European Food Safety Authority

ZOONOSES MONITORING

ESTONIA

The Report referred to in Article 9 of Directive 2003/99/EC

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

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

IN 2008

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Estonia**

Reporting Year:

Laboratory name	Description	Contribution
Veterinary and Food Board (VFB)	The Veterinary and Food Board, a governmental agency carrying out its tasks under the government of the Ministry of Agriculture, functions as a supervising body and ensures that the requirements of the legislation that governs veterinary, food safety, market regulation, animal welfare and farm animal breeding are followed. The broader objective of VFB is to ensure the consumers the production of safe, healthy and quality raw materials for food and food, to prevent and eradicate infectious animal diseases, to protect people from diseases common to both people and animals and diseases that are spread by animals. VFB coordinates the monitoring of zoonoses in Estonia.	Responsible for reporting on trends and sources of zoonoses. Data on zoonotic agents in animals, food and feed; antimicrobial resistance data on isolates from animals, feed and food.
Veterinary and Food Laboratory (VFL)	Veterinary and Food Laboratory carries out statutory testing under various farm animal disease surveillance and food safety control programs and laboratory testing of imported and exported animals and relevant goods.	Data on zoonotic agents in animals, food and feed, antimicrobial resistance data on isolates from animals and food.

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Laboratory name	Description	Contribution
Estonian Agricultural Registers and Information Board (ARIB)	The Estonian Agricultural Registers and Information Board is a governmental institution subordinated to the Ministry of Agriculture. ARIB`s functions are to maintain the register of farm animals as well as the register of agricultural supports and agricultural parcels and to allocate different agricultural, fishery and rural development supports. ARIB also implements the EU agricultural market regulation measures and milk quota system.	Susceptible animal population data.
Health Protection Inspectorate (HPI)	Health Protection Inspectorate is a governmental institution under the subordination of the Ministry of Social Affairs. The area of its activity includes the organisation of supervision of drinking and bathing water; registration of communicable and parasitic diseases, investigation of the circumstances of infection transmission and working out measures for prevention and control of communicable diseases; supervision of the organisation of immunization of population and monitoring of immunization coverage.	Data on human zoonoses and food-borne outbreaks. Also antimicrobial resistance data on isolates from humans.

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 Estonia during the year 2008 .

The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal 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 Community 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 Community 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 Community Summary Report on zoonoses that is published each year by EFSA.

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

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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.

A. Information on susceptible animal population

Sources of information:

Estonian Veterinary and Food Board and Estonian Agricultural Registers and Information Board.

Dates the figures relate to and the content of the figures:

All the figures provided are from December 31, 2008.

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

The number of susceptible population has been quite stable recently.
The data presented in the table includes backyard animals.

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

The highest cattle population density is in the middle-part of Estonia (Järva county) and the biggest pig farm is situated in the Viljandi county. The highest poultry flocks density is in the northern part of Estonia (Harjumaa county).

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	**Category of animals**		**Year**		**Year**		**Year**		**Year**
Bears	**wild**			29					
Cattle (bovine animals)	**calves (under 1 year)**	3936		6409		65915		4452	
	dairy cows and heifers	5242		32349		147491		5742	
	in total	6144		56747		236681		6703	
	meat production animals	896		3704		8417		1072	
	mixed herds	1096		3106		8811		1300	
Deer	**wild**			143					
	wild - roe deer			2088					
Gallus gallus (fowl)	**broilers**			8268180					
	in total	62						98	
	laying hens			137699					
Goats	**animals over 1 year**	450		254		1889		471	
	animals under 1 year	85		56		277		97	
	in total	461		310		2166		483	

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	**Category of animals**		**Year**		**Year**		**Year**		**Year**
Ostriches	**farmed**			18					
Pigs	**breeding animals - unspecified - sows and gilts**	70				26935		87	
	fattening pigs	86				105922		108	
	in total	99		474893		258350		122	
Quails	**in total**			35486					
Reindeers	**wild**			1634					
Sheep	**animals over 1 year**	1801		9744		47364		1926	
	animals under 1 year (lambs)	1008		8870		16723		1086	
	in total	1833		18614		64087		1958	
Solipeds, domestic	**horses - in total**			13					
Wild boars	**wild**			2109					

2. 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.

2.1 SALMONELLOSIS

2.1.1 General evaluation of the national situation

A. General evaluation

History of the disease and/or infection in the country

Surveillance of salmonellosis in human population is undertaken by the Health Protection Inspectorate.
Data show that human salmonellosis is the most frequently reported disease in Estonia. Moreover, the majority of cases have acquired the infection in Estonia. Thus, salmonellosis is an important zoonotic disease in Estonia.
The number of foodborne outbreaks, where Salmonella was detected as a causative agent is on the first place among other outbreaks during years.

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

Surveillance of salmonella in feed, animals and food is carried out in Estonia for many years. In addition to the surveillance systems, monitoring programmes are conducted and they provide additional epidemiological information.
The State Programme on Monitorning and Surveillance of Animal Infectious Diseases is in place. The data received in the frames of this programme shows that the prevalent Salmonella serotypes isolated from cattle were S.Dublin and S.Infantis (in 2007 - S.Typhimurium and S.Lexington; in 2006 - S.Typhimurium, S.Reading and S.Dublin; in 2005 - S.Typhimurium and S.Dublin; in 2004 - S.Dublin and S.group C). S.Cholerasuis and Salmonella enterica subsp. enterica (in 2007 - S.Inganda; in 2006 - S.Enteritidis; in 2005 - S.Typhimurium; in 2004 - S.Stanleyville) were the predominant serotypes isolated from pigs.
S.Enteritidis and S.Lexington were isolated from poultry (Gallus gallus) in 2008.
No turkey, geese and duck flocks are present in Estonia.
Salmonella was found in 5,2 % (in 2007 - 10,7 %) of samples of feed materials and feedingstuffs in 2008. S.Agona was detected in 75 % of positive cases. In 2007 S.Lexington was the prevalent serotype.
In 2002 the Estonian Salmonella Monitoring Programme for Food of Animal Origin has been started and is approved annually by the Director General of the Veterinary and Food Board. Food of animal origin is sampled and analyzed according to the requirements of the programme. In addition food samples are taken in the frames of official surveillance programmes of Veterinary and Food Board.
2282 samples of meat and meat products has been tested in 2008. The number of positive samples decreased in comparison with the previous years. 0,4 % of the meat samples tested were positive (in 2007 - 0,6 %; 2006 - 1,1 %; 2005 - 1,4 %; 2004 - 0,8 %). 40 % of all positive samples composed pig meat, 30 % - bovine meat and products thereof and 10 % (in 2007 - 13 %; 2006 - 60 %; 2005 -

58,3 %; 2004 - 38,8 %) of all positive meat samples compose fresh broiler meat. The predominant isolates were S.Infantis, S.Newport and S.Typhimurium (in 2007 - S.Enteritidis).
There were no positive samples of milk, milk products during last 3 years.
The overall prevalence of Salmonella in foodstuffs decreased and was 0,36 % (in 2007 - 0,5 %; 2006 - 0,79 %; 2005 - 0,8 %; 2004 - 0,5 %).
Antimicrobial resistance:
Salmonella isolates from foodstuffs tested for antibiotic resistance are collected in the frames of monitoring or surveillance programmes.
In 2008 41 (in 2007 - 60; in 2006 - 54) Salmonella spp. isolates were tested in the frames of the Antimicrobial Resistance Monitoring of Zoonotic Agents. 34 isolates originated from animals, 7 from food of animal origin. Investigations were performed by the Veterinary and Food Laboratory.
The number of human cases of salmonellosis is increasing since the year 2004. In 2008 the number of registered human cases of salmonellosis increased 1,5 times in comparison with the year 2007. The predominant causative agent of salmonellosis in humans is S.Enteritidis. Young children are more exposed to the illness in Estonia, especially children from 1 to 4 years old.
The number of food borne outbreaks caused by Salmonella increased in 2008. There were 46 outbreaks registered: 7 general and 39 family outbreaks of salmonellosis registered (in 2007 - 25 outbreaks; in 2006 - 16 outbreaks; in 2005 - 17 outbreaks). In approximately all cases Salmonella enteritidis was the causative agent of the outbreak.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Salmonella infection in humans is mostly food borne. In most cases the relevance of human cases to foodstuffs is determined on the basis of epidemiological investigation. The examination is usually complicated due to small quantities of food batches, which are usually already consumed before the examination starts.
Transmission from an infected person to person is possible.
Salmonella Enteritidis is the predominant agent discovered in humans during years.
Salmonella Typhimurium is on the second position among the other serotypes isolated from humans.
Salmonella Enteritidis is a most frequently detected serovar in poultry and poultry meat during years.
Salmonella Dublin was the predominant agent found in cattle and Salmonella Cholerasuis was the predominant isolate found in pigs in 2008.
In 2007 Salmonella Typhimurium was the predominant agent discovered in cattle and Salmonella Enteritidis was the predominant agent isolated from pigs.

Recent actions taken to control the zoonoses

Surveillance of salmonella in feed, animals and food is carried out in Estonia for many years. In addition to the surveillance systems, monitoring programmes are

conducted and they provide additional epidemiological information.
Salmonella monitoring in animals is carried out according to the State Programme on Monitorning and Surveillance of Animal Infectious Diseases. Salmonella monitoring in food of animal origin is performed according to the Salmonella Monitoring Programme in Food of Animal Origin since the year 2002. Both above mentioned programmes and prevention measures in case of salmonella detection are based on the requirements of the Regulation of the Minister of Agriculture No 46 "Prevention against salmonellosis".

2.1.2 Salmonellosis in humans

2.1.3 Salmonella in foodstuffs

A. Salmonella spp. in eggs and egg products

Monitoring system

Sampling strategy

Eggs at packing centres and egg products at production plants are sampled by the Veterinary and Food Board officials according to the Salmonella Monitoring Programme for Food of Animal Origin (SMPF) and in the frames of official food surveillance sampling plans.
At retail sampling of table eggs and egg products is performed in accordance with the Veterinary and Food Board annual plan as a part of official food control.
Sampling in the frames of SMPF and official food control is performed randomly.
Targeted sampling is preformed in cases of suspicion, consumer complains etc.
In addition to official monitoring and surveillance plans, every food business operator has the obligation to take samples in the frames of self control programmes.

Frequency of the sampling

Eggs at egg packing centres (foodstuff based approach)

Sampling distributed evenly throughout the year

Eggs at retail

Sampling distributed evenly throughout the year

Egg products (at production plant and at retail)

Sampling distributed evenly throughout the year

Type of specimen taken

Eggs at egg packing centres (foodstuff based approach)

Mixture of yolk and white

Eggs at retail

Mixture of yolk and white

Egg products (at production plant and at retail)

dried/liquid egg products etc.

Methods of sampling (description of sampling techniques)

Eggs at egg packing centres (foodstuff based approach)

Eggs are sampled randomly. Sample taken - 5 eggs, sample analyzed - 25 g mixture of yolk and white. Samples are stored at +2+4C and analyzed as soon as possible.

Eggs at retail

Sample analyzed - 25 g mixture of egg yolk and white. Samples are stored at +2+4C and analyzed as soon as possible.

Raw material for egg products (at production plant)

Sampling is random. Sample analyzed - 25 g. Samples are stored at +2+4C and analyzed as soon as possible.

Egg products (at production plant and at retail)

Egg products are sampled randomly. Sample analyzed - 25 g.

Definition of positive finding

Eggs at egg packing centres (foodstuff based approach)

A sample where Salmonella spp. has been isolated.

Eggs at retail

A sample where Salmonella spp. has been isolated.

Raw material for egg products (at production plant)

A sample where Salmonella spp. has been isolated.

Egg products (at production plant and at retail)

A sample where Salmonella spp. has been isolated.

Diagnostic/analytical methods used

Eggs at egg packing centres (foodstuff based approach)

ISO 6579:2003

Eggs at retail

Bacteriological method: ISO 6579:2003

Raw material for egg products (at production plant)

ISO 6579:2003

Egg products (at production plant and at retail)

Bacteriological method: ISO 6579:2003

Control program/mechanisms

The control program/strategies in place

Salmonella Monitoring Programme for Food of Animal Origin (SMPF) is established according to the Regulation of Minister of Agriculture No 46 from 29.03.2007 "Prevention against salmonellosis". SMPF started in 2002 and is approved annually by the Director General of Veterinary and Food Board.
In addition to the monitoring programme samples are taken in the frames of official surveillance and by the industry in accordance with their self control programmes.

Recent actions taken to control the zoonoses

Salmonella Monitoring Programme for Food of Animal origin is in place since the year 2002.

Measures in case of the positive findings

When salmonella is detected in samples taken at packaging centres, contaminated eggs can be used for the production of pasteurized products.
When salmonella is detected in food already present on the market, contaminated food or raw material will be withdrawn from the market or handling.

Notification system in place

Salmonella detection in food is notifiable since 2000 according to the Infectious Animal Disease Control Act and the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".
Laboratories investigating the safety and quality of the products on enterprises which handle food of animal origin are required to notify the Veterinary and Food Board about the isolation of pathogens which may cause infectious animal diseases subject to notification or registration or about suspicion of the occurrence of such pathogens in raw food material or products. In addition, such laboratories are obliged to notify the Health Protection Inspectorate about isolation of zoonotic agents.
Local Veterinary centres notify the local offices of the Health Protection Inspectorate about isolation of Salmonella in food.

Results of the investigation

In the year 2008 Salmonella has not been detected in analyzed eggs and egg products samples.

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

The Estonian Salmonella Monitoring Programme for Food of Animal Origin 2002-2008 indicate that eggs taken at packaging centres are not contaminated with Salmonella.
2,3 % of 308 egg product samples tested in the frames of the monitoring programme were positive for Salmonella during last 7 years. At the same time since the year 2004 there were no positive egg products samples found in the frames of the monitoring programme.

Relevance of the findings in animals to findings in foodstuffs and to human cases

In the year 2008 there were 13 possible outbreaks of human salmonellosis where eggs and egg products were suspected to be the source of infection.

B. Salmonella spp. in broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

At slaughterhouses and cutting plants sampling is performed by the Veterinary and Food Board officials according to the Salmonella Monitoring Programme for Food of Animal Origin (SMPF) and in the frames of official food surveillance sampling plans.
In the frames of official food surveillance poultry meat, offal, carcase chilling water are sampled randomly at slaughterhouse. Targeted sampling is preformed in cases of suspicion.
Samples are taken also at border inspection posts in the frames of border veterinary checks. The samples are taken randomly, but in case of noncompliance, more stringent checks of consignments of the same origin are carried out.
In addition to official monitoring and surveillance plans, every food business operator has the obligation to take samples in the frame of self control programmes.

At meat processing plant

In the frames of official food surveillance programme sampling is performed randomly. Targeted sampling is performed in cases of suspicion, consumer complains etc.

At retail

Random sampling is performed in accordance with the Veterinary and Food Board annual plan as a part of official food control. Targeted sampling is preformed in cases of suspicion, consumer complains and etc.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Other: neck skin, fresh meat, scrap cuttings

At meat processing plant

Other: meat preparations, minced meat, meat products

At retail

Other: fresh and minced meat, meat products etc.

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

Salmonella Monitoring Programme for Food of Animal Origin comprises analyzes of randomly sampled meat or neck skin from carcasses at slaughterhouse and meat or scrap cuttings from cutting plants. At slaughterhouses sampling is performed once a week. Samples are taken immediately after veterinary inspection at the final stage of slaughter line before chilling of carcasses. Neck skin pieces of 10 g are taken using sterile instruments. Samples from 15 carcasses may be accumulated into one clean sample container, marked in the way that the flock of origin and sampling date can be identified and sent to the laboratory as soon as possible. Storing temperature +2 +4 C.
The sampling at cutting plants is performed randomly and carried out each week during the year or twice per year depending on the production capacity.

At meat processing plant

According to the official food surveillance sampling plans sampling is performed as follows:
minced meat, meat preparations plants - raw material is sampled, if it does not originate from the slaughterhouse of the same establishment (sample analyzed 10 g); minced meat, meat preparations and meat preparations made from minced meat are sampled (sample consists of 5 subsamples, which are examined individually; sample size - 10 g),
meat products establishments - meat products are sampled regularly. Analyzed sample size - 25 g.

At retail

Sample analyzed - 10 or 25 g according to the Commission Regulation 2073/2005. Number of subsamples is 5. Samples are stored at +2+4C and analyzed as soon as possible.

Definition of positive finding

At slaughterhouse and cutting plant

A sample where Salmonella spp. has been isolated.

At meat processing plant

A sample where Salmonella spp. has been isolated.

At retail

A sample where Salmonella spp. has been isolated.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

ISO 6579:2003

At meat processing plant

ISO 6579:2003

At retail

Bacteriological method: ISO 6579:2003

Control program/mechanisms

The control program/strategies in place

Salmonella Monitoring Programme for Food of Animal Origin (SMPF) is established according to the Regulation of Minister of Agriculture No 46 from 29.03.2007 "Prevention against salmonellosis". SMPF started in 2002 and is approved annually by the Director General of Veterinary and Food Board.
Prevention of salmonelloosis is based on analyzes made in the frames of salmonella monitoring programme, official control plans and establishment`s self control programme.

Measures in case of the positive findings or single cases

In case of positive findings in poultry meat at handling establishments, the extent of contamination and its sources should be investigated. Thorough cleaning and disinfection should be carried out. The supervisory official may require the improvement of the effectiveness of cleaning procedures on the establishment.
Poultry meat should be destroyed or considered conditionally fit for human consumption and could be destined for manufacturing of heat treated meat products under the supervision of official veterinarian.
When salmonella is detected in food on the market, the food business operator has the obligation to remove the production with positive Salmonella finding from the market or handling.

Notification system in place

Salmonella detection in food is notifiable since 2000 according to the Infectious Animal Disease Control Act and the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".
Laboratories investigating the safety and quality of the products on enterprises which handle food of animal origin are required to notify the Veterinary and Food Board about the isolation of pathogens which may cause infectious animal diseases subject to notification or registration or about suspicion of the occurrence of such pathogens in raw food material or products. In addition, such laboratories are obliged to notify the Health Protection Inspectorate about isolation of zoonotic agents.
Local Veterinary centres notify the local offices of the Health Protection Inspectorate about isolation of Salmonella in food.

Results of the investigation

Altogether 0,85 % of 233 investigated samples of broiler meat and broiler meat products were positive for Salmonella in the year 2008 (in 2007 - 1,3 %; in 2005 - 11,2 %; in 2006 - 5,4 %).
The predominant serovar detected is Salmonella Enteritidis during years.

There were no positive samples found in 102 broiler neck skin samples taken at slaughterhouse in the frames of the Salmonella/Campylobacter baseline survey and in 48 samples of fresh broiler meat taken at cutting plant in the frames of Salmonella Monitoring Programme for Food of Animal Origin.

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

Data received from Salmonella Monitoring Programme for Food of Animal Origin 2002-2008 and analyzes of samples taken in the frames of official control show that during years Salmonella has been detected mostly in fresh broiler meat samples.
Salmonella Enteritidis is the prevalent serovar in broiler meat.

Relevance of the findings in animals to findings in foodstuffs and to human cases

In the year 2008 broiler meat and products thereof were supposed to be the source of infection in 1 verified general outbreak and in 9 possible human outbreaks. The relevance of the source of infection in humans to broiler meat and products thereof in possible outbreaks has been determined on the basis of epidemiological investigation, but not bacteriologically.
Salmonella Enteritidis is the main serovar detected in humans during many years.

C. Salmonella spp. in turkey meat and products thereof

Monitoring system

Sampling strategy

At meat processing plant

Random sampling is performed as a part of official food control. Targeted sampling is preformed in cases of suspicion, consumer complains and etc.

At retail

Random sampling is performed as a part of official food control. Targeted sampling is preformed in cases of suspicion, consumer complains and etc.

Frequency of the sampling

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At meat processing plant

Other: fresh meat, meat products

At retail

Other: fresh meat, meat products

Methods of sampling (description of sampling techniques)

At meat processing plant

Sample analyzed - 10 or 25 g. Number of subsamples is 5. Samples are stored at +2+4C and analyzed as soon as possible.

At retail

Sample analyzed - 10 or 25 g. Number of subsamples is 5. Samples are stored at +2+4C and analyzed as soon as possible.

Definition of positive finding

At meat processing plant

A sample where Salmonella spp. has been isolated.

At retail

A sample where Salmonella spp. has been isolated.

Diagnostic/analytical methods used

At meat processing plant

ISO 6579:2003

At retail

Bacteriological method: ISO 6579:2003

Control program/mechanisms

The control program/strategies in place

As turkey meat in Estonia is mostly imported, sampling is performed at meat processing plants, at retail or at border inspection posts. Sampling is random and is performed in the frames of the official food control.

Measures in case of the positive findings or single cases

The food or raw material for food should be removed from the market or handling.

Notification system in place

Salmonella detection in food is notifiable since 2000 according to the Infectious Animal Disease Control Act and the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".
Laboratories investigating the safety and quality of the products on enterprises which handle food of animal origin are required to notify the Veterinary and Food Board about the isolation of pathogens which may cause infectious animal diseases subject to notification or registration or about suspicion of the occurrence of such pathogens in raw food material or products. In addition, such laboratories are obliged to notify the Health Protection Inspectorate about isolation of zoonotic agents.
Local Veterinary centres notify the local offices of the Health Protection Inspectorate about isolation of Salmonella in food.

Results of the investigation

There were no positive samples in 2008.

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

The consumption of turkey meat is very small in Estonia.
It is very difficult to make any evaluation, as only imported turkey meat has been analyzed and the amount of the analyzed samples is very small.

Relevance of the findings in animals to findings in foodstuffs and to human cases

No positive samples were detected in 2008. Turkey meat and products thereof were not confirmed or suspected as a source of infection in humans.

D. Salmonella spp. in pig meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

Fresh meat from pigs is sampled by the Veterinary and Food Board officials according to the Salmonella Monitoring Programme for Food of Animal Origin (SMPF) and in the frames of official food surveillance sampling plans. In addition to official monitoring and surveillance, every food business operator has the obligation to take samples in the frames of self control programmes.
SMPF comprises analyzes of randomly sampled swabs from pig carcasses at slaughterhouse and meat or scrap cuttings from cutting plants. The number of carcass swab samples is related to the number of annually slaughtered animals (0,15 % of slaughtered pigs in previous year) and the number of meat or scrap cuttings samples to the capacity of the cutting plant (from cutting plants with production quantity over 5 tons per week - one sample once a week; from cutting plants with production quantity up to 5 tons per week - one sample twice a year).
In addition, at the slaughterhouses all carcasses with infection suspicions and pigs slaughtered under special conditions should be sampled.
The sampling in the frames of official food surveillance is performed randomly. Targeted sampling is preformed in cases of suspicion, consumer complains etc.

At meat processing plant

Raw material, minced meat, meat preparations and meat products are sampled randomly in the frame of official food surveillance by the officials of Veterinary and Food Board following the frequencies established in decrees of Director General of Veterinary and Food Board. Targeted sampling is performed in cases of suspicion, consumer complains etc.

At retail

Random sampling is performed by the officials of the Veterinary and Food Board in accordance with the annual plans as a part of official food control. Targeted sampling is performed in cases of suspicion, consumer complains and etc.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Other: carcass swabs, fresh meat

At meat processing plant

Other: fresh meat, minced meat, meat preparations, meat products

At retail

Other: minced meat, meat preparations, ready-to-eat and not-ready-to-eat products

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

Salmonella Monitoring Programme for Food of Animal Origin:
at slaughterhouse - swab samples should be taken after the inspection of the carcasses at the final stage of the slaughter line before chilling of the carcass. 2 surface samples should be taken from each carcass, each from 700 cm2, altogether 1400 cm2. The first sample should be taken from the inner and outer surface of hind side, including inguinal, altogether from area of 700 cm2. The second surface sample should be taken from the inner and outer surface of thoracic cavity and abdominal cavity in the area of sternum, altogether from area of 700 cm2. Two sterile pre-hydrated with 10 ml of buffered peptone water hydrasponges are used for sampling.
The samples are sent to the laboratory as soon as possible. The samples should be marked so, that enables to identify an animal, stockbreeder and date of sampling.
at cutting plant - samples should be taken during meat cutting from production line or any other appropriate site in the cutting plant. Samples with size of at least 25 g are stored at 0+4C and sent to the laboratory as soon as possible.
According to the official food surveillance sampling plans random sampling of meat is performed at slaughterhouses. Sample analyzed - 25 g of meat. At cutting plants or their departments samples from raw material and from cuttings is sampled regularly in the frames of official surveillance. If appropriate, crushed meat for heat treated meat products production and raw material for minced meat production for retail establishments is sampled.

At meat processing plant

According to official food surveillance sampling plans:
minced meat, meat preparations (incl. raw sausages) plants - raw material is sampled, if not originating from the slaughterhouse of the same establishment (sample analyzed 10 or 25 g); minced meat, meat preparations and meat preparations made of minced meat are sampled (each sample consists of 5 subsamples, which are examined individually; subsample weight analyzed - 10 g each).
meat products establishments - meat products are sampled regularly. Sample analyzed - 25 g.

At retail

Sample analyzed - 10 or 25 g according to the Commission Regulation 2073/2005. Number of subsamples taken are 5. Samples are stored at +2+4C

and analyzed as soon as possible.

Definition of positive finding

At slaughterhouse and cutting plant

A sample where Salmonella spp. has been isolated.

At meat processing plant

A sample where Salmonella spp. has been isolated. In case of 5 subsamples the sample is considered to be positive, if Salmonella spp. was isolated in one of subsamples.

At retail

A sample where Salmonella spp. has been isolated. In case of 5 subsamples the sample is considered to be positive, if Salmonella spp. was isolated in one of subsamples.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

ISO 6579:2003

At meat processing plant

ISO 6579:2003

At retail

Bacteriological method: ISO 6579:2003

Control program/mechanisms

The control program/strategies in place

Salmonella Monitoring Programme for Food of Animal Origin (SMPF) is established according to the Regulation of the Minister of Agriculture no 46 from 29.03.2007 "Prevention against salmonellosis". SMPF started in 2002 and is approved annually by the Director General of Veterinary and Food Board.
Prevention of salmonellosis is based on analyzes made in the frames of salmonella monitoring programme, official control sampling and establishment`s self control programmes.

Measures in case of the positive findings or single cases

In case of positive Salmonella findings at slaughterhouses and cutting plants, the extent of contamination and its sources should be investigated. Thorough cleaning and disinfection should be carried out and the effectiveness of cleaning procedures should be improved. The infected carcasses should be destroyed or considered as conditionally fit for human consumption and should be destined for heat treatment.
Retail: the food or raw material for food should be removed from the market or handling.

Notification system in place

Salmonella detection in food is notifiable since 2000 according to the Infectious

Animal Disease Control Act and the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".
Laboratories investigating the safety and quality of the products of enterprises which handle food of animal origin are required to notify the Veterinary and Food Board about the isolation of pathogens which may cause infectious animal diseases subject to notification or registration or about suspicion of the occurrence of such pathogens in raw food material or products. In addition, such laboratories are obliged to notify the Health Protection Inspectorate about isolation of zoonotic agents.
Local Veterinary centres notify the local offices of the Health Protection Inspectorate about isolation of Salmonella in food.

