ZOONOSES MONITORING

LATVIA

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 2006

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Latvia**
Reporting Year: **2006**

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/ 99/ EC[1]. 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 Latvia during the year 2006. 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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[1] 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:

Agricultural Data Centre (ADC)
ADC is a state agency under the supervision of the Ministry of Agriculture that performs collection, processing and analysis of zootechnical, veterinary and agricultural data in the republic of Latvia to develop a uniform register of animals and herds (cattle, pigs, sheep, goats etc.) and a pedigree information system according to international standarts.

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

Data on poultry - average population during the year
Data on cattle, pigs, horses, goats and sheep: 01.01. 2007.

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

Animals - cattle, pigs, sheep, goats, horses, rabbits, swamp beaver, fur animals, poultry, bee gardens, fishponds, hatcheries of aquatic animals, wild animals and birds, which are kept in a holding.
Herd - an agricultural animal or group of animals belonging to one owner.
Holding - shall mean separate confined area in which animals are kept regularly or temporary.
Poultry - shall mean fowl, turkeys, guinea fowl, ducks, geese, quails, pigeons, pheasants, partridges, ratites and etc. birds reared or kept in captivity for breeding, the production of meat
or eggs for consumption, or for re-stocking supplies of game.
Day-old chicks - poultry less than 72 hours old, not yet fed; except muscovy ducks (Cairina moschata) or their crosses may be fed and ratites (Ratitae) less than 5 days old, not yet fed.
Commercial poultry - poultry 72 hours old or more, reared for the production and sale for trade or to companies of meat and/ or eggs for consumption, or for restocking supplies of game.
Poultry flock - all poultry of the same health status kept on the same premises or in the same enclosure and constituting a single epidemiological unit. In housed poultry this will include all birds sharing the same airspace.

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

Animals and herds are distributed almost evenly over the whole territory of Latvia. Concerning poultry population, there are two districts, where the holdings with biggest numbers of birds are located: Riga district and Bauska district, both in the centre/ southern centre of Latvia.

Table Susceptible animal populations

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks	Year*	Number of holdings	Year*	Number of slaughtered animals	Year*	Livestock numbers (live animals)	Year*
Cattle (bovine animals)	in total	54724		54724		113443		401468	
Deer	farmed - in total	41		41					
Ducks	in total (1)	3		3				1110	
Gallus gallus (fowl)	broilers	76		3				1539229	
	breeding flocks for meat production line - in total	16		1				112875	
	laying hens	64		25				1627856	
	parent breeding flocks for egg production line	9		1				64060	
	parent breeding flocks for meat production line	16		1				112875	
	breeding flocks for egg production line - in total	9		1				64060	
	in total (2)	165		28		13331241		3344020	
Geese	in total (3)	2		2				620	
Goats	in total	2380		2380				10966	
Pigs	in total	3274		3274		493683		354739	
Sheep	in total (4)	3924		3924		6247		64280	
Solipeds, domestic	horses - in total	8011		8011		429		13370	
Turkeys	in total (5)	2		2				80	

(1): 1 mixed holding with ducks, geese and turkeys
1 mixed holding with laying hens, ducks, turkeys and pheasants
1 mixed holding with mainly ducks and few broilers
(2): Number of all slaughtered poultry (including ducks, turkeys, geese, hens and etc.)
(3): 1 holding with geese only
(4): Number of slaughtered sheeps and goats together
(5): 1 mixed holding with ducks, geese and turkeys
1 mixed holding with laying hens, ducks, turkeys and pheasants
1 mixed holding with mainly ducks and few broilers

Footnote

Data on commercial poultry population

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

The prevalence of Salmonella in animals and food of animal origin has been monitored over a long period of time. From 1967 until the end of 2002, 51836 Salmonella isolates were obtained from animal samples. Most isolates originated from poultry (57,6%) and from pigs (29,0%). In cattle and fur animals, Salmonella was isolated in lower numbers, 8,6% and 2,7%, respectively. Goats (0,05%), horses (0,01%) and other animals (2,0%) were also investigated.
The main serotypes found in poultry in the same period of time (1967-2003) were S. Gallinarum-pullorum (87,1%), S. Enteritidis (9,6% of isolates) and S. Typhimurium (2,8%). In pigs, besides S. Choleraesuis (94,0%), mainly S. Typhimurium was found (0,8%), while in cattle S. Enteritidis (57,9%) and S. Dublin (35,4%) were the most prominent serotypes. In fur animals, four different serotypes were isolated: S. Choleraesuis (29,9%), S. Dublin (23,5%), S. Enteritidis (22,5%) and S. Typhimurium (20,6%).

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

As there have been changes in the control programmes during the last years, and targeted sampling in food was established only recently (in 2004), it is not possible to perform any further evaluation of trends.
Results from the baseline study show that laboratory methods used for isolation of Salmonella in the national control programme should be revised.

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

S. Enteritidis is the most prevalent serotype isolated from poultry and also from poultry meat. Accordingly, also human cases of S. Enteritidis-caused illness prevail during the last 5 years. The increase in the number of human salmonellosis cases is predominantly reported during the summer months.

2.1.2. Salmonellosis in humans

2.1.3. Salmonella in foodstuffs

A. Salmonella spp. in eggs and egg products

Additional information

The National control programme does not include eggs and egg products, but there is a laboratory control programme in place to control the companies which are part of the food chain. Samples of eggs and egg products were taken in the scope of this programme.

B. Salmonella spp. in broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

Inspectors of the Food and Veterinary Service are taking the samples. One sample consists of 5 units. Every unit is packed and stored separately, and also laboratory testing is performed on each unit. For laboratory testing, 10g of each unit are taken for further investigations.

At meat processing plant

Inspectors of the Food and Veterinary Service are taking the samples. One sample consists of 5 units. Every unit is packed and stored separately, and also laboratory testing is performed on each unit. For laboratory testing, 10g of each unit are taken for further investigations.

At retail

Inspectors of the Food and Veterinary Service are taking the samples. One sample consists of 5 units. Every unit is packed and stored separately, and also laboratory testing is performed on each unit. For laboratory testing, 10g of each unit are taken for further investigations.

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

Fresh meat

At meat processing plant

Meat products: fresh meat and meat products

At retail

Meat preparations: meat products, fresh meat

Definition of positive finding

At slaughterhouse and cutting plant

None of the units is allowed to contain Salmonella spp. The sample is considered positive, if one or more of the units are positive.

At meat processing plant

None of the units is allowed to contain Salmonella spp. The sample is considered positive, if one or more of the units are positive.

At retail

None of the units is allowed to contain Salmonella spp. The sample is considered positive, if one or more of the units are positive.

Diagnostic/ analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: LVS EN ISO 6579:2003

At meat processing plant

Bacteriological method: LVS EN ISO 6579:2003

At retail

Bacteriological method: LVS EN ISO 6579:2003

Control program/ mechanisms

The control program/ strategies in place

National control programme on Salmonella, based on the Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council of 17 November 2003 on the control of salmonella and other specified foodborne zoonotic agents.

Measures in case of the positive findings or single cases

The inspector immediately has to perform an inspection at the slaughterhouse, processing plant or at the store. He decides what to do with the rest of the batch, if there are still products left, and collects all necessary documents to clarify the origin of the product. The inspector also decides on the actions that have to be taken in the company, like asking for HACCP system improvements etc. Disinfection has to be carried out at all places where the infected product had contact with.

C. Salmonella spp. in pig meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

Pig meat and products thereof are not sampled at slaughterhouses and cutting plants.

At meat processing plant

Inspectors of the Food and Veterinary Service are taking the samples. One sample consists of 5 units. Every unit is packed and stored separately, and also laboratory testing is performed on each unit. For laboratory testing, 25g of each unit (except fresh meat - 10g) are taken for further investigations.

At retail

Inspectors of the Food and Veterinary Service are taking the samples. One sample consists of 5 units. Every unit is packed and stored separately, and also laboratory testing is performed on each unit. For laboratory testing, 25g of each unit (except fresh meat - 10g) are taken for further investigations.

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

Fresh meat

At retail

Meat products: and fresh meat

Definition of positive finding

At meat processing plant

None of the units is allowed to contain Salmonella spp. The sample is considered positive, if one or more of the units are positive.

At retail

None of the units is allowed to contain Salmonella spp. The sample is considered positive, if one or more of the units are positive.

Diagnostic/ analytical methods used

At meat processing plant

Bacteriological method: LVS EN ISO 6579:2003

At retail

Bacteriological method: LVS EN ISO 6579:2003

Control program/ mechanisms

The control program/ strategies in place

National control programme on Salmonella, based on the Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council of 17 November 2003 on the control of salmonella and other specified foodborne zoonotic agents.

Measures in case of the positive findings or single cases

The inspector immediatly has to perform an inspection at the processing plant or at the store. He decides what to do with the rest of the batch, if there are still products left, and collects all necessary documents to clarify the origin of the product. The inspector also decides on the actions that have to be taken in the company, like asking for HACCP system improvements etc. Disinfection has to be carried out at all places where the infected product had contact with.

