



## LITHUANIA

The Report referred to in Article 5 of Directive 92/117/EEC

### TRENDS AND SOURCES OF ZOO NOSES AND ZOO NOTIC AGENTS IN HUMANS, FOODSTUFFS, ANIMALS AND FEEDINGSTUFFS

including information on foodborne outbreaks and  
antimicrobial resistance in zoonotic agents

IN 2004

## INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Lithuania**

Reporting Year: **2004**

**Institutions and laboratories involved in monitoring:**

<b>Laboratory name</b>	<b>Description</b>	<b>Contribution</b>
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## **PREFACE**

This report is submitted to the European Commission in accordance with Article 5 of Council Directive 92/117/EEC<sup>1</sup>. 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 Lithuania during the year 2004. 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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<sup>1</sup> Council Directive 92/117/ECC of 17 December 1992 concerning measures for protection against specified zoonoses and specified zoonotic agents in animals and products of animal origin in order to prevent outbreaks of foodborne infections and intoxications, OJ L 62, 15.3.1993, p. 38

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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.

**Table 14.1 Susceptible animal populations: number of herds and holdings rearing animals**

\* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks		Number of holdings	
			Year*		Year*
Cattle (bovine animals)	dairy cows and heifers			193413	
	in total			195226	
Ducks	in total			2	
Gallus gallus	mixed flocks/holdings (1)				
	broilers (2)	1183			
	laying hens	83			
	parent birds for meat production line	49			
	parent birds for egg production line	5			
	in total			198778	
Geese	in total			1	
Goats	in total			3665	
Pigs	sows and gilts			20143	
	fattening pigs			148102	
	mixed herds			156873	
	in total			169200	
Sheep	in total			2630	
Solipeds	horses - in total			54647	
Turkeys	in total			3	
Farmed reindeers	in total			0	
Farmed wild boars	in total			0	
Farmed deer	in total			0	

(1): 182 flocks montly

(2): 182 flocksat one period of growth

**Table 14.2 Susceptible animal populations: number of animals**

\* Only if different than current reporting year

Animal species	Category of animals	Livestock numbers (live animals)		Number of slaughtered animals	
			Year*		Year*
Cattle (bovine animals)	calves (under 1 year)	188900			
	dairy cows and heifers	526900			
	meat production animals	96300			
	in total	916715			
Ducks	in total	46739			
Gallus gallus	parent birds - in total	425000			
	broilers (1)	24000000			
	laying hens	2300000			
	parent birds for meat production line	385000			
	parent birds for egg production line	40000			
	in total	26728000			
Geese	in total	52437			
Goats	in total	7112			
Pigs	sows and gilts	94270			
	breeding animals	96505			
	fattening pigs	517320			
	in total	1057358			
Sheep	in total	34292			
Solipeds	horses - in total	63587			
Turkeys	in total	98438			
Farmed reindeers	in total	0			
Farmed wild boars	in total	0			
Farmed deer	in total	0			

(1): 3 692 230 at one period of growth

**Footnote**

Data on the 1st of January 2004

## **2. INFORMATION ON SPECIFIC ZONOSSES AND ZONOTIC 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**

### **2.1.2. Salmonellosis in humans**

#### **A. Salmonellosis in humans**

##### **Reporting system in place for the human cases**

Health minister's order regulates information providing system on communicable diseases and its list. Clinician informs territorial public healthcare institution about suspected or probable or confirmed case in 12 hours by phone, in 72 hours sends an urgent report. When diagnosis is changed clinician informs territorial public healthcare institution in 12 hours. Territorial public healthcare institutions register every case in standard form. In the end of every month data on morbidity of communicable diseases are summarised and sent to national level CCDPC. CCDPC publishes monthly bulletin of morbidity in infectious diseases and sends it to regional public healthcare centers, State public healthcare service, State food and veterinary service, bordering countries WHO, EU communicable diseases surveillance network. Every year territorial public healthcare institutions provide annual statistical data on extended epidemiological investigations.

##### **Case definition**

Clinical picture compatible with salmonellosis, isolation of *Salmonella* (non-typhi, non-paratyphi) from a clinical specimen.

##### **Diagnostic/analytical methods used**

Methods used:

Bacteriological culture

Quality assurance procedures:

Internal quality control system:

a) standard media quality control procedures

b) standard antisera control procedures

c) standard antimicrobial susceptibility testing control procedures

External "PT" Quality Assessment Programmes. Labquality Helsinki Finland .

Reference: WHO Manual for the laboratory identification and antimicrobial susceptibility testing of bacterial pathogens of public health concern in the developing world. 2003

##### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and cases are registered in State register for communicable diseases.

##### **History of the disease and/or infection in the country**

Since 1959 there are detected 2 peaks of salmonellosis incidence: 1975-1980 *S.typhimurium* outspread through milk formula produced in centralised milk formula kitchens and in children departments of hospitals. Since 1989 to 1998 was noticed second peak of incidence where *S. enteritidis* dominated.

### **Results of the investigation**

Territorial public healthcare institutions perform an epidemiological investigation of salmonellosis clusters according to standardised protocol. These protocols are kept in territorial public healthcare institutions. Computerised communicable diseases reporting system is implemented in two regional public health centers (Vilnius, Kaunas).

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

Since 1998 is a trend of decrease in incidence. Incidence decreased from 68,8/100 000 in 1998 to 33,3/100 000 in 2003. In 2004 incidence rate increased to 54/100 000 per population. Last years mostly ( 85%) there have been registered sporadic cases. During last years the main reason of salmonellosis is chicken, other poultry, eggs and their products.

### **Relevance as zoonotic disease**

Between all diarrhoea diseases salmonellosis consist about 10%. About 70% of patients are infected from homemade food.

Table 3.4.1.A Salmonellosis in man - species/serotype distribution

Salmonella	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc	unknown status
S. Bovismorbificans	1852	0	1852	0	0	0	0
S. Braenderup	1		1				
S. Derby	3		3				
S. Dublin	2		2				
S. Enteritidis	1		1				
S. Glostrup	1649		1649				
S. Hadar	7		7				
S. Infantis	1		1				
S. Kentucky	21		21				
S. Oranienburg	1		1				
S. Tshingwe	3		3				
S. Typhimurium	86		86				
S. Virchow	1		1				
Salmonella spp. clinical case	75		75				
	25		25				

**Footnote**

General incidence rate per 100 000 population was 54,4.

Table 3.4.1.B Salmonellosis in man - age distribution

Age Distribution	S. Enteritidis			S. Typhimurium			Salmonella spp.		
	All	M	F	All	M	F	All	M	F
<1 year	96	55	41	6	3	3	109	64	45
1 to 4 years(1)	388	204	184	24	13	11	430	225	205
5 to 14 years(2)	448	219	229	20	6	14	496	236	260
15 to 24 years(3)	223	106	117	13	7	6	253	123	130
25 to 44 years(4)	229	121	108	7	2	5	257	139	118
45 to 64 years(5)	101	47	54	5	1	4	111	52	59
65 years and older(6)	164	56	108	11	3	8	198	66	132
Age unknown									
<b>Total :</b>	<b>1649</b>	<b>808</b>	<b>841</b>	<b>86</b>	<b>35</b>	<b>51</b>	<b>1854</b>	<b>905</b>	<b>949</b>

(1) : 1 to 3 years

(2) : 4 to 14 years

(3) : 15 to 29 years

(4) : 30 to 49 years

(5) : 50 to 59 years

(6) : 60 years and older

Table 3.4.2 Salmonellosis in man - seasonal distribution

Month	S. Enteritidis		S. Typhimurium		Salmonella spp.	
	Cases	Cases	Cases	Cases	Cases	Cases
January	118		12		136	
February	42		2		47	
March	74		4		93	
April	61		13		88	
May(1)	126		3		141	
June	132		10		164	
July(2)	172		14		191	
August(3)	298		13		322	
September(4)	262		7		281	
October	166		4		180	
November	116		3		126	
December	82		1		85	
not known						
<b>Total :</b>	<b>1649</b>		<b>86</b>		<b>1854</b>	

(1) : 1 clinical case  
(2) : 3 clinical cases  
(3) : 1 clinical case  
(4) : 20 clinical cases

## 2.1.3. Salmonella in foodstuffs

Table 3.3.1 Salmonella sp. in meat and meat products

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium	S. group B	S. group D
<b>Bovine meat</b>										
<b>fresh</b>										
- at processing plant	Labs. of SFVS		sample	25g	3					
- at retail	Labs. of SFVS		sample	25g	8					
<b>minced meat</b>										
- at processing plant	Labs. of SFVS		sample	25g	2					
- at retail	Labs. of SFVS		sample	25g	8					
<b>meat products</b>										
<b>non-ready-to-eat</b>										
- at retail	Labs. of SFVS		sample	25g	3					
<b>ready-to-eat</b>										
- at processing plant	Labs. of SFVS		sample	25g	4	3				3
<b>Pig meat</b>										
<b>fresh</b>										
- at processing plant (1)	Labs. of SFVS		sample	25g	11	2		1	1	
- at retail (2)	Labs. of SFVS		sample	25g	46	1		1		
<b>minced meat</b>										
- at processing plant	Labs. of SFVS		sample	25g	6					
- at retail	Labs. of SFVS		sample	25g	18					
<b>meat products</b>										
<b>non-ready-to-eat</b>										
- at processing plant	Labs. of SFVS		sample	25g	3					
- at retail	Labs. of SFVS		sample	25g	10					

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<b>ready-to-eat</b> - at processing plant	Labs. of SFVS	sample	25g	13	3		2		1
	Labs. of SFVS	sample	25g	13					
- at retail	Labs. of SFVS	sample	25g	13					
<b>Broiler meat</b>									
<b>fresh</b>									
- at processing plant	Labs. of SFVS	sample	25g	3					
- at retail	Labs. of SFVS	sample	25g	23					
<b>minced meat</b>									
- at retail	Labs. of SFVS	sample	25g	2					
<b>meat products</b>									
<b>non-ready-to-eat</b>									
- at processing plant	Labs. of SFVS	sample	25g	9					
- at retail	Labs. of SFVS	sample	25g	8	1	1			
<b>ready-to-eat</b>									
- at processing plant	Labs. of SFVS	sample	25g	8					
- at retail	Labs. of SFVS	sample	25g	22					
<b>Turkey meat</b>									
<b>fresh</b>									
- at processing plant	Labs. of SFVS	sample	25g	1					
<b>minced meat</b>									
- at processing plant	Labs. of SFVS	sample	25g	1					
<b>meat products</b>									
<b>non-ready-to-eat</b>									
- at processing plant	Labs. of SFVS	sample	25g	2					
<b>ready-to-eat</b>									
- at processing plant	Labs. of SFVS	sample	25g	2					
- at retail	Labs. of SFVS	sample	25g	1					
<b>Other meat</b>									
<b>fresh</b>									
- at processing plant	Labs. of SFVS	sample	25g	1					
<b>minced meat</b>									

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- at retail	Labs. of SFVS	sample	25g	4					
<b>Mixed meat</b>									
<b>minced meat</b>									
- at processing plant	Labs. of SFVS	sample	25g	2					
- at retail	Labs. of SFVS	sample	25g	11					
<b>Other animals or mixed meat</b>									
<b>meat products</b>									
<b>non-ready-to-eat</b>									
- at processing plant	Labs. of SFVS	sample	25g	11					
- at retail	Labs. of SFVS	sample	25g	4					
<b>ready-to-eat</b>									
- at processing plant	Labs. of SFVS	sample	25g	44	1				1
- at retail	Labs. of SFVS	sample	25g	60					

(1) : Together with subproducts

(2) : Together with subproducts

Labs. of SFVS - Laboratories of SFVS

**Table 3.3.2 Salmonella sp. in other food**

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium	S. group D
<b>cow milk</b>									
raw	Laboratories of SFVS		sample	25ml	6				
<b>Dairy products</b>									
ready-to-eat	Laboratories of SFVS		sample	25g/ml	153				
<b>Table eggs</b>									
- at retail	Laboratories of SFVS		sample	25g	20				
<b>Egg products</b>	Laboratories of SFVS		sample	25g	1				
<b>Fishery products</b>									
fish	Laboratories of SFVS		sample	25g	32				
<b>Other food</b>	Laboratories of SFVS		sample	25g/ml	305	2	1		1

**2.1.4. Salmonella in animals****Table 3.2.1 Salmonella sp. in Poultry breeding flocks (Gallus gallus)**

	Source of information	Remarks	Epidemiological unit	Flocks tested	Flocks positive	S. Enteritidis	S. Typhimurium
<b>Gallus gallus</b>							
parent breeding flocks for egg production line	SFVS AHD		Flock	6	0		
day-old chicks	SFVS AHD		Flock	4	0		
- during production period	SFVS AHD		Flock	6	0		
- during rearing period	SFVS AHD		Flock	4	0		
parent breeding flocks for meat production line	SFVS AHD		Flock	72	0		
day-old chicks	SFVS AHD		Flock	35	0		
- during rearing period	SFVS AHD		Flock	48	0		
- during production period	SFVS AHD		Flock	52	0		
parent breeding flocks, unspecified	SFVS AHD		Flock	1	0		

