decision 2013/652/EC. If a MIC value to cefotaxime, ceftazidime or meropenem were above the ECOFF, the isolate was further tested with panel two.

Cut-off values used in testing

EUCAST ECOFFs

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

The resistance prevalence has been quite stable compared to the years 2010 and 2013. However, slightly increasing trends in resistance to ampicillin, sulfamethoxazole and trimethoprim can be seen when comparing resistance levels in 2015 to years 2010 and 2013.

Results of the investigation

The antimicrobial resistance levels in indicator E. coli in pigs varied from none to moderate. The most common resistance traits were seen against tetracycline, sulfamethoxazole, trimethoprim and ampicillin (in descending order). Resistance to the other monitored antimicrobials was between 0-1%. Although no ESBL/AmpC nor carbapenemase producing E. coli was detected among the randomly selected indicator E. coli, nine (3%,) ESBL or AmpC E. coli isolates were found in the specific monitoring.

4.4 STAPHYLOCOCCUS AUREUS METICILLIN RESISTANT (MRSA) INFECTION

4.4.1 Staphylococcus in foodstuffs

4.4.1.1 Antimicrobial resistance in S. aureus, meticillin resistant (MRSA) Meat from pig

Description of sampling designs

Details of the sampling design and sampling strategy are described in 'Staphylococcus aureus, meticillin resistant (MRSA) from meat and products thereof'.

Stratification procedures per animal populations and food categories

See 'Staphylococcus aureus, meticillin resistant (MRSA) from meat and products thereof'.

Randomisation procedures per animal populations and food categories

See 'Staphylococcus aureus, meticillin resistant (MRSA) from meat and products thereof'.

Sampling strategy used in monitoring

Frequency of the sampling

See 'Staphylococcus aureus, meticillin resistant (MRSA) from meat and products thereof'.

Type of specimen taken

See 'Staphylococcus aureus, meticillin resistant (MRSA) from meat and products thereof'.

Methods of sampling (description of sampling techniques)

See 'Staphylococcus aureus, meticillin resistant (MRSA) from meat and products thereof'.

Procedures for the selection of isolates for antimicrobial testing

One MRSA isolate from each sample, if available, was tested for antimicrobial susceptibility. Each sample represented different epidemiological units (batch).

Laboratory methodology used for identification of the microbial isolates

The details of the laboratory methodology used for identification of the isolates are described in 'Staphylococcus aureus, meticillin resistant (MRSA) from meat and products thereof'.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The antimicrobial susceptibility was tested using Sensititre plates (EUST, TREK Diagnostics) against the following antimicrobials: clindamycin, tetracycline, rifampicin, streptomycin, fusidic acid, penicillin, chloramphenicol, kanamycin, erythromycin, ciprofloxacin, cefoxitin, tiamulin, linezolid, synerzid (quinupristin-dalfopristin), mupirocin, vancomycin, gentamicin, trimethoprim and sulfamethoxazole.

Cut-off values used in testing

EUCAST ECOFFs

Results of the investigation

Of the total of 303 meat samples tested, nine were found positive for MRSA. All isolates were resistant against tetracycline and clindamycin. MICs above ECOFF were also found against erythromycin, streptomycin, ciprofloxacin, linezolid, tiamulin, quinupristin/dalfopristin and trimethoprim.

5 FOODBORNE OUTBREAKS

Foodborne outbreaks are incidences of two or more human cases of the same disease or infection where the cases are linked or are probably linked to the same food source. Situation, in which the observed human cases exceed the expected number of cases and where a same food source is suspected, is also indicative of a foodborne outbreak.

5.1 Outbreaks

5.1.1 Foodborne outbreaks

System in place for identification, epidemological investigations and reporting of foodborne 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 (583/86), the Decree (1365/2011) concerning the follow-up and reporting of food- and waterborne outbreaks and the Communicable Diseases Decree (786/86). Physicians have to 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 municipal outbreak investigation group has to notify THL in case an outbreak is suspected. The local municipal outbreak investigation groups are responsible for the investigation of every suspected food- and waterborne outbreak in their area and for its reporting to the Finnish Food Safety Authority Evira. The notification and final 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, e.g. 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 Poisoning Register (NFPR). The system has been in use since the beginning of 2010. Evira evaluates each final municipal report in co-operation with THL in order to classify the outbreaks based on the strength of evidence. The data is recorded in the National Food Poisoning Register and a national summary report on outbreaks is published by Evira every third year. There were no major differences in the reporting activity at the national level in 2015 compared to previous years. By the introduction of the electronic reporting system, the pick lists used for the collection of data into the National Food Poisoning Register have been harmonized with data collection on EU level by EFSA.

Description of the types of outbreaks covered by the reporting:

All general domestic food- and waterborne outbreaks must be reported in Finland. Illness of more than 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 NFPR, 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 definite communicable diseases and traditional foodborne agents such as those causing intoxications. 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.

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

In 2015, the municipal food control authorities notified 43 food- and waterborne outbreaks, of which 40 were associated with food and three with drinking water. The total number of outbreaks was almost the same as in year 2014. Since 2001, the annual number of reported outbreaks has fluctuated between 32 and 58 with a few year intervals. The lowest number so far, 32 outbreaks, was recorded in 2007. Most of the reported outbreaks are foodborne (93 % in 2015). The number of human cases follows the number of outbreaks usually varying from about 800 to 2000 disease cases annually. Usually about 50 % of the reported outbreaks have been medium size when evaluated by number of cases per outbreak (11-100 persons infected). A few large waterborne outbreaks with a very large number of human cases have been reported. E.g. due to contaminated drinking water, a total of >8000 persons became ill in an outbreak in 2007. In 2015, two large outbreaks (over 100 persons infected) were reported.

Relevance of the different causative agents, food categories and the agent/food category combinations

During the last ten years the most common reported causative agent has been norovirus. In 2015 norovirus caused 12 (30 %) foodborne outbreaks. Salmonella Newport caused an outbreak associated with smoothies/puddings made of chia seeds where 45 persons got ill. Campylobacter jejuni caused a medium sized outbreak with 15 cases via unpasteurized milk. Other classic food poisoning bacteria like Bacillus cereus (1), Staphylococcus aureus (1) and Clostridium perfringens (2) from different sources caused 4 foodborne outbreaks. In 19 (48 %) of the foodborne outbreaks the causative agent remained unknown. In most of these cases however, the investigations showed descriptive epidemiological association between eating a certain food or meal and becoming ill. The most common vehicle (48 %) reported in 2015 was a buffet meal or mixed food where no specific food item was determined as the cause of the outbreak. The investigations revealed a specific food to be the vehicle in only 13 (32 %) outbreaks. Of these, the most common vehicles (4; 10 %) were broiler meat and products thereof.

Relevance of the different type of places of food production and preparation in outbreaks

In 23 (53 %) outbreaks 2015, the place of exposure was a restaurant. In 14 (33 %) outbreaks the place of origin of problem was in a restaurant.