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Agona	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Meat from broilers (Gallus gallus)									
fresh		batch	10g	60	14		14		
- Surveillance - HACCP or own checks by industry		batch	25 g	78	0				
frozen									
- Surveillance - HACCP or own checks by industry		batch	25 g	9	1		1		
meat products									
raw but intended to be eaten cooked		batch	10g	76	5	1	4		
cooked, ready-to-eat		batch	10g	18	0				
- Surveillance - HACCP or own checks by industry		batch	25 g	11	1		1		
Meat from poultry, unspecified									
- Surveillance - HACCP or own checks by industry		batch	25 g	8	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
Milk, cows'								
raw	HACCP	batch	25 g	9	0			
Cheeses made from cows' milk								
soft and semi-soft	HACCP	batch	25 g	26	0			
Dairy products (excluding cheeses)								
butter								
made from pasteurised milk		batch	25g	5	0			
- Surveillance - HACCP or own checks by industry		batch	25 g	7	0			
cream								
- Surveillance - HACCP or own checks by industry		batch	25 g	17	0			
milk powder and whey powder	HACCP	batch	25 g	5	0			
ice-cream	HACCP	batch	25 g	12	0			
dairy products, not specified								
ready-to-eat								
made from pasteurised milk		batch	25g	12	0			
- Surveillance - HACCP or own checks by industry		batch	25 g	19	0			
yoghurt								
- Surveillance - HACCP or own checks by industry		batch	25 g	73	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. Virchow	S. Infantis	S. Derby	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Saintpaul
Meat from pig												
fresh		batch	10g	40	0							
- Surveillance - HACCP or own checks by industry		batch	25 g	117	16			1	15			
minced meat												
- Surveillance - HACCP or own checks by industry		batch	25 g	14	0							
meat products												
raw but intended to be eaten		batch	25g	8	0							
cooked, ready-to-eat		batch	25g	22	0							
unspecified, ready-to-eat												
- Surveillance - HACCP or own checks by industry		batch	25 g	26	0							
Meat from bovine animals												
fresh		batch	25g	5	1						1	

- Surveillance - HACCP or own checks by industry		batch	25 g	374	4			2		2		
minced meat												
intended to be eaten cooked		batch	25g	8	1	1						
Meat from turkey												
fresh												
chilled		batch	25g	2	2							4
Meat, mixed meat												
meat products												
cooked, ready-to-eat												
chilled		batch	25g	15	0							
meat preparation												
intended to be eaten cooked												
chilled		batch	25g	2	2		4					

Footnote

Regarding the rows "meat from turkey-fresh-chilled" and "meat, mixed meat-meat preparation intended to be eaten cooked-chilled", in the row "Total units positive for Salmonella spp." given "2" because 2 batches were tested, but in the rows "S. Saintpul" and "S. Infantis" given "4", because more than 1 isolate have been recovered from the different units of one sample (sample consist of 5 units. Every unit is packed and stored separately, and also laboratory testing is performed on each unit) from the same batch.

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Infantis	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Eggs									
- Surveillance - HACCP or own checks by industry		batch	25 g	16	0				
Egg products									
- Surveillance - HACCP or own checks by industry		batch	25 g	6	0				
Fruits and vegetables									
precut									
ready-to-eat	HACCP	batch	25 g	12	0				
Fish									
raw									
frozen		batch	25g	3	0				
smoked									
cold-smoked		batch	25g	3	0				
- Surveillance - HACCP or own checks by industry		batch	25 g	21	0				
Surimi									
frozen		batch	25g	2	0				
Fishery products, unspecified									
ready-to-eat									
chilled		batch	25g	7	0				
Vegetables									
products									
canned									
- Surveillance - HACCP or own checks by industry		batch	25 g	6	0				
Other products of animal origin									
gelatin and collagen									
- Surveillance - HACCP or own checks by industry		batch	25 g	5	0				
Mushrooms									

- Surveillance - HACCP or own checks by industry		batch	25 g	4	0				
Spices and herbs									
- Surveillance - HACCP or own checks by industry		batch	25 g	12	0				
Cereals and meals									
- Surveillance - HACCP or own checks by industry		batch	25 g	8	0				
Confectionery products and pastes									
- Surveillance - HACCP or own checks by industry		batch	25 g	23	0				
Fats and oils (excluding butter)									
oils									
- Surveillance - HACCP or own checks by industry		batch	25 g	3	0				
Beverages, non-alcoholic									
- Surveillance - HACCP or own checks by industry		batch	25 g	26	0				
Other food of non-animal origin									
- Surveillance - HACCP or own checks by industry		batch	25 g	18	0				
Other food									
- Surveillance - HACCP or own checks by industry		batch	25 g	477	11	1	9	1	

2.1.4. Salmonella in animals

A. Salmonella spp. in Gallus gallus - breeding flocks for egg production and flocks of laying hens

Monitoring system

Sampling strategy

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

Look at Salmonella spp. in animal

B. Salmonella spp. in Gallus gallus - breeding flocks for meat production and broiler flocks

Monitoring system

Sampling strategy

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

Look at Salmonella spp. in animal

C. Salmonella spp. in turkey - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

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

Look at Salmonella spp. in animal

D. Salmonella spp. in geese - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Breeding flocks

Look at Salmonella spp. in animal

E. Salmonella spp. in ducks - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Breeding flocks

Look at Salmonella spp. in animal

F. Salmonella spp. in pigs

Additional information

Salmonellosis in other animals than poultry is not surveyed. Table 1.2 shows results of investigations on request of the owner or veterinarian in case of clinical symptoms.

G. Salmonella spp. in bovine animals

Additional information

Salmonellosis in other animals than poultry is not surveyed. Table 1.2 shows results of investigations on request of the owner or veterinarian in case of clinical symptoms.

H. Salmonella spp. in animal

Monitoring system

Sampling strategy

Sampling of poultry flocks is carried out according to the Council Directive 90/ 539/ EEC and Council Directive 92/ 117/ EC:
I Monitoring and control for S.pullorum and S.gallinarum in poultry breeding flocks and poultry flocks for egg production.
All adult poultry breeding flocks must be sampled during laying phase: at least 10% of the flock.
All adult poultry flocks for egg production must be sampled during laying phase:
1-20 birds: 100%
20-100 birds: not less than 20 birds
1000 birds or more: 1%, but not less than 100 birds
At the hatchery, preventive samples should be taken before every hatching. Samples must be taken from the holdings before introduction of chickens.
II Monitoring and control for S.typhimurium and S.enteritidis in poultry breeding flocks .
1. All egg production and meat production line birds reared for breeding must be sampled:
(a)day–old chicks
- samples must be taken from the internal linings of boxes in which the chicks are delivered to a holding;
- samples from the carcasses of chicks found to be dead on arrival
(b)pullets at four weeks of age
- pooled faeces samples
(c)pullets two weeks prior to entering the laying phase

- pooled faeces samples
2.All adult breeding flocks must be sampled:
1)at least every two weeks
a)breeding flocks whose eggs are hatched at the hatchery with a total incubator capacity of less than 1000 eggs – pooled faeces sample
b)breeding flocks whose eggs are hatched at the hatchery with a total incubator capacity of 1000 eggs or more
- pooled samples of meconium taken from 250 chicks hatched from eggs supplied to the hatchery from one breeding flock
- samples of carcasses of 50 chicks which are dead in the shells of eggs or which have been hatched from eggs supplied to the hatchery from one breeding flock.
2)such samples must also be taken from breeding flocks comprising less than 250 birds whose eggs are hatched in hatcheries with total incubator capacity of 1000 eggs or more.
3)Every eight weeks, the sampling provided for in point 2. must be replaced by offical sampling.
III Monitoring and control for S.typhimurium and S.enteritidis in poultry flocks for egg production.
(a)day–old chicks
- samples must be taken from the internal linings of boxes in which the chiks delivered to a holding;
- samples from the carcasses of chicks found to be dead on arrival
(b)pullets two weeks prior to entering the laying phase
- pooled faeces samples
(c)must be sampled during laying phase - every 15 weeks and 4 weeks before leaving for slaughter - pooled faeces samples
VI Monitoring and control for S.typhimurium and S.enteritidis in broiler flocks.
(a)one week before leaving for slaughter - pooled faeces samples
All other animal herds are under the supervision of the state authorized veterinarians and are under the supervision of the regional offices of the Food and Veterinary Service. The Food and Veterinary Service (FVS) of the Republic of Latvia is a state administrative institution headed by the CVO and supervised by the Ministry of Agriculture. Regarding veterinary issues, FVS ensures unified state surveillance over prevention, control and eradication of animal contagious diseases and zoonoses, elaboration and implementaion of animal disease surveillance programmes. Every time when clinical symptoms give reasons to a suspicion on salmonellosis, individual samples of the animal must be taken and examined bacteriologically for salmonellosis.

Frequency of the sampling

Animals at farm

Other: According to the Council Directive 90/ 539/ EEC and Council Directive 92/ 117/ EC

Type of specimen taken

Animals at farm

Other: Faeces; blood; day old chicks; down or dust taken from the hatchers;swabs

taken from the walls of the hatchery; litter or water from a drinker.

Case definition

Animals at farm

A positive case is a unit (flock, herd or individual animal) confirmed positive for Salmonella. In general, the flock or herd is epidemiological unit.

Diagnostic/ analytical methods used

Animals at farm

Bacteriological method: EN ISO 6579:2002 Annex D

Vaccination policy

The preventative vaccination of poultry against S.pullorum and S.gallinarum is prohibited in Latvia, but preventative vaccination against zoonotic salmonellosis agents is permitted using inactivated vaccines.

