

BELGIUM

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

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

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

IN 2011

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: Belgium

Reporting Year: 2011

Laboratory name	Description	Contribution
FASFC AFSCA FAVV	Federal Agency for the Safety of the Food Chain	
IPH WIV ISP	Scientific Institute of Public Health	
VAR CODA CERVA	Veterinary and Agrochemical Research Centre	
ITG	Institute of Tropical Medicine	

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/99/ EC*. The information has also been forwarded to the European Food Safety Authority (EFSA).

The report contains information on trends and sources of zoonoses and zoonotic agents in Belgium during the year 2011 .

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.

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

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1. ANIMAL POPULATIONS

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

A. Information on susceptible animal population

Sources of information

SANITEL and BELTRACE database of the Federal Agency for the Safety of the Food Chain.

Dates the figures relate to and the content of the figures

Number of animals = number of animals at a certain time point of the year.

Number of slaughtered animals = total number of slaughtered animals during the year.

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

Holding: any establishment, construction or, in the case of an open-air farm, any place in which animals are held, kept or handled.

The location of the holding is based on the address and the coordinates of the geographical entity. A geographical entity is a unit of one building or a complex of buildings included grounds and territories where an animal species is or could be held.

Herd: an animal or group of animals kept on a holding as an epidemiological unit; if more than one herd is kept on a holding, each of these herds shall form a distinct unit and shall have the same health status.

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

For the last years, there's a significant decrease in total number of holdings for bovines. The total number of bovine animals is only slightly decreasing what means that the mean total number of animals per premise is increasing.

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

Belgium can be geographically divided into two regions: the Flemish region situated in the north of the country and the Walloon region situated in the south. There's a very dense animal population of bovines, swine and poultry in the Flemish region. The Walloon region is important for his cattle breeding holdings of the Belgian Blue White race. The number of swine and poultry holdings in the Walloon region is limited.

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals	Data	Year*	Data	Year*	Data	Year*	Data	Year*
Cattle (bovine animals)	meat production animals			536636					
	calves (under 1 year)			322754					
	- in total			859390		2682370		34540	
Deer	farmed - in total					9174		2667	
	wild - at game handling establishment - Surveillance			12504					
Ducks	meat production flocks	4							
Gallus gallus (fowl)	parent breeding flocks, unspecified - in total	935							
	laying hens	1166							
	broilers	8682							
	- in total			304719679					
Goats	- in total			6701		48989		11710	
Pigs	fattening pigs					5375356			
	breeding animals - unspecified - sows and gilts					583919			

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals	Data	Year*	Data	Year*	Data	Year*	Data	Year*
Pigs	- in total			11801106				9075	
Sheep	- in total			127250		204128		29150	
Solipeds, domestic	horses - in total			9669					
Turkeys	meat production flocks	167							
Wild boars	farmed - in total			10169					

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

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

2.1 SALMONELLOSIS

2.1.1 General evaluation of the national situation

2.1.2 Salmonella in foodstuffs

A. Salmonella spp. in pig meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

A monitoring program was organized by the FASFC in slaughterhouses and cutting plants.

Sampling was done by a specially trained staff. For most matrices, independent samples were taken per matrix in order to evaluate the contamination with 95% confidence.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Surface of carcass

At meat processing plant

Minced meat, ham, sausages and other

At retail

Meat, minced meat, ham, pate, sausages, meat salads and other

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

The matrices were carcasses, cuts and minced meat of pork. Sampling of pork carcasses was done by means of swabs. The following contamination levels were analyzed: 10 g or 25g (cutting, minced meat of pork) and 600 cm² (pork carcasses).

At meat processing plant

The samples were more than 200 g of meat. The detection of Salmonella has been assessed in 10g or 25g of sample.

At retail

The presence of Salmonella has been assessed in 10g or 25g of sample.

Definition of positive finding

At slaughterhouse and cutting plant

A sample is considered positive in case of detection of *Salmonella* in the sample.

At meat processing plant

A sample is considered positive in case of detection of *Salmonella* in the sample.

At retail

A sample is considered positive in case of detection of *Salmonella* in the sample.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

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

The rates of *salmonella* contamination of carcasses and cutting meat of pig estimated in 2011 were statistically similar to 2010.

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

The main serotype found on *Salmonella* risk farms (fattening pigs), on carcasses and in pig meat is *Salmonella* Typhimurium.

B. *Salmonella* spp. in bovine meat and products thereof

Monitoring system

Sampling strategy

At meat processing plant

A monitoring program was organized at meat processing plants and at retail by the FASFC.

Frequency of the sampling

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At meat processing plant

Minced meat, sausages and other

At retail

Meat, minced meat, pate, sausages, meat salads and other

Methods of sampling (description of sampling techniques)

At meat processing plant

The samples were more than 200 g of meat. The detection of *Salmonella* has been assessed in 10g or 25g of sample.

At retail

The presence of *Salmonella* has been assessed in 10g or 25g of sample.

Definition of positive finding

At slaughterhouse and cutting plant

A sample is considered positive in case of detection of *Salmonella* in the sample.

At meat processing plant

A sample is considered positive in case of detection of *Salmonella* in the sample.

At retail

A sample is considered positive in case of detection of *Salmonella* in the sample.

C. *Salmonella* spp. in broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

A monitoring program in Belgian slaughterhouses and cutting plants was organized by the FASFC.

The matrices were carcasses, cuts and meat preparation of broilers. The carcass samples of broiler consisted of 10g of neck skin. The following contamination levels were analyzed: 25g cutting meat and 10g of minced meat of chicken and 1g of chicken carcasses.

Sampling was done by a specially trained staff. For most matrices, independent samples were taken per matrix in order to detect a minimal contamination rate of 1% with 95% confidence.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Neck skin and cutting meat

At meat processing plant

Minced meat, sausages, meat and other

At retail

Minced meat, sausages, meat and other

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

The matrices were carcasses, cuts and meat preparation of broilers. The carcass samples of broiler consisted of 10g of neck skin. The following contamination levels were analyzed: 25g cutting meat and 10g of minced meat of chicken and 1g of chicken carcasses.

At meat processing plant

The samples were about 200 g of meat. The detection of *Salmonella* has been assessed in 10g or 25g of sample.

At retail

The presence of *Salmonella* has been assessed in 25g of sample.

Definition of positive finding

At slaughterhouse and cutting plant

A sample is considered positive in case of detection of *Salmonella* in the sample.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

Control program/mechanisms

The control program/strategies in place

A microbiological control of carcasses and meat of poultry is made with the aim of following the level of contamination by *Salmonella*.

Measures in case of the positive findings or single cases

In case of positive findings, no measure is taken face to products which entered normally the food chain. But corrective measures must be taken at the level of the slaughterhouse or of the cutting plant by the FBO.

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

The rate of *Salmonella* contamination of poultry meat observed in 2011 is comparable with the previous years.

D. *Salmonella* spp. in food

Monitoring system

Sampling strategy

A monitoring program was organized by the Federal Agency for the Safety of the Food Chain. More than 200 Belgian slaughterhouses, more than 100 meat cutting plants and more than 100 retail trades representative of the Belgian production, were selected for this study. The samples assayed were carcasses, cuts and minced meat from pork, carcasses, cuts and meat preparation from chicken, layer carcasses, beef minced meat and other foodstuffs. Sampling was done by a specially trained staff of the Federal Agency for the Safety of the Food Chain. For most of the matrices, approximately 100 - 300 independent samples were taken per matrix in order to detect a minimal contamination rate of 1% with 95% confidence. *Salmonella* isolates were serotyped and serotypes Typhimurium, Enteritidis, Virchow and Hadar were lysotyped. The antibiotic resistance profiles were determined for all isolates, and included ceftriaxone, ampicillin, kanamycin, sulfamethoxazole, tetracycline, nalidixic acid, ciprofloxacin, chloramphenicol and trimethoprim.

Frequency of the sampling

Meat samples have been taken every week from the first to the 52nd week.

Samples are taken according to the national control program or in the frame of RASFF, complaints or suspicion.

Type of specimen taken

Meat, milk and dairy products and other foods such as eggs, fishery products, ...

Methods of sampling (description of sampling techniques)

Sampling of pork carcasses was done by means of swabs. The carcass samples of broiler and layer consisted of 10g of neck skin. The other samples were about 200g of meat.

The detection of *Salmonella* has been assessed in these dilutions: 25g (cutting and minced meat of pork, chicken cuts and beef), 600 cm² (pork carcasses), and 1g (chicken and layer carcasses, chicken meat preparation).

Definition of positive finding

A sample is considered to be positive after biochemical confirmation of one *Salmonella* spp. in the sample.

Diagnostic/analytical methods used

Five laboratories licensed by the Federal Agency for the Safety of the Food Chain and accredited following ISO 17025 standard analyzed all the samples. The Belgian official method SP-VG-M002 was used for the detection of *Salmonella* in 25g, 1g or on swabs:

- pre-enrichment in buffered peptone water at 37°C for 16 to 20 h,
- selective enrichment on the semi-solid Diassalm medium at 42°C for 24 h,
- isolation of positive colonies on XLD at 37°C for 24 h,
- confirmation of minimum 2 colonies on TSI at 37°C and miniaturised biochemical tests,
- serotyping and lysotyping were done at the National Reference Center for *Salmonella* and *Shigella* (NRCSS-IPH) and at the Institute Pasteur, both located in Brussels, respectively.
- antibiotic resistance determination by IPH Brussels by disk diffusion method.

Preventive measures in place

Controls are made in place by the Federal Agency in case of notification.

Control program/mechanisms

The control program/strategies in place

Notification is mandatory since 1/3/2004 (Ministerial Decree on mandatory notification in the food chain of 22/1/2004). For Salmonella, absence in 25g in ready-to-eat food putted on the market is mandatory.

Laboratories have to inform the Federal Agency in case of a positive sample.

Measures in case of the positive findings or single cases

Measures to be taken in the case of a non-compliant result:

- Notification of the producer or importer
- Possibility of a counter analysis
- Destruction of the non compliant batch or single sample
- Further investigation: additional sampling, possible recall, RASFF, ...

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Meat from broilers (<i>Gallus gallus</i>) - carcase - at slaughterhouse - Surveillance	PRI 003	Unspecified	Official sampling	food sample > neck skin		Batch	1g	458	18		5
Meat from broilers (<i>Gallus gallus</i>) - fresh - at processing plant - Surveillance	TRA 200	Unspecified	Official sampling	food sample > meat		Batch	25g	430	24	2	2
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail - Surveillance	DIS819 DIS821	Unspecified	Official sampling	food sample > meat		Batch	200g	337	38	4	12
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at processing plant - Surveillance	TRA202	Unspecified	Official sampling	food sample > meat		Batch	>200g	48	3		1
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at retail - Surveillance	DIS826	Unspecified	Official sampling	food sample > meat		Batch	150g	56	7		2
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at processing plant - Surveillance	TRA416	Unspecified	Official sampling	food sample		Batch	>200g	45	0		
Meat from broilers (<i>Gallus gallus</i>) - meat products - raw but intended to be eaten cooked - at processing plant - Surveillance	TRA208	Unspecified	Official sampling	food sample > meat		Batch	>150g	54	0		
Meat from broilers (<i>Gallus gallus</i>) - meat products - raw but intended to be eaten cooked - at retail - Surveillance	DIS876	Unspecified	Official sampling	food sample > meat		Batch	100g	43	2		1
Meat from turkey - fresh - at retail - Surveillance	DIS821	Unspecified	Official sampling	food sample > meat		Batch	200g	17	0		
Meat from turkey - meat products - cooked, ready-to-eat - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample > meat		Batch	200g	3	0		
Meat from other poultry species - carcase - at slaughterhouse (laying hens)	PRI 004	Unspecified	Official sampling	food sample > neck skin		Batch	1g	446	96	69	2

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Meat from turkey - meat preparation - intended to be eaten cooked - at processing plant - Surveillance	TRA202	Unspecified	Official sampling	food sample > meat		Batch	>200g	13	3		1
Meat from turkey - meat preparation - intended to be eaten cooked - at retail - Surveillance	DIS826	Unspecified	Official sampling	food sample > meat		Batch	150g	3	0		
Meat from turkey - meat products - raw but intended to be eaten cooked - at processing plant - Surveillance	TRA202	Unspecified	Official sampling	food sample > meat		Batch	>200g	5	0		
Meat from turkey - meat products - raw but intended to be eaten cooked - at retail - Surveillance	DIS826	Unspecified	Official sampling	food sample > meat		Batch	150g	15	0		
	Salmonella spp., unspecified	Other serovars	S. 6,7:e,h:-	S. 9:-:-	S. Agona	S. Braenderup	S. Infantis	S. Montevideo	S. Muenchen	S. Newport	S. Oranienburg
Meat from broilers (<i>Gallus gallus</i>) - carcass - at slaughterhouse - Surveillance	3	2					1				
Meat from broilers (<i>Gallus gallus</i>) - fresh - at processing plant - Surveillance	1	9					5				
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail - Surveillance	1	2			2		2	8	4		
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at processing plant - Surveillance											

Table Salmonella in poultry meat and products thereof

	Salmonella spp., unspecified	Other serovars	S. 6,7:e,h:-	S. 9:-:-	S. Agona	S. Braenderup	S. Infantis	S. Montevideo	S. Muenchen	S. Newport	S. Oranienburg
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at retail - Surveillance		1									
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at processing plant - Surveillance											
Meat from broilers (<i>Gallus gallus</i>) - meat products - raw but intended to be eaten cooked - at processing plant - Surveillance											
Meat from broilers (<i>Gallus gallus</i>) - meat products - raw but intended to be eaten cooked - at retail - Surveillance											
Meat from turkey - fresh - at retail - Surveillance											
Meat from turkey - meat products - cooked, ready-to-eat - at retail - Surveillance											
Meat from other poultry species - carcase - at slaughterhouse (laying hens)		1	2	4		6		6	1		3
Meat from turkey - meat preparation - intended to be eaten cooked - at processing plant - Surveillance										2	
Meat from turkey - meat preparation - intended to be eaten cooked - at retail - Surveillance											
Meat from turkey - meat products - raw but intended to be eaten cooked - at processing plant - Surveillance											

Table Salmonella in poultry meat and products thereof

	Salmonella spp., unspecified	Other serovars	S. 6,7:e,h:-	S. 9:-:-	S. Agona	S. Braenderup	S. Infantis	S. Montevideo	S. Muenchen	S. Newport	S. Oranienburg
Meat from turkey - meat products - raw but intended to be eaten cooked - at retail - Surveillance											
	S. Paratyphi B	S. Paratyphi B var. Java	S. Rissen								
Meat from broilers (<i>Gallus gallus</i>) - carcase - at slaughterhouse - Surveillance	4	3									
Meat from broilers (<i>Gallus gallus</i>) - fresh - at processing plant - Surveillance	1	4									
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail - Surveillance	1	2									
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at processing plant - Surveillance		2									
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at retail - Surveillance		4									
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at processing plant - Surveillance											
Meat from broilers (<i>Gallus gallus</i>) - meat products - raw but intended to be eaten cooked - at processing plant - Surveillance											

Table Salmonella in poultry meat and products thereof

	S. Paratyphi B	S. Paratyphi B var. Java	S. Rissen
Meat from broilers (<i>Gallus gallus</i>) - meat products - raw but intended to be eaten cooked - at retail - Surveillance		1	
Meat from turkey - fresh - at retail - Surveillance			
Meat from turkey - meat products - cooked, ready-to-eat - at retail - Surveillance			
Meat from other poultry species - carcase - at slaughterhouse (laying hens)		1	1
Meat from turkey - meat preparation - intended to be eaten cooked - at processing plant - Surveillance			
Meat from turkey - meat preparation - intended to be eaten cooked - at retail - Surveillance			
Meat from turkey - meat products - raw but intended to be eaten cooked - at processing plant - Surveillance			
Meat from turkey - meat products - raw but intended to be eaten cooked - at retail - Surveillance			

Table Salmonella in milk and dairy products

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Milk, cows' - raw milk - intended for direct human consumption - at farm - Surveillance	DPA013	Unspecified	Official sampling	food sample > milk		Batch	200ml	39	0		
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	22	0		
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		Batch	>200g	30	0		
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	30	0		
Dairy products (excluding cheeses) - milk powder and whey powder - at processing plant - Surveillance	TRA123	Unspecified	Official sampling	food sample		Batch	500g	45	0		
Cheeses made from cows' milk - fresh - made from pasteurised milk - at processing plant - Surveillance	TRA134	Unspecified	Official sampling	food sample		Batch	>200g	20	0		
Cheeses made from cows' milk - fresh - made from pasteurised milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	18	0		
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		Batch	200g	24	0		
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant - Surveillance	TRA134	Unspecified	Official sampling	food sample		Batch	>200g	39	0		

Table Salmonella in milk and dairy products

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	38	0		
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		Batch	200g	29	0		
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at processing plant - Surveillance	TRA134	Unspecified	Official sampling	food sample		Batch	>200g	59	0		
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	59	0		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		Batch	200g	25	0		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		Batch	>200g	33	0		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	33	1		1
Cheeses made from sheep's milk - unspecified - made from pasteurised milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	118	0		
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		Batch	200g	19	0		

Table Salmonella in milk and dairy products

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		Batch	>200g	4	0		
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	62	1		1
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at farm - Surveillance	DPA009	Unspecified	Official sampling	food sample		Batch	200g	47	0		
Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - at farm - Surveillance	DPA025	Unspecified	Official sampling	food sample		Batch	200g	45	0		
Milk, cows' - raw milk - intended for direct human consumption - at retail - Surveillance	DIS837	Unspecified	Official sampling	food sample > milk		Batch	200ml	10	0		

	Salmonella spp., unspecified
Milk, cows' - raw milk - intended for direct human consumption - at farm - Surveillance	
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail - Surveillance	
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant - Surveillance	

Table Salmonella in milk and dairy products

	Salmonella spp., unspecified
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail - Surveillance	
Dairy products (excluding cheeses) - milk powder and whey powder - at processing plant - Surveillance	
Cheeses made from cows' milk - fresh - made from pasteurised milk - at processing plant - Surveillance	
Cheeses made from cows' milk - fresh - made from pasteurised milk - at retail - Surveillance	
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm - Surveillance	
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant - Surveillance	
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail - Surveillance	
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm - Surveillance	
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at processing plant - Surveillance	

Table Salmonella in milk and dairy products

	Salmonella spp., unspecified
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at retail - Surveillance	
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	
Cheeses made from sheep's milk - unspecified - made from pasteurised milk - at retail - Surveillance	
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at farm - Surveillance	

Table Salmonella in milk and dairy products

Salmonella spp., unspecified	
Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - at farm - Surveillance	
Milk, cows' - raw milk - intended for direct human consumption - at retail - Surveillance	

Table Salmonella in other food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Eggs - table eggs - at retail - Surveillance	DIS868	Unspecified	Official sampling	food sample		Batch	25g	118	0		
Egg products - at processing plant - Surveillance	TRA105	Unspecified	Official sampling	food sample		Batch	>500g	111	0		
Fishery products, unspecified - cooked - at processing plant - Surveillance	TRA402 TRA416	Unspecified	Official sampling	food sample		Batch	>200g	45	0		
Fishery products, unspecified - cooked - at retail - Surveillance	DIS808	Unspecified	Official sampling	food sample		Batch	200g	58	0		
Crustaceans - unspecified - cooked - at processing plant - Surveillance	TRA401 TRA403	Unspecified	Official sampling	food sample		Batch	>200g	45	0		
Crustaceans - unspecified - cooked - at retail - Surveillance	DIS852	Unspecified	Official sampling	food sample		Batch	100g	47	0		
Live bivalve molluscs - unspecified - at retail - Surveillance	DIS806	Unspecified	Official sampling	food sample		Batch	2,5kg	87	2		
Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months - at retail - Surveillance	DIS862	Unspecified	Official sampling	food sample		Batch	200g	59	0		
Infant formula - dried - intended for infants below 6 months - at retail - Surveillance	DIS803	Unspecified	Official sampling	food sample		Batch	400g	86	0		
Juice - fruit juice - unpasteurised - at retail - Surveillance	DIS872	Unspecified	Official sampling	food sample		Batch	150ml	76	0		
Bakery products - pastry - at processing plant - Surveillance	TRA515	Unspecified	Official sampling	food sample		Batch	>200g	40	0		
Bakery products - pastry - at retail - Surveillance	DIS805	Unspecified	Official sampling	food sample		Batch	>100g	60	0		

Table Salmonella in other food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Chocolate - at processing plant - Surveillance	TRA501	Unspecified	Official sampling	food sample		Batch	>100g	42	0		
Chocolate - at retail - Surveillance	DIS834	Unspecified	Official sampling	food sample		Batch	>100g	46	0		
Crustaceans - unspecified - raw - at processing plant - Surveillance	TRA403	Unspecified	Official sampling	food sample		Batch	>250g	45	0		
Crustaceans - unspecified - raw - at retail - Surveillance	DIS852	Unspecified	Official sampling	food sample		Batch	100g	46	0		
Egg products - at retail - Surveillance	DIS885	Unspecified	Official sampling	food sample		Batch	100g	20	0		
Fish - raw - at retail - Surveillance	DIS873	Unspecified	Official sampling	food sample		Batch	100g	91	0		
Fruits - at processing plant - Surveillance	TRA516	Unspecified	Official sampling	food sample		Batch	>200g	45	0		
Fruits - at retail - Surveillance	DIS855	Unspecified	Official sampling	food sample		Batch	100g	46	0		
Fruits and vegetables - pre-cut - at processing plant - Surveillance	TRA502	Unspecified	Official sampling	food sample		Batch	>200g	31	0		
Fruits and vegetables - pre-cut - at retail - Surveillance	DIS813	Unspecified	Official sampling	food sample		Batch	200g	60	0		
Infant formula - dried - intended for infants below 6 months - at processing plant - Surveillance	TRA171	Unspecified	Official sampling	food sample		Batch	>400g	10	0		
Spices and herbs - dried - at processing plant - Surveillance	TRA504	Unspecified	Official sampling	food sample		Batch	>100g	59	2		
Spices and herbs - dried - at retail - Surveillance	DIS828	Unspecified	Official sampling	food sample		Batch	100g	59	0		
Vegetables - at processing plant - Surveillance	TRA508	Unspecified	Official sampling	food sample		Batch	>200g	8	0		
Vegetables - at retail - Surveillance	DIS841	Unspecified	Official sampling	food sample		Batch	150g	443	2		2

Table Salmonella in other food

	Salmonella spp., unspecified	S. Caracas	S. Mbandaka	S. Paratyphi B var. Java	S. Thompson
Eggs - table eggs - at retail - Surveillance					
Egg products - at processing plant - Surveillance					
Fishery products, unspecified - cooked - at processing plant - Surveillance					
Fishery products, unspecified - cooked - at retail - Surveillance					
Crustaceans - unspecified - cooked - at processing plant - Surveillance					
Crustaceans - unspecified - cooked - at retail - Surveillance					
Live bivalve molluscs - unspecified - at retail - Surveillance			1	1	
Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months - at retail - Surveillance					
Infant formula - dried - intended for infants below 6 months - at retail - Surveillance					
Juice - fruit juice - unpasteurised - at retail - Surveillance					
Bakery products - pastry - at processing plant - Surveillance					
Bakery products - pastry - at retail - Surveillance					
Chocolate - at processing plant - Surveillance					