Evaluation of the severity and clinical picture of the human cases

Altogether 1430 persons were reported to fall ill in food- and waterborne outbreaks in 2015. The number of patients afflicted by food poisoning was 667 persons (47 %), while 763 persons (53 %) were infected through contaminated drinking water. According to the reports, 19 persons were hospitalized in five outbreaks. No deaths were reported.

Descriptions of single outbreaks of special interest

In April 2015, two school classes visited a dairy farm and 15 out of the 30 persons got ill. The farm served the children ice cream made on the farm. However, the manufacturing process of the ice cream included heating of the milk used as raw material. The children were also offered to taste the unpasteurized milk produced at the farm. According to the questionnaire, 94 % of those falling ill had tasted the unpasteurized milk. The same PFGE strain of Campylobacter jejuni that was found in the samples of the patients, was also found in the samples of the cows and in the filter of the milking machine. In July 2015, a Salmonella Newport outbreak was discovered in Southern Finland. 45 cases came to the authorities knowledge. The outbreak was associated with various puddings and smoothies made of chia seeds. The products were sold in health food stores in the metropolitan area.

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 is in charge of coordinating 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 analyzed 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 have to demonstrate their proficiency either by obtaining a hygiene proficiency certificate or a certificate of vocational qualification. Independent Proficiency Examiners accredited by the Finnish Food Safety Authority Evira 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 has 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 in order to control outbreaks caused by the most important zoonoses. The prevailing national system for monitoring and surveillance of zoonoses covers Campylobacter, Listeria and the EHEC bacterium in production animals or foodstuffs. The Finnish Strategy on Zoonoses was revised in 2013, highlighting Campylobacter, Yersinia, Listeria, the EHEC bacterium and norovirus as the main foodborne agents that the key actions are targeted on. The network-like Finnish Zoonosis Centre between the national organizations; the Finnish Food Safety Authority Evira 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.

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)	12,731	914,886	277,427	
	Cattle (bovine animals) - calves (under 1 year) - veal calves	10,950	307,086		
	Cattle (bovine animals) - dairy cows and heifers	7,858	285,100		
	Cattle (bovine animals) - meat production animals	3,789	299,542		
	Cattle (bovine animals) - mixed herds	2,235	23,158		
Deer	Deer - farmed	23	302	51	
	Deer - wild			237	
Ducks	Ducks	735	3,520	7,217	
Gallus gallus (fowl)	Gallus gallus (fowl)	1,250	11,847,700	67,645,631	5,417
	Gallus gallus (fowl) - breeding flocks, unspecified			340	
	Gallus gallus (fowl) - broilers	318	6,839,600	67,016,090	3,468
	Gallus gallus (fowl) - laying hens	1,266	4,094,407	59,105	1,609
Geese	Geese	334	558	5,278	
Goats	Goats	924	6,507	238	
Moose	Moose - wild			177	
Mouflons	Mouflons			2	
Pheasants	Pheasants	458	95,100		
Pigs	Pigs	1,433	1,257,847	2,068,664	
	Pigs - breeding animals	808	121,408	42,329	
	Pigs - fattening pigs	1,175	1,136,439	2,026,335	
Reindeers	Reindeers	4,384	194,652	69,801	
Sheep	Sheep	3,693	142,978	50,391	
Solipeds, domestic	Solipeds, domestic - horses	16,000	74,600	1,630	
Turkeys	Turkeys	573	29,200	822,889	353
Wild boars	Wild boars - farmed	202	695	376	
	Wild boars - wild			5	

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

Region	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 infected herds tested under surveillance	Number of herds tested under surveillance by bulk milk	Number of animals or pools tested under surveillance by bulk milk	Number of infected herds tested under surveillance by bulk milk	Number of notified abortions whatever cause	Number of isolations of Brucella infections	Number of abortions due to Brucella abortus	Number of animals tested by microbiology under investigations of suspect cases
FINLAND	156	0	0	0	12,731	0	914,886	8	517	12,731	0	818	818	0	117	0	0	93

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

Region	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 infected herds tested under surveillance	Number of animals tested by microbiology under investigations of suspect cases
FINLAND	23	0	0	0	4,617	0	149,485	108	4,422	4,617	0	3

DISEASE STATUS TABLES

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

Region	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 examinations	Number of animals detected positive in bacteriological examination	Total number of herds
FINLAND	12,731	0	914,886	0	0	0	4	0	12,731

Table Tuberculosis in farmed deer

Region	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 examinations	Number of animals detected positive in bacteriological examination	Total number of herds
FINLAND	0	23	302	0	0	23

Table BRUCELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Deer - zoo animals - Zoo - Unknown - animal sample - blood - Unspecified - Official sampling - Not specified	animal	5	0	Brucella	0
	Dogs - pet animals - Unspecified - Unknown - animal sample - blood - Unspecified - Official sampling - Not specified	animal	13	0	Brucella canis	0
	Dogs - pet animals - Unspecified - Unknown - animal sample - Clinical investigations - Official sampling - Suspect sampling	animal	16	0	Brucella canis	0
	Moose - zoo animal - Zoo - Unknown - animal sample - blood - Unspecified - Official sampling - Not specified	animal	2	0	Brucella	0
	Other ruminants - zoo animals - Zoo - Unknown - animal sample - blood - Unspecified - Official sampling - Not specified	animal	3	0	Brucella	0
	Pigs - unspecified - Farm - Unknown - animal sample - foetus/stillbirth - Clinical investigations - Official sampling - Suspect sampling	animal	50	0	Brucella, unspecified sp.	0
	Pigs - Unspecified - Unknown - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	animal	87	0	Brucella	0
	Pigs - Unspecified - Unknown - animal sample - blood - Surveillance - Official sampling - Selective sampling	animal	1297	0	Brucella	0
	Reindeers - semi-domesticated - Unspecified - Finland - animal sample - blood - Unspecified - Official sampling - Not specified	animal	124	0	Brucella	0
	Reindeers - zoo animals - Zoo - Unknown - animal sample - blood - Unspecified - Official sampling - Not specified	animal	2	0	Brucella	0
	Seals - wild - Natural habitat - Finland - animal sample - Unspecified - Official sampling - Suspect sampling	animal	15	1	Brucella pinnipedialis	1
	Wild boars - farmed - Slaughterhouse - Finland - animal sample - blood - Monitoring - Official sampling - Convenient sampling	animal	114	0	Brucella	0
	Wild boars - wild - Hunting - Unknown - animal sample - Monitoring - Official sampling - Convenient sampling	animal	171	7	Brucella suis	7

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	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	slaughter animal batch	1547	59	Campylobacter jejuni	59
	Gallus gallus (fowl) - broilers - Slaughterhouse - Finland - animal sample - caecum - Control and eradication programmes - Industry sampling - Objective sampling	slaughter animal batch	335	3	Campylobacter jejuni	3