Measures in case of the positive findings or single cases

As soon as a diagnosis has been officially approved, a State veterinary inspector shall specify the measures that are to be taken on the affected holding.
Measures to be taken in poultry house:
• place disinfectant mats at the entrance and exit of the house and other buildings;
• take samples (bedding, feedingstuffs, water, dust, faecal samples, surface rinses) and sending them to the NDC for laboratory testing, to determine the possible paths and sources of infection;
• bacteriological testing of dead birds;
• destroy dead birds using methods that reduce the risk of agents being spread where possible;
• restrict the movement of people in the house;
• prohibit the taking in and removal of birds from an affected house;
• eggs are destroyed or sent to an egg processing and/ or egg product manufacturing undertaking for heat processing using methods that guarantee the eradication of salmonellosis agents;
• transfer and slaughter adult poultry away from other poultry. Products from these birds may be used following heat treatment that ensures the inactivation of salmonellosis agents;
• the destruction or processing of eggs, as well as the slaughter and destruction of birds is documented;
• after the measures specified above have been taken, the house and surrounding area, as well as vehicles, equipment and other materials that may be contaminated with disease agents are cleaned, washed and disinfected under the supervision of an authorised veterinarian or veterinary inspector;
• control the movement of people who tend poultry, process poultry slaughter products and eggs, operate vehicles used to transport birds, slaughter products and eggs, by ensuring the required disinfection treatment;
• bedding and manure is disinfected or subjected to biothermic treatment;
• measures are taken to control pests and rodents.

Notification system in place

Regulation of Cabinet of Ministers Nr. 323, 28 august 1998 "The list of animal infectious diseases"

determines animal infectious diseases which eradication is organised and managed by the Food and Veterinary Service.

Table Salmonella in breeding flocks of Gallus gallus

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Gallus gallus (fowl)							
parent breeding flocks for egg production line	OS	flock	9	0	0	0	0
parent breeding flocks for meat production line	OS	flock	16	0	0	0	0

Footnote

OS - official sampling

Table Salmonella in other poultry

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Gallinarum	S. Derby
Gallus gallus (fowl)									
laying hens	Self control	animal	5	1	1				
during production period	OS	flock	11	4	4				
broilers	Self control	animal	16	4	4				
during rearing period (1)	Baseline study	flock	121	11	9				2
unspecified									
day-old chicks	Self control	animal	100	4	4				
during production period	Self control	animal	142	6	4			2	
Ducks	Self control	animal	2	0					
Geese	OS	flock	2	0					
- Surveillance - HACCP or own checks by industry		animal	2	0					
Turkeys	Self control	animal	1	0					
Partridges	Self control	animal	2	0					
Pheasants	Self control	animal	2	0					
Quails	Self control	animal	7	0					
- at farm - Monitoring - official sampling		flock	2	0					
Ostriches	Self control	animal	6	0					
farmed	OS	flock	3	0					

(1) : EU baseline study in broiler flocks (1.10.2005. - 30.09.2006.)

Footnote

OS - official sampling
Animal mean pooled samples (for example - pooled feaces samples; pooled samples from dead birds etc.)

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Dublin	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Hadar
Cattle (bovine animals)	EI	animal	2	0					
- Surveillance - HACCP or own checks by industry		animal	3	0					
- Clinical investigations		animal	25	0					
Pigs									
unspecified	EI	animal	2	0					
- Clinical investigations		animal	59	0					
Solipeds, domestic	CI	animal	5	0					
Fur animals									
- Clinical investigations		animal	23	4	1	1	2		
Pet animals, all	CI	animal	26	1					1
Zoo animals, all	CI	animal	9	2				2	

Footnote

EI - epidemiological investigation; CI - clinical investigation

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. Montevideo	S. Senftenberg	S. Meleagridis	S. Mbanden	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Tennessee	S. Edinburg	S. Jerusalem	S. Lamberhurst
Feed material of land animal origin																
dairy products	HACCP	batch	25g	1	0											
meat meal	HACCP	batch	25g	3	0											
meat and bone meal	HACCP	batch	25g	18	0											
blood meal	HACCP	batch	25g	5	0											
animal fat	HACCP	batch	25g	4	0											
Feed material of marine animal origin																
fish meal	OS	batch	25 g	5	2							2				
- Surveillance - HACCP or own checks by industry		batch	25g	287	27	12	1	4	3				2	1	1	3
fish oil		batch	25ml	7	0											
Compound feedingstuffs for fur animal																
- Surveillance - HACCP or own checks by industry		batch	25g	30	4					1	3					

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified	S. Cubana	S. Lexington
Feed material of cereal grain origin										
barley derived	HACCP	batch	25g	4	0					
wheat derived	HACCP	batch	25g	9	0					
maize	HACCP	batch	25g	8	0					
derived	HACCP	batch	25g	6	1					1
other cereal grain derived	HACCP	batch	25g	11	0					
Feed material of oil seed or fruit origin										
rape seed derived	HACCP	batch	25g	1	0					
soya (bean) derived	OS	batch	25 g	1	0					
- Surveillance - HACCP or own checks by industry		batch	25g	15	1				1	
sunflower seed derived	HACCP	batch	25g	11	0					
other oil seeds derived	HACCP	batch	25g	3	0					

Footnote

OS - official sampling

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified
Compound feedingstuffs for pigs								
final product (1)		batch	25 g	39	0			
- Surveillance - HACCP or own checks by industry		batch	25g	12	0			
Compound feedingstuffs for poultry (non specified)								
final product		batch	25 g	24	0			
- Surveillance - HACCP or own checks by industry		batch	25g	1	0			
Compound feedingstuffs for poultry -breeders								
final product (2)		batch	25g	6	0			
Compound feedingstuffs for poultry - laying hens								
final product (3)		batch	25g	3	0			
Compund feedingstuffs for poultry - broilers								
final product (4)		batch	25g	8	0			
Pet food								
final product		batch	25 g	2	0			
- Surveillance - HACCP or own checks by industry		batch	25g	40	0			
Complementary feedingstuffs		batch	25 g	10	0			

(1) : Official sampling
(2) : HACPP by industry
(3) : HACPP by industry
(4) : HACPP by industry

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		Pet animals, all		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Zoo animals, all		Fur animals	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=		1					30					2		4
Number of isolates serotyped	N=	0	1	0	0	0	0	30	0	0	0	0	2	0	4
Number of isolates per type															
S. Derby								2							
S. Dublin															1
S. Enteritidis								26							1
S. Hadar			1												
S. Typhimurium															2
Salmonella spp.													2		
S. Gallinarum								2							

Footnote

(*) M : Monitoring, C : Clinical

Table Salmonella serovars in food

Serovars		Other food		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=	11		6		16		21		4		4	
Number of isolates serotyped	N=	11	0	6	0	16	0	21	0	4	0	4	0
Number of isolates per type													
S. Agona								1					
S. Derby				2		1							
S. Enteritidis		9				15		20					
S. Infantis		1										4	
S. Saintpaul										4			
S. Typhimurium		1		2									
S. Virchow				1									
Salmonella spp.				1									

Footnote

(*) M : Monitoring, C : Clinical

2.1.7. Antimicrobial resistance in Salmonella isolates

Antimicrobial resistance is the ability of certain microorganisms to survive or grow in the presence of a given concentration of antimicrobial agent that usually would kill or inhibit the microorganism species in question. Antimicrobial resistant Salmonella strains may be transferred from animals or foodstuffs to humans.

Table Antimicrobial susceptibility testing of S.Enteritidis in animals

n = Number of resistant isolates

S. Enteritidis

	Gallus gallus (fowl) - laying hens - Surveillance - HACCP or own checks by industry		Fur animals		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - Surveillance - HACCP or own checks by industry		Gallus gallus (fowl) - laying hens - Monitoring - official sampling	
Isolates out of a monitoring programme	no		no						yes				no		yes	
Number of isolates available in the laboratory	4		1						38				8		4	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines																
Tetracyclin									35	6			6	0	3	0
Amphenicols																
Chloramphenicol	4	0							37	7			7	0	4	0
Cephalosporins																
Cefotaxim			1	0									1	0		
Fluoroquinolones																
Ciprofloxacin			1	0												
Quinolones																
Nalidixic acid	4	0							37	35			7	6	4	0
Aminoglycosides																
Streptomycin	3	0							27	5			6	0	4	0
Gentamicin	1	0	1	0					7	0			5	0	2	0
Neomycin			1	0									1	0		
Kanamycin	4	0	1	0					32	1			6	0	4	0
Penicillins																
Ampicillin	4	0	1	0					19	10			4	0	3	0
Trimethoprim + sulfonamides																
Trimethoprim + Sulfamethoxazol	3	0	1	0					28	0			3	0		

Fully sensitive	4	100.0	1	100.0						3	7.9		2	25.0	4	100.0				
Resistant to 1 antimicrobial	0	0	0	0						18	47.4		6	75.0	0	0				
Resistant to 2 antimicrobials	0	0	0	0						11	28.9		0	0	0	0				
Resistant to 3 antimicrobials	0	0	0	0						0	0		0	0	0	0				
Resistant to 4 antimicrobials	0	0	0	0						6	15.8		0	0	0	0				
Resistant to >4 antimicrobials	0	0	0	0						0	0		0	0	0	0				

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

n = Number of resistant isolates	S. Typhimurium									
	Cattle (bovine animals)		**Pigs**		**Gallus gallus (fowl)**		**Turkeys**		**Fur animals**	
Isolates out of a monitoring programme										no
Number of isolates available in the laboratory										2
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines										
Tetracyclin									1	0
Amphenicols										
Chloramphenicol									2	0
Cephalosporins										
Cefotaxim									1	0
Quinolones										
Nalidixic acid									2	0
Trimethoprim									2	0
Aminoglycosides										
Streptomycin									2	0
Gentamicin									2	0
Kanamycin									2	0
Penicillins										
Ampicillin									1	0
Fully sensitive									2	100.0
Resistant to 1 antimicrobial									0	0
Resistant to 2 antimicrobials									0	0
Resistant to 3 antimicrobials									0	0
Resistant to 4 antimicrobials									0	0
Resistant to >4 antimicrobials									0	0

Table Antimicrobial susceptibility testing of Salmonella in animals

n = Number of resistant isolates

Salmonella spp.