**Table 3.2.2 Salmonella sp. in other commercial poultry**

	Source of information	Remarks	Epidemiological unit	Flocks tested	Flocks positive	S. Enteritidis	S. Typhimurium	S. Infantis	S. group B	S. group C
<b>Gallus gallus</b>										
<b>laying hens</b>										
day-old chicks	Labs. of SFVS	Agent id.	Flock	100	0					
- during rearing period	Labs. of SFVS	Agent id.	Flock	146	1			1		
- during production period	Labs. of SFVS	Agent id.	Flock	663	2	1				1
unspecified	Labs. of SFVS	Agent id.	Flock	483	2	2				
<b>broilers</b>										
day-old chicks	Labs. of SFVS	Agent id.	Flock	208	0					
- during rearing period	Labs. of SFVS	Agent id.	Flock	640	0					
unspecified	Labs. of SFVS	Agent id.	Flock	889	17	14			1	2

**Footnote**

SFVS - State Food and Veterinary Service; Labs. of SFVS - Laboratories of SFVS  
Agent id. - Agent identification

**Table 3.2.3 Salmonella sp. in non-commercial poultry and birds**

	Source of information	Remarks	Epidemiological unit	Flocks tested	Flocks positive	S. Enteritidis	S. Typhimurium	S. Infantis	S. London	S. group C2
<b>Pigeons</b>	Labs. of SFVS	Agent id.	Flock	5	2		2			
<b>Ducks</b>	Labs. of SFVS	Agent id.	Flock	3	3				3	
<b>Gallus gallus</b>	Labs. of SFVS	Agent id.	Flock	184	14	10		1	2	1

**Footnote**

SFVS - State Food and Veterinary Service; Labs. of SFVS - Laboratories of SFVS  
 Agent id. - Agent identification

**Table 3.2.4 Salmonella sp. in animals ( non poultry)**

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	S. Enteritidis	S. Typhimurium	S. Dublin	S. Choleraesuis	S. Derby
<b>Cattle (bovine animals)</b>	Labs. of SFVS	Agent id.	Animal	87	2	1		1		
<b>Sheep</b>	Labs. of SFVS	Agent id.	Animal	14	0					
<b>Pigs</b>										
unspecified	Labs. of SFVS	Agent id.	Animal	93	6				5	1
<b>Farmed wild boars</b>	Labs. of SFVS	Agent id.	Animal	15	0					
<b>all animals</b>	Labs. of SFVS	Agent id.	Animal	28	0					

**Footnote**

SFVS - State Food and Veterinary Service; Labs. of SFVS - Laboratories of SFVS

Agent id. - Agent identification

### 2.1.5. Salmonella in feedstuffs

**Table 3.1.1 Salmonella sp. in feed material of animal origin**

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium	S. Agona
<b>Feed material of marine animal origin</b>									
Fish meal	Labs. of SFVS	Agent id.	Sample	25 g	130	1			1

#### Footnote

SFVS - State Food and Veterinary Service; Labs. of SFVS - Laboratories of SFVS  
 Agent id. - Agent identification

**Table 3.1.2 Salmonella sp. in feed of vegetable origin**

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium	S. Agona	S. Tennessee	S. Dessau
<b>Feed material of cereal grain origin</b>											
other cereal grain derived	Labs. of SFVS	Agent id.	Sample	25 g	58	0					
<b>Feed material of oil seed or fruit origin</b>											
other oil seeds derived	Labs. of SFVS	Agent id.	Sample	25 g	173	5			2	1	2

**Footnote**

SFVS - State Food and Veterinary Service; Labs of SFVS - Laboratories of SFVS  
 Agent id. - Agent identification

**Table 3.1.3 Salmonella sp. in compound feedingstuff**

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium	S. group E
<b>Compound feedingstuffs for cattle</b>									
Final product	NVL	Agent. id.	Sample	25 g	10	0			
<b>Compound feedingstuffs for pigs</b>									
Final product	NVL	Agent. id.	Sample	25 g	23	1			1
<b>Compound feedingstuffs for poultry (non specified)</b>									
Final product	NVL	Agent. id.	Sample	25 g	22	0			

**Footnote**

NVL - National Veterinary Laboratory,  
Agent id. - Agent identification

### **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 3.3.3 Salmonella serovars in animals**

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus		Other poultry	
	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Sources of isolates								
Number of isolates in the laboratory		2		6	23	14		5
Number of isolates serotyped								

**Footnote**

(\*) M : Monitor, C : Clinical

Table 3.3.4 Salmonella serovars in food

Serovars	Bovine meat		Pig meat		Broiler meat		Other poultry		Other products of animal origin		Bakery products		Other processed food products	
	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Sources of isolates														
Number of isolates in the laboratory	N=													
Number of isolates serotyped	N=													
	3		6		1				1		1		2	
	3		6		1				1		1		2	
<b>Number of isolates per type</b>														
S. Enteritidis					1									2
S. Typhimurium			4											
S. group B			1											
S. group D	3		1						1		1			
<b>Total of typed <i>Salmonella</i>/isolates</b>														

**Footnote**

(\*) M : Monitor, C : Clinical

**Table 3.3.9 S. Enteritidis phagetypes in humans**

Phagetype	humans	
	M(*)	C(*)
Sources of isolates		
Number of isolates in the laboratory N=		
Number of isolates serotyped N=		

**Footnote**

(\*) M : Monitor, C : Clinical  
 S.Enteritidis isolates were not phagetyped

**Table 3.3.10 S. Typhimurium phage types in humans**

Phagetype	humans	
	M(*)	C(*)
Sources of isolates		
Number of isolates in the laboratory N=		
Number of isolates serotyped N=		

**Footnote**

(\*) M : Monitor, C : Clinical  
 S.Typhimurium isolates were not phagetyped

### **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. Derby in Pigs - quantitative data [Diffusion method]

S. Derby		Percentage of resistant isolates (R%) and percentage of isolates with the concentration ( $\mu\text{l/ml}$ ) or zone (mm) of inhibition equal to																																					
Pigs																																							
Isolates out of a monitoring program	no																																						
Number of isolates available in the laboratory	1																																						
Antimicrobials:	N	%R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
<b>Tetracycline</b>	1	100%	1																																				
<b>Amphenicols</b>																																							
Chloramphenicol	1	0																								1													
<b>Fluroquinolones</b>																																							
Ciprofloxacin	1	0																																					1
<b>Quinolones</b>																																							
Nalidixic acid	1	0																																					1
<b>Trimethoprim</b>																																							
Trimethoprim	1	0%																																					1
<b>Aminoglycosides</b>																																							
Streptomycin	1	0																																					
Gentamicin	1	0																																					
Kanamycin	1	0																																					
Kanamycin	1	0																																					
<b>Trimethoprim + sulfonamides</b>																																							
Trimethoprim + sulfonamides	1	0%																																					
<b>Penicillins</b>																																							
Ampicillin	1	0																																					
Ampicillin	1	0																																					

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

Percentage of resistant isolates (R%) and percentage of isolates with the concentration ( $\mu\text{l/ml}$ ) or zone (mm) of inhibition equal to		23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	%R	N
<b>S. Dublin</b>																					
<b>Cattle (bovine animals)</b>																					
Isolates out of a monitoring program	no																				
Number of isolates available in the laboratory	1																				
<b>Antimicrobials:</b>		1																		0%	1
<b>Tetracycline</b>			1																		
<b>Amphenicols</b>																					
Chloramphenicol																		1			
<b>Fluroquinolones</b>																					
Ciprofloxacin																					1
<b>Quinolones</b>																					
Nalidixic acid																			1		
<b>Trimethoprim</b>																					
Trimethoprim																					1
<b>Aminoglycosides</b>																					
Streptomycin																					
Gentamicin																					1
Kanamycin																					
Trimethoprim + sulfonamides																					
Trimethoprim + sulfonamides																					
Trimethoprim + sulfonamides																					1
<b>Penicillins</b>																					
Ampicillin																					
Ampicillin																					1

**Table 3.2.5.2 Antimicrobial susceptibility testing of S. Enteritidis in animals**

S. Enteritidis											
	Cattle (bovine animals)		Pigs		Gallus gallus		Gallus gallus - monitoring programme		Turkeys		
Isolates out of a monitoring program					no		yes				
Number of isolates available in the laboratory					10		17				
<b>Antimicrobials:</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	
Tetracycline					1	0%	14	0%			
<b>Amphenicols</b>											
Chloramphenicol					1	0%	14	0%			
<b>Fluoroquinolones</b>											
Ciprofloxacin					1	0%	14	0%			
<b>Quinolones</b>											
Nalidixic acid					1	0%	14	0%			
Trimethoprim					1	0%	14	21%			
<b>Aminoglycosides</b>											
Streptomycin					1	0%	14	21%			
Gentamicin					1	100%					
Kanamycin					1	0%	14	0%			
Trimethoprim + sulfonamides					1	0%	14	21%			
<b>Penicillins</b>											
Ampicillin					1	0%	14	14%			
<b>Number of multiresistant isolates</b>											
fully sensitives							8	57%			
resistant to 1 antimicrobial					1	100%	3	21%			
resistant to 2 antimicrobials							1	7%			
resistant to 4 antimicrobials							2	14%			



**Table Antimicrobial susceptibility testing of S. Enteritidis in Gallus gallus - quantitative data [Diffusion method]**

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
<b>S. Enteritidis</b>																	
<b>Gallus gallus</b>																	
Isolates out of a monitoring program	no																
Number of isolates available in the laboratory	1																
<b>Antimicrobials:</b>	<b>N</b>	<b>%R</b>															
<b>Tetracycline</b>	1	0%															
<b>Amphenicols</b>																	
Chloramphenicol	1	0															
<b>Fluroquinolones</b>																	
Ciprofloxacin	1	0															
<b>Quinolones</b>																	
Nalidixic acid	1	0															
<b>Trimethoprim</b>	1	0%															
<b>Aminoglycosides</b>																	
Streptomycin	1	0															
Gentamicin	1	100															
Kanamycin	1	0															
<b>Trimethoprim + sulfonamides</b>	1	0%															
<b>Penicillins</b>																	
Ampicillin	1	0															

Table Antimicrobial susceptibility testing of *S. Enteritidis* in Broiler meat - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration ( $\mu\text{l/ml}$ ) or zone (mm) of inhibition equal to		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
<b>S. Enteritidis</b>																	
<b>Broiler meat</b>																	
Isolates out of a monitoring program	no																
Number of isolates available in the laboratory	9																
<b>Antimicrobials:</b>	N	9	%R	11%													
<b>Tetracycline</b>																	
<b>Amphenicols</b>																	
Chloramphenicol		9	0		1	1	1	1	1								
<b>Fluoroquinolones</b>																	
Ciprofloxacin		9	0							2	1	3	1				2
<b>Quinolones</b>																	
Nalidixic acid		9	11	1						1							
<b>Trimethoprim</b>																	
Trimethoprim		9	11%	1					4	2	1		1				
<b>Aminoglycosides</b>																	
Streptomycin		9	0					1									
Gentamicin		9	0					2	3	2							
Kanamycin		9	0					1	2	2	1	1					
<b>Trimethoprim + sulfonamides</b>																	
Trimethoprim + sulfonamides		9	0%					2	1	1	3	1					
<b>Penicillins</b>																	
Ampicillin		9	0							3	1	2					

**Table Antimicrobial susceptibility testing of S. Enteritidis in Cream - import - import controls - quantitative data [Diffusion method]**

Percentage of resistant isolates (R%) and percentage of isolates with the concentration ( $\mu\text{l/ml}$ ) or zone (mm) of inhibition equal to		35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	%R	N					
<b>S. Enteritidis</b>																																						
<b>Cream - import - import controls</b>																																						
Isolates out of a monitoring program	no																																					
Number of isolates available in the laboratory	1																																					
<b>Antimicrobials:</b>		1													1																0%	1						
<b>Tetracycline</b>																																						
<b>Amphenicols</b>																																						
Chloramphenicol												1																										
<b>Fluoroquinolones</b>																																						
Ciprofloxacin																																						
<b>Quinolones</b>																																						
Nalidixic acid																																						
<b>Trimethoprim</b>																																						
<b>Aminoglycosides</b>																																						
Streptomycin																																						
Gentamicin																																						
Kanamycin																																						
<b>Trimethoprim + sulfonamides</b>																																						
<b>Penicillins</b>																																						
Ampicillin																																						