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	N of clinical affected herds	Zoonoses		N of units positive
Not Available	Cattle (bovine animals) - Artificial insemination station - Finland - animal sample - blood - Unspecified - Official sampling - Not specified	animal	2	0			Coxiella	0
	Cattle (bovine animals) - Farm - Finland - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	animal	131	0			Coxiella	0
	Sheep - Farm - Finland - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	animal	15	0			Coxiella	0

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	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	animal	277427	0	Echinococcus, unspecified sp.	0
	Deer - farmed - Game handling estabilishment - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	51	0	Echinococcus, unspecified sp.	0
	Deer - wild - Game handling estabilishment - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	237	0	Echinococcus, unspecified sp.	0
	Foxes - wild - Natural habitat - Finland - animal sample - faeces - Monitoring - Official sampling - Convenient sampling	animal	273	0	Echinococcus multilocularis	0
	Goats - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	238	0	Echinococcus, unspecified sp.	0
	Moose - wild - Game handling estabilishment - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	177	0	Echinococcus, unspecified sp.	0
	Pigs - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	2068664	0	Echinococcus, unspecified sp.	0
	Raccoon dogs - wild - Natural habitat - Finland - animal sample - faeces - Monitoring - Official sampling - Convenient sampling	animal	338	0	Echinococcus multilocularis	0
	Reindeers - semi-domesticated - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	69801	4	Echinococcus granulosus complex	4
	Sheep - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	57572	0	Echinococcus, unspecified sp.	0
	Solipeds, domestic - horses - Slaughterhouse - European Union - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	1630	1	Echinococcus granulosus complex	1
	Voles - wild - Natural habitat - Finland - animal sample - Survey - Official sampling - Objective sampling	animal	1100	0	Echinococcus multilocularis	0
	Wild boars - farmed - Game handling estabilishment - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	376	0	Echinococcus, unspecified sp.	0
	Wild boars - wild - Game handling estabilishment - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	5	0	Echinococcus, unspecified sp.	0
	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling	animal	41	10	Echinococcus granulosus complex	10
Pohjois-Savo (NUTS 2006)	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling	animal	6	2	Echinococcus granulosus complex	2
Pohjois-Karjala (NUTS 2006)	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling	animal	13	3	Echinococcus granulosus complex	3
Kainuu (NUTS 2006)	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling	animal	12	3	Echinococcus granulosus complex	3
Pohjanmaa	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling	animal	3	0	Echinococcus granulosus complex	0
Pohjois-Suomi	Reindeers - semi-domesticated - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	69801	4	Echinococcus granulosus complex	4
Pohjois-Pohjanmaa (NUTS 2006)	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling	animal	5	1	Echinococcus granulosus complex	1
Lappi (NUTS 2006)	Wolves - wild - Natural habitat - Finland - animal sample - Monitoring - Official sampling - Convenient sampling	animal	2	1	Echinococcus granulosus complex	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	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	herd/flock	1	1	VTEC O157	1
	Cattle (bovine animals) - unspecified - Slaughterhouse - Finland - animal sample - faeces - Control and eradication programmes - Industry sampling - Objective sampling	animal	625	18	VTEC O157	18

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Method	Zoonoses	N of units tested	N of units positive
FINLAND	Fish - gravad /slightly salted - Processing plant - Finland - food sample - Survey - national survey - Official sampling - Convenient sampling	single (food/feed)	10	Gram	168	15	<= 100	Listeria monocytogenes	168	1
							>100	Listeria monocytogenes	168	0
	Fish - gravad /slightly salted - Processing plant - Finland - food sample - Survey - national survey - Official sampling - Convenient sampling	single (food/feed)	25	Gram	168	15	Not Available	Listeria monocytogenes	168	15
	Fish - smoked - cold-smoked - Processing plant - Finland - food sample - Survey - national survey - Official sampling - Convenient sampling	single (food/feed)	10	Gram	239	3	<= 100	Listeria monocytogenes	239	0
							>100	Listeria monocytogenes	239	0
	Fish - smoked - cold-smoked - Processing plant - Finland - food sample - Survey - national survey - Official sampling - Convenient sampling	single (food/feed)	25	Gram	239	3	Not Available	Listeria monocytogenes	239	3
	Fishery products, unspecified - ready-to-eat - chilled - Processing plant - Finland - food sample - Survey - national survey - Official sampling - Convenient sampling	single (food/feed)	10	Gram	18	0	<= 100	Listeria monocytogenes	18	0
							>100	Listeria monocytogenes	18	0
	Fishery products, unspecified - ready-to-eat - chilled - Processing plant - Finland - food sample - Survey - national survey - Official sampling - Convenient sampling	single (food/feed)	25	Gram	18	0	Not Available	Listeria monocytogenes	18	0