Table Salmonella in other food

	Salmonella spp., unspecified	S. Caracas	S. Mbandaka	S. Paratyphi B var. Java	S. Thompson
Chocolate - at retail - Surveillance					
Crustaceans - unspecified - raw - at processing plant - Surveillance					
Crustaceans - unspecified - raw - at retail - Surveillance					
Egg products - at retail - Surveillance					
Fish - raw - at retail - Surveillance					
Fruits - at processing plant - Surveillance					
Fruits - at retail - Surveillance					
Fruits and vegetables - pre-cut - at processing plant - Surveillance					
Fruits and vegetables - pre-cut - at retail - Surveillance					
Infant formula - dried - intended for infants below 6 months - at processing plant - Surveillance					
Spices and herbs - dried - at processing plant - Surveillance		1			1
Spices and herbs - dried - at retail - Surveillance					
Vegetables - at processing plant - Surveillance					
Vegetables - at retail - Surveillance					

Table Salmonella in other food

Table Salmonella in red meat and products thereof

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Meat from pig - carcase - at slaughterhouse - Surveillance	PRI 002	Unspecified	Official sampling	food sample > carcass swabs		Batch	600cm2	649	44		15
Meat from pig - fresh - at processing plant - Surveillance	TRA 306	Unspecified	Official sampling	food sample > meat		Batch	25g	292	6		5
Meat from pig - minced meat - intended to be eaten raw - at retail - Surveillance	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	9	0		
Meat from pig - minced meat - intended to be eaten cooked - at processing plant - Surveillance	TRA 303	Unspecified	Official sampling	food sample > meat		Batch	10g	87	1		
Meat from pig - minced meat - intended to be eaten cooked - at retail - Surveillance	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	17	0		
Meat from pig - meat preparation - intended to be eaten raw - at processing plant - Surveillance	TRA316	Unspecified	Official sampling	food sample > meat		Batch	>200g	19	0		
Meat from pig - meat preparation - intended to be eaten raw - at retail - Surveillance	DIS874	Unspecified	Official sampling	food sample > meat		Batch	100g	6	0		
Meat from pig - meat preparation - intended to be eaten cooked - at processing plant - Surveillance	TRA312	Unspecified	Official sampling	food sample > meat		Batch	>200g	30	0		
Meat from pig - meat preparation - intended to be eaten cooked - at retail - Surveillance	DIS875	Unspecified	Official sampling	food sample > meat		Batch	100g	42	0		
Meat from pig - meat products - cooked, ready-to-eat - at processing plant - Surveillance	TRA317	Unspecified	Official sampling	food sample > meat		Batch	>200g	41	0		
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample > meat		Batch	200g	38	0		
Meat from bovine animals - carcase - at slaughterhouse - Surveillance	PRI 030	Unspecified	Official sampling	food sample > carcass swabs		Batch	1600cm2	649	3		1

Table Salmonella in red meat and products thereof

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Meat from bovine animals - minced meat - intended to be eaten raw - at retail - Surveillance	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	43	0		
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Surveillance	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	30	0		
Meat from bovine animals - meat preparation - intended to be eaten cooked - at processing plant - Surveillance	TRA312	Unspecified	Official sampling	food sample > meat		Batch	>200g	14	0		
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail - Surveillance	DIS875	Unspecified	Official sampling	food sample > meat		Batch	100g	14	0		
Meat from bovine animals - meat products - cooked, ready-to-eat - at processing plant - Surveillance	TRA317	Unspecified	Official sampling	food sample > meat		Batch	>200g	2	0		
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample > meat		Batch	200g	2	0		
Other products of animal origin - gelatin and collagen - at processing plant - Surveillance	TRA357	Unspecified	Official sampling	food sample		Batch	>200g	4	0		
Other products of animal origin - gelatin and collagen - at retail - Surveillance	DIS892	Unspecified	Official sampling	food sample		Batch	75g	87	0		
Meat from bovine animals - meat preparation - intended to be eaten raw - at processing plant - Surveillance	TRA316	Unspecified	Official sampling	food sample > meat		Batch	>200g	26	0		
Meat from bovine animals - meat preparation - intended to be eaten raw - at retail - Surveillance	DIS874	Unspecified	Official sampling	food sample > meat		Batch	100g	49	0		

Table Salmonella in red meat and products thereof

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Meat from bovine animals and pig - meat preparation - intended to be eaten cooked - at processing plant - Surveillance	TRA312	Unspecified	Official sampling	food sample > meat		Batch	>200g	15	0		
Meat from bovine animals and pig - meat preparation - intended to be eaten cooked - at retail - Surveillance	DIS875	Unspecified	Official sampling	food sample > meat		Batch	100g	3	0		
Meat from bovine animals and pig - meat preparation - intended to be eaten raw - at processing plant - Surveillance	TRA316	Unspecified	Official sampling	food sample > meat		Batch	>200g	15	0		
Meat from bovine animals and pig - meat preparation - intended to be eaten raw - at retail - Surveillance	DIS874 DIS815	Unspecified	Official sampling	food sample > meat		Batch	100g	240	0		
Meat from bovine animals and pig - minced meat - intended to be eaten cooked - at retail - Surveillance	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	9	0		
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail - Surveillance	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	5	0		
Meat from other animal species or not specified - fresh - at retail - Surveillance	DIS883	Unspecified	Official sampling	food sample > meat		Batch	200g	63	0		
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at processing plant - Surveillance	TRA300 TRA416	Unspecified	Official sampling	food sample > meat		Batch	>200g	89	0		
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample > meat		Batch	200g	106	0		

Table Salmonella in red meat and products thereof

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Meat from other animal species or not specified - meat products - pâté - at processing plant - Surveillance	TRA301	Unspecified	Official sampling	food sample > meat		Batch	>200g	45	0		
Meat from other animal species or not specified - meat products - pâté - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample > meat		Batch	200g	46	0		
Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - at processing plant - Surveillance	TRA317	Unspecified	Official sampling	food sample > meat		Batch	>200g	45	0		
Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample > meat		---	200g	46	0		

	Salmonella spp., unspecified	S. Bovismorbificans	S. Brandenburg	S. Derby	S. Livingstone	S. London	S. Montevideo	S. Typhimurium var. Copenhagen
Meat from pig - carcase - at slaughterhouse - Surveillance	2		6	8	1	1	1	10
Meat from pig - fresh - at processing plant - Surveillance								1
Meat from pig - minced meat - intended to be eaten raw - at retail - Surveillance								
Meat from pig - minced meat - intended to be eaten cooked - at processing plant - Surveillance		1						
Meat from pig - minced meat - intended to be eaten cooked - at retail - Surveillance								

Table Salmonella in red meat and products thereof

	Salmonella spp., unspecified	S. Bovismorbillans	S. Brandenburg	S. Derby	S. Livingstone	S. London	S. Montevideo	S. Typhimurium var. Copenhagen
Meat from pig - meat preparation - intended to be eaten raw - at processing plant - Surveillance								
Meat from pig - meat preparation - intended to be eaten raw - at retail - Surveillance								
Meat from pig - meat preparation - intended to be eaten cooked - at processing plant - Surveillance								
Meat from pig - meat preparation - intended to be eaten cooked - at retail - Surveillance								
Meat from pig - meat products - cooked, ready-to-eat - at processing plant - Surveillance								
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance								
Meat from bovine animals - carcase - at slaughterhouse - Surveillance	1						1	
Meat from bovine animals - minced meat - intended to be eaten raw - at retail - Surveillance								
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Surveillance								
Meat from bovine animals - meat preparation - intended to be eaten cooked - at processing plant - Surveillance								
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail - Surveillance								

Table Salmonella in red meat and products thereof

	Salmonella spp., unspecified	S. Bovismorbificans	S. Brandenburg	S. Derby	S. Livingstone	S. London	S. Montevideo	S. Typhimurium var. Copenhagen
Meat from bovine animals - meat products - cooked, ready-to-eat - at processing plant - Surveillance								
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail - Surveillance								
Other products of animal origin - gelatin and collagen - at processing plant - Surveillance								
Other products of animal origin - gelatin and collagen - at retail - Surveillance								
Meat from bovine animals - meat preparation - intended to be eaten raw - at processing plant - Surveillance								
Meat from bovine animals - meat preparation - intended to be eaten raw - at retail - Surveillance								
Meat from bovine animals and pig - meat preparation - intended to be eaten cooked - at processing plant - Surveillance								
Meat from bovine animals and pig - meat preparation - intended to be eaten cooked - at retail - Surveillance								
Meat from bovine animals and pig - meat preparation - intended to be eaten raw - at processing plant - Surveillance								
Meat from bovine animals and pig - meat preparation - intended to be eaten raw - at retail - Surveillance								

Table Salmonella in red meat and products thereof

	Salmonella spp., unspecified	S. Bovismorbillians	S. Brandenburg	S. Derby	S. Livingstone	S. London	S. Montevideo	S. Typhimurium var. Copenhagen
Meat from bovine animals and pig - minced meat - intended to be eaten cooked - at retail - Surveillance								
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail - Surveillance								
Meat from other animal species or not specified - fresh - at retail - Surveillance								
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at processing plant - Surveillance								
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at retail - Surveillance								
Meat from other animal species or not specified - meat products - pâté - at processing plant - Surveillance								
Meat from other animal species or not specified - meat products - pâté - at retail - Surveillance								
Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - at processing plant - Surveillance								
Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - at retail - Surveillance								

Table Salmonella in red meat and products thereof

2.1.3 **Salmonella** in animals

A. **Salmonella** spp. in *Gallus Gallus* - breeding flocks

Monitoring system

Sampling strategy

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

Breeding flocks are sampled as day-old chicks, at the age of 4 and 16 weeks and every 2 weeks during production. An official control takes place at 16 weeks, 22 weeks, 46 weeks and 58 or 62 weeks. A specific **Salmonella** control is performed 4 times a year in the hatcheries by the owner.

Frequency of the sampling

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

Every flock is sampled

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

As day old chicks and at the age of 4 and 16 weeks

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

Every 2 weeks

Type of specimen taken

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

Internal linings of delivery boxes

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

Socks/ boot swabs

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

Socks/ boot swabs

Methods of sampling (description of sampling techniques)

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

At the farm, pieces (5 by 5 cm) of the inner linings of delivery boxes are taken of each flock. 2 samples are taken, one for the hen-chicks and one for the cock-chicks. Each sample consists of 20 pieces of interlining. The two samples are analyzed separately. On voluntary basis, 20 living hen-chicks and 20 living cock-chicks are brought to the laboratory for serological testing.

The samples have to be taken the day of delivery, the samples have to reach the lab within 24 hours of sampling.

In the hatcheries, pooled samples from dead-in-the-shell chicks and of fluff and meconium, are taken by the owner every 3 months. These are sent to an accredited laboratory.

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

Samples are taken by the owner at 4 weeks and by one of the animal health organizations at 16 weeks, both in accordance with regulation (EU) Nr. 200/2010.

Breeding flocks: Production period

All samples are taken in accordance with Regulation (EC) Nr. 200/2010.

Case definition

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

A sample is considered positive if *Salmonella Enteritidis*, *Typhimurium*, *Hadar*, *Infantis* or *Virchow* is isolated. A flock is considered positive as soon as one sample is positive.

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

A sample is considered positive if *Salmonella Enteritidis*, *Typhimurium*, *Hadar*, *Infantis* or *Virchow* is isolated. A flock is considered positive as soon as one sample is positive. If the farmer requests a confirmation sampling, new samples (5 feces and 2 dust samples) are taken by or under the supervision of the competent authority. The result of the confirmation sampling is binding.

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

A sample is considered positive if *Salmonella Enteritidis*, *Typhimurium*, *Hadar*, *Infantis* or *Virchow* is isolated. A flock is considered positive as soon as one sample is positive. If the farmer requests a confirmation sampling, new samples (5 feces and 2 dust samples) are taken by or under the supervision of the competent authority. The result of the confirmation sampling is binding.

Diagnostic/analytical methods used

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

Bacteriological method: ISO 6579:2002 annex D

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

Bacteriological method: ISO 6579:2002 annex D

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

Bacteriological method: ISO 6579:2002 annex D

Vaccination policy

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

Vaccination against *Salmonella Enteritidis* is compulsory for parent breeding flocks and prohibited for grand parent flocks. Vaccination against *Salmonella Typhimurium* is strongly recommended for parent breeding flocks and prohibited for grandparent flocks.

Other preventive measures than vaccination in place

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

All breeding flocks must have Health Qualification A. The qualification consists of minimal requirements for infrastructure, management, hygiene and biosecurity measures.

Control program/mechanisms

The control program/strategies in place

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

The national control programme for *Salmonella* in breeding flocks is based on Regulations (EG) Nrs. 2160/2003, 200/2010 and 1177/2006.

Measures in case of the positive findings or single cases

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

- 1) treatment of flock with antimicrobials is forbidden;
- 2) Incubation of hatching eggs is prohibited;
- 3) Incubated hatching eggs are removed and destroyed;
- 4) Not yet incubated hatching eggs may be pasteurized and put on the market for human consumption;
- 5) Positive breeding flocks are slaughtered within the month;
- 6) Cleaning and disinfection of housing after removal of the breeding flock;

- 7) After cleaning and disinfection, a hygienogram is performed;
- 8) Sampling of the house (swab control) for the detection of *Salmonella*;
- 8) A new flock is admitted if *Salmonella* can not be found after cleaning and disinfection, otherwise the disinfection and swab control is repeated.

Notification system in place

Zoonotic *Salmonella* is notifiable since the first of Januari 2004. Notification is done by phone, fax or electronically to the Federal Agency for the Safety of the Food Chain. Laboratories and farmers are submitted to the notification.

Results of the investigation

Salmonella was not found in day old chicks. During rearing, of the 354 flocks, 1 flock was positive for following *Salmonella* serotypes were each found in 1 flock: *S. Kottbus*, *S. Paratyphi B* var. *Java*, *S. Soerenga* and *S. Tennessee*. In addition, 1 flock was considered negative for *Salmonella Typhimurium* after confirmation sampling.

During production, of the 581 flocks (grandparent and parent flocks), 1 flock was positive for *S. Typhimurium* and 16 flocks were positive for other than the 5 serotypes for which a target is set. In addition, 3 flocks were considered negative for *Salmonella Enteritidis* after confirmation sampling and 8 flocks for *Salmonella Typhimurium*. These flocks do not count as positive flocks.

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

During rearing, the number of positive flocks (all *Salmonella* spp.) decreased from 6 in 2008 to 3 in 2009, increased to 7 in 2010 and decreased to 4 in 2011. The total number of rearing flocks was again higher in 2011 compared to 2010.

During production, the number of positive flocks for *Salmonella* serotypes for which a target is set increased from 0 in 2009 to 3 in 2010 and decreased again to 1 in 2011. The source of infection could not be traced. The number of positive flocks of other serotypes has decreased slightly compared to 2010 (from 19 to 16).

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

The total number of reported human *Salmonella* isolates decreased in 2011 to 3.272 (3.660 in 2010) mainly due to a decrease of the number of *Salmonella Enteritidis* cases to 492 (823 in 2010).

B. *Salmonella* spp. in *Gallus Gallus* - broiler flocks

Monitoring system

Sampling strategy

Broiler flocks

The official surveillance program for broilers in accordance with Regulations (EC) 2160/2003 and 646/2007 started in 2009. It is compulsory to sample all flocks on farms with more than 200 birds in the last three weeks before slaughter. Sampling of day-old chicks in the framework of the sanitary qualification is optional.

Frequency of the sampling

Broiler flocks: Day-old chicks

Other: not compulsory

Broiler flocks: Before slaughter at farm

Every flock is sampled in the last 3 weeks before slaughter.

Broiler flocks: At slaughter (flock based approach)

Sampling distributed evenly throughout the year

Type of specimen taken

Broiler flocks: Day-old chicks

Internal linings of delivery boxes

Broiler flocks: Before slaughter at farm

Socks/ boot swabs

Broiler flocks: At slaughter (flock based approach)

Organs: caeca

Methods of sampling (description of sampling techniques)

Broiler flocks: Day-old chicks

Pieces of inner linings of the delivery boxes are sampled by the owner in the same way as for breeding flocks. The samples have to reach an accredited laboratory within 48 hours of sampling.

Broiler flocks: Before slaughter at farm

All flocks are sampled, by the owner, within 3 weeks before slaughter. The sampling is performed conform Regulation (EC) n° 646/2007. Samples have to reach an accredited laboratory within 48 hours.

Broiler flocks: At slaughter (flock based approach)

The intact caeca of 10 poultry from the same flock is taken in slaughterhouse with the aim of determining the load in salmonellas entering the slaughterhouse and to compare the result obtained with the Salmonella exit control in the farm of origin.

Case definition

Broiler flocks: Day-old chicks

A sample is considered positive if a *Salmonella* spp. is isolated. A flock is considered positive as soon as one sample is positive.

Broiler flocks: Before slaughter at farm

A sample is considered positive if a *Salmonella* spp. is isolated. A flock is considered positive as soon as one sample is positive.

Diagnostic/analytical methods used

Broiler flocks: Day-old chicks

Bacteriological method: ISO 6579:2002 annex D

Broiler flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002 annex D

Broiler flocks: At slaughter (flock based approach)

Bacteriological method: ISO 6579:2002 annex D

Vaccination policy

Broiler flocks

There is no vaccination policy for broiler flocks.

Other preventive measures than vaccination in place

Broiler flocks

Minimal requirements are laid down for holdings with at least 200 broilers on infrastructure, management, hygiene and bio-security issues in the framework of the sanitary qualification.

Control program/mechanisms

The control program/strategies in place

Broiler flocks

The sanitary qualification for farms with more than 200 birds contains preventive measures (infrastructure, management, hygiene and biosecurity) for the control of *Salmonella*.

Following measures are taken when a flock is positive for *Salmonella* spp:

1° logistic slaughter of the flock at the end of production.

2° mandatory cleaning and disinfection.

3° hygienogram after disinfection and after the house has dried up.

4° swab control on the presence of *Salmonella* before restocking the house.

If the following flock is positive for the same serotype of *Salmonella*, the disinfection must be performed by an external company.

When the same serotype of *Salmonella* is found at three consecutive times, the farm must be evaluated on biosecurity and hygiene by the farm veterinarian and necessary measures must be taken. An epidemiological investigation and/or tests are performed to find the source of the infection.

It is at all times prohibited to treat for *Salmonella* with antibiotics.

Measures in case of the positive findings or single cases

Broiler flocks: Day-old chicks

It is prohibited to treat the flock for *Salmonella* with antibiotics.

Broiler flocks: Before slaughter at farm

See 'the control program/strategies' in place.

Notification system in place

Zoonotic *Salmonella* is notifiable since the first of January 2004. Notification is done by phone, fax or by e-mail to the Federal Agency for the Safety of the Food Chain. Farmers and laboratories are obliged to notify.

Results of the investigation

5.436 batches of day old chicks were sampled, 39 were positive for *Salmonella* spp. of which 1 was positive for *S. Enteritidis* and 30 for *S. Minnesota*. Due to *Salmonella Minnesota*, there were twice as

many positive batches compared to 2010.

8.682 flocks of broilers were sampled in the last 3 weeks of production. 288 were positive for *Salmonella* spp of which 18 for *S. Typhimurium*. This is a major decrease of the number of *S. Typhimurium* positive flocks compared to 2010. The main serotype found was *Salmonella Paratyphi B* (incl. var. Java).

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

The prevalence of all serotypes in day old chicks has increased compared to 2010 due to *S. Minnesota*. *S. Minnesota* was also found in 5 flocks of breeders. The prevalence in broiler flocks of *Salmonella Typhimurium* has decreased compared with the results of 2010. The increase of the number of *S. Paratyphi B* (incl. var. Java) positive flocks continued in 2011.

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

At farm level and at the level of the slaughterhouse (carcasses) and cutting plants (meat) *Salmonella Paratyphi B* (var Java) was the main serotype found. A decrease of the prevalence of *S. Typhimurium* was seen at farm level and on carcasses. The total number of reported human *Salmonella* isolates decreased in 2011 to 3.272 (3.660 in 2010) mainly due to a decrease in the number of *Salmonella Enteritidis* cases to 492 (823 in 2010). The decrease of *S. Typhimurium* at farm and on carcasses could not be translated into a decrease of human cases. This is probably due to other sources of infection.

C. *Salmonella* spp. in *Gallus Gallus* - flocks of laying hens

Monitoring system

Sampling strategy

Laying hens flocks

All laying hen flocks on farms with at least 200 laying hens are under a *Salmonella* control program.

Flocks are sampled by the owner at the age of day old chicks, 16, 24, 39 and 54 weeks and in the last 3 weeks of production.

Frequency of the sampling

Laying hens: Day-old chicks

Every flock is sampled

Laying hens: Rearing period

At the age of 16 weeks

Laying hens: Production period

Every 15 weeks

Laying hens: Before slaughter at farm

Every flock is sampled

Laying hens: At slaughter

Sampling distributed evenly throughout the year

Type of specimen taken

Laying hens: Day-old chicks

Internal linings of delivery boxes

Laying hens: Rearing period

Socks/ boot swabs

Laying hens: Production period

Socks/ boot swabs

Laying hens: Before slaughter at farm

Socks/ boot swabs

Laying hens: At slaughter

Other: caeca

Methods of sampling (description of sampling techniques)

Laying hens: Day-old chicks

At the farm, 20 pieces (5 by 5 cm) of the inner linings of delivery boxes are taken of each batch. On voluntary basis, 20 living hen-chicks are brought to the laboratory for serological testing.

The samples have to reach an accredited laboratory within 48 hours of sampling.

Laying hens: Rearing period

Samples are taken in accordance with Regulation (EC) No. 517/2011.

Laying hens: Production period

Samples are taken in accordance with Regulation (EC) No. 517/2011.

Laying hens: Before slaughter at farm

Samples are taken in accordance with Regulation (EC) No. 517/2011.

Case definition

Laying hens: Day-old chicks

A sample is considered positive if *S. Enteritidis* or *S. Typhimurium* is isolated. A flock is considered positive as soon as one sample is positive.

Laying hens: Rearing period

A sample is considered positive if *S. Enteritidis* or *S. Typhimurium* is isolated. A flock is considered positive as soon as one sample is positive.

Laying hens: Production period

A sample is considered positive if *S. Enteritidis* or *S. Typhimurium* is isolated. A flock is considered positive as soon as one sample is positive.

Laying hens: Before slaughter at farm

A sample is considered positive if *Salmonella* is isolated. A flock is considered positive as soon as one sample is positive.

Diagnostic/analytical methods used

Laying hens: Day-old chicks

Bacteriological method: ISO 6579:2002 annex D

Laying hens: Rearing period

Bacteriological method: ISO 6579:2002 annex D

Laying hens: Production period

Bacteriological method: ISO 6579:2002 annex D

Laying hens: Before slaughter at farm

Bacteriological method: ISO 6579:2002 annex D

Vaccination policy

Laying hens flocks

Vaccination against *Salmonella Enteritidis* is compulsory and vaccination against *Salmonella Typhimurium* is strongly recommended.

Other preventive measures than vaccination in place

Laying hens flocks

Minimal requirements for infrastructure, management, hygiene and bio-security issues are laid down under health qualification B*.