**Table 3.2.7.6 Antimicrobial susceptibility testing of S. Enteritidis in humans - qualitative data**

S. Enteritidis		
humans		
Isolates out of a monitoring program	no	
Number of isolates available in the laboratory	1994	
<b>Antimicrobials:</b>		
	<b>N</b>	<b>%R</b>
Tetracycline	1743	5,56%
<b>Amphenicols</b>		
Chloramphenicol	1743	1,84%
<b>Cephalosporin</b>		
Ceftazidim	1743	0,11%
<b>Fluoroquinolones</b>		
Ciprofloxacin	1743	0,06%
Trimethoprim	1743	0,57%
<b>Aminoglycosides</b>		
Gentamicin	1743	0,57%
Trimethoprim + sulfonamides	1743	1,55%
<b>Penicillins</b>		
Ampicillin	1743	6,37%
<b>Number of multiresistant isolates</b>		
fully sensitives	1480	84,91%
resistant to 1 antimicrobial	207	11,88%
resistant to 2 antimicrobials	43	2,47%
resistant to 3 antimicrobials	6	0,34%
resistant to 4 antimicrobials	5	0,29%
resistant to >4 antimicrobials	2	0,11%

**Table Antimicrobial susceptibility testing of S. Infantis in Gallus gallus - quantitative data [Diffusion method]**

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to		22	23	24	25	26	27	28	29	30	31	32	33	34	35
<b>S. Infantis</b>															
<b>Gallus gallus</b>															
Isolates out of a monitoring program	no														
Number of isolates available in the laboratory	1														
<b>Antimicrobials:</b>	<b>N</b>	<b>%R</b>													
<b>Tetracycline</b>	1	0%													
<b>Amphenicols</b>															
Chloramphenicol	1	0	1												
<b>Fluroquinolones</b>															
Ciprofloxacin	1	0													1
<b>Quinolones</b>															
Nalidixic acid	1	0			1										
<b>Trimethoprim</b>	1	0%								1					
<b>Aminoglycosides</b>															
Streptomycin	1	0				1									
Gentamicin	1	0											1		
Kanamycin	1	0											1		
<b>Trimethoprim + sulfonamides</b>	1	0%												1	
<b>Penicillins</b>															
Ampicillin	1	0												1	



**Table Antimicrobial susceptibility testing of S. Panama in Pig meat - import - import controls - quantitative data [Diffusion method]**

Percentage of resistant isolates (R%) and percentage of isolates with the concentration ( $\mu\text{l/ml}$ ) or zone (mm) of inhibition equal to		35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	%R	N
<b>S. Panama</b>													1																		0%	1	
<b>Pig meat - import - import controls</b>																																	1
Isolates out of a monitoring program	yes																															1	
Number of isolates available in the laboratory																																1	
<b>Antimicrobials:</b>																																	
<b>Tetracycline</b>																																0%	
<b>Amphenicols</b>																																0	
Chloramphenicol														1																		0	
<b>Fluoroquinolones</b>																																0	
Ciprofloxacin																																0	
<b>Quinolones</b>																																0	
Nalidixic acid																																0%	
<b>Trimethoprim</b>																																0%	
<b>Aminoglycosides</b>																																0	
Streptomycin																																0	
Gentamicin																																0	
Kanamycin																																0	
<b>Trimethoprim + sulfonamides</b>																																0%	
<b>Penicillins</b>																																0	
Ampicillin																																0	

**Footnote**

from Germany

Table Antimicrobial susceptibility testing of *S. Schwarzengrund* in Other meat - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration ( $\mu\text{l/ml}$ ) or zone (mm) of inhibition equal to		22	23	24	25	26	27	28	29	30	31	32	33	34	35
<b>S. Schwarzengrund</b>															
<b>Other meat</b>															
Isolates out of a monitoring program	no														
Number of isolates available in the laboratory	1														
<b>Antimicrobials:</b>	<b>N</b>	<b>%R</b>													
<b>Tetracycline</b>	1	0%													
<b>Amphenicols</b>															
Chloramphenicol	1	0				1									
<b>Fluroquinolones</b>															
Ciprofloxacin	1	100													
<b>Quinolones</b>															
Nalidixic acid	1	0												1	
<b>Trimethoprim</b>	1	0%													
<b>Aminoglycosides</b>															
Streptomycin	1	0													
Gentamicin	1	0												1	
Kanamycin	1	0												1	
<b>Trimethoprim + sulfonamides</b>	1	0%													
<b>Penicillins</b>															
Ampicillin	1	0													

**Table Antimicrobial susceptibility testing of S. Typhimurium in Prepared food, non-ready to eat - official food or feed controls - quantitative data [Diffusion method]**

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to																																						
S. Typhimurium																																						
Prepared food, non-ready to eat - official food or feed controls																																						
Isolates out of a monitoring program	yes																																					
	2																																					
Number of isolates available in the laboratory	2																																					
		N	%R	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35					
<b>Antimicrobials:</b>		2	100%	2																																		
<b>Tetracycline</b>		2	100%	2																																		
<b>Amphenicols</b>		2	50	1																																		
Chloramphenicol		2	50	1																																		
<b>Fluoroquinolones</b>		2	0																																			
Ciprofloxacin		2	0																																			
<b>Quinolones</b>		2	0																																			
Nalidixic acid		2	0																																			
<b>Trimethoprim</b>		2	100%	2																																		
<b>Aminoglycosides</b>		2	100	2																																		
Streptomycin		2	100	2																																		
Gentamicin		2	0																																			
Kanamycin		2	50	1																																		
<b>Trimethoprim + sulfonamides</b>		2	50%	1																																		
<b>Penicillins</b>		2	100	2																																		
Ampicillin		2	100	2																																		

**Table 3.2.7.7 Antimicrobial susceptibility testing of S. Typhimurium in humans - qualitative data**

S. Typhimurium		
humans		
Isolates out of a monitoring program	no	
Number of isolates available in the laboratory	133	
<b>Antimicrobials:</b>		
	<b>N</b>	<b>%R</b>
Tetracycline	115	9,56%
<b>Cephalosporin</b>		
Ceftazidim	115	0,87%
<b>Fluoroquinolones</b>		
Ciprofloxacin	115	0%
<b>Aminoglycosides</b>		
Gentamicin	115	0,87%
Trimethoprim + sulfonamides	115	4,35%
<b>Penicillins</b>		
Ampicillin	115	43,48%
<b>Number of multiresistant isolates</b>		
fully sensitives	83	72,17%
resistant to 1 antimicrobial	23	20,0%
resistant to 2 antimicrobials	9	7,82%
resistant to 3 antimicrobials	0	
resistant to 4 antimicrobials	0	
resistant to >4 antimicrobials	0	
<b>Number of multiresistant DT104</b>		
with penta resistance	0	

**Table 3.2.5.1 Antimicrobial susceptibility testing of Salmonella spp. in animals**

Salmonella spp.											
	Cattle (bovine animals)		Pigs		Gallus gallus		Ducks		Turkeys		
Isolates out of a monitoring program	no		no		no		no				
Number of isolates available in the laboratory	2		6		4		3				
<b>Antimicrobials:</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	
Tetracycline	1	0%	2	100%	2	50%	3	33%			
<b>Amphenicols</b>											
Chloramphenicol	1	0%	2	50%	2	0%	3	0%			
<b>Fluoroquinolones</b>											
Ciprofloxacin	1	0%	2	0%	2	0%	3	0%			
<b>Quinolones</b>											
Nalidixic acid	1	0%	2	50%	2	50%	3	0%			
Trimethoprim	1	0%	2	0%	2	50%	3	0%			
<b>Aminoglycosides</b>											
Streptomycin	1	0%	2	50%	2	50%	3	0%			
Gentamicin	1	0%	2	0%	2	0%	3	0%			
Kanamycin	1	0%	2	50%	2	50%	3	0%			
Trimethoprim + sulfonamides	1	0%	2	0%	2	0%	3	0%			
<b>Penicillins</b>											
Ampicillin	1	0%	2	0%	2	50%	3	0%			
<b>Number of multiresistant isolates</b>											
fully sensitives	1	100%			1	50%	2	66%			
resistant to 1 antimicrobial			1	50%			1	33%			
resistant to >4 antimicrobials			1	50%	1	50%					

**Table 3.2.5.5 Antimicrobial susceptibility testing of Salmonella spp. in food**

Salmonella spp.															
	Broiler meat		Other poultry meat		Pig meat		Bovine meat		Other meat		Prepared food, non-ready to eat - monitoring programme		Prepared food, non-ready to eat		
Isolates out of a monitoring program	no				yes				no		no		no		
Number of isolates available in the laboratory	9				1				1		2		2		
<b>Antimicrobials:</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	<b>N</b>	<b>%R</b>	
Tetracycline	9	11%			1	0%			1	0%					
<b>Amphenicols</b>															
Chloramphenicol	9	0%			1	0%			1	0%					
<b>Fluoroquinolones</b>															
Ciprofloxacin	9	0%			1	0%			1	100%					
<b>Quinolones</b>															
Nalidixic acid	9	11%			1	0%			1	0%					
Trimethoprim					1	0%			1	0%					
<b>Aminoglycosides</b>															
Streptomycin	9	0%			1	0%			1	0%					
Gentamicin	9	0%			1	0%			1	0%					
Kanamycin	9	0%			1	0%			1	0%					
Trimethoprim + sulfonamides	9	0%			1	2%									
<b>Penicillins</b>															
Ampicillin	9	0%			1	0%			1	0%					
<b>Number of multiresistant isolates</b>															
fully sensitives	7	88%			1	100%									
resistant to 1 antimicrobial	2	22%							1	100%					

**Table 3.2.7.5 Antimicrobial susceptibility testing of Salmonella spp. in humans - qualitative data**

Salmonella spp.		
humans		
Isolates out of a monitoring program	no	
Number of isolates available in the laboratory	2237	
<b>Antimicrobials:</b>	<b>N</b>	<b>%R</b>
Tetracycline	1955	5,73%
<b>Amphenicols</b>		
Chloramphenicol	1955	2,56%
<b>Cephalosporin</b>		
Ceftazidim	1955	0,20%
<b>Fluoroquinolones</b>		
Ciprofloxacin	1955	0,05%
Trimethoprim	1955	0,51%
<b>Aminoglycosides</b>		
Gentamicin	1955	0,61%
Trimethoprim + sulfonamides	1955	1,74%
<b>Penicillins</b>		
Ampicillin	1955	8,95%
<b>Number of multiresistant isolates</b>		
fully sensitives	1641	83,94%
resistant to 1 antimicrobial	242	12,38%
resistant to 2 antimicrobials	56	2,86%
resistant to 3 antimicrobials	8	0,41%
resistant to 4 antimicrobials	6	0,31%
resistant to >4 antimicrobials	2	0,10%

**Table Antimicrobial susceptibility testing of S. group C in Gallus gallus - monitoring programme - quantitative data [Diffusion method]**

Percentage of resistant isolates (R%) and percentage of isolates with the concentration ( $\mu\text{l/ml}$ ) or zone (mm) of inhibition equal to		22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	%R	N
S. group C																				
Gallus gallus - monitoring programme																				
Isolates out of a monitoring program		yes																		
Number of isolates available in the laboratory		2																		
<b>Antimicrobials:</b>																				
<b>Tetracycline</b>																	1		50%	2
<b>Amphenicols</b>																				
Chloramphenicol																			0	2
<b>Fluoroquinolones</b>																				
Ciprofloxacin																			0	2
<b>Quinolones</b>																				
Nalidixic acid																			50	2
<b>Trimethoprim</b>																			0%	2
<b>Aminoglycosides</b>																				
Streptomycin																			50	2
Gentamicin																			0	2
Kanamycin																			50	2
<b>Trimethoprim + sulfonamides</b>																			0%	2
<b>Penicillins</b>																				
Ampicillin																			0	2

Table Antimicrobial susceptibility testing of S. group C2 in Gallus gallus - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration ( $\mu\text{l/ml}$ ) or zone (mm) of inhibition equal to		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
<b>S. group C2</b>																	
<b>Gallus gallus</b>																	
Isolates out of a monitoring program	no																
Number of isolates available in the laboratory	1																
<b>Antimicrobials:</b>	<b>N</b>	<b>%R</b>	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>Tetracycline</b>	1	100%		1													
<b>Amphenicols</b>																	
Chloramphenicol	1	0														1	
<b>Fluoroquinolones</b>																	
Ciprofloxacin	1	0														1	
<b>Quinolones</b>																	
Nalidixic acid	1	100		1													
<b>Trimethoprim</b>	1	100%		1													
<b>Aminoglycosides</b>																	
Streptomycin	1	100				1											
Gentamicin	1	0														1	
Kanamycin	1	100		1													
<b>Trimethoprim + sulfonamides</b>	1	0%										1					
<b>Penicillins</b>																	
Ampicillin	1	100														1	

**Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Animals****Test Method Used**

Disc diffusion
Agar dilution
Broth dilution
E-test

**Standards used for testing**

NCCLS
CASFM

**Subject to quality control**

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content microg	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
<b>Tetracycline</b>							30	19	15...18	14
<b>Amphenicols</b>										
Chloramphenicol							30	18	13...17	12
Florfenicol										
<b>Fluoroquinolones</b>										
Ciprofloxacin							5	21	16...20	15
Enrofloxacin										
<b>Quinolones</b>										
Nalidixic acid							30	19	14...18	13
<b>Trimethoprim</b>							5	16	14...15	13
<b>Sulfonamides</b>										
Sulfonamide										
<b>Aminoglycosides</b>										
Streptomycin							10	15	12...14	11
Gentamicin							10	15	13...14	12
Neomycin										
Kanamycin							30	18	14...17	13
<b>Trimethoprim + sulfonamides</b>							1.25,23.75	16	11...15	10
<b>Cephalosporin</b>										
Ceftazidim										
3rd generation cephalosporins										
<b>Penicillins</b>										
Ampicillin							10	17	14...16	13

**Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Food****Test Method Used**

Disc diffusion
Agar dilution
Broth dilution
E-test

**Standards used for testing**

NCCLS
CASFM

**Subject to quality control**

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content microg	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
<b>Tetracycline</b>							30	19	15...18	14
<b>Amphenicols</b>										
Chloramphenicol							30	18	13...17	12
Florfenicol										
<b>Fluoroquinolones</b>										
Ciprofloxacin							5	21	16...20	15
Enrofloxacin										
<b>Quinolones</b>										
Nalidixic acid							30	19	14...18	13
<b>Trimethoprim</b>							5	16	14...15	13
<b>Sulfonamides</b>										
Sulfonamide							250,300	17	13...17	12
<b>Aminoglycosides</b>										
Streptomycin							10	15	12...14	11
Gentamicin							10	15	13...14	12
Neomycin										
Kanamycin							30	18	14...17	13
<b>Trimethoprim + sulfonamides</b>							1.25,23.75	16	11...15	10
<b>Cephalosporin</b>										
Ceftazidim										
3rd generation cephalosporins										
<b>Penicillins</b>										
Ampicillin							10	17	14...16	13

**Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Feedingstuff****Test Method Used**

Disc diffusion
Agar dilution
Broth dilution
E-test

**Standards used for testing**

NCCLS
CASFM

**Subject to quality control**

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content microg	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
<b>Tetracycline</b>							30	19	15...18	14
<b>Amphenicols</b>										
Chloramphenicol							30	18	13...17	12
Florfenicol										
<b>Fluoroquinolones</b>										
Ciprofloxacin							5	21	16...20	15
Enrofloxacin										
<b>Quinolones</b>										
Nalidixic acid							30	19	14...18	13
<b>Trimethoprim</b>							5	16	14...15	13
<b>Sulfonamides</b>										
Sulfonamide										
<b>Aminoglycosides</b>										
Streptomycin							10	15	12...14	11
Gentamicin							10	15	13...14	12
Neomycin										
Kanamycin							10	18	14...17	13
<b>Trimethoprim + sulfonamides</b>							1.25,23.75	16	11...15	10
<b>Cephalosporin</b>										
Ceftazidim										
3rd generation cephalosporins										
<b>Penicillins</b>										
Ampicillin							10	17	14...16	13

**Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Humans****Test Method Used**

Disc diffusion
Agar dilution
Broth dilution
E-test

**Standards used for testing**

NCCLS
CASFM

**Subject to quality control**

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content microg	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
<b>Tetracycline</b>							30	19	15...18	14
<b>Amphenicols</b>										
Chloramphenicol							30	18	13...17	12
Florfenicol										
<b>Fluoroquinolones</b>										
Ciprofloxacin							5	21	16...20	15
Enrofloxacin										
<b>Quinolones</b>										
Nalidixic acid							30	19	14...18	13
<b>Trimethoprim</b>							5	16	11...15	10
<b>Sulfonamides</b>										
Sulfonamide										
<b>Aminoglycosides</b>										
Streptomycin										
Gentamicin							10	15	13...14	12
Neomycin										
Kanamycin										
<b>Trimethoprim + sulfonamides</b>							1.25,23.75	16	11...15	10
<b>Cephalosporin</b>										
Ceftazidim							30	18	15...17	14
3rd generation cephalosporins										
<b>Penicillins</b>										
Ampicillin							10	17	14...16	13

## **2.2. CAMPYLOBACTERIOSIS**

### **2.2.1. General evaluation of the national situation**

### **2.2.2. Campylobacteriosis in humans**

#### **A. Thermophilic Campylobacter in humans**

##### **Reporting system in place for the human cases**

Health minister's order regulates information providing system on communicable diseases and its list. Clinician informs territorial public healthcare institution about suspected or detected case in 12 hours by phone, in 72 hours sends an urgent report. When diagnosis is changed clinician informs territorial public healthcare institution in 12 hours. Territorial public healthcare institutions register every case in standard form. In the end of every month data on morbidity of communicable diseases are summarised and sent to national level CCDPC. CCDPC publishes monthly bulletin of morbidity in infectious diseases and sends it to regional public healthcare centers, State public healthcare service, State food and veterinary service bordering countries WHO, EU communicable diseases surveillance network. Every year territorial public healthcare institutions provide annual statistical data on extended epidemiological investigations.

##### **Case definition**

Clinical picture compatible with campylobacteriosis, isolation of Campylobacter sp. from any clinical specimen.

##### **Diagnostic/analytical methods used**

Methods used:

Bacteriological culture

Quality assurance procedures:

Internal quality control system:

a) standard media quality control procedures

b) standard antimicrobial susceptibility testing control procedures

External "PT" Quality Assessment Programmes.

Labquality Helsinki Finland .

Reference: WHO Manual for the laboratory identification and antimicrobial susceptibility testing of bacterial pathogens of public health concern in the developing world. 2003

##### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and cases are registered in State register for communicable diseases.

##### **History of the disease and/or infection in the country**

Campylobacteriosis started to be registrate since 1995 in Lithuania.

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

During last years incidence rate per 100 000 population of campylobacteriosis is increased from 0,2 in 1995 to 23,1 in 2004. Compylobacteriosis makes 5% in the structure of diarrhoeal diseases. The largest morbidity is in children under 3 years. More than 50% of campylobacter specimen aren't typed. Among typed campylobacter: C.jejuni make 37,3%, C. coli - 3,3%, C. lari - 2,1% in 2004. The results of cluster investigations show that campilobacter outspreads through poultry and it's products. During last years an outbreaks aren't detected in Lithuania.

### **Relevance as zoonotic disease**

As in all European countries campylobateriosis remains one of the dominant zoonosis in Lithuania.

**Table 6.3.A Campylobacteriosis in man - species/serotype distribution**

Campylobacter	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc	unknown status
C. coli	797	0	797	0	0	0	0
C. jejuni	26		26				
C. upsaliensis	297		297				
C. upsaliensis	0		0				
Campylobacter spp.	474		474				

**Footnote**

General 23,1 cases of campylobacteriosis in 2004 per 100 000 population

Table 6.3.B Campylobacteriosis in man - age distribution

Age Distribution	C. coli			C. jejuni			Campylobacter spp.		
	All	M	F	All	M	F	All	M	F
<1 year	4	1	3	48	28	20	142	87	55
1 to 4 years(1)	8	6	2	130	97	33	302	210	92
5 to 14 years(2)	11	6	5	86	56	30	222	134	88
15 to 24 years(3)	2	0	2	18	8	10	61	28	33
25 to 44 years(4)	0	0	0	8	5	3	28	14	14
45 to 64 years(5)	1	1	0	4	2	2	12	6	6
65 years and older(6)	0	0	0	3	0	3	30	14	16
Age unknown									
<b>Total :</b>	<b>26</b>	<b>14</b>	<b>12</b>	<b>297</b>	<b>196</b>	<b>101</b>	<b>797</b>	<b>493</b>	<b>304</b>

(1) : 1 to 3 years

(2) : 4 to 14 years

(3) : 15 to 29 years

(4) : 30 to 49 years

(5) : 50 to 59 years

(6) : 60 years and older

Table 6.3.C Campylobacteriosis in man - seasonal distribution

Month	C. coli		C. jejuni		C. upsaliensis		Campylobacter spp.	
	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases
January	0	18	0	0	53			
February	0	16	0	0	43			
March	2	35	0	0	67			
April	5	29	0	0	76			
May	2	29	0	0	79			
June	6	19	0	0	80			
July	3	27	0	0	75			
August	0	29	0	0	81			
September	2	36	0	0	83			
October	2	27	0	0	58			
November	1	17	0	0	44			
December	3	15	0	0	58			
not known								
<b>Total :</b>	<b>26</b>	<b>297</b>	<b>0</b>	<b>0</b>	<b>797</b>			

## 2.2.3. Campylobacter in foodstuffs

Table 6.2 Thermophilic Campylobacter spp. in food

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	C. coli	C. lari	C. upsaliensis	C. jejuni	Campylobacter spp.
<b>Bovine meat</b>										
<b>fresh</b>										
- at retail	Labs. of SFVS		sample	25	1					
<b>meat products</b>										
- at processing plant	Labs. of SFVS		sample	25	3					
<b>Pig meat</b>										
<b>fresh</b>										
- at retail	Labs. of SFVS		sample	25	1					
<b>meat products</b>										
- at processing plant	Labs. of SFVS		sample	25	2					
<b>Poultry meat</b>										
<b>fresh</b>										
- at retail	Labs. of SFVS		sample	25	2					
<b>meat products</b>										
- at retail	Labs. of SFVS		sample	25	6					
<b>Other meat</b>										
<b>meat products</b>										
- at processing plant	Labs. of SFVS		sample	25	3					
<b>Dairy products</b>										
ready-to-eat	Labs. of SFVS		sample	25	5					
<b>Fishery products</b>										
fish	Labs. of SFVS		sample	25	4					
<b>Table eggs</b>	Labs. of SFVS		sample	25	1					
<b>Processed fruits and vegetables (1)</b>	Labs. of SFVS		sample	25	2					

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(1) : These two samples are from processed potato

Labs. of SFVS - Laboratories of SFVS

## 2.2.4. Campylobacter in animals

Table 6.1.1 Thermophilic Campylobacter spp. in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	C. jejuni	C. coli	C. lari	C. upsaliensis
<b>Cattle (bovine animals)</b>									
dairy cows	Labs. of SFVS	Agent id.	Animal	1424	1	1			
<b>Sheep</b>	Labs. of SFVS	Agent id.	Animal	1	0				
<b>Pigs</b>	Labs. of SFVS	Agent id.	Animal	6	0				
<b>Gallus gallus</b>									
<b>broilers</b>									
- at farm	Labs. of SFVS	Agent id.	Flock	1806	0				
<b>Other poultry</b>	Labs. of SFVS	Agent id.	Animal	3	0				
<b>Pet animals</b>									
dogs	Labs. of SFVS	Agent id.	Animal	4	2	1		1	

## Footnote

SFVS - State Food and Veterinary Service; Labs. of SFVS - Laboratories of SFVS  
Agent id. - Agent identification

### **2.2.5. Antimicrobial resistance in *Campylobacter* isolates**

**Table 6.1.3 Antimicrobial susceptibility testing of Campylobacter in humans**

Campylobacter spp.		
humans		
Isolates out of a monitoring program	no	
Number of isolates available in the laboratory	957	
<b>Antimicrobials:</b>		
	<b>N</b>	<b>%R</b>
Tetracycline	646	0,62%
<b>Fluoroquinolones</b>		
Ciprofloxacin	646	15,94%
Trimethoprim	646	30,03%
<b>Macrolides</b>		
Erythromycin	646	0,93%
<b>Penicillins</b>		
Ampicillin	646	13,31%
<b>Number of multiresistant isolates</b>		
fully sensitives	352	54,49%
resistant to 1 antimicrobial	85	13,16%
resistant to 2 antimicrobials	115	17,80%
resistant to 3 antimicrobials	61	9,44%
resistant to 4 antimicrobials	33	5,11%
resistant to >4 antimicrobials	0	

**Table 6.1.6 Breakpoints used for antimicrobial susceptibility testing of Campylobacter in Humans****Test Method Used**

Disc diffusion
Agar dilution
Broth dilution
E-test

**Standards used for testing**

NCCLS
CASFM

**Subject to quality control**

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content microg	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
<b>Tetracycline</b>										
<b>Fluoroquinolones</b>										
Ciprofloxacin							5	18		17
<b>Quinolones</b>										
Nalidixic acid							30	16		15
<b>Aminoglycosides</b>										
Gentamicin										
<b>Macrolides</b>										
Erythromycin							15	20		19
<b>Penicillins</b>										
Ampicillin										

## **2.3. LISTERIOSIS**

### **2.3.1. General evaluation of the national situation**

#### **A. Listeriosis general evaluation**

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

26 samples ovine tested all negative

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

26 ovines tested all negative

## **2.3.2. Listeriosis in humans**

### **A. Listeriosis in humans**

#### **Reporting system in place for the human cases**

Health minister's order regulates information providing system on communicable diseases and its list. Clinician informs territorial public healthcare institution about suspected or detected case in 12 hours by phone, in 72 hours sends an urgent report. When diagnosis is changed clinician informs territorial public healthcare institution in 12 hours. Territorial public healthcare institutions register every case in standard form. In the end of every month data on morbidity of communicable diseases are summarised and sent to national level CCDPC. CCDPC publishes monthly bulletin of morbidity in infectious diseases and sends it to regional public healthcare centers, State public healthcare service, State food and veterinary service bordering countries WHO, EU communicable diseases surveillance network. Every year territorial public healthcare institutions provide annual statistical data on extended epidemiological investigations.