	Cats - pet animals		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Fur animals		Gallus gallus (fowl) - Monitoring - official sampling	
Isolates out of a monitoring programme		no						no				no		yes
Number of isolates available in the laboratory		1						2				1		2
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines														
Tetracyclin											1	1	2	0
Amphenicols														
Chloramphenicol													2	0
Cephalosporins														
Cefotaxim											1	0		
Fluoroquinolones														
Ciprofloxacin											1	0		
Quinolones														
Nalidixic acid	1	1					2	0					2	0
Trimethoprim	1	0												
Aminoglycosides														
Streptomycin	1	1					2	1					2	0
Gentamicin	1	0					2	0			1	0		
Neomycin							2	0						
Kanamycin	1	0					2	0			1	0	2	0
Penicillins														
Ampicillin	1	1					2	0			1	0		
Trimethoprim + sulfonamides	1	0											2	0
Fully sensitive	0	0					1	50.0			0	0	2	100.0
Resistant to 1 antimicrobial	0	0					1	50.0			1	100.0	0	0
Resistant to 2 antimicrobials	0	0					0	0			0	0	0	0
Resistant to 3 antimicrobials	1	100.0					0	0			0	0	0	0
Resistant to 4 antimicrobials	0	0					0	0			0	0	0	0
Resistant to >4 antimicrobials	0	0					0	0			0	0	0	0

Table Antimicrobial susceptibility testing of Salmonella spp. in food

n = Number of resistant isolates

Salmonella spp.

	Meat from bovine animals - Surveillance - HACCP or own checks by industry		Meat from broilers (Gallus gallus) - Surveillance - HACCP or own checks by industry		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Meat from other poultry species		Meat from poultry, unspecified		Meat, mixed meat		Meat, mixed meat - Surveillance - HACCP or own checks by industry	
Isolates out of a monitoring programme	no		no		yes				yes		yes		no		yes		no	
Number of isolates available in the laboratory	5		7		1				9		8		2		12		10	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines																		
Tetracyclin	3	0	7	0					4	0	7	4			5	0	6	1
Amphenicols																		
Chloramphenicol	5	0	5	0	1	0			6	0	8	0	1	0	12	0	10	0
Cephalosporins																		
Cefotaxim													1	0	4	0	4	0
Fluoroquinolones																		
Ciprofloxacin									3	0			1	0				
Quinolones																		
Nalidixic acid	5	1	7	2	1	0			9	2	8	2	1	0	8	1	6	4
Aminoglycosides																		
Streptomycin	5	2	7	5	1	0			9	0	8	0	2	0	11	0	9	0
Gentamicin	1	0	2	0					5	0	8	0	1	0	5	0	4	0
Neomycin											3	0			8	0		
Kanamycin	5	0	7	0	1	0			9	0	1	0	1	0			6	0
Penicillins																		
Ampicillin	4	0	2	0	1	0			5	0	5	5	1	0	11	4	9	0
Trimethoprim + sulfonamides	2	2	5	5	1	0			4	0	5	0	2	0	4	0	2	0
Fully sensitive	2	40.0	0	0	1	100.0			7	77.8	1	12.5	2	100.0	7	58.3	6	60.0

Resistant to 1 antimicrobial	2	40.0	2	28.6	0	0			2	22.2	3	37.5	0	0	5	41.7	3	30.0
Resistant to 2 antimicrobials	1	20.0	5	71.4	0	0			0	0	4	50.0	0	0	0	0	1	10.0
Resistant to 3 antimicrobials	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0
Resistant to 4 antimicrobials	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0
Resistant to >4 antimicrobials	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0

Table Breakpoints for antibiotic resistance testing in Animals

Test Method Used

- Disc diffusion
- Agar dilution
- Broth dilution
- E-test

Standards used for testing

- NCCLS

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol							30	12		18
Florfenicol										
Tetracyclines										
Tetracyclin							30	14		19
Fluoroquinolones										
Ciprofloxacin							5	15		21
Enrofloxacin										
Quinolones										
Nalidixic acid							30	13		19
Trimethoprim							5	10		16
Sulfonamides										
Sulfonamide										
Aminoglycosides										
Streptomycin							10	11		15
Gentamicin							10	12		15
Neomycin							30	12		17
Kanamycin							30	13		18
Trimethoprim + sulfonamides							25	10		16
Cephalosporins										
Cefotaxim							30	14		23
3rd generation cephalosporins										
Penicillins										
Ampicillin							10	13		17

Table Breakpoints for antibiotic resistance testing in Food

Test Method Used

- Disc diffusion
- Agar dilution
- Broth dilution
- E-test

Standards used for testing

- NCCLS

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol							30	12		18
Florfenicol										
Tetracyclines										
Tetracyclin							30	14		19
Fluoroquinolones										
Ciprofloxacin							5	15		21
Enrofloxacin										
Quinolones										
Nalidixic acid							30	13		19
Trimethoprim							5	10		16
Sulfonamides										
Sulfonamide										
Aminoglycosides										
Streptomycin							10	11		15
Gentamicin							10	12		15
Neomycin							30	12		17
Kanamycin							30	13		18
Trimethoprim + sulfonamides							25	10		16
Cephalosporins										
Cefotaxim							30	14		23
3rd generation cephalosporins										
Penicillins										
Ampicillin							10	13		17

Table Breakpoints for antibiotic resistance testing in Feedingstuff

Test Method Used

Disc diffusion

Agar dilution

Broth dilution

E-test

Standards used for testing

NCCLS

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol							30	12		18
Florfenicol										
Tetracyclines										
Tetracyclin							30	14		19
Fluoroquinolones										
Ciprofloxacin							5	15		21
Enrofloxacin										
Quinolones										
Nalidixic acid							30	13		19
Trimethoprim							5	10		16
Sulfonamides										
Sulfonamide										
Aminoglycosides										
Streptomycin							10	11		15
Gentamicin							10	12		15
Neomycin							30	12		17
Kanamycin							30	13		18
Trimethoprim + sulfonamides							25	10		16
Cephalosporins										
Cefotaxim							30	14		23
3rd generation cephalosporins										
Penicillins										
Ampicillin							10	13		17

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

Campylobacter in food has been monitored for the first time in 2004. In 2004 and 2005, there was no control programme in place for thermophilic Campylobacter in feed or animals.
Campylobacter in broiler flocks has been monitored for the first time in 2006.
Campylobacteriosis is a notifiable disease in humans and animals.

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

Because of the short time that Campylobacter is controlled in food and monitored in broiler flocks, it is not possible to evaluate trends.
The number of human cases is very low and presumably does not reflect the real situation.

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 retail

Inspectors of the Food and Veterinary Service are taking the samples. One sample consists of 1 unit. For laboratory
testing, 10g of sample are taken for further investigations.

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

Fresh meat

At retail

Meat products: fresh meat and meat products

Definition of positive finding

At retail

The sample is not allowed to contain Campylobacter spp.

Diagnostic/ analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 10272:1995

At retail

Bacteriological method: ISO 10272:1995

Control program/ mechanisms

The control program/ strategies in place

In 2004, a coordinated programme of the European Commission according to the recommendations of 19 December 2003 regarding the bacteriological safety of fresh poultry meat was implemented as the first targeted control programme on Campylobacter. In 2005 and 2006, surveillance of Campylobacter in fresh poultry meat was continued as a national control programme.

Measures in case of the positive findings or single cases

The inspector immediatly has to perform an inspection at the slaughterhouse or at the store. He decides what to do with the rest of the batch, if there are still products left. The inspector also decides on the actions that have to be taken in the company, like asking for HACCP system improvements etc. Desinfection has to be carried out.

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. lari	C. jejuni	C. upsaliensis	thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus)										
meat preparation										
intended to be eaten cooked		batch	10g	20	0					

2.2.4. Campylobacter in animals

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic Campylobacter spp.	C. jejuni	C. coli	C. lari	C. upsaliensis	thermophilic Campylobacter spp., unspecified
Cattle (bovine animals)									
dairy cows (1)		animal	2	0					
Pigs (2)		animal	6	3				3	
Gallus gallus (fowl)									
broilers									
- at farm (3)		animal	62	27	23			4	
- at slaughterhouse (4)		slaughter batch	70	33	32			1	
- at farm - Surveillance - HACCP or own checks by industry		animal	30	0					
Dogs (5)		animal	4	0					
Cats (6)		animal	3	1	1				

(1) : Clinical cases
(2) : Clinical cases
(3) : Official sampling
(4) : Official sampling
(5) : Clinical cases
(6) : Clinical cases

Footnote

Animal mean pooled sample

2.2.5. Antimicrobial resistance in Campylobacter isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in poultry

Laboratory used for detection for resistance

Breakpoints used in testing

-Campylobacter spp. culture suspension 0.5 McFarland inoculated with Muller-Hinton with 5% defibrinated horse serum
-incubation for 48 hours at +37+-0.5C with 9%CO2
-reading of results
-Interpretation: up to 20mm - resistant, from 21mm - susceptible

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

Laboratory used for detection for resistance

Breakpoints used in testing

-Campylobacter spp. culture suspension 0.5 McFarland inoculated with Muller-Hinton with 5% defibrinated horse serum
-incubation for 48 hours at +37+-0.5C with 9%CO2
-reading of results
-Interpretation: up to 20mm - resistant, from 21mm - susceptible

Table Antimicrobial susceptibility testing of Campylobacter in animals

n = Number of resistant isolates	Campylobacter spp., unspecified					
	Gallus gallus (fowl)		**Cattle (bovine animals)**		**Pigs**	
Isolates out of a monitoring programme	yes					
Number of isolates available in the laboratory	55					
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines						
Tetracyclin	36	17				
Fluoroquinolones						
Ciprofloxacin	15	7				
Quinolones						
Nalidixic acid	55	37				
Aminoglycosides						
Gentamicin	52	4				
Macrolides						
Erythromycin	14	2				
Penicillins						
Ampicillin	52	13				
Fully sensitive	18	32.7				
Resistant to 1 antimicrobial	12	21.8				
Resistant to 2 antimicrobials	10	18.2				
Resistant to 3 antimicrobials	12	21.8				
Resistant to 4 antimicrobials	3	5.5				