Control program/mechanisms

The control program/strategies in place

Laying hens flocks

The national control program for *Salmonella* in laying hens is based on Regulations (EC) Nos. 2160/2003, 1177/2006 and 517/2011.

Measures in case of the positive findings or single cases

Laying hens flocks

1) Pasteurization of eggs before human consumption.

- 2) Cleaning and disinfection of housing after removal of the positive flock.
- 3) Swab sampling of housing before entering new flock. If result is positive for *Salmonella*, cleaning and disinfection has to be repeated.

Notification system in place

Zoonotic *Salmonella* is notifiable by the farmer and the laboratory since the first of January 2004.

Notification is done by phone, fax or electronic to the Federal Agency for the Safety of the Food Chain.

Results of the investigation

No batches of day old chicks sampled was positive for *Salmonella* spp.

During rearing, 416 flocks were sampled of which 4 were positive for *Salmonella* spp (no *S. Typhimurium* or *S. Enteritidis*).

During production, 750 flocks were sampled of which 39 were positive for *Salmonella* (13 for *S. Enteritidis* and 3 for *S. Typhimurium*).

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

The prevalence for all *Salmonella* serotypes and specific for *S. Enteritidis* and *S. Typhimurium* has decreased compared to 2010.

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

The total number of reported human *Salmonella* isolates decreased in 2011 to 3.272 (3.660 in 2010) mainly due to a decrease in the number of *Salmonella Enteritidis* cases to 492 (823 in 2010). The decrease of the prevalence of *Salmonella Enteritidis* in layers is translated in a decrease of human cases. At the level of the slaughterhouse and cutting plants, *Salmonella Enteritidis* is the main serotype found. However a decrease in *Salmonella* spp and in specific *S. Enteritidis* is also seen here. In Belgium, all layers are vaccinated against *Salmonella Enteritidis*. The period given protection by the vaccine may be too short to cover the stress during transport.

D. *Salmonella* spp. in bovine animals

Monitoring system

Sampling strategy

There was no official monitoring of cattle in 2011 in Belgium. Isolates were diagnostic samples sent to the NRL *Salmonella*, animal health, for serotyping.

Vaccination policy

In 2011, no vaccine was authorized for the vaccination of cattle against salmonellosis.

Results of the investigation

Results from the NRL *Salmonella*, AH indicate that the number of *Salmonella* isolates from cattle (n=36) has further decreased as compared to 2010 (n=50). Most frequently found serotypes are Typhimurium (33.3%) and Dublin (30.6%). The proportion of *S. Dublin* isolates seems to diminish as compared to former years.

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

Data from the NRL *Salmonella*, AH show that in cattle, *S. Dublin* used to be the principal serotype between 2002 and 2010, but declined in 2010 and 2011 to the same low level as *S. Typhimurium*.

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

Monitoring system

Sampling strategy

Breeding flocks

Health Qualification A is mandatory for all commercial breeding flocks. They are at least sampled as day-old chicks, when entering the production unit if this is on a different farm than the rearing unit, at one point during production and within the last 3 weeks before slaughter.

Meat production flocks

On voluntary basis (Health Qualification A), day-old chicks are sampled.

On farms with a capacity of 5000 or more birds (Health Qualification B), all flocks are sampled within 3 weeks before slaughter.

Frequency of the sampling

Breeding flocks: Day-old chicks

Every flock is sampled

Breeding flocks: Production period

Every flock is sampled

Meat production flocks: Day-old chicks

Control 'at entry' is not mandatory.

Meat production flocks: Before slaughter at farm

Other: ____ meat production flocks are sampled within 3 weeks before slaughter on a voluntary basis.

Type of specimen taken

Breeding flocks: Day-old chicks

Internal linings of delivery boxes

Breeding flocks: Production period

Blood

Meat production flocks: Day-old chicks

Internal linings of delivery boxes

Meat production flocks: Before slaughter at farm

Faeces

Methods of sampling (description of sampling techniques)

Breeding flocks: Day-old chicks

At the farm, pieces (5 by 5 cm) of the inner linings of delivery boxes are taken of each flock. 2 samples are taken, one for the hen-chicks and one for the cock-chicks. Each sample consists of 20 pieces of inner lining. The two samples are analyzed separately.

Breeding flocks: Production period

Faeces samples are taken by the owner from the delivery boxes at time of delivery. A sample made of 60 X 5-10g subsamples is taken of every flock with different origin of rearing. The samples have to reach an accredited laboratory within 48 hours of sampling.

Once during production, 60 blood samples are taken of each flock. If one or more blood sample is positive, additional faeces samples are taken to confirm the result.

Within 3 weeks before slaughter, a pooled faeces sample consisting of 60 X 1g subsamples is taken of each flock.

Meat production flocks: Day-old chicks

Pieces of inner linings of the delivery boxes are sampled by the owner on a voluntary basis (Health Qualification A) in the same way as for breeding flocks.

Meat production flocks: Before slaughter at farm

On farms with more than 5000 birds (Health Qualification B), all flocks are sampled, by the owner, within 3 weeks before slaughter. The sampling can be performed in 3 ways. 1) A pooled faeces sample (60 X 1g) taken with swabs. 2) A pooled faeces sample (60 X 1g) taken by hand. 3) Two pair of overshoes, pooled. The samples have to reach an accredited laboratory within 48 hours.

Case definition

Breeding flocks: Day-old chicks

A flock is positive if *Salmonella* is found.

Breeding flocks: Production period

A flock is positive if *Salmonella* is found.

Meat production flocks: Day-old chicks

A flock is positive if *Salmonella* is found.

Meat production flocks: Before slaughter at farm

A flock is positive if *Salmonella* is found.

Diagnostic/analytical methods used

Breeding flocks: Day-old chicks

Bacteriological method: ISO 6579:2002

Breeding flocks: Production period

Serological method: ELISA, if positive followed by bacteriological confirmation ISO 6579:2002.

Meat production flocks: Day-old chicks

Bacteriological method: ISO 6579:2002

Meat production flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002

Vaccination policy

Breeding flocks

There is no vaccination policy.

Meat production flocks

There is no vaccination policy.

Other preventive measures than vaccination in place

Breeding flocks

Health Qualification A is mandatory. Hygienic infrastructural and management obligations are included.

Meat production flocks

If the holding has a capacity of 5000 birds or more, Health Qualification B is mandatory, A is optional. Both include hygienic infrastructural and management obligations.

Measures in case of the positive findings or single cases

Samples are taken for monitoring purposes only. Flocks are slaughtered at the end of the day (logistic slaughter) if samples taken before slaughter are positive.

Notification system in place

A notification system for zoonotic *Salmonella* is in place since 1 January 2004. The notification can be done by e-mail, fax or phone.

Results of the investigation

There were no breeding flocks sampled in 2011.

All 4 meat production flocks sampled were negative for *Salmonella* spp.

F. *Salmonella* spp. in geese - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Breeding flocks

Health Qualification A is mandatory for all commercial breeding flocks. They are at least sampled as day-old chick, when entering the production unit if this is on a different farm than the rearing unit, at one point during production and within the last 3 weeks before slaughter.

Frequency of the sampling

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

Every flock is sampled

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

Once a year

Meat production flocks: Day-old chicks

Control 'at entry' is not mandatory.

Meat production flocks: Before slaughter at farm

within 3 weeks prior to slaughter. This is not mandatory in all cases.

Type of specimen taken

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

Internal linings of delivery boxes

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

Blood

Meat production flocks: Day-old chicks

Internal linings of delivery boxes

Meat production flocks: Before slaughter at farm

Faeces

Methods of sampling (description of sampling techniques)

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

At the farm, pieces of the inner linings of delivery boxes are taken of each flock. Two samples are taken, one for the hen-chicks and one for the cock-chicks. Each sample consists of 20 pieces of inner lining. The two samples are analyzed separately.

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

Faeces samples are taken by the owner from the delivery boxes at time of delivery. A sample made of 60 X 5-10g subsamples is taken of every flock with different origin of rearing. The samples have to reach an accredited and validated laboratory within 48 hours of sampling.

Once during production, 60 blood samples are taken of each flock. If one or more blood sample is positive, additional faeces samples are taken to confirm the result.

Within 3 weeks before slaughter, a pooled faeces sample consisting of 60 X 1g subsamples is taken of each flock.

Meat production flocks: Day-old chicks

Pieces of inner linings of the delivery boxes are sampled by the owner on a voluntary basis (Health Qualification A) in the same way as for breeding flocks.

Meat production flocks: Before slaughter at farm

On farms with more than 5.000 birds, all flocks are sampled, by the owner, within 3 weeks before slaughter. The sampling can be performed in 3 ways. 1) A pooled faeces sample (60 X 1g) taken with swabs. 2) A pooled faeces sample (60 X 1g) taken by hand. 3) Two pair of overshoes, pooled. The samples have to reach an accredited laboratory within 48 hours.

Case definition

Breeding flocks: Day-old chicks

A flock is positive if *Salmonella* is found.

Breeding flocks: Production period

A flock is positive if *Salmonella* is found.

Meat production flocks: Day-old chicks

A flock is positive if *Salmonella* is found.

Meat production flocks: Before slaughter at farm

A flock is positive if *Salmonella* is found.

Diagnostic/analytical methods used

Breeding flocks: Day-old chicks

Bacteriological method: ISO 6579:2002

Breeding flocks: Production period

Serological method: ELISA, if positive, followed by bacteriological confirmation.

Meat production flocks: Day-old chicks

Bacteriological method: ISO 6579:2002

Meat production flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002

Vaccination policy

Breeding flocks

There is no vaccination policy for breeding flocks.

Meat production flocks

There is no vaccination policy for meat production flocks.

Other preventive measures than vaccination in place

Breeding flocks

Health Qualification A is mandatory for breeding flocks, hygienic infrastructural and management obligations are included.

Meat production flocks

If the holding has a capacity of 5000 birds or more, Health Qualification B is mandatory, A optional for meat production flocks. Both include hygienic infrastructural and management obligations.

Measures in case of the positive findings or single cases

Breeding flocks

The samples are taken for monitoring purposes only. At this moment, no measures are implemented in case of a positive finding. At time of slaughter, poultry positive for *Salmonella* is slaughtered at the end of the day (logistic slaughter).

Meat Production flocks

If samples taken within 3 weeks before slaughter are positive for *Salmonella*, the flock is slaughtered at the end of the day (logistic slaughter).

Notification system in place

A notification system for zoonotic *Salmonella* is in place since 1 January 2004. The notification can be done by e-mail, fax or post.

Results of the investigation

No breeding flocks or meat production flocks were tested in 2011.

G. *Salmonella* spp. in pigs

Monitoring system

Sampling strategy

Breeding herds

For diagnostic purposes and in the framework of research projects, pigs are sampled and isolates are sent to the NRL *Salmonella*, Animal Health for serotyping and resistance analysis.

Multiplying herds

For diagnostic purposes and in the framework of research projects, pigs are sampled and isolates are sent to the NRL *Salmonella*, AH for serotyping and resistance analysis.

Fattening herds

Every 4 months, 12 blood samples are taken for the serological surveillance of *Salmonella* in farms with at least 31 fattening pigs.

Samples are taken for bacteriological detection on farms that are considered risk herds for *Salmonella*.

For diagnostic purposes and in the framework of research projects, pigs are sampled and isolates are sent to the NRL *Salmonella*, AH for serotyping and resistance analysis.

Frequency of the sampling

Fattening herds at farm

4

Type of specimen taken

Fattening herds at farm

Blood

Methods of sampling (description of sampling techniques)

Fattening herds at farm

Depending on the capacity of the farm, 10 to 12 blood samples are taken of the fattening pigs. The blood samples are taken of all ages.

Case definition

Fattening herds at farm

Risk farms are identified as farms with a mean S/P ratio higher than 0.6 for 3 consecutive sampling rounds.

Diagnostic/analytical methods used

Fattening herds at farm

indirect LPS--*Salmonella* ELISA

Vaccination policy

Breeding herds

No vaccine is authorized in Belgium for the vaccination of pigs against Salmonellosis.

Multiplying herds

No vaccine is authorized in Belgium for the vaccination of pigs against salmonellosis.

Fattening herds

No vaccine is authorized in Belgium for the vaccination of pigs against salmonellosis.

Control program/mechanisms

The control program/strategies in place

Fattening herds

Risk farms are identified as farms with a mean S/P ratio equal or higher than 0.6 for 3 consecutive sampling rounds. Following mandatory measures are applied on risk farms:

- 1) completion of a checklist on bio-security and other measures;
- 2) formulating and implementing a herd specific salmonella action plan, based on the result of the checklist;
- 3) bacteriological evaluation of the farm.

Measures in case of the positive findings or single cases

The measures are explained under control strategy in place.

Notification system in place

Zoonotic Salmonella is notifiable by operators and laboratories since the first of January 2004. Notification is done by phone, fax or electronic to the Federal Agency of the Safety of the Food Chain.

Results of the investigation

5.976 herds with fattening pigs were sampled in 2011. 1.509 farms had at least once a mean S/P ratio of more than 0.6. 114 herds were classified as Salmonella risk herds of which 33 herds were classified as a Salmonella risk herd for the second time.

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

Laboratory findings from the NRL Salmonella, AH concerning isolates that were sent in for serotyping in 2011 are available. The number of pig strains tested in 2011 was considerably lower as compared to 2010 (n=203 and 465, respectively). Mostly S. Typhimurium isolates were found (55.2%; 67.5% in 2010), but also S. Derby (6.9%; 7.3% in 2010). As for S. Typhimurium isolates from pigs, half are classic variant O5+. Almost all Salmonella pig strains typed as Group B were monophasic 4[5]:i:-.

During the last 12 years (2000-2011), S. Typhimurium absolutely is the most prevalent serotype among pig isolates, representing about 55% of pig Salmonella in 2011. Serotype Derby always is the second most important serotype with about 7% of the pig strains in 2010 and 2011.

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

The main serotype found on Salmonella risk farms (fattening pigs), on carcasses and in pig meat is Salmonella Typhimurium. The decrease of Salmonella positive carcasses and pig meat did not translate in a decrease of the number of human cases. At the level of the slaughter house and cutting plant, a relative increase in Salmonella Typhimurium var Copenhagen was found. This also was not translated in an increase of the number of human cases for this serotype.

H. *Salmonella* spp. in turkey - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Meat production flocks

All flocks are sampled within three weeks of slaughter.

Frequency of the sampling

Meat production flocks: Day-old chicks

Control 'at entry' is not mandatory.

Meat production flocks: Before slaughter at farm

Every flock is sampled

Type of specimen taken

Meat production flocks: Day-old chicks

Internal linings of delivery boxes

Meat production flocks: Before slaughter at farm

Socks/ boot swabs

Methods of sampling (description of sampling techniques)

Meat production flocks: Day-old chicks

Pieces of inner linings of the delivery boxes are sampled by the owner on a voluntary basis (Health Qualification A). The samples have to reach an accredited laboratory within 48 hours of sampling.

Meat production flocks: Before slaughter at farm

All flocks are sampled, by the owner, within 3 weeks before slaughter conform Regulation (EC) n° 584/2008.

Case definition

A flock is positive if *Salmonella* is found.

Monitoring system

Case definition

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

A flock is positive if *Salmonella* is found.

Meat production flocks: Day-old chicks

A flock is positive if *Salmonella* is found.

Meat production flocks: Before slaughter at farm

A flock is positive if *Salmonella* is found.

Diagnostic/analytical methods used

Meat production flocks: Day-old chicks

Bacteriological method: ISO 6579:2002 annex D.

Meat production flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002 annex D.

Vaccination policy

Meat production flocks

There is no vaccination policy for meat production flocks.

Other preventive measures than vaccination in place

Meat production flocks

Health Qualification B* includes infrastructural, management hygiene and bio-security obligations.

Measures in case of the positive findings or single cases

Following measures are taken when a flock is positive for *Salmonella* spp:

1° logistic slaughter of the flock at the end of production.

2° mandatory cleaning and disinfection.

3° hygienogram after disinfection and after the house has dried up.

4° swab control on the presence of *Salmonella* before restocking the house.

If the following flock is positive for the same serotype of *Salmonella*, the disinfection must be performed by an external company.

When the same serotype of *Salmonella* is found at three consecutive times, the farm must be evaluated on biosecurity and hygiene by the farm veterinarian and necessary measures must be taken. An epidemiological investigation and/or tests are performed to find the source of the infection.

It is at all times prohibited to treat for *Salmonella* with antibiotics.

Notification system in place

Zoonotic *Salmonella* is notifiable since 1 January 2004. Notification is done by phone, fax or e-mail.

Results of the investigation

There are no turkey breeding flocks in Belgium.

167 meat production flocks were tested in 2011. There were no positive flocks for *Salmonella* spp.

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

There is a low incidence of *Salmonella* in turkey meat production flocks in Belgium.

Table Salmonella in breeding flocks of *Gallus gallus*

	No of flocks under control programme	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Target Verification	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis
Gallus gallus (fowl) - breeding flocks, unspecified - adult - Control and eradication programmes			Census	Official and industry sampling			yes				
Gallus gallus (fowl) - parent breeding flocks, unspecified - adult - Control and eradication programmes	581	DGZ/ARSIA	Census	Official and industry sampling	environmental sample > boot swabs		yes	Flock	581	17	
Gallus gallus (fowl) - parent breeding flocks, unspecified - day-old chicks - Control and eradication programmes	329	DGZ	Census	Industry sampling	environmental sample > delivery box liner		no	Flock	329	0	
Gallus gallus (fowl) - parent breeding flocks, unspecified - during rearing period - Control and eradication programmes	354	DGZ/ARSIA	Census	Official and industry sampling	environmental sample > boot swabs		no	Flock	354	4	
	S. Hadar	S. Infantis	S. Typhimurium	S. Virchow	S. 1,4,[5],12:i:-	Salmonella spp., unspecified	S. 4,5:i:-	S. Havana	S. Idikan	S. Indiana	S. Kottbus
Gallus gallus (fowl) - breeding flocks, unspecified - adult - Control and eradication programmes											
Gallus gallus (fowl) - parent breeding flocks, unspecified - adult - Control and eradication programmes			1			1	1	1	1	2	1
Gallus gallus (fowl) - parent breeding flocks, unspecified - day-old chicks - Control and eradication programmes											

Table Salmonella in breeding flocks of *Gallus gallus*

	S. Hadar	S. Infantis	S. Typhimurium	S. Virchow	S. 1,4,[5],12:i:-	Salmonella spp., unspecified	S. 4,5:i:-	S. Havana	S. Idikan	S. Indiana	S. Kottbus
Gallus gallus (fowl) - parent breeding flocks, unspecified - during rearing period - Control and eradication programmes											1
	S. Minnesota	S. Paratyphi B var. Java	S. Rissen	S. Senftenberg	S. Soerenga	S. Tennessee					
Gallus gallus (fowl) - breeding flocks, unspecified - adult - Control and eradication programmes											
Gallus gallus (fowl) - parent breeding flocks, unspecified - adult - Control and eradication programmes	5	1	1	1			1				
Gallus gallus (fowl) - parent breeding flocks, unspecified - day-old chicks - Control and eradication programmes											
Gallus gallus (fowl) - parent breeding flocks, unspecified - during rearing period - Control and eradication programmes		1				1	1				

Table Salmonella in other birds

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Guinea fowl - at farm - Monitoring	ARSIA	Census	Industry sampling	environmental sample > boot swabs		Flock	2	0			

Table Salmonella in other poultry

	No of flocks under control programme	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Target Verification	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis
Gallus gallus (fowl) - laying hens - day-old chicks - Control and eradication programmes ¹⁾	110	DGZ/ARSIA	Census	Industry sampling	environmental sample > delivery box liner		no	Flock	110	0	
Gallus gallus (fowl) - laying hens - during rearing period - Control and eradication programmes	416	DGZ/ARSIA	Census	Industry sampling	environmental sample > boot swabs		no	Flock	416	4	
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes	750	DGZ/ARSIA/LAVETAN	Census	Official and industry sampling	environmental sample > boot swabs		yes	Flock	750	39	13
Gallus gallus (fowl) - broilers - day-old chicks - Control and eradication programmes ²⁾	5436	DGZ/ARSIA/LAVETAN	Census	Industry sampling	environmental sample > delivery box liner		no	Flock	5436	39	1
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes	8682	DGZ/ARSIA/LAVETAN	Census	Official and industry sampling	environmental sample > boot swabs		yes	Flock	8682	288	
Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes ³⁾										0	
Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes	167	DGZ/ARSIA/LAVETAN	Census	Official and industry sampling	environmental sample > boot swabs		yes	Flock	167	0	
Ducks - meat production flocks	4	ARSIA	Census	Industry sampling	environmental sample > boot swabs		no	Flock	4	0	

Table Salmonella in other poultry

	S. Typhimurium	S. 1,4,[5],12:i: -	Salmonella spp., unspecified	Other serovars	S. 3,10:-:1,7	S. 3,19:-:-	S. 4,5:i:-	S. 6,7:e,h:-	S. 6,8:e,h:-	S. Agona	S. Anatum
Gallus gallus (fowl) - laying hens - day-old chicks - Control and eradication programmes ¹⁾											
Gallus gallus (fowl) - laying hens - during rearing period - Control and eradication programmes											
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes	3			2				1		3	
Gallus gallus (fowl) - broilers - day-old chicks - Control and eradication programmes ²⁾			1								
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes	18		16	13	1	5	2		2	12	2
Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes ³⁾											
Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes											
Ducks - meat production flocks											

	S. Banalia	S. Braenderup	S. Brandenburg	S. Bredeney	S. Coeln	S. Cubana	S. Derby	S. Dublin	S. Give	S. Hadar	S. Idikan
Gallus gallus (fowl) - laying hens - day-old chicks - Control and eradication programmes ¹⁾											
Gallus gallus (fowl) - laying hens - during rearing period - Control and eradication programmes											1

Table Salmonella in other poultry

	S. Banalia	S. Braenderup	S. Brandenburg	S. Bredeney	S. Coeln	S. Cubana	S. Derby	S. Dublin	S. Give	S. Hadar	S. Idikan
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes		3				1					1
Gallus gallus (fowl) - broilers - day-old chicks - Control and eradication programmes ²⁾											
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes	1	2		1	1		2	1	1	6	2
Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes ³⁾											
Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes											
Ducks - meat production flocks											
	S. Indiana	S. Infantis	S. Kedougou	S. Kentucky	S. Kottbus	S. Lexington	S. Livingstone	S. Mbandaka	S. Minnesota	S. Mons	S. Montevideo
Gallus gallus (fowl) - laying hens - day-old chicks - Control and eradication programmes ¹⁾											
Gallus gallus (fowl) - laying hens - during rearing period - Control and eradication programmes					1			1			
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes		2					4			1	
Gallus gallus (fowl) - broilers - day-old chicks - Control and eradication programmes ²⁾		1							30		

Table Salmonella in other poultry

	S. Indiana	S. Infantis	S. Kedougou	S. Kentucky	S. Kottbus	S. Lexington	S. Livingstone	S. Mbandaka	S. Minnesota	S. Mons	S. Montevideo
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes	3	11	1	6	4	2		3	36		1
Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes ³⁾											
Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes											
Ducks - meat production flocks											
	S. Newport	S. Ohio	S. Paratyphi B	S. Paratyphi B var. Java	S. Rissen	S. Saintpaul	S. Schwarzengrund	S. Senftenberg	S. Stourbridge	S. Tennessee	S. Virchow
Gallus gallus (fowl) - laying hens - day-old chicks - Control and eradication programmes ¹⁾											
Gallus gallus (fowl) - laying hens - during rearing period - Control and eradication programmes								1			
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes		1			6		1	1			
Gallus gallus (fowl) - broilers - day-old chicks - Control and eradication programmes ²⁾										6	
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes	1		17	54	26	1	1	31	1		7
Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes ³⁾											

Table Salmonella in other poultry

	S. Newport	S. Ohio	S. Paratyphi B	S. Paratyphi B var. Java	S. Rissen	S. Saintpaul	S. Schwarzengrund	S. Senftenberg	S. Stourbridge	S. Tennessee	S. Virchow
Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes											
Ducks - meat production flocks											
S. Yoruba											
Gallus gallus (fowl) - laying hens - day-old chicks - Control and eradication programmes ¹⁾											
Gallus gallus (fowl) - laying hens - during rearing period - Control and eradication programmes											
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes		1									
Gallus gallus (fowl) - broilers - day-old chicks - Control and eradication programmes ²⁾											
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes			1								
Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes ³⁾											
Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes											
Ducks - meat production flocks											

Comments:

Table Salmonella in other poultry

Comments:

- ¹⁾ flock equals same flock of origin of hatching eggs
- ²⁾ flock equals same flock of origin of hatching eggs
- ³⁾ There are no turkey breeding flocks

Footnote:

Gallus gallus - laying hens - adult:

1 flock was positive for 2 different serotypes: *S. Enteritidis* and *S. Braenderup*

2 flocks were positive for 3 different serotypes:

1 for *S.O4:D:-*, *S. Yoruba* and *S. Agona*;

1 for *S. O6,7:e,h*, *S. Schwartzengrund* and *S. Braenderup*.