Results of the investigation

0,3 % of the 1259 investigated samples of pig meat and pig meat products were positive for salmonella in 2008 (2007 - 0,27 %; 2006 - 0,27 %; 2005 - 0,5 %).
1 S.Typhimurium, 1 S.Eingedi, 1 S.Newport and 1 S.enterica subsp. enterica has been isolated (in 2007 - 2 S.Typhimurium and 1 S.Cholerasuis and 1 S.London; in 2006 - 2 S.Typhimurium and 1 S.group B; in 2005 - 3 S.Typhimurium, 2 S.Dublin, 1 S.Enteritidis and 1 S.Panama).
According to the data from Salmonella Monitoring Programme for Food of Animal Origin 2002 - 2008 altogether 4 (0,2 %) of 2060 pig meat samples taken at cutting plants and 3 (0,07 %) of 4093 swab samples taken from carcasses at slaughter were positive for Salmonella.

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

In comparison with the previous 2 years the number of positive pig meat samples was the same in the year 2008:
2004 - 1
2005 - 7
2006 - 4
2007 - 4
2008 - 4 positive samples.

Relevance of the findings in animals to findings in foodstuffs and to human cases

In the year 2008 the pig meat and product thereof were suspected to be the purpose of the 3 possible outbreaks.
The predominant Salmonella serotype in humans was S.Enteritidis and on the second position was S.Typhimurium.

E. Salmonella spp. in bovine meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

Fresh meat from cattle is sampled by Veterinary and Food Board officials according to the Salmonella Monitoring Programme for Food of Animal Origin (SMPF) and in the frames of official food surveillance sampling plan. In addition to official monitoring and surveillance, every food business operator is obliged to take samples in the frames of the self control programmes.
SMPF comprises analyzes of randomly sampled swabs from carcasses of cattle at slaughterhouse and meat or scrap cuttings from cutting plants. The number of surface swab samples is related to the number of annually slaughtered animals (0,6 % of slaughtered cattle in previous year) and the number of meat or scrap cuttings samples to the capacity of the cutting plant (from cutting plants with production quantity over 5 tons per week - one sample once a week; from cutting plants with production quantity up to 5 tons per week - one sample twice a year). In addition at the slaughterhouses, all carcasses with infection suspicions and cattle slaughtered under special conditions should be sampled.
Sampling in the frame of official food control is performed randomly. Targeted sampling is preformed in cases of suspicion, consumer complains etc.

At meat processing plant

In the frame of official food control raw material, minced meat, meat preparations and meat products are sampled randomly by the officials of Veterinary and Food Board following the frequencies established in decrees of Director General of Veterinary and Food Board. Targeted sampling is performed in cases of suspicion, consumer complains etc.

At retail

Random sampling is performed in accordance with the Veterinary and Food Board annual plan as a part of official food control. Targeted sampling is preformed in cases of suspicion, consumer complains and etc.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Other: surface of carcase, fresh meat

At meat processing plant

Other: fresh meat, meat preparations, minced meat, meat products

At retail

Other: fresh meat, minced meat, ready-to-eat and not-ready-to-eat products

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

Salmonella Monitoring Programme for Food of Animal Origin:
at slaughterhouse - swab samples should be taken after inspection of carcasses at the final stage of the slaughter line before chilling of the carcase. 2 surface samples should be taken from each carcass, each from 700 cm2, altogether 1400 cm2. The first sample should be taken from the inner and outer surface of hind side, including inguinal, altogether from area of 700 cm2. The second surface sample should be taken from the inner and outer surface of thoracic cavity and abdominal cavity in the area of sternum, altogether from area of 700 cm2. Two sterile hydrasponges pre-hydrated in 10 ml of buffered pepton water are used for sampling.
Samples are sent to the laboratory as soon as possible and should be marked so, that it enables to identify an animal, stockbreeder and date of sampling.
In addition to the monitoring programme, meat is sampled at slaughterhouses according to the official food surveillance sampling plans. The weight of sample analysed is 25 g.
at cutting plants - samples should be taken during meat cutting from production line or any other appropriate site of the cutting plant. Samples with the weight of at least 25 g are stored at 0+4 C and sent to the laboratory as soon as possible.
In addition, regular sampling of raw material and cuttings at cutting plants or departments is performed according to the official surveillance sampling plans. If appropriate, crushed meat for heat treated meat products production and raw material for minced meat production for retail establishments are sampled. The weight of sample analysed is 10 or 25 g according to the Commission Regulation 2073/2005.

At meat processing plant

According to the official food control sampling plan:
at minced meat/meat preparation (incl. raw sausages) plants - raw material is sampled, if not originating from the slaughterhouse of the same establishment (sample weight 25 g); minced meat, meat preparations and meat preparations made from minced meat are sampled (sample consists of 5 subsamples, which are examined individually; sample weight - 10 g),
at meat products establishments - meat products are sampled regularly. Weight of the sample analyzed is 25 g.

At retail

Sample analyzed - 10 or 25 g. Number of subsamples is 5. Samples are stored

at +2+4C and analyzed as soon as possible.

Definition of positive finding

At slaughterhouse and cutting plant

Salmonella positive sample/batch - a sample/batch where Salmonella spp. has been isolated.

At meat processing plant

Sample is considered to be positive, if Salmonella spp was isolated or if Salmonella spp was isolated in any of subsamples (minced meat, meat preparations).

At retail

A sample where Salmonella spp. has been isolated. Sample is considered to be positive, if Salmonella spp was isolated in any of subsamples.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

ISO 6579:2003

At meat processing plant

ISO 6579:2003

At retail

Bacteriological method: ISO 6579:2003

Preventive measures in place

Animal products should be examined in order to prevent the spread of illness to people and to find out the health status of the herd from which animal products originate. Sampling is performed in the frames of Salmonella Monitoring Programme for Food of Animal Origin, official food surveillance and establishment`s self control programmes.

Control program/mechanisms

The control program/strategies in place

Salmonella Monitoring Programme for Food of Animal Origin (SMPF) has been established according to the Regulation of Minister of Agriculture No 46 from 29.03.2007 "Prevention against salmonellosis". SMPF started in 2002 and is approved annually by the Director General of the Veterinary and Food Board.
Prevention of salmonellosis is based on analyzes made in the frames of salmonella monitoring programme, official control plans and establishment`s self control programmes.

Measures in case of the positive findings or single cases

In case of positive Salmonella findings at slaughterhouses and cutting plants, the extent of contamination and its sources should be investigated. Thorough cleaning and disinfection should be carried out and the effectiveness of cleaning procedures should be improved. The infected carcasses should be destroyed or considered as conditionally fit for human consumption and should be destined

for heat treatment.
Retail: the food or raw material for food should be removed from the market or handling.

Notification system in place

Salmonella detection in food is notifiable since 2000 according to the Infectious Animal Disease Control Act and the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".
Laboratories investigating the safety and quality of the products of enterprises which handle food of animal origin are required to notify the Veterinary and Food Board about the isolation of pathogens which may cause infectious animal diseases subject to notification or registration or about suspicion of the occurrence of such pathogens in raw food material or products. In addition, such laboratories are obliged to notify the Health Protection Inspectorate about isolation of zoonotic agents.
Local Veterinary centres notify the local offices of the Health Protection Inspectorate about isolation of Salmonella in food.

Results of the investigation

529 samples were analyzed in 2008. 0,6 % of the samples analyzed were found to be positive for Salmonella.
2 carcass swab samples taken in the frames of the monitoring programme were positive for Salmonella: S.Infantis and S.enterica subsp.enterica were detected (in 2007 - 6 samples were positive: 1 S.Lexington, 3 S.enterica and 2 Salmonella spp).

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

In the year 2008 Salmonella has been isolated in 0,6 % of the samples analyzed in comparison with the previous years when 1,2 % in 2007; 0,38 % in 2006 and 0,2 % in 2005 of the bovine meat has been contaminated with Salmonella (mostly fresh and minced meat).
The Salmonella Monitoring Programme for Food of Animal Origin 2002-2008 data document that Salmonella has not been isolated from the samples of fresh bovine meat taken at cutting plants. Salmonella was detected in 0,4 % of the swab samples taken from carcasses at slaughter in 2002; in 0,6 % of the samples in 2003; in 0,3 % of the swab samples in 2006; d in 1,8 % of the samples analyzed in 2007 and in 0,6 % of the samples in 2008.

Relevance of the findings in animals to findings in foodstuffs and to human cases

In 2008 no one case of human infection was epidemiologically linked to bovine meat or products thereof.

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Meat from broilers (Gallus gallus) - carcass - at slaughterhouse - Survey - EU baseline survey [1)]	VFB	batch	27 g	102	0			
Meat from broilers (Gallus gallus) - fresh - at cutting plant - domestic production - Monitoring - official sampling	VFB	batch	25 g	48	0			
Meat from broilers (Gallus gallus) - fresh - at processing plant - Surveillance - official controls	VFB	single	25 g	8	0			
Meat from broilers (Gallus gallus) - fresh - at retail - Surveillance - official controls	VFB	single	25 g	4	1	1		
Meat from broilers (Gallus gallus) - fresh - at slaughterhouse - Surveillance - official controls	VFB	single	25 g	4	0			
Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls	VFB	single	10 g	20	0			
Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	11	1		1	
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls	VFB	single	10 g	20	0			
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls	VFB	single	10 g	15	0			
Meat from broilers (Gallus gallus) - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	1	0			
Meat from broilers (Gallus gallus) - offal - at slaughterhouse - Surveillance - official controls	VFB	single	25 g	4	0			
Meat from other poultry species - - neck skin - Monitoring - official sampling [2)]	VFB	batch	25 g	5	0			

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Meat from other poultry species - fresh - at slaughterhouse - Surveillance - official controls [3)]	VFB	single	25 g	1	0			
Meat from other poultry species - meat products - at retail - Surveillance - official controls	VFB	single	10 g	1	0			
Meat from turkey - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	4	0			
Meat from turkey - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls	VFB	single	10 g	3	0			

Comments:

[1)] Commission Decision 2007/516/EC

[2)] meat from quail, laying hen

[3)] meat from ostrich

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Cheeses made from cows' milk - hard - made from pasteurised milk - at processing plant - Surveillance - official controls [1)]	VFB	single	25 g	9	0			
Cheeses made from cows' milk - hard - made from pasteurised milk - at processing plant - domestic production - Monitoring - official sampling [2)]	VFB	single	25 g	5	0			
Cheeses made from cows' milk - hard - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls [3)]	VFB	single	25 g	2	0			
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant - Surveillance - official controls	VFB	single	25 g	4	0			
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant - domestic production - Monitoring - official sampling	VFB	single	25 g	4	0			
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail - Surveillance - official controls	VFB	single	25 g	1	0			
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail - Surveillance - official controls	VFB	single	25 g	1	0			
Dairy products (excluding cheeses) - dairy products, not specified - at processing plant - Surveillance - official controls	VFB	single	25 g	36	0			
Dairy products (excluding cheeses) - dairy products, not specified - at retail - Surveillance - official controls	VFB	single	25 g	2	0			
Dairy products (excluding cheeses) - dairy products, not specified - made from pasteurised milk - at processing plant - domestic production - Monitoring - official sampling	VFB	single	25 g	16	0			

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Dairy products (excluding cheeses) - ice-cream - at processing plant - Surveillance - official controls [4)]	VFB	single	25 g	3	0			
Dairy products (excluding cheeses) - ice-cream - at retail - Surveillance - official controls	VFB	single	25 g	4	0			
Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - at processing plant - domestic production - Monitoring - official sampling	VFB	single	25 g	3	0			
Dairy products (excluding cheeses) - milk powder and whey powder - at processing plant - Surveillance - official controls	VFB	single	25 g	10	0			
Infant formula - at retail - Surveillance - official controls	VFB	single	25 g	2	0			
Infant formula - dried - at processing plant - Surveillance - official controls	VFB	single	25 g	2	0			
Infant formula - dried - at processing plant - domestic production - Monitoring - official sampling	VFB	batch	25 g	1	0			
Milk, cows' - pasteurised milk - at processing plant - Surveillance - official controls	VFB	single	25 g	3	0			
Milk, cows' - raw - intended for direct human consumption - at farm - Surveillance - official controls	VFB	single	25 g	1	0			

Comments:

[1)] hard and semi-hard cheeses
[2)] hard and semi-hard cheeses
[3)] hard and semi-hard cheeses
[4)] made from pateurised milk

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Dublin	S. Eingedi	S. Enteritidis	S. Infantis	S. Newport	S. Typhimurium
Meat from bovine animals - carcass - - carcass swabs - Monitoring - official sampling	VFB	animal	swab	324	2				1		
Meat from bovine animals - fresh - at cutting plant - domestic production - Monitoring - official sampling	VFB	single	25 g	77	0						
Meat from bovine animals - fresh - at processing plant - Surveillance - official controls	VFB	single	25 g	48	0						
Meat from bovine animals - fresh - at retail - Surveillance - official controls	VFB	single	25 g	5	0						
Meat from bovine animals - fresh - at slaughterhouse - Surveillance - official controls	VFB	single	25 g	2	0						
Meat from bovine animals - fresh - at slaughterhouse - Surveillance - official controls - suspect sampling [1)]	VFB	single	25 g	30	1	1					
Meat from bovine animals - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls	VFB	single	10 g	1	0						
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	1	0						
Meat from bovine animals - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls	VFB	single	25 g	16	0						
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls	VFB	single	25 g	3	0						
Meat from bovine animals - minced meat - intended to be eaten cooked - at processing plant - Surveillance - official controls	VFB	single	10 g	12	0						

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Dublin	S. Eingedi	S. Enteritidis	S. Infantis	S. Newport	S. Typhimurium
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	10	0						
Meat from bovine animals - offal - at processing plant - Surveillance - official controls	VFB	single	25 g	2	0						
Meat from other animal species or not specified - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	2	0						
Meat from pig - carcass - - carcass swabs - Monitoring - official sampling	VFB	animal	swab	520	1						
Meat from pig - fresh - at cutting plant - domestic production - Monitoring - official sampling	VFB	single	25 g	305	0						
Meat from pig - fresh - at processing plant - Surveillance - official controls	VFB	single	25 g	119	0						
Meat from pig - fresh - at retail - Surveillance - official controls	VFB	single	25 g	5	0						
Meat from pig - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls [2)]	VFB	single	10 g	93	2		1			1	1
Meat from pig - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	36	0						
Meat from pig - meat products - cooked, ready-to -eat - at processing plant - Surveillance - official controls	VFB	single	25 g	113	0						
Meat from pig - meat products - cooked, ready-to -eat - at retail - Surveillance - official controls	VFB	single	25 g	19	0						
Meat from pig - minced meat - intended to be eaten cooked - at processing plant - Surveillance - official controls	VFB	single	10 g	10	0						

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Dublin	S. Eingedi	S. Enteritidis	S. Infantis	S. Newport	S. Typhimurium
Meat from pig - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	39	1				1		
Meat from pig - offal - at retail - Surveillance - official controls	VFB	single	25 g	1	0						
Meat from pig - offal - at slaughterhouse - Surveillance - official controls - suspect sampling [3)]	VFB	single	25 g	3	0						
Meat from sheep - fresh - at processing plant - Surveillance - official controls	VFB	single	25 g	3	0						
Meat from sheep - fresh - at slaughterhouse - Surveillance - official controls	VFB	single	25 g	24	0						
Meat from sheep - minced meat - at processing plant - Surveillance - official controls	VFB		10 g	2	0						
Meat from wild boar - fresh - at processing plant - Surveillance - official controls	VFB	single	25 g	3	0						
Meat from wild boar - fresh - at slaughterhouse - Surveillance - official controls	VFB	single	25 g	3	0						
Meat from wild game - land mammals - at processing plant - Surveillance - official controls	VFB	single	25 g	18	0						
Meat from wild game - land mammals - fresh - at slaughterhouse - Surveillance - official controls [4)]	VFB	single	25 g	5	0						
Meat, mixed meat - at processing plant - Surveillance - official controls	VFB	single	25 g	31	0						
Meat, mixed meat - at retail - Surveillance - official controls	VFB	single	25 g	3	0						
Meat, mixed meat - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls	VFB	single	10 g	35	0						

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Dublin	S. Eingedi	S. Enteritidis	S. Infantis	S. Newport	S. Typhimurium
Meat, mixed meat - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls [5]	VFB	single	10 g	11	2					1	1
Meat, mixed meat - meat products - at processing plant - Surveillance - official controls	VFB	single	25 g	60	0						
Meat, mixed meat - meat products - at retail - Surveillance - official controls	VFB	single	25 g	6	0						
Meat, mixed meat - minced meat - intended to be eaten cooked - at processing plant - Surveillance - official controls	VFB	single	10 g	16	0						
Meat, mixed meat - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	10 g	14	0						
Other products of animal origin - gelatin and collagen - in total - Surveillance - official controls [6]	VFB	single	25 g	1	0						

	S. 1,4,5,12:-:1,2	S. 1,4,5,12:i:-	Salmonella spp., unspecified	S. Chartres
Meat from bovine animals - carcass - - carcass swabs - Monitoring - official sampling	1			
Meat from bovine animals - fresh - at cutting plant - domestic production - Monitoring - official sampling				
Meat from bovine animals - fresh - at processing plant - Surveillance - official controls				
Meat from bovine animals - fresh - at retail - Surveillance - official controls				
Meat from bovine animals - fresh - at slaughterhouse - Surveillance - official controls				

Table Salmonella in red meat and products thereof

	S. 1,4,5,12:-:1,2	S. 1,4,5,12:i:-	Salmonella spp., unspecified	S. Chartres
Meat from bovine animals - fresh - at slaughterhouse - Surveillance - official controls - suspect sampling [1)]				
Meat from bovine animals - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls				
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls				
Meat from bovine animals - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls				
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls				
Meat from bovine animals - minced meat - intended to be eaten cooked - at processing plant - Surveillance - official controls				
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls				
Meat from bovine animals - offal - at processing plant - Surveillance - official controls				
Meat from other animal species or not specified - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls				
Meat from pig - carcass - - carcass swabs - Monitoring - official sampling		1		
Meat from pig - fresh - at cutting plant - domestic production - Monitoring - official sampling				
Meat from pig - fresh - at processing plant - Surveillance - official controls				

Table Salmonella in red meat and products thereof

	S. 1,4,5,12:-:1,2	S. 1,4,5,12:i:-	Salmonella spp., unspecified	S. Chartres
Meat from pig - fresh - at retail - Surveillance - official controls				
Meat from pig - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls [2)]				
Meat from pig - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls				
Meat from pig - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls				
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls				
Meat from pig - minced meat - intended to be eaten cooked - at processing plant - Surveillance - official controls				
Meat from pig - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls				
Meat from pig - offal - at retail - Surveillance - official controls				
Meat from pig - offal - at slaughterhouse - Surveillance - official controls - suspect sampling [3)]				
Meat from sheep - fresh - at processing plant - Surveillance - official controls				
Meat from sheep - fresh - at slaughterhouse - Surveillance - official controls				
Meat from sheep - minced meat - at processing plant - Surveillance - official controls				

Table Salmonella in red meat and products thereof

	S. 1,4,5,12:-:1,2	S. 1,4,5,12:i:-	Salmonella spp., unspecified	S. Chartres
Meat from wild boar - fresh - at processing plant - Surveillance - official controls				
Meat from wild boar - fresh - at slaughterhouse - Surveillance - official controls				
Meat from wild game - land mammals - at processing plant - Surveillance - official controls				
Meat from wild game - land mammals - fresh - at slaughterhouse - Surveillance - official controls [4)]				
Meat, mixed meat - at processing plant - Surveillance - official controls				
Meat, mixed meat - at retail - Surveillance - official controls				
Meat, mixed meat - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls				
Meat, mixed meat - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls [5)]				1
Meat, mixed meat - meat products - at processing plant - Surveillance - official controls				
Meat, mixed meat - meat products - at retail - Surveillance - official controls				
Meat, mixed meat - minced meat - intended to be eaten cooked - at processing plant - Surveillance - official controls				
Meat, mixed meat - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls				
Other products of animal origin - gelatin and collagen - in total - Surveillance - official controls [6)]				

Table Salmonella in red meat and products thereof

Comments:

[1)] post mortem inspection
[2)] in one sample 2 Salmonella serovars were found
[3)] post mortem inspection
[4)] meat from reindeer
[5)] in one sample 2 Salmonella serovars were found
[6)] import control

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Bakery products - at processing plant - Surveillance - official controls	VFB	single	25 g	15	0			
Confectionery products and pastes - at processing plant - Surveillance - official controls	VFB	single	25 g	21	0			
Egg products - at processing plant - Surveillance - official controls	VFB	single	25 g	1	0			
Egg products - at retail - Surveillance - official controls	VFB	single	25 g	10	0			
Egg products - liquid - at processing plant - domestic production - Monitoring - official sampling	VFB	single	25 g	6	0			
Eggs - at packing centre - Monitoring - official sampling (Quail egg)	VFB	single	25 g	1	0			
Eggs - table eggs - at packing centre - Monitoring - official sampling	VFB	single	25 g	12	0			
Eggs - table eggs - at packing centre - Surveillance - official controls	VFB	single	25 g	2	0			
Eggs - table eggs - at retail - Surveillance - official controls	VFB	single	25 g	13	0			
Fish - raw - chilled - at processing plant - Surveillance - official controls	VFB	single	25 g	2	0			
Fishery products, unspecified - at processing plant - Surveillance - official controls [1)]	VFB	single	25 g	14	0			
Fishery products, unspecified - at retail - Surveillance - official controls	VFB	single	25 g	33	0			
Fishery products, unspecified - raw - chilled - at processing plant - Surveillance - official controls	VFB	single	25 g	11	0			
Fishery products, unspecified - raw - frozen - at processing plant - Surveillance - official controls	VFB	single	25 g	4	0			

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Fruits - at processing plant - Surveillance - official controls	VFB	single	25 g	6	0			
Fruits and vegetables - precut - at retail - Surveillance - official controls	VFB	single	25 g	13	0			
Fruits and vegetables - precut - ready-to-eat - at retail - Surveillance - official controls	VFB	single	25 g	1	0			
Juice - at retail - Surveillance - official controls	VFB	single	25 g	6	0			
Other food - at processing plant - Surveillance - official controls	VFB	single	25 g	6	0			
Other processed food products and prepared dishes - at processing plant - Surveillance - official controls	VFB	single	25 g	39	0			
Other processed food products and prepared dishes - at retail - Surveillance - official controls	VFB	single	25 g	28	0			
Ready-to-eat salads - at processing plant - Surveillance - official controls	VFB	single	25 g	41	0			
Ready-to-eat salads - at retail - Surveillance - official controls	VFB	single	25 g	47	0			
Seeds, sprouted - ready-to-eat - at retail - Surveillance - official controls	VFB	single	25 g	7	0			
Vegetables - non-precut - at processing plant - Surveillance - official controls	VFB	single	25 g	7	0			
Vegetables - pre-cut - at processing plant - Surveillance - official controls	VFB	single	25 g	4	0			
Vegetables - products - at processing plant - Surveillance - official controls	VFB	single	25 g	16	0			

Comments:

[1)] ready-to-eat

2.1.4 Salmonella in animals

A. Salmonella spp. in pigs

Monitoring system

Sampling strategy

Multiplying herds

In order to monitor salmonellosis in breeding, multiplying or fattening pig herds, pig herds as well as animals sent to the artificial fertilization stations should be examined. In the frames of the official control herds should be examined in the quantities provided by the monitoring plan of the Veterinary and Food Board.
Herds should be examined bacteriologically on the basis of copro samples, taking into account the following proportions:
size of the herd / number of animals to be examined
less than 25 / equal to the number of animals
25-100 / 25
over 100 / 30.
Faeces samples should be taken by age groups or keeping groups from fattening pigs less than one year old. Faeces samples are taken from 5-10 animals should be united into one pooled sample at the laboratory.
When transferring pigs to artificial fertilization station or to the breeding herd kept for the purposes of artificial fertilization, animals should be examined bacteriologically within 30 days before the transfer on the basis of individual faeces samples or at the fertilization station during the quarantine on the basis of individual faeces samples.

Type of specimen taken

Breeding herds

Faeces

Multiplying herds

Faeces

Fattening herds at farm

Faeces

Methods of sampling (description of sampling techniques)

Multiplying herds

In order to diagnose salmonellosis in pigs on the basis of a clinical picture or pathologic-anatomical findings the faeces samples should be taken from the rectum of animals with the doubt of salmonellosis.
From the rectum of animals under examination a faeces sample (at least 10 grams) should be taken by an individual plastic glove or bag, the inside of which shall be turned out then and marked for identification of the sample.

The individual faeces samples should be halved in the laboratory. At least 5 grams is necessary for the studies and at least 5 g should be preserved at the temperature 4°C until the end of bacteriological studies. The halves under study may be united by five into a pooled sample. If the pooled sample has positive reaction, the animals accumulated under the pooled sample shall be examined again on the basis of individual samples.

Case definition

Multiplying herds

An animal or flock where Salmonella spp. has been isolated.

Diagnostic/analytical methods used

Breeding herds

ISO 6579:2003

Multiplying herds

ISO 6579:2003

Fattening herds at farm

ISO 6579:2003

Fattening herds at slaughterhouse (herd based approach)

ISO 6579:2003

Vaccination policy

Breeding herds

Vaccination against salmonella is forbidden in Estonia.

Multiplying herds

Vaccination against salmonella is forbidden in Estonia.

Fattening herds

Vaccination against salmonella is forbidden in Estonia.

Control program/mechanisms

The control program/strategies in place

Multiplying herds

Samples are taken in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved annually by the Director General of the Veterinary and Food Board.
To monitor salmonellosis among pigs, herds as well as animals sent to artificial fertilization stations shall be examined. Herds shall be examined bacteriologically on the basis of faeces samples, taking into account the following proportions:
size of the herd / number of animals to be examined
less than 25 / equal to the number of animals
25-100 / 25
over 100 / 30
The faeces samples taken from animals under examination shall be united into a

pooled sample.
When transferring the pigs to artificial fertilization station or to the breeding herd kept for the purposes of artificial fertilization, they shall be examined bacteriologically within 30 days before the transfer on the basis of individual faeces samples or in the fertilization station during the quarantine on the basis of individual faeces samples.

Fattening herds

Samples are taken in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved annually by the Director General of the Veterinary and Food Board.
Faeces samples shall be taken from fattening pigs less than one year old by age groups or keeping groups. Faeces samples are taken from 5-10 animals and are pooled at the laboratory, taking into account the following proportions:
size of the herd / number of animals to be examined
less than 25 / equal to the number of animals
25-100 / 25
over 100 / 30.