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
FINLAND	Badgers - wild - Natural habitat - Finland - animal sample - brain - Monitoring - passive - Official sampling - Convenient sampling	animal	7	0	Lyssavirus	0
	Bats - wild - Natural habitat - Finland - animal sample - brain - Monitoring - passive - Official sampling - Convenient sampling	animal	26	0	Lyssavirus	0
	Bears - wild - Natural habitat - Finland - animal sample - brain - Surveillance - Official sampling - Suspect sampling	animal	8	0	Lyssavirus	0
	Cats - pet animals - Unspecified - Finland - animal sample - brain - Clinical investigations - Official sampling - Suspect sampling	animal	9	0	Lyssavirus	0
	Dogs - pet animals - Unspecified - Finland - animal sample - brain - Clinical investigations - Official sampling - Suspect sampling	animal	18	0	Lyssavirus	0
	Foxes - wild - Hunting - Finland - animal sample - brain - Monitoring - Official sampling - Convenient sampling	animal	92	0	Lyssavirus	0
	Foxes - wild - Natural habitat - Finland - animal sample - brain - Surveillance - Official sampling - Suspect sampling	animal	12	0	Lyssavirus	0
	Lynx - wild - Hunting - Finland - animal sample - brain - Monitoring - Official sampling - Convenient sampling	animal	12	0	Lyssavirus	0
	Lynx - wild - Natural habitat - Finland - animal sample - brain - Surveillance - Official sampling - Suspect sampling	animal	33	0	Lyssavirus	0
	Marten - wild - Natural habitat - Finland - animal sample - brain - Monitoring - passive - Official sampling - Convenient sampling	animal	5	0	Lyssavirus	0
	Minks - wild - Natural habitat - Finland - animal sample - brain - Monitoring - passive - Official sampling - Convenient sampling	animal	4	0	Lyssavirus	0
	Other carnivores - wild - Natural habitat - Finland - animal sample - brain - Monitoring - passive - Official sampling - Convenient sampling	animal	2	0	Lyssavirus	0
	Otter - wild - Natural habitat - Finland - animal sample - brain - Monitoring - passive - Official sampling - Convenient sampling	animal	18	0	Lyssavirus	0
	Otter - wild - Natural habitat - Finland - animal sample - brain - Surveillance - Official sampling - Suspect sampling	animal	20	0	Lyssavirus	0
	Polecats - wild - Natural habitat - Finland - animal sample - brain - Monitoring - passive - Official sampling - Convenient sampling	animal	5	0	Lyssavirus	0
	Raccoon dogs - wild - Hunting - Finland - animal sample - brain - Monitoring - passive - Official sampling - Convenient sampling	animal	244	0	Lyssavirus	0
	Raccoon dogs - wild - Natural habitat - Finland - animal sample - brain - Surveillance - Official sampling - Suspect sampling	animal	18	0	Lyssavirus	0
	Solipeds, domestic - horses - Farm - Finland - animal sample - brain - Clinical investigations - Official sampling - Suspect sampling	animal	1	0	Lyssavirus	0
	Wolverine - wild - Natural habitat - Finland - animal sample - brain - Surveillance - Official sampling - Convenient sampling	animal	4	0	Lyssavirus	0
	Wolves - wild - Natural habitat - Finland - animal sample - brain - Surveillance - Official sampling - Convenient sampling	animal	16	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	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	132	0	Salmonella	0
	Cattle (bovine animals) - unspecified - Farm - Finland - animal sample - faeces - Control and eradication programmes - Official sampling - Suspect sampling	herd/flock		N_A	56	2	Salmonella Typhimurium DT U302	1
							Salmonella Typhimurium U 277	1
	Cattle (bovine animals) - unspecified - Farm - Finland - animal sample - faeces - Monitoring - Industry sampling - Not specified	herd/flock		N_A	2811	11	Salmonella Coeln	1
							Salmonella Enteritidis Other	1
							Salmonella Konstanz	1
							Salmonella Typhimurium DT 1	2
							Salmonella Typhimurium DT 135	1
							Salmonella Typhimurium DT 41	2
							Salmonella Typhimurium U 277	4
	Cattle (bovine animals) - unspecified - Slaughterhouse - Finland - animal sample - lymph nodes - Control and eradication programmes - Industry sampling - Objective sampling	animal		N_A	3178	3	Salmonella Typhimurium DT 41	1
							Salmonella Typhimurium U 277	2
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Industry sampling - Not specified	herd/flock	3120	N	3120	2	Salmonella Cerro	1
							Salmonella Livingstone	1
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	3648	Y	3648	2	Salmonella Cerro	1
							Salmonella Livingstone	1
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Official sampling - Not specified	herd/flock	528	N	528	0	Salmonella	0
	Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - adult - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	4	Y	4	0	Salmonella	0
	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	1	Y	1	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	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	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	939	Y	939	1	Salmonella Enteritidis 6a	1
	Gallus gallus (fowl) - laying hens - day-old chicks - Farm - Finland - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	236	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	307	0	Salmonella	0
	Gallus gallus (fowl) - laying hens - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	127	N	127	1	Salmonella Typhimurium U 277	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	133	Y	133	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	65	0	Salmonella	0

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	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	90	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	20	Y	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	15	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	8	0	Salmonella	0
	Pigs - breeding animals - Farm - Finland - animal sample - faeces - Control and eradication programmes - Industry sampling - Census	herd/flock		N_A	52	0	Salmonella	0
	Pigs - breeding animals - Slaughterhouse - Finland - animal sample - lymph nodes - Control and eradication programmes - Industry sampling - Objective sampling	animal		N_A	3195	3	Salmonella Typhimurium RDNC	3
	Pigs - breeding animals - unspecified - boars - Farm - European Union - animal sample - faeces - Control and eradication programmes - Industry sampling - Census	animal		N_A	344	1	Salmonella Typhimurium DT 120	1
	Pigs - fattening pigs - Slaughterhouse - Finland - animal sample - lymph nodes - Control and eradication programmes - Industry sampling - Objective sampling	animal		N_A	3213	0	Salmonella	0
	Pigs - unspecified - Farm - Finland - animal sample - faeces - Control and eradication programmes - Official sampling - Suspect sampling	herd/flock		N_A	38	3	Salmonella Typhimurium RDNC	3
	Pigs - unspecified - Farm - Finland - animal sample - faeces - Monitoring - Industry sampling - Not specified	herd/flock		N_A	571	1	Salmonella Derby	1
	Turkeys - fattening flocks - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Industry sampling - Not specified	herd/flock		N_A	283	0	Salmonella	0
	Turkeys - fattening flocks - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	333	Y	333	0	Salmonella	0
	Turkeys - fattening flocks - before slaughter - Farm - Finland - Not Available - Control and eradication programmes - Official sampling - Not specified	herd/flock		N_A	50	0	Salmonella	0
	Turkeys - parent breeding flocks - adult - Farm - Finland - Not Available - Control and eradication programmes - Industry sampling - Census	herd/flock	7	N	7	0	Salmonella	0
	Turkeys - parent breeding flocks - adult - Farm - Finland - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	7	Y	7	0	Salmonella	0
	Turkeys - parent breeding flocks - adult - Farm - Finland - Not Available - Control and eradication programmes - Official sampling - Census	herd/flock	7	N	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	5	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	8	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	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	3194	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	1660	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	199	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	39	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	67	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	6441	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	1420	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	67	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	10	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	26	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	12	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	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Compound feedingstuffs for cattle - final product - Farm - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	3	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for cattle - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	98	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for cattle - final product - Retail - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	9	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for fish - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	9	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for fur animal - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	28	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for horses - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	1	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for horses - final product - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	1	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for pigs - final product - Farm - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	3	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for pigs - final product - Farm - Netherlands - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	3	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for pigs - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	42	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for poultry (non specified) - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	47	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for poultry (non specified) - final product - Retail - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	1	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for sheep - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	1	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for sheep - final product - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	1	0	Salmonella spp., unspecified	0
	Compound feedingstuffs, not specified - final product - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	8	0	Salmonella spp., unspecified	0
	Compound feedingstuffs, not specified - final product - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	1	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - barley derived - Farm - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	3	0	Salmonella spp., unspecified	0