2.1.4 Salmonella in feedingstuffs

Table Salmonella in compound feedingstuffs

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Compound feedingstuffs for cattle - final product - Surveillance	TRA055			feed sample		Batch	25g	11	0		
Compound feedingstuffs for pigs - final product - Surveillance	TRA055			feed sample		Batch	25g	105	2		1
Compound feedingstuffs for poultry - breeders - final product - Surveillance	TRA055			feed sample		Batch	25g	115	0		
Compound feedingstuffs for poultry - broilers - final product - Surveillance	TRA055			feed sample		Batch	25g	117	2		
Compound feedingstuffs for poultry - laying hens - final product - Surveillance ¹⁾	TRA055			feed sample		Batch	25g	122	4		
Compound feedingstuffs for sheep - final product - Surveillance	TRA055			feed sample		Batch	25g	7	0		
Pet food - dog snacks (pig ears, chewing bones) - Surveillance ²⁾	TRA055- IEC401- TRA082-			feed sample		Batch	25g	132	9		

	Salmonella spp., unspecified	Other serovars	S. 3,10:-:-	S. 4,5:i:-	S. 6,7:-:-	S. 6,7:z29	S. Agona	S. Cerro	S. Chichiri	S. Derby	S. Havana
Compound feedingstuffs for cattle - final product - Surveillance											

Table Salmonella in compound feedingstuffs

	Salmonella spp., unspecified	Other serovars	S. 3,10:-:-	S. 4,5:i:-	S. 6,7:-:-	S. 6,7:z29	S. Agona	S. Cerro	S. Chichiri	S. Derby	S. Havana
Compound feedingstuffs for pigs - final product - Surveillance											
Compound feedingstuffs for poultry - breeders - final product - Surveillance											
Compound feedingstuffs for poultry - broilers - final product - Surveillance					1						
Compound feedingstuffs for poultry - laying hens - final product - Surveillance	¹⁾						1				
Compound feedingstuffs for sheep - final product - Surveillance											
Pet food - dog snacks (pig ears, chewing bones) - Surveillance	²⁾	1		2	1			2	1	1	1

	S. Idikan	S. Infantis	S. Mbandaka	S. Minnesota	S. Montevideo	S. Senftenberg	S. Tennessee	S. Typhimurium - 5
Compound feedingstuffs for cattle - final product - Surveillance								
Compound feedingstuffs for pigs - final product - Surveillance	1							
Compound feedingstuffs for poultry - breeders - final product - Surveillance								
Compound feedingstuffs for poultry - broilers - final product - Surveillance					1			

Table Salmonella in compound feedingstuffs

	S. Idikan	S. Infantis	S. Mbandaka	S. Minnesota	S. Montevideo	S. Senftenberg	S. Tennessee	S. Typhimurium - 5
Compound feedingstuffs for poultry - laying hens - final product - Surveillance ¹⁾		1	1		1	1	1	
Compound feedingstuffs for sheep - final product - Surveillance								
Pet food - dog snacks (pig ears, chewing bones) - Surveillance ²⁾			1					2

Comments:

¹⁾ Two samples with 2 serotypes a) S. 6,7:z29 and S. Tennessee b) S.Mbandaka and S. Montevideo

²⁾ Two samples with 2 serotypes a) S. Mbandaka and S.Typhimurium 5 b)S. Agona and S.Salmonella spp. unspecified. One sample with 3 serotypes: S. Havana and S. 3,10: - : - and S.Chichiri

Table Salmonella in feed material of animal origin

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Feed material of land animal origin - Surveillance	TRA055			feed sample		Batch	25g	5			
Feed material of land animal origin - animal fat - Surveillance	TRA055			feed sample		Batch	25g	40			
Feed material of land animal origin - blood meal - Surveillance	TRA055			feed sample		Batch	25g	2	1		
Feed material of land animal origin - blood products - Surveillance	TRA055			feed sample		Batch	25g	2			
Feed material of land animal origin - bone meal - Surveillance	TRA055			feed sample		Batch	25g	3			
Feed material of land animal origin - egg powder - Surveillance	IEC401			feed sample		Batch	25g	22			
Feed material of land animal origin - meat and bone meal - Surveillance	¹⁾ TRA055-IEC 402-IEC 404			feed sample		Batch	25g	106	2		
Feed material of land animal origin - poultry offal meal - Surveillance	²⁾ TRA055			feed sample		Batch	25g	7	3		
Feed material of marine animal origin - fish meal - Surveillance	TRA055			feed sample		Batch	25g	8			
	Salmonella spp., unspecified	Other serovars	S. 13,23:-:-	S. 6,7:-:-	S. Give	S. Infantis	S. Kedougou	S. Livingstone	S. Montevideo	S. Virchow	
Feed material of land animal origin - Surveillance											

Table Salmonella in feed material of animal origin

	Salmonella spp., unspecified	Other serovars	S. 13,23:-:-	S. 6,7:-:-	S. Give	S. Infantis	S. Kedougou	S. Livingstone	S. Montevideo	S. Virchow
Feed material of land animal origin - animal fat - Surveillance										
Feed material of land animal origin - blood meal - Surveillance							1			
Feed material of land animal origin - blood products - Surveillance										
Feed material of land animal origin - bone meal - Surveillance										
Feed material of land animal origin - egg powder - Surveillance										
Feed material of land animal origin - meat and bone meal - Surveillance ¹⁾						1		1	1	1
Feed material of land animal origin - poultry offal meal - Surveillance ²⁾			1	1	1				1	
Feed material of marine animal origin - fish meal - Surveillance										

Comments:

¹⁾ Two samples with 2 serotypes a) S. Livingstone and S. Montevideo b) S. Infantis and S. Virchow

²⁾ One sample with 2 serotypes S. Give and S. Montevideo

Table Salmonella in other feed matter

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium
Feed material of oil seed or fruit origin - groundnut derived - Surveillance	IEC207			feed sample		Batch	25g	7			
Feed material of oil seed or fruit origin - linseed derived - Surveillance	IEC207-TRA055			feed sample		Batch	25g	12			
Feed material of oil seed or fruit origin - other oil seeds derived - Surveillance	IEC207			feed sample		Batch	25g	1			
Feed material of oil seed or fruit origin - palm kernel derived - Surveillance	TRA055			feed sample		Batch	25g	3			
Feed material of oil seed or fruit origin - rape seed derived - Surveillance	IEC207-TRA055			feed sample		Batch	25g	17			
Feed material of oil seed or fruit origin - soya (bean) derived - Surveillance	IEC207-TRA055			feed sample		Batch	25g	62	1		
Feed material of oil seed or fruit origin - sunflower seed derived - Surveillance	IEC207-TRA055			feed sample		Batch	25g	17			

	Salmonella spp., unspecified	S. 3,19:--
Feed material of oil seed or fruit origin - groundnut derived - Surveillance		
Feed material of oil seed or fruit origin - linseed derived - Surveillance		
Feed material of oil seed or fruit origin - other oil seeds derived - Surveillance		

Table Salmonella in other feed matter

	Salmonella spp., unspecified	S. 3,19:-:-
Feed material of oil seed or fruit origin - palm kernel derived - Surveillance		
Feed material of oil seed or fruit origin - rape seed derived - Surveillance		
Feed material of oil seed or fruit origin - soya (bean) derived - Surveillance		1
Feed material of oil seed or fruit origin - sunflower seed derived - Surveillance		

2.1.5 *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 phageotypes in human cases and in foodstuffs or animals may indicate that the food category or animal species in question serves as a source of human infections. However as information is not available from all potential sources of infections, conclusions have to be drawn with caution.

Table *Salmonella* serovars in animals

Serovar	Cattle (bovine animals)				Pigs				Gallus gallus (fowl)				Other poultry
	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	
Number of isolates in the laboratory			36				203					952	
Number of isolates serotyped	0	0	36	0	0	0	203	0	0	0	952	0	0
Number of isolates per serovar													
S. Agona							1				13		
S. Albany											2		
S. Anatum							1				3		
S. Banalia											1		
S. Bareilly											1		
S. Braenderup											6		

Table Salmonella serovars in animals

Serovar	Cattle (bovine animals)				Pigs				Gallus gallus (fowl)				Other poultry
	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	
Number of isolates in the laboratory			36				203				952		
Number of isolates serotyped	0	0	36	0	0	0	203	0	0	0	952	0	0
Number of isolates per serovar													
S. Brandenburg			3				3				2		
S. Bredeney											4		
S. Cerro											8		
S. Choleraesuis							2				0		
S. Coeln											7		
S. Cubana											4		
S. Derby							14				3		
S. Dublin			11				0				1		
S. Enteritidis			3				2				65		
S. Essen											2		
S. Gallinarum biovar Pullorum											1		

Table Salmonella serovars in animals

Serovar	Cattle (bovine animals)				Pigs				Gallus gallus (fowl)				Other poultry
	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	
Number of isolates in the laboratory			36				203				952		
Number of isolates serotyped	0	0	36	0	0	0	203	0	0	0	952	0	0
Number of isolates per serovar													
S. Give											16		
S. Goldcoast											1		
S. Hadar							1				16		
S. Havana											1		
S. Hillingdon											1		
S. Idikan											8		
S. Indiana											8		
S. Infantis							8				20		
S. Jerusalem											2		
S. Kedougou							2				1		
S. Kentucky											15		

Table Salmonella serovars in animals

Serovar	Cattle (bovine animals)				Pigs				Gallus gallus (fowl)				Other poultry
	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	
Number of isolates in the laboratory			36				203				952		
Number of isolates serotyped	0	0	36	0	0	0	203	0	0	0	952	0	0
Number of isolates per serovar													
S. Kottbus											9		
S. Lexington											2		
S. Livingstone							4				21		
S. Mbandaka							7				39		
S. Minnesota			1				0				86		
S. Mons											1		
S. Montevideo											5		
S. Newport											1		
S. Ohio											2		
S. Ouakam											2		
S. Paratyphi B							1				235		

Table Salmonella serovars in animals

Serovar	Cattle (bovine animals)				Pigs				Gallus gallus (fowl)				Other poultry
	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	
Number of isolates in the laboratory			36				203				952		
Number of isolates serotyped	0	0	36	0	0	0	203	0	0	0	952	0	0
Number of isolates per serovar													
S. Rissen			2				7				57		
S. Saintpaul											1		
S. Schwarzengrund											2		
S. Senftenberg											56		
S. Soerenga											2		
S. Stourbridge											1		
S. Tennessee											25		
S. Tsevie											1		
S. Typhimurium			12				112				93		
S. Umbilo			1										
S. Virchow											9		

Table Salmonella serovars in animals

Serovar	Cattle (bovine animals)				Pigs				Gallus gallus (fowl)				Other poultry
	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	Control program	Monitoring	Clinical	Surveillance	
Number of isolates in the laboratory			36				203				952		
Number of isolates serotyped	0	0	36	0	0	0	203	0	0	0	952	0	0
Number of isolates per serovar													
S. Welikade											1		
S. Worthington											1		
S. Yoruba											2		
S. group B			3				32				41		
S. group C1							4				10		
S. group C2											2		
S. group D							1						
S. group E											11		
Salmonella spp., unspecified							1				22		

Table Salmonella serovars in animals

Serovar	Other poultry		
	Monitoring	Clinical	Surveillance
Number of isolates in the laboratory			
Number of isolates serotyped	0	0	0
Number of isolates per serovar			
S. Agona			
S. Albany			
S. Anatum			
S. Banalia			
S. Bareilly			
S. Braenderup			
S. Brandenburg			
S. Bredeney			
S. Cerro			
S. Choleraesuis			
S. Coeln			

Table Salmonella serovars in animals

Serovar	Other poultry			
	Sources of isolates	Monitoring	Clinical	Surveillance
Number of isolates in the laboratory				
Number of isolates serotyped		0	0	0
Number of isolates per serovar				
S. Cubana				
S. Derby				
S. Dublin				
S. Enteritidis				
S. Essen				
S. Gallinarum biovar Pullorum				
S. Give				
S. Goldcoast				
S. Hadar				
S. Havana				
S. Hillingdon				

Table Salmonella serovars in animals

Serovar	Other poultry			
	Sources of isolates	Monitoring	Clinical	Surveillance
Number of isolates in the laboratory				
Number of isolates serotyped		0	0	0
Number of isolates per serovar				
S. Idikan				
S. Indiana				
S. Infantis				
S. Jerusalem				
S. Kedougou				
S. Kentucky				
S. Kottbus				
S. Lexington				
S. Livingstone				
S. Mbandaka				
S. Minnesota				

Table Salmonella serovars in animals

Serovar	Other poultry			
	Sources of isolates	Monitoring	Clinical	Surveillance
Number of isolates in the laboratory				
Number of isolates serotyped		0	0	0
Number of isolates per serovar				
S. Mons				
S. Montevideo				
S. Newport				
S. Ohio				
S. Ouakam				
S. Paratyphi B				
S. Rissen				
S. Saintpaul				
S. Schwarzengrund				
S. Senftenberg				
S. Soerenga				

Table Salmonella serovars in animals

Serovar	Other poultry		
	Monitoring	Clinical	Surveillance
Number of isolates in the laboratory			
Number of isolates serotyped	0	0	0
Number of isolates per serovar			
S. Stourbridge			
S. Tennessee			
S. Tsevie			
S. Typhimurium			
S. Umbilo			
S. Virchow			
S. Welikade			
S. Worthington			
S. Yoruba			
S. group B			
S. group C1			

Table Salmonella serovars in animals

Serovar	Other poultry		
	Monitoring	Clinical	Surveillance
Number of isolates in the laboratory			
Number of isolates serotyped	0	0	0
Number of isolates per serovar			
S. group C2			
S. group D			
S. group E			
Salmonella spp., unspecified			

Footnote:

Salmonella spp., unspecified = not typable at the NRL

Table Salmonella serovars in feed

Serovar	Compound feedingstuffs for pigs		All feedingstuffs (Some isolates are from monitoring of feed compounds, others are from samples taken for internal controls.)	
	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory			197	
Number of isolates serotyped	0	0	95	0
Number of isolates per serovar				
S. Agama			1	
S. Agona			9	
S. Anatum			6	
S. Brandenburg			14	
S. Cerro			2	
S. Cubana			5	
S. Derby			10	
S. Enteritidis			4	
S. Essen			3	

Table Salmonella serovars in feed

Serovar	Compound feedingstuffs for pigs		All feedingstuffs (Some isolates are from monitoring of feed compounds, others are from samples taken for internal controls.)	
	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory			197	
Number of isolates serotyped	0	0	95	0
Number of isolates per serovar				
S. Hadar			1	
S. Heidelberg			1	
S. Idikan			7	
S. Infantis			5	
S. Jerusalem			1	
S. Lagos			1	
S. Livingstone			7	
S. Mbandaka			3	
S. Minnesota			2	
S. Montevideo			6	

Table Salmonella serovars in feed

Serovar	Compound feedingstuffs for pigs		All feedingstuffs (Some isolates are from monitoring of feed compounds, others are from samples taken for internal controls.)	
	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory			197	
Number of isolates serotyped	0	0	95	0
Number of isolates per serovar				
S. Ohio			1	
S. Paratyphi B			2	
S. Rissen			4	

2.1.6 Antimicrobial resistance in *Salmonella* isolates

A. Antimicrobial resistance in *Salmonella* in cattle

Sampling strategy used in monitoring

Type of specimen taken

Laboratory findings of the NRL *Salmonella*, animal health.

Methods of sampling (description of sampling techniques)

Diagnostic samples sent to NRL.

See: "Antimicrobial resistance of *Salmonella* spp. in animals - All animals" for more details.

Control program/mechanisms

The control program/strategies in place

There was no monitoring programme for *Salmonella* in cattle in 2011.

Results of the investigation

A total of 18 *Salmonella* isolates were tested for their susceptibility. Eight were *S. Dublin*, six *S. Typhimurium*, two *S. Enteritidis* and one each of *S. Anatum* and *S. Rissen*.

Six strains were fully susceptible, which represents 33,3%. Most resistance was found against sulfonamides (50,0%), ampicillin (44,4%), nalidixic acid (38,9%), streptomycin and tetracycline (both 33,3%), but also against chloramphenicol (16,7%), florphenicol (11,1%) and ceftiofur (11,1%).

B. Antimicrobial resistance in *Salmonella* in foodstuff derived from pigs

Sampling strategy used in monitoring

Procedures for the selection of isolates for antimicrobial testing

All strains isolated during the zoonosis monitoring program were sent to the Institute of Public Health for serotyping and determination of antimicrobial resistance.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The antimicrobials tested and the breakpoints used are listed in the following table.

AntimicrobialBreakpoints

(μ g / ml)

Ampicillin 4

Cefotaxime 0.5

Ceftazidim 2

Chloramphenicol 16

Ciprofloxacin 0.06

Florfenicol 16

Gentamicin 2

Kanamycin 8

Nalidixic acid 16

Streptomycin 16

Sulphamethoxazole 256

Tetracycline 8

Trimethoprim 2

Minimum Inhibitory Concentrations were determined using broth microdilution (Sensititre EUMVS2 panel) following the NCCLS standards.

Results of the investigation

In total, 141 *Salmonella* strains from pork were tested for their antibiotic susceptibility. This included strains from carcasses and cut meats. In general resistance was decreased but still high resistance was observed to streptomycine (38%), ampicillin (60%), sulphamethoxazole (44%) and tetracycline (32%). Resistance to more than four antibiotics was observed in 15% of the tested isolates. The percentage of strains sensitive to all antibiotics tested significantly increased to 48% coming from 14,5% in 2010. All strains were sensitive to gentamycin very low resistance was observed for cefotaxim, ceftazidim (0.6%), colistin (2%), ciprofloxacin (4%) and kanamycin and nalidixic acid (3%).

Salmonella Typhimurium was the most dominantly isolated serotype (65%) from pork and 6 strain were from the serotype *Salmonella* Typhiurium monophasic. The observed trends are similar as described above, with high resistance to ampicillin (78%), tetracycline (42%), sulphamethoxazole (53%) and streptomycin (49%). Thirty eight percent of all Typhimurium strains were sensitive to all antibiotics.

C. Antimicrobial resistance in *Salmonella* in foodstuff derived from poultry

Sampling strategy used in monitoring

Procedures for the selection of isolates for antimicrobial testing

All strains isolated during the zoonosis monitoring program were sent to the Institute of Public Health for serotyping and determination of antimicrobial resistance.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The antimicrobials tested and the breakpoints used are listed in the following table.

AntimicrobialBreakpoints

(μ g / ml)

Ampicillin 4

Cefotaxime 0.5

Ceftazidim 2

Chloramphenicol 16

Ciprofloxacin 0.06

Florfenicol 16

Gentamicin 2

Kanamycin 8

Nalidixic acid 16

Streptomycin 16

Sulphamethoxazole 256

Tetracycline 8

Trimethoprim 2

Minimum Inhibitory Concentrations were determined using broth microdilution method (Sensititre EUMVS2 panel) following the NCCLS standards.

Results of the investigation

In 2011, 177 *Salmonella* isolates from poultry meats were tested for their antimicrobial susceptibility. A total of 44 % were sensitive to all tested antibiotics, which is an increase of 5% compared to last year. In general resistance levels were higher compared to 2010. Resistance to sulfamethoxazol (36%), streptomycin (33%), ampicillin (29%), and trimethoprim (20%) were most prevalent. Multiresistance (resistance to more than four antibiotics) was observed in 48 % of all isolates. Little or no resistance was found for gentamicin (0%), florfenicol (0%), cefotaxim and ceftazidim (2%), chloramphenicol (0%) and kanamycin (2%).

The resistance to ciprofloxacin further decreased from 16% in 2010 to 14% in 2011. The colistin resistance was high with 11% of the strains all these strains were isolated from spent hens and were from the serotype Enteritidis..

Compared to these general results, higher resistances were observed in broiler meat and poultry meat products, with 56% resistance to ampicillin, 50% resistant to streptomycin, 55% to sulphamethoxazole. Fifty two percent of these isolates showed multiresistance. On the other hand, *Salmonella* isolates from spent hens showed little antibiotic resistance, with only 4% showing multiresistance. In broiler meat 7 monophasic *Salmonella* Typhimurium strains were isolated.

In total, 28 *Salmonella Paratyphi B* isolates from poultry-derived food products were tested for their antibiotic susceptibility. The resistance of this serotype was very high, but the resistance was decreased compared to previous years. Resistance in this serotype is still high for ampicillin (75%) and trimethoprim (89%) and streptomycin (64%). The degree of multiresistance observed was 75% which is a small decrease (80% in 2010).

Almost all 57 *Salmonella Enteritidis* showed full susceptibility against all tested antibiotics except for colistin were 32% showed resistance. The reason for this increase is not known for the moment but is also observed in *Salmonella Enteritidis* isolated from the farm.

D. Antimicrobial resistance in *Salmonella* in pigs

Sampling strategy used in monitoring

Type of specimen taken

Laboratory findings of the NRL *Salmonella*, animal health.

Methods of sampling (description of sampling techniques)

Diagnostic samples sent to the NRL *Salmonella*, animal health.

See: "Antimicrobial resistance of *Salmonella* spp. in animals - All animals" for more details.

Results of the investigation

A total of 103 *Salmonella* isolates from pigs were tested for their susceptibility. Most of the strain tested were *S. Typhimurium* (n=68), *S. Derby* (n=8) and *S. Livingstone* (n=3).

18.4 % of strains were fully susceptible. Most resistance was found against sulfonamides (68.9%), ampicillin (64.1%), tetracycline (62.1%) and streptomycin (55.3%).