Table Breakpoints used for antimicrobial susceptibility testing in Animals

Test Method Used

- Disc diffusion
- Agar dilution
- Broth dilution
- E-test

Standards used for testing

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracyclines										
Tetracyclin							30	21		20
Fluoroquinolones										
Ciprofloxacin							5	21		20
Quinolones										
Nalidixic acid							30	21		20
Aminoglycosides										
Gentamicin							10	21		20
Macrolides										
Erythromycin							15	21		20
Penicillins										
Ampicillin							10	21		20

Footnote

In future antibiotic resistence of Campylobacter we use MIC

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

Monitoring of Listeria monocytogenes in food has been started in 2003 in the frame of a national surveillance programme. It was the first targeted control programme that has been set up additionally to the laboratory control programme, because Listeria is considered to be one of the most important microorgansims to cause human disease that may have fatal outcome. Especially the risk groups like pregnant women, newborns and small children and older people are very sensitive to Listeria infections, and there have been fatal cases in humans in the past.
In 2004, 2005 and 2006 the national control programme on Listeria monocytogenes was based on the Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council of 17 November 2003 on the control of Salmonella and other specified foodborne zoonotic agents.

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

Due to a short time of controlling foodstuffs and risk products it is hardly possible to evaluate trends.

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

Listeria monocytogenes is detected at a low percentage in foodstuffs, especially in risk products. Human cases are occuring sporadically.

Additional information

In 2006 Listeria monocytogenes was not detected in foodstuffs. On this year foodstuffs in food producing establishments were tested doubly - in 25g (presence) and 1g (CFU). Foodstuffs in retail were tested in 1g.
The samples were tested according to EN ISO 1129 - 2 : 1998.

2.3.2. Listeriosis in humans

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	Listeria monocytogenes presence in x g	> detection limit but =< 100 cfu/ g	L. monocytogenes > 100 cfu/ g
Milk, cows'		batch	25 g	10	0			
raw								
intended for direct human consumption		batch	1g	14	0	0	0	
Cheeses made from cows' milk								
soft and semi-soft								
made from pasteurised milk		batch	25g, 1g	10	0	0	0	
- Surveillance - HACCP or own checks by industry		batch	25 g	2	0			
Dairy products (excluding cheeses)								
butter	HACCP	batch	25 g	3	0			
cream	HACCP	batch	25 g	3	0			
dairy products, not specified								
ready-to-eat								
made from pasteurised milk		batch	25g, 1g	7	0	0	0	
- Surveillance - HACCP or own checks by industry		batch	25 g	16	0			
yoghurt								
- Surveillance - HACCP or own checks by industry		batch	25 g	32	0			
dairy desserts								
- Surveillance - HACCP or own checks by industry		batch	25 g	4	0			
ice-cream								
- Surveillance - HACCP or own checks by industry		batch	25 g	5	0			

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Listeria monocytogenes presence in x g	> detection limit but =< 100 cfu/ g	L. monocytogenes > 100 cfu/ g
Meat from pig								
meat products								
unspecified, ready-to-eat		batch	25g, 1g	6	0	0	0	
Meat from bovine animals								
meat products								
unspecified, ready-to-eat		batch	25g,1g	10	0	0	0	
Fish								
smoked		batch	25g, 1g	9	0	0	0	
- Surveillance - HACCP or own checks by industry		batch	25 g	1	1			
raw								
- Surveillance - HACCP or own checks by industry		batch	25 g	13	0			
Meat from other animal species or not specified								
meat products								
unspecified, ready-to-eat		batch	25g, 1g	19	0	0	0	
Meat, mixed meat								
- Surveillance - HACCP or own checks by industry		batch	25g	6	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	Listeria spp., unspecified
Cattle (bovine animals) (1)		animal	2	1	1	
- Clinical investigations		animal	66	6	6	
Pigs (2)		animal	5	0		
Solipeds, domestic						
horses						
- Clinical investigations		animal	1	0		

(1) : Epidemiological investigation
(2) : Clinical cases

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

In 2006, there were national control programme for VTEC in food, but no control programme was existing in Latvia regarding VTEC infections in animals.

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 Escherichia coli, pathogenic	E.coli, pathogenic, unspecified	Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified
Meat from broilers (Gallus gallus)									
fresh		batch	10g	35	0				
Meat from bovine animals									
fresh		batch	10g	18	0				
minced meat									
intended to be eaten cooked									
chilled		batch	10g	9	0				
Milk, cows'									
raw		batch	10g	14	0				

Footnote

Laboratory method used: ISO 7251:2005. The next step after E.coli detection is serotyping used kit of serums (the kit consist from serotypes which can to able produce verotoxins). If the detect kit serotypes then PCR method used for detection of genes VT1, VT2 and etc. in the E. coli cultures.

2.4.4. Escherichia coli, pathogenic in animals

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

The use of intradermal tuberculin tests for diagnosis of bovine tuberculosis in Latvia was started in 1927. In the prewar period, intradermal tuberculin tests were not compulsory and were done on a voluntary basis. In 1937, 10,4% of the tested cows were positive.
After the Second World War private farms were eliminated. The majority of animals were moved to collective farms, where infected and non-infected animals were kept together, and tuberculosis continued to spread.
Since tuberculosis preventive measures were introduced after 1960, the number of newly infected farms decreased. The tuberculosis eradication programme for domestic animals was introduced in 1968. Also testing of pigs, sheep, cats, birds and shepherd dogs was started with the aim to identify sources of infection.

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

Bovine tuberculosis in Latvia was almost eradicated by 1975. In the following years, bovine tuberculosis was diagnosed only on 7 farms in 4 regions:
- 1 farm in 1977
- 1 farm in 1978
- 2 farms in 1980
- 2 farms in 1981
- 1 farm in 1989

Latvia is free from bovine tuberculosis since 1990.
The last time that tuberculosis in birds was diagnosed in Latvia was in 1993. The last case of tuberculosis was diagnosed in 1994.

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

In 2006, no human infection with M. bovis was detected.

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

Latvia is going to apply for the officially tuberculosis free status.

Monitoring system

Sampling strategy

Latvia has a national control programme in place to control tuberculosis in bovines. The programme is based on the Regulation of Cabinet of Ministers Nr. 298, 21 April 2006 "Procedures for prevention and combatting of such infectious diseases as to which both animals and humans are susceptible".

Frequency of the sampling

Cattle are tested on farm by using intradermal tuberculin test. 100% of stock bulls are tested annually. All other cattle older than 6 weeks are tested biannually. In case of transportation to another herd, each animal has to be tested by using intradermal tuberculin test within 30 days before transportation.

Type of specimen taken

Other: intradermal tuberculin test

Case definition

A single animal from wich M. bovis has been isolated.

Diagnostic/ analytical methods used

For bacteriological examination of tissue from animals positive in the intradermal test:
Classical bacteriology OIE manual 2.3.3. Bovine tuberculosis

Vaccination policy

Vaccination is prohibited.

Measures in case of the positive findings or single cases

If the result of the intradermal test is positive, the test has to be repeated. In case the second test also has a positive result, the animal has to be slaughtered within 30 days, and the diagnosis is confirmed by isolating Mycobacteria from the tissues. The herd is placed under restriction and has to be tested repeatedly.

Notification system in place

The Veterinary Surveillance Department of the Food and Veterinary Service is responsible for organization of the control of infectious animal diseases including zoonoses.
Surveillance and control of zoonotic diseases in animals is regulated by a number of special EU acts and national legislation. The general and basic national acts are the following:
- Law on Food Surveillance Circulation,
- Law on Veterinary Medicine,
- The Regulation of the Cabinet of Ministers Nr. 323, 28 August 1998 "The list of animal infectious diseases" determines animal infectious diseases which surveillance is organised and managed by the Food and Veterinary Service.
- Regulation of the Cabinet of Ministers Nr. 298, 21 April 2006 "Procedures for prevention and combat of such infectious diseases as to which both animals and humans are susceptible" determines how to carry out prophylaxis and control of certain zoonoses.
Also the Directive 2003/ 99/ EK is implemented into national law by Regulation issued by the Cabinet of Ministers:
- Regulation of the Cabinet of Ministers Nr. 744, 8 September 2006 "Procedures for surveillance and exchange of information of such infectious diseases as to which both animals and humans are susceptible, and of the antimicrobial resistance of agents".
If an infection with a zoonotic agent is suspected, this shall be notified to regional office of the Food and Veterinary Service. The regional office then informs the Veterinary Surveillance Department. State veterinary inspectors carry out further epidemiological investigation, sampling and take appropriate measures to prevent spread of the disease or entering of the food chain by a zoonotic agent.

B. Mycobacterium bovis in farmed deer

Additional information

In 2006, there was no program in place for control of Mycobacterium bovis in farmed deer in Latvia.

C. Mycobacterium spp., unspecified in animal - Pigs - at farm

Monitoring system

Sampling strategy

Intradermal tuberculin test is carried out on farm. 100% of the breeding boars are tested annually. Sows, breeding boars which are used for breeding on the own farm exclusively, and young sows are tested annually as follows: 10% of the herd, but not less than 10 animals. If the herd consists of 1-10 animals, all animals are tested.

Type of specimen taken

Other: intradermal tuberculin test

Case definition

A single animal from which M.bovis or M.avium has been isolated.