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Feed material of cereal grain origin - barley derived - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	1	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - maize derived - Border inspection activities - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	2	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - other cereal grain derived - by-products of brewing and distilling - Border inspection activities - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	16	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - other cereal grain derived - by-products of brewing and distilling - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	21	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - other cereal grain derived - Farm - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	3	0	Salmonella spp., unspecified	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	24	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - other cereal grain derived - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	10	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - wheat derived - Farm - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	2	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - wheat derived - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	53	0	Salmonella spp., unspecified	0
	Feed material of land animal origin - dairy products - Farm - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	2	0	Salmonella spp., unspecified	0
	Feed material of land animal origin - dairy products - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	26	0	Salmonella spp., unspecified	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	1	0	Salmonella spp., unspecified	0
	Feed material of land animal origin - offal - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	7	0	Salmonella spp., unspecified	0
	Feed material of marine animal origin - fish meal - Border inspection activities - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	2	0	Salmonella spp., unspecified	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	3	0	Salmonella spp., unspecified	0
	Feed material of oil seed or fruit origin - linseed derived - Border inspection activities - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	4	0	Salmonella spp., unspecified	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	1	0	Salmonella spp., unspecified	0
	Feed material of oil seed or fruit origin - rape seed derived - Border inspection activities - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	41	2	Salmonella Tennessee	1
							Salmonella Typhimurium	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Feed material of oil seed or fruit origin - rape seed derived - Farm - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	2	0	Salmonella spp., unspecified	0
	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	2	0	Salmonella spp., unspecified	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	11	0	Salmonella spp., unspecified	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Border inspection activities - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	24	0	Salmonella spp., unspecified	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	1	0	Salmonella spp., unspecified	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	9	0	Salmonella spp., unspecified	0
	Feed material of oil seed or fruit origin - sunflower seed derived - Border inspection activities - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	3	0	Salmonella spp., unspecified	0
	Other feed material - forages and roughages - Border inspection activities - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	batch (food/feed)	25	Gram	1	0	Salmonella spp., unspecified	0
	Other feed material - forages and roughages - Farm - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	5	0	Salmonella spp., unspecified	0
	Other feed material - miscellaneous - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	11	0	Salmonella spp., unspecified	0
	Other feed material - tubers, roots and similar products - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	2	0	Salmonella spp., unspecified	0
	Other feed material - tubers, roots and similar products - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	16	0	Salmonella spp., unspecified	0
	Other feed material - yeast - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	3	0	Salmonella spp., unspecified	0
	Pet food - final product - Processing plant - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	49	0	Salmonella spp., unspecified	0
	Pet food - final product - Retail - Not Available - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	75	0	Salmonella spp., unspecified	0
	Premixtures - Feed mill - Finland - feed sample - Surveillance - Official sampling - Selective sampling	single (food/feed)	25	Gram	7	0	Salmonella spp., unspecified	0

Table STAPHYLOCOCCUS AUREUS METICILLIN RESISTANT (MRSA) in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Meat from pig - fresh - Retail - Not Available - food sample - meat - Survey - national survey - Official sampling - Objective sampling	batch (food/feed)	25	Gram	303	9	Methicillin resistant Staphylococcus aureus (MRSA)	9

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cats - Unspecified - Finland - animal sample - Clinical investigations - Official sampling - Suspect sampling	animal	209	3	Toxoplasma gondii	3
	Dogs - Unspecified - Finland - animal sample - Clinical investigations - Official sampling - Suspect sampling	animal	812	2	Toxoplasma gondii	2
	Hares - wild - Natural habitat - Finland - animal sample - Monitoring - passive - Official sampling - Convenient sampling	animal	130	5	Toxoplasma gondii	5
	Sheep - Farm - Finland - animal sample - Clinical investigations - Official sampling - Suspect sampling	animal	133	1	Toxoplasma gondii	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Badgers - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	10	0	Trichinella, unspecified sp.	0
	Bears - wild - Hunting - Finland - animal sample - organ/tissue - Surveillance - HACCP and own check - Not specified	animal	21	0	Trichinella, unspecified sp.	0
	Bears - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	9	0	Trichinella, unspecified sp.	0
	Bears - wild - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	35	3	Trichinella nativa	3
	Beavers - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	2	0	Trichinella, unspecified sp.	0
	Crows - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	1	0	Trichinella, unspecified sp.	0
	Eagle - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	13	0	Trichinella, unspecified sp.	0
	Falcons - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	4	0	Trichinella, unspecified sp.	0
	Foxes - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	178	60	Trichinella, unspecified sp.	60
	Lynx - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	53	11	Trichinella, unspecified sp.	11
	Marten - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	7	2	Trichinella, unspecified sp.	2
	Minks - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	8	0	Trichinella, unspecified sp.	0
	Otter - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	47	3	Trichinella, unspecified sp.	3
	Owls - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	10	0	Trichinella, unspecified sp.	0
	Pigs - breeding animals - not raised under controlled housing conditions - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	42329	0	Trichinella, unspecified sp.	0
	Pigs - fattening pigs - not raised under controlled housing conditions - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	2026355	0	Trichinella, unspecified sp.	0
	Polecats - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	4	0	Trichinella, unspecified sp.	0
	Raccoon dogs - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	300	116	Trichinella nativa	1
					Trichinella, unspecified sp.	115
	Seals - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	11	0	Trichinella, unspecified sp.	0
	Solipeds, domestic - horses - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	1630	0	Trichinella, unspecified sp.	0
	Wild boars - farmed - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	376	0	Trichinella, unspecified sp.	0
	Wild boars - farmed - Unspecified - Finland - animal sample - organ/tissue - Surveillance - HACCP and own check - Not specified	animal	21	0	Trichinella, unspecified sp.	0
	Wild boars - wild - Hunting - Finland - animal sample - organ/tissue - Surveillance - HACCP and own check - Not specified	animal	16	2	Trichinella nativa	1
					Trichinella pseudospiralis	1
	Wild boars - wild - Slaughterhouse - Finland - animal sample - organ/tissue - Surveillance - Official sampling - Census	animal	5	0	Trichinella, unspecified sp.	0
	Wolverine - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	4	4	Trichinella, unspecified sp.	4
	Wolves - wild - Natural habitat - Finland - animal sample - organ/tissue - Monitoring - passive - Official sampling - Convenient sampling	animal	36	13	Trichinella, unspecified sp.	13

Foodborne Outbreaks: summarized data

		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	5	0	0				
Campylobacter jejuni	Milk	1	15	0	0				
Clostridium perfringens	Bovine meat and products thereof	1	10	0	0				
	Broiler meat (Gallus gallus) and products thereof					1	5	0	0
Hepatovirus A	Unknown	1	6	4	0				
Listeria monocytogenes	Buffet meals	1	24	1	0				
Norovirus	Bakery products	2	50	0	0				
	Mixed food	2	155	2	0	2	27	0	0
	Buffet meals	2	24	0	0	4	114	0	0
Salmonella Newport	Cereal products including rice and seeds/pulses (nuts, almonds)	1	45	6	0				
Shigella flexneri	Unknown					1	7	6	0
Staphylococcal enterotoxins	Broiler meat (Gallus gallus) and products thereof					1	22	0	0
thermotolerant Campylobacter, unspecified	Tap water, including well water					1	17	0	0
Unknown	Bovine meat and products thereof	1	7	0	0				
	Broiler meat (Gallus gallus) and products thereof	1	25	0	0	1	7	0	0
	Crustaceans, shellfish, molluscs and products thereof	1	12	0	0				
	Vegetables and juices and other products thereof					1	2	0	0
	Fruit, berries and juices and other products thereof					1	3	0	0
	Tap water, including well water	1	726	0	0	1	20	0	0
	Mixed food					3	12	0	0
	Buffet meals					4	36	0	0
	Unknown					6	54	0	0