E. Antimicrobial resistance in *Salmonella* in poultry

Sampling strategy used in monitoring

Type of specimen taken

Laboratory findings of the NRL *Salmonella*, animal health.

Methods of sampling (description of sampling techniques)

Analysis of diagnostic samples sent to the NRL *Salmonella*, animal health.

See: "Antimicrobial resistance of *Salmonella* spp. in animals - All animals" for more details.

Results of the investigation

Three hundred fifty-six poultry *Salmonella* isolates were tested for their susceptibility. Of these, 56 were *S. Enteritidis*, 93 *Paratyphi B*, 42 *S. Typhimurium* and 30 *S. Minnesota*.

Hundred ninety-six strains were fully susceptible, which represents 55.1%. Most resistance was found against ampicillin (36.8%), sulfonamides (28.4%), nalidixic acid (27.8%), trimetoprim-sulfonamides (22.5%), streptomycin (20.5%) and tetracyclines (17.1%).

F. Antimicrobial resistance of *Salmonella* spp. in food

Sampling strategy used in monitoring

Procedures for the selection of isolates for antimicrobial testing

All strains isolated during the zoonosis monitoring program were sent to the Institute of Public Health for serotyping and determination of antimicrobial resistance.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The antimicrobials tested are listed in the following table.

Antimicrobial
Ampicillin
Cefotaxim
Ceftazidim
Streptomycin
Kanamycin
Tetracycline
Sulfamethoxazole
Trimethoprim
Nalidixic acid
Ciprofloxacin
Chloramphenicol
Florfenicol
Gentamicin

Cut-off values used in testing

Minimum Inhibitory Concentrations (MIC) were determined by the use of broth microdilution (Sensititre EUMVS2 panel) according to the NCCLS standards.

The antimicrobials tested and the breakpoints used are listed in the following table.

Antimicrobial	Breakpoints(microg / ml)
Ampicillin	8
Cefotaxim	0,5
Streptomycin	16
Kanamycin	8
Tetracycline	8
Sulfamethoxazole	256
Trimethoprim	2
Nalidixic acid	16 - 32
Ciprofloxacin	0,06
Chloramphenicol	16
Florfenicol	16
Ceftazidim	2

Table Antimicrobial susceptibility testing of *Salmonella* in meat from pig

Salmonella Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	S. Enteritidis		S. Typhimurium		S. 1,4,[5],12:i:-		S. Derby		Salmonella spp.	
			yes						yes	
			103						141	
	N	n	N	n	N	n	N	n	N	n
Aminoglycosides - Gentamicin			103	0					141	0
Aminoglycosides - Kanamycin			103	4					141	4
Aminoglycosides - Streptomycin			103	50					141	53
Amphenicols - Chloramphenicol			103	14					141	14
Amphenicols - Florfenicol			103	8					141	8
Fluoroquinolones - Ciprofloxacin			103	4					141	6
Penicillins - Ampicillin			103	81					141	84
Quinolones - Nalidixic acid			103	2					141	4
Tetracyclines - Tetracycline			103	43					141	45
Trimethoprim			103	17					141	19
Fully sensitive			103	40					141	68
Resistant to 1 antimicrobial			103	6					141	11
Resistant to 2 antimicrobials			103	14					141	16
Resistant to 3 antimicrobials			103	20					141	22
Resistant to 4 antimicrobials			103	14					141	14
Resistant to >4 antimicrobials			103	9					141	10
Cephalosporins - Cefotaxime			103	0					141	1
Cephalosporins - Ceftazidim			103	0					141	1
Polymyxins - Colistin			103	2					141	3

Table Antimicrobial susceptibility testing of *Salmonella* in meat from pig

Salmonella	S. Enteritidis		S. Typhimurium		S. 1,4,[5],12:i:-		S. Derby		Salmonella spp.	
			yes						yes	
			103						141	
	N	n	N	n	N	n	N	n	N	n
Sulfonamides - Sulfamethoxazol			103	55					141	62

Table Antimicrobial susceptibility testing of *Salmonella* in meat from broilers (*Gallus gallus*)

Salmonella Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	S. Enteritidis		S. Typhimurium		S. 1,4,[5],12:i:-		S. Paratyphi B var. Java		Salmonella spp.	
			yes				yes		yes	
			34				15		58	
Antimicrobials:	N	n	N	n	N	n	N	n	N	n
Aminoglycosides - Gentamicin			34	0			15	0	58	0
Aminoglycosides - Kanamycin			34	0			15	3	58	3
Aminoglycosides - Streptomycin			34	21			15	11	58	32
Amphenicols - Chloramphenicol			34	0			15	0	58	0
Amphenicols - Florfenicol			34	0			15	0	58	0
Fluoroquinolones - Ciprofloxacin			34	4			15	7	58	12
Penicillins - Ampicillin			34	21			15	11	58	34
Quinolones - Nalidixic acid			34	5			15	7	58	13
Tetracyclines - Tetracycline			34	16			15	2	58	18
Trimethoprim			34	4			15	15	58	21
Fully sensitive			34	10			15	0	58	15
Resistant to 1 antimicrobial			34	2			15	0	58	4
Resistant to 2 antimicrobials			34	1			15	0	58	1
Resistant to 3 antimicrobials			34	3			15	2	58	7
Resistant to 4 antimicrobials			34	13			15	3	58	17
Resistant to >4 antimicrobials			34	18			15	10	58	14
Cephalosporins - Cefotaxime			34	0			15	2	58	2
Cephalosporins - Ceftazidim			34	0			15	2	58	2
Polymyxins - Colistin			34	0			15	0	58	0

Table Antimicrobial susceptibility testing of *Salmonella* in meat from broilers (*Gallus gallus*)

Salmonella	S. Enteritidis		S. Typhimurium		S. 1,4,[5],12:i:-		S. Paratyphi B var. Java		Salmonella spp.	
			yes				yes		yes	
			34				15		58	
Antimicrobials:	N	n	N	n	N	n	N	n	N	n
Sulfonamides - Sulfamethoxazol			34	22			15	11	58	36

Table Antimicrobial susceptibility testing of *Salmonella* spp. in Meat from broilers (*Gallus gallus*) - carcass - chilled - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

Salmonella spp. Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcase - chilled - at slaughterhouse - Surveillance																									
	yes																									
	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048			
Aminoglycosides - Gentamicin	2	58	0						13	34	10	1														
Aminoglycosides - Kanamycin	8	58	3											54	1				3							
Aminoglycosides - Streptomycin	32	58	32												12	8	6	7	25							
Amphenicols - Chloramphenicol	16	58	0											14	43	1										
Amphenicols - Florfenicol	16	58	0											2	51	5										
Cephalosporins - Cefotaxime	0.5	58	2				36	17	3					2												
Fluoroquinolones - Ciprofloxacin	0.06	56	12			42	2		2	8	2															
Penicillins - Ampicillin	4	58	34									21	2	1			34									
Quinolones - Nalidixic acid	16	58	13												44	1		1	12							
Tetracyclines - Tetracycline	8	58	18									12	26	2					18							
Trimethoprim	2	58	21							37								21								
Cephalosporins - Ceftazidim	2	58	2							41	13	2		1		1										
Polymyxins - Colistin	2	58	0											58												
Sulfonamides - Sulfamethoxazol		58	58												5	9	4	4				36				

Table Antimicrobial susceptibility testing of *Salmonella* spp. in Meat from poultry, unspecified - meat products - raw but intended to be eaten cooked - chilled - at retail - domestic production - Surveillance - Official sampling - food sample - meat - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

Salmonella spp.	Meat from poultry, unspecified - meat products - raw but intended to be eaten cooked - chilled - at retail - domestic production - Surveillance																							
	yes																							
	27																							
Antimicrobials:	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	>2048	lowest	highest
Aminoglycosides - Gentamicin	2	27	0						10	12	5													
Aminoglycosides - Kanamycin	8	27	1											26							1			
Aminoglycosides - Streptomycin	32	27	11												5	3	8	7	4					
Amphenicols - Chloramphenicol	16	27	0											11	14	2								
Amphenicols - Florfenicol	16	27	0										3	20	3	1								
Cephalosporins - Cefotaxime	0.5	27	2					11	10	3	1			2										
Fluoroquinolones - Ciprofloxacin	0.06	9	9							4	3	1	1											
Penicillins - Ampicillin	4	27	14								2	8	1	2			14							
Quinolones - Nalidixic acid	16	27	9											17	1		1	8						
Tetracyclines - Tetracycline	8	27	4									14	8	1				4						
Trimethoprim	2	27	12							15							1	11						
Cephalosporins - Ceftazidim	2	27	2						16	9						2								
Polymyxins - Colistin	2	27	0										27											
Sulfonamides - Sulfamethoxazol		27	27												6	5	3	1	1		11			

Table Antimicrobial susceptibility testing of *Salmonella* spp. in Meat from broilers (*Gallus gallus*) - carcass - spent hens - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

Salmonella spp. Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcase - spent hens - at slaughterhouse - Surveillance																									
	yes																									
	92																									
Antimicrobials:	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest	
Aminoglycosides - Gentamicin	2	92	0						15	54	22	1														
Aminoglycosides - Kanamycin	8	92	0											90	2											
Aminoglycosides - Streptomycin	32	92	16										3	38	23	8	4	7	9							
Amphenicols - Chloramphenicol	16	92	0										5	35	51	1										
Amphenicols - Florfenicol	16	92	0										9	79	4											
Cephalosporins - Cefotaxime	0.5	92	0				72	17	1	2																
Fluoroquinolones - Ciprofloxacin	0.06	92	4			85	3		4																	
Penicillins - Ampicillin	4	92	4							9	55	23	1				4									
Quinolones - Nalidixic acid	16	92	3											86	2	1		3								
Tetracyclines - Tetracycline	8	92	2							39	48	3					1	1								
Trimethoprim	2	92	3						87	1	1						3									
Cephalosporins - Ceftazidim	2	92	1						81	9	1		1													
Polymyxins - Colistin	2	92	20										72	20												
Sulfonamides - Sulfamethoxazol		92	92											12	18	25	11	10			16					

Table Antimicrobial susceptibility testing of *Salmonella* spp. in Meat from pig - carcass - chilled - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

Salmonella spp. Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from pig - carcase - chilled - at slaughterhouse - Surveillance																								
	yes																								
	141																								
Antimicrobials:	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides - Gentamicin	2	141	0						15	97	28	1													
Aminoglycosides - Kanamycin	8	141	4											132	5										
Aminoglycosides - Streptomycin	32	141	53											4	40	36	8	5	48						
Amphenicols - Chloramphenicol	16	141	14										1	21	105		1	13							
Amphenicols - Florfenicol	16	141	8										1	98	28	6	4	4							
Cephalosporins - Cefotaxime	0.5	141	1					89	48	3				1											
Fluoroquinolones - Ciprofloxacin	0.06	141	6				130	5	2	3	1														
Penicillins - Ampicillin	4	141	84									5	31	20	1	1		83							
Quinolones - Nalidixic acid	16	141	4												124	13									
Tetracyclines - Tetracycline	8	141	45										11	78	3	4	2	2	41						
Trimethoprim	2	141	19									117	5						19						
Cephalosporins - Ceftazidim	2	141	1									92	48					1							
Polymyxins - Colistin	2	141	3											138	3										
Sulfonamides - Sulfamethoxazol		141	141												10	13	20	23	12	1	3	59			

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Meat from pig - carcass - chilled - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from pig - carcase - chilled - at slaughterhouse - Surveillance																								
	yes																								
	103																								
Antimicrobials:	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides - Gentamicin	2	103	0						15	64	23	1													
Aminoglycosides - Kanamycin	8	103	4											95	4										
Aminoglycosides - Streptomycin	32	103	50											4	27	17	5	4	46						
Amphenicols - Chloramphenicol	16	103	14										1	20	68		1	13							
Amphenicols - Florfenicol	16	103	8										1	84	4	6	4	4							
Cephalosporins - Cefotaxime	0.5	103	0				82	18	3																
Fluoroquinolones - Ciprofloxacin	0.06	103	4			94	5	2	1	1															
Penicillins - Ampicillin	4	103	81								2	12	7	1	1		80								
Quinolones - Nalidixic acid	16	103	2												90	11			2						
Tetracyclines - Tetracycline	8	103	43										6	48	3	3	2	2	39						
Trimethoprim	2	103	17							81	5							17							
Cephalosporins - Ceftazidim	2	103	0						82	21															
Polymyxins - Colistin	2	103	2										101	2											
Sulfonamides - Sulfamethoxazol		103	103												4	9	11	19	4	1	1	54			

Table Antimicrobial susceptibility testing of *S. Enteritidis* in Meat from broilers (*Gallus gallus*) - carcass - spent hens - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Enteritidis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcase - spent hens - at slaughterhouse - Surveillance																							
	yes																							
	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	
Aminoglycosides - Gentamicin	2	57	0						11	35	11													
Aminoglycosides - Kanamycin	8	57	0												56	1								
Aminoglycosides - Streptomycin	32	57	1										2	36	17	1				1				
Amphenicols - Chloramphenicol	16	57	0										5	23	29									
Amphenicols - Florfenicol	16	57	0										7	47	3									
Cephalosporins - Cefotaxime	0.5	57	0					43	11	1	2													
Fluoroquinolones - Ciprofloxacin	0.06	57	1				53	3		1														
Penicillins - Ampicillin	4	57	1								6	33	16	1				1						
Quinolones - Nalidixic acid	16	57	0													54	2	1						
Tetracyclines - Tetracycline	8	57	1								30	25	1					1						
Trimethoprim	2	57	0							55	1	1												
Cephalosporins - Ceftazidim	2	57	1						52	3	1			1										
Polymyxins - Colistin	2	57	18										39	18										
Sulfonamides - Sulfamethoxazol		57	57												8	11	24	4	9			1		

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Meat from broilers (*Gallus gallus*) - carcass - chilled - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcase - chilled - at slaughterhouse - Surveillance																							
	yes																							
	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	
Aminoglycosides - Gentamicin	2	34	0						4	21	8	1												
Aminoglycosides - Kanamycin	8	34	0											34										
Aminoglycosides - Streptomycin	32	34	21												8	3	2	2	19					
Amphenicols - Chloramphenicol	16	34	0											4	30									
Amphenicols - Florfenicol	16	34	0										1	31	2									
Cephalosporins - Cefotaxime	0.5	34	0				27	6	1															
Fluoroquinolones - Ciprofloxacin	0.06	34	4			28	2		1	1	2													
Penicillins - Ampicillin	4	34	21									12	1				21							
Quinolones - Nalidixic acid	16	34	5											29				1	4					
Tetracyclines - Tetracycline	8	34	16									3	14	1				16						
Trimethoprim	2	34	4						30								4							
Cephalosporins - Ceftazidim	2	34	0						28	4	2													
Polymyxins - Colistin	2	34	0									34					5	3	1	3			22	
Sulfonamides - Sulfamethoxazol		34	34																					

Table Antimicrobial susceptibility testing of *S. Paratyphi B* var. *Java* in Meat from broilers (*Gallus gallus*) - carcass - chilled - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Paratyphi B var. Java Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcase - chilled - at slaughterhouse - Surveillance																							
	yes																							
	15																							
	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest
Aminoglycosides - Gentamicin	2	15	0						8	7														
Aminoglycosides - Kanamycin	8	15	3											12					3					
Aminoglycosides - Streptomycin	32	15	11														4	5	6					
Amphenicols - Chloramphenicol	16	15	0											8	6	1								
Amphenicols - Florfenicol	16	15	0											1	13	1								
Cephalosporins - Cefotaxime	0.5	15	2				3	8	2					2										
Fluoroquinolones - Ciprofloxacin	0.06	15	7			8		1	6															
Penicillins - Ampicillin	4	12	11											1			11							
Quinolones - Nalidixic acid	16	15	7											8			7							
Tetracyclines - Tetracycline	8	15	2								5	8					2							
Trimethoprim	2	15	15														15							
Cephalosporins - Ceftazidim	2	15	2						7	6				1		1								
Polymyxins - Colistin	2	15	0										15											
Sulfonamides - Sulfamethoxazol		15	15												1	3					11			

Table Antimicrobial susceptibility testing of *S. Enteritidis* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Enteritidis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	1	0									1															
Aminoglycosides - Kanamycin	8	1	0														1										
Aminoglycosides - Streptomycin	32	1	0															1									
Amphenicols - Chloramphenicol	16	1	0																1								
Amphenicols - Florfenicol	16	1	0																1								
Cephalosporins - Cefotaxime	0.25	1	0									1															
Fluoroquinolones - Ciprofloxacin	0.06	1	0							1																	
Penicillins - Ampicillin	4	1	0														1										
Quinolones - Nalidixic acid	8	1	0															1									
Tetracyclines - Tetracycline	8	1	0															1									
Trimethoprim	2	1	0														1										
Cephalosporins - Ceftazidim	2	1	0													1											
Polymyxins - Colistin	2	1	1															1									
Sulfonamides - Sulfamethoxazol	256	1	0																	1							

Table Antimicrobial susceptibility testing of *S. Enteritidis* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Enteritidis	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Paratyphi B* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Paratyphi B Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	2	0									2														
Aminoglycosides - Kanamycin	8	2	0														2									
Aminoglycosides - Streptomycin	32	2	0															1		1						
Amphenicols - Chloramphenicol	16	2	0													1	1									
Amphenicols - Florfenicol	16	2	0													1	1									
Cephalosporins - Cefotaxime	0.25	2	1									1					1									
Fluoroquinolones - Ciprofloxacin	0.06	2	1					1				1														
Penicillins - Ampicillin	4	2	1												1					1						
Quinolones - Nalidixic acid	8	2	1															1				1				
Tetracyclines - Tetracycline	8	2	0												2											
Trimethoprim	2	2	1											1							1					
Cephalosporins - Ceftazidim	2	2	1											1					1							
Polymyxins - Colistin	2	2	0													2										
Sulfonamides - Sulfamethoxazol	256	2	1																		1					1

Table Antimicrobial susceptibility testing of *S. Paratyphi B* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Paratyphi B	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Hadar* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Hadar Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0																						
Aminoglycosides - Kanamycin	8	1	0																						
Aminoglycosides - Streptomycin	32	1	1																						1
Amphenicols - Chloramphenicol	16	1	0																						1
Amphenicols - Florfenicol	16	1	0																						1
Cephalosporins - Cefotaxime	0.25	1	0																						
Fluoroquinolones - Ciprofloxacin	0.06	1	1																						
Penicillins - Ampicillin	4	1	0																						
Quinolones - Nalidixic acid	8	1	1																						1
Tetracyclines - Tetracycline	8	1	1																						1
Trimethoprim	2	1	0																						
Cephalosporins - Ceftazidim	2	1	0																						
Polymyxins - Colistin	2	1	0																						
Sulfonamides - Sulfamethoxazol	256	1	0																						1

Table Antimicrobial susceptibility testing of *S. Hadar* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Hadar	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Infantis* in Compound feedingstuffs, not specified - quantitative data [Dilution method]Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Infantis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	≤ 0.002	≤ 0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	2	0										2													
Aminoglycosides - Kanamycin	8	2	0														2									
Aminoglycosides - Streptomycin	32	2	1															1					1			
Amphenicols - Chloramphenicol	16	2	0															1	1							
Amphenicols - Florfenicol	16	2	0															2								
Cephalosporins - Cefotaxime	0.25	2	0										2													
Fluoroquinolones - Ciprofloxacin	0.06	2	0						2																	
Penicillins - Ampicillin	4	2	1													1					1					
Quinolones - Nalidixic acid	8	2	0															2								
Tetracyclines - Tetracycline	8	2	0													2										
Trimethoprim	2	2	0												2											
Cephalosporins - Ceftazidim	2	2	0												2											
Polymyxins - Colistin	2	2	0													2										
Sulfonamides - Sulfamethoxazol	256	2	1																			1				1

Table Antimicrobial susceptibility testing of *S. Infantis* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Infantis	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:		lowest highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Montevideo* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Montevideo Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	6	0										6													
Aminoglycosides - Kanamycin	8	6	0														6									
Aminoglycosides - Streptomycin	32	6	0															5	1							
Amphenicols - Chloramphenicol	16	6	0														3	3								
Amphenicols - Florfenicol	16	6	0														6									
Cephalosporins - Cefotaxime	0.25	6	0									6														
Fluoroquinolones - Ciprofloxacin	0.06	6	0						5		1															
Penicillins - Ampicillin	4	6	1													5					1					
Quinolones - Nalidixic acid	8	6	0															6								
Tetracyclines - Tetracycline	8	6	0													5	1									
Trimethoprim	2	6	1												5						1					
Cephalosporins - Ceftazidim	2	6	0											6												
Polymyxins - Colistin	2	6	0													6										
Sulfonamides - Sulfamethoxazol	256	6	1																2	3						1

Table Antimicrobial susceptibility testing of *S. Montevideo* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Montevideo	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:		lowest highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Livingstone* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Livingstone Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																											
	1675																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	1	6	0									1	5															
Aminoglycosides - Kanamycin	8	6	0															6										
Aminoglycosides - Streptomycin	32	6	0															2	4									
Amphenicols - Chloramphenicol	16	6	0														2	1	3									
Amphenicols - Florfenicol	16	6	0														2	2	2									
Cephalosporins - Cefotaxime	0.25	6	0									4	2															
Fluoroquinolones - Ciprofloxacin	0.06	6	0					4		2																		
Penicillins - Ampicillin	4	6	0													6												
Quinolones - Nalidixic acid	8	6	0															6										
Tetracyclines - Tetracycline	8	6	0													1	5											
Trimethoprim	2	6	0													6												
Cephalosporins - Ceftazidim	2	6	0												3	3												
Polymyxins - Colistin	2	6	1														5	1										
Sulfonamides - Sulfamethoxazol	256	6	0															3	3									

Table Antimicrobial susceptibility testing of *S. Livingstone* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Livingstone	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:		lowest highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Mbandaka* in Compound feedingstuffs, not specified - quantitative data [Dilution method]Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Mbandaka Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	≤ 0.002	≤ 0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	2	0										2													
Aminoglycosides - Kanamycin	8	2	0														2									
Aminoglycosides - Streptomycin	32	2	0															1	1							
Amphenicols - Chloramphenicol	16	2	0															2								
Amphenicols - Florfenicol	16	2	0															2								
Cephalosporins - Cefotaxime	0.25	2	0										1	1												
Fluoroquinolones - Ciprofloxacin	0.06	2	0					2																		
Penicillins - Ampicillin	4	2	0													2										
Quinolones - Nalidixic acid	8	2	0															2								
Tetracyclines - Tetracycline	8	2	0													1	1									
Trimethoprim	2	2	0													2										
Cephalosporins - Ceftazidim	2	2	0													2										
Polymyxins - Colistin	2	2	0														2									
Sulfonamides - Sulfamethoxazol	256	2	0																			2				