Measures in case of the positive findings or single cases

The infection sources and spreading ways should be found out in a herd infected by salmonellosis and then they should be removed or blocked.
In order to discover the origin of infection, samples on presence of salmonellas should be taken also from contact farm animals, while one pooled sample taken from 5-10 animals should be examined, and from feeding stuffs. If any animal has the characteristics of clinical salmonellosis, individual samples should be taken from such animals.
If salmonellosis is detected at farm in animals other than pigs or it is detected in people working at farm, the herds of pigs at farms should be examined.
In case of diagnosing salmonellosis in a pig, animals in the herd of origin, which have not been examined for salmonellosis, should be examined or if salmonellosis has been detected in the course of annual monitoring, samples should be taken from the herd of origin.
The stockbreeder should immediately separate the animals that are clinically ill and salmonella positive from other animals as safely as possible.
The separated animals should be subjected to medical treatment if necessary and the occurrence of salmonellas should be studied on the basis of individual faeces samples 2 times with a one month interval until receiving two consecutive negative results, or animals should be sent for slaughter.
Slaughter of clinically healthy, but salmonella positive pigs shall be performed at the end of the day or the other day in order to separate the positive and negative animals. The slaughter rooms should be cleaned and disinfected after slaughter of that animals.
Pigs should be kept inside premises so that they cannot be in contact with other

animals.
Only the personnel looking after animals are allowed to stay at farm. When looking after the animals, the personnel should wear appropriate protective clothes and in leaving the livestock premises their footwear should be cleaned thoroughly and disinfected.
A stockbreeder has to keep records on salmonella studies concerning all farm animals.
After sending the animals doubted to be infected or actually infected for slaughter, the livestock premises, bedsteads, feeding stands and keeping tools should be cleaned and disinfected according to the prescriptions of veterinarian.
Manure and used litter of pigs should be handled according to the prescriptions of authorized veterinarian so that the spread of salmonella should be prevented.
Deratization, disinfection and protection against wild birds should be organized.
The access of dogs and cats to livestock premises should be precluded.

Notification system in place

Infection with Sallmonella spp. (S. enteritidis, S. typhimurium, S. dublin, S. newport, S. cholerasuis) is notifiable since 2000 according to the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

In the year 2008 there were no positive samples found in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases.
8,2 % of the lymph nodes samples taken in the frames of the State Salmonella Monitoring Programme for Food of Animal Origin were found to be positive.
34 holdings with breeding pigs were investigated in the frames of the baseline survey according to the Commission Decision of 20 December 2007 concerning a financial contribution from the Community towards baseline survey on the prevalence Salmonella spp. and Methicillin-resistant Staphylococcus aureus in herds of breeding pigs to be carried out in the Member States (2008/55/EC). 1 holding was positive for Salmonella enterica subsp. enterica.

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

No positive samples taken in the frames of of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases were detected.
In 2008 there were 12 faeces samples (9 positive samples taken in the frames of clinical investigations + 3 positive samples taken in the frames of the baseline study from 1 holding) and 12 (8,2 %) lymph nodes samples taken from pigs found positive for Salmonella: Salmonella enterica subsp. enterica and S.Cholerasuis were the predominant serovars detected.
In 2007 altogether 40 samples were positive for Salmonella. S.enteritidis and S.typhimurium were the most frequently isolated serovars. There were 6,4 % positive lymph nodes samples found that were taken in the frames of the

baseline survey according to the Commission Decision of 29 September 2006 concerning a financial contribution from the Community towards baseline survey on the prevalence of Salmonella in slaughter pigs to be carried out in the Member States (2006/668/EC).
In 2006 Salmonela enteritidis and Salmonella Agona were the predominat serovars isolated in the Veterinary and Food Laboratory.
In 2005 Salmonella Stanleyville was isolated in 3 and Salmonella Typhimurium in 8 samples taken from pigs.
In the year 2004 there were no S.Stanleyville isolated and S.typhimurium composes 0,4 % of the samples tested.

Relevance of the findings in animals to findings in foodstuffs and to human cases

There were no link found between human cases of salmonellosis and salmonellosis in pigs in the year 2008.

B. Salmonella spp. in bovine animals

Monitoring system

Sampling strategy

To monitor salmonellosis in cattle, herds as well as animals sent to artificial fertilization stations should be examined. In the frames of official control cattle herds should be examined in the quantities provided by the monitoring plan of the Veterinary and Food Board.
Herds should be examined bacteriologically on the basis of faeces samples, taking into account the following proportions:
size of the herd / number of animals to be examined
less than 25 / equal to the number of animals
25-100 / 25
over 100 / 30.
From cattle less than one year old faeces samples should be taken by age groups or keeping groups. Faeces samples taken from 5-10 animals should be united into a pooled sample.
In transferring the cattle to artificial fertilization station or to the breeding herd kept for the purposes of artificial fertilization, animals should be examined bacteriologically within 30 days before the transfer on the basis of individual faeces samples or in the fertilization station during the quarantine on the basis of individual faeces samples.

Type of specimen taken

Animals at farm

Faeces

Methods of sampling (description of sampling techniques)

Animals at farm

To diagnose salmonellosis in cattle on the basis of a clinical picture or pathologic-anatomical findings the faeces samples should be taken from the rectum of animals with the doubt of salmonellosis.
Faeces sample weighting at least 10 grams should be taken from the rectum of animals under examination by an individual plastic glove or bag, the inside of which should be turned out then and marked for identification of the sample.
The individual faeces samples should be halved at the laboratory. At least 5 grams is necessary for the studies and at least 5 g should be preserved at the temperature 4°C until the end of bacteriological studies. The halves under study may be united by five into a pooled sample. If the pooled sample has positive reaction, the animals accumulated under the pooled sample should be examined again on the basis of individual samples.
To diagnose salmonellosis in cattle, besides faeces samples, also organ samples should be taken from dead animals.
Animals tissue samples of at least 25 grams should be taken from liver, spleen and from lymph nodes in small intestine and caecum area (3-5 pieces), each

sample should be placed separately in a new plastic bag and marked for identification of the sample. The organ samples from one animal may be accumulated in an additional package.
The organ samples from one animal may be integrated into one sample in the laboratory. The sample should be homogenised and pre-enriched in buffered peptone water.
The following samples should be taken from the herd infected by salmonellosis detected during the studies or monitoring:
- individual faeces samples from all cattle over one year old. The samples may be accumulated by five into an additional package;
- individual faeces samples from the cattle less than one year old, that have clinical characteristics referring to salmonellosis;
- faeces samples from the cattle without clinical characteristics, breakdown by age groups or keeping groups, samples taken from 5-10 animals are pooled at the laboratory;
- samples of feedingstuffs or their components.

Case definition

Animals at farm

An animal or flock where Salmonella spp. has been isolated.

Diagnostic/analytical methods used

Animals at farm

Bacteriological method: ISO 6579:2002

Animals at slaughter (herd based approach)

Bacteriological method: ISO 6579:2002

Vaccination policy

Vaccination against salmonella is forbidden in Estonia.

Other preventive measures than vaccination in place

Vaccination against salmonella is forbidden in Estonia.

Control program/mechanisms

The control program/strategies in place

Sampling is performed in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved annually by the Director General of the Veterinary and Food Board.

Measures in case of the positive findings or single cases

In a herd infected with Salmonella the infection sources and spreading ways should be detected and then removed or blocked.
To find out the origin of infection, samples on presence of Salmonella also from contact farm animals and from feedstuffs should be taken. If any animal has the characteristics of clinical salmonellosis, individual samples should be taken from such animals.

If salmonellosis is diagnosed at farm in animals other than cattle or it is detected in people working at farm, the cattle herds at farms should be examined.
In case of diagnosing salmonellosis in cattle, the animals in the herd of origin which have not been examined for salmonellosis, should be examined or if salmonellosis has been detected in the course of annual monitoring, samples should be taken from the herd of origin.
The stockbreeder should immediately separate the animals that are clinically ill and salmonella positive from other animals as safely as possible.
The separated animals should be subjected to medical treatment if necessary, and the occurrence of salmonellas should be tested on the basis of individual faeces samples 2 times with 1 month interval until receiving two consecutive negative results, or animals should be sent for slaughter.
Animals should be kept inside premises so that they cannot be in contact with the other animals.
Only the personnel looking after animals is allowed to stay at farm. When looking after the animals, the personnel should wear appropriate protective clothes and in leaving the livestock premises their footwear should be cleaned thoroughly and disinfected.
A stockbreeder has to keep records on salmonella studies concerning all farm animals.
After sending the animals doubted to be infected or actually infected for slaughter, the livestock premises, bedsteads, feeding stands and keeping tools should be cleaned and disinfected according to the prescriptions of veterinarian.
Manure and used litter of cattle should be handled according to the prescriptions of authorized veterinarian so that the spread of salmonella should be prevented.
Deratization, disinfection and protection against wild birds should be organized.
Dogs and cats access to livestock premises should be precluded.

Notification system in place

Infection with Sallmonella spp. (S. enteritidis, S. typhimurium, S. dublin, S. newport, S. cholerasuis) is notifiable since 2000 according to the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

1607 samples were tested in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases. 0,2 % of the samples tested were positive for Salmonella (in 2007 - 0,8 %).
Salmonella Infantis was found in all cases in 2008 (in 2007 - Salmonella enteritidis was isolated in 2 samples, S.typhimurium in 3, S.Lexington in 3, S.Stanleyville in 1 and S.Dublin in 1 sample).

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

The existing control programmes and investigations document that situation is quite stable.

C. Salmonella spp. in Gallus Gallus - breeding flocks

Monitoring system

Sampling strategy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

In accordance with the Infectious Animal Disease Control Act, the annual volume of salmonella in breeding poultry testing is laid down by the State Program on Monitoring and Surveillance of Animal Infectious Diseases approved annually by the Director General of the Veterinary and Food Board. Instructions for salmonella monitoring in breeding poultry are laid down in the Ministry of Agriculture Regulation No 46 "Prevention against salmonellosis", 29.03.2007, which also provides guidelines for the prevention and control of salmonella in breeding poultry and for the handling of products originating from suspected or infected birds.

Frequency of the sampling

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Every flock is sampled

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Every flock is sampled

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Every flock is sampled

Type of specimen taken

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Dead chicks

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Faeces

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Faeces

Methods of sampling (description of sampling techniques)

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Day-old chicks that are weak or dead, internal linings of chick boxes and dust shall be sampled as 10 samples per flock/lot.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

For the purposes of detecting Salmonella, the number of copro samples, boot swabs samples and dust samples to be studied bacteriologically, depends on the size of birds flock.
number of birds in the flock / number of samples
250–349 / 200
350–449 / 220
450–799 / 250

800–999 / 260
1000 and more / 300
The individual copro samples of the birds under examination shall be integrated into a pooled sample.

Breeding flocks: Production period

See "Breeding flocks: Rearing period"

Case definition

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

A flock or sample is considered to be positive if the presence of Salmonella spp. is detected at least in one of the samples.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

A flock or sample is considered to be positive if the presence of Salmonella spp. is detected at least in one of the samples.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

A flock or sample is considered to be positive if the presence of Salmonella spp. is detected at least in one of the samples.

Diagnostic/analytical methods used

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Bacteriological method: ISO 6579:2002

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Bacteriological method: ISO 6579:2002

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Bacteriological method: ISO 6579:2002

Vaccination policy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Vaccination against salmonella in Estonia could only be performed basing on the Veterinary and Food Board approval.

Other preventive measures than vaccination in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Surveillance of salmonella in feed, animals and food is carried out for many years in Estonia. In addition to surveillance systems, monitoring programme is conducted, which provides additional epidemiological information:
Feed samples:
1) On the enterprises handling feedstuffs the final products shall be studied bacteriologically under the framework of monitoring and self-inspection.
2) From imported feedstuffs official samples shall be taken in the course of random inspection during their storing.
Food control:
Salmonella Monitoring Programme for Food of Animal Origin is established

according to the Regulation of Minister of Agriculture No 46, 29.03.2007, “Prevention against salmonellosis”. This programme started in the year 2002 and is approved annually by the Director General of the Veterinary and Food Board. In the frames of this programme the fresh meat from poultry at cutting plants and neck skin at slaughterhouses, eggs from egg packaging centres and egg products are taken.

Control program/mechanisms

The control program/strategies in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Sampling is performed in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved annually by the General Director of the Veterinary and Food Board and is established according to the Regulation of the Minister of Agriculture No 46 from 29.03.2007 "Prevention against Salmonellosis"; Commission Regulation No 1003/2005 of 30 June 2005 implementing Regulation No 2160/2003 as regards Community target for the reduction of the prevalence of certain salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation No 2160/2003 and Commission Regulation No 1168/2006 of 31 July 2006 implementing Regulation (EC) No 2160/2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/2005.

Recent actions taken to control the zoonoses

Breeding flocks are investigated in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved annually by the General Director of the Veterinary and Food Board and is established according to the Regulation of the Minister of Agriculture No 46 from 29.03.2007 "Prevention against Salmonellosis".

Measures in case of the positive findings or single cases

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

According to the regulation No 46, if salmonella presence is suspected in breeding flocks of Gallus gallus, the official veterinarian is obligated to take action to confirm the diagnosis and prevent the spread of the disease.
It is prohibited to take birds to a flock doubted to be infected or actually infected or to take them out, except for slaughter. All bird’s flocks (young birds, breeding flock, productive flock), where Salmonella spp. was diagnosed should be executed or sent immediately for slaughter or destroyed in accordance with Regulation No 1774/2002.
After the flock infected by salmonellosis was sent to the slaughterhouse, the carriage boxes, transport boxes and transport means shall be cleaned, washed and disinfected. The litter of flocks infected by salmonellosis shall be composted away from the livestock buildings. Enclosures and inventory of poultry farm shall be cleaned, washed and disinfected after the litter of birds has been taken out and tested then bacteriologically for

salmonellas. The dead and slaughtered birds shall be made harmless or utilised. Poultry buildings should be checked on the efficiency of deratisation, disinfection and on protection against wild birds. Empty period is required for 21 day. Disposal of manure is restricted. Feedingstuffs should be destroyed or heat-treated. Vaccination of birds is forbidden in Estonia.

Notification system in place

Infection with Salmonella spp. (S.enteritidis, S.typhimurium, S.dublin, S.newport, S.cholerasuis) is notifiable since 2000 according to the Ministry of Agriculture Regulation No 34" List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

In the year 2008 3 breeding flocks were tested. All tests were negative.

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

In 2008 no Salmonella positive breeding flocks were detected in Estonia.

D. Salmonella spp. in Gallus Gallus - flocks of laying hens

Monitoring system

Sampling strategy

Laying hens flocks

In accordance with the Infectious Animal Disease Control Act, the annual volume of salmonella tests in laying hens of Gallus gallus is laid down by the State Program on Monitoring and Surveillance of Animal infectious Diseases adopted by the General Director of the Veterinary and Food Board. Instructions for salmonella monitoring in laying hens of Gallus gallus are laid down in the Ministry of Agriculture Regulation No 46 "Prevention against salmonellosis", 29.03.2007, which also provides guidelines for the prevention and control of salmonella in laying hens of Gallus gallus and for the handling of products originating from suspected or infected birds.

Frequency of the sampling

Laying hens: Day-old chicks

Every flock is sampled

Laying hens: Rearing period

Every flock is sampled

Laying hens: Production period

Once a year

Laying hens: Before slaughter at farm

8 weeks prior to slaughter

Type of specimen taken

Laying hens: Day-old chicks

Dead chicks

Laying hens: Rearing period

Faeces

Laying hens: Production period

Faeces

Laying hens: Before slaughter at farm

Faeces

Methods of sampling (description of sampling techniques)

Laying hens: Day-old chicks

Day-old chicks that are weak or dead, internal linings of chick boxes and dust shall be sampled-10 samples per flock/lot.

Laying hens: Rearing period

For the purposes of detecting Salmonella the number of copro samples, boot swabs samples and dust samples to be studied bacteriologically depends on the

size of birds flock:
Number of birds in the flock / Number of samples
50–59 / 35
60–89 / 40
90–199 / 50
200–249 / 55
250–349 / 200
350–449 / 220
450–799 / 250
800–999 / 260
1000 and more / 300
The individual faeces samples of the birds under examination shall be integrated into a pooled sample.

Laying hens: Production period

see "Laying hens: Rearing period".

Laying hens: Before slaughter at farm

see "Laying hens: Rearing period".

Laying hens: At slaughter

see "Laying hens: Rearing period".

Case definition

Laying hens: Day-old chicks

A flock or sample is considered to be positive if the presence of Salmonella spp. is detected at least in one of the samples.

Laying hens: Rearing period

A flock or sample is considered to be positive if the presence of Salmonella spp. is detected at least in one of the samples.

Laying hens: Production period

A flock or sample is considered to be positive if the presence of Salmonella spp. is detected at least in one of the samples.

Laying hens: Before slaughter at farm

A flock or sample is considered to be positive if the presence of Salmonella spp. is detected at least in one of the samples.

Laying hens: At slaughter

A flock or sample is considered to be positive if the presence of Salmonella spp. is detected at least in one of the samples.

Diagnostic/analytical methods used

Laying hens: Day-old chicks

Bacteriological method: ISO 6579:2002

Laying hens: Rearing period

Bacteriological method: ISO 6579:2002

Laying hens: Production period

Bacteriological method: ISO 6579:2002

Laying hens: Before slaughter at farm

Bacteriological method: ISO 6579:2002

Vaccination policy

Laying hens flocks

Vaccination against salmonella in Estonia could only be performed basing on the Veterinary and Food Board approval.

Control program/mechanisms

The control program/strategies in place

Laying hens flocks

Sampling is performed in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved annually by the General Director of the Veterinary and Food Board and is established according to the Regulation of the Minister of Agriculture No 46 from 29.03.2007 "Prevention against Salmonellosis"; Commission Regulation No 1168/2006 of 31 July 2006 implementing Regulation (EC) No 2160/2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/2005.

Measures in case of the positive findings or single cases

Laying hens flocks

According to the Regulation No 46, if salmonella presence is suspected in laying hens of Gallus gallus the official veterinarian is obliged to take action to confirm the diagnosis and prevent the spread of the disease. The official veterinarian should find out the infection sources and their spreading ways, remove or block them. It is prohibited to take birds to a flock doubted to be infected or actually infected or to take them out, except for slaughter. All bird’s flocks (young birds, breeding flock, productive flock), where Salmonella spp. was diagnosed should be executed or sent immediately for slaughter or destroyed in accordance with Regulation No 1774/2002. After the flock infected by salmonellosis was sent to the slaughterhouse, the carriage boxes, transport boxes and transport means shall be cleaned, washed and disinfected. The litter of flocks infected by salmonellosis shall be composted away from the livestock buildings. Enclosures and inventory of poultry farm shall be cleaned, washed and disinfected after the litter of birds has been taken out and tested then bacteriologically for salmonellas. The dead and slaughtered birds shall be made harmless or utilised. Poultry buildings should be checked on the efficiency of deratisation, disinfection and on protection against wild birds. Empty period is required for 21 day. Disposal of manure is restricted. Feedingstuffs should be destroyed or heat-

treated.

Notification system in place

Salmonellosis is notifiable according to the Minister of Agriculture Regulation No. 34 of 25 November 1999 “List of Notifiable Diseases and Diseases subject to Registration”.

Results of the investigation

In the year 2008 52 flocks of laying hens were analyzed. 7,7 % of flocks were found to be positive: 1,9 % of flocks were positive for Salmonella enteritidis and 5,8 % of flocks were positive for Salmonella Lexington.

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

The overall prevalence of Salmonella enteritidis in laying hens flocks was 1,9% in 2008.

E. Salmonella spp. in Gallus Gallus - broiler flocks

Monitoring system

Sampling strategy

Broiler flocks

In accordance with the Infectious Animal Disease Control Act, the annual volume of broiler flocks testing for presence of Salmonella is laid down by the State Program on Monitoring and Surveillance of Animal Infectious Diseases approved annually by the Director General of the Veterinary and Food Board. Instructions for salmonella monitoring in broiler flocks are laid down in the Ministry of Agriculture Regulation No 46 "Prevention against salmonellosis", 29.03.2007, which also provides guidelines for the prevention and control of salmonella in broilers and for the handling of products originating from suspected or infected birds.
Estonia target referred to in Article 4(1) of Regulation (EC) No 2160/2003 for the reduction of Salmonella enteritidis and Salmonella typhimurium in broiler flocks of Gallus gallus (Community target) is as follows: a reduction of the maximum percentage to 1 % or less by 31 December 2011.

Frequency of the sampling

Broiler flocks: Before slaughter at farm

2-3 weeks prior to slaughter

Type of specimen taken

Broiler flocks: Before slaughter at farm

Socks/ boot swabs

Methods of sampling (description of sampling techniques)

Broiler flocks: Before slaughter at farm

For the purposes of detecting Salmonella the number of faeces samples to be studied bacteriologically depends on the size of birds flock:
number of birds in the flock /number of samples
250-349 / 200
350-449 / 220
450-799 / 250
800-999 / 260
1000 and more / 300
The sampling frame covers all flocks of broilers covered by the scope of Regulation (EC) No 2160/2003 and Regulation 646/2007/EC.
Flocks of broilers shall be sampled on the initiative of the food business operator and by the competent authority.
- Sampling on the initiative of the food business operator shall take place in accordance with Article 5(3) of Regulation (EC) No 2160/2003 within three weeks before the birds are moved to the slaughterhouse.

- Sampling by the competent authority shall include each year at least one flock of broilers on 10 % of the holdings with more than 5000 birds. It shall be done on a risk basis each time the competent authority considers it necessary.
A sampling carried out by the competent authority may replace the sampling on the initiative of the food business operator.
However, by way of derogation from point (a), the competent authority may decide to sample at least one flock of broilers per round on holdings with several flocks if:
1) an all in/all out system is used;
2) the same management applies to all flocks;
3) feed and water supply is common to all flocks;
4) during one year and at least six rounds, Salmonella spp were tested according to the monitoring scheme set out in point (b) in all flocks on the holding and samples of all flocks of at least one round were taken by the competent authority; and
5) all results from the testing for Salmonella enteritidis or Salmonella typhimurium were negative.

Case definition

Broiler flocks: Before slaughter at farm

A flock or samples is considered to be positive when the presence of Salmonella spp. is detected at least in one of the samples.

Diagnostic/analytical methods used

Broiler flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002

Vaccination policy

Broiler flocks

Vaccination against salmonella in Estonia could only be performed basing on the Veterinary and Food Board approval.

Other preventive measures than vaccination in place

Broiler flocks

Surveillance of salmonella in feed, animals and food is carried out for many years in Estonia. In addition to surveillance systems, monitoring programme is conducted, which provide an additional epidemiological information:
Feed samples:
1) On the enterprises handling feedstuffs the final products shall be studied bacteriologically under the framework of monitoring and self-inspection.
2) From imported feedstuffs official samples shall be taken in the course of random inspection in their storing.
Food control:
Salmonella Monitoring Programme for Food of Animal Origin is established according to the Regulation of Minister of Agriculture No 46, 29.03.2007,

"Prevention of salmonellosis". This programme started in the year 2002 and is approved annually by the Director General of the Veterinary and Food Board. In the frames of this programme the fresh meat from poultry at cutting plants and neck skin at slaughterhouses, eggs from egg packaging centres and egg products are taken.

Control program/mechanisms

The control program/strategies in place

Broiler flocks

Sampling is performed in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved annually by the General Director of the Veterinary and Food Board and is established according to the Regulation of the Minister of Agriculture No 46 from 29.03.2007 "Prevention against Salmonellosis"; Commission Regulation No 646/2007 of 12 June 2007 implementing Regulation No 2160/2003 as regards Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation No 1091/2005.

Recent actions taken to control the zoonoses

Broiler flocks are investigated in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved annually by the General Director of the Veterinary and Food Board and is established according to the Regulation of the Minister of Agriculture No 46 from 29.03.2007 "Prevention against Salmonellosis".

Measures in case of the positive findings or single cases

Broiler flocks: Before slaughter at farm

According to the regulation No 46, if salmonella presence is suspected in broiler flocks of Gallus gallus, the official veterinarian is obligated to take action to confirm the diagnosis and prevent the spread of the disease.
It is prohibited to take birds to a flock doubted to be infected or actually infected or to take them out, except for slaughter. All bird's flocks (young birds, breeding flock, productive flock), where Salmonella spp. was diagnosed should be executed or sent immediately for slaughter or destroyed in accordance with Regulation No 1774/2002. After the flock infected by salmonellosis was sent to the slaughterhouse, the carriage boxes, transport boxes and transport means shall be cleaned, washed and disinfected. The litter of flocks infected by salmonellosis shall be composted away from the livestock buildings. Enclosures and inventory of poultry farm shall be cleaned, washed and disinfected after the litter of birds has been taken out and tested then bacteriologically for salmonellas. The dead and slaughtered birds shall be made harmless or utilised. Poultry buildings should be checked on the efficiency of deratisation, disinfection and on protection against wild birds. Empty period is required for 21 day. Disposal of manure is restricted. Feedingstuffs should be destroyed or heat-

treated.

Notification system in place

Infection with Salmonella spp. (S.enteritidis, S.typhimurium, S.dublin, S.newport, S.cholerasuis) is notifiable since 2000 according to the Ministry of Agriculture Regulation No 34" List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

In the 2008 350 broiler flocks were tested. 3 broiler flocks were positive for Salmonella enteritidis.

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

The overall prevalence of Salmonella in broiler flocks was 0,86% in 2008.

Relevance of the findings in animals to findings in foodstuffs and to human cases

S. enteritidis is the most widespread serotype among humans. Poultry meat is supposed to be the main source of human infection.