Causative agent	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	unknown	458	General	Mixed food	N_A	Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent$Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Inadequate chilling	N_A	1	5	0	0
Campylobacter jejuni	unknown	464	General	Milk	raw milk	Descriptive epidemiological evidence$Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans$Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Farm	Farm (not specified)	EEA	Inadequate heat treatment$Unprocessed contaminated ingredient	Two school classes visited a farm. The farm served the children ice cream made on the farm. However, the manufacturing process of the ice cream included heating of the milk used as raw material. The children also were offered to taste unpasteurized milk. According to the questionnaire, 94 % of those falling ill had tasted unpasteurized milk. The same PFGE strain of Campylobacter jejuni that was found in the samples of the patients, was also found in the samples of the cows and the filter of the milking machine.	1	15	0	0
Clostridium perfringens	unknown	471	General	Bovine meat and products thereof	minced meat sauce	Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent$Descriptive environmental evidence	School or kindergarten	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Inadequate chilling	N_A	1	10	0	0

Causative agent	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
Hepatovirus A	unknown	531	General	Unknown	N_A	Descriptive epidemiological evidence	Multiple places of exposure in one country	Unknown	EEA	Unknown	N_A	1	6	4	0
Listeria monocytogenes	unknown	490	General	Buffet meals	N_A	Descriptive epidemiological evidence$Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Storage time/temperature abuse$Unprocessed contaminated ingredient	N_A	1	24	1	0
Norovirus	unknown	449	General	Bakery products	strawberry cake	Analytical epidemiological evidence$Descriptive epidemiological evidence	Temporary mass catering (fairs or festivals)	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Inadequate heat treatment$Unprocessed contaminated ingredient	N_A	1	24	0	0
		451	General	Mixed food	N_A	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	EEA	Infected food handler	N_A	1	24	2	0
		461	General	Buffet meals	N_A	Analytical epidemiological evidence$Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Infected food handler	N_A	1	11	0	0
		486	General	Mixed food	N_A	Analytical epidemiological evidence$Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Infected food handler	N_A	1	131	0	0
		496	General	Buffet meals	N_A	Descriptive epidemiological evidence	Others	Household	EEA	Infected food handler	N_A	1	13	0	0

Causative agent	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	unknown	503	General	Bakery products	raspberry cake	Descriptive epidemiological evidence	Canteen or workplace catering	Unknown	EEA	Unknown	N_A	1	26	0	0
Salmonella Newport	unknown	472	General	Cereal products including rice and seeds/pulses (nuts, almonds)	Chia seeds	Descriptive epidemiological evidence	Household	Retail	EEA	Storage time/temperature abuse$Unprocessed contaminated ingredient	The outbreak was associated with various puddings and smoothies made of chia seeds. The products were sold in health food stores in the metropolitan area.	1	45	6	0
Unknown	unknown	478	General	Crustaceans, shellfish, molluscs and products thereof	seafood salad	Analytical epidemiological evidence$Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	12	0	0
		493	General	Bovine meat and products thereof	meatballs	Analytical epidemiological evidence$Descriptive epidemiological evidence$Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Storage time/temperature abuse	N_A	1	7	0	0
		497	General	Tap water, including well water	N_A	Descriptive epidemiological evidence$Descriptive environmental evidence	Household	Water source	EEA	Water treatment failure	N_A	1	726	0	0
		501	General	Broiler meat (Gallus gallus) and products thereof	chicken ceasar salad	Analytical epidemiological evidence$Descriptive epidemiological evidence$Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Inadequate chilling$Infected food handler$Storage time/temperature abuse$Water treatment failure	N_A	1	25	0	0

Causative agent	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
Clostridium perfringens	unknown	508	General	Broiler meat (Gallus gallus) and products thereof	N_A	Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent$Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Finland	Inadequate chilling	N_A	1	5	0	0
Norovirus	unknown	444	General	Mixed food	N_A	Descriptive epidemiological evidence	School or kindergarten	School or kindergarten	EEA	Infected food handler	N_A	1	7	0	0
		467	General	Buffet meals	N_A	Descriptive epidemiological evidence	Household	Unknown	EEA	Unknown	N_A	1	11	0	0
		504	General	Buffet meals	N_A	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	EEA	Infected food handler	N_A	1	14	0	0
		506	General	Buffet meals	N_A	Descriptive epidemiological evidence	Canteen or workplace catering	Canteen or workplace catering	EEA	Infected food handler	N_A	1	55	0	0
		507	General	Buffet meals	N_A	Descriptive epidemiological evidence	Others	Unknown	EEA	Unknown	N_A	1	34	0	0
		516	General	Mixed food	N_A	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	EEA	Infected food handler	N_A	1	20	0	0
Shigella flexneri	unknown	474	General	Unknown	N_A	Descriptive epidemiological evidence	Others	Unknown	EEA	Unknown	N_A	1	7	6	0

Causative agent	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
Staphylococcal enterotoxins	unknown	513	General	Broiler meat (Gallus gallus) and products thereof	N_A	Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent$Descriptive environmental evidence	Household	Household	EEA	Cross-contamination$Storage time/temperature abuse	The outbreak occurred at a private dinner commune of several households	1	22	0	0
thermotolerant Campylobacter, unspecified	unknown	500	General	Tap water, including well water	N_A	Descriptive epidemiological evidence$Descriptive environmental evidence	Household	Water source	EEA	Water treatment failure	N_A	1	17	0	0
Unknown	unknown	429	General	Mixed food	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	3	0	0
		448	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	7	0	0
		450	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	6	0	0
		452	General	Mixed food	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	2	0	0

Causative agent	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	unknown	456	General	Buffet meals	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	14	0	0
		465	General	Buffet meals	N_A	Descriptive epidemiological evidence$Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Inadequate chilling	N_A	1	2	0	0
		466	General	Tap water, including well water	N_A	Descriptive epidemiological evidence$Descriptive environmental evidence	Household	Water source	EEA	Water treatment failure	N_A	1	20	0	0
		469	General	Mixed food	N_A	Descriptive epidemiological evidence	School or kindergarten	Unknown	EEA	Unknown	N_A	1	7	0	0
		475	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	9	0	0
		479	Household / domestic kitchen	Fruit, berries and juices and other products thereof	blue berries	Descriptive epidemiological evidence	Household	Unknown	Estonia	Unknown	N_A	1	3	0	0
		485	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	4	0	0
		487	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	18	0	0