Table Antimicrobial susceptibility testing of *S. Mbandaka* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Mbandaka	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of S. Minnesota in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Minnesota Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																											
	1675																											
	Cut-off value	N	n	≤ 0.002	≤ 0.004	≤ 0.008	≤ 0.015	≤ 0.016	≤ 0.03	≤ 0.06	≤ 0.12	≤ 0.25	≤ 0.5	≤ 1	≤ 2	≤ 4	≤ 8	≤ 16	≤ 32	≤ 64	≤ 128	≤ 256	≤ 512	≥ 4096	≥ 1024	≥ 2048		
Aminoglycosides - Gentamicin	1	2	0														2											
Aminoglycosides - Kanamycin	8	2	0																2									
Aminoglycosides - Streptomycin	32	2	0																	2								
Amphenicols - Chloramphenicol	16	2	0																		2							
Amphenicols - Florfenicol	16	2	0																		2							
Cephalosporins - Cefotaxime	0.25	2	0													2												
Fluoroquinolones - Ciprofloxacin	0.06	2	0													2												
Penicillins - Ampicillin	4	2	0																2									
Quinolones - Nalidixic acid	8	2	0																		2							
Tetracyclines - Tetracycline	8	2	0																	2								
Trimethoprim	2	2	0																2									
Cephalosporins - Ceftazidim	2	2	0														1	1										
Polymyxins - Colistin	2	2	0																2									
Sulfonamides - Sulfamethoxazol	256	2	0																							2		

Table Antimicrobial susceptibility testing of *S. Minnesota* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Minnesota	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:		lowest highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Agona* in Compound feedingstuffs, not specified - quantitative data [Dilution method]Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Agona Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	≤ 0.002	≤ 0.004	≤ 0.008	≤ 0.015	≤ 0.016	≤ 0.03	≤ 0.06	≤ 0.12	≤ 0.25	≤ 0.5	≤ 1	≤ 2	≤ 4	≤ 8	≤ 16	≤ 32	≤ 64	≤ 128	≤ 256	≤ 512	≥ 4096	≥ 1024	≥ 2048
Aminoglycosides - Gentamicin	1	9	0									4	5													
Aminoglycosides - Kanamycin	8	9	0															8	1							
Aminoglycosides - Streptomycin	32	9	1															1	5	2				1		
Amphenicols - Chloramphenicol	16	9	0															1	8							
Amphenicols - Florfenicol	16	9	0															5	4							
Cephalosporins - Cefotaxime	0.25	9	0							1	8															
Fluoroquinolones - Ciprofloxacin	0.06	9	0					6		3																
Penicillins - Ampicillin	4	9	2														6	1				2				
Quinolones - Nalidixic acid	8	9	0																9							
Tetracyclines - Tetracycline	8	9	0														1	8								
Trimethoprim	2	9	0														8	1								
Cephalosporins - Ceftazidim	2	9	0													3	6									
Polymyxins - Colistin	2	9	1															8	1							
Sulfonamides - Sulfamethoxazol	256	9	1																	1		7				1

Table Antimicrobial susceptibility testing of *S. Agona* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Agona	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:		lowest highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Senftenberg* in Compound feedingstuffs, not specified - quantitative data [Dilution method]Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Senftenberg Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	≤ 0.002	≤ 0.004	≤ 0.008	≤ 0.015	≤ 0.016	≤ 0.03	≤ 0.06	≤ 0.12	≤ 0.25	≤ 0.5	≤ 1	≤ 2	≤ 4	≤ 8	≤ 16	≤ 32	≤ 64	≤ 128	≤ 256	≤ 512	≥ 4096	≥ 1024	≥ 2048
Aminoglycosides - Gentamicin	1	2	0											2												
Aminoglycosides - Kanamycin	8	2	0														2									
Aminoglycosides - Streptomycin	32	2	0															1	1							
Amphenicols - Chloramphenicol	16	2	0															2								
Amphenicols - Florfenicol	16	2	0															2								
Cephalosporins - Cefotaxime	0.25	2	0										1	1												
Fluoroquinolones - Ciprofloxacin	0.06	2	0							2																
Penicillins - Ampicillin	4	2	0													2										
Quinolones - Nalidixic acid	8	2	0															2								
Tetracyclines - Tetracycline	8	2	0														2									
Trimethoprim	2	2	0												2											
Cephalosporins - Ceftazidim	2	2	0											1	1											
Polymyxins - Colistin	2	2	0													2										
Sulfonamides - Sulfamethoxazol	256	2	0																	2						

Table Antimicrobial susceptibility testing of *S. Senftenberg* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Senftenberg	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:		lowest highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Derby* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Derby Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	8	0									2	6														
Aminoglycosides - Kanamycin	8	8	0														8										
Aminoglycosides - Streptomycin	32	8	1															5	1	1			1				
Amphenicols - Chloramphenicol	16	8	1														4		3			1					
Amphenicols - Florfenicol	16	8	0														4		3	1							
Cephalosporins - Cefotaxime	0.25	8	0							6	2																
Fluoroquinolones - Ciprofloxacin	0.06	8	0			4	3		1																		
Penicillins - Ampicillin	4	8	1												4	2	1				1						
Quinolones - Nalidixic acid	8	8	0															8									
Tetracyclines - Tetracycline	8	8	5														3				4	1					
Trimethoprim	2	8	1											7							1						
Cephalosporins - Ceftazidim	2	8	0										4	4													
Polymyxins - Colistin	2	8	0														8										
Sulfonamides - Sulfamethoxazol	256	8	2																	4	2					2	

Table Antimicrobial susceptibility testing of *S. Derby* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Derby	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Rissen* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Rissen Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	3	0										3													
Aminoglycosides - Kanamycin	8	3	0														3									
Aminoglycosides - Streptomycin	32	3	0															2		1						
Amphenicols - Chloramphenicol	16	3	1															2		1						
Amphenicols - Florfenicol	16	3	0															1	1	1						
Cephalosporins - Cefotaxime	0.25	3	0										3													
Fluoroquinolones - Ciprofloxacin	0.06	3	0						3																	
Penicillins - Ampicillin	4	3	1												2					1						
Quinolones - Nalidixic acid	8	3	0															3								
Tetracyclines - Tetracycline	8	3	1													2					1					
Trimethoprim	2	3	1												2						1					
Cephalosporins - Ceftazidim	2	3	0												3											
Polymyxins - Colistin	2	3	0													3										
Sulfonamides - Sulfamethoxazol	256	3	1																		2					1

Table Antimicrobial susceptibility testing of *S. Rissen* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Rissen	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:		lowest highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Virchow* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Virchow Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	1	0									1														
Aminoglycosides - Kanamycin	8	1	0														1									
Aminoglycosides - Streptomycin	32	1	0																							
Amphenicols - Chloramphenicol	16	1	0																							
Amphenicols - Florfenicol	16	1	0																							
Cephalosporins - Cefotaxime	0.25	1	0									1														
Fluoroquinolones - Ciprofloxacin	0.06	1	0					1																		
Penicillins - Ampicillin	4	1	0													1										
Quinolones - Nalidixic acid	8	1	0																1							
Tetracyclines - Tetracycline	8	1	0															1								
Trimethoprim	2	1	0													1										
Cephalosporins - Ceftazidim	2	1	0													1										
Polymyxins - Colistin	2	1	0														1									
Sulfonamides - Sulfamethoxazol	256	1	0																		1					

Table Antimicrobial susceptibility testing of *S. Virchow* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Virchow	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Compound feedingstuffs, not specified																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	34	0									3	28	3												
Aminoglycosides - Kanamycin	8	34	1														33							1		
Aminoglycosides - Streptomycin	32	34	17															7	9	1	2	15				
Amphenicols - Chloramphenicol	16	34	5														12	17				5				
Amphenicols - Florfenicol	16	34	5													1	24	4		5						
Cephalosporins - Cefotaxime	0.25	34	1						25	8				1												
Fluoroquinolones - Ciprofloxacin	0.06	34	1				17		16		1															
Penicillins - Ampicillin	4	34	23												7	4				23						
Quinolones - Nalidixic acid	8	34	2														31	1	2							
Tetracyclines - Tetracycline	8	34	14												3	16		1		3	11					
Trimethoprim	2	34	8										25	1			1				7					
Cephalosporins - Ceftazidim	2	34	0									28	6													
Polymyxins - Colistin	2	34	1												33	1										
Sulfonamides - Sulfamethoxazol	256	34	20														1		7	5	1				20	

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Compound feedingstuffs, not specified - quantitative data [Dilution method]

S. Typhimurium	Compound feedingstuffs, not specified	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Senftenberg* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Senftenberg Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	3	0																							
Aminoglycosides - Kanamycin	8	3	0																							
Aminoglycosides - Streptomycin	32	3	0																							
Amphenicols - Chloramphenicol	16	3	0																							
Amphenicols - Florfenicol	16	3	0																							
Cephalosporins - Cefotaxime	0.25	3	0											1	2											
Fluoroquinolones - Ciprofloxacin	0.06	3	0																							
Penicillins - Ampicillin	4	3	0																							
Quinolones - Nalidixic acid	8	3	0																							
Tetracyclines - Tetracycline	8	3	0																							
Trimethoprim	2	3	0																							
Cephalosporins - Ceftazidim	2	3	0																							
Polymyxins - Colistin	2	3	0																							
Sulfonamides - Sulfamethoxazol	256	3	0																							

Table Antimicrobial susceptibility testing of *S. Senftenberg* in Other products of animal origin - quantitative data [Dilution method]

S. Senftenberg	Other products of animal origin	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of S. Derby in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Derby Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	10	0									4	6														
Aminoglycosides - Kanamycin	8	10	0														10										
Aminoglycosides - Streptomycin	32	10	1														1		4	4		1					
Amphenicols - Chloramphenicol	16	10	0														1	9									
Amphenicols - Florfenicol	16	10	0														1	9									
Cephalosporins - Cefotaxime	0.25	10	1							3	6						1										
Fluoroquinolones - Ciprofloxacin	0.06	10	4				2		4		3		1														
Penicillins - Ampicillin	4	9	1												4	4				1							
Quinolones - Nalidixic acid	8	10	4														5	1			4						
Tetracyclines - Tetracycline	8	10	4													5		1		1	3						
Trimethoprim	2	10	1										8		1					1							
Cephalosporins - Ceftazidim	2	10	1									1	8						1								
Polymyxins - Colistin	2	10	0													10											
Sulfonamides - Sulfamethoxazol	256	10	2																4	2	2					2	

Table Antimicrobial susceptibility testing of *S. Derby* in Other products of animal origin - quantitative data [Dilution method]

S. Derby	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Paratyphi B* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Paratyphi B Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	2	0									2														
Aminoglycosides - Kanamycin	8	2	0														2									
Aminoglycosides - Streptomycin	32	2	0																1	1						
Amphenicols - Chloramphenicol	16	2	0														2									
Amphenicols - Florfenicol	16	2	0														2									
Cephalosporins - Cefotaxime	0.25	2	1							1							1									
Fluoroquinolones - Ciprofloxacin	0.06	2	2									2														
Penicillins - Ampicillin	4	2	2																2							
Quinolones - Nalidixic acid	8	2	2																	2						
Tetracyclines - Tetracycline	8	2	1												1						1					
Trimethoprim	2	2	2																	2						
Cephalosporins - Ceftazidim	2	2	1									1							1							
Polymyxins - Colistin	2	2	0													2										
Sulfonamides - Sulfamethoxazol	256	2	1																1						1	

Table Antimicrobial susceptibility testing of *S. Paratyphi B* in Other products of animal origin - quantitative data [Dilution method]

S. Paratyphi B	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Rissen* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Rissen Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0																						
Aminoglycosides - Kanamycin	8	1	0																						
Aminoglycosides - Streptomycin	32	1	0																						
Amphenicols - Chloramphenicol	16	1	0																						
Amphenicols - Florfenicol	16	1	0																						
Cephalosporins - Cefotaxime	0.25	1	0																						
Fluoroquinolones - Ciprofloxacin	0.06	1	0																						
Penicillins - Ampicillin	4	1	0																						
Quinolones - Nalidixic acid	8	1	0																						
Tetracyclines - Tetracycline	8	1	0																						
Trimethoprim	2	1	0																						
Cephalosporins - Ceftazidim	2	1	0																						
Polymyxins - Colistin	2	1	0																						
Sulfonamides - Sulfamethoxazol	256	1	0																						

Table Antimicrobial susceptibility testing of *S. Rissen* in Other products of animal origin - quantitative data [Dilution method]

S. Rissen	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Virchow* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Virchow Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	2	0									1	1														
Aminoglycosides - Kanamycin	8	2	0														2										
Aminoglycosides - Streptomycin	32	2	0															2									
Amphenicols - Chloramphenicol	16	2	0														2										
Amphenicols - Florfenicol	16	2	0													1	1										
Cephalosporins - Cefotaxime	0.25	2	1							1				1													
Fluoroquinolones - Ciprofloxacin	0.06	2	1				1							1													
Penicillins - Ampicillin	4	2	1											1							1						
Quinolones - Nalidixic acid	8	2	1														1					1					
Tetracyclines - Tetracycline	8	2	0												2												
Trimethoprim	2	2	1										1									1					
Cephalosporins - Ceftazidim	2	2	0										1	1													
Polymyxins - Colistin	2	2	0													2											
Sulfonamides - Sulfamethoxazol	256	2	0															1	1								

Table Antimicrobial susceptibility testing of *S. Virchow* in Other products of animal origin - quantitative data [Dilution method]

S. Virchow	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of S. Hadar in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Hadar Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0																						
Aminoglycosides - Kanamycin	8	1	0																						
Aminoglycosides - Streptomycin	32	1	0																						
Amphenicols - Chloramphenicol	16	1	0																						
Amphenicols - Florfenicol	16	1	0																						
Cephalosporins - Cefotaxime	0.25	1	0																						
Fluoroquinolones - Ciprofloxacin	0.06	1	0																						
Penicillins - Ampicillin	4	1	0																						
Quinolones - Nalidixic acid	8	1	0																						
Tetracyclines - Tetracycline	8	1	0																						
Trimethoprim	2	1	0																						
Cephalosporins - Ceftazidim	2	1	0																						
Polymyxins - Colistin	2	1	0																						
Sulfonamides - Sulfamethoxazol	256	1	0																						

Table Antimicrobial susceptibility testing of *S. Hadar* in Other products of animal origin - quantitative data [Dilution method]

S. Hadar	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Infantis* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Infantis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																												
	1675																												
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048			
Aminoglycosides - Gentamicin	1	9	0									2	7																
Aminoglycosides - Kanamycin	8	9	0														9												
Aminoglycosides - Streptomycin	32	9	1															6	2			1							
Amphenicols - Chloramphenicol	16	9	0														2	7											
Amphenicols - Florfenicol	16	9	0														6	3											
Cephalosporins - Cefotaxime	0.25	9	0							3	6																		
Fluoroquinolones - Ciprofloxacin	0.06	9	0				9																						
Penicillins - Ampicillin	4	9	1												8						1								
Quinolones - Nalidixic acid	8	9	0														8	1											
Tetracyclines - Tetracycline	8	9	1												1	7						1							
Trimethoprim	2	9	1										8								1								
Cephalosporins - Ceftazidim	2	9	0								3	6																	
Polymyxins - Colistin	2	9	0													9													
Sulfonamides - Sulfamethoxazol	256	9	2																	5	1	1	1			1			

Table Antimicrobial susceptibility testing of *S. Infantis* in Other products of animal origin - quantitative data [Dilution method]

S. Infantis	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Montevideo* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Montevideo Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	3	0																						
Aminoglycosides - Kanamycin	8	3	0																						
Aminoglycosides - Streptomycin	32	3	0																						
Amphenicols - Chloramphenicol	16	3	0																						
Amphenicols - Florfenicol	16	3	0																						
Cephalosporins - Cefotaxime	0.25	3	0											2	1										
Fluoroquinolones - Ciprofloxacin	0.06	3	0																						
Penicillins - Ampicillin	4	3	0																						
Quinolones - Nalidixic acid	8	3	0																						
Tetracyclines - Tetracycline	8	3	0																						
Trimethoprim	2	3	0																						
Cephalosporins - Ceftazidim	2	3	0																						
Polymyxins - Colistin	2	3	0																						
Sulfonamides - Sulfamethoxazol	256	3	0																			1	2		

Table Antimicrobial susceptibility testing of *S. Montevideo* in Other products of animal origin - quantitative data [Dilution method]

S. Montevideo	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	6	0									2	4													
Aminoglycosides - Kanamycin	8	6	0														6									
Aminoglycosides - Streptomycin	32	6	4															2			1	3				
Amphenicols - Chloramphenicol	16	6	1														1	4			1					
Amphenicols - Florfenicol	16	6	1														4	1		1						
Cephalosporins - Cefotaxime	0.25	6	0							6																
Fluoroquinolones - Ciprofloxacin	0.06	6	0				3		3																	
Penicillins - Ampicillin	4	6	5												1					5						
Quinolones - Nalidixic acid	8	6	0														6									
Tetracyclines - Tetracycline	8	6	4													2				1	3					
Trimethoprim	2	6	1									5								1						
Cephalosporins - Ceftazidim	2	6	0								6															
Polymyxins - Colistin	2	6	0													6										
Sulfonamides - Sulfamethoxazol	256	6	4																	2					4	

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Other products of animal origin - quantitative data [Dilution method]

S. Typhimurium	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of S. Enteritidis in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Enteritidis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	8	0									5	3													
Aminoglycosides - Kanamycin	8	8	0														7	1								
Aminoglycosides - Streptomycin	32	8	2														1	5					2			
Amphenicols - Chloramphenicol	16	8	0														1	7								
Amphenicols - Florfenicol	16	8	0														1	7								
Cephalosporins - Cefotaxime	0.25	8	0							7	1															
Fluoroquinolones - Ciprofloxacin	0.06	8	0			1	4		3																	
Penicillins - Ampicillin	4	8	0													1	2	4	1							
Quinolones - Nalidixic acid	8	8	0																8							
Tetracyclines - Tetracycline	8	8	0														7	1								
Trimethoprim	2	8	0													8										
Cephalosporins - Ceftazidim	2	8	0													8										
Polymyxins - Colistin	2	8	4															4	4							
Sulfonamides - Sulfamethoxazol	256	8	2																	5	1				2	

Table Antimicrobial susceptibility testing of *S. Enteritidis* in Other products of animal origin - quantitative data [Dilution method]

S. Enteritidis	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Livingstone* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Livingstone Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	2	0									1	1												
Aminoglycosides - Kanamycin	8	2	0													2									
Aminoglycosides - Streptomycin	32	2	0														1	1							
Amphenicols - Chloramphenicol	16	2	0													1	1								
Amphenicols - Florfenicol	16	2	0													2									
Cephalosporins - Cefotaxime	0.25	2	0								2														
Fluoroquinolones - Ciprofloxacin	0.06	2	0				2																		
Penicillins - Ampicillin	4	2	0											2											
Quinolones - Nalidixic acid	8	2	0													2									
Tetracyclines - Tetracycline	8	2	0												2										
Trimethoprim	2	2	0										2												
Cephalosporins - Ceftazidim	2	2	0									2													
Polymyxins - Colistin	2	2	0												2										
Sulfonamides - Sulfamethoxazol	256	2	0																2						

Table Antimicrobial susceptibility testing of *S. Livingstone* in Other products of animal origin - quantitative data [Dilution method]

S. Livingstone	Other products of animal origin	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Mbandaka* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Mbandaka Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	3	0										2	1											
Aminoglycosides - Kanamycin	8	3	0													3									
Aminoglycosides - Streptomycin	32	3	0														1	2							
Amphenicols - Chloramphenicol	16	3	0														3								
Amphenicols - Florfenicol	16	3	0													1	2								
Cephalosporins - Cefotaxime	0.25	3	0								3														
Fluoroquinolones - Ciprofloxacin	0.06	3	0				3																		
Penicillins - Ampicillin	4	3	0											3											
Quinolones - Nalidixic acid	8	3	0													3									
Tetracyclines - Tetracycline	8	3	0												3										
Trimethoprim	2	3	0										3												
Cephalosporins - Ceftazidim	2	3	0									3													
Polymyxins - Colistin	2	3	0											3											
Sulfonamides - Sulfamethoxazol	256	3	0																1	2					

Table Antimicrobial susceptibility testing of *S. Mbandaka* in Other products of animal origin - quantitative data [Dilution method]

S. Mbandaka	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of S. Kentucky in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Kentucky Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0																						
Aminoglycosides - Kanamycin	8	1	0																						
Aminoglycosides - Streptomycin	32	1	0																						
Amphenicols - Chloramphenicol	16	1	0																						
Amphenicols - Florfenicol	16	1	0																						
Cephalosporins - Cefotaxime	0.25	1	0																						
Fluoroquinolones - Ciprofloxacin	0.06	1	0																						
Penicillins - Ampicillin	4	1	0																						
Quinolones - Nalidixic acid	8	1	0																						
Tetracyclines - Tetracycline	8	1	0																						
Trimethoprim	2	1	0																						
Cephalosporins - Ceftazidim	2	1	0																						
Polymyxins - Colistin	2	1	0																						
Sulfonamides - Sulfamethoxazol	256	1	0																						

Table Antimicrobial susceptibility testing of *S. Kentucky* in Other products of animal origin - quantitative data [Dilution method]

S. Kentucky	Other products of animal origin	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Agona* in Other products of animal origin - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Agona Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Other products of animal origin																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0									1													
Aminoglycosides - Kanamycin	8	1	0														1								
Aminoglycosides - Streptomycin	32	1	0																						
Amphenicols - Chloramphenicol	16	1	0																						
Amphenicols - Florfenicol	16	1	0																						
Cephalosporins - Cefotaxime	0.25	1	0									1													
Fluoroquinolones - Ciprofloxacin	0.06	1	0							1															
Penicillins - Ampicillin	4	1	0														1								
Quinolones - Nalidixic acid	8	1	0																						
Tetracyclines - Tetracycline	8	1	0															1							
Trimethoprim	2	1	0															1							
Cephalosporins - Ceftazidim	2	1	0															1							
Polymyxins - Colistin	2	1	0																1						
Sulfonamides - Sulfamethoxazol	256	1	0																						

Table Antimicrobial susceptibility testing of *S. Agona* in Other products of animal origin - quantitative data [Dilution method]

S. Agona	Other products of animal origin	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Enteritidis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	31	0									20	11														
Aminoglycosides - Kanamycin	8	31	0														31										
Aminoglycosides - Streptomycin	32	31	2													8	17	1	3				2				
Amphenicols - Chloramphenicol	16	31	0													1	22	8									
Amphenicols - Florfenicol	16	31	0													1	27	3									
Cephalosporins - Cefotaxime	0.25	31	1							27	3						1										
Fluoroquinolones - Ciprofloxacin	0.06	31	2				13		16		1		1														
Penicillins - Ampicillin	4	31	4											1	12	13	1			4							
Quinolones - Nalidixic acid	8	31	2														29						2				
Tetracyclines - Tetracycline	8	31	2												13	16							2				
Trimethoprim	2	31	2										29								2						
Cephalosporins - Ceftazidim	2	31	0									27	3		1												
Polymyxins - Colistin	2	31	16													15	16										
Sulfonamides - Sulfamethoxazol	256	31	3														1		5	20	2				3		

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

S. Enteritidis	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Livingstone Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	9	0									1	8													
Aminoglycosides - Kanamycin	8	9	0														9									
Aminoglycosides - Streptomycin	32	9	0														3	5	1							
Amphenicols - Chloramphenicol	16	9	0														2	7								
Amphenicols - Florfenicol	16	9	0														7	2								
Cephalosporins - Cefotaxime	0.25	9	0								7	2														
Fluoroquinolones - Ciprofloxacin	0.06	9	0					6		2	1															
Penicillins - Ampicillin	4	9	1												8						1					
Quinolones - Nalidixic acid	8	9	0														9									
Tetracyclines - Tetracycline	8	9	0												3	6										
Trimethoprim	2	9	1											8							1					
Cephalosporins - Ceftazidim	2	9	0									9														
Polymyxins - Colistin	2	9	0												9											
Sulfonamides - Sulfamethoxazol	256	9	1																1	7					1	