Table Salmonella in breeding flocks of Gallus gallus

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Hadar	S. Infantis	S. Typhimurium	S. Virchow	Salmonella spp., unspecified
Gallus gallus (fowl) - parent breeding flocks for egg production line - day-old chicks - at hatchery - Control and eradication programmes - official sampling	3	VFB	flock	3	0						
Gallus gallus (fowl) - parent breeding flocks for egg production line - during production period - - faeces - Control and eradication programmes - official sampling	6	VFB	flock	6	0						
Gallus gallus (fowl) - parent breeding flocks for egg production line - during rearing period - - faeces - Control and eradication programmes - official sampling	3	VFB	flock	3	0						

Table Salmonella in other poultry

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Lexington	S. Typhimurium	Salmonella spp., unspecified
Gallus gallus (fowl) - broilers - - faeces - Monitoring - official sampling	350	VFB	flock	350	3	3			
Gallus gallus (fowl) - laying hens - - faeces - Control and eradication programmes - industry sampling	52	VFB	flock	36	1	1			
Gallus gallus (fowl) - laying hens - - faeces - Control and eradication programmes - official and industry sampling	52	VFB	flock	52	4	1	3		
Gallus gallus (fowl) - laying hens - - faeces - Control and eradication programmes - official sampling	52	VFB	flock	48	4	1	3		
Gallus gallus (fowl) - laying hens - - faeces - Control and eradication programmes - official sampling - suspect sampling	52	VFB	flock	1	1	1			

Table Salmonella in other birds

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Meleagridis	S. Typhimurium	Salmonella spp., unspecified
Ostriches - at farm - Clinical investigations	VFL	animal	3	0				
Other poultry (organs)	VFL	animal	7	0				
Quails - at farm - Clinical investigations	VFL	animal	1	0				
Quails - at farm - Monitoring - official sampling	VFB	flock	1	0				
Quails - in total - Clinical investigations	VFL	flock	13	0				
Zoo animals, all - at zoo - Clinical investigations	VFL	animal	3	0				

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Agona	S. Choleraesuis	S. Dublin	S. Enteritidis	S. Infantis	S. Isangi	S. Typhimurium
Cats - pet animals - in total - Clinical investigations	VFL	animal	4	1							
Cattle (bovine animals) - adult cattle over 2 years - at farm - Monitoring - official sampling	VFB	animal	1607	3					3		
Cattle (bovine animals) - at farm - Clinical investigations (official sampling)	VFB	animal	28	0							
Cattle (bovine animals) - in total - Clinical investigations	VFL	animal	60	11			10				1
Pigs - at farm - Clinical investigations (official sampling)	VFB	animal	20	0							
Pigs - at farm - Monitoring - official sampling	VFB	animal	810	0							
Pigs - breeding animals - at farm - Survey - EU baseline survey [1)]	VFB	holding	34	1							
Pigs - fattening pigs - - lymph nodes - Monitoring - official sampling	VFB	animal	146	12	1	3	1	2	1	1	2
Pigs - in total - Clinical investigations	VFL	animal	79	6		4			1		

	S. 4,12:i:-	Salmonella spp., unspecified	S. enterica subsp. enterica
Cats - pet animals - in total - Clinical investigations	1		
Cattle (bovine animals) - adult cattle over 2 years - at farm - Monitoring - official sampling			
Cattle (bovine animals) - at farm - Clinical investigations (official sampling)			

Table Salmonella in other animals

	S. 4,12:i:-	Salmonella spp., unspecified	S. enterica subsp. enterica
Cattle (bovine animals) - in total - Clinical investigations			
Pigs - at farm - Clinical investigations (official sampling)			
Pigs - at farm - Monitoring - official sampling			
Pigs - breeding animals - at farm - Survey - EU baseline survey [1)]			1
Pigs - fattening pigs - - lymph nodes - Monitoring - official sampling	1		
Pigs - in total - Clinical investigations	1		

Comments:

[1)] Commission Decision 2008/55/EC

2.1.5 Salmonella in feedingstuffs

Table Salmonella in feed material of animal origin

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of marine animal origin - fish meal - at feed mill - Monitoring - official sampling	VFB	batch	600 g	4	0			

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Agona	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of cereal grain origin - maize - derived - at farm - Monitoring - official sampling	VFB	batch	600 g	1	0				
Feed material of cereal grain origin - maize - in total - Monitoring - official sampling (at intermediary)	VFB	batch	600 g	3	0				
Feed material of cereal grain origin - other cereal grain derived - at farm - Monitoring - official sampling	VFB	batch	600 g	3	0				
Feed material of cereal grain origin - other cereal grain derived - at feed mill - Monitoring - official sampling	VFB	batch	600 g	1	0				
Feed material of oil seed or fruit origin - linseed derived - at feed mill - Monitoring - official sampling	VFB	batch	600 g	1	0				
Feed material of oil seed or fruit origin - other oil seeds derived - in total - Monitoring - official sampling (at intermediary)	VFB	batch	600 g	1	0				
Feed material of oil seed or fruit origin - rape seed derived - at farm - Monitoring - official sampling	VFB	batch	600 g	3	0				
Feed material of oil seed or fruit origin - rape seed derived - at feed mill - Monitoring - official sampling	VFB	batch	600 g	3	0				
Feed material of oil seed or fruit origin - rape seed derived - in total - Monitoring - official sampling (at intermediary)	VFB	batch	600 g	12	5	5			
Feed material of oil seed or fruit origin - soya (bean) derived - at farm - Monitoring - official sampling	VFB	batch	600 g	1	0				
Feed material of oil seed or fruit origin - soya (bean) derived - at feed mill - Monitoring - official sampling	VFB	batch	600 g	3	0				

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Agona	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of oil seed or fruit origin - soya (bean) derived - in total - Monitoring - official sampling (at intermediary)	VFB	batch	600 g	1	0				
Feed material of oil seed or fruit origin - sunflower seed derived - in total - Monitoring - official sampling (at intermediary)	VFB	batch	600 g	3	0				
Other feed material - tubers, roots and similar products - at feed mill - Monitoring - official sampling	VFB	batch	600 g	1	0				

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Agona	S. Enteritidis	S. Havana	S. Meleagridis var. 15,34	S. Typhimurium	Salmonella spp., unspecified
Compound feedingstuffs for cattle - final product - at farm - Monitoring - official sampling	VFB	batch	600 g	3	0						
Compound feedingstuffs for cattle - final product - at feed mill - Monitoring - official sampling	VFB	batch	600 g	1	0						
Compound feedingstuffs for pigs - final product - at farm - Monitoring - official sampling	VFB	batch	600 g	2	0						
Compound feedingstuffs for pigs - final product - at feed mill - Monitoring - official sampling	VFB	batch	600 g	1	0						
Compound feedingstuffs, not specified - at farm - Monitoring - official sampling [1)]	VFB	batch	600 g	2	0						
Compound feedingstuffs, not specified - final product - at farm - Monitoring - official sampling	VFB	batch	600 g	104	3	1		1	1		

Comments:

[1)] for Chinchillas

2.1.6 Salmonella serovars and phagetype distribution

The methods of collecting, isolating and testing of the Salmonella isolates are described in the chapters above respectively for each animal species, foodstuffs and humans. The serotype and phagetype distributions can be used to investigate the sources of the Salmonella infections in humans. Findings of same serovars and phagetypes in human cases and in foodstuffs or animals may indicate that the food category or animal species in question serves as a source of human infections. However as information is not available from all potential sources of infections, conclusions have to be drawn with caution.

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Quails		Cats - pet animals	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory	**3**	**11**	**15**	**6**	**22**	**1**			**1**			**1**
Number of isolates serotyped	**3**	**11**	**15**	**6**	**22**	**1**	**0**	**0**	**1**	**0**	**0**	**1**
Number of isolates per serovar												
S. Agona			1									
S. Choleraesuis			3	4								
S. Dublin		10	1									
S. Enteritidis			2		16	1						
S. Infantis	3		1	1								
S. Isangi			1									
S. Meleagridis					6				1			

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Quails		Cats - pet animals	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory	**3**	**11**	**15**	**6**	**22**	**1**			**1**			**1**
Number of isolates serotyped	**3**	**11**	**15**	**6**	**22**	**1**	**0**	**0**	**1**	**0**	**0**	**1**
Number of isolates per serovar												
S. Typhimurium		1	2									
S. enterica subsp. enterica			4	1								1

Table Salmonella serovars in food

Serovars	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin		Meat, mixed meat	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory	**3**		**8**		**2**						**5**	
Number of isolates serotyped	**3**	**0**	**8**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**5**	**0**
Number of isolates per serovar												
S. Dublin	1											
S. Eingedi			3									
S. Enteritidis					1							
S. Infantis	1		1									
S. Newport			2								3	
S. Typhimurium			1		1						1	
S. enterica subsp. enterica	1		1									
S. Chartres											1	

Table Salmonella serovars in feed

Serovars	Other feed material		Compound feedingstuffs, not specified	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory	**5**	**0**	**3**	**0**
Number of isolates serotyped	**5**	**0**	**3**	**0**
Number of isolates per serovar				
S. Agona	5		1	
S. Havana			1	
S. Meleagridis var. 15,34			1	

2.1.7 Antimicrobial resistance in Salmonella isolates

A. Antimicrobial resistance in Salmonella in cattle

Sampling strategy used in monitoring

Frequency of the sampling

The isolates originate from samples that routinely come to the lab, e.g Salmonella control programme, clinical samples.

Type of specimen taken

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

Methods of sampling (description of sampling techniques)

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

Procedures for the selection of isolates for antimicrobial testing

One isolate from each herd or case is included to the present report.

Methods used for collecting data

All isolates and data concerning isolates were collected from local laboratories and tested in the Central Veterinary and Food Laboratory.

Laboratory methodology used for identification of the microbial isolates

Details of laboratory methodology are described in the text Salmonella spp. in bovine animals. Serotyping is performed in the VFL Central Lab.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Resistance testing performed according to ISO 20776-1:2006 (using MIC).
Antimicrobials included in monitoring are ampicillin, gentamicin, ciprofloxacin, chloramphenicol, florfenicol, cefotaxim, sulfamethoxazol, trimethoprim, nalidixic acid, streptomycin, kanamycin, tetracyclin.

Breakpoints used in testing

Details of breakpoints are described in the table Breakpoints for antimicrobial susceptibility testing of Salmonella in Animals

Results of the investigation

In 2008 7 Salmonella isolates from cattle were tested (2 S.Typhimurium, 1 S.Infantis and 4 S.Dublin).
All strains were fully sensitive.
Detailed information about the year 2008 can be found in the resistance tables.

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

The number of fully sensitive isolates is increasing from year to year.

Relevance of the findings in animals to findings in foodstuffs and to human cases

In 2008 the number of isolated from humans Salmonella strains resistant to ampicillin, sulfonamide, trimetoprim, gentamicin, kanamycin, nalidixic acid and cefotaxim increased in comparison with the year 2007.
In the year 2008 15,7 % of Salmonella strains isolated from humans were resistant to ampicillin, 12,2 % to tetracyclin, 9,9 % to streptomycin, 8,4 % to sulfonamide, 7,6 % to nalidixic acid, 5,4 % to trimethoprim, 4,3 % to chloramphenicol, 3,6 % to gentamicin, 3,5 % to cefotaxim, 2,8 % to kanamycin, 0,6 % to ciprofloxacin.

B. Antimicrobial resistance in Salmonella in pigs

Sampling strategy used in monitoring

Frequency of the sampling

The isolates originate from samples that routinely come to the lab, e.g control programmes, clinical samples.

Type of specimen taken

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

Methods of sampling (description of sampling techniques)

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

Procedures for the selection of isolates for antimicrobial testing

One isolate from each positive herd was included in present report.

Methods used for collecting data

All isolates and data concerning isolates are collected in the Central Veterinary and Food Laboratory.
Susceptibility testing is performed in the Central Lab.

Laboratory methodology used for identification of the microbial isolates

Details of laboratory methodology are described in the text Salmonella spp. in pigs.
Serotyping is performed in the VFL Central Lab.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Resistance testing performed according to ISO 20776-1:2006 (using MIC).
Antimicrobials included in monitoring are ampicillin, gentamicin, ciprofloxacin, chloramphenicol, florfenicol, cefotaxim, sulfamethoxazol, trimethoprim, nalidixic acid, streptomycin, kanamycin, tetracyclin.

Breakpoints used in testing

Details of breakpoints are described in the table Breakpoints for antibiotic resistance testing of Salmonella.

Results of the investigation

18 Salmonella strains originated from pigs were tested in 2008.
8 strains (44,4 %) were fully sensitive,
3 strains (16,7 %) were resistant to 1 antimicrobial,
1 strain (5,6 %) were resistant to 2 antimicrobials,
6 strains (33,3 %) was resistant to 6 antimicrobials.
44,4 % were resistant to sulfamethoxazol and to streptomycin; 38,9 % to tetracyclin and 33,3 % to ampicillin, florfenicol and chloramphenicol.

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

The number of multiresistant isolates increased.

Relevance of the findings in animals to findings in foodstuffs and to human cases

In 2008 the number of isolated from humans Salmonella strains resistant to ampicillin, sulfonamide, trimetoprim, gentamicin, kanamycin, nalidixic acid and cefotaxim increased in comparison with the year 2007.
In the year 2008 15,7 % of Salmonella strains isolated from humans were resistant to ampicillin, 12,2 % to tetracyclin, 9,9 % to streptomycin, 8,4 % to sulfonamide, 7,6 % to nalidixic acid, 5,4 % to trimethoprim, 4,3 % to chloramphenicol, 3,6 % to gentamicin, 3,5 % to cefotaxim, 2,8 % to kanamycin, 0,6 % to ciprofloxacin.

C. Antimicrobial resistance in Salmonella in poultry

Sampling strategy used in monitoring

Frequency of the sampling

The isolates originate from samples that routinely come to the lab, e.g control programmes, clinical samples.

Type of specimen taken

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

Methods of sampling (description of sampling techniques)

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

Procedures for the selection of isolates for antimicrobial testing

One isolate from each flock or batch was included.

Methods used for collecting data

All isolates and data concerning isolates are collected in the Central Veterinary and Food Laboratory.
Susceptibility testing is performed in the Central Lab.

Laboratory methodology used for identification of the microbial isolates

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

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Antimicrobials included in monitoring are ampicillin, gentamicin, kanamycin, ciprofloxacin, chloramphenicol, cefotaxim, sulfamethoxazol, trimethoprim, nalidixic acid, streptomycin, tetracyclin.

Breakpoints used in testing

Details of breakpoints are described in the table Breakpoints for antibiotic resistance testing of Salmonella.

Results of the investigation

In 2008 7 Salmonella isolates were tested: 5 S.Enteritidis and 2 S.Lexington. The number of fully sensitive isolates increased 3 times in comparison with the previous year.
5 strains (71,4 %) were fully sensitive (in 2007 - 25 %),
2 strains (28,5 %) were resistant to 2 antimicrobials.
Resistance was discovered to nalidixic acid and ciprofloxacin.

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

The situation is becoming better in comparison with the year 2007. The number of fully sensitive isolates increased significantly.
No cases of multiresistance were detected this year.

Relevance of the findings in animals to findings in foodstuffs and to human cases

In 2008 the number of isolated from humans Salmonella strains resistant to

ampicillin, sulfonamide, trimetoprim, gentamicin, kanamycin, nalidixic acid and cefotaxim increased in comparison with the year 2007.In the year 2008 15,7 % of Salmonella strains isolated from humans were resistant to ampicillin, 12,2 % to tetracyclin, 9,9 % to streptomycin, 8,4 % to sulfonamide, 7,6 % to nalidixic acid, 5,4 % to trimethoprim, 4,3 % to chloramphenicol, 3,6 % to gentamicin, 3,5 % to cefotaxim, 2,8 % to kanamycin, 0,6 % to ciprofloxacin.

D. Antimicrobial resistance in Salmonella in foodstuff derived from cattle

Sampling strategy used in monitoring

Frequency of the sampling

The isolates originate from samples that routinely come to the lab, e.g Salmonella control programme.

Type of specimen taken

Details of sampling are described in the text Salmonella spp. in bovine meat and products thereof

Methods of sampling (description of sampling techniques)

Methods of sampling are described in the text Salmonella spp. in bovine meat and products thereof

Procedures for the selection of isolates for antimicrobial testing

One isolate from each positive batch/sample is included to the present report.

Methods used for collecting data

Isolates and data concerning isolates were collected from local laboratories and tested in the VFL Central Lab.

Laboratory methodology used for identification of the microbial isolates

Details of laboratory methodology are described in the text Salmonella spp. in bovine meat and products thereof.
Serotyping is performed in the VFL Central Lab.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Antimicrobials included in monitoring are ampicillin, gentamicin, kanamycin, ciprofloxacin, chloramphenicol, florfenicol, cefotaxim, sulphamethoxazol, trimethoprim, nalidixic acid, streptomycin, tetracyclin.

Breakpoints used in testing

Details of breakpoints are described in the table Breakpoints for antibiotic resistance testing of Salmonella

Results of the investigation

3 Salmonella isolates were tested: S.Infantis, S.Dublin and S.enterica sbsp.enterica.
All strains were fully sensitive.

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

The number of Salmonella isolates is very small, thus it is very hard to make any decision.

E. Antimicrobial resistance in Salmonella in foodstuff derived from pigs

Sampling strategy used in monitoring

Frequency of the sampling

The isolates originate from samples that routinely come to the lab, e.g Salmonella control programme.

Type of specimen taken

Details of sampling are described in the text Salmonella spp. in pig meat and products thereof

Methods of sampling (description of sampling techniques)

Methods of sampling are described in the text Salmonella spp. in pig meat and products thereof

Procedures for the selection of isolates for antimicrobial testing

One isolate from each positive batch/sample is included to the present report.

Methods used for collecting data

Isolates and data concerning isolates were collected from local laboratories and tested in the VFL Central Lab.

Laboratory methodology used for identification of the microbial isolates

Details of laboratory methodology are described in the text Salmonella spp. in pig meat and products thereof.
Serotyping is performed in the VFL Central Lab.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Antimicrobials included in monitoring are ampicillin, gentamicin, kanamycin, ciprofloxacin, chloramphenicol, florfenicol, cefotaxim, trimethoprim, sulfamethoxazol, nalidixic acid, streptomycin, tetracyclin.

Breakpoints used in testing

Details of breakpoints are described in the table Breakpoints for antibiotic resistance testing of Salmonella

Results of the investigation

3 strains isolated from pig meat were tested in 2008: S.Eingedi, S.Newport and S.enterica subsp. enterica.
1 strain (33,3 %) was fully sensitive,
1 strain was resistant to 1 antimicrobial,
1 strain was resistant to 4 antimicrobials.
Strains were resistant: 33,3 % to ampicillin, florfenicol and streptomycin and 66,7 % to tetracyclin.

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

The number of fully sensitive isolates decreased this year.

F. Antimicrobial resistance in Salmonella in foodstuff derived from poultry

Sampling strategy used in monitoring

Frequency of the sampling

The isolates originated from samples that routinely come to the lab, e.g Salmonella control programme.

Type of specimen taken

Details of sampling are described in the text Salmonella spp. in broiler meat and products thereof.

Methods of sampling (description of sampling techniques)

Methods of sampling are described in the text Salmonella spp. in broiler meat and products thereof.

Procedures for the selection of isolates for antimicrobial testing

One isolate from each positive batch is included to the present report.

Methods used for collecting data

All isolates and data concerning isolates are collected in the Central Veterinary and Food Laboratory.
Susceptibility testing is performed in the Central Lab.

Laboratory methodology used for identification of the microbial isolates

Details of laboratory methodology are described in the text Salmonella spp. in poultry.
Serotyping is performed in the VFL Central Lab.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Resistance testing performed according to ISO 20776-1:2006.
Antimicrobials included in monitoring were ampicillin, gentamicin, kanamycin, ciprofloxacin, chloramphenicol, florfenicol, cefotaxim, sulphamethoxazol, trimethoprim, nalidixic acid, streptomycin, tetracyclin.

Breakpoints used in testing

Details of breakpoints are described in the table Breakpoints for antibiotic resistance testing of Salmonella.

Results of the investigation

In the year 2008 no Salmonella strains were isolated from foodstuffs derived from poultry. Thus antimicrobial resistance testing was not performed.

Table Antimicrobial susceptibility testing of S. Enteritidis in Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Monitoring - quantitative data [Dilution method]

S. Enteritidis		Pigs - fattening pigs - - lymph nodes - Monitoring																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		2																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	2	0							2															
	Kanamycin	16	2	0									2													
	Neomycin		0	0																						
	Streptomycin	32	2	0										1	1											
Amphenicols	Chloramphenicol	16	2	0											1	1										
	Florfenicol	16	2	0											1	1										
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	2	0				1		1																
Fluoroquinolones	Ciprofloxacin	0.06	2	0			1	1																		
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	2	0							1	1														
Quinolones	Nalidixic acid	16	2	0										1	1											
Sulfonamides	Sulfamethoxazol	256	2	1															1		1					
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	2	0									1		1											
Trimethoprim	Trimethoprim	2	2	0						1	1															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S.Enteritidis in animals

S. Enteritidis		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Pigs - fattening pigs - - lymph nodes - Monitoring	
Isolates out of a monitoring program (yes/no)						no								no	
Number of isolates available in the laboratory						5								2	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin					5	0							2	0
	Kanamycin					5	0							2	0
	Streptomycin					5	0							2	0
Amphenicols	Chloramphenicol					5	0							2	0
	Florfenicol					5	0							2	0
Cephalosporins	Cefotaxim					5	0							2	0
Fluoroquinolones	Ciprofloxacin					5	2							2	0
Fully sensitive	Fully sensitive					5	3							2	1
Penicillins	Ampicillin					5	0							2	0
Quinolones	Nalidixic acid					5	2							2	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial					5	0							2	1
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials					5	2							2	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials					5	0							2	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials					5	0							2	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials					5	0							2	0
Sulfonamides	Sulfamethoxazol					5	2							2	1
Tetracyclines	Tetracyclin					5	0							2	0
Trimethoprim	Trimethoprim					5	0							2	0

Table Antimicrobial susceptibility testing of S. Enteritidis in Gallus gallus (fowl) - quantitative data [Dilution method]

S. Enteritidis		Gallus gallus (fowl)																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		5																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	5	0							4	1														
	Kanamycin	16	5	0									4	1												
	Neomycin		0	0																						
	Streptomycin	32	5	0										5												
Amphenicols	Chloramphenicol	16	5	0										1	2	2										
	Florfenicol	16	5	0										1	4											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	5	0					4	1																
Fluoroquinolones	Ciprofloxacin	0.06	5	2			3			2																
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	5	0								5														
Quinolones	Nalidixic acid	16	5	2										1	2					2						
Sulfonamides	Sulfamethoxazol	256	5	0															5							
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	5	0									2	3												
Trimethoprim	Trimethoprim	2	5	0						1	4															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S. Typhimurium in Cattle (bovine animals) - quantitative data [Dilution method]

S. Typhimurium		Cattle (bovine animals)																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		2																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	2	0								2														
	Kanamycin	16	2	0									1	1												
	Neomycin		0	0																						
	Streptomycin	32	2	0											2											
Amphenicols	Chloramphenicol	16	2	0										1	1											
	Florfenicol	16	2	0									1		1											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	2	0					2																	
Fluoroquinolones	Ciprofloxacin	0.06	2	0			2																			
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	2	0								2														
Quinolones	Nalidixic acid	16	2	0										1	1											
Sulfonamides	Sulfamethoxazol	256	2	0													1	1								
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	2	0									2													
Trimethoprim	Trimethoprim	2	2	0						1	1															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

S. Typhimurium		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Pigs - fattening pigs - - lymph nodes - Monitoring	
Isolates out of a monitoring program (yes/no)		no												no	
Number of isolates available in the laboratory		2												2	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	2	0											2	0
	Kanamycin	2	0											2	0
	Streptomycin	2	0											2	2
Amphenicols	Chloramphenicol	2	0											2	1
	Florfenicol	2	0											2	1
Cephalosporins	Cefotaxim	2	0											2	0
Fluoroquinolones	Ciprofloxacin	2	0											2	0
Fully sensitive	Fully sensitive	2	2											2	0
Penicillins	Ampicillin	2	0											2	1
Quinolones	Nalidixic acid	2	0											2	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	2	0											2	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	2	0											2	1
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	2	0											2	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	2	0											2	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	2	0											2	1
Sulfonamides	Sulfamethoxazol	2	0											2	1
Tetracyclines	Tetracyclin	2	0											2	2
Trimethoprim	Trimethoprim	2	0											2	0

Table Antimicrobial susceptibility testing of S. Typhimurium in Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Monitoring - quantitative data [Dilution method]

S. Typhimurium		Pigs - fattening pigs - - lymph nodes - Monitoring																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		2																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	2	0							1		1													
	Kanamycin	16	2	0										2												
	Neomycin		0	0																						
	Streptomycin	32	2	2															2							
Amphenicols	Chloramphenicol	16	2	1											1				1							
	Florfenicol	16	2	1											1		1									
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	2	0					2																	
Fluoroquinolones	Ciprofloxacin	0.06	2	0			1	1																		
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	2	1								1						1								
Quinolones	Nalidixic acid	16	2	0										2												
Sulfonamides	Sulfamethoxazol	256	2	1															1		1					
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	2	2														2								
Trimethoprim	Trimethoprim	2	2	0						1	1															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S. Typhimurium in Other food - quantitative data [Dilution method]

S. Typhimurium		Other food																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		1																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	1	0								1													
	Kanamycin	16	1	0										1											
	Neomycin		0	0																					
	Streptomycin	32	1	1															1						
Amphenicols	Chloramphenicol	16	1	0											1										
	Florfenicol	16	1	0											1										
Cephalosporins	3rd generation cephalosporins		0	0																					
	Cefotaxim	0.5	1	0					1																
Fluoroquinolones	Ciprofloxacin	0.06	1	1							1														
	Enrofloxacin		0	0																					
Penicillins	Ampicillin	4	1	1														1							
Quinolones	Nalidixic acid	16	1	1																1					
Sulfonamides	Sulfamethoxazol	256	1	0															1						
	Sulfonamide		0	0																					
Tetracyclines	Tetracyclin	8	1	1														1							
Trimethoprim	Trimethoprim	2	1	0						1															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																					

Table Antimicrobial susceptibility testing of Salmonella in animals

Salmonella spp.		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Pigs - breeding animals - at farm - Survey - EU baseline survey		Quails		Pigs - fattening pigs - - lymph nodes - Monitoring	
Isolates out of a monitoring program (yes/no)		no		no		no								no		no		no	
Number of isolates available in the laboratory		5		4		2								3		2		7	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	5	0	4	0	2	0							3	0	2	0	7	0
	Kanamycin	5	0	4	0	2	0							3	0	2	0	7	0
	Streptomycin	5	0	4	1	2	0							3	3	2	0	7	2
Amphenicols	Chloramphenicol	5	0	4	1	2	0							3	3	2	0	7	1
	Florfenicol	5	0	4	1	2	0							3	3	2	0	7	1
Cephalosporins	Cefotaxim	5	0	4	0	2	0							3	0	2	0	7	0
Fluoroquinolones	Ciprofloxacin	5	0	4	0	2	0							3	0	2	0	7	0
Fully sensitive	Fully sensitive	5	5	4	3	2	2							3	0	2	2	7	4
Penicillins	Ampicillin	5	0	4	1	2	0							3	3	2	0	7	1
Quinolones	Nalidixic acid	5	0	4	0	2	0							3	0	2	0	7	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	5	0	4	0	2	0							3	0	2	0	7	2
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	5	0	4	0	2	0							3	0	2	0	7	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	5	0	4	0	2	0							3	0	2	0	7	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	5	0	4	0	2	0							3	0	2	0	7	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	5	0	4	1	2	0							3	3	2	0	7	1
Sulfonamides	Sulfamethoxazol	5	0	4	1	2	0							3	3	2	0	7	2
Tetracyclines	Tetracyclin	5	0	4	1	2	0							3	3	2	0	7	1
Trimethoprim	Trimethoprim	5	0	4	0	2	0							3	0	2	0	7	0

Table Antimicrobial susceptibility testing of Salmonella spp. in food

Salmonella spp.		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Meat from other poultry species		Other food	
Isolates out of a monitoring program (yes/no)		no		no						no	
Number of isolates available in the laboratory		3		3						1	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	3	0	3	0					1	0
	Kanamycin	3	0	3	0					1	0
	Streptomycin	3	0	3	1					1	1
Amphenicols	Chloramphenicol	3	0	3	0					1	0
	Florfenicol	3	0	3	1					1	0
Cephalosporins	Cefotaxim	3	0	3	0					1	0
Fluoroquinolones	Ciprofloxacin	3	0	3	0					1	1
Fully sensitive	Fully sensitive	3	3	3	1					1	0
Penicillins	Ampicillin	3	0	3	1					1	1
Quinolones	Nalidixic acid	3	0	3	0					1	1
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	3	0	3	1					1	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	3	0	3	0					1	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	3	0	3	0					1	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	3	0	3	1					1	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	3	0	3	0					1	1
Sulfonamides	Sulfamethoxazol	3	0	3	0					1	0
Tetracyclines	Tetracyclin	3	0	3	2					1	1
Trimethoprim	Trimethoprim	3	0	3	0					1	0

Table Antimicrobial susceptibility testing of Other serotypes in Cattle (bovine animals) - quantitative data [Dilution method]

Other serotypes		Cattle (bovine animals)																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		5																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	5	0						1	4															
	Kanamycin	16	5	0									5													
	Neomycin		0	0																						
	Streptomycin	32	5	0											3	1	1									
Amphenicols	Chloramphenicol	16	5	0										2	3											
	Florfenicol	16	5	0										2	3											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	5	0			3	2																		
Fluoroquinolones	Ciprofloxacin	0.06	5	0			5																			
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	5	0							1	4														
Quinolones	Nalidixic acid	16	5	0										5												
Sulfonamides	Sulfamethoxazol	256	5	0														4	1							
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	5	0								1	3	1												
Trimethoprim	Trimethoprim	2	5	0							5															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

4 S.Dublin and 1 S.Infantis were tested.

Table Antimicrobial susceptibility testing of Other serotypes in Pigs - quantitative data [Dilution method]

Other serotypes		Pigs																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		4																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	4	0							2	2													
	Kanamycin	16	4	0									3	1											
	Neomycin		0	0																					
	Streptomycin	32	4	1													3		1						
Amphenicols	Chloramphenicol	16	4	1										2	1				1						
	Florfenicol	16	4	1										2	1		1								
Cephalosporins	3rd generation cephalosporins		0	0																					
	Cefotaxim	0.5	4	0					4																
Fluoroquinolones	Ciprofloxacin	0.06	4	0			1	3																	
	Enrofloxacin		0	0																					
Penicillins	Ampicillin	4	4	1								2	1					1							
Quinolones	Nalidixic acid	16	4	0										1	3										
Sulfonamides	Sulfamethoxazol	256	4	1														2	1			1			
	Sulfonamide		0	0																					
Tetracyclines	Tetracyclin	8	4	1									1	2				1							
Trimethoprim	Trimethoprim	2	4	0						1	3														
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																					

Footnote:

1 S.eneterica subsp. enterica, 2 S.Choleraesuis and 1 S.Infantis were tested.

Table Antimicrobial susceptibility testing of Other serotypes in Gallus gallus (fowl) - quantitative data [Dilution method]

Other serotypes		Gallus gallus (fowl)																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		2																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	2	0							1	1														
	Kanamycin	16	2	0									2													
	Neomycin		0	0																						
	Streptomycin	32	2	0											1	1										
Amphenicols	Chloramphenicol	16	2	0											1	1										
	Florfenicol	16	2	0											2											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	2	0					1	1																
Fluoroquinolones	Ciprofloxacin	0.06	2	0			2																			
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	2	0							1	1														
Quinolones	Nalidixic acid	16	2	0										2												
Sulfonamides	Sulfamethoxazol	256	2	0															2							
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	2	0									2													
Trimethoprim	Trimethoprim	2	2	0							2															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

2 S.Lexington isolates were tested.

Table Antimicrobial susceptibility testing of Other serotypes in Quails - quantitative data [Dilution method]

Other serotypes		Quails																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		2																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	2	0							2															
	Kanamycin	16	2	0									2													
	Neomycin		0	0																						
	Streptomycin	32	2	0										1	1											
Amphenicols	Chloramphenicol	16	2	0											1	1										
	Florfenicol	16	2	0											2											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	2	0					2																	
Fluoroquinolones	Ciprofloxacin	0.06	2	0			1	1																		
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	2	0								1	1													
Quinolones	Nalidixic acid	16	2	0										2												
Sulfonamides	Sulfamethoxazol	256	2	0														1	1							
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	2	0									1	1												
Trimethoprim	Trimethoprim	2	2	0							2															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

S.Meleagridis and S.Agona were tested.