#### **Case definition**

Infection caused by *Listeria monocytogenes*, isolation of *L.monocytogenes* from a normally sterile site: blood, or cerebrospinal fluid or joint, pleural or pericardial fluid.

#### **Diagnostic/analytical methods used**

Methods used-

Bacteriological culture

Quality assurance procedures:

Internal quality control system:

a) standard media quality control procedures

b) standard antimicrobial susceptibility testing control procedures

External "PT" Quality Assessment Programmes.

Labquality Helsinki Finland

Reference: WHO Manual for the laboratory identification and antimicrobial susceptibility testing of bacterial pathogens of public health concern in the developing world. 2003

#### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and cases are registered in State register for communicable diseases.

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

During last years have been registered sporadic cases of listeriosis in Lithuania. Since 1998 to 2004 have been registered 8 cases of listeriosis. During above mentioned period have been registered 3 fatal cases of 8. For most patients the source of infection isn't detected.

#### **Relevance as zoonotic disease**

Although incidence rate isn't large therefore due large cases of death this zoonosis remains a big problem in Lithuania.

**Table 7.2.A Listeriosis in man - species/serotype distribution**

	Cases	Cases Inc
<b>Listeria</b>	1	0
Listeria spp.(1) congenital cases deaths	1	0,00

(1) : L.monocytogenes

**Footnote**

inc. rate per 100 000 population

Table 7.2.B Listeriosis in man - age distribution

Age Distribution	L. monocytogenes			Listeria spp.		
	All	M	F	All	M	F
<1 year	0	0	0			
1 to 4 years	0	0	0			
5 to 14 years	0	0	0			
15 to 24 years	0	0	0			
25 to 44 years	0	0	0			
45 to 64 years	1	1	0			
65 years and older	0	0	0			
Age unknown						
<b>Total :</b>	1	1	0	0	0	0

## 2.3.3. Listeria in foodstuffs

Table 7.1 Listeria monocytogenes in food

	Source of information	Remarks	Epidemiological unit	Sample weight	Definition used	Units tested	<100 cfu/g	>100 cfu/g	L. monocytogenes
<b>Bovine meat</b>									
carcasse	Labs. of SFVS		sample	25		3			
<b>Pig meat</b>									
meat products ready-to-eat - at retail	Labs. of SFVS		sample	25		4			
<b>Poultry meat (1)</b>									
unspecified (3)	Labs. of SFVS		sample	1		1			
<b>Other meat</b>									
unspecified (3)	Labs. of SFVS		sample	1		2			1
<b>Cheeses</b>									
- at processing plant	Labs. of SFVS		sample	25		22			
- at retail	Labs. of SFVS		sample	25		19			
<b>Dairy products</b>									
other products ready-to-eat - at processing plant	Labs. of SFVS		sample	25		10			
- at retail	Labs. of SFVS		sample	25		1			
<b>cow milk</b>									
raw for direct human consumption	Labs. of SFVS		sample	25		4			
<b>Fishery products</b>									
other - at retail	Labs. of SFVS		sample	25		6			

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<b>Sweets (2)</b>	Labs. of SFVS	sample	25	5				
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- (1) : 5 samples were frozen chicken breast fillet (one of them was positive) and 5 samples were frozen broilers for grill.
- (2) : This is milk sugar for food products.
- (3) : Subproducts from pig

Labs. of SFVS - Laboratories of SFVS

**2.4. VEROCYTOTOXIC ESCHERICHIA COLI**

**2.4.1. General evaluation of the national situation**

**2.4.2. Verocytotoxic Escherichia coli in humans**

**Table 11.3.A Verocytotoxic Escherichia coli infections in man - species/serotype distribution**

Pathogenic Escherichia coli	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
HUS	0					
- clinical cases	0					
- lab. confirmed cases	0					
- caused by O157 (VT+)	0					
- caused by other VTEC	0					
E.coli infect. (except HUS)	0					
- laboratory confirmed	0					
- caused by O157 (VT+)	0					
- caused by other VTEC	0					

**Footnote**

Verocytotoxic Escherichia coli (VTEC) isn't laboratory identified in Lithuania

**2.4.3. Pathogenic Escherichia coli in foodstuffs**

**2.4.4. Pathogenic Escherichia coli in animals**

**Table 11.1 Verocytotoxic Escherichia coli in animals**

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	VTEC O 157	VTEC O 157:H7

(1) : ff

**2.5. TUBERCULOSIS****2.5.1. General evaluation of the national situation****2.5.2. Tuberculosis in humans****Table 1.2.A Tuberculosis in man - species/serotype distribution**

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
<b>Mycobacterium</b>	1924	55	1924	55	0	0
M. bovis	0		0			
M. tuberculosis reactivation of previous cases	1924	55,8	1924	55,8		

Table 1.2.B Tuberculosis in man - age distribution

Age Distribution	M. bovis		
	All	M	F
<1 year	0		
1 to 4 years	0		
5 to 14 years	0		
15 to 24 years	0		
25 to 44 years	0		
45 to 64 years	0		
65 years and older	0		
Age unknown	0		
<b>Total :</b>	<b>0</b>	<b>0</b>	<b>0</b>

### 2.5.3. Mycobacterium in animals

**Table 1.1.3 Tuberculosis in animals**

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	M. bovis	M. tuberculosis	M. avium spp.
<b>Goats (1)</b>	SFVS AHD, NVL	skin test, Agent id.	sheep and goats	822	0			
<b>Pigs</b>	SFVS AHD, NVL	skin test, Agent id.	pig	389	0			
<b>Cattle (bovine animals)</b>	SFVS AHD, NVL	skin test, Agent id.	bovine	514914	1			1

(1) : goats and sheep

#### Footnote

SFVS AHD - State Food and Veterinary Service Animal Health Department

NVL - National Veterinary Laboratory

Agent id. - Agent identification

## 1.1.1 Bovine tuberculosis

<b>MANDATORY</b>	<b>CATTLE</b>		
Number of herds under official control:	195226	Number of animals under official control:	916715
	<b>OTF bovine herds</b>	<b>OTF bovine herds with status suspended</b>	<b>Bovine herds infected with tuberculosis</b>
Status of herds at year end (a):	195226	0	0
New cases notified during the year (b):			
	<b>Units tested</b>	<b>Units suspected</b>	<b>Units positive</b>
Routine tuberculin test (c) - data concerning herds:	195226	0	0
Routine tuberculin test (c) - data concerning animals:	512863	0	0
	<b>Animals slaughtered</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Routine post-mortem examination (d):	75	0	0
		<b>Herds suspected</b>	<b>Herds confirmed</b>
Follow up of suspected cases in post-mortem examination (e):			
Follow-up investigation of suspected cases: trace, contacts (f):			
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Other routine investigations: exports (g):			
Other routine investigations: tests at AI stations (h):			
	<b>All animals</b>	<b>Positives</b>	<b>Contacts</b>
Animals destroyed (i):			
Animals slaughtered (j):			
<b>VOLUNTARY</b>	<b>CATTLE</b>		
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Other investigations: imports (k):			
	<b>Herds tested</b>	<b>Herds suspected</b>	<b>Herds positive</b>
Other investigations: farms at risk (l):			
	<b>Samples tested</b>	<b>M. bovis isolated</b>	
Bacteriological examination (m):	109	0	

## 1.1.2 Tuberculosis in farmed deer

<b>MANDATORY</b>	<b>FARMED DEER</b>		
Number of herds under official control:	0	Number of animals under official control:	0
	<b>"OTF" herds</b>	<b>"OTF" herds with status suspended</b>	<b>Herds infected with tuberculosis</b>
Status of herds at year end (a):			
New cases notified during the year (b):			
	<b>Units tested</b>	<b>Units suspected</b>	<b>Units positive</b>
Routine tuberculin test (c) - data concerning herds:			
Routine tuberculin test (c) - data concerning animals:			
	<b>Animals slaughtered</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Routine post-mortem examination (d):			
		<b>Herds suspected</b>	<b>Herds confirmed</b>
Follow up of suspected cases in post-mortem examination (e):			
Follow-up investigation of suspected cases: trace, contacts (f):			
	<b>Herds tested</b>	<b>Herds suspected</b>	<b>Herds positive</b>
Other routine investigations: exports (g):			
Other routine investigations: tests at AI stations (h):			
	<b>All animals</b>	<b>Positives</b>	<b>Contacts</b>
Animals destroyed (i):			
Animals slaughtered (j):			
<b>VOLUNTARY</b>	<b>FARMED DEER</b>		
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Other investigations: imports (k):			
	<b>Herds tested</b>	<b>Herds suspected</b>	<b>Herds positive</b>
Other investigations: farms at risk (l):			
	<b>Samples tested</b>	<b>M. bovis isolated</b>	
Bacteriological examination (m):			

## **2.6. BRUCELLOSIS**

### **2.6.1. General evaluation of the national situation**

### **2.6.2. Brucellosis in humans**

#### **A. Brucellosis in humans**

##### **Reporting system in place for the human cases**

Health minister's order regulates information providing system on communicable diseases and its list. Clinician informs territorial public healthcare institution about suspected or detected case in 12 hours by phone, in 72 hours sends an urgent report. When diagnosis is changed clinician informs territorial public healthcare institution in 12 hours. Territorial public healthcare institutions register every case in standard form and report about every suspected or detected case of brucellosis to the national level CCDPC in 2 hours by phone, in 12 hours by fax or email.

In the end of every month data on morbidity of communicable diseases are summarised and sent to national level CCDPC. CCDPC publishes monthly bulletin of morbidity in infectious diseases and sends it to regional public healthcare centers, State public healthcare service, State food and veterinary service bordering countries WHO, EU communicable diseases surveillance network. Every year territorial public healthcare institutions provide annual statistical data on extended epidemiological investigations.

##### **Case definition**

Clinical picture compatible with brucellosis, demonstration of a specific antibody response, demonstration by immunofluorescence of *Brucella* sp. in a clinical specimen, isolation of *Brucella* sp. from a clinical specimen.

##### **Diagnostic/analytical methods used**

Methods used:

Bacteriological culture.

Serum antibodies agglutination reaction with febrile Antigene.

Quality assurance procedures:

Internal quality control system: a) standard media quality control procedures b) standard antimicrobial susceptibility testing control procedures.

External "PT" Quality Assessment Programmes. Labquality Helsinki Finland .

Reference: Mackie and McCartney "Practical medical microbiology", 1996. Department of Health and Human Services "Biosafety in microbiology and biomedical laboratories", 1999. Yagupsky, P., et al. "Detection of brucellae in blood cultures", 1999.

##### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and cases are registered in State register for communicable diseases.

### **History of the disease and/or infection in the country**

Brucellosis was often diseases among humans and animals in post-war years in Lithuania. Brucellosis of horned cattle's and pig's often was imported from Kaliningrad district. In 1953 sheep brucellosis was imported with brood sheep to Moletu district. Hare's brucellosis has been diagnosed first time in 1958. 1920 sick cattle have been registered in 54 farms in 1956. 28 cases of human brucellosis have been registered in 1956. Cases of brucellosis have been registered every year by 1962. Since 1963 to 1977 cases of brucellosis haven't been registered in Lithuania. 4 farm's workers and 1 private cow owner's child have sick with brucellosis in one Lithuanian district in 1978 (the cow was bought without veterinary verification in Kaliningrad district). Human vaccination against brucellosis was stoped in 1965 and animal vaccination in 1968.

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

4 human brucellosis cases have been registered in one administration territory in 1991. 14 sick persons with brucellosis have been detected by performing prophylaxis investigations in Utena's meat corporation in 1992. Supposedly the cluster of brucellosis has been formed duo cattle acquired in Belarus. 1 case of brucellosis has been registered in 2004.