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

S. Livingstone	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Mbandaka Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	11	1									1	9					1									
Aminoglycosides - Kanamycin	8	11	1													9	1				1						
Aminoglycosides - Streptomycin	32	11	2														7	2		1	1						
Amphenicols - Chloramphenicol	16	11	1													1	9			1							
Amphenicols - Florfenicol	16	11	1													1	2	7			1						
Cephalosporins - Cefotaxime	0.25	11	1							2	7	1				1											
Fluoroquinolones - Ciprofloxacin	0.06	11	2				8		1			1					1										
Penicillins - Ampicillin	4	11	2												9					2							
Quinolones - Nalidixic acid	8	11	2													9					2						
Tetracyclines - Tetracycline	8	11	3												1	7				1	2						
Trimethoprim	2	11	2										9							2							
Cephalosporins - Ceftazidim	2	11	1									1	9					1									
Polymyxins - Colistin	2	11	1												10	1											
Sulfonamides - Sulfamethoxazol	256	11	2															1	4	4					2		

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

S. Mbandaka	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Kentucky Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	5	3									1	1				1	2								
Aminoglycosides - Kanamycin	8	5	0														5									
Aminoglycosides - Streptomycin	32	5	3															1	1			3				
Amphenicols - Chloramphenicol	16	5	0														4	1								
Amphenicols - Florfenicol	16	5	0														5									
Cephalosporins - Cefotaxime	0.25	5	0								1	4														
Fluoroquinolones - Ciprofloxacin	0.06	5	4						1									4								
Penicillins - Ampicillin	4	5	4													1					4					
Quinolones - Nalidixic acid	8	5	4															1				4				
Tetracyclines - Tetracycline	8	5	3														2			1		2				
Trimethoprim	2	5	1												4						1					
Cephalosporins - Ceftazidim	2	5	0											1	4											
Polymyxins - Colistin	2	5	0														5									
Sulfonamides - Sulfamethoxazol	256	5	3																1	1				3		

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

S. Kentucky	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Agona Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	3	0									2	1														
Aminoglycosides - Kanamycin	8	3	0														2	1									
Aminoglycosides - Streptomycin	32	3	0															1	1	1							
Amphenicols - Chloramphenicol	16	3	0														1	2									
Amphenicols - Florfenicol	16	3	0														1	1	1								
Cephalosporins - Cefotaxime	0.25	3	1								2						1										
Fluoroquinolones - Ciprofloxacin	0.06	3	1				1		1					1													
Penicillins - Ampicillin	4	3	1											1			1			1							
Quinolones - Nalidixic acid	8	3	1														2					1					
Tetracyclines - Tetracycline	8	3	0												1	2											
Trimethoprim	2	3	1										2								1						
Cephalosporins - Ceftazidim	2	3	1										2							1							
Polymyxins - Colistin	2	3	0												3												
Sulfonamides - Sulfamethoxazol	256	3	1																1	1						1	

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

S. Agona	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Dublin Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0									1													
Aminoglycosides - Kanamycin	8	1	0														1								
Aminoglycosides - Streptomycin	32	1	0																						
Amphenicols - Chloramphenicol	16	1	0															1							
Amphenicols - Florfenicol	16	1	0															1							
Cephalosporins - Cefotaxime	0.25	1	0								1														
Fluoroquinolones - Ciprofloxacin	0.06	1	0				1																		
Penicillins - Ampicillin	4	1	0											1											
Quinolones - Nalidixic acid	8	1	0															1							
Tetracyclines - Tetracycline	8	1	0															1							
Trimethoprim	2	1	0												1										
Cephalosporins - Ceftazidim	2	1	0											1											
Polymyxins - Colistin	2	1	1															1							
Sulfonamides - Sulfamethoxazol	256	1	0																		1				

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

S. Dublin	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals)																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	9	0									1	8													
Aminoglycosides - Kanamycin	8	9	0														9									
Aminoglycosides - Streptomycin	32	9	6															3			1	5				
Amphenicols - Chloramphenicol	16	9	1														3	4	1		1					
Amphenicols - Florfenicol	16	9	1														6	2		1						
Cephalosporins - Cefotaxime	0.25	9	0							6	2	1														
Fluoroquinolones - Ciprofloxacin	0.06	9	0				4		4	1																
Penicillins - Ampicillin	4	9	6												3						6					
Quinolones - Nalidixic acid	8	9	1															7	1	1						
Tetracyclines - Tetracycline	8	9	6													3					6					
Trimethoprim	2	9	3										6					1		2						
Cephalosporins - Ceftazidim	2	9	0									5	4													
Polymyxins - Colistin	2	9	0													9										
Sulfonamides - Sulfamethoxazol	256	9	7																	1		1			7	

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

S. Typhimurium	Cattle (bovine animals)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Enteritidis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals)																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	3	0									3														
Aminoglycosides - Kanamycin	8	3	0														3									
Aminoglycosides - Streptomycin	32	3	1															1		1	1					
Amphenicols - Chloramphenicol	16	3	2															1				2				
Amphenicols - Florfenicol	16	3	0														1	2								
Cephalosporins - Cefotaxime	0.25	3	0								2	1														
Fluoroquinolones - Ciprofloxacin	0.06	3	1				2							1												
Penicillins - Ampicillin	4	3	0											3												
Quinolones - Nalidixic acid	8	3	1														2				1					
Tetracyclines - Tetracycline	8	3	0											3												
Trimethoprim	2	3	0										3													
Cephalosporins - Ceftazidim	2	3	0									3														
Polymyxins - Colistin	2	3	3														3									
Sulfonamides - Sulfamethoxazol	256	3	2																	1					2	

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

S. Enteritidis	Cattle (bovine animals)	
	Isolates out of a monitoring program (yes/no)	
Number of isolates available in the laboratory		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Livingstone* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Livingstone Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																											
	1675																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	1	3	0										3															
Aminoglycosides - Kanamycin	8	3	1														2						1					
Aminoglycosides - Streptomycin	32	3	2																1				2					
Amphenicols - Chloramphenicol	16	3	1															2				1						
Amphenicols - Florfenicol	16	3	0															2	1									
Cephalosporins - Cefotaxime	0.25	3	0								1	2																
Fluoroquinolones - Ciprofloxacin	0.06	3	1					1	1				1															
Penicillins - Ampicillin	4	3	2														1				2							
Quinolones - Nalidixic acid	8	3	1																2				1					
Tetracyclines - Tetracycline	8	3	1														2						1					
Trimethoprim	2	3	2											1					1		1							
Cephalosporins - Ceftazidim	2	3	0											1	2													
Polymyxins - Colistin	2	3	0														3											
Sulfonamides - Sulfamethoxazol	256	3	2																			1					2	

Table Antimicrobial susceptibility testing of *S. Livingstone* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

S. Livingstone	Pigs - breeding animals - raised under controlled housing conditions	
	Isolates out of a monitoring program (yes/no)	Number of isolates available in the laboratory
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of S. Mbandaka in Ducks - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Mbandaka Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Ducks																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0																						
Aminoglycosides - Kanamycin	8	1	0																						
Aminoglycosides - Streptomycin	32	1	0																						
Amphenicols - Chloramphenicol	16	1	0																						
Amphenicols - Florfenicol	16	1	0																						
Cephalosporins - Cefotaxime	0.25	1	0																						
Fluoroquinolones - Ciprofloxacin	0.06	1	1																						
Penicillins - Ampicillin	4	1	1																						
Quinolones - Nalidixic acid	8	1	1																						
Tetracyclines - Tetracycline	8	1	1																						
Trimethoprim	2	1	0																						
Cephalosporins - Ceftazidim	2	1	0																						
Polymyxins - Colistin	2	1	0																						
Sulfonamides - Sulfamethoxazol	256	1	1																						1

Table Antimicrobial susceptibility testing of *S. Mbandaka* in Ducks - quantitative data [Dilution method]

S. Mbandaka	Ducks	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Minnesota Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	50	0									2	42	6													
Aminoglycosides - Kanamycin	8	50	1													48	1	1									
Aminoglycosides - Streptomycin	32	50	8													1		36	4	1	2	6					
Amphenicols - Chloramphenicol	16	50	2													2	46				2						
Amphenicols - Florfenicol	16	50	0													4	44	2									
Cephalosporins - Cefotaxime	0.25	50	2						13	33	2					2											
Fluoroquinolones - Ciprofloxacin	0.06	50	4				3		42	1	2	1	1														
Penicillins - Ampicillin	4	50	7												37	5	1	2		5							
Quinolones - Nalidixic acid	8	50	3														46	1			3						
Tetracyclines - Tetracycline	8	50	3													46	1			1	2						
Trimethoprim	2	50	6										44				2				4						
Cephalosporins - Ceftazidim	2	50	2									23	25						2								
Polymyxins - Colistin	2	50	1												49	1											
Sulfonamides - Sulfamethoxazol	256	50	11															1	5	25	8				11		

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

S. Minnesota	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Agona* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Agona Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	1	0									1														
Aminoglycosides - Kanamycin	8	1	0														1									
Aminoglycosides - Streptomycin	32	1	1																			1				
Amphenicols - Chloramphenicol	16	1	0																			1				
Amphenicols - Florfenicol	16	1	0																			1				
Cephalosporins - Cefotaxime	0.25	1	0									1														
Fluoroquinolones - Ciprofloxacin	0.06	1	0						1																	
Penicillins - Ampicillin	4	1	1																				1			
Quinolones - Nalidixic acid	8	1	0																			1				
Tetracyclines - Tetracycline	8	1	0																			1				
Trimethoprim	2	1	1																					1		
Cephalosporins - Ceftazidim	2	1	0														1									
Polymyxins - Colistin	2	1	0																			1				
Sulfonamides - Sulfamethoxazol	256	1	1																							1

Table Antimicrobial susceptibility testing of *S. Agona* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

S. Agona	Pigs - breeding animals - raised under controlled housing conditions	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Senftenberg Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	26	1									3	21	1	1											
Aminoglycosides - Kanamycin	8	26	0														26									
Aminoglycosides - Streptomycin	32	26	3															5	13	3	2	2	1			
Amphenicols - Chloramphenicol	16	26	1															1	23	1			1			
Amphenicols - Florfenicol	16	26	0															14	10	2						
Cephalosporins - Cefotaxime	0.25	26	1							4	20	1						1								
Fluoroquinolones - Ciprofloxacin	0.06	26	3				16		6	1		1	2													
Penicillins - Ampicillin	4	26	5													19	1	1				5				
Quinolones - Nalidixic acid	8	26	3															23					3			
Tetracyclines - Tetracycline	8	26	1														2	22	1				1			
Trimethoprim	2	26	4													21	1						4			
Cephalosporins - Ceftazidim	2	26	1													11	13	1				1				
Polymyxins - Colistin	2	26	0															26								
Sulfonamides - Sulfamethoxazol	256	26	5																	4	14	2	1			5

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

S. Senftenberg	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Derby Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	5	0									1	4														
Aminoglycosides - Kanamycin	8	5	0														5										
Aminoglycosides - Streptomycin	32	5	0															3	2								
Amphenicols - Chloramphenicol	16	5	0															3	2								
Amphenicols - Florfenicol	16	5	0															5									
Cephalosporins - Cefotaxime	0.25	5	0									1	4														
Fluoroquinolones - Ciprofloxacin	0.06	5	0						1		4																
Penicillins - Ampicillin	4	5	0														2	3									
Quinolones - Nalidixic acid	8	5	0															5									
Tetracyclines - Tetracycline	8	5	0														3	2									
Trimethoprim	2	5	0													5											
Cephalosporins - Ceftazidim	2	5	0													5											
Polymyxins - Colistin	2	5	0														5										
Sulfonamides - Sulfamethoxazol	256	5	0																	5							

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

S. Derby	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Paratyphi B Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	98	1									80	17			1											
Aminoglycosides - Kanamycin	8	98	7														91		1			6					
Aminoglycosides - Streptomycin	32	98	26															5	7	60	4	22					
Amphenicols - Chloramphenicol	16	98	2													7	45	31	13		2						
Amphenicols - Florfenicol	16	98	1													20	50	24	3	1							
Cephalosporins - Cefotaxime	0.25	98	26							32	28	12		1	3	22											
Fluoroquinolones - Ciprofloxacin	0.06	98	76				15		7		2	33	25	14	1		1										
Penicillins - Ampicillin	4	98	77											1	16	1	3			77							
Quinolones - Nalidixic acid	8	98	75														23				1	74					
Tetracyclines - Tetracycline	8	98	17											35	38	8		3	3	11							
Trimethoprim	2	98	95										3							95							
Cephalosporins - Ceftazidim	2	98	21									35	37		5	8		13									
Polymyxins - Colistin	2	98	1												97	1											
Sulfonamides - Sulfamethoxazol	256	98	61														4	13	17	2	1				61		

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

S. Paratyphi B	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Rissen Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	18	1									3	13	1				1									
Aminoglycosides - Kanamycin	8	18	2														16					2					
Aminoglycosides - Streptomycin	32	18	2															1	10	3	2	1	1				
Amphenicols - Chloramphenicol	16	18	0															1	17								
Amphenicols - Florfenicol	16	18	0															11	7								
Cephalosporins - Cefotaxime	0.25	18	1							5	10	2					1										
Fluoroquinolones - Ciprofloxacin	0.06	18	1				14		3									1									
Penicillins - Ampicillin	4	18	2												1	10	5				2						
Quinolones - Nalidixic acid	8	18	1															17					1				
Tetracyclines - Tetracycline	8	18	2													1	15					1	1				
Trimethoprim	2	18	4										14								4						
Cephalosporins - Ceftazidim	2	18	0										3	13	2												
Polymyxins - Colistin	2	18	0														18										
Sulfonamides - Sulfamethoxazol	256	18	4															1		11	2					4	

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

S. Rissen	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Dublin Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals)																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	10	0									7	3														
Aminoglycosides - Kanamycin	8	10	0														9	1									
Aminoglycosides - Streptomycin	32	10	0															1	5	4							
Amphenicols - Chloramphenicol	16	10	2													2	5		1		2						
Amphenicols - Florfenicol	16	10	0													4	5		1								
Cephalosporins - Cefotaxime	0.25	10	0							7	2	1															
Fluoroquinolones - Ciprofloxacin	0.06	10	1				6		2	1		1															
Penicillins - Ampicillin	4	10	0											3	6	1											
Quinolones - Nalidixic acid	8	10	1														8	1		1							
Tetracyclines - Tetracycline	8	10	0												8	1	1										
Trimethoprim	2	10	0										10														
Cephalosporins - Ceftazidim	2	10	0									9	1														
Polymyxins - Colistin	2	10	8													2	8										
Sulfonamides - Sulfamethoxazol	256	10	4															3	3							4	

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

S. Dublin	Cattle (bovine animals)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Pigs - breeding animals - raised under controlled housing conditions -
quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																												
	1675																												
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048			
Aminoglycosides - Gentamicin	1	77	2									9	61	5	2														
Aminoglycosides - Kanamycin	8	77	6														71			1		5							
Aminoglycosides - Streptomycin	32	77	42															19	11	5	4	38							
Amphenicols - Chloramphenicol	16	77	18														25	33	1		18								
Amphenicols - Florfenicol	16	77	11													1	55	6	4	6	5								
Cephalosporins - Cefotaxime	0.25	77	4							52	18	3					4												
Fluoroquinolones - Ciprofloxacin	0.06	77	10					41		22	4	1	5	3	1														
Penicillins - Ampicillin	4	77	60													14	3				60								
Quinolones - Nalidixic acid	8	77	8															63	6	1	1	6							
Tetracyclines - Tetracycline	8	77	47													2	25	1	2	2	2	43							
Trimethoprim	2	77	39												37	1			1		38								
Cephalosporins - Ceftazidim	2	77	5												56	15	1		2		3								
Polymyxins - Colistin	2	77	3														74	3											
Sulfonamides - Sulfamethoxazol	256	77	53															1		10	11	2		1		52			

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Pigs - breeding animals - raised under controlled housing conditions -
quantitative data [Dilution method]

S. Typhimurium	Pigs - breeding animals - raised under controlled housing conditions	
	Isolates out of a monitoring program (yes/no)	Number of isolates available in the laboratory
		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Enteritidis* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Enteritidis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	1	0									1														
Aminoglycosides - Kanamycin	8	1	0														1									
Aminoglycosides - Streptomycin	32	1	0															1								
Amphenicols - Chloramphenicol	16	1	0															1								
Amphenicols - Florfenicol	16	1	0															1								
Cephalosporins - Cefotaxime	0.25	1	0									1														
Fluoroquinolones - Ciprofloxacin	0.06	1	0						1																	
Penicillins - Ampicillin	4	1	0													1										
Quinolones - Nalidixic acid	8	1	0															1								
Tetracyclines - Tetracycline	8	1	0													1										
Trimethoprim	2	1	0													1										
Cephalosporins - Ceftazidim	2	1	0												1											
Polymyxins - Colistin	2	1	0														1									
Sulfonamides - Sulfamethoxazol	256	1	0																1							

Table Antimicrobial susceptibility testing of *S. Enteritidis* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

S. Enteritidis	Pigs - breeding animals - raised under controlled housing conditions	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Derby* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Derby Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																											
	1675																											
	Cut-off value	N	n	≤ 0.002	≤ 0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	1	12	0										12															
Aminoglycosides - Kanamycin	8	12	0														12											
Aminoglycosides - Streptomycin	32	12	4															2	6			4						
Amphenicols - Chloramphenicol	16	12	1															11				1						
Amphenicols - Florfenicol	16	12	1														4	7		1								
Cephalosporins - Cefotaxime	0.25	12	1							3	8							1										
Fluoroquinolones - Ciprofloxacin	0.06	12	3				8		1			1	2															
Penicillins - Ampicillin	4	13	1											1	9		2				1							
Quinolones - Nalidixic acid	8	12	3														8	1			3							
Tetracyclines - Tetracycline	8	12	8												2	2					8							
Trimethoprim	2	12	4										8								4							
Cephalosporins - Ceftazidim	2	12	1										11							1								
Polymyxins - Colistin	2	12	0													12								2	1	1	1	7
Sulfonamides - Sulfamethoxazol	256	12	8																									

Table Antimicrobial susceptibility testing of *S. Derby* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

S. Derby	Pigs - breeding animals - raised under controlled housing conditions	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Paratyphi B* in Pigs - breeding animals - raised under controlled housing conditions -
quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Paratyphi B Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																									
	1675																									
	Cut-off value	N	n	≤ 0.002	≤ 0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	1	0										1													
Aminoglycosides - Kanamycin	8	1	0														1									
Aminoglycosides - Streptomycin	32	1	1																				1			
Amphenicols - Chloramphenicol	16	1	0																							
Amphenicols - Florfenicol	16	1	0																							
Cephalosporins - Cefotaxime	0.25	1	0										1													
Fluoroquinolones - Ciprofloxacin	0.06	1	0						1																	
Penicillins - Ampicillin	4	1	1																					1		
Quinolones - Nalidixic acid	8	1	0																							
Tetracyclines - Tetracycline	8	1	0																							
Trimethoprim	2	1	1																					1		
Cephalosporins - Ceftazidim	2	1	0												1											
Polymyxins - Colistin	2	1	0															1								
Sulfonamides - Sulfamethoxazol	256	1	1																							1

Table Antimicrobial susceptibility testing of *S. Paratyphi B* in Pigs - breeding animals - raised under controlled housing conditions -
quantitative data [Dilution method]

S. Paratyphi B	Pigs - breeding animals - raised under controlled housing conditions	
	Isolates out of a monitoring program (yes/no)	Number of isolates available in the laboratory
		1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Rissen* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Rissen Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																										
	1675																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	7	0									3	4														
Aminoglycosides - Kanamycin	8	7	0															7									
Aminoglycosides - Streptomycin	32	7	0															1	3	1	2						
Amphenicols - Chloramphenicol	16	7	2															4	1		2						
Amphenicols - Florfenicol	16	7	0															2	2	3							
Cephalosporins - Cefotaxime	0.25	7	1									1	4	1				1									
Fluoroquinolones - Ciprofloxacin	0.06	7	0					6		1																	
Penicillins - Ampicillin	4	7	3														3	1			3						
Quinolones - Nalidixic acid	8	7	0															6	1								
Tetracyclines - Tetracycline	8	7	4															2	1			4					
Trimethoprim	2	7	4														3					4					
Cephalosporins - Ceftazidim	2	7	1														1	5			1						
Polymyxins - Colistin	2	7	0															7									
Sulfonamides - Sulfamethoxazol	256	7	4																		3						4

Table Antimicrobial susceptibility testing of *S. Rissen* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

S. Rissen	Pigs - breeding animals - raised under controlled housing conditions	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:		
	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Virchow Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0																						
Aminoglycosides - Kanamycin	8	1	0																						
Aminoglycosides - Streptomycin	32	1	0																						
Amphenicols - Chloramphenicol	16	1	0																						
Amphenicols - Florfenicol	16	1	0																						
Cephalosporins - Cefotaxime	0.25	1	0											1											
Fluoroquinolones - Ciprofloxacin	0.06	1	0											1											
Penicillins - Ampicillin	4	1	0																						
Quinolones - Nalidixic acid	8	1	0																						
Tetracyclines - Tetracycline	8	1	0																						
Trimethoprim	2	1	0																						
Cephalosporins - Ceftazidim	2	1	0																						
Polymyxins - Colistin	2	1	0																						
Sulfonamides - Sulfamethoxazol	256	1	0																						

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

S. Virchow	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Hadar Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	10	0									1	8	1												
Aminoglycosides - Kanamycin	8	10	0														10									
Aminoglycosides - Streptomycin	32	10	8																1	1	5	3				
Amphenicols - Chloramphenicol	16	10	0													1	7	2								
Amphenicols - Florfenicol	16	10	0													1	9									
Cephalosporins - Cefotaxime	0.25	10	1							8	1							1								
Fluoroquinolones - Ciprofloxacin	0.06	10	10										9	1												
Penicillins - Ampicillin	4	10	2											1	7					2						
Quinolones - Nalidixic acid	8	10	10																			10				
Tetracyclines - Tetracycline	8	10	9												1					2	7					
Trimethoprim	2	10	2										8							2						
Cephalosporins - Ceftazidim	2	10	1									8	1						1							
Polymyxins - Colistin	2	10	0													10										
Sulfonamides - Sulfamethoxazol	256	10	2															2	3	3					2	

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

S. Hadar	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Infantis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	18	0									6	12													
Aminoglycosides - Kanamycin	8	18	0														18									
Aminoglycosides - Streptomycin	32	18	0															17	1							
Amphenicols - Chloramphenicol	16	18	0														6	11	1							
Amphenicols - Florfenicol	16	18	0														16	2								
Cephalosporins - Cefotaxime	0.25	18	1							4	13						1									
Fluoroquinolones - Ciprofloxacin	0.06	18	0				10		7	1																
Penicillins - Ampicillin	4	18	3													13	2		1		2					
Quinolones - Nalidixic acid	8	18	0															17	1							
Tetracyclines - Tetracycline	8	18	0													10	7	1								
Trimethoprim	2	18	0													15	1	2								
Cephalosporins - Ceftazidim	2	18	1										5	11	1			1								
Polymyxins - Colistin	2	18	0														18									
Sulfonamides - Sulfamethoxazol	256	18	2																2	7	7					2