Table Antimicrobial susceptibility testing of Other serotypes in Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Monitoring - quantitative data [Dilution method]

Other serotypes		Pigs - fattening pigs - - lymph nodes - Monitoring																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		7																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	7	0							2	5														
	Kanamycin	16	7	0									4	3												
	Neomycin		0	0																						
	Streptomycin	32	7	2											3		2	1		1						
Amphenicols	Chloramphenicol	16	7	1										1	3	2			1							
	Florfenicol	16	7	1											6		1									
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	7	0					7																	
Fluoroquinolones	Ciprofloxacin	0.06	7	0			3	4																		
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	7	1								6						1								
Quinolones	Nalidixic acid	16	7	0										1	4	2										
Sulfonamides	Sulfamethoxazol	256	7	2															4	1		2				
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	7	1									5		1			1								
Trimethoprim	Trimethoprim	2	7	0							5	1	1													
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

2 S.Choleraesuis, 1 S.Dublin, 1 S.Infantis, 1 S.Agona, 1 S.Isangi and 1 S.enterica subsp. enterica were tested.

Table Antimicrobial susceptibility testing of Other serotypes in Meat from pig - quantitative data [Dilution method]

Other serotypes		Meat from pig																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		3																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	3	0								3													
	Kanamycin	16	3	0									1	1	1										
	Neomycin		0	0																					
	Streptomycin	32	3	1											1		1			1					
Amphenicols	Chloramphenicol	16	3	0											2	1									
	Florfenicol	16	3	1										1		1	1								
Cephalosporins	3rd generation cephalosporins		0	0																					
	Cefotaxim	0.5	3	0				1	2																
Fluoroquinolones	Ciprofloxacin	0.06	3	0			2	1																	
	Enrofloxacin		0	0																					
Penicillins	Ampicillin	4	3	1								2							1						
Quinolones	Nalidixic acid	16	3	0										3											
Sulfonamides	Sulfamethoxazol	256	3	0																3					
	Sulfonamide		0	0																					
Tetracyclines	Tetracyclin	8	3	2									1					2							
Trimethoprim	Trimethoprim	2	3	0							3														
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																					

Footnote:

S.Eingedi, S.Newport and S.enterica subsp. enterica were tested.

Table Antimicrobial susceptibility testing of Other serotypes in Meat from bovine animals - quantitative data [Dilution method]

Other serotypes		Meat from bovine animals																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		3																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	3	0							3															
	Kanamycin	16	3	0									3													
	Neomycin		0	0																						
	Streptomycin	32	3	0												2	1									
Amphenicols	Chloramphenicol	16	3	0											2	1										
	Florfenicol	16	3	0											2	1										
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	3	0				1	1	1																
Fluoroquinolones	Ciprofloxacin	0.06	3	0			3																			
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	3	0							1	2														
Quinolones	Nalidixic acid	16	3	0										3												
Sulfonamides	Sulfamethoxazol	256	3	0														1	1	1						
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	3	0									3													
Trimethoprim	Trimethoprim	2	3	0							3															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

S.Infantis, S.Dublin and S.enterica subsp. enterica were tested.

Table Antimicrobial susceptibility testing of S. enterica subsp. enterica in Pigs - breeding animals - at farm - Survey - EU baseline survey - quantitative data [Dilution method]

S. enterica subsp. enterica		Pigs - breeding animals - at farm - Survey - EU baseline survey																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		3																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	3	0								3														
	Kanamycin	16	3	0										3												
	Neomycin		0	0																						
	Streptomycin	32	3	3																3						
Amphenicols	Chloramphenicol	16	3	3															3							
	Florfenicol	16	3	3													3									
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	3	0					3																	
Fluoroquinolones	Ciprofloxacin	0.06	3	0			2	1																		
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	3	3														3								
Quinolones	Nalidixic acid	16	3	0										3												
Sulfonamides	Sulfamethoxazol	256	3	3																		3				
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	3	3														3								
Trimethoprim	Trimethoprim	2	3	0						3																
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Breakpoints for antibiotic resistance testing

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
ISO_20776-1:2006 2007/407/EC

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**	EUCAST, 2007/407/EC			2	0.25	32				
	Kanamycin	EUCAST, 2007/407/EC			16	0.5	16				
	Streptomycin	EUCAST, 2007/407/EC			32	2	256				
Amphenicols	**Chloramphenicol**	EUCAST, 2007/407/EC			16	2	256				
	Florfenicol	EUCAST, 2007/407/EC			16	2	32				
Cephalosporins	**Cefotaxim**	EUCAST, 2007/407/EC			0.5	0.06	8				
Fluoroquinolones	**Ciprofloxacin**	EUCAST, 2007/407/EC			0.06	0.008	8				
Penicillins	**Ampicillin**	EUCAST, 2007/407/EC			4	0.5	64				
Quinolones	**Nalidixic acid**	EUCAST, 2007/407/EC			16	2	256				
Sulfonamides	**Sulfamethoxazol**	EUCAST, 2007/407/EC			256	8	1024				
Tetracyclines	**Tetracyclin**	EUCAST, 2007/407/EC			8	0.5	64				
Trimethoprim	**Trimethoprim**	EUCAST, 2007/407/EC			2	0.25	32				

Table Breakpoints for antibiotic resistance testing

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
ISO_20776-1:2006 2007/407/EC

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**	EUCAST, 2007/407/EC			2	0.25	32				
	Kanamycin	EUCAST, 2007/407/EC			16	0.5	16				
	Streptomycin	EUCAST, 2007/407/EC			32	2	256				
Amphenicols	**Chloramphenicol**	EUCAST, 2007/407/EC			16	2	256				
	Florfenicol	EUCAST, 2007/407/EC			16	2	32				
Cephalosporins	**Cefotaxim**	EUCAST, 2007/407/EC			0.5	0.06	8				
Fluoroquinolones	**Ciprofloxacin**	EUCAST, 2007/407/EC			0.06	0.008	8				
Penicillins	**Ampicillin**	EUCAST, 2007/407/EC			4	0.5	64				
Quinolones	**Nalidixic acid**	EUCAST, 2007/407/EC			16	2	256				
Sulfonamides	**Sulfamethoxazol**	EUCAST, 2007/407/EC			256	8	1024				
Tetracyclines	**Tetracyclin**	EUCAST, 2007/407/EC			8	0.5	64				
Trimethoprim	**Trimethoprim**	EUCAST, 2007/407/EC			2	0.25	32				

2.2 CAMPYLOBACTERIOSIS

2.2.1 General evaluation of the national situation

A. Thermophilic Campylobacter general evaluation

History of the disease and/or infection in the country

Human campylobacteriosis is one of the most important diseases in Estonia. This disease is on the second position according to the number of registered cases in the country behind salmonellosis.

The number of cases registered in 2008 significantly decreased in comparison with the previous years. There were 154 human cases of campylobacteriosis registered in the year 2008 (in 2007 - 114, 2006 - 124, 2005 - 124).

Campylobacter jejuni is the pathogen most frequently detected in humans and in poultry meat.

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

The number of Campylobacter spp. isolated from poultry meat and caeca samples was very small during years. C.jejuni was the most frequently detected strain.

All Campylobacter strains tested on antimicrobial resistance during last years were fully sensitive.

The number of foodborne outbreaks caused by Campylobacter increased in 2008. 4 household outbreaks caused by Campylobacter were reported in 2008 (in 2007 - 1, in 2006 - 3 outbreaks): 3 with unknown food implicated and 1 with mixed red meat and products thereof implicated.

In 2008 102 broiler slaughter batches were analyzed in the frames of the EU baseline survey. Intact caeca at time of evisceration and neck skin samples were taken from broilers at slaughterhouse. 6,9 % of the slaughter batches were found to be Campylobacter positive. In all cases C.jejuni was detected.

In 2007 46 broiler slaughter batches were analyzed (intact caeca and neck skin). Campylobacter jejuni was detected in one neck skin sample.

There are no official monitoring programmes in regard to Campylobacter in feedingstuffs.

Positive food samples taken in the frames of official food control in 2008 form 6,1 % of the analyzed samples (2007 - 4 %; in 2006 - 2,4 %; in 2005 - 5,5 %). All positive samples originate from poultry meat (broilers).

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Poultry meat is thought to be the most significant source of infection in humans. In most cases the sources of infection were not laboratory confirmed. C.jejuni is a predominant isolate in humans during years.

2.2.2 Campylobacteriosis in humans

2.2.3 Campylobacter in foodstuffs

A. Thermophilic Campylobacter in Broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

One whole broiler carcass was taken per the slaughter batch for detection of Salmonella and Campylobacter. Sampling was performed in the frames of the EU baseline survey (Commission Decision 2007/516/EC). Carcass was taken immediately after chilling, but before further processing such as freezing, cutting or packaging.

At retail

Official sampling was performed in the frames of official food control programme.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Other: neck skin

At retail

Other: fresh meat, meat preparation

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

Whole broiler carcass taken per the slaughter batch at slaughterhouse and broiler neck skin sample taken from the carcass at laboratory.

At retail

The samples of 25 g each taken from broiler meat, handled hygienically, placed in refrigerated containers and sent immediately to the laboratory.

Definition of positive finding

At slaughterhouse and cutting plant

A sample where Thermofilic Campylobacter was isolated.

At retail

A sample where Thermofilic Campylobacter was isolated.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 10272-1:2006

At retail

ISO 10272-1:2006

Control program/mechanisms

The control program/strategies in place

Sampling was performed randomly at slaughterhouse in the frames of the EU baseline survey and at retail level in the frames of the official food control plans.

Measures in case of the positive findings or single cases

The own check plan of the food handling establishment should be improved.

Notification system in place

Campylobacter jejuni is a pathogen subject to registration since 2000 according to the Infectious Animal Disease Control Act and the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".
Laboratories inspecting the safety and quality of the products on enterprises which handle food of animal origin are required to register Campylobacter and notify the Veterinary and Food Board about the isolation of pathogens which may cause infectious animal diseases subject to notification or registration or about suspicion of the occurrence of such pathogens in raw food material or products.
Laboratories report quarterly the list of registered pathogens in food to the Veterinary and Food Board.

Results of the investigation

4,9 % of the broiler slaughter batches taken in the frames of the EU baseline survey were found to be positive. In all cases Campylobacter jejuni was found.
6,1 % of the samples taken in the frames of official food control were found to be positive in 2008. All positive samples were taken from broiler meat.

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

The occurrence of Campylobacter in fresh broiler meat is quite high. During last 4 years it seems to be stable:
2004 - 56 samples taken and 26,8 % of them were positive,
2005 - 278 samples and 7,5 % of them were positive,
2006 - 80 samples - 6,3 % were positive
2007 - 70 samples - 7,1 % were positive
2008 - 151 samples - 5,3 % were positive.
In 2005, 2007 and 2008 the prevalent Campylobacter specie was C.jejuni, in 2006 - C.coli.

Relevance of the findings in animals to findings in foodstuffs and to human cases

Most of the human cases of campylobacteriosis are foodborne in Estonia and are caused by C.jejuni.

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus) - carcass - at slaughterhouse - Survey - EU baseline survey (neck skin taken at laboratory) [1)]	VFB	batch	27 g	102	5		5			
Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	25 g	15	2		2			
Meat from broilers (Gallus gallus) - meat products - at retail - Surveillance - official controls	VFB	single	25 g	24	0					
Meat from broilers (Gallus gallus) - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	25 g	2	1	1				
Meat from other poultry species - meat products - at retail - Surveillance - official controls	VFB	single	25 g	1	0					
Meat from turkey - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	25 g	4	0					
Meat from turkey - meat products - at retail - Surveillance - official controls	VFB	single	25 g	1	0					

Comments:

[1)] Commission Decision 2007/516/EC

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Other processed food products and prepared dishes - at retail - Surveillance - official controls	VFB	single	25 g	2	0					

2.2.4 Campylobacter in animals

A. Thermophilic Campylobacter in Gallus gallus

Monitoring system

Sampling strategy

Sampling was performed at slaughterhouse in the frames of the EU baseline survey (Commission Decision 2007/516/EC). Sampling was based on random selection of slaughter batches regarding sampling days and batches to be sampled. Sampling was performed all the year round. A 12-month period was divided into 12 periods of 1 month. In each month 1/12th of the total sample size was taken.
All samples were taken from 1 slaughterhouse.
Sample taken was broiler intact ceaca.
Ceaca samples were taken at the time of evisceration. Each sample consisted of 10 intact caeca taken from the birds belonging to the same slaughter batch.

Frequency of the sampling

At slaughter

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughter

intact caeca

Methods of sampling (description of sampling techniques)

At slaughter

Samples taken were intact ceaca. Ceaca samples were taken at the time of evisceration. Each sample consisted of 10 caeca taken from the birds belonging to the same slaughter batch.
Caeca samples were transported as intact caeca to the laboratory as soon as possible. At the laboratory, the ceaca contents were aseptically removed and pooled to 1 composite sample.

Case definition

At slaughter

A slaughter batch is considered positive for Campylobacter spp. if the presence of the agent is confirmed in the pooled sample from this batch.

Diagnostic/analytical methods used

At slaughter

ISO 10272-1:2006(E)

Vaccination policy

No vaccination.

Measures in case of the positive findings or single cases

The supervision official should inform the veterinarian performing supervision of the broilers farm. The infection sources and their spreading ways should be investigated and eliminated.

Notification system in place

Detection of Campylobacter is not notifiable.

Results of the investigation

2 % of ceaca samples (from 2 different batches) taken were found to be positive for Campylobacter in 2008. Campylobacter jejuni was found.

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

2 caeca samples were positive in 2008. No caeca samples were detected to be positive in 2006 and 2007.

In 2005 no caeca samples were taken.

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study - at slaughterhouse - Survey - EU baseline survey (caeca sample)	VFB	batch	102	2	0	2	0	0	0

2.2.5 Antimicrobial resistance in Campylobacter isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in cattle

Results of the investigation

Antimicrobial resistance testing was not performed in 2008, as no samples for Campylobacter testing were taken from cattle.

B. Antimicrobial resistance in Campylobacter jejuni and coli in pigs

Results of the investigation

Antimicrobial resistance testing was not performed in 2008, as no samples for Campylobacter testing were taken from pigs.

C. Antimicrobial resistance in Campylobacter jejuni and coli in poultry

Sampling strategy used in monitoring

Frequency of the sampling

Campylobacter isolates that originate from samples that routinely come to the Veterinary and Food Laboratory in the frames of official control or monitoring programmes performed by VFB officials.

Methods of sampling (description of sampling techniques)

Campylobacter isolates that are discovered in poultry of Estonian origin in all laboratories are included in monitoring. Isolates are stored and then sent to the VFL central laboratory, which performs antimicrobial resistance testing

Procedures for the selection of isolates for antimicrobial testing

Campylobacter isolates that are discovered in poultry of Estonian origin are included in monitoring. Selection of isolates depends on the amount of isolates present in the laboratory. Usually 1 isolate per sample.

Methods used for collecting data

All isolates detected in the local laboratories and data concerning them are collected in the VFL Central Laboratory.
All isolates are tested in the VFL Central Laboratory.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

VetMIC Camp for antimicrobial susceptibility testing of Campylobacter jejuni and hippurate-negative thermophilic Campylobacer spp. SVA Dept. of antiobiotics, SE-75189 Uppsala, Sweden.
The inoculum density in the panels was 50-250 CFU/ml. The panels are incubated in a microaerophilic atmosphere +37 +/- 1,0 for 40-48 h.
Control strain: Campylobacter jejuni ATCC 33560.
The antimicrobials included in monitoring are tetracycline, nalidixic acid, ciprofloxacin, streptomycin, gentamicin, erythromycin.

Breakpoints used in testing

Commission Decision of 19 July 2007 concerning a financial contribution from the Community towards a survey on the prevalence and antimicrobial resistance of Campylobacter spp. in broiler flocks and on the prevalence of Campylobacter spp. and Salmonella spp. in broiler carcasses to be carried out in the Member States (2007/516/EC)

Control program/mechanisms

The control program/strategies in place

Only Campylobacter isolates derived from domesic poultry are included into monitoring.

Results of the investigation

2 Campylobacter jejuni isolates were detected in 2008 and were tested on antimicrobial resistance. All of them were fully sensitive.

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

There were no Campylobacter found in poultry during years 2005-2007 years, so no antimicrobial resistance testing was performed. In 2008 2 Campylobacter jejuni isolates were tested with negative result (all of them were fully sensitive).

D. Antimicrobial resistance in Campylobacter jejuni and coli in foodstuff derived from cattle

Sampling strategy used in monitoring

Frequency of the sampling

Campylobacter isolates that originate from samples that routinely come to the Veterinary and Food Laboratory in the frames of official control or monitoring programmes performed by VFB officials.

Methods of sampling (description of sampling techniques)

Campylobacter isolates that are discovered in foodstuffs of Estonian origin in all laboratories are included in monitoring. Isolates are stored and then sent to the VFL central laboratory, which performs antimicrobial resistance testing.

Procedures for the selection of isolates for antimicrobial testing

Campylobacter isolates that are discovered in foodstuffs of Estonian origin are included in monitoring. Selection of isolates depends on the amount of isolates present in the laboratory. Usually 1 isolate per sample.

Methods used for collecting data

All isolates detected in the local laboratories and data concerning them are collected in the VFL Central Laboratory.
All isolates are tested in the VFL Central Laboratory.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Results of the investigation

No Campylobacter isolates were detected in foodstuffs derived from cattle in 2008.

E. Antimicrobial resistance in Campylobacter jejuni and coli in foodstuff derived from pigs

Sampling strategy used in monitoring

Frequency of the sampling

Campylobacter isolates that originate from samples that routinely come to the Veterinary and Food Laboratory in the frames of official control or monitoring programmes performed by VFB officials.

Methods of sampling (description of sampling techniques)

Campylobacter isolates that are discovered in foodstuffs of Estonian origin in all laboratories are included in monitoring. Isolates are stored and then sent to the VFL central laboratory, which performs antimicrobial resistance testing.

Procedures for the selection of isolates for antimicrobial testing

Campylobacter isolates that are discovered in foodstuffs of Estonian origin are included in monitoring. Selection of isolates depends on the amount of isolates present in the laboratory. Usually 1 isolate per sample.

Methods used for collecting data

All isolates detected in the local laboratories and data concerning them are collected in the VFL Central Laboratory.
All isolates are tested in the VFL Central Laboratory.

Additional information

No antimicrobial testing was performed, as no Campylobacter positive samples of foodstuffs derived from pigs were detected in 2008.

F. Antimicrobial resistance in Campylobacter jejuni and coli in foodstuff derived from poultry

Sampling strategy used in monitoring

Frequency of the sampling

Campylobacter isolates that originate from samples that routinely come to the Veterinary and Food Laboratory in the frames of official control or monitoring programmes performed by VFB officials.

Methods of sampling (description of sampling techniques)

Campylobacter isolates that are discovered in foodstuffs of Estonian origin in all laboratories are included in monitoring. Isolates are stored and then sent to the VFL central laboratory, which performs antimicrobial resistance testing.

Procedures for the selection of isolates for antimicrobial testing

Campylobacter isolates that are discovered in foodstuffs of Estonian origin are included in monitoring. Selection of isolates depends on the amount of isolates present in the laboratory. Usually 1 isolate per sample.

Methods used for collecting data

All isolates detected in the local laboratories and data concerning them are collected in the VFL Central Laboratory.
All isolates are tested in the VFL Central Laboratory.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

VetMIC Camp for antimicrobial susceptibility testing of Campylobacter jejuni and hippurate-negative thermophilic Campylobacer spp. SVA Dept. of antiobiotics, SE-75189 Uppsala, Sweden.
The inoculum density in the panels was 50-250 CFU/ml. The panels are incubated in a microaerophilic atmosphere +37 +/- 1,0 for 40-48 h.
Control strain: Campylobacter jejuni ATCC 33560.
The antimicrobials included in monitoring are tetracycline, nalidixic acid, ciprofloxacin, streptomycin, gentamicin, erythromycin.

Breakpoints used in testing

Commission Decision of 19 July 2007 concerning a financial contribution from the Community towards a survey on the prevalence and antimicrobial resistance of Campylobacter spp. in broiler flocks and on the prevalence of Campylobacter spp. and Salmonella spp. in broiler carcasses to be carried out in the Member States (2007/516/EC)

Control program/mechanisms

The control program/strategies in place

Only Campylobacter isolates derived from foodstuffs of domestic origin are included into monitoring.

Results of the investigation

In 2008 5 Campylobacetr jejuni strains were isolated from broiler neck skin taken at slaughterhouse in the frames of EU baseline survey (Commission Decision

2007/516/EC). All of them were tested on antimicrobial resistance.
All strains were fully sensitive.

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

Due to the small amount of Campylobacter isolates it is very difficult to make any decision. During last 2 years there was no antimicrobial resistance of Campylobacter isolates detected.
In 2008 5 Campylobacter jejuni isolates detected in broiler neck skin were tested. All isolates were fully sentsitive.
In the year 2007 one Campylobacter jejuni strain, isolated from broiler neck skin was tested. This strain was fully sensitive.
In 2006 there were no Campylobacter isolated from poultry of domestic origin. So no sensitivity testing was performed.
In the year 2005 7 Campylobacter jejuni strains and 2 C.coli strains were obtained for sensitivity testing.
Resistance of C.jejuni isolated from broiler meat was detected to nalidixic acid (2 from 3) and oxytetracycline (2 from 3).
Resistance of C.jejuni (1 isolate) isolated from turkey meat was detected to ampicillin, nalidixic acid and enrofloxacin.
1 C.coli isolate from broiler meat was fully sensitive.

Table Antimicrobial susceptibility testing of C. jejuni in broilers - Gallus gallus (fowl) - sampling in the framework of the broiler baseline study - at slaughterhouse - Survey - EU baseline survey - quantitative data [Dilution method]

C. jejuni		Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study - at slaughterhouse - Survey - EU baseline survey																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		2																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	2	0						1	1														
	Spectinomycin	2	2	0								1	1												
Fluoroquinolones	Ciprofloxacin	1	2	0					2																
Macrolides	Erythromycin	4	2	0							2														
Penicillins	Ampicillin		0	0																					
Quinolones	Nalidixic acid	16	2	0										2											
Tetracyclines	Tetracyclin	2	2	0					2																

Footnote:

Campylobacter jejuni was isolated from broilers intact caeca

Table Antimicrobial susceptibility testing of C. jejuni in Meat from broilers (Gallus gallus) - at slaughterhouse - animal sample - neck skin - Survey - EU baseline survey - quantitative data [Dilution method]

C. jejuni		Meat from broilers (Gallus gallus) - - neck skin - Survey - EU baseline survey																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		5																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	5	0							2	3														
	Spectinomycin	2	0	0																						
Fluoroquinolones	Ciprofloxacin	1	5	0					2	3																
Macrolides	Erythromycin	4	5	0							4		1													
Penicillins	Ampicillin		0	0																						
Quinolones	Nalidixic acid	16	5	0										4	1											
Tetracyclines	Tetracyclin	2	5	0					3	2																

Table Antimicrobial susceptibility testing of Campylobacter in animals

Campylobacter spp., unspecified		**Gallus gallus (fowl)**		**Cattle (bovine animals)**		**Pigs**	
Isolates out of a monitoring program (yes/no)		no					
Number of isolates available in the laboratory		2					
Antimicrobials:		**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides	**Gentamicin**	2	0				
	Spectinomycin	2	0				
Fluoroquinolones	**Ciprofloxacin**	2	0				
Fully sensitive	**Fully sensitive**	2	2				
Macrolides	**Erythromycin**	2	0				
Quinolones	**Nalidixic acid**	2	0				
Tetracyclines	**Tetracyclin**	2	0				

Footnote:

2 Campylobacter jejuni isolates were tested.

Table Antimicrobial susceptibility testing of Campylobacter in food

Campylobacter spp., unspecified		Meat from other poultry species		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)	
Isolates out of a monitoring program (yes/no)								no	
Number of isolates available in the laboratory								5	
Antimicrobials:		N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin							5	0
	Spectinomycin							5	0
Fluoroquinolones	Ciprofloxacin							5	0
Fully sensitive	Fully sensitive							5	5
Macrolides	Erythromycin							5	0
Quinolones	Nalidixic acid							5	0
Tetracyclines	Tetracyclin							5	0

Footnote:

Campylobacter jejuni isolates were tested

Table Breakpoints used for antimicrobial susceptibility testing

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
ISO_20776-1:2006

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**				1	0.12	16				
	Spectinomycin				2	0.5	64				
Fluoroquinolones	**Ciprofloxacin**				1	0.06	8				
Macrolides	**Erythromycin**				4	0.5	64				
Quinolones	**Nalidixic acid**				16	1	64				
Tetracyclines	**Tetracyclin**				2	0.12	16				

Footnote:

Standard for breakpoint:
Commission Decision of 19 July 2007 concerning a financial contribution from the Community towards a survey on the prevalence and antimicrobial resistance of Campylobacter spp. in broiler flocks and on the prevalence of Campylobacter spp. and Salmonella spp. in broiler carcasses to be carried out in the Member States (2007/516/EC)

Table Breakpoints used for antimicrobial susceptibility testing

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
ISO_20776-1:2006

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**				1	0.12	16				
	Spectinomycin				2	0.5	64				
Fluoroquinolones	**Ciprofloxacin**				1	0.06	8				
Macrolides	**Erythromycin**				4	0.5	64				
Quinolones	**Nalidixic acid**				16	1	64				
Tetracyclines	**Tetracyclin**				2	0.12	16				

Footnote:

Standard for breakpoint:
Commission Decision of 19 July 2007 concerning a financial contribution from the Community towards a survey on the prevalence and antimicrobial resistance of Campylobacter spp. in broiler flocks and on the prevalence of Campylobacter spp. and Salmonella spp. in broiler carcasses to be carried out in the Member States (2007/516/EC)

2.3 LISTERIOSIS

2.3.1 General evaluation of the national situation

A. Listeriosis general evaluation

History of the disease and/or infection in the country

During years the number of laboratory confirmed cases of Listeriosis in Estonia has been very low.
There were 8 cases of human listeriosis recorded in the year 2008
3 cases in 2007,
1 case in 2006,
2 cases in 2005,
2 cases in 2004.
No outbreaks involving Listeria spp. were reported.