Vaccination policy

Vaccination is prohibited.

Notification system in place

The Veterinary Surveillance Department of the Food and Veterinary Service is responsible for the organization of the control of infectious animal diseases including zoonoses.
Surveillance and control of zoonotic diseases in animals is regulated by a number of special EU acts and national legislation. The general and basic national acts are the following:
- Law on Food Surveillance Circulation,
- Law on Veterinary Medicine,
- Also the Directive 2003/ 99/ EK is implemented into national law by Regulation issued by the Cabinet of Ministers:
- Regulation of the Cabinet of Ministers Nr. 744, 8 September 2006 "Procedures for surveillance and exchange of information of such infectious diseases as to which both animals and humans are susceptible, and of the antimicrobial resistance of agents".
If an infection with a zoonotic agent is suspected, this shall be notified to regional office of the Food and Veterinary Service. The regional office then informs the Veterinary Surveillance Department. State veterinary inspectors carry out further epidemiological investigation, sampling and take appropriate measures to prevent spread of the disease or entering of the food chain by a zoonotic agent.

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
Pigs		animal	10302	0			
Zoo animals, all (1)		animal	3	1			1

(1) : Suspect sampling; classical bacteriology, method: OIE Manual chapter 2.7.8. Avian tuberculosis

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/ 432/ EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests (*)	Number of animals tested			
LATVIJA	54724	401468	0	0	0	0	2	70687	14454	0	0
Total	54724	401468	0	0	0	0		70687	14454	0	0

Footnote

The animals were investigated once a year in mixed farms, every second year in farms where only cattle are kept.
There was requirement to investigate each animal during 30 days before entry into new herd, but system do not seperate routine tests from test carried out before movement.

(*) Legend:

In column "Interval between routine tuberculin tests" use the following numeric codes: (0) no routine tests; (1) tests once a year; (2) tests each two years; (3) tests each three years concerning 24 month-old animals; (4) tests each 4 years; (5) others (please give details).

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 time that bovine brucellosis was diagnosed in Latvia was in 1963 and the last case of brucellosis in pigs was diagnosed in 1994. Vaccination has never been used as an instrument in brucellosis eradication and control. Brucella melitensis has never been detected in Latvia at all. Preventive vaccination of animals and usage of hyper - immune serum against brucellosis is prohibited. An animal is considered to be infected when the individual blood sample is positive.
All abortions have to be reported. They are investigated bacteriologically.

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

As Latvia has been free of bovine brucellosis since 1963, and the status of freedom from brucellosis is controlled by the responsible authority, brucellosis is not considered to pose a risk on animal or human health. Latvia is going to apply for the officially brucellosis free status.

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

Since 1988, no cases of human brucellosis have been registered.

2.6.2. Brucellosis in humans

2.6.3. Brucella in foodstuffs

2.6.4. Brucella in animals

A. Brucella abortus in bovine animals

Status as officially free of bovine brucellosis during the reporting year

The entire country free

Latvia has been free, but not officially free of bovine brucellosis since 1963.

Additional information

Latvia is going to apply for the officially brucellosis free status.

Monitoring system

Sampling strategy

Sampling is part of a national control programme and takes place on farm. The programme is based on the Regulation of Cabinet of Ministers Nr. 298, 21 April 2006 "Procedures for prevention and combatting of such infectious diseases as to which both animals and humans are susceptible".

Frequency of the sampling

100% of the stock bulls are tested on brucellosis annually. In 2006, according to national control program all other cattle older than 24 months in the 20% of the total number of herds are tested (100% of the animals in the elect herd) on brucellosis. And other cattle than stock bulls are tested in case of transportation to another herd if animal has not to be tested within 30 days before transportation.

Type of specimen taken

Other: milk/ blood

Methods of sampling (description of sampling techniques)

Samples are taken on farm.

Case definition

An animal is considered to be infected when the individual blood sample is positive in the complement fixation test or in the agglutination. In that case, the whole herd is considered to be infected.

Diagnostic/ analytical methods used

Serological tests are carried out by using the Rose-Bengal-Test (RBT) on blood serum samples for a first screening in cases that no milk is available or the number of animals is very low. In bigger dairy herds, bulk tank milk samples are tested by using ELISA. If blood samples turn out positive in the RBT or bulk milk samples after the ELISA, individual serological testing has to be carried out on each animal.

Vaccination policy

Vaccination is prohibited.

Measures in case of the positive findings or single cases

Regulation of Cabinet of Ministers Nr. 298, 21 April 2006 "Procedures for Prevention and Combating of Such Infectious Diseases as to Which Both Animals and Humans are Susceptible". The Regulations determines: the list of zoonotic diseases, which are under control and eradication, procedures of sampling for laboratory investigation, eradication measures, cooperation between institutions involved in the control, surveillance, registration and eradication of zoonotic diseases.
If determinig the brucellosis serologically in a herd of cows, in a holding affected by the infection:
- an investigation shall be commenced and up to the ascertainment of results, the supervision of the herd shall be ensured;
-serologically positive animals or animals suspected of the illness shall be isolated;
- susceptible animals may be sent to a slaughterhouse with the permission of a an inspector for an immediate slaughtering;
- samples for laboratory examinations shall be taken repeatedly;
- serologically positive animals shall be slaughtered within 30 days of the confirmations of diagnosis;
- the premises of the holding, equipment, materials, tools, vehicles and the accoutrements therefor, ramps and passages which have been in contact with hosts of infectious diseases shall be cleaned, washed and disinfected under supervision of a veterinarian with materials which destroy the brucellosis agent.

Notification system in place

- Regulation of Cabinet of Ministers Nr. 323, 28 august 1998 "The list of animal infectious diseases" determines animal infectious diseases that eradication are organised and managed by the Food and Veterinary Service.
- Regulation of Cabinet of Ministers Nr. 298, 21 April 2006 "Procedures for Prevention and Combatting of Such Infectious Diseases as to Which Both Animals and Humans are Susceptible" determines how to carry out prophylaxis and eradication of zoonoses. If an owner of an undertaking (company), owner of animals, hunter or head of laboratory determines zoonoses or he or she has suspicions regarding the illness of animals, he or she shall
notify an authorised veterinarian or a territorial unit of the Food and Veterinary Service therefor.
- Regulation of Cabinet of Ministers Nr. 301, 13 April 2004 "Veterinary requirements for circulation of cattle and pigs" determines veterinary requirements for circulation of cattle and
pigs (excepting wild boars) among member states of EU.
- Food and Veterinary Service (FVS) Order Nr. 241, 21.09.2001 determines the list of zoonoses immediately notifiabble to the Central Bureau of the FVS.

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

As Latvia has been free of bovine brucellosis since 1963, and the status of freedom from brucellosis is controlled by the responsible authority, brucellosis is not considered to pose a risk on animal or human health.

B. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

The entire country free

Latvia has been free, but not officially free.

Additional information

B. melitensis has never been detected in Latvia at all.

Monitoring system

Sampling strategy

In 2006, according to the national control programme, 5% of the total number of sheep older than 6 month were tested on brucellosis.

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Blood samples are taken at farm.

Case definition

An animal is considered to be infected when the individual blood sample is positive in the Rose Bengal Test (RBT). In that case, the whole herd is considered to be infected.

Diagnostic/ analytical methods used

Blood serum samples are tested by RBT.

Vaccination policy

Vaccination is prohibited.

Measures in case of the positive findings or single cases

See B. abortus in bovines

Notification system in place

See B. abortus in bovines.

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

As no case of B. melitensis has ever been detected in Latvia, it does not pose a risk on animal and human health.

C. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

The entire country free

Latvia has been free, but not officially free.

Additional information

Brucella melitensis has never been detected in Latvia at all.

Monitoring system

Sampling strategy

In 2006, according to the national control programme, 5% of the total number of goats older than 6 month were tested on brucellosis.

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Blood samples are taken at farm.

Case definition

An animal is considered to be infected when the individual blood sample is positive in the RBT. In that case, the whole herd is considered to be infected.

Diagnostic/ analytical methods used

Blood serum samples are tested by RBT.

Vaccination policy

Vaccination is prohibited.

Measures in case of the positive findings or single cases

See B. abortus in bovines.

Notification system in place

See B. abortus in bovines.

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

See B. melitensis in sheep.

D. B. suis in animal - Pigs - at farm

Monitoring system

Sampling strategy

All breeding boars that are used for artificial insemination are tested annually. Sows, young sows and breeding boars that are used for breeding in the own herd are tested as follows: 10% of the animals annually, but not less than 10 animals. If the herd consists of 1-10 animals, all animals are tested.

Type of specimen taken

Blood

Case definition

If the RBT is positive, the animal is tested serologically again. If the second testing also reveals positive results, the animal is slaughtered and tissues are submitted for bacteriological examination. If B. suis can be isolated, the animal and the herd, respectively, is positive.

Diagnostic/ analytical methods used

Rose Bengal Test
Complement Fixation Test
Classical bacteriology (OIE Manual)

Vaccination policy

Vaccination is prohibited.

Measures in case of the positive findings or single cases

See bovine brucellosis

Notification system in place

See bovine brucellosis

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

Brucellosis in pigs was first detected in Latvia in 1981, and the last case was registered in 1994. Since then, no case of brucellosis in pigs has been detected.