Table 2.3.A Brucellosis in man - species/serotype distribution

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
<b>Brucella</b>	1	0	1	0	0	0
B. abortus	1	0,00	1	0,00		
B. melitensis						
B. suis						
occupational cases						

Table 2.3.B Brucellosis in man - age distribution

Age Distribution	B. abortus			B. melitensis			Brucella spp.		
	All	M	F	All	M	F	All	M	F
<1 year									
1 to 4 years									
5 to 14 years									
15 to 24 years									
25 to 44 years									
45 to 64 years	1	0	1						
65 years and older									
Age unknown									
<b>Total :</b>	1	0	1	0	0	0	0	0	0

### 2.6.3. Brucella in foodstuffs

**Table 2.2 Brucella sp. in food**

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	B. melitensis	B. abortus	B. suis

#### Footnote

No positive cases

## 2.6.4. Brucella in animals

Table 2.1.3 Brucellosis in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	B. melitensis	B. abortus	B. suis
<b>Pigs</b>	SFVS AHD, NVL	serology, Agent id.	animal, abortion material	8127	0			
<b>Cattle (bovine animals) (1)</b>	SFVS AHD, NVL	serology, Agent id.	animal, abortion material	491420	0			
<b>Wildlife</b>								
hares	SFVS AHD	serology	animal	26	0			
<b>Sheep</b>								
mixed herds	SFVS AHD, NVL	serology, Agent id.	animal, abortion material	861	0			
<b>Goats</b>								
mixed herds	SFVS AHD, NVL	serology, Agent id.	animal, abortion material	678	0			
<b>Solipeds</b>								
horses	SFVS AHD	serology	animal	264	0			

(1) : 305 samples from aborted cattle tested microbiologically all negative

## Footnote

SFVS AHD - State Food and Veterinary Service Animal Health Department,  
 NVL - National Veterinary Laboratory  
 Agent id. - Agent identification

## 2.1.1 Bovine brucellosis

<b>MANDATORY</b>	<b>CATTLE</b>		
Number of herds under official control:	195226	Number of animals under official control:	916715
	<b>OBF bovine herds</b>	<b>OBF bovine herds with status suspended</b>	<b>Bovine herds infected with brucellosis</b>
Status of herds at year end (a):	195226	0	0
New cases notified during the year (b):			
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Notification of clinical cases, including abortions (c):			
	<b>Units tested</b>	<b>Units suspected</b>	<b>Units positive</b>
Routine testing (d1) - data concerning herds:			
Routine testing (d2) - number of animals tested:			
Routine testing (d3) - number of animals tested individually:	305	0	0
		<b>Herds suspected</b>	<b>Herds confirmed</b>
Follow-up investigation of suspected cases: trace, contacts (e):			
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Other routine investigations: exports (f):			
Other routine investigations: tests at AI stations (g):			
	<b>All animals</b>	<b>Positives</b>	<b>Contacts</b>
Animals destroyed (h):			
Animals slaughtered (i):			
<b>VOLUNTARY</b>	<b>CATTLE</b>		
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Other investigations: imports (k):			
	<b>Herds tested</b>	<b>Herds suspected</b>	<b>Herds positive</b>
Other investigations: farms at risk (l):			
	<b>Samples tested</b>	<b>Brucella isolated</b>	
Bacteriological examination (m):	267	0	

## 2.1.2 Ovine and caprine brucellosis

MANDATORY	SHEEP AND GOATS		
	Number of holdings under official control:(5)	6850	Number of animals under official control:(4)
	<b>OBF ovine and caprine holdings</b>	<b>OBF ovine and caprine holdings with status suspended</b>	<b>OBF ovine and caprine holdings infected with brucellosis</b>
Status of herds at year end (a):	6850	0	0
New cases notified during the year (b):			
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Notification of clinical cases, including abortions (c):			
	<b>Units tested</b>	<b>Units suspected</b>	<b>Units positive</b>
Routine testing (d) - data concerning holdings:(1)	750	0	0
Routine testing (d) - data concerning animals:(2)	2220	0	0
		<b>Holdings suspected</b>	<b>Holdings confirmed</b>
Follow-up investigation of suspected cases: trace, contacts (e):			
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Other routine investigations: exports (f):			
	<b>All animals</b>	<b>Positives</b>	<b>Contacts</b>
Animals destroyed (g):			
Animals slaughtered (h):			
VOLUNTARY	SHEEP AND GOATS		
	<b>Animals tested</b>	<b>Animals suspected</b>	<b>Animals positive</b>
Other investigations: imports (i):			
	<b>Holdings tested</b>	<b>Holdings suspected</b>	<b>Holdings positive</b>
Other investigations: farms at risk (j):			
	<b>Samples tested</b>	<b>Brucella isolated</b>	
Bacteriological examination (k):(3)	31	0	

(1) : 127 Sheep + 210 Goats

(2) : 1597 Sheep + 623 Goats

(3) : 17 samples pat. material and 14 blood samples

(4) : 34292 Sheep + 7112 Goats

(5) : 2952 Sheep+ 3898 Goats

## **2.7. YERSINIOSIS**

### **2.7.1. General evaluation of the national situation**

### **2.7.2. Yersiniosis in humans**

#### **A. Yersiniosis in humans**

##### **Reporting system in place for the human cases**

Health minister's order regulates information providing system on communicable diseases and its list. Clinician informs territorial public healthcare institution about suspected or detected case in 12 hours by phone, in 72 hours sends an urgent report. When diagnosis is changed clinician informs territorial public healthcare institution in 12 hours. Territorial public healthcare institutions register every case in standard form. In the end of every month data on morbidity of communicable diseases are summarised and sent to national level CCDPC. CCDPC publishes monthly bulletin of morbidity in infectious diseases and sends it to regional public healthcare centers, State public healthcare service, State food and veterinary service bordering countries WHO, EU communicable diseases surveillance network. Every year territorial public healthcare institutions provide annual statistical data on extended epidemiological investigations.

##### **Case definition**

Clinical picture compatible with Yersiniosis, isolation of *Yersinia enterocolitica* or pseudotuberculosis from a clinical specimen.

##### **Diagnostic/analytical methods used**

Methods used:

Bacteriological culture

Enzyme linked immunosorbent assay (ELISA) IgG Enzyme linked immunosorbent assay (ELISA) IgA

Quality assurance procedures:

Internal quality control system:

a) standard media quality control procedures

b) standard antimicrobial susceptibility testing control procedures

c) internal quality control procedures

External "PT" Quality Assessment Programmes.

Labquality Helsinki Finland .

Reference:WHO Manual for the laboratory identification and antimicrobial susceptibility testing of bacterial pathogens of public health concern in the developing world. 2003.

Instructions for use of manufacturer

##### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and

cases are registered in State register for communicable diseases.

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

During last 1995-2004 years it is evident increase trend of yersiniosis. Incidence rate per 100 000 population increased since 2,0 in 1995 to 13,4 in 2004 in Lithuania. More than 90% cases make yersinia enterocolitica. During last years have been observed sporadic cases of yersiniosis. On the basis of patients anamnesis most patients have been infected through raw vegetables and pork.

**Table 8.3.A Yersiniosis in man - species/serotype distribution**

Yersinia	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
Y. enterocolitica	470	0	470	0	0	0
Y. pseudotuberculosis	175		175			
Y. enterocolitica O:3	4		4			
Y. enterocolitica O:9	286		286			
	5		5			

**Footnote**

General inc. - 13,6 cases of yersiniosis in 2004 per 100 000 population

Table 8.3.B Yersiniosis in man - age distribution

Age Distribution	Y. enterocolitica			Yersinia spp.		
	All	M	F	All	M	F
<1 year	52	27	25	53	27	26
1 to 4 years(1)	127	62	65	129	63	66
5 to 14 years(2)	179	93	86	180	94	86
15 to 24 years(3)	59	32	27	59	32	27
25 to 44 years(4)	31	16	15	31	16	15
45 to 64 years(5)	9	3	6	9	3	6
65 years and older(6)	9	2	7	9	2	7
Age unknown						
<b>Total :</b>	<b>466</b>	<b>235</b>	<b>231</b>	<b>470</b>	<b>237</b>	<b>233</b>

(1) : 1 to 3 years

(2) : 4 to 14 years

(3) : 15 to 29 years

(4) : 30 to 49 years

(5) : 50 to 59 years

(6) : 60 years and older

Table 8.3.C Yersiniosis in man - seasonal distribution

Month	Y. enterocolitica		Yersinia spp.	
	Cases		Cases	
January	35		36	
February	32		34	
March	35		35	
April	47		47	
May	39		39	
June	37		37	
July	31		31	
August	45		45	
September	47		47	
October	44		44	
November	41		41	
December	33		34	
not known				
<b>Total :</b>	<b>466</b>		<b>470</b>	

### 2.7.3. Yersinia in foodstuffs

### 2.7.4. Yersinia in animals

**Table 8.1 Yersinia enterocolitica in animals**

	Source of information	Remarks	Epidemiological unit	Units tested	Y. enterocolitica	Y. enterocolitica O:3	Y. enterocolitica O:9
Farmed fish	Labs. of SFVS	Agent id.		210	0	0	0

#### Footnote

SFVS - State Food and Veterinary Service; Labs. of SFVS - Laboratories of SFVS  
 Agent id. - Agent identification

## **2.8. TRICHINELLOSIS**

### **2.8.1. General evaluation of the national situation**

### **2.8.2. Trichinellosis in humans**

#### **A. Trichinellosis in humans**

##### **Reporting system in place for the human cases**

Health minister's order regulates information providing system on communicable diseases and its list. Clinician informs territorial public healthcare institution about suspected or detected case in 12 hours by phone, in 72 hours sends an urgent report. When diagnosis is changed clinician informs territorial public healthcare institution in 12 hours. Territorial public healthcare institutions register every case in standard form. In the end of every month data on morbidity of communicable diseases are summarised and sent to national level CCDPC. CCDPC publishes monthly bulletin of morbidity in infectious diseases and sends it to regional public healthcare centers, State public healthcare service, State food and veterinary service bordering countries WHO, EU communicable diseases surveillance network. Every year territorial public healthcare institutions provide annual statistical data on extended epidemiological investigations.

##### **Case definition**

Common signs and symptoms among symptomatic persons, demonstration of *Trichinella* larvae in tissue obtained by muscle biopsy, or demonstration of a specific *Trichinella* antibody response

##### **Diagnostic/analytical methods used**

Methods used: Enzyme linked immunosorbent assay (ELISA) IgG

Quality assurance procedures:

Internal quality control procedure

Reference: Instruction for use of manufacturer

##### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according to Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and cases are registered in State register for communicable diseases.

##### **History of the disease and/or infection in the country**

During last 15 years the largest incidence have been registered in 1990-1995 period. Till 1990 the main source of infection was boar. After 1990 the main source of infection was pork.

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

In 2000-2004 the incidence decreased and rate per 100 000 population was 0,06. During last

years the main source of infection was grown pork in private farms that wasn't tested by veterinary service for trichinella. Every year of 10-40% cases the source of infection isn't detected.

**Relevance as zoonotic disease**

The problem remains, because not all residents test home grown pork for trichinellosis.

**Table 4.2.A Trichinellosis in man - species/serotype distribution**

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
<b>Trichinella</b>	22	0	22	0	0	0
T. spiralis	22	0,6	22	0,6		
Trichinella spp.						

**Footnote**

Cases inc. per 100 000 population

Table 4.2.B Trichinellosis in man - age distribution

Age Distribution	Trichinella spp.		
	All	M	F
<1 year	0	0	0
1 to 4 years(1)	0	0	0
5 to 14 years(2)	0	0	0
15 to 24 years(3)	11	8	3
25 to 44 years(4)	6	2	4
45 to 64 years(5)	2	1	1
65 years and older(6)	3	2	1
Age unknown			
<b>Total :</b>	<b>22</b>	<b>13</b>	<b>9</b>

(1) : 1 to 3 years

(2) : 4 to 14 years

(3) : 15 to 29 years

(4) : 30 to 49 years

(5) : 50 to 59 years

(6) : 60 years and older

### 2.8.3. Trichinella in animals

Table 4.1 Trichinella in animals

	Source of information	Remarks	Epidemiological unit	Animals tested	Animals positive
<b>Pigs</b>	SFVS AHD		animal	867757	21
<b>Wildlife</b>					
wild boars	SFVS AHD		animal	9168	78
foxes	SFVS AHD		animal	54	7
other (1)	SFVS AHD		animal	105	2
<b>Stray cats</b>	SFVS AHD		animal	14	0

(1) : 2 racoon dogs found positive

#### Footnote

SFVS AHD - State Food and Veterinary Service Animal Health Department

## **2.9. ECHINOCOCCOSIS**

### **2.9.1. General evaluation of the national situation**

### **2.9.2. Echinococcosis in humans**

#### **A. Echinococcus spp in humans**

##### **Reporting system in place for the human cases**

Health minister's order regulates information providing system on communicable diseases and its list. Clinician informs territorial public healthcare institution about suspected or detected case in 12 hours by phone, in 72 hours sends an urgent report. When diagnosis is changed clinician informs territorial public healthcare institution in 12 hours. Territorial public healthcare institutions register every case in standard form. In the end of every month data on morbidity of communicable diseases are summarised and sent to national level CCDPC. CCDPC publishes monthly bulletin of morbidity in infectious diseases and sends it to regional public healthcare centers, State public healthcare service, State food and veterinary service bordering countries WHO, EU communicable diseases surveillance network. Every year territorial public healthcare institutions provide annual statistical data on extended epidemiological investigations.

##### **Case definition**

Clinical picture compatible with echinococcosis, diagnosis by histopathology, a combination of imaging techniques and serological tests.