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

No Listeria monitoring programme in animals exists in the country. Animals are investigated in the frames of clinical investigations or
In the year 2008 there were 21,3 % of samples taken from cattle (in 2007 - 11,8 %), 1,2 % of samples taken from pigs (in 2007 - 2,2 %) and 14,7 % of samples taken from sheep (in 2007 - 24 %) positive for Listeria spp.
Listeria monocytogenes was found in all samples, except 1 sample taken from sheep, where Listeria Ivanovii was found (in 2007 - 3 samples were positive for L.Ivanovii).
3,4 % of ready-to-eat products were Listeria positive in 2008 (in 2007 - 2,4 %).
Raw milk intended for direct human consumption was more contaminated among ready-to-eat products. 20 % of the raw milk samples were positive (in 2007 - 9 %).
Presence of Listeria was determined in 6,4 % of ready-to-eat fishery products (in 2007 - 4,6 %; in 2006 - 7,4 %; in 2005 - 13,3%).

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

The number of human cases of listeriosis is very small (1-2 per year). In all cases Listeria monocytogenes has been detected.
Foodborne transmission is believed to be more important than transmission from animals.

2.3.2 Listeriosis in humans

A. Listeriosis in humans

History of the disease and/or infection in the country

2.3.3 Listeria in foodstuffs

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Cheeses made from cows' milk - hard - made from pasteurised milk - at processing plant - Surveillance - official controls	VFB	single	25 g	15	0	15	0	0	0	0
Cheeses made from cows' milk - hard - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls	VFB	single	25 g	2	0	2	0	0	0	0
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant - Surveillance - official controls	VFB	single	25 g	12	0	12	0	0	0	0
Dairy products (excluding cheeses) - dairy products, not specified - at processing plant - Surveillance - official controls	VFB	single	25 g	54	1	54	1	0	0	0
Dairy products (excluding cheeses) - dairy products, not specified - at retail - Surveillance - official controls	VFB	single	25 g	5	0	4	0	1	0	0
Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - at processing plant - Surveillance - official controls	VFB	single	25 g	5	0	4	0	1	0	0
Infant formula - at processing plant - Surveillance - official controls	VFB	single	25 g	2	0	2	0	0	0	0
Infant formula - at retail - Surveillance - official controls	VFB	single	25 g	2	0	0	0	2	0	0
Milk, cows' - pasteurised milk - at processing plant - Surveillance - official controls	VFB	single	25 g	6	0	6	0	0	0	0
Milk, cows' - raw - intended for direct human consumption - at farm - Surveillance - official controls	VFB	single	25 g	24	3	23	3	1	0	0

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Milk, cows' - raw - intended for direct human consumption - at retail - Surveillance - official controls	VFB	single	25 g	6	3	5	3	1	0	0
Milk, cows' - raw milk for manufacture - at processing plant - Surveillance - official controls	VFB	single	25 g	1	0	1	0	0	0	0

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Bakery products - at processing plant - Surveillance - official controls	VFB	single	25 g	29	0	19	0	10	0	0
Fish - smoked - at processing plant - Surveillance - official controls	VFB	single	25 g	15	2	13	2	2	0	0
Fish - smoked - at retail - Surveillance - official controls	VFB	single	25 g	7	2	6	2	1	0	0
Fishery products, unspecified - raw - at processing plant - Surveillance - official controls	VFB	single	25 g	2	0	0	0	2	0	0
Fishery products, unspecified - raw - at retail - Surveillance - official controls	VFB	single	25 g	2	0	1	0	1	0	0
Fishery products, unspecified - ready-to-eat - at processing plant - Surveillance - official controls	VFB	single	25 g	56	1	44	1	12	0	0
Fishery products, unspecified - ready-to-eat - at retail - Surveillance - official controls	VFB	single	25 g	16	1	7	1	9	0	0
Meat from bovine animals - fresh - at retail - Surveillance - official controls	VFB	single	25 g	1	0	1	0	0	0	0
Meat from bovine animals - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls	VFB	single	25 g	18	0	16	0	2	0	0
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls	VFB	single	25 g	12	0	8	0	4	0	0
Meat from broilers (Gallus gallus) - fresh - at retail - Surveillance - official controls	VFB	single	25 g	1	1	1	1	0	0	0
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls	VFB	single	25 g	19	0	19	0	0	0	
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls	VFB	single	25 g	10	0	3	0	7	0	0

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Meat from other animal species or not specified - meat products - at processing plant - Surveillance - official controls	VFB	single	25 g	61	3	57	3	4	0	0
Meat from other animal species or not specified - meat products - at retail - Surveillance - official controls	VFB	single	25 g	15	0	5	0	10	0	0
Meat from pig - meat preparation - at processing plant - Surveillance - official controls	VFB	single	25 g	1	0	1	0	0	0	0
Meat from pig - meat products - cooked, ready-to -eat - at processing plant - Surveillance - official controls	VFB	single	25 g	110	5	101	5	9	0	0
Meat from pig - meat products - cooked, ready-to -eat - at retail - Surveillance - official controls	VFB	single	25 g	26	0	14	0	12	0	0
Meat from turkey - meat products - at processing plant - Surveillance - official controls	VFB	single	25 g	3	1	3	1	0	0	0
Other food - at processing plant - Surveillance - official controls	VFB	single	25 g	4	0	2	0	2	0	0
Other food - at retail - Surveillance - official controls	VFB	single	25 g	1	0	1	0	0	0	0
Other processed food products and prepared dishes - unspecified - ready-to-eat foods - at processing plant - Surveillance - official controls	VFB	single	25 g	28	0	12	0	16	0	0
Other processed food products and prepared dishes - unspecified - ready-to-eat foods - at retail - Surveillance - official controls	VFB	single	25 g	90	0	44	0	46	0	0
Ready-to-eat salads - at processing plant - Surveillance - official controls	VFB	single	25 g	38	3	14	1	24	2	0
Ready-to-eat salads - at retail - Surveillance - official controls	VFB	single	25 g	64	5	27	4	37	1	0
Vegetables - non-precut - at processing plant - Surveillance - official controls	VFB	single	25 g	8	0	5	0	3	0	0

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Vegetables - pre-cut - at processing plant - Surveillance - official controls	VFB	single	25 g	3	0	3	0	0	0	0
Vegetables - products - at processing plant - Surveillance - official controls	VFB	single	25 g	20	0	11	0	9	0	0
Vegetables - products - at retail - Surveillance - official controls	VFB	single	25 g	8	0	2	0	6	0	0

2.3.4 Listeria in animals

Table Listeria in animals

	Source of information	Sampling unit	Units tested	Total units positive for Listeria spp.	L. monocytogenes	L. ivanovii	Listeria spp., unspecified
Cattle (bovine animals)	VFL	animal	80	17	17		
Pigs	VFL	animal	84	1	1		
Sheep	VFL	animal	34	5	4	1	

Footnote:

Type of material taken: brain, abortion material, internal organs.
Brain samples taken from cattle and sheep were investigated in case of BSE and rabies analyzes negative results.

2.4 E. COLI INFECTIONS

2.4.1 General evaluation of the national situation

A. Verotoxigenic Escherichia coli infections general evaluation

History of the disease and/or infection in the country

There were no outbreaks registered in Estonia due to VTEC. The number of human cases is not very significant. All of them were autochtone cases and all were laboratory confirmed.

There were 3 human cases registered in 2008.

In the year 2007 3 human cases of VTEC O157 were reported; in 2006 - 6; in 2005 - 15 human cases and in 2004 no human cases were reported.

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

In the year 2005 the monitoring programme of VTEC O157 was started. Dairy cows are analyzed at farm. Animals from farms with more than 100 dairy cows are tested. This monitoring is a part of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases.

The investigations show no presence of Verotoxigenic E.coli O157 on big farms with more than 100 animals.

One positive animal was detected in 2008.

No positive cases were discovered in 2007.

In 2006 VTEC O157 was detected in dairy cows on 1 small farm with 17 animals. The investigation of that animals was started due to the VTEC human case linked to the consumption of raw cows milk from that farm. Samples taken from 13 animals were found to be positive.

No positive food samples were detected since the year 2006.

Recent actions taken to control the zoonoses

In 2005 the monitoring of VTEC O157 in dairy cows started in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases. The programme is approved annually by the Director General of the Veterinary and Food Board.

2.4.2 E. coli infections in humans

2.4.3 Escherichia coli, pathogenic in foodstuffs

Table VT E. coli in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC)-VTEC O157	Verotoxigenic E. coli (VTEC)-VTEC non-O157	Verotoxigenic E. coli (VTEC)-VTEC, unspecified
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	25 g	3	0	0		
Meat from bovine animals - meat products - at retail - Surveillance - official controls	VFB	single	25 g	6	0	0		
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	25 g	7	0	0		
Meat from pig - meat products - at retail - Surveillance - official controls	VFB	single	25 g	1	0	0		
Meat from pig - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	25 g	13	0	0		
Meat from sheep - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	25 g	1	0	0		
Meat, mixed meat - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls	VFB	single	25 g	8	0	0		
Milk, cows' - raw - intended for direct human consumption - at retail - domestic production - Surveillance - official controls	VFB	single	25 g	6	0	0		

2.4.4 Escherichia coli, pathogenic in animals

A. Verotoxigenic Escherichia coli in cattle (bovine animals)

Monitoring system

Sampling strategy

Faecal samples are taken from dairy cows representing farms with more than 100 animals. 4 samples should be taken at each farm, one sample per animal. 4 samples taken at farm are pooled in the laboratory.
Sampling is random and farms are located in different counties in Estonia.
Sampling is performed by the officials from Veterinary and Food Board in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases.

Frequency of the sampling

Animals at farm

Once a year

Type of specimen taken

Animals at farm

Faeces

Methods of sampling (description of sampling techniques)

Animals at farm

Samples should be taken from the rectum of dairy cows. 1 sample should be taken per animal, 4 samples per farm. Samples are divided in the laboratory into 2 parts: one part is pooled in the laboratory and sample weight analyzed is 20 g (5 g x 4 samples). In case of positive result, each sample from the other part should be tested individually.

Case definition

Animals at farm

Animal is considered to be positive, if VTEC O157 has been isolated from its faecal sample.
In case of VTEC O157 isolation in pooled feacal sample, each sample should be tested separately.

Diagnostic/analytical methods used

Animals at farm

With following modifications: Bacteriological method EVS-EN ISO 16654

Control program/mechanisms

The control program/strategies in place

Samples are taken in the frames of State Programme on Monitoring and Surveillancce of Animal Infectious Diseases which is approved annually by the

Director General of the Veterinary and Food Board.

Measures in case of the positive findings or single cases

In case of detection VTEC O157 in live animals the local veterinary officer, Veterinary and Food Board and the Health Protection Inspectorate county department should be notified. An epidemiological investigation should be started. Restrictions may be imposed on livestock holdings where VTEC O157 is detected. Follow-up testing will also be conducted.

Notification system in place

VTEC O157 and other verotoxigenic strains are notifiable since the year 2000 according to the Regulation of the Ministry of Agriculture No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

In the year 2008 209 dairy cows from the different dairy farms were tested. One animal was positive.

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

In the year 2005 the investigation of VTEC O157 presence in dairy cows was started in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases and investigations followed in 2006, 2007 and 2008.
No positive animals were detected in 2005 and 2007.
13 positive animals were detected in 2006 and 1 positive animal in 2008.

Table VT E. coli in animals

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC)-VTEC O157	Verotoxigenic E. coli (VTEC)-VTEC non-O157	Verotoxigenic E. coli (VTEC)-VTEC, unspecified
Cattle (bovine animals) - dairy cows - at farm - Surveillance - official controls - selective sampling [1)]	VFB	animal	20 g	209	1	1		

Comments:

[1)] Milk production farms with more than 100 animals were tested. 4 feacal samples were taken from each farm, one sample per animal

Footnote:

E.coli O157:H7 stxl/stx2 gene result was negative, but eae gene result was positive.

2.5 TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1 General evaluation of the national situation

A. Tuberculosis general evaluation

History of the disease and/or infection in the country

Tuberculosis in animals is notifiable since 1962.
The last case of bovine tuberculosis had been detected in Estonia in 1986. Estonia consider the Estonian herds tuberculosis-free.
Human Tuberculosis Register has been created in 1997. No cases of human tuberculosis caused by M.bovis has been ever reported.
The incidence rate of human pulmonary tuberculosis due to M.tuberculosis in Estonia is among the highest in Europe.

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

The disease is notifiable according to the Regulation of the Ministry of Agriculture No 34 "List of Notifiable Diseases and Diseases subject to Registration" and the requirements for controlling tuberculosis of bovine animals are approved by the Regulation of the Minister of Agriculture No 61 (in force since 23.04.2004).
According to the above mentioned Regulation if Tuberculosis is suspected in a bovine animal the official veterinarian is obliged to take an action to confirm the diagnosis and to prevent the spread of the disease.
Holding infected or suspected of being infected with tuberculosis is subjected under official restrictions for effective preventive methods against the spread of the disease. This includes the strict prohibition of all movement and transportation of animals and persons other than official veterinarians and persons concerned with the care of the animals.
The infection is eradicated by stamping out of the entire herd. The prophylaxis of tuberculosis has been carried out by avoiding the infection of a tuberculosis-free herd and finding out the infected animals in time by regular tuberculin testing of the herd.
Every year the examination on tuberculosis has been based on the State Programme on Monitoring and Surveillance of Animal Infectious Diseases, which is approved by the Director General of the Veterinary and Food Board.
There were no reported cases of human tuberculosis due to M.bovis in the year 2008. All bacteriologically confirmed cases in humans have been caused by M.tuberculosis. The increased number of multi-drug resistant Mycobacterium Tuberculosis strains and co-infection with HIV becomes a big problem.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Since bovine tuberculosis in cattle seems to be eliminated in Estonia, there is no probability of contracting M.bovis infection from domestic animals or domestic animal products.

All bacteriologically confirmed cases in humans have been caused by M.tuberculosis.

Additional information

Since the year 2005 according to the State Programme on Monitoring and Surveillance of Animal Infectiuos Diseases and in accordance with Council Directive 97/12 all over 6 weeks old cattle (except fattening bulls who are not used for breeding and will be slaughtered after rearing period) are subject for routine serological testing on tuberculosis at yearly intervals.

2.5.2 Tuberculosis, mycobacterial diseases in humans

2.5.3 Mycobacterium in animals

A. Mycobacterium bovis in bovine animals

Status as officially free of bovine tuberculosis during the reporting year

Additional information

Estonian bovine herds are not OTF according to EC legislation.

Monitoring system

Sampling strategy

Since the year 2005 according to the State Programme on Monitoring and Surveillance of Animal Infectious Diseases and Council Directive 97/12 all over 6 weeks old cattle (except fattening bulls who are not used for breeding and will be slaughtered after rearing period) are subject for routine serological testing on tuberculosis at yearly intervals.

Frequency of the sampling

All over 6 weeks old cattle (except fattening bulls who are not used for breeding and will be slaughtered after rearing period) are subject for routine serological testing on tuberculosis in accordance with Council Directive 97/12 at yearly intervals.

Type of specimen taken

Other: intradermal tuberculin test

Methods of sampling (description of sampling techniques)

Specimens for bacteriological examination are lymph nodes and internal organs.

Case definition

A positive case is defined as an animal where Mycobacterium bovis has been isolated.

Diagnostic/analytical methods used

Laboratory diagnostic method used in the VFL is performed according to OIE Manual for Diagnostic Tests and Vaccines for Terrestrial Animals 2004. Diagnostic tests are tuberculin skin test and microscopy, histology, culture. Confirmation is performed by biochemical tests and PCR. Method is accredited by the Estonian Accreditation Centre.

Vaccination policy

Vaccination against tuberculosis is forbidden in Estonia.

Control program/mechanisms

The control program/strategies in place

The State Programme on Monitoring and Surveillance of Animal Infectious

Diseases is a national programme approved annually by the Director General of the Veterinary and Food Board.
The Ministry of Agriculture Regulation No 61 "Prevention of bovine animals against tuberculosis" (made in accordance with Community legislation) is in force since 01.05.2004.

Measures in case of the positive findings or single cases

Veterinary and Food Board apply following restrictions and measures:
declare OTF status invalid,
organize epidemiological investigation,
ensure that all at least 6 weeks old bovine animals native of tuberculoses positive herds should be tuberculin tested according to the EC Regulation 1226/2002,
all in point 3 mentioned tuberculoses positive animals should be slaughtered,
bovine animals could be taken out from the herd only for slaughter,
disinfection is required,
milk has to be heat treated.

Notification system in place

Infection with Mycobacterium bovis is notifiable in bovine animals since 1962 and since 2000 it is notifiable according to the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

There were no positive results in 2008.

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

Surveillance programme for bovine tuberculoses started in 1962. The last positive case had been reported in 1986. Consequently thereof we consider our bovine herds free from tuberculoses.
Since the year 2005 tuberculoses surveillance programme has been implemented according to the EC legislation.

Relevance of the findings in animals to findings in foodstuffs and to human cases

There is no evidence of contracting domestic tuberculosis from animals. There were no human cases of tuberculosis caused by M.bovis reported during years.

B. Mycobacterium bovis in farmed deer

Additional information

There is no farmed deer in Estonia.

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium spp.	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified
Gallus gallus (fowl) - at farm	VFL	animal	1	0	0	0	0

Table Bovine tuberculosis - data on herds - Community co-financed eradication programmes

Region	Total number of herds	Total number of herds under the programme	Number of herds checked	Number of positive herds	Number of new positive herds	Number of herds depopulated	% positive herds depopulated	Indicators		
								% herd coverage	% positive herds Period herd prevalence	% new positive herds Herd Incidence
Eesti	6144	6144	6144	0	0	0	0	100	0	0
Total	6144	6144	6144	0	0	0	N.A.	100.0	0.0	0.0
Total - 1										

Table Bovine tuberculosis - data on animals - Community co-financed eradication programmes

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Eesti	236681	236681	213608	213608	0	0	0	90.25	0
Total	236681	236681	213608	213608	0	0	0	90.25	0.0
Total - 1									

Table Bovine tuberculosis - data on status of herds at the end of the period - Community co-financed eradication programmes

	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check positive							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Eesti	6144	236681	0	0	0	0	6144	213608	0	0	6144	236608	0	0
Total	6144	236681	0	0	0	0	6144	213608	0	0	6144	236608	0	0
Total - 1														

2.6 BRUCELLOSIS

2.6.1 General evaluation of the national situation

A. Brucellosis general evaluation

History of the disease and/or infection in the country

The last positive B.abortus case in bovine animals had been registered in 1961.
B. melitensis in goat and sheep has never been reported in Estonia. There were no cases of human brucellosis registered in Estonia since 1957.

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

Estonian bovine and sheep herds are not OBF according to the EC legislation, but we are considering them as brucellosis-free, as during many years there were no positive cases registered.
Since 2005 the brucellosis surveillance programme in bovine animals is implemented according to the EC legislation.
No official surveillance programmes for Brucella detection in food exists in Estonia.
No human cases were recorded during many years, so the situation seems to be stable.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

As brucellosis has not been detected in production animals during years, the risk of humans obtaining brucellosis from Estonian animal products is negligible.

2.6.2 Brucellosis in humans

2.6.3 Brucella in animals

A. Brucella abortus in bovine animals

Status as officially free of bovine brucellosis during the reporting year

Additional information

Estonian bovine herds are not OBF according to the EC legislation.

Monitoring system

Sampling strategy

Compulsory bacteriological investigation of all abortions.
All over 12 month old cattle are subject to routine serological testing for brucellosis (except fattening bulls who are not used for breeding and will be slaughtered after rearing period).
Dairy cows: milk samples are tested serologically.
Other cattle: blood samples are tested serologically.
Bulls in the artificial insemination centres: blood samples are tested serologically once a year.
Sampling is performed by the VFB official veterinarians and authorized veterinarians.
Samples are taken at farm.
Sampling is a part of a permanent monitoring scheme.

Frequency of the sampling

All over 12 month old cattle (except fattening bulls who are not used for breeding and will be slaughtered after rearing period).
Bulls in the artificial insemination centres tested serologically - blood samples are taken once a year.

Type of specimen taken

Other: milk, blood

Methods of sampling (description of sampling techniques)

Pooled milk samples (10 animals) from cows and pooled blood samples (10 animals) from heifers and bulls.
Abortion - fetuses and fetal membranes.

Case definition

An animal from which B.abortus has been isolated.

Diagnostic/analytical methods used

Laboratory diagnostic method used in VFL is performed according to OIE Manual for Diagnostic Tests and Vaccines for Terrestrial Animals 2004. Diagnostic test - serology (indirect ELISA) for monitoring purposes. If samples react positively in screening tests, confirmation should be performed by the other

serological tests (CFT, CompELISA).
For clinical cases (abortion) - microbiological examination for isolation and identification of bacteria. Confirmation is done by biochemical tests and the slide agglutination test and sending Brucella strain to the reference laboratory.
Method is accredited by the Estonian Accreditation Centre.

Vaccination policy

Vaccination against brucellosis is forbidden in Estonia.

Control program/mechanisms

The control program/strategies in place

Sampling is performed in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases - the national programme approved annually by the Director General of the Veterinary and Food Board.
Ministry of Agriculture Regulation No 120 "Prevention of bovine animals against brucellosis" (made up in accordance with Community legislation) is in force since 06.08.2004.

Measures in case of the positive findings or single cases

Veterinary and Food Board apply following restrictions and measures:
declare OBF status invalid,
organize epidemiological investigation,
all bovine animals and brucellosis susceptible animals in the epidemic point should be destroyed,
Veterinary and Food Board may allow to send clinically healthy animals for slaughter to the appointed slaughterhouse. Slaughter should be performed separately from the other animals. Meat should be heat treated,
movement of the people, cars and animals to the epidemic point and out could be allowed only by authority of the Veterinary and Food Board,
disinfection is required,
milk should be heat treated.

Notification system in place

Infection with Brucellosis is notifiable in bovine, ovine and swine animals since 1962 and since 2000 it is notifiable according to the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

All samples were negative in 2008.

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

Surveillance programme for bovine brucellosis started in 1962. The last positive case has been recorded in 1961. Consequently thereof we consider our bovine herds free from brucellosis.
Since the year 2005 brucellosis surveillance programme has been implemented according to the EC legislation.

No human cases registered since 1957.

Relevance of the findings in animals to findings in foodstuffs and to human cases

The risk of humans contracting brucellosis from Estonian animal products is considered negligible.

B. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

Additional information

Estonian sheep herds are not OBF according to the EC legislation.
During 47 years there were no positive B.melitensis cases reported. Consequently thereof we consider our sheep herds free from brucellosis.

Monitoring system

Sampling strategy

Blood samples are taken from parent stock of breeding herds once a year and analyzed serologically.

Frequency of the sampling

Once a year.

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Serology - individual blood sample.
Bacteriology - samples from abortion material, udder secretions or from tissues removed at post-mortem.

Case definition

An animal from which B.melitensis has been isolated.

Diagnostic/analytical methods used

Laboratory diagnostic method used in the VFL is performed according to OIE Manual for Diagnostic Tests and Vaccines 2004.
For monitoring purposes: serology - Rose Bengal Test (antigen produced by VLA), a further test is a Complement Fixation Test.
For clinical cases: microbiological examination for isolation and identification of bacteria. Confirmation is done by biochemical tests and the slide agglutination test and sending Brucella strain to a reference laboratory.
Method is accredited by the Estonian Accreditation Centre.

Vaccination policy

Vaccination against brucella is forbidden in Estonia.

Control program/mechanisms

The control program/strategies in place

Sampling is performed in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases - the national programme approved annually by the Director General of the Veterinary and Food Board.
Ministry of Agriculture Regulation No 16 "Preventionof ovine and caprine animals against brucellosis" is in force since 08.03.2008.

Measures in case of the positive findings or single cases

Measures include notification, investigation of all suspected cases by veterinary authorities by serological testing of blood samples and microbiological testing in case of abortions, isolation of suspect cases and herd restrictions, killing of positive herds and disinfection of the shed, restrictions on use of raw milk for human consumption, dead animals carcasses should be disposed in accordance with the requirements of the Regulation 1774/2002.

Notification system in place

Infection with Brucella is notifiable in bovine, ovine and swine animals since 1962 and since 2000 it is notifiable according to the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

All samples have been negative in 2008.

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

Surveillance programme for Brucella in sheep started since 1962. Untill now no positive B.melitensis cases were reported.

Relevance of the findings in animals to findings in foodstuffs and to human cases

As there were no registered cases of brucellosis in sheep since 1962, the risk of obtaining human brucellosis in Estonia is negligible.

C. Brucella melitensis in goats

Monitoring system

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Individual blood sample for serology.

Case definition

An animal from which B.melitensis has been isolated.

Diagnostic/analytical methods used

Laboratory diagnostic method used in the VFL is performed according to OIE Manual of Diagnostic Tests and Vaccines 2004.
For monitoring purposes serology is used: Rose Bengal Test (antigen produced by VLA), a further test is a Complement Fixation Test
For suspected or clinical cases - microbiological examination of isolation and identification of bacteria. Confirmation is performed by biochemical tests and the slide agglutination test and sending Brucella strain to a reference laboratory.
Method is accredited by the Estonian Accreditation Centre.