Causative agent	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	unknown	489	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	10	0	0
		505	Household / domestic kitchen	Vegetables and juices and other products thereof	N_A	Descriptive epidemiological evidence	Household	Unknown	Sweden	Unknown	N_A	1	2	0	0
		514	General	Broiler meat (Gallus gallus) and products thereof	N_A	Descriptive epidemiological evidence$Descriptive environmental evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	EEA	Inadequate chilling$Storage time/temperature abuse$Unprocessed contaminated ingredient	N_A	1	7	0	0
		515	General	Buffet meals	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	EEA	Unknown	N_A	1	8	0	0
		518	General	Buffet meals	N_A	Descriptive epidemiological evidence	Others	Unknown	EEA	Unknown	N_A	1	12	0	0

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: Micromethod dilution (in microtiter plate)

Country of Origin: Finland

	AM substance	Ciprofloxacin	Erythromycin (Erythromycin A)	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**	**32**	**64**
	N of tested isolates	**3**	**3**	**3**	**3**	**3**	**3**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**
0.5				3		1	
1						1	
4					3	1	
<=0.12		3					
<=0.5							3
<=1			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: Census

Programme Code: AMR MON

Analytical Method: Micromethod dilution (in microtiter plate)

Country of Origin: Finland

	AM substance	Ciprofloxacin	Erythromycin (Erythromycin A)	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**	**32**	**64**
	N of tested isolates	**58**	**58**	**58**	**58**	**58**	**58**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**1**	**0**	**0**
0.25		6		26			
0.5		1		32		4	
1						41	
2					3	11	
4					37	2	
8					17		
64					1		
<=0.12		51					
<=0.5							58
<=1			58				

Table Antimicrobial susceptibility testing of Salmonella Cerro in Gallus gallus (fowl) - broilers

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
0.5														1	1
4			1												
64												1			
<=0.015							1								
<=0.03										1					
<=0.25				1											
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
0.06							1								
0.5														1	
8			1												
16												1			
<=0.03										1					
<=0.25				1											1
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Suspect sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
0.5														1	
2		1													
4			1												
16												1			
<=0.015							1								
<=0.03										1					
<=0.25				1											1
<=0.5					1				1						
<=1								1							
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**	**2**	**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**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
0.25							1								
0.5														1	1
4			1					1							
16												1			
>64		1													
>128											1				
<=0.03										1					
<=0.25				1											
<=0.5					1				1						
<=2													1		
<=8						1									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Suspect sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**	**2**	**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								
2		1													
4			1												
16												1			
<=0.03										1					
<=0.25				1										1	1
<=0.5					1				1						
<=1								1							
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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								
0.5														1	
1									1						
2		1						1							
8			1												
16												1			
<=0.03										1					
<=0.25				1											1
<=0.5					1										
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
0.06							1								
1														1	
8			1												
16												1			
<=0.03										1					
<=0.25				1											1
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
0.5														2	
2		2													
8			2												
16												2			
<=0.015							2								
<=0.03										2					
<=0.25				2											2
<=0.5					2				2						
<=1								2							
<=2													2		
<=4											2				
<=8						2									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**	**1**	**0**	**0**	**1**
0.5														1	
4			1												
>32															1
>1024												1			
<=0.015							1								
<=0.03										1					
<=0.25				1											
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
0.5														1	
4			1												
16												1			
<=0.015							1								
<=0.03										1					
<=0.25				1											1
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
0.5														1	
1									2						
4			1												
32												2			
<=0.015							2								
<=0.03										2					
<=0.25				2										1	2
<=0.5					2										
<=1		2						2							
<=2			1										2		
<=4											2				
<=8						2									

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - lymph nodes

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
1									1						
4			1												
32												1			
<=0.015							1								
<=0.03										1					
<=0.25				1										1	1
<=0.5					1										
<=1		1						1							
<=2													1		
<=4											1				
<=8						1									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**
0.03							1								
0.5															1
1														1	
8			1												
32									1						
>64		1											1		
>128						1									
>1024												1			
<=0.03										1					
<=0.25				1											
<=0.5					1										
<=1								1							
<=4											1				

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Control and eradication programmes

Sampler: Official sampling

Sampling Strategy: Suspect sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.5														2	
1														1	
2		1						1							
4			3												
16												1			
32												1			
64												1			
<=0.015							2								
<=0.03										3					
<=0.25				3											3
<=0.5					3				3						
<=1		2						2							
<=2													3		
<=4											3				
<=8						3									

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - lymph nodes

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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							1								
0.5														2	
1									1						
2		1													
4			2												
64												2			
<=0.015							1								
<=0.03										2					
<=0.25				2											2
<=0.5					2				1						
<=1		1						2							
<=2													2		
<=4											2				
<=8						2									

Sampling Stage: Farm

Sampling Type: animal sample - faeces

Sampling Context: Monitoring

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.03							1								
0.06										3					
0.5															1
1									1					1	
2		1						4							
4			3												
16												1			
32												3			
<=0.015							3								
<=0.03										1					
<=0.25				4										3	3
<=0.5					4				3						
<=1		3													
<=2			1										4		
<=4											4				
<=8						4									

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - lymph nodes

Sampling Context: Control and eradication programmes

Sampler: Industry sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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								
0.06										1					
0.5														2	
2		1						2							
4			1												
32												1			
64												1			
<=0.03										1					
<=0.25				2											2
<=0.5					2				2						
<=1		1													
<=2			1										2		
<=4											2				
<=8						2									

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**
0.06										1					
1														1	
2								1							
4			1												
32												1			
<=0.015							1								
<=0.25				1											1
<=0.5					1				1						
<=1		1													
<=2													1		
<=4											1				
<=8						1									

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

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**
MIC	**N of resistant isolates**	**31**	**0**	**0**	**0**	**2**	**1**	**0**	**2**	**0**	**1**	**37**	**46**	**0**	**33**
0.03							10								
0.06							1			3					
0.12										1					
0.25							1								
0.5														50	95
1									128					2	15
2		62						30	11						
4		110	128						1				16		1
8		11	46								1				
16		1	3			17			1			7			
32		1				2									
>32															32
64		1											13		
>64		28											33		
128											1				
>1024												37			
<=0.015							205								
<=0.03										213					
<=0.25				217										165	74

MIC	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	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**	**217**
	N of resistant isolates	**31**	**0**	**0**	**0**	**2**	**1**	**0**	**2**	**0**	**1**	**37**	**46**	**0**	**33**
<=0.5					217				76						
<=1		3						187							
<=2			40										155		
<=4											215				
<=8						198						173			

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

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
	Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.125	0.25	0.25	8	0.5	0.5	0.06	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	9	9	9	9	9	9	9	9	9	9
MIC	N of resistant isolates	7	9	8	8	9	8	0	0	0	0
0.03								4			
0.06								3			
0.12		2									
0.25		4							6		
0.5		2									
2				2							1
4			4	3	1	1	4				1
8		1	1	3		4	2				6
16			3			4	2				1
32					1						
64					5						
>64			1		2						
<=0.015								2			
<=0.03										9	
<=0.06				1							
<=0.12							1		3		