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. melitensis	B. abortus	B. suis	Brucella spp., unspecified
Pigs		animal	8154	0				
Dogs		animal	1	0				
Wild boars		animal	23	0				
Deer								
farmed								
red deer		animal	3	0				
Zoo animals, all		animal	4	0				
Solipeds, domestic								
horses		animal	1	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 samples			Information about abortions			Epidemiological investigation					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds tested	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 microbio logically	Number of animals positive microbio logically
																		Serologically	BST		
LATVIJA	54724	401468	0	0	0	0	16839	48582	0	1237	23962	0	904	0	0	0	0	0	0	0	0
Total	54724	401468	0	0	0	0	16839	48582	0	1237	23962	0	904	0	0	0	0	0	0	0	0

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

Region	Total number of existing ovine / caprine		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 microbiologically	Number of animals positive microbiologically	Number of suspended herds
LATVIJA	6304	75246	0	0	0	0	518	2727	0	0	0	0	0	0
Total	6304	75246	0	0	0	0	518	2727	0	0	0	0	0	0

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

There is no program in place to control or monitor Yersinia enterocolitica in animals or food.

2.7.2. Yersiniosis in humans

2.7.3. Yersinia in foodstuffs

2.7.4. 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:9	Y. enterocolitica - O:3	Y. enterocolitica - unspecified
Pigs (1)		animal	2	0					
Dogs (2)		animal	1	0					
Cats (3)		animal	4	0					
Rats									
wild									
- Surveillance		animal	2	0					

(1) : Clinical cases
(2) : Clinical cases
(3) : Clinical cases

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

In year 2006 Food and Veterinary Service has elaborated the methodologycal guidelines for the veterinary expertise of cows, sheep, goats and horses for slaughter houses which determine the order and methods for identifying trichinellosis agents which based on requirements of the Regulation (EC) No 854/ 2004 of the European Parliament and of the Council of 29 April 2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption and Commission Regulation (EC) No 2075/ 2005 of 5 December 2005 laying down specific rules on official controls for Trichinella in meat.
All the carcasses of pigs and horses are tested for the trichinellosis agent.
In cases when animals are slaughtered at home or hunted for personal use, the owner of the animals or a hunter is responsible for bringing samples of the meat over to a laboratory for testing.

2.8.2. Trichinellosis in humans

2.8.3. Trichinella in animals

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	Trichinella spp., unspecified
Pigs		animal	493683	0		
Solipeds, domestic						
horses		animal	429	0		
Wild boars						
wild		animal	1262	11		11
Beavers						
wild		animal	2	1		1
Hedgehogs						
wild		animal	1	0		

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

Surveillance in productive animals is achieved trough the official meat inspection, where macroscopic investigation on hydatid cysts at the abattoir is part of the meat inspection procedure according to the methodologycal guidelines of Food and Veterinary service for the veterinary expertise of cows, sheep, goats and horses for slaughter houses which based on requirements of the Regulation (EC) No 854/ 2004 of the European Parliament and of the Council of 29 April 2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption.
There are no official monitoring programmes for echinococcosis in the final hosts, dogs and cats. Treatment with an anti-helmintic drugs is advised.

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)		animal	113443	0			
Sheep (1)		animal	6247	0			
Pigs		animal	493683	721			721
Solipeds, domestic		animal	429	0			

(1) : (1)

Footnote

(1): number of small ruminants (sheep and goats) together

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

In 2006, Latvia had no monitoring programme in place to control Toxoplasma spp. in animals. Samples are sent by private veterinarians.

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 gondii
Dogs		animal	116	33
Cats		animal	79	12

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

The main reservoir for rabies in Latvia are red foxes and racoon dogs. During the last years, the density of red foxes and racoon dogs in Latvia has been increasing from 1,16 per square kilometre in 1998 up to 1,7 per square kilometre in 2003. The rabies cases in red foxes varied between 71 and 144 in the years from 1993 until 1999, in racoon dogs there were between 20 and 39 cases of rabies. Since the year 2000, these numbers increased and had a peak in 2003 (471 cases in red foxes, 285 cases in racoon dogs). In 2004, 170 rabies cases in red foxes and 130 rabies cases in racoon dogs were diagnosed. In 2005, 165 rabies cases in red foxes and 126 rabies cases in racoon dogs were diagnosed. In 2006, 187 rabies cases in red foxes and 153 rabies cases in racoon dogs were diagnosed.
Other animals affected in 2005 and 2006 were for example minks, roes, martens, dogs, cats and cattle.

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

Infection generally occurs through a bite from infected animals. Wild animals (foxes and racoon dogs) are the most common source of infection in Latvia.

Additional information

In Latvia, the oral vaccination of foxes and racoon dogs against rabies has been started in 1998. Vaccination campaigns have been carried out twice per year: during spring and autumn. From 1998 – 2004, vaccine baits were distributed by hands (manual distribution), but in 2005 aerial distribution was used for the first time .

2.11.2. Lyssavirus (rabies) in animals

A. Rabies in dogs

Additional information

All dogs must be vaccinated against rabies once per year.

B. Rabies virus in animal

Monitoring system

Sampling strategy

In 2006, there were active and passive surveillance programmes in place regarding rabies.
In case of suspicion of rabies in a wild, pet or productive animal, the owner or finder, respectively, has to report immediately to a private veterinarian or the FVS. In dead animals, a partial post mortem is performed and brain material is taken for further investigations. For pet or productive animals under suspicion - see measures.
Sampling is also performed in red foxes and racoon dogs to control the uptake of vaccine baits and to determine the antibody titer. These foxes and racoon dogs are hunted and submitted to the National Diagnostic Centre.

Frequency of the sampling

Foxes and racoon dogs - during hunting season
Animals found dead, suspicions - throughout the year

Methods of sampling (description of sampling techniques)

Detection of viral antigens by an immunofluorescence test in neurological tissue (brain) in connection to partial post-mortem examination.

Case definition

A case that is laboratory confirmed.

Diagnostic/ analytical methods used

Detection of viral antigens by an immunofluorescence test in neurological tissue (brain) in connection to partial post-mortem examination.
If the detection of viral antigens by an immunofluorescence test in neurological tissue (brain) was negative then for following investigation used flourescent antibody test in cell culture.
Exceptional cases used mouse inoculation test.

Vaccination policy

All cats, dogs and ferrets must be vaccinated against rabies once per year.
Foxes - see general evaluation

Control program/ mechanisms

The control program/ strategies in place

Vaccination of foxes and racoon dogs by distribution of vaccine baits twice a year in the whole territory of Latvia will be continued in order to eradicate rabies.

Measures in case of the positive findings or single cases

Suspected animals will be put under observation for 15 days. If the animal is vaccinated and no symptoms occur, the animal is re-vaccinated. In case the animal is not vaccinated, it has to be euthanised. Brain tissue is submitted to the National Diagnostic Centre for further investigations.
If the animal has not been vaccinated and the owner refueses to euthanise it, vaccination is performed and serum titer is determined.

Notification system in place

Regulation of Cabinet of Ministers Nr. 323, 28 august 1998 "The list of animal infectious diseases" determines animal infectious diseases that eradication are organised and managed by the Food and Veterinary Service.
Regulation of Cabinet of Ministers Nr. 298, 21 April 2006 "Procedures for prevention and combating of such infectious diseases as to which both animals and humans are susceptible" determines how to carry out prophylaxis and eradication of such infectious diseases (zoonoses) as to which both animals and humans are susceptible.
If an owner of an undertaking (company), owner of animals , hunter or head of laboratory determines zoonoses or he or she has suspicions regarding the illness of animals, he or she shall notify an authorised veterinarian or a territorial unit of the Food and Veterinary Service therefor.
If illness of animals or humans with zoonoses has been determined, a branch of the Public Health Agency and a territorial unit of the Food and Veterinary Service provide written information regarding:
- location of the determined zoonoses; and
- measures taken for limitation of zoonoses

Food and Veterinary Service (FVS)Order Nr. 241, 21.09.2001. issued by FVS determines the list of zoonoses immediately notified to the Central Authority of FVS.

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

In accordance with the epidemiological surveillance data, rabies cases in humans since 1974 have been registered as follows:
- 1982: 1 case in Kraslava district, source of infection: dog;
- 1986: 1 case in Kraslava district, source of infection: fox;
- 1993: 1 case in Saldus district, source of infection: fox;
- 2003: 1 case in Daugavpils district, source of infection: dog.

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	unspecified Lyssavirus	European Bat Lyssavirus - unspecified	classical rabies virus (genotype 1)
Cattle (bovine animals)		animal	27	13			13
Sheep		animal	1	0			
Solipeds, domestic		animal	2	0			
Dogs		animal	156	31			31
Cats		animal	171	44			44
Foxes							
wild		animal	336	187			187
Raccoon dogs							
wild		animal	203	153			153
Wolves							
wild		animal	1	1			1
Badgers							
wild		animal	16	8			8
Marten							
wild		animal	31	6			6
Wild boars							
wild		animal	4	1			1
Deer							
wild							
roe deer		animal	33	9			9
Rats							
pet animal		animal	2	0			
Polecats							
wild		animal	27	9			9
Beavers							
wild		animal	7	3			3
Hares							
wild		animal	2	0			
Otter		animal	4	1			1
Moose							

wild		animal	4	3			3
Minks							
wild		animal	14	0			
Squirrels							
wild		animal	1	0			
Hedgehogs							
wild		animal	1	1			1
Other animals		animal	2	1			1

2.12. Q-FEVER

2.12.1. General evaluation of the national situation

2.12.2. Coxiella (Q-fever) in animals

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1. ESCHERICHIA COLI, NON-PATHOGENIC

3.1.1. General evaluation of the national situation

3.1.2. Antimicrobial resistance in Escherichia coli, non-pathogenic isolates

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1. HISTAMINE

4.1.1. General evaluation of the national situation

4.1.2. Histamine in foodstuffs

4.2. ENTEROBACTER SAKAZAKII

4.2.1. General evaluation of the national situation

4.2.2. Enterobacter sakazakii in foodstuffs

4.3. STAPHYLOCOCCAL ENTEROTOXINS

4.3.1. General evaluation of the national situation

4.3.2. Staphylococcal enterotoxins in foodstuffs

5. FOODBORNE OUTBREAKS

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

A. Foodborne outbreaks

System in place for identification, epidemological investigations and reporting of foodborne outbreaks

Clinicians are legally responsible for notifying of the 99 infectious diseases, including food-borne diseases (is to be notified within 12 hours). Notification is required for cases of suspected infectious disease, a change or discharge of diagnosis of an infectious disease, the final diagnosis and outcome of infectious disease and laboratory confirmation of the diagnosis.
Epidemiologists of 10 local branches of the State Agency "Public Health Agency" (PHA) receive information from clinicians and perform investigation of the cases (outbreaks), take environmental samples for laboratory investigation, collect, store and analyze the epidemiological data, organize preventive and control measures.