Control program/mechanisms

The control program/strategies in place

Sampling is performed in the frames of the State Programme on Monitoring and Surveillance of Animal Infectious Diseases - the national programme approved annually by the Director General of the Veterinary and Food Board.
Ministry of Agriculture Regulation No 16 "Prevention of ovine and caprine animals against brucellosis" is in force since 08.03.2008.

Measures in case of the positive findings or single cases

Measures include notification, investigation of all suspected cases by veterinary authorities by serological testing of blood samples and microbiological testing in case of abortions, isolation of suspect cases and herd restrictions, killing of positive herds and disinfection of the shed, restrictions on use of raw milk for human consumption, dead animals carcasses should be disposed in accordance with the requirements of the Regulation 1774/2002.

Notification system in place

Infection with Brucella is notifiable in bovine, ovine and swine animals since 1962 and since 2000 it is notifiable according to the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

In 2008 no positive results were received.

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

Brucellosis in animals and in humans is very rare disease in Estonia.
B.melitensis in goats has never been reported.
Human cases of brusellosis had not be diagnosed during more than 50 years.

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. abortus	B. melitensis	B. suis	Brucella spp., unspecified
Cattle (bovine animals) - at farm	VFL	animal	2118	0				
Dogs	VFL	animal	2	0				
Pigs - at farm	VFL	animal	3125	0				
Pigs - at farm - Monitoring - official sampling	VFB	animal	879	0				
Sheep and goats - at farm	VFL	animal	79	0				
Wild boars - from hunting	VFL	animal	18	0				
Zoo animals, all - at zoo	VFL	animal	38	0				

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance						Investigations of suspect cases								
							Serological tests			Examination of bulk milk			Information about			Epidemiological investigation					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Number of positive animals		Number of animals examined microbiologically	Number of animals positive microbiologically
																		Sero logically	BST		
Eesti	6144	236681	0	0	0	0	4561	148806	0	4561	101103	0	0	0	0	0	0	0	0	0	0
Total	6144	236681	0	0.0	0	0.0	4561	148806	0	4561	101103	0	0	0	0	0	0	0	0	0	0
Total - 1																					

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

Region	Total number of existing		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases				
	Herds	Animals	Number of herds	%	Number of herds	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbio logically	Number of animals positive microbio logically	Number of suspended herds
Eesti	2294	66253	0	0	0	0	49	1684	0	1684	0	0	0	0
Total	2294	66253	0	0.0	0	0.0	49	1684	0	1684	0	0	0	0
Total - 1														

2.7 YERSINIOSIS

2.7.1 General evaluation of the national situation

A. Yersinia enterocolitica general evaluation

History of the disease and/or infection in the country

Human cases of yersiniosis are reported in Estonia every year. The number of cases varied during the years 1999-2008. The peak was mentioned in 1999 (113 cases), then the number of cases varied during years:
2000 - 60 cases,
2001 - 51,
2002 - 20,
2003 - 31,
2004 - 15,
2005 - 31,
2006 - 42
2007 - 76
2008 - 42.

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

There is no special programme for monitoring of Yersinia spp. in animals in Estonia. Isolation of Yersinia was related to the confirmation of the presence of cross-reacting antibody in case of positive brucellosis serological reaction.
In 2008 17,4 % of samples taken from cattle were positive for Y.enterocolitica. In 2006 4,7 % of samples taken from sheep and in 2007 25 % of samples taken from cattle were positive for Yersinia enterocolitica.
In 2008 no food samples were analyzed.
In 2007 47 % of samples tested were positive for Yersinia enterocolitica. No pathogenic species of Yersinia were found. 74 % of tested raw carrots (pelled and pre-cut) samples were positive for non-pathogenic Yersinia enterocolitica.
In 2006 20 % of fresh meat samples taken at retail were positive for Yersinia enterocolitica.
The number of human cases is unstable and varies during years. A significant part of human infections is of domestic origin. Yersiniosis has it`s greatest potential as a zoonosis in young children.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Yersinia infection in humans is mostly foodborne, zoonotic source is often not defined. In most cases the supposed source of infection in humans is determined on the basis of epidemiological investigation, but not bacteriologically.

2.7.2 Yersiniosis in humans

2.7.3 Yersinia in animals

Table Yersinia in animals

	Source of information	Sampling unit	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica-O:3	Y. enterocolitica-O:9	Y. enterocolitica-unspecified
Cattle (bovine animals) - Clinical investigations	VFL	animal	23	4	4	0	0	0	0

Footnote:

There is no special programme for monitoring of Yersinia spp. in animals in Estonia. Investigation of Yersinia spp. was related to confirmation of the presence of cross-reacting antibody in case of positive brucellosis serological reaction.

2.8 TRICHINELLOSIS

2.8.1 General evaluation of the national situation

A. Trichinellosis general evaluation

History of the disease and/or infection in the country

The data of the previous investigations show that trichinellosis had been diagnosed both in wild and in farmed domestic animals in Estonia.
The last case of trichinellosis in domestic pig had been diagnosed in 1999. During last 9 years there were no cases of trichinellosis found in farmed animals.
Among wild animals there are still some cases of trichinellosis diagnosed each year.
Human trichinellosis is relatevely rare disease in Estonia. The number of human cases per year is very small and in the years 2000-2008 it varied from 0 to 3 cases per year.
The peak of incidence was noted in the year 1993, when 43 human cases of trichinellosis had been diagnosed.

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

Investigations show that during years no Trichinella found in domestic farmed animals. At the same time Trichinellosis was diagnosed in wild animals: wild boars, lynxes and bears.

The risk of acquiring human trichinellosis from domestic animals is considered to be very low as Trichinella has not been detected in animals that are usually consumed as food in Estonia.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

In most human cases the supposed source of infection is associated with consumption of wild animals meat.

Recent actions taken to control the zoonoses

Carcases of animals (swine, horse, wild game and etc.) are systematically sampled at slaughterhouses as a part of the post-mortem examination.

2.8.2 Trichinellosis in humans

2.8.3 Trichinella in animals

A. Trichinella in pigs

Number of officially recognised Trichinella-free holdings

There are no officially recognized Trichinella-free holdings in Estonia.

Monitoring system

Sampling strategy

General

Samples are taken at the slaughterhouse. Sampling is performed by authorized or official veterinarians at post mortem inspection in accordance with the Commission Regulation 2075/2005 requirements.

Frequency of the sampling

General

Carcasses of domestic pigs are systematically sampled at slaughterhouses as a part of the post-mortem inspection.

Type of specimen taken

General

In the case of the whole carcasses, a specimen is to be taken from pillar of the diaphragm at the transition to the sinewy part.
In the absence of both diaphragm pillars, a specimen is to be taken from the rib part or breastbone part of the diaphragm or from the jaw muscle, tongue or abdominal muscles tongue muscle or the jaw muscle, abdominal muscle.
For cuts of meat and frozen samples, a sample of striated muscle is to be taken.

Methods of sampling (description of sampling techniques)

General

According to the requirements of the Commission Regulation 2075/2005.

Case definition

General

An animal where Trichinella spp. was detected.

Diagnostic/analytical methods used

General

Detection methods described in Chapters I and III of the Annex I of Commission Regulation 2075/2005.

Control program/mechanisms

The control program/strategies in place

Each slaughtered pig has to be examined at slaughterhouses at post-mortem

inspection.

Recent actions taken to control the zoonoses

Carcasses do not leave the premises before the result of the Trichinella examination is found to be negative.

Measures in case of the positive findings or single cases

In case of discovering of Trichina larvae, the animal carcass and the viscera are declared to be unfit for human consumption and should be directly disposed in accordance with the requirements of the Regulation 1774/2002.

Notification system in place

Notification is in place since the year 2000 in accordance with the Regulation of the Ministry of Agriculture No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation including description of the positive cases and the

No positive cases were reported in the year 2008.

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

No positive cases reported.

Breeding sows and boars

No positive cases reported.

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

The last case of trichinellosis in pigs had been discovered at the private farm in the year 1999. Since that time no Trichinella has been found in domestic pigs.

Relevance of the findings in animals to findings in foodstuffs and to human cases

The risk of contracting trichinellosis from domestic pigs is close to zero due to the extensive surveillance programmes of pig production in place.

B. Trichinella in horses

Monitoring system

Sampling strategy

Carcases are sampled at the slaughterhouse. Sampling is performed by authorized or official veterinarians at post-mortem inspection.

Frequency of the sampling

All slaughtered animals intended for human consumption are sampled. Sampling is performed according to the requirements of the Regulation 2075/2005.

Type of specimen taken

Specimens are to be taken from the lingual or jaw muscle.
In case of their lacking, a specimen is to be taken from a pillar of the diaphragm at the transition to the sinewy part.

Methods of sampling (description of sampling techniques)

In accordance with the Regulation 2075/2005.

Case definition

An animal where Trichinella spp. was detected.

Diagnostic/analytical methods used

In accordance with the Chapter I of the Annex I of Regulation 2075/2005

Results of the investigation including the origin of the positive animals

In 2008 no positive cases were reported.

Control program/mechanisms

The control program/strategies in place

Every carcase should be examined at post-mortem inspection.

Measures in case of the positive findings or single cases

See part "Trichinella in pigs".

Notification system in place

Notification is in place since the year 2000 according to the Regulation of the Minister of Agriculture No 34 "List of Notifiable Diseases and Diseases subject to Registration".

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

No Trichinella is found in horses during years.
The number of slaughtered horses is not very big (2-14 horses per year), as there is no tradition to consume horse meat in Estonia.

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	T. britovi	Trichinella spp., unspecified
Badgers - from hunting	VFL	animal	1	1			1
Bears - in total	VFB, VFL	animal	50	5		3	2
Lynx - from hunting	VFL	animal	12	5		3	2
Pigs - at slaughterhouse - Surveillance - official controls [1)]	VFB	animal	474859	0			
Solipeds, domestic - horses - at slaughterhouse - Surveillance - official controls	VFB	animal	13	0			
Wild boars - wild - in total	VFB, VFL	animal	4255	12		3	9

Comments:

[1)] not raised under controlled housing conditions in integrated production system

2.9 ECHINOCOCCOSIS

2.9.1 General evaluation of the national situation

A. Echinococcus spp. general evaluation

History of the disease and/or infection in the country

There were no reported cases of echinococcosis in farmed animals in the years 2004-2006 and in 2008. In 2007 one case of liver ehhinococcosis was registered in cattle.
In 2005 2 cases of echinococcosis in wild reindeer had been diagnosed at post-mortem inspection.
Since 1986 only 2 cases of human echinococcosis were reported. The situation seems to be stable and the risk for humans to acquire the disease is negligible.

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

Surveillance and control of Echinococcus spp. is carried out by the meat inspectors according the the Regulation 854/2004. Mandatory meat inspection covers all known potential intermediate host species. All carcasses intended for human consumption are inspected for incidence of hydatid cysts. The prevalence of echinococcus in animals intended for human consumption is close to zero.
Human echinococcosis is not a public health problem in Estonia.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Human echinococcosis is a very rear disease in Estonia.

2.9.2 Echinococcosis in humans

2.9.3 Echinococcus in animals

Table Echinococcus in animals

	Source of information	Sampling unit	Units tested	Total units positive for Echinococcus spp.	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Cattle (bovine animals) - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal	48075	0			
Goats - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal	58	0			
Pigs - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal	474859	0			
Reindeers - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal	1634	0			
Sheep - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal	5750	0			
Solipeds, domestic - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal	13	0			

2.10 TOXOPLASMOSIS

2.10.1 General evaluation of the national situation

A. Toxoplasmosis general evaluation

History of the disease and/or infection in the country

Data concerning human cases of toxoplasmosis is available since 1997. The number of human cases of toxoplasmosis varies during years. The highest incidence rate was detected in 2004 when 16 cases were registered. Since that time there is a decrease tendency in number of human cases of toxoplasmosis: in 2005 there were 5 cases, in 2006 3 cases, in 2007 and in 2008 1 human case of toxoplasmosis registered.
No special programme is present on monitoring of toxoplasmosis in animals.

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

There is no official surveillance programme in regard of Toxoplasma in animals.
Animals are investigated in case of suspicion.
In 2008 no positive animals were detected.
There is no enough information about the most common sources of infection.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

The supposed source of infection in humans is usually determined by epidemiological investigation, but not bacteriologically.

2.10.2 Toxoplasmosis in humans

2.10.3 Toxoplasma in animals

Table Toxoplasma in animals

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma	T. gondii
Cats	VFL	single	6	0	
Zoo animals, all - at zoo - Clinical investigations	VFL	single	1	0	

2.11 RABIES

2.11.1 General evaluation of the national situation

A. Rabies general evaluation

History of the disease and/or infection in the country

Rabies was widely spread all over Estonia which area is 45 227 km². Estonia borders Latvia on the south and Russia on the east, the frequency of rabies infections is also high in these countries. Rabies in Estonia originates from wildlife and its main reservoir are red foxes and raccoon dogs.
Number of registered rabies cases in animals are available from 1950.
There was an urban rabies period in 1950 - 1959, when rabies was diagnosed mainly in domestic animals. Therefore, compulsory vaccination program of dogs and cats got started in 1953. In 1962 - 1967 there was rabies-free period. From 1968 up to the present time
salivatic rabies cases are diagnosed in wild and domestic animals in Estonia. The structure of rabies infections across species has been relatively stable across the years.
The oral vaccination programme started in 2004. Since that time the number of infections of farm animals has significantly decreased in bovines from 15 cases registered in 2004 and 19 cases in 2005 to no cases of infection registered in 2008.
In the dogs and cats category, the occurrence of rabies has a tendency to decrease: from 20 cases registered in 2004 to 0 cases in 2007 and 1 case in 2008. Rabies cases in dogs decreased significantly. This may be due to the improved awareness of pet owners, who vaccinate their cats alongside dogs.
Wild animals: there was registered only 1 case in red fox in 2008.
Although the last mortal case of rabies in humans was registered in Estonia more than 20 years ago, rabies is still an important zoonotic disease in Estonia. The number of animal attacks of humans increased continuously over the years 1999 - 2003 with the peak in the year 2003 (4436). After the year 2003 there is noted a decrease in the number of attacks: in 2004 - 3763, 2005 - 3334, 2006 - 2948, 2007 - 2588, 2008 - 2485.

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

During the years 2001-2003 the number of rabies cases among animals has grown very quickly, being 167 in 2001, 422 in 2002 and in year 2003 the numbers made a sad record - 814 rabies cases were diagnosed. The decrease in number of cases has been noted since the year 2004 - 314 cases, 266 in the year 2005, 114 cases in 2006, 4 cases in 2007.
In the year 2008 only 3 rabies cases were registered. 1 case was registered in wild, 1 in farmed animals and 1 in pet.

Rabies was widely distributed in all counties in Estonia, even in the islands Hiiumaa and Saaremaa. Thus the oral vaccination program of wildlife has been performed in 2004 for the first time on the small island named Vormsi (about 100 square km). Vaccination was performed 2 times a year.
After that in Autumn 2005 the oral vaccination programme in the frames of Transition Facility program started. Bait drop area covered 25 540 km² of Northern part of Estonia. Since the year 2006 the oral vaccination is performed on the whole territory of the country 2 times per year (in spring and autumn). Vaccine baits are distributed by aircraft. The vaccination will be followed until no cases of rabies are registered in the country. The analyzes show that 90 % of vaccine had been eaten by the animals in 2008 (82 % in 2007; 85 % in 2006; 74 % in 2005).
The rabies-positive brain samples obtained from rabid animals were genotyped. These samples were tested in AFSSA Nancy. Obtained results show, that no vaccine-induced rabies case have occurred in Estonia during oral vaccination campaigns with SAG2 vaccine. All positive animals were infected with wild rabies strains present in Estonia. All positive isolates belonged to the lineage formed by the classical rabies virus (genotype 1) with the bootstrap value 100%.
Due to good medical aid in the case of injury and free post-exposure immunoprofilaxis for people, which is a part of the National Immunisation Programme financed from the state budget, there were no reported cases of rabies among people. But there is still a high risk of humans being attacked by infected animals. As a result of oral vaccination the number of animal attacks is significantly decreasing.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

The risk of contracting rabies in Estonia is not so high, as it was some years ago, due to the vaccination programme of wild animals and mandatory vaccination of cats and dogs in the country.
There are still a lot of human cases of injury from animals every year.
No transmission of rabies to humans has been recorded. People being in contact with wild animals in Estonia should be aware of the risk.

Recent actions taken to control the zoonoses

The oral vaccination program of wildlife in the frames of Transition Facility program started in Autumn 2005 (10.10.2005- 3.11.2005), when the Northern part of the country was covered.
Since the year 2006 the oral vaccination of wildlife is performed on the whole territory of the country twice per year (in spring and autumn).
The investigations show a significant decrease in number of positive cases among animals and in number of attacks of humans by animals.
The vaccination will be carried out until no positive cases are present in Estonia.

Additional information

The investigations show a significant decrease in number of positive rabies cases among animals and in number of attacks of humans by animals due to the oral vaccination of wild animals on the whole territory of the country.
The oral vaccination of wildlife (started in 2005) shows a significant decrease in number of positive cases registered in animals:
2003 - 814
2004 - 314
2005 - 266
2006 - 114
2007 - 4
2008 - 3 cases.

2.11.2 Rabies in humans

2.11.3 Lyssavirus (rabies) in animals

A. Rabies in dogs

Monitoring system

Sampling strategy

Rabies is diagnosed on the basis of clinical symptoms and in the laboratory by determination of the virus antigens from tactile preparations made from brain tissue by immunofluorescence method or by the isolation of the virus from brain tissues of an infected animal in cell cultures or test animals.
After receiving the information about an animal with the suspicion to be infected with rabies or an animal who has been bitten by animal with rabies suspicion or in unknown state of health, the authorized veterinarian, who services the region, is obliged to check as soon as possible the state of the animal and to take necessary measures to prevent the spread of infection.

Frequency of the sampling

Each animal with rabies suspicion should be examined.

Type of specimen taken

Organs/tissues: brain

Methods of sampling (description of sampling techniques)

The brain of the animal or its head (in case of small animals the whole carcass) is sent to the laboratory for analysis.
If the brain is damaged, the cervical vertebrae together with the spinal cord have to be sent for analysis.

Case definition

Clinical diagnosis with laboratory confirmation.
Laboratory criteria for diagnosis:
- detection by direct fluorescent antibody of viral antigens in the brain, if FAT test result is suspicious or negative:
- isolation (inoculation in cell culture or in a laboratory animal) of rabies virus from brain tissue, and
- detection of rabies nucleic acid in brain tissue (heminested PCR)

Diagnostic/analytical methods used

Fluorescent Antibody Test (FAT) on smears from hippocampus or medulla oblongata

Vaccination policy

Vaccination of cats and dogs:
The animal keeper has to guarantee that his or her cats and dogs are vaccinated.

The first vaccination of dogs and cats takes place when the animal is 3 months old and the second vaccination - at the age of 12 months. Further on, the animal is vaccinated once a year.
At least 30 days has to pass from the vaccination of a hunting dog before it is taken to the forest or placed into the circumstances where it can meet a wild animal.
Animals are vaccinated by the veterinary supervisory officials, authorized veterinarians or licensed veterinarians.
The veterinarian keeps record of the vaccinations against rabies and reports to the Veterinary and Food Board according to the rules established by the Director General of the Veterinary and Food Board.
The veterinarian issues a certificate after animal vaccination at animal keeper request or makes an appropriate entrance on the animal registration document.
The animal keeper is obliged to present the vaccination certificate or the registration document with the appropriate entrance to the veterinary supervisory official or the authorized veterinarian at his or her request.
If the veterinarian finds out that a cat or a dog is not vaccinated or that more than 12 months have passed from its vaccination, the animal has to be vaccinated as soon as possible.
Vaccination of farm animals:
It is advisable to vaccinate farm animals, which graze in woodland pastures and in pastures that are surrounded by woodlands.
The Veterinary and Food Board have the right to carry out obligatory vaccination of the farm animals of endangered zones determined by the Board at the expense of resources provided for it.

Control program/mechanisms

The control program/strategies in place

According to the Regulation of Minister of Agriculture No 67 "Rules for Rabies Prevention" all animals with rabies suspicion or an animal who has been bitten by an animal with rabies suspicion or in unknown state of health, the authorized veterinarian, who services the region, is obliged to check the state of the animal as soon as possible. The sample should be taken and sent to the laboratory. Necessary measures to prevent the spread of infection should be provided.

Recent actions taken to control the zoonoses

Rabies in Estonia originates from wildlife and its main reservoir are red foxes and raccoon dogs. The oral vaccination programme of wildlife started in autumn 2005 in the frames of Transition Facility Programme, when bait drop area covered only the Northern part of Estonia. Since the year 2006 the whole country is covered by vaccination and the baits are distributed twice a year (in spring and autumn). Vaccination of wild animals will be performed until no cases of rabies are registered in Estonia.
The investigations show that the number of positive cases significantly decreased from 266 cases registered in 2005 to 3 cases registered in 2008.

Measures in case of the positive findings or single cases

If rabies is diagnosed in a cat or a dog on the basis of clinical symptoms or if the animal keeper cannot ensure safe isolation of the animal or the animal keeper cannot be identified, the veterinary supervisory official prescribes compulsory slaughter of the animal. The appropriate slaughter of the animal is arranged by the veterinary supervisory official.
If rabies is not confirmed within 14 days, the veterinary supervisory official or the authorized veterinarian can release the animal from isolation after animal`s examination and if necessary, its vaccination.
The cat or dog with rabies or rabies suspicion has to be slaughtered without damaging its head.
The veterinary supervisory official or the authorized veterinarian has to take samples from the slaughtered animal, also from the animal who has died during the isolation period and to send these samples to the laboratory.
After the sample for analysis has been taken the carcass of the animal has to be burnt.
If rabies is diagnosed in one animal of the herd the authorized veterinarian has to examine all other animals in the herd in order to find typical clinical symptoms of rabies or animals with traces of bites.
The veterinary supervisory official has to issue an order for compulsory slaughter of all animals sick with rabies.
After having taken samples, the carcass of the animal has to be burnt immediately or buried pursuant to the prescriptions of the veterinary supervisory official.
The animals with the suspicion of rabies have to be isolated for at least 14 days into an area surrounded by barriers or into a separate closed room pursuant to the orders of the veterinary supervisory official or the authorized veterinarian.
If the infection source is not known, the authorized veterinarian or the veterinary supervisory official can order to vaccinate the rest animals in the herd. The herd has to remain under the supervision of the local authority of the Veterinary and Food Board for at least 30 days. The animal keeper is obliged to notify the authorized veterinarian about all health disturbances of the animals.
Restrictions for the herd are established and abolished by the head of the local authority of the Veterinary and Food Board in a written form.
The following restrictions have to be established for the herd in which an animal has been diagnosed with rabies or rabies suspicion:
prohibition to transfer to another herd until the restrictions are abolished;
prohibition to kill the animal for using it as a food until restrictions are abolished;
prohibition to use raw milk and raw milk products for food and for sale until the restrictions are abolished.
Wild animals with suspicious behavior should be slaughtered pursuant to the orders of the veterinary supervisory official or the authorized veterinarian without damaging the animalâ€™s head and samples should be sent to the laboratory.

After samples have been taken the carcass of the wild animal has to be burnt or buried pursuant to the prescription of the veterinarian.

Notification system in place

Rabies is a notifiable disease since 1950 and since 2000 it is notifiable according to the Regulation of the Minister of Agriculture No 34 "List of Notifiable Diseases and Diseases subject to Registration".

Results of the investigation

During the year 2008 32 dog brain tissue samples have been tested for rabies. 1 sample was positive.

Investigations of the human contacts with positive cases

No data available.

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

Rabies in Estonia originates from wildlife and red foxes and raccoon dogs are its main reservoir. Thus the oral vaccination of wild animals started in the year 2005 and will be performed each year (in spring and autumn) until no cases of rabies are registered in Estonia.

The vaccination of dogs and cats is obligatory and free of charge in Estonia.

Relevance of the findings in animals to findings in foodstuffs and to human cases

The highest number of human cases of injury in the year 2008 was registered in Harjumaa (especially Tallinn city), Tartumaa and Ida-Virumaa counties. The same situation was in the year 2006 and 2007.
From year to year it is noticed a decrease in the number of dog bites. 1830 dog bites have been registered in the year 2008 (in 2007 - 1924, in 2006 - 2200 and in 2005 - 2407 bites).
In 2008 the animal attacks on humans were caused in majority by dogs (73,6 %), followed by cats (22,5 %) and rats (1,7 %) and mice (0,3 %).

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	Unspecified Lyssavirus	Classical rabies virus (genotype 1)	European Bat Lyssavirus - unspecified
Bats - wild - from hunting - Control and eradication programmes	VFB	animal	1	0			
Beavers - wild - from hunting - Control and eradication programmes	VFB	animal	2	0			
Cats - in total - Control and eradication programmes	VFB	animal	67	0			
Cattle (bovine animals) - at farm - Control and eradication programmes	VFB	animal	24	0			
Deer - wild - roe deer - at farm - Control and eradication programmes	VFB	animal	1	0			
Dogs - in total - Control and eradication programmes	VFB	animal	32	1		1	
Ferrets - wild - from hunting - Control and eradication programmes	VFB	animal	3	0			
Foxes - wild - from hunting - Control and eradication programmes	VFB	animal	80	1		1	
Goats - at farm - Control and eradication programmes	VFB	animal	1	0			
Lynx - wild - from hunting - Control and eradication programmes	VFB	animal	2	0			
Marten - wild - from hunting - Control and eradication programmes	VFB	animal	9	0			
Raccoon dogs - wild - from hunting - Control and eradication programmes	VFB	animal	66	0			
Sheep - at farm - Control and eradication programmes	VFB	animal	12	1		1	
Solipeds, domestic - at farm - Control and eradication programmes	VFB	animal	1	0			

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	Unspecified Lyssavirus	Classical rabies virus (genotype 1)	European Bat Lyssavirus - unspecified
Squirrels - wild - from hunting - Control and eradication programmes	VFB	animal	4	0			
Weasel - from hunting - Control and eradication programmes	VFB	animal	1	0			
Wild boars - wild - from hunting - Control and eradication programmes	VFB	animal	2	0			

2.12 Q-FEVER

2.12.1 General evaluation of the national situation

2.12.2 Coxiella (Q-fever) in animals

A. Coxiella spp., unspecified in animal

Notification system in place

Disease is not notifiable according to Estonian legislation.

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

Q-fever in animals is not monitored in Estonia. This disease was not ever diagnosed in the country.

2.13 CYSTICERCOSIS, TAENIOSIS

2.13.1 General evaluation of the national situation

2.13.2 Cysticerci in animals

A. Cysticerci spp., unspecified in animal

Monitoring system

Sampling strategy

All slaughtered animals are examined visually at post-mortem inspection.

Frequency of the sampling

All slaughtered animals intended for human consumption are examined routinely at slaughterhouses.

Type of specimen taken

Other: liver, carcass

Methods of sampling (description of sampling techniques)

Macroscopic examination of carcasses is routinely done at post-mortem inspection at the slaughterhouse.

Case definition

A sample (liver) or carcass, where Cysticercus was detected.

Diagnostic/analytical methods used

Visual examination, microscopy

Measures in case of the positive findings or single cases

In case of detecting of Cysticerci the animal carcass or organs are declared as unfit for human consumption.