##### **Diagnostic/analytical methods used**

Methods used:

Echinococcus granulosus IgG Enzyme linked immunosorbent assay (ELISA);

Echinococcus multilocularis IgG Enzyme linked immunosorbent assay (ELISA);

Echinococcus Western Blot IgG

Quality assurance procedures:

Internal quality control procedures

Reference: Instructions for use of manufacturers

##### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and cases are registered in State register for communicable diseases.

##### **History of the disease and/or infection in the country**

There are registered sporadic cases of echinococcosis.

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

In 2000 - 2004 it is noticed increase trend of echinococcosis in Lithuania. Despite increase trend in 2004 incidence rate per 100 000 population was 0,43. The main source of infection is domestic dogs. For 60% cases the source of infection isn't detected.

**Table 9.2.A Echinococcosis in man - species/serotype distribution**

Echinococcus	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
E. granulosus	15	0	15	0	0	0
E. multilocularis	14		14			
Echinococcus spp.	1		1			

**Footnote**

General inc.- 0,4 cases of echinococcosis per 100 000 population

Table 9.2.B Echinococcosis in man - age distribution

Age Distribution	E. granulosus			E. multilocularis			Echinococcus spp.			
	All	M	F	All	M	F	All	M	F	
<1 year	0	0	0	0	0	0	0	0	0	0
1 to 4 years(1)	0	0	0	0	0	0	0	0	0	0
5 to 14 years(2)	1	0	1	0	0	0	1	0	0	1
15 to 24 years(3)	5	2	3	0	0	0	5	2	3	3
25 to 44 years(4)	1	1	0	0	0	0	1	1	0	0
45 to 64 years(5)	4	0	4	0	0	0	4	0	0	4
65 years and older(6)	3	2	1	1	0	1	4	2	2	2
Age unknown										
<b>Total :</b>	14	5	9	1	0	1	15	5	10	10

(1) : 1 to 3 years

(2) : 4 to 14 years

(3) : 15 to 29 years

(4) : 30 to 49 years

(5) : 50 to 59 years

(6) : 60 years and older

### 2.9.3. Echinococcus in animals

**Table 9.1 Echinococcus sp. in animals**

	Source of information	Remarks	Epidemiological unit	Units tested	Echinococcus spp.	E. multilocularis	E. granulosus
Pigs	SFVS AHD			2503	71		

#### Footnote

SFVS AHD - State Food and Veterinary Service, Animal Health Department

## **2.10. TOXOPLASMOSIS**

### **2.10.1. General evaluation of the national situation**

### **2.10.2. Toxoplasmosis in humans**

#### **A. Toxoplasmosis in humans**

##### **Reporting system in place for the human cases**

Health minister's order regulates information providing system on communicable diseases and its list. Clinician informs territorial public healthcare institution about suspected or detected case in 12 hours by phone, in 72 hours sends an urgent report. When diagnosis is changed clinician informs territorial public healthcare institution in 12 hours. Territorial public healthcare institutions register every case in standard form. In the end of every month data on morbidity of communicable diseases are summarised and sent to national level CCDPC. CCDPC publishes monthly bulletin of morbidity in infectious diseases and sends it to regional public healthcare centers, State public healthcare service, State food and veterinary service bordering countries WHO, EU communicable diseases surveillance network. Every year territorial public healthcare institutions provide annual statistical data on extended epidemiological investigations.

##### **Case definition**

Clinical picture compatible with toxoplasmosis, demonstration of a specific toxoplasma antibody response, demonstration of the agent in body tissues, detection of toxoplasma nucleic acid.

##### **Diagnostic/analytical methods used**

Methods used: Enzyme linked immunosorbent assay (ELISA) IgG;  
Enzyme linked immunosorbent assay (ELISA) IgG avidity;  
Enzyme linked immunosorbent assay (ELISA) IgM;  
Immunosorbent agglutination assay (ISAGA) IgA and IgM;  
Toxoplasmosis Western Blot IgG and IgM.  
Quality assurance procedures:  
Internal quality control procedures  
External "PT" Quality Assessment Programmes.  
"Labquality", Helsinki, Finland.  
Reference: Instructions for use of manufacturers

##### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and cases are registered in State register for communicable diseases.

##### **History of the disease and/or infection in the country**

The disease began to register in 1992. Since 1999 it started to register congenital toxoplasmosis.

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

During last 2000-2004 years incidence is increased. Most diseases have been registered in 2004 and incidence rate per 100 000 population was 4.9. Every year have been registered sporadic congenital toxoplasmosis cases. In 2001 12 cases of congenital toxoplasmosis have been registered in Lithuania.

### **Relevance as zoonotic disease**

The largest morbidity is among 18-39 years old women therefore remains a threat of congenital toxoplasmosis.

**Table 10.2.A Toxoplasmosis in man - species/serotype distribution**

	Cases	Cases Inc
<b>Toxoplasma</b>	172	5
Toxoplasma spp. congenital cases	172 3	5,0

**Footnote**

Cases inc. per 100 000 population

**Table 10.2.B Toxoplasmosis in man - age distribution**

Age Distribution	Toxoplasma spp.		
	All	M	F
<1 year	2	0	2
1 to 4 years(1)	1	1	0
5 to 14 years(2)	10	6	4
15 to 24 years(3)	92	6	86
25 to 44 years(4)	59	3	56
45 to 64 years(5)	3	1	2
65 years and older(6)	5	2	3
Age unknown			
<b>Total :</b>	<b>172</b>	<b>19</b>	<b>153</b>

(1) : 1 to 3 years

(2) : 4 to 14 years

(3) : 15 to 29 years

(4) : 30 to 49 years

(5) : 50 to 59 years

(6) : 60 years and older

### 2.10.3. Toxoplasma in animals

**Table 10.1 Toxoplasma gondii in animals**

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive
<b>Goats</b>	NVL	Serology	Animal	1	0
<b>Pet animals</b>					
cats	NVL	Serology	Animal	24	0

#### Footnote

NVL - National Veterinary Laboratory

## **2.11. RABIES**

### **2.11.1. General evaluation of the national situation**

#### **A. Rabies General evaluation**

##### **History of the disease and/or infection in the country**

Rabies has been compulsory notifiable an enzootic disease in Lithuania for many years. The State Food and Veterinary Service has carried out surveillance and risk assessment of the epidemiological situation of zoonotic diseases and has developed and implemented prevention and control measures as regard rabies in a country. Suspected cases were notified to the local State Food and Veterinary Services and relevant samples were collected and submitted to veterinary laboratories for the investigation by direct immunofluorescence test and biological test. Mouse inoculation has been used to confirm or rule out rabies on negative samples tested by immunofluorescence method.

Private veterinarians vaccinate approximately 200000 dogs and 25000 cats annually. This represents about 70 % of the estimated dog population and about 10 % cat population. Only inactivated vaccines of the highly immunogenic strains of the rabies virus have been used for vaccination dogs and cats. Emergency vaccination of domestic animals is carried out in the areas where the positive case of rabies was detected.

Pet animal movements have been controlled at the border entry points and it is required obligatory vaccination against rabies and appropriate animal identification and veterinary certificate for commercial movements of pet animals and approved passport or veterinary certificate for non-commercial movements of animals. Since October of 2004, for international movements, all dogs and cats must be identified by tattoo or microchip. They should be vaccinated against rabies with live or inactivated vaccine of at least one antigenic dose and authorized veterinarian should do vaccination. Pet passport should be used for the movement of animals between Member States. All identified pet animals should be registered into computerized database that will be accessible for all relevant competent authorities.

Oral vaccination of wildlife was pursued according Lithuanian National Rabies Prevention Programme during the period of 1995-2000. SAG 1, Lysvulpen (in 1998) and Rabifox (in 1999-2000) marked oral rabies vaccines were used in small-defined wildlife living areas covering of approximately from 1000 until 12000 square kilometers. The oral vaccination was carried out twice per year in March-April and October-November. Aircraft, hunters, game wardens and forest workers were involved in distribution of baits with tetracycline marked vaccine. Semi-thin slides of tooth and mandible of shot foxes and raccoon dogs were examined microscopically for the fluorescence of tetracycline deposits and blood samples for ELISA test were used in order to determine the efficiency of oral vaccination of wildlife.

Rabies has been widespread in the whole territory of the Republic of Lithuania. Wildlife rabies has enzootic pattern of the disease while urban rabies has been eradicated. Rabid wild animals are the main reservoir of this disease in a country and they course sporadic cases of rabies in domestic animals. Since 1960 eleven people have died of rabies: dogs infected two, foxes - four, raccoon dogs - two, badger - one, cat - one and the origin of the one case was unidentified. Aggressive dogs pose high risk of rabies to humans, because in each incident they could be considered as rabies-suspected animals.

The main reservoir species of rabies virus and the main animals distributing the disease were red

foxes (*Vulpes vulpes*) and raccoon dogs (*Nyctereutes procyonoides*). Rabies is more widespread in wooded areas, but on the other hand wild predators moved as well into areas of human settlements.

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

The main reservoir species of rabies virus and the main animals distributing the disease were red foxes (*Vulpes vulpes*) and raccoon dogs (*Nyctereutes procyonoides*). Rabies is more widespread in wooded areas, but on the other hand wild predators moved as well into areas of human settlements.

### **Recent actions taken to control the zoonoses**

The long-term strategy for eradication of rabies in Lithuania contains the following elements:

- oral vaccination of wild animals, especially red foxes and raccoon dogs, with vaccine which should create sufficient immunity starting in the territory from the west and west-southern parts of Lithuania along the Baltic sea coast, the Nemunas river bank, at the Lithuanian-Kaliningrad region, Lithuanian-Polish and in the north at the Lithuanian-Latvian borders; for the effectiveness of vaccination campaign against rabies, it would be great advantage if all Baltic states and Poland start this campaign at the same time and coordinate their activities;
- rabies eradication campaign should last not less than 5-10 years;
- in order to keep Lithuanian territory free from rabies it is necessary to create a buffer zone at the border with Byelorussia and Kaliningrad region, where oral vaccination of wild animals should be continued for many years until the rabies will be eradicated in those countries;
- compulsory vaccination of dogs and cats;
- implementation of the identification and registration system for dogs and cats;
- control of the population of stray dogs and cats.

### **Suggestions to the Community for the actions to be taken**

Rabies is a serious threat for human and animal health. The disease is widespread and endemic in the three Baltic States in wildlife and causes a significant number of cases in domestic animals.

1. Epidemiologically the three Baltic Member States can be considered as one region. The infection dynamics seems to be similar in all the three countries.
2. Previous vaccination programs carried out in two countries seems to be not sufficiently effective and should be thoroughly modified and improved in the future.
3. More structured and standardized information about the organization and the progress of the programs would be necessary.
4. The exchange of information among the three countries has been established.
5. Experiences in the field showed that the efficacy of used vaccine in raccoon dogs is similar to as that in foxes.
6. In all the three Baltic Member States the shortage of financial resources is major obstacle for implementation of a fully effective, cost efficient, large scale and long term eradication program.
7. In Lithuania the preparedness for controlling the rabies eradication programme in internationally accredited laboratory is sufficient.

#### **Recommendations**

The Estonian, Latvian and Lithuanian authorities should consider the eradication of rabies as a

priority.

1. The three Baltic Member States has to be regarded as one single area in the design of eradication strategies.
2. The necessary financial resources for large scale, long term vaccination programs should be made available.
3. The collaboration has to be further developed among the three Baltic States and extended to the other neighboring countries.
4. An agreement should be reached among the neighboring countries to allow a mutual cross border vaccination.

## **2.11.2. Rabies in humans**

### **A. Rabies in humans**

#### **Reporting system in place for the human cases**

Reporting system is regulated according Health minister's order. Clinician about suspected case informs territorial public healthcare institution and territorial public healthcare institution informs CCDPC and territorial food and veterinary services.

#### **Case definition**

Acute encephalomyelitis, detection by direct fluorescent antibody of viral antigens in a clinical specimen; detection of rabies nucleic acid in clinical specimen; isolation (in cell culture or in a laboratory animal) of rabies virus from saliva, cerebrospinal fluid (CSF), or central nervous system tissue; identification of a rabies-neutralising antibody titre ( complete neutralisation) in the serum or CSF of an unvaccinated person.

#### **Diagnostic/analytical methods used**

Fluorescent antibody test;  
ELISA for Ab detection ;  
Mouse infection method;  
Cell culture method;  
Serological investigation methods;  
Virus neutralising method in cell cultures;  
PCR;

#### **Notification system in place**

Every probable, suspected, or confirmed case is registered in personal healthcare institution according Health minister's order and is informed to territorial public healthcare institution where cases are registered. All detected cases are reported to the national level CCDPC and cases are registered in State register for communicable diseases.

#### **History of the disease and/or infection in the country**

Since 1960 to 2004 have been registered 11 fatal cases. 7 cases died from wild animals. 4 cases from domestic animal (cats, dogs). These people didn't applied for medical advice and therefore there wasn't administered immunoprophylaxis for them.