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

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**	**0**	**9**	**9**	**0**	**2**	**0**	**0**	**0**	**1**	**4**	**3**	**0**	**2**
0.25							1								
0.5														1	2
1									3						2
4			8	4	1										
>4				5											
8			1		4						1				
>8					4		1								
16						1									
>32															2
64		1											1		
>64		8											2		
>128											1				
>1024												4			
<=0.015							7								
<=0.03										9					
<=0.25														8	3
<=0.5									6						
<=1								9							
<=2													6		
<=4											7				
<=8						8						5			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from pig - fresh

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
	Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.125	0.25	0.25	8	0.5	0.5	0.06	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
MIC	N of resistant isolates	1	1	1	1	1	1	0	0	0	0
0.06								1			
0.25									1		
0.5		1									
8			1	1							
16							1				1
32						1					
>64					1						
<=0.03										1	

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from pig - fresh

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	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**	**1**	**0**	**0**	**1**
0.03							1								
1									1						
4			1										1		
>4				1											
>8					1										
>32															1
>64		1													
>1024												1			
<=0.03										1					
<=0.25														1	
<=1								1							
<=4											1				
<=8						1									

Table Antimicrobial susceptibility testing of Methicillin resistant Staphylococcus aureus (MRSA) in Meat from pig - fresh

Sampling Stage: Retail | Sampling Type: food sample - meat | Sampling Context: Survey - national survey

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

Analytical Method: Dilution - sensititre

Country Of Origin:Denmark

AM Substance	Cefoxitin	Chloramphenicol	Ciprofloxacin	Clindamycin	Erythromycin (Erythromycin A)	Fusidic acid	Gentamicin	Kanamycin	Linezolid	Mupirocin	Penicillin	Quinupristin/Dalfopristin	Rifampicin	Streptomycin
Performed CC MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Performed MLST MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
ECOFF	4	16	1	0.25	1	0.5	2	8	4	1	0.12	1	0.03	16
Lowest limit	0.5	4	0.25	0.12	0.25	0.5	1	4	1	0.5	0.12	0.5	0.015	4
Highest limit	16	64	8	4	8	4	16	64	8	4	2	4	0.5	32
N of tested isolates	2	2	2	2	2	2	2	2	2	2	2	2	2	2
N of resistant isolates	2	0	1	2	2	0	0	0	0	0	2	1	0	2
MIC														
1												1		
2									1					
>2											2			
4												1		
>4				2										
8	1	2	1					1						
>8					2									
16	1													
32														1
>32														1
<=0.015													2	
<=0.25			1											
<=0.5						2				2				
<=1							2		1					
<=4								1						

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Survey - national survey

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method: Dilution - sensititre

Country of Origin: Denmark

AM substance	Sulfamethoxazole	Tetracycline	Tiamulin	Trimethoprim	Vancomycin
Performed CC MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available
Performed MLST MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available
ECOFF	128	1	2	2	2
Lowest limit	64	0.5	0.5	2	1
Highest limit	512	16	4	32	16
N of tested isolates	2	2	2	2	2
N of resistant isolates	0	2	1	2	0
MIC					
>4			1		
>16		2			
>32				2	
<=0.5			1		
<=1					2
<=64	2				

Sampling Stage: Retail | Sampling Type: food sample - meat | Sampling Context: Survey - national survey

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

Analytical Method: Dilution - sensititre

Country Of Origin:Finland

	AM Substance	Cefoxitin		Chloramphenicol		Ciprofloxacin		Clindamycin		Erythromycin (Erythromycin A)		Fusidic acid		Gentamicin		Kanamycin		Linezolid		Mupirocin		Penicillin		Quinupristin/Dalfopristin		Rifampicin		Streptomycin	
	Performed CC MRSA characterisation	Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available	
	Performed MLST MRSA characterisation	Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available		Not Available	
	ECOFF	4		16		1		0.25		1		0.5		2		8		4		1		0.12		1		0.03		16	
	Lowest limit	0.5		4		0.25		0.12		0.25		0.5		1		4		1		0.5		0.12		0.5		0.015		4	
	Highest limit	16		64		8		4		8		4		16		64		8		4		2		4		0.5		32	
	N of tested isolates	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
MIC	N of resistant isolates	3	4	0	0	0	2	3	4	3	0	0	0	0	0	0	0	0	0	0	0	3	4	3	3	0	0	0	2
0.5											2																		
1																									1				
2																		2	2						3				
>2																						3	4						
4							2		1															3					
>4								3	3																				
8				3	4												2											2	1
>8										3																			
16		3	4																										
>32																												2	
<=0.015																										3	4		
<=0.25						3	2			2																			
<=0.5												3	4							3	4								
<=1														3	4			1	2										
<=4																3	2											1	1

Sampling Stage: Retail | Sampling Type: food sample - meat | Sampling Context: Survey - national survey

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

Analytical Method: Dilution - sensititre

Country of Origin: Finland

	AM substance	Sulfamethoxazole		Tetracycline		Tiamulin		Trimethoprim		Vancomycin	
	Performed CC MRSA characterisation	Not Available		Not Available		Not Available		Not Available		Not Available	
	Performed MLST MRSA characterisation	Not Available		Not Available		Not Available		Not Available		Not Available	
	ECOFF	128		1		2		2		2	
	Lowest limit	64		0.5		0.5		2		1	
	Highest limit	512		16		4		32		16	
	N of tested isolates	3	4	3	4	3	4	3	4	3	4
MIC	N of resistant isolates	0	0	3	4	3	4	0	4	0	0
>4						3	4				
>16				3	4						
>32									4		
<=1										3	4
<=2								3			
<=64		3	4								

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
CARBA MON	Meat from bovine animals - fresh	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Retail	N_A	Monitoring	Official sampling	food sample - meat	batch (food/feed)	Brazil	N_A	3	0
										Denmark	N_A	3	0
										Finland	N_A	286	0
										Netherlands	N_A	6	0
										Poland	N_A	1	0
										United States	N_A	1	0
	Meat from pig - fresh	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Retail	N_A	Monitoring	Official sampling	food sample - meat	batch (food/feed)	Denmark	N_A	9	0
										Finland	N_A	292	0
										Germany	N_A	2	0
	Pigs - fattening pigs	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Slaughterhouse	N_A	Monitoring	Official sampling	animal sample - caecum	herd/flock	Finland	N_A	306	0
ESBL MON	Meat from bovine animals - fresh	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Retail	N_A	Monitoring	Official sampling	food sample - meat	batch (food/feed)	Brazil	N_A	3	0
										Denmark	N_A	3	0
										Finland	N_A	286	0
										Netherlands	N_A	6	0
										Poland	N_A	1	0
										United States	N_A	1	0