Notification system in place

Cysticerci detection in food and in animals is notifiable since 2000 according to the Infectious Animal Disease Control Act and the Ministry of Agriculture Regulation No 34 "List of Notifiable Diseases and Diseases subject to Registration".
Laboratories investigating the safety and quality of the products on enterprises which handle food of animal origin are required to notify the Veterinary and Food Board about the isolation of pathogens which may cause infectious animal diseases subject to notification or registration or about suspicion of the occurrence of such pathogens in raw food material or products. In addition, such laboratories are obliged to notify the Health Protection Inspectorate about isolation of zoonotic agents.
Local Veterinary centres notify the local offices of the Health Protection

Inspectorate about isolation of zoonotic agents in food and animals.

Results of the investigation

Cysticercus tenuicollis was found in 0,2 % of samples taken from sheep and in 0,05 % of samples taken from wild boar. All cases were laboratory confirmed.

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

Cysticercosis is very rare disease in animals in Estonia.

Table Cysticerci in animal

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Cysticerci	Cysticerci spp., unspecified
Cattle (bovine animals) - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal		48075	0	
Pigs - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal		474859	0	
Sheep - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal		5750	13	13
Wild boars - at slaughterhouse - Surveillance - official controls (at post mortem inspection)	VFB	animal		2109	1	1

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1 ENTEROCOCCUS, NON-PATHOGENIC

3.1.1 General evaluation of the national situation

3.1.2 Antimicrobial resistance in Enterococcus, non-pathogenic isolates

A. Antimicrobial resistance of Enterococcus spp., unspecified in animal

Sampling strategy used in monitoring

Frequency of the sampling

The Enterococcus isolates are collected from the samples that are coming routinely to the laboratory in the frames of State Programme on Monitoring and Surveillance of Animal Diseases. Samples are taken from the clinically healthy animals.

Methods of sampling (description of sampling techniques)

There is no Enterococcus monitoring programme in animals in the frames of the official control. Analyzes are performed in the frames of the project on Monitoring of Antimicrobial Resistance of Zoonotic Agents detected in Animals funded by the Ministry of Agriculture. Project leaders are from the Estonian University of Life Sciences. Analyzes are performed by the Veterinary and Food Laboratory.
There is no special programme for faeces sampling for this project. The Enterococcus isolates are collected from the samples that are coming routinely to the laboratory in the frames of State Programme on Monitoring and Surveillance of Animal Diseases. Samples are taken from the clinically healthy animals.

Methods used for collecting data

There is no special programme for faeces sampling for this project. The Enterococcus isolates are collected from the samples that are coming routinely to the laboratory in the frames of State Programme on Monitoring and Surveillance of Animal Diseases. Samples are taken from the clinically healthy animals.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Ampicillin, erythromycin, virginiamycin, gentamicin, streptomycin, kanamycin, tetracyclin, chloramphenicol, vancomycin, narasin, bacitracin, linezolid according to the Report from the Task Force on Zoonoses Data Collection including guidance for harmonized monitoring and reporting of antimicrobial resistance in commensal Escherichia coli and Enterococcus spp. from food animals. The EFSA Journal (2008) 141: 1-44.

Breakpoints used in testing

According to the Report from the Task Force on Zoonoses Data Collection including guidance for harmonized monitoring and reporting of antimicrobial resistance in commensal Escherichia coli and Enterococcus spp. from food animals. The EFSA Journal (2008) 141: 1-44.

Results of the investigation

In 2008 there were analyzed 4 E.faecalis derived from pigs samples, 5 E.faecalis derived from cattle samples, 7 E.faecium derived from cattle sample and 9 E.faecium derived from pigs samples.
8 isolates (32 %) from 25 isolates tested were fully sensitive (in 2007 - 36 %).
7 isolates (28 %) were resistant to 1 antimicrobial,
2 isolates (8 %) were resistant to 2 antimicrobials,
1 isolate (4 %) was resistant to 3 antimicrobials, to 4, to 6 and to 7 antimicrobials,
4 isolates (16 %) were resistant to 5 antimicrobials.
Isolates were resistant to erythromycin (44 %), tetracyclin (44 %), streptomycin (32 %), kanamycin (28 %), narazin (16 %), chloramphenicol (12 %), vancomycin (8 %), bacitracin (8 %), virginiamycin (4 %), gentamicin (4 %), linezolid (4 %).

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

In 2008 the number of multiresistant isolates increased. At the same time increased the number of isolates resistant to erythromycin, tetracyclin, kanamycin, narazin, chloramphenicol, gentamicin, linezolid.

Table Antimicrobial susceptibility testing of E. faecium in Cattle (bovine animals) - quantitative data [Dilution method]

E. faecium		Cattle (bovine animals)																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		7																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	7	0											5	2									
	Kanamycin	1024	7	0														1	1	4	1					
	Streptomycin	*128*	7	1														5	1			1				
Amphenicols	Chloramphenicol	32	7	0										2	4	1										
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	32	7	1											1	4	1	1								
	Vancomycin	4	7	2								5			2											
Ionophores	Narasin	2	7	2						2	1	2		2												
Macrolides	Erythromycin	4	7	3							2		1	1	2		1									
Oxazolidines	Linezolid	4	7	0									3	4												
Penicillins	Ampicillin	4	7	0							2	1	3	1												
Streptogramins	Virginiamycin	*4*	7	1									2	4	1											
Tetracyclines	Tetracyclines	2	7	1							3	2	1					1								

Table Antimicrobial susceptibility testing of E. faecium in Pigs - quantitative data [Dilution method]

E. faecium		Pigs																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		9																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	9	0											6	3									
	Kanamycin	1024	9	3															2	4			3			
	Streptomycin	*128*	9	3													1	5				3				
Amphenicols	Chloramphenicol	32	9	0										1	6	2									
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	32	9	1								1			1	1	5		1						
	Vancomycin	4	9	0								7	2												
Ionophores	Narasin	2	9	2							2	5		2											
Macrolides	Erythromycin	4	9	4							2		1	2	3			1							
Oxazolidines	Linezolid	4	9	1									1	7		1									
Penicillins	Ampicillin	4	9	0								2	3	4											
Streptogramins	Virginiamycin	*4*	9	0									3	6											
Tetracyclines	Tetracyclines	2	9	4								5					1	3							

Table Antimicrobial susceptibility testing of E. faecium - qualitative data

E. faecium		Cattle (bovine animals)		Pigs	
Isolates out of a monitoring program (yes/no)		no		no	
Number of isolates available in the laboratory		7		9	
Antimicrobials:		N	n	N	n
Aminoglycosides	Gentamicin	7	0	9	0
	Kanamycin	7	0	9	3
	Streptomycin	7	1	9	3
Amphenicols	Chloramphenicol	7	0	9	0
Fully sensitive	Fully sensitive	7	3	9	2
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	7	1	9	1
	Vancomycin	7	2	9	0
Ionophores	Narasin	7	2	9	2
Macrolides	Erythromycin	7	3	9	4
Oxazolidines	Linezolid	7	0	9	1
Penicillins	Ampicillin	7	0	9	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	7	2	9	3
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	7	1	9	1
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	7	0	9	1
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	7	0	9	1
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	7	1	9	1
Streptogramins	Virginiamycin	7	1	9	0
Tetracyclines	Tetracyclines	7	1	9	4

Table Antimicrobial susceptibility testing of E. faecalis - qualitative data

E. faecalis		Cattle (bovine animals)		Pigs	
Isolates out of a monitoring program (yes/no)		no		no	
Number of isolates available in the laboratory		5		4	
Antimicrobials:		N	n	N	n
Aminoglycosides	Gentamicin	5	1	4	0
	Kanamycin	5	2	4	2
	Streptomycin	5	2	4	2
Amphenicols	Chloramphenicol	5	1	4	2
Fully sensitive	Fully sensitive	5	3	4	0
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	5	0	4	0
	Vancomycin	5	0	4	0
Ionophores	Narasin	5	0	4	0
Macrolides	Erythromycin	5	2	4	2
Oxazolidines	Linezolid	5	0	4	0
Penicillins	Ampicillin	5	0	4	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	5	0	4	2
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	5	2	4	2
Streptogramins	Virginiamycin	5	0	4	0
Tetracyclines	Tetracyclines	5	2	4	4

Table Antimicrobial susceptibility testing of E. faecalis in Pigs - quantitative data [Dilution method]

E. faecalis		Pigs																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		4																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	4	0											1	3									
	Kanamycin	1024	4	2														2					2			
	Streptomycin	512	4	2														2				2				
Amphenicols	Chloramphenicol	32	4	2											2			2								
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	32	4	0											2	2										
	Vancomycin	4	4	0								2	2													
Ionophores	Narasin	2	4	0						2	1		1													
Macrolides	Erythromycin	4	4	2							1	1						2								
Oxazolidines	Linezolid	4	4	0									4													
Penicillins	Ampicillin	4	4	0								4														
Streptogramins	Virginiamycin	32	4	0									1			2	1									
Tetracyclines	Tetracyclines	2	4	4													1	3								

Table Antimicrobial susceptibility testing of E. faecalis in Cattle (bovine animals) - quantitative data [Dilution method]

E. faecalis		Cattle (bovine animals)																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		5																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	5	1											2	2				1						
	Kanamycin	1024	5	2														3					2			
	Streptomycin	512	5	2															3			2				
Amphenicols	Chloramphenicol	32	5	1											4			1								
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	32	5	0										1	1	3										
	Vancomycin	4	5	0									4	1												
Ionophores	Narasin	2	5	0						1	4															
Macrolides	Erythromycin	4	5	2							1		1	1				2								
Oxazolidines	Linezolid	4	5	0								1	4													
Penicillins	Ampicillin	4	5	0								4	1													
Streptogramins	Virginiamycin	32	5	0												4	1									
Tetracyclines	Tetracyclines	2	5	2								3						2								

Table Breakpoints for antibiotic resistance of Enterococcus, non-pathogenic

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
ISO_20776-1:2006

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**				32	2	256				
	Kanamycin				1024	16	2048				
	Streptomycin				512	8	1024				
Amphenicols	**Chloramphenicol**				32	0.5	64				
Glycopeptides (Cyclic peptides, Polypeptides)	**Bacitracin**				32	1	128				
	Vancomycin				4	1	128				
Ionophores	**Narasin**				2	0.12	4				
Macrolides	**Erythromycin**				4	0.5	64				
Oxazolidines	**Linezolid**				4	0.5	16				
Penicillins	**Ampicillin**				4	0.25	32				
Streptogramins	**Virginiamycin**				32	0.5	64				
Tetracyclines	**Tetracyclines**				2	0.5	64				

Footnote:

Standard for breakpoints used:
EUCAST, SVARM 2007 evaluation (Swedish Veterinary Antimicrobial Resistance Monitoring ISSN 1650-6332 Uppsala. www.sva.se) and Report from the Task Force on Zoonoses Data Collection including guidance for harmonized monitoring and reporting of antimicrobial resistance in commensial E.coli and Enterococcus spp. from food animals (The EFSA journal (2008)141:1-44).

3.2 ESCHERICHIA COLI, NON-PATHOGENIC

3.2.1 General evaluation of the national situation

A. Escherichia coli general evaluation

History of the disease and/or infection in the country

Notification of human E.coli started in 1970. The peak incidence (1464) of cases has been detected in 1976. After that there is noted a decline in the number of cases.
There is no E.coli monitoring programme in animals in the frames of the official control. Analyzes are performed in the frames of the project on Monitoring of Antimicrobial Resistance of Zoonotic Agents detected in Animals funded by the Ministry of Agriculture.

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

Since 2001 the investigations of E.coli antimicrobial resistance are performed in the frames of the project on Monitoring of Antimicrobial Resistance of Zoonotic Agents detected in Animals and funded by the Ministry of Agriculture. Project leaders are from the Estonian University of Life Sciences. Analyzes are performed by the Veterinary and Food Laboratory.
There is no special programme for sampling of faeces for this project. The E.coli isolates are collected from the samples that are coming routinely to the laboratory in the frames of State Programme on Monitoring and Surveillance of Animal Diseases. Samples are taken from the clinically healthy animals.
In 2008 20 E.coli isolates derived from pigs and cattle were analyzed: 10 from pigs and 10 from cattle.
All E.coli strains isolated from cattle were fully sensitive (in 2005 - 78 %; in 2006 - 43 %; in 2007 - 16 %).
5 isolates derived from pigs (50 %) were fully sensitive (in 2005 - 55 %; in 2006 - 27 %; in 2007 - 5,3 %),
2 strains were resistant to 1 antimicrobial (in 2005 - 23 %; in 2006 - 36 %, in 2007 - 37 %),
1 strain was resistant to 3 antimicrobials,
1 strain was resistant to 4 antimicrobials,
1 strain was resistant to 5 antimicrobials.
The number of fully sensitive isolates is continuously increasing from year to year.
Resistance to ciprofloxacin decreased significantly: from 73 % in 2007 to 0 % in 2008.
Isolates derived from pigs in 2008 were resistant to ampicillin (20 %), streptomycin (40 %), tetracyclin (30 %), kanamycin (10 %), sulfamethoxazol (20 %) and trimethoprim (20 %).

3.2.2 Antimicrobial resistance in Escherichia coli, non-pathogenic

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals) - quantitative data [Dilution method]

E. coli		Cattle (bovine animals)																								
Isolates out of a monitoring program (yes/no)		no																								
Number of isolates available in the laboratory		10																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	10	0								10														
	Kanamycin	8	10	0									2	7	1											
	Neomycin		0	0																						
	Streptomycin	16	10	0										6	3	1										
Amphenicols	Chloramphenicol	16	10	0										5	5											
	Florfenicol	16	10	0									2	7	1											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.25	10	0				5	5																	
	Ceftiofur	1	10	0						6	4															
Fluoroquinolones	Ciprofloxacin	0.06	10	0		2	7	1																		
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	8	10	0									4	6												
Quinolones	Nalidixic acid	16	10	0									3	7												
Sulfonamides	Sulfamethoxazol	256	10	0												3	6	1								
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	10	0								3	7													
Trimethoprim	Trimethoprim	2	10	0						1	8	1														
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of E. coli in Pigs - quantitative data [Dilution method]

E. coli		Pigs																							
Isolates out of a monitoring program (yes/no)		no																							
Number of isolates available in the laboratory		10																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	10	0								8	2												
	Kanamycin	8	10	1										7	2	1									
	Neomycin		0	0																					
	Streptomycin	16	10	4										1	4	1	1	2	1						
Amphenicols	Chloramphenicol	16	10	0										4	4	2									
	Florfenicol	16	10	0											7	3									
Cephalosporins	3rd generation cephalosporins		0	0																					
	Cefotaxim	0.25	10	0				2	8																
	Ceftiofur	1	10	0						2	8														
Fluoroquinolones	Ciprofloxacin	0.06	10	0		1	9																		
	Enrofloxacin		0	0																					
Penicillins	Ampicillin	8	10	2									6	2			2								
Quinolones	Nalidixic acid	16	10	0									4	6											
Sulfonamides	Sulfamethoxazol	256	10	2												1	2	3		2			2		
	Sulfonamide		0	0																					
Tetracyclines	Tetracyclin	8	10	3									6	1			1	2							
Trimethoprim	Trimethoprim	2	10	2						2	5	1					2								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																					

Table Antimicrobial susceptibility testing of E. coli in animals

E. coli		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys	
Isolates out of a monitoring program (yes/no)		no		no					
Number of isolates available in the laboratory		10		10					
Antimicrobials:		N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	10	0	10	0				
	Kanamycin	10	0	10	1				
	Streptomycin	10	0	10	4				
Amphenicols	Chloramphenicol	10	0	10	0				
	Florfenicol	10	0	10	0				
Cephalosporins	Cefotaxim	10	0	10	0				
	Ceftiofur	10	0	10	0				
Fluoroquinolones	Ciprofloxacin	10	0	10	0				
Fully sensitive	Fully sensitive	10	10	10	5				
Penicillins	Ampicillin	10	0	10	2				
Quinolones	Nalidixic acid	10	0	10	0				
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	10	0	10	2				
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	10	0	10	0				
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	10	0	10	1				
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	10	0	10	1				
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	10	0	10	1				
Sulfonamides	Sulfamethoxazol	10	0	10	2				
Tetracyclines	Tetracyclin	10	0	10	3				
Trimethoprim	Trimethoprim	10	0	10	2				

Table Breakpoints used for antimicrobial susceptibility testing

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
ISO_20776-1:2006

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**				2	0.5	64				
	Kanamycin				8	16	2048				
	Streptomycin				16	2	256				
Amphenicols	**Chloramphenicol**				16	0.5	64				
	Florfenicol				16	2	32				
Cephalosporins	**Cefotaxim**				0.25	0.06	2				
	Ceftiofur				1	0.12	16				
Fluoroquinolones	**Ciprofloxacin**				0.06	0.008	1				
Penicillins	**Ampicillin**				8	0.25	32				
Quinolones	**Nalidixic acid**				16	1	128				
Sulfonamides	**Sulfamethoxazol**				256	16	2048				
Tetracyclines	**Tetracyclin**				8	0.5	64				
Trimethoprim	**Trimethoprim**				2	0.25	32				

Table Breakpoints used for antimicrobial susceptibility testing

Footnote:

Standard for breakpoints used:
EUCAST, SVARM 2007 evaluation (Swedish Veterinary Antimicrobial Resistance Monitoring ISSN 1650-6332 Uppsala. www.sva.se) and Report from the Task Force on Zoonoses Data Collection including guidance for harmonized monitoring and reporting of antimicrobial resistance in commensial E.coli and Enterococcus spp. from food animals (The EFSA journal (2008)141:1-44).

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1 HISTAMINE

4.1.1 General evaluation of the national situation

A. Histamine General evaluation

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

The situation is quite favorable, but the number of samples taken is not sufficient for making any conclusion.
No positive samples were detected during last 3 years.

4.1.2 Histamine in foodstuffs

A. Histamine in foodstuffs

Monitoring system

Sampling strategy

Samples are taken in the frames of import control. Sampling was performed by the officials of the Veterinary and Food Board.

Frequency of the sampling

Sampling distributed evenly throughout the year.

Type of specimen taken

Other: fishery products

Methods of sampling (description of sampling techniques)

Sampling is performed randomly, sample weight analysed is 5 g.

Definition of positive finding

According to the Regulation 2073/2005.

Diagnostic/analytical methods used

HPLC

Measures in case of the positive findings or single cases

The batch should be removed from the market.

Results of the investigation

In 2008 no unsatisfactory samples were detected.

Table Histamine in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units in non-conformity	<= 100 mg/kg	>100 - <= 200 mg/kg	>200 - <= 400 mg/kg	> 400 mg/kg
Fish - Fishery products which have undergone enzyme maturation treatment in brine - in total - Surveillance - official controls (import control)	VFB	batch	5 g	4	0	4	0	0	0

4.2 ENTEROBACTER SAKAZAKII

4.2.1 General evaluation of the national situation

A. Enterobacter sakazakii general evaluation

History of the disease and/or infection in the country

The situation seems to be stable.
There are no human cases registered during years.

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

It is very hard to make any conclusion, as the number of samples analyzed is very small. In 2008 1 batch, in 2007 3 batches and in 2006 2 batches were analyzed.
No positive samples were detected in 2007 and 2008. In 2006 one batch was found to be positive for E.sakazakii.

4.2.2 Enterobacter sakazakii in foodstuffs

A. Enterobacter sakazakii in foodstuffs

Monitoring system

Sampling strategy

Samples are taken randomly at processing plant.

Frequency of the sampling

Sampling distributed evenly throughout the year.

Type of specimen taken

Other: dried infant formulae

Methods of sampling (description of sampling techniques)

According to the Regulation 2073/2005 30 sub-samples are taken from the batch and analyzed separately. Sample weight analyzed is 10 g.

Definition of positive finding

The sample is considered to be positive, if in any of 30 subsamples Enterobacter sakazakii is isolated.

Diagnostic/analytical methods used

Bacteriological method: ISO 22964.

Preventive measures in place

When possible, the batch is supposed for recycling.
The batch should be removed from the market.

Results of the investigation

1 batch was analyzed in the year 2008 with negative result.

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

No positive batches were detected in 2007 and 2008.

Table Enterobacter sakazakii in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Enterobacter sakazakii	E. sakazakii
Infant formula - dried - at processing plant - domestic production - Surveillance - official controls (sample consists of 30 sub-samples) [1)]	VFB	batch	10 g	1	0	

Comments:

[1)] sample consists of 30 sub-samples

4.3 STAPHYLOCOCCAL ENTEROTOXINS

4.3.1 General evaluation of the national situation

A. Staphylococcal enterotoxins general evaluation

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

There were no samples detected with the values of coagulase-positive staphylococci >100000 cfu/g during last 3 years. Thus staphylococcal enterotoxins were not analyzed.

4.3.2 Staphylococcal enterotoxins in foodstuffs

A. Staphylococcal enterotoxins in foodstuffs

Monitoring system

Sampling strategy

Analyzes of cheeses, milk powder and whey powder are performed, as referred to in the coagulase-positive staphylococci criteria in Chapter 2.2 of the Annex I of the Commission Regulation (EC) No 1441/2007 amending Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs. If values of coagulase-positive staphylococci > 10(5) cfu/g are detected, the batch has to be tested for staphylococcal enterotoxins.

Methods of sampling (description of sampling techniques)

If values of coagulase-positive staphylococci > 10(5) cfu/g are detected, the batch has to be tested for staphylococcal enterotoxins.

Definition of positive finding

According to the Commission Regulation 2073/2005.

Results of the investigation

No values of coagulase-positive staphylococci > 10(5) cfu/g were detected in foodstuffs in the year 2008, so no analyzes for staphylococcal enterotoxins were performed.

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

No analyzes for staphylococcal enterotoxins were performed during last 2 years.

5. FOODBORNE

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.

A. Foodborne outbreaks

System in place for identification, epidemological investigations and reporting of

Outbreak investigations, an important and challenging component of epidemiology and public health, can help to identify the source of ongoing outbreaks and prevent additional cases.
Foodborne infections are registered in Estonia in the same way as infectious diseases (priority list).
There is reporting system in place, where clinicians, mainly family physicians reporting cases of foodborne outbreaks to the local Public Health Service.
The local Public Health Service is responsible for the investigation of foodborne disease outbreaks. Investigation procedures include epidemiological investigations, food sampling, diagnostic laboratory assays.
Under the regulation of Ministry of Social Affairs No 99 (in force since 15.06.2003) local offices of the HPI provide obligatory information to the Veterinary and Food local Services (VFB) about all cases of zoonoses diagnosed in humans (standard form).
Obligatory reported zoonoses:
Brucellosis,
Echinococcosis,
Campylobacter enteritis,
Cryptosporodiosis,
Leptospirosis,
Rabies,
Salmonellosis,
Antrax,
Trichinellosis,
Tuberculosis (Mycobasterium bovis),
Tularemia.
The HPI and VFB share monitoring data on zoonoses at the local level on a monthly basis, but there is a daily/immediate contact if needed and a system for dealing with outbreaks.

Description of the types of outbreaks covered by the reporting:

Definition of outbreaks:
Outbreak - an incident in which 2 or more persons experience a similar illness after ingestion of the same food, or after ingestion of water from the same source, and where epidemiological evidence implicates the food or water as the source of the illness.
Household outbreak - an outbreak affecting 2 or more persons in the same private household not apparently connected with any other case or outbreak.

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

There is mentioned an increase tendency in the number of outbreaks. Especially

in the last year the number of outbreaks increased twice:

Year	Number of foodborne outbreaks	Number of human cases involved
2000	10	224
2001	6	105
2002	5	127
2003	0	0
2004	7	25
2005	20	115
2006	27	173
2007	28	92
2008	51	111

In 2000-2003 only general outbreaks were reported (with 10 or more cases), since 2004 general outbreaks and family clusters with 2 or more cases are reported.

Evaluation of the severity and clinical picture of the human cases

Diarrhoeal diseases - diarrhoea, abdominal pain, vomiting, fever, anorexia, dehydration may be sever. Occasionally - complications in different body systems.

Descriptions of single outbreaks of special interest

The Estonian Health Protection Inspectorate (HPI) investigated
an outbreak of salmonellosis in a kindergarten in Harju County that took place in May 2008.
94 salmonellosis cases had been reported, including 85 children aged two to seven years and nine members of the personnel including one kitchen worker. Of the 94 cases, 71 (64 children and 7 staff members) were laboratory-confirmed for Salmonella enteritidis and 23 were shown to be epidemiologically linked. Salmonella enteritidis was identified in the frozen sample of one whole hen from Lithuania. The human and food isolates were sent for phage typing and genotyping to the National Public Health Institute in Finland. The results of the investigation showed that Salmonella eneteritidis strains isolated from humans and from chicken were identical.
The results of the cohort study indicated that the outbreak was food-borne and the probable vehicle of infection was the chicken soup served for lunch. Cross-contamination during food handling was also possible: ingredients of the soup with poultry meat could have been prepared and processed with contaminated utensils or had contact with contaminated working surfaces.

Control measures or other actions taken to improve the situation

Improvement of administrative supervision.
Searching for food handling errors.
Obligatory case report.

Concurrent disinfection.
Contact tracing and investigation of source of infection.
Collaboration and information exchange between Health Protection Inspectorate and Veterinary Food Board.
Information of public via mass media about current situation and preventive measures.

Foodborne Outbreaks: summarized data

	Total number of outbreaks	Outbreaks	Human cases	Hospitalized	Deaths	Number of verified outbreaks
Bacillus	0	0	0	0	0	0
Campylobacter	4	4	8	7	0	0
Clostridium	0	0	0	0	0	0
Escherichia coli, pathogenic	0	0	0	0	0	0
Foodborne viruses	0	0	0	0	0	0
Listeria	0	0	0	0	0	0
Other agents	0	0	0	0	0	0
Parasites	0	0	0	0	0	0
Salmonella	46	41	99	46	0	5
Staphylococcus	0	0	0	0	0	0
Unknown	1	1	4	3	0	0
Yersinia	0	0	0	0	0	0

Verified Foodborne Outbreaks: detailed data

S. Enteritidis

	Value
Code	1
Subagent Choice	Salmonella; S. Enteritidis
Outbreak type	General
Human cases	94
Hospitalized	5
Deaths	0
Foodstuff implicated	Broiler meat (Gallus gallus) and products thereof
More Foodstuff	
Type of evidence	Laboratory detection in implicated food, Analytical epidemiological evidence, Laboratory characterization of food and human isolates, Laboratory detection in human cases
Setting	School, kindergarten
Place of origin of problem	Other place of origin
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Cross-contamination
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	2
Subagent Choice	Salmonella; S. Enteritidis
Outbreak type	General
Human cases	22
Hospitalized	1
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	Analytical epidemiological evidence, Laboratory detection in human cases
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3
Subagent Choice	Salmonella; S. Enteritidis
Outbreak type	General
Human cases	7
Hospitalized	2
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	
Type of evidence	Laboratory detection in human cases, Analytical epidemiological evidence
Setting	Canteen or workplace catering
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	4
Subagent Choice	Salmonella; S. Enteritidis
Outbreak type	General
Human cases	6
Hospitalized	0
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	
Type of evidence	Analytical epidemiological evidence, Laboratory detection in human cases
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	5
Subagent Choice	Salmonella; S. Enteritidis
Outbreak type	General
Human cases	4
Hospitalized	3
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	
Type of evidence	Analytical epidemiological evidence, Laboratory detection in human cases
Setting	Residential institution (nursing home, prison, boarding school)
Place of origin of problem	Other place of origin
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	