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

Epizootic situation in Lithuania is bad because every year rabies cases are registered among wild and domestic animals. Therefore is a real threat to be infected with rabies virus.

### **2.11.3. Lyssavirus (rabies) in animals**

#### **A. Rabies in dogs**

##### **Monitoring system**

###### **Methods of sampling (description of sampling techniques)**

The system for management of suspected rabies cases allows for rapid and effective integration between SFVS, private vets, public health and municipal authorities, with detailed records collected and municipal instructions issued for disease control and containment.

Euthanasia is practiced for suspected rabies cases, which is of concern given the potential risk for human and animal exposure and disease transmission. Euthanasia is recommended in the following situations:

- ; All animals showing clinical signs suspicious of rabies
- ; Non-vaccinated in-contact animals
- ; In-contact animals showing evidence of a bite injury

If in-contact animals are not euthanased, the recommended observation period is 10 days.

##### **Vaccination policy**

According to the Lithuanian National Rabies prevention programme, vaccination of dogs and cats is compulsory and all domestic animals are vaccinated after contact with rabies-suspected animals.

The total number of vaccines given to dogs and cats has been increasing slightly since 1994, with approximately 203,570 vaccines administered to dogs and 29,540 to cats in 2004. Vaccination coverage of dogs is widely reported to be about 70% for dogs (similar to the ~ 65% levels reported to WHO, 1994) and 20% for cats (higher than the ~1% figure reported to WHO, 1994).

Each local community is responsible for stray animal control, with municipality regulations in place for capture of stray dogs and cats. Any dog or cat roaming around a community without a collar is deemed to be a stray and may be captured (usually with nets) and held in an animal shelter for 3-4 days while attempts are made to locate the owner (who bears any costs of the capture). If owners cannot be traced, the shelter will attempt to re-home the animal and, if unsuccessful, the animal will be euthanased. In Vilnius, the number of captured animals exceeds 150 dogs and 300 cats per month, with many kittens being brought in by the public. Stray animal control appears to operate in all the larger cities and municipalities in Lithuania.

**Table 5.1 Rabies in animals**

	Source of information	Remarks	Animals tested	Animals positive
<b>Cattle (bovine animals)</b>	SFVS AHD		130	65
<b>Sheep</b>			0	0
<b>Goats</b>			0	0
<b>Pigs</b>			0	0
<b>Solipeds</b>	SFVS AHD		26	5
<b>Wildlife</b>				
foxes	SFVS AHD		609	197
other (1)	SFVS AHD		132	50
raccoon dog	SFVS AHD		409	161
<b>Pet animals</b>				
dogs	SFVS AHD		287	41
cats	SFVS AHD		271	34

(1) : Positive cases: 30- martens; 13- polecats; 2- beavers; one - badger, wild boar, otter, hedgehog, wolf

**Footnote**

SFVS AHD - State Food and Veterinary Service Animal Health Department

### **3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE**

### **3.1. E. COLI INDICATORS**

#### **3.1.1. General evaluation of the national situation**

#### **3.1.2. Antimicrobial resistance in *Escherichia coli* isolates**

**Table 13.8 Antimicrobial susceptibility testing of E.coli. in humans - qualitative data**

E.coli		
humans		
Isolates out of a monitoring program	no	
Number of isolates available in the laboratory	2	
<b>Antimicrobials:</b>		
	<b>N</b>	<b>%R</b>
Tetracycline	2	0%
<b>Amphenicols</b>		
Chloramphenicol	2	0%
<b>Cephalosporin</b>		
Ceftazidim	2	0%
<b>Fluoroquinolones</b>		
Ciprofloxacin	2	0%
Trimethoprim	2	0%
<b>Aminoglycosides</b>		
Gentamicin	2	0%
<b>Penicillins</b>		
Ampicillin	2	50,0%

**Table 13.7 Breakpoints used for antibiotic resistance testing of E.coli in Humans****Test Method Used**

Disc diffusion
Agar dilution
Broth dilution
E-test

**Standards used for testing**

NCCLS
CASFM

Subject to quality control

Escherichia coli	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content microg	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
<b>Tetracycline</b>							30	19	15...18	14
<b>Amphenicols</b>										
Chloramphenicol							30	18	13...17	12
Florfenicol										
<b>Fluoroquinolones</b>										
Ciprofloxacin							5	21	16...20	15
Enrofloxacin										
<b>Quinolones</b>										
Nalidixic acid							30	19	14...18	13
<b>Trimethoprim</b>							5	16	11...15	10
<b>Sulfonamides</b>										
Sulfonamide										
<b>Aminoglycosides</b>										
Streptomycin										
Gentamicin							10	15	13...14	12
Neomycin										
Kanamycin										
<b>Trimethoprim + sulfonamides</b>							1.25,23.75	16	11...15	10
<b>Cephalosporin</b>										
Ceftazidim							30	18	15...17	14
3rd generation cephalosporins										
<b>Penicillins</b>										
Ampicillin							10	17	14...16	13

## 4. **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, epidemiological investigations and reporting of foodborne outbreaks**

In case of foodborne outbreak occurs territorial Public Health Centre informs Centre for Communicable Diseases Prevention and Control (CCDPC) and territorial State Food and Veterinary Services by phone in 2 hours, by fax or e-mail in 12 hours. CCDPC as soon as possible sends information about the outbreak to the Ministry of Health and State Public Health Service, informs Media.

Territorial Public Health Centres and territorial State Food and Veterinary Services investigate an outbreak and organize relevant measures. CCDPC also gives methodological help. Microbiological investigation of specimens from suspected cases and sick people is performed in microbiology laboratories of hospitals and Public Health Centres; samples of suspected food - in laboratories of State Food and Veterinary Service. 10 days after outbreak territorial public health institution sends final outbreak investigation material to CCDPC. Health minister's orders regulate information providing on outbreaks and their investigation rules.

#### **Description of the types of outbreaks covered by the reporting:**

40 foodborne outbreaks have been registered in 2004: 32 outbreaks of salmonellosis, 4 - of trichinellosis, 3 of shigellosis and 1 of botulism. 27 (67,5%) outbreaks outspread from homemade food, 13 (32,5%) - general outbreaks outspread in kindergardens and schools and also they were related with food aquired in food trading enterprises.

#### **National evaluation of the reported outbreaks in the country:**

##### **Trends in numbers of outbreaks and numbers of human cases involved**

376 cases got sick of food borne outbreaks, 198 patients were hospitalised. 1 fatal case was registered from botulism.

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

32 (80%) of 40 food borne outbreaks had the reason of *S. enteritidis*, 4 (10%) - *trichinella*, 3 (7,5%) - *S. sonnei*, 1 (2,5%) - *Cl. botulinum*.

16 (50%) of 32 salmonellosis outbreak outspread through poultry, eggs and it's products, cream products with raw eggs, for 11 (34%) outbreaks reason wasn't detected.

3 (75%) of 4 trichinellosis outbreaks outspread through pork and 1 (25%) - boar.

##### **Relevance of the different type of places of food production and preparation in**

### **outbreaks**

28 (70%) of 40 outbreaks occurred due homemade food, 4(10%) - due food acquired in retail store, 5 (12,5%) - in kindergartens, 2 (5%) - in schools and 1 (2,5%) - in restaurant.

### **Descriptions of single outbreaks of special interest**

1)In different districts from September 17 till September 19 have been reported 52 cases of acute intestinal infections among workers of one company. From 29 patients *S.Enteritidis* have been isolated. 130 persons from different administrative regions of Lithuania participated at the party on 17/09/2004. Food for this party was prepared by restaurant. Outbreak investigation was performed by local public health centre and local food and veterinary service. Cohort study was conducted. Results of cohort study showed that the cause of the outbreak was farsid salmon  $RR=2.79$ , 95% CI 1.95-4.00,  $P<0.05$ . Salmon was filled in with raw eggs stuffing. Restaurant was temporarily closed according to decision of State food and veterinary service.

2)In Vilnius from 25 September till 13 of October have been reported 41 cases of acute intestinal infections. From 34 patients *Shigella Sonnei* have been isolated. 23 patients were hospitalized. The cause of the outbreak - unpasteurized curd, produced at the private milk company. Results of case-control study:  $OR=14.78$ , 95% CI 3.33-65.5,  $P<0.05$ . This curd was in sale at 2 Vilnius markets. Epidemiological investigation showed that the curd was not heated before the final consumption.

After suspicion that the cause of the outbreak may be unpasteurized curd on sale in Vilnius market, State food and veterinary service embargoed production and sale of this curd.

Bacteriological investigation of food handlers of private milk farm was performed. 3 positive persons were directed to the doctor. Antimicrobial resistance of *S.sonnei* comparing isolates from patients and from food handlers was identical.

Table 12. Foodborne outbreaks in humans

1	2	3	4			5			6	7		8	9	10
			General outbreak	Family outbreak	ill	died	in hospital	Source		Confirmed	Suspected			
Trichinella		F	2	0	0					pork	C	Laboratory	private home	carcass meat not tested for trichinas
Trichinella		F	8	0	4					pork	C	Laboratory	private home	carcass meat was not tested for trichinas
Trichinella		F	5	0	5					boar	C	Laboratory	private home	carcass meat was not tested for trichinas
Trichinella		F	5	0	3					pork	C	Laboratory	private home	carcass meat was not tested for trichinas
Salmonella - S. Enteritidis	G		3	0	3					unknown	S		kindergarten	unknown
Salmonella - S. Enteritidis	G		38	0	17					pork dishes	C	laboratory	private party (the food was prepared in private home)	inadequate heating, cross-contamination, deficiency in food handling
Salmonella - S. Enteritidis	G		10	0	8					meat and other salads with mayonnaise	C	Epidemiology (case-control study)	retail store	inadequate heating, cross-contamination of food
Salmonella - S. Enteritidis	G		13	0	13					chicken	S		kindergarten	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	G		26	0	5					unknown	S		kindergarten	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	G		3	0	2					unknown	S		kindergarten	unknown
Salmonella - S. Enteritidis	G		5	0	5					unknown	S		retail store	unknown
Salmonella - S. Enteritidis	G		6	0	6					cookies with cream	S		retail store	use of contaminated ingredient
Salmonella - S. Enteritidis	G		52	0	28					farsi salmon	C	Epidemiology (cohort study)	restaurant	inadequate heating, prepered food in advance

Salmonella - S. Enteritidis	G	35	0	6	unknown	S		kindergarten	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis		2	0	2	unknown	S		private home	unknown
Salmonella - S. Enteritidis	F	3	0	3	eggs	S		private home	inadequate heating
Salmonella - S. Enteritidis	F	2	0	2	eggs	S		private home	inadequate heating
Salmonella - S. Enteritidis	F	2	0	2	eggs	S		private home	inadequate heating
Salmonella - S. Enteritidis	F	3	0	3	layer-cake	S		private home	unknown
Salmonella - S. Enteritidis	F	2	0	2	chicken	S		private home	inadequate heating
Salmonella - S. Enteritidis	F	7	0	6	goose products	S		private home	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	F	6	0	6	unknown	S		private party in private home	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	F	4	0	4	unknown	S		private party in private home	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	F	2	0	0	eggs	S		private home	served and eaten raw
Salmonella - S. Enteritidis	F	3	0	3	unknown	S		private home	unknown
Salmonella - S. Enteritidis	F	3	0	2	eggs	S		private home	inadequate heating
Salmonella - S. Enteritidis	F	3	0	0	unknown	S		private home	unknown
Salmonella - S. Enteritidis	F	2	0	2	unknown	S		private home	unknown
Salmonella - S. Enteritidis	F	3	0	3	fish roasted		C	Epidemiology (cohort study)	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	F	3	0	3	chicken	S		private home	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	F	3	0	3	chicken	S		private home	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	F	2	0	2	pork	S		private home	inadequate heating, deficiency in food handling
Salmonella - S. Enteritidis	F	3	0	3	chicken	S		private home	inadequate heating
Salmonella - S. Enteritidis	F	5	0	5	layer-cake with raw eggs	S		private home	use of contaminated ingredient
Salmonella - S. Enteritidis	F	4	0	2	chicken products	S		private home	inadequate heating
Salmonella - S. Enteritidis	F	2	0	2	eggs	S		private home	inadequate heating
Shigella - S. sonnei	G	41	0	23	Curd made in private farm		C	Epidemiology (case-control study)	contamination by infected person, deficiency in food handling

Shigella - S. sonnei	G	18	0	6	unknown	S	School	contamination by infected person, deficiency in food handling
Shigella - S. sonnei	G	34	0	1	Fresh vegetables salad	C	School	contamination by infected person, deficiency in food handling
Clostridium - C. botulinum	F	3	1	3	Mushrooms canned in private home	C	Private home	Improper canning and storage

**Footnote**

- G - general outbreak
- F - family outbreak
- S - source was suspected
- C - source was confirmed