Description of the types of outbreaks covered by the reporting:

In 2006, there were family and general outbreaks, and also 5 international ones (Shigellosis, Hepatitis A, Salmonellosis and Gastroenterocolitis). 13% of all outbreaks related to food-borne diseases were general, i.e. connected with the residents of an institution(kindergartens, caffees, hospitals, army etc.).

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

In 2006, 307 outbreaks were reported affecting all together 937 people (with possible or evident relationship with food source, with food as possible infection transmission vehicle, and by direct contact with the diseased person or contaminated household objects)

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

Among all foodborne outbreaks 43 (14%) was caused by Salmonella Enteritidis, 106 (34,5%)- by Rotavirus, and 29 (9,4%) by Norovirus. For 79 outbreaks the aethyological agent was remained unknown and 10 outbreaks was mixed the aethyological agent - Norovirus, Rotovirus and Salmonella.
For salmonellosis outbreaks the main implicated food source was chicken meet and eggs (egg-containing products), also meat balls and cakes.

Descriptions of single outbreaks of special interest

In 2006, there was an outbreak of gastroenteritis due to Salmonella Enteritidis associated with

attending an open-air public holiday event . Of approximately 260 persons who attended the public holiday event 107 participants were interviewed and 49 persons fulfilled the criteria of an outbreak case (attack rate = 46%). Stool specimens from 27 patients, including 17 kitchen workers, were tested microbiologically, and 8 specimens were positive for Salmonella Enteritidis. The retrospective cohort study revealed fried pork (this food was fried with a mixture of raw eggs) as the likely cause of the outbreak.

Table Foodborne outbreaks in humans

Causative agent	General outbreak	Household outbreak	Total Number of persons			Food implicated			Type of evidence for implication of the food	Place where food was consumed	Contributing factors
			ill (in total)	died	in hospital	Food (sub)category	Suspected as a source	Confirmed as a source			
1	2	3	4	5	6	7			8	9	10
Diphyllobothrium - D. latum		x	2	0					Lab. confirmed	Household	
Food borne viruses		x	2							Household	
Food borne viruses		x	2							Household	
Food borne viruses		x	2							Household	
Food borne viruses		x	2							Household	
Food borne viruses		x	2	0						Household	
Food borne viruses		x	3							Household	
Food borne viruses		x	3							Household	
Food borne viruses		x	3							Household	
Food borne viruses	x		3							Cafe	
Food borne viruses	x		6							Kindergarten	
Food borne viruses	x		6	0						Kindergarten	
Food borne viruses	x		13			Fish in dough				Army	
Food borne viruses - adenovirus		x	2	0						Household	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)		24	2	0						Household	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)		x	3	0						Household	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)		x	4	0						Household	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	x		2	0						Hospital	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	x		2	0						School	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus) (2)	x		13	0		Mayonnaise sauce			Epid. evidence	Army	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	x		14	0						Caffees	
Food borne viruses - hepatitis A virus		2	3	0						Household	
Food borne viruses - hepatitis A virus		2	4	0						Household	
Food borne viruses - hepatitis A virus		5	2	0						Household	

Food borne viruses - hepatitis A virus	x		13	0						Hospital	
Food borne viruses - rotavirus		X	4	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	
Food borne viruses - rotavirus		x	2	0						Household	

Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	2	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	3	0					Household	
Food borne viruses - rotavirus		x	4	0					Household	
Food borne viruses - rotavirus		x	4	0					Household	
Food borne viruses - rotavirus		x	4	0					Household	
Food borne viruses - rotavirus		x	4	0					Household	
Food borne viruses - rotavirus		x	4	0					Household	
Food borne viruses - rotavirus		x	4	0					Household	
Food borne viruses - rotavirus		x	4	0					Household	
Food borne viruses - rotavirus		x	4	0					Household	

Food borne viruses - rotavirus		x	5	0						Household	
Food borne viruses - rotavirus		x	6	0						Household	
Food borne viruses - rotavirus	x		2	0						Boarding-school	
Food borne viruses - rotavirus	x		2	0						Kindergarten	
Food borne viruses - rotavirus	x		2	0						Kindergarten	
Food borne viruses - rotavirus	x		2	0						Kindergarten	
Food borne viruses - rotavirus	x		2	0						Kindergarten	
Food borne viruses - rotavirus	x		6	0						Health centre	
Food borne viruses - rotavirus	x		6	0						Kindergarten	
Food borne viruses - rotavirus	x		8	0						Kindergarten	
Klebsiella - K. pneumoniae		x	2	0						Household	
Proteus		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	
Salmonella - S. Enteritidis		x	2	0						Household	Hig. deficiencies
Salmonella - S. Enteritidis		x	2	0						Household	Hig. deficiencies
Salmonella - S. Enteritidis		x	2	0		Cheese pizza	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	2	0		Egg-cont. sweets	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	2	0		Eggs (own hens)	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	2	0		Raw eggs	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	2	0		Raw eggs	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	2	0		Smoked chicken	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	3	0						Household	
Salmonella - S. Enteritidis		x	3	0						Household	
Salmonella - S. Enteritidis		x	3	0		Cake cream	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	3	0		Homemade cake	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	3	0		Minced meat balls	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	3	0		Pancakes	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	3	0		Raw eggs	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	4	0						Household	
Salmonella - S. Enteritidis		x	4	0		Raw eggs	x		Epid. evidence	Household	
Salmonella - S. Enteritidis		x	5	0						Household	
Salmonella - S. Enteritidis	x		2	0						Hotel (abroad)	
Salmonella - S. Enteritidis	x		2	0		Grilled chicken	x		Epid. evidence	Caffe	
Salmonella - S. Enteritidis	x		2	0		Meatball	x		Epid. evidence	Caffe	
Salmonella - S. Enteritidis	x		2	0		Pork chop (c. egg)	x		Epid. evidence	Caffe	
Salmonella - S. Enteritidis	x		3	0						Leisure centre	
Salmonella - S. Enteritidis	x		7	0						Kindergarten	
Salmonella - S. Enteritidis	x		7	0		Chicken chop	x		Epid. evidence	Leisure complex	
Salmonella - S. Enteritidis	x		8	0		Diferent food items		x	Lab. evidence	Caffee	
Salmonella - S. Enteritidis	x		8	0		Poultry	x		Epid. evidence	Pub	
Salmonella - S. Enteritidis	x		15	0		Chicken meat	x		Epid. evidence	Child care centre	

Salmonella - S. Enteritidis		x		15	0		Smoked chicken	x		Epid. evidence	Kindergarten			
Salmonella - S. Enteritidis		x		17	0		Chicken chop	x		Epid. evidence	Kindergarten			
Salmonella - S. Enteritidis		x		19	0		Salad with mayonnaise	x		Epid. evidence	Restaurant			
Salmonella - S. Enteritidis		x		31	0		Home-made food	x		Epid. evidence	Kindergarten			
Salmonella - S. Enteritidis		x		49	0		Chop with eggs	x		Epid. evidence	Outdoor entreprise			
Salmonella - S. Enteritidis		x		60	0		Ready-to-serve-food	x		Epid. evidence	Boarding school	Ill canteen worker		
Salmonella - S. Typhimurium			x	2	0						Household			
Salmonella - S. Typhimurium			x	2	0						Household			
Salmonella - S. Typhimurium			x	2	0						Household			
Salmonella - S. Virchow		x		2	0		Ready-to-serve-food	x		Epid. evidence	Canteen			
Shigella - S. dysenteriae		x		5	0						Abroad			
Shigella - S. sonnei			5	3	0						Household			
Shigella - S. sonnei			x	2	0						Household			
Shigella - S. sonnei		x		3	0						Nursery			
Shigella - S. sonnei		x		12	0						Abroad			
Staphylococcus - S. aureus			4	2	0						Household			
Staphylococcus - S. aureus			x	4	0						Household			
Staphylococcus - S. aureus (1)			x	5	0						Household			
Staphylococcus - S. aureus			x	5	0						Household			
Staphylococcus - S. aureus		x		6	0		Vinaigrette		x	Lab. confirmed	Kindergarten			
Trichinella - T. spiralis			x	2	0		Household pig		x	Lab. confirmed	Household			
Trichinella - T. spiralis			x	3	0		Wild boar		x		Household			
Unknown			2	4	0						Household			
Unknown			9	3	0						Household			
Unknown			61	2	0						Household			
Unknown			x	13	0						Household			
Unknown		2		2	0						Kindergarten			
Unknown		x		2	0						Abroad			
Unknown		x		2	0						Hospital			
Unknown		x		4	0						Abroad			
Unknown		x		4	0						Kindergarten			
Yersinia - Y. enterocolitica			x	2	0						Household			Rodents

(1) : Mixed outbreak - S. aureus, Salmonella B group
(2) : Mixed outbreak - Norovirus, Rotavirus, Astrovirus