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

S. Infantis	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigeons																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	16	0																							
Aminoglycosides - Kanamycin	8	16	0																							
Aminoglycosides - Streptomycin	32	16	1																							
Amphenicols - Chloramphenicol	16	16	1																							
Amphenicols - Florfenicol	16	16	1																							
Cephalosporins - Cefotaxime	0.25	16	1																							
Fluoroquinolones - Ciprofloxacin	0.06	16	2																							
Penicillins - Ampicillin	4	16	2																							
Quinolones - Nalidixic acid	8	16	1																							
Tetracyclines - Tetracycline	8	16	2																							
Trimethoprim	2	16	3																							
Cephalosporins - Ceftazidim	2	16	1																							
Polymyxins - Colistin	2	16	0																							
Sulfonamides - Sulfamethoxazol	256	16	4																							

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

S. Typhimurium	Pigeons	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of S. Enteritidis in Rabbits - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Enteritidis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Rabbits																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	1	0									1														
Aminoglycosides - Kanamycin	8	1	0														1									
Aminoglycosides - Streptomycin	32	1	0															1								
Amphenicols - Chloramphenicol	16	1	0																1							
Amphenicols - Florfenicol	16	1	0																1							
Cephalosporins - Cefotaxime	0.25	1	0									1														
Fluoroquinolones - Ciprofloxacin	0.06	1	1									1														
Penicillins - Ampicillin	4	1	0															1								
Quinolones - Nalidixic acid	8	1	1																						1	
Tetracyclines - Tetracycline	8	1	0															1								
Trimethoprim	2	1	0															1								
Cephalosporins - Ceftazidim	2	1	0														1									
Polymyxins - Colistin	2	1	0															1								
Sulfonamides - Sulfamethoxazol	256	1	0																						1	

Table Antimicrobial susceptibility testing of *S. Enteritidis* in Rabbits - quantitative data [Dilution method]

S. Enteritidis	Rabbits	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Paratyphi B* in Poultry, unspecified - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Paratyphi B Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Poultry, unspecified																								
	1675																								
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024
Aminoglycosides - Gentamicin	1	1	0									1													
Aminoglycosides - Kanamycin	8	1	0														1								
Aminoglycosides - Streptomycin	32	1	0																						
Amphenicols - Chloramphenicol	16	1	0															1							
Amphenicols - Florfenicol	16	1	0																1						
Cephalosporins - Cefotaxime	0.25	1	0									1													
Fluoroquinolones - Ciprofloxacin	0.06	1	1										1												
Penicillins - Ampicillin	4	1	1																						
Quinolones - Nalidixic acid	8	1	1																						
Tetracyclines - Tetracycline	8	1	0														1								
Trimethoprim	2	1	1																						
Cephalosporins - Ceftazidim	2	1	0														1								
Polymyxins - Colistin	2	1	0															1							
Sulfonamides - Sulfamethoxazol	256	1	0																						

Table Antimicrobial susceptibility testing of *S. Paratyphi B* in Poultry, unspecified - quantitative data [Dilution method]

S. Paratyphi B	Poultry, unspecified	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	1675
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Hadar* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Hadar Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																														
	1675																														
	Cut-off value	N	n	≤ 0.002	≤ 0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048					
Aminoglycosides - Gentamicin	1	1	0										1																		
Aminoglycosides - Kanamycin	8	1	0														1														
Aminoglycosides - Streptomycin	32	1	1																								1				
Amphenicols - Chloramphenicol	16	1	0																												
Amphenicols - Florfenicol	16	1	0																												
Cephalosporins - Cefotaxime	0.25	1	0										1																		
Fluoroquinolones - Ciprofloxacin	0.06	1	0							1																					
Penicillins - Ampicillin	4	1	1																									1			
Quinolones - Nalidixic acid	8	1	0																												
Tetracyclines - Tetracycline	8	1	1																									1			
Trimethoprim	2	1	1																										1		
Cephalosporins - Ceftazidim	2	1	0														1														
Polymyxins - Colistin	2	1	0																										1		
Sulfonamides - Sulfamethoxazol	256	1	1																											1	

Table Antimicrobial susceptibility testing of *S. Hadar* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

S. Hadar	Pigs - breeding animals - raised under controlled housing conditions	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of *S. Infantis* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

S. Infantis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																										
	1675																										
	Cut-off value	N	n	≤ 0.002	≤ 0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	4	0									1	3														
Aminoglycosides - Kanamycin	8	4	0														4										
Aminoglycosides - Streptomycin	32	4	0															2	1	1							
Amphenicols - Chloramphenicol	16	4	0														2	2									
Amphenicols - Florfenicol	16	4	0														3	1									
Cephalosporins - Cefotaxime	0.25	4	0									1	3														
Fluoroquinolones - Ciprofloxacin	0.06	4	0					2		2																	
Penicillins - Ampicillin	4	4	0												4												
Quinolones - Nalidixic acid	8	4	0														4										
Tetracyclines - Tetracycline	8	4	0												2	2											
Trimethoprim	2	4	0												4												
Cephalosporins - Ceftazidim	2	4	0											1	3												
Polymyxins - Colistin	2	4	0													4											
Sulfonamides - Sulfamethoxazol	256	4	0																1	3							

Table Antimicrobial susceptibility testing of *S. Infantis* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

S. Infantis	Pigs - breeding animals - raised under controlled housing conditions	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	1675	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Montevideo Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																									
	1675																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	4	0											3	1											
Aminoglycosides - Kanamycin	8	4	0														4									
Aminoglycosides - Streptomycin	32	4	0															3	1							
Amphenicols - Chloramphenicol	16	4	0															2	2							
Amphenicols - Florfenicol	16	4	0															3	1							
Cephalosporins - Cefotaxime	0.25	4	0											4												
Fluoroquinolones - Ciprofloxacin	0.06	4	0						3		1															
Penicillins - Ampicillin	4	4	0														4									
Quinolones - Nalidixic acid	8	4	0															4								
Tetracyclines - Tetracycline	8	4	0															1	3							
Trimethoprim	2	4	0														4									
Cephalosporins - Ceftazidim	2	4	0														3	1								
Polymyxins - Colistin	2	4	0															4								
Sulfonamides - Sulfamethoxazol	256	4	0																	1	3					

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

S. Montevideo	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																											
	1675																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	1	66	0									24	40	2														
Aminoglycosides - Kanamycin	8	66	0														65	1										
Aminoglycosides - Streptomycin	32	66	36															9	11	10	11	25						
Amphenicols - Chloramphenicol	16	66	8													2	23	28	5		8							
Amphenicols - Florfenicol	16	66	6													10	40	7	3	5	1							
Cephalosporins - Cefotaxime	0.25	66	4							47	9	6					4											
Fluoroquinolones - Ciprofloxacin	0.06	66	14				31		19	2		4	6	4														
Penicillins - Ampicillin	4	66	38													24	3	1	1		37							
Quinolones - Nalidixic acid	8	66	16															48	2	1		15						
Tetracyclines - Tetracycline	8	66	24													12	26	4			6	18						
Trimethoprim	2	66	22													43	1					22						
Cephalosporins - Ceftazidim	2	66	3													48	12	3		2	1							
Polymyxins - Colistin	2	66	0															66										
Sulfonamides - Sulfamethoxazol	256	66	43																4	1	9	8	1			43		

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

S. Typhimurium	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Cut-off values for antibiotic resistance testing of *Salmonella* in Animals

Test Method Used		Standard methods used for testing		
Broth dilution		NCCLS/CLSI		
			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin	EFSA	2	
	Streptomycin	EFSA	32	
Amphenicols	Chloramphenicol	EFSA	16	
Cephalosporins	Cefotaxime	EFSA	0.5	
Fluoroquinolones	Ciprofloxacin	EFSA	0.06	
Penicillins	Ampicillin	EFSA	4	
Quinolones	Nalidixic acid	EFSA	16	
Sulfonamides	Sulfonamides	EFSA	256	
Tetracyclines	Tetracycline	EFSA	8	
Trimethoprim	Trimethoprim	EFSA	2	

Table Cut-off values for antibiotic resistance testing of *Salmonella* in Feed

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		32	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.5	
Fluoroquinolones	Ciprofloxacin		0.06	
Penicillins	Ampicillin		4	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

Table Cut-off values for antibiotic resistance testing of *Salmonella* in Food

Test Method Used		Standard methods used for testing		
Broth dilution		NCCLS/CLSI		
			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin	EFSA	2	
	Kanamycin		8	
	Streptomycin	EFSA	32	
Amphenicols	Chloramphenicol	EFSA	16	
	Florfenicol		16	
Cephalosporins	Cefotaxime	EFSA	0.5	
	Ceftazidim		2	
Fluoroquinolones	Ciprofloxacin	EFSA	0.06	
Penicillins	Ampicillin	EFSA	4	
Quinolones	Nalidixic acid	EFSA	16	
Sulfonamides	Sulfonamides	EFSA	256	
Tetracyclines	Tetracycline	EFSA	8	
Trimethoprim	Trimethoprim	EFSA	2	

Table Cut-off values for antibiotic resistance testing of *Salmonella* in Food

		Concentration (microg/ml)	Zone diameter (mm)	
		Standard	Resistant >	Resistant <=
Polymyxins	Colistin		2	

2.2 CAMPYLOBACTERIOSIS

2.2.1 General evaluation of the national situation

A. Thermophilic Campylobacter general evaluation

History of the disease and/or infection in the country

Campylobacteriosis is a leading bacterial foodborne gastrointestinal disease in humans in all parts of the world. It can also cause post-infectious complications as Guillain-Barré syndrome.

In 80% of the cases, the infection route of campylobacteriosis is food, but domestic animals including pets can also be involved. The transmission of this pathogen to humans is mostly due to consumption of undercooked poultry, pork and beef, unpasteurized milk, contaminated drinking water, or contacts with the faeces of infected pets. This report will focus on *Campylobacter jejuni* and *Campylobacter coli* that are the principal strains causing enteritis in humans.

The contamination with *Campylobacter* of poultry carcasses and meat is monitored since 2000 by the Federal Agency for the Safety of the Food Chain. The rate of positive poultry samples is stable, but high. Chicken and layer meat have to be well cooked and cross-contamination should be avoided during preparation.

2.2.2 Campylobacter in foodstuffs

A. Thermophilic Campylobacter in Broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

A monitoring program was organized by FASFC to evaluate the level of Campylobacter spp. contamination of broiler meat in Belgian slaughterhouses and cutting plants. Campylobacters is counted on carcasses and cuts of poultry because it is especially the quantitative load of Campylobacter which plays a role in the stake in danger of the consumers.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Neck skin samples and cuts of broilers with and without skin

At meat processing plant

Meat, minced meat, sausages and other

At retail

Meat, minced meat, sausages and other

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

The matrices were carcasses, cuts and meat preparation of broilers. The Campylobacter spp. contamination levels were analyzed : 1g carcasses, 1g cutting meat and 1g meat preparation.

At meat processing plant

The samples were about 200 g of meat. The amount of Campylobacter has been assessed in 1g of sample.

At retail

The amount of Campylobacter has been assessed in 1g of sample.

Definition of positive finding

At slaughterhouse and cutting plant

A sample is considered positive in case of detection of more than 100 cfu Campylobacter in the sample.

At meat processing plant

A sample is considered positive in case of detection of more than 100 cfu Campylobacter in the sample.

At retail

A sample is considered positive in case of detection of more than 100 cfu Campylobacter in the sample.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 10272:1995

B. C., thermophilic in food

Monitoring system

Sampling strategy

A monitoring program was organized by the Federal Agency for the Safety of the Food Chain. More than 200 Belgian slaughterhouses, more than 100 meat cutting plants and more than 100 retail trades representative of the Belgian production of carcasses and meat, were selected for this study. The samples assayed were carcasses and minced meat from pork, carcasses, cuts and meat preparation from chicken, and layer carcasses. Sampling was done by a specially trained staff of the Federal Agency for the Safety of the Food Chain.

Frequency of the sampling

Samples have been taken every week from the first to the 52nd week, except during the 30th week.

Type of specimen taken

meat and dairy products

Methods of sampling (description of sampling techniques)

Sampling of pork carcasses was done by means of swabs (4 areas from the same half carcass constituting 600 cm² were putted in the same stomacher bag).

The carcass samples of broiler and layer consisted of 10g of neck skin. The other samples were about 200g of meat. 10g to 25g representative of the whole sample were weighted in the laboratory, and the detection of *Campylobacter* has been assessed in these quantities or dilutions: 25g for pork minced meat, 600 cm² (pork carcasses), 0,01g for chicken carcasses and layer carcasses, 1g for chicken meat preparation, and for chicken cuts, 0,1g and 25g.

No pooling has been done.

Definition of positive finding

A sample is considered to be positive after biochemical or genetic confirmation of one *Campylobacter* in the sample.

Diagnostic/analytical methods used

For detection of *Campylobacter* in meat samples or swabs the official Belgian SP-VG-M003 method was used following :

- selective enrichment on Preston at 42°C for 48 h,
- isolation on mCCDA at 42°C for 24 h - 120 h,
- confirmation of minimum 1 colony with miniaturised biochemical tests or by PCR typing.

Measures in case of the positive findings or single cases

Measures to be taken in the case of a non-compliant result:

- Notification of the producer or importer
- Possibility of a counter analysis
- Destruction of the non compliant batch or single sample
- Further investigation: additional sampling, possible recall, RASFF, ...

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

The results showed that, even if the contamination by *Campylobacter* spp. of pig carcasses is zero, the pork represents a relatively low risk for the consumer seen the evolution of this contamination during the operations of cut.

Table Campylobacter in other food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Campylobacter	C. coli	C. jejuni
Meat from pig - fresh - at slaughterhouse	PRI 002	Unspecified	Official sampling	food sample > carcass swabs		Batch	600cm2	667	67		
Meat from pig - minced meat - intended to be eaten raw - at retail	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	9	0		
Meat from bovine animals - minced meat - intended to be eaten raw - at retail	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	31	0		
Milk, cows' - raw milk - intended for direct human consumption - at farm	DPA013	Unspecified	Official sampling	food sample > milk		Batch	200ml	37	0		
Live bivalve molluscs - at retail	DIS806	Unspecified	Official sampling	food sample		Batch	>1,5kg	87	0		
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	24	0		
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	22	0		
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	19	0		
Meat from bovine animals and pig - minced meat - intended to be eaten cooked - at retail	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	8	0		
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	4	0		
Meat from other animal species or not specified - fresh - at retail	DIS883	Unspecified	Official sampling	food sample > meat		Batch	200g	63	0		
Meat from pig - minced meat - intended to be eaten cooked - at processing plant	TRA 303	Unspecified	Official sampling	food sample > meat		Batch	1g	91	0		

Table Campylobacter in other food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Campylobacter	C. coli	C. jejuni
Meat from pig - minced meat - intended to be eaten cooked - at retail	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	16	0		
Milk, cows' - raw milk - intended for direct human consumption - at retail	DIS837	Unspecified	Official sampling	food sample > milk		Batch	150ml	10	0		

	C. lari	C. upsaliensis	Thermophilic Campylobac- ter spp., unspecified
Meat from pig - fresh - at slaughterhouse			67
Meat from pig - minced meat - intended to be eaten raw - at retail			
Meat from bovine animals - minced meat - intended to be eaten raw - at retail			
Milk, cows' - raw milk - intended for direct human consumption - at farm			
Live bivalve molluscs - at retail			
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm			
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail			
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail			
Meat from bovine animals and pig - minced meat - intended to be eaten cooked - at retail			

Table Campylobacter in other food

	C. lari	C. upsaliensis	Thermophilic Campylobact er spp., unspecified
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail			
Meat from other animal species or not specified - fresh - at retail			
Meat from pig - minced meat - intended to be eaten cooked - at processing plant			
Meat from pig - minced meat - intended to be eaten cooked - at retail			
Milk, cows' - raw milk - intended for direct human consumption - at retail			

Table Campylobacter in poultry meat

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Campylobacter	C. coli	C. jejuni
Meat from broilers (<i>Gallus gallus</i>) - carcase - at slaughterhouse	PRI 003	Unspecified	Official sampling	food sample > neck skin		Batch	1g	335	130		
Meat from broilers (<i>Gallus gallus</i>) - fresh - at processing plant	TRA 200	Unspecified	Official sampling	food sample > meat		Batch	1g	711	99		
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail	DIS819 DIS821	Unspecified	Official sampling	food sample > meat		Batch	>200g	403	69		
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at processing plant	TRA202	Unspecified	Official sampling	food sample > meat		Batch	>200g	47	0		
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at retail	DIS826	Unspecified	Official sampling	food sample > meat		Batch	150g	56	0		
Meat from turkey - fresh - at retail	DIS821	Unspecified	Official sampling	food sample > meat		Batch	>200g	15	0		
Meat from turkey - meat preparation - intended to be eaten cooked - at processing plant	TRA202	Unspecified	Official sampling	food sample > meat		Batch	>200g	12	0		
Meat from turkey - meat preparation - intended to be eaten cooked - at retail	DIS826	Unspecified	Official sampling	food sample > meat		Batch	150g	3	0		
	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified								
Meat from broilers (<i>Gallus gallus</i>) - carcase - at slaughterhouse			130								

Table Campylobacter in poultry meat

	C. lari	C. upsaliensis	Thermophilic Campylobact er spp., unspecified
Meat from broilers (<i>Gallus gallus</i>) - fresh - at processing plant			99
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail			69
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at processing plant			
Meat from broilers (<i>Gallus gallus</i>) - meat preparation - intended to be eaten cooked - at retail			
Meat from turkey - fresh - at retail			
Meat from turkey - meat preparation - intended to be eaten cooked - at processing plant			
Meat from turkey - meat preparation - intended to be eaten cooked - at retail			

2.2.3 Campylobacter in animals

A. Thermophilic Campylobacter in *Gallus gallus*

Monitoring system

Sampling strategy

In 2011 no monitoring was realised for Campylobacter by analysis of caeca.

Frequency of the sampling

At slaughter

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughter

caeca

Methods of sampling (description of sampling techniques)

At slaughter

10 caeca pairs are pooled to one sample. 6 samples are taken of each examined flock. The caeca are emptied at the laboratory. The content is examined for Campylobacter.

Case definition

At slaughter

A sample is positive if Campylobacter is detected.

Measures in case of the positive findings or single cases

Samples are taken for monitoring purposes only. No measures are taken in case of positive findings.

2.2.4 Antimicrobial resistance in *Campylobacter* isolates

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

Sampling strategy used in monitoring

Procedures for the selection of isolates for antimicrobial testing

All strains isolated in the zoonosis monitoring program and originating from pork were sent to the Institute of Public Health for determination of antimicrobial resistance.

Laboratory methodology used for identification of the microbial isolates

Specification (*coli/jejuni*) with PCR (Debruyn et al, Res Microbiol, 2008)

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The antimicrobials tested and the breakpoints used are listed in the following table.

Antimicrobial	Breakpoints (g / ml)
Jejunicoli	
Chloramphenicol	1616
Tetracycline	22
Nalidixic acid	1632
Ciprofloxacin	11
Erytromycin	416
Gentamicin	12
Streptomycin	2 4

Minimum Inhibitory Concentrations were determined following the NCCLS guidelines.

Results of the investigation

In total, 54 *Campylobacter* isolates were analysed, of which 50 belonged to *C. coli* and 4 to *C. jejuni*.

The number of isolates that were sensitive to all tested antibiotics was 5% which is an increase compared to last year (2%). The resistance against streptomycin (80%) and tetracycline (76%) was high, and 46% of all isolates showed resistance to three or more antibiotics tested. Complete resistance was not observed.

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

Sampling strategy used in monitoring

Procedures for the selection of isolates for antimicrobial testing

All strains isolated in the zoonosis monitoring program and originating from poultry were sent to the Institute Public Health for determination of antimicrobial resistance.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

The antimicrobials tested and the breakpoints used are listed in the following table.

AntimicrobialBreakpoints (g / ml)

	Jejunicoli
Chloramphenicol	1616
Tetracycline	22
Nalidixic acid	1632
Ciprofloxacin	11
Erytromycin	416
Gentamicin	12
Streptomycin	2 4

Minimum Inhibitory Concentrations were determined following the NCCLS guidelines.

Results of the investigation

451 *Campylobacter* strains were isolated in poultry meat and carcasses and tested for antimicrobial susceptibility (342 *C. jejuni* and 106 *C. coli* strains).

In total 37% of all *campylobacter* strains from poultry meat were sensitive to all tested antibiotics.

Tetracycline resistance was most dominantly present (54%), followed closely by resistance to Nalidixic acid (42.3%) and ciprofloxacin (44.1%).

Overall antibiotic resistance was more prevalent in *C. coli* than in *C. jejuni*, with only 15 *C. coli* strains sensitive to all antibiotics. The number of multiresistant strains, resistant to three or more antibiotics, decreased from 62.5% in 2010 to 52%. A high resistance was observed for tetracycline (74%), ciprofloxacin (65%) and nalidixic acid (51%), though which is significantly less compared to 2010 and 2008. For *C. jejuni*, 33% of all strains were sensitive to all antibiotics tested, which is almost the same as last year (34%). The resistance against erythromycin is increased from 4% in 2010 to 11% in 2011. No resistance against chloramphenicol is observed. Thirty seven percent of the *C. jejuni* strains was resistant to three or more antibiotics. High resistance was observed for nalidixic acid (40%), tetracycline (48%) and ciprofloxacin (38%).

Table Antimicrobial susceptibility testing of *Campylobacter* in Meat from pig

Campylobacter	C. coli		C. jejuni		Campylobacter spp., unspecified	
	Isolates out of a monitoring program (yes/no)		yes			
	Number of isolates available in the laboratory		50		4	
	N	n	N	n	N	n
Aminoglycosides - Gentamicin	50	2	4	0		
Fluoroquinolones - Ciprofloxacin	50	20	4	2		
Macrolides - Erythromycin	50	16	4	0		
Penicillins - Ampicillin	0		0			
Quinolones - Nalidixic acid	50	15	4	1		
Tetracyclines - Tetracycline	50	38	4	2		
Fully sensitive	50	2	4	1		
Resistant to 1 antimicrobial	50	7	4	1		
Resistant to 2 antimicrobials	50	17	4	1		
Resistant to 3 antimicrobials	50	11	4	1		
Resistant to 4 antimicrobials	50	9	4	0		
Resistant to >4 antimicrobials	50	4	4	0		
Aminoglycosides - Streptomycin	50	40	4	1		
Amphenicols - Chloramphenicol	50	0	4	0		

Table Antimicrobial susceptibility testing of *Campylobacter* in Meat from broilers (*Gallus gallus*)

Campylobacter Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	C. coli		C. jejuni		Campylobacter spp., unspecified	
	yes		yes			
	28		108			
	N	n	N	n	N	n
Aminoglycosides - Gentamicin	28	1	108	2		
Fluoroquinolones - Ciprofloxacin	28	20	108	52		
Macrolides - Erythromycin	28	3	108	8		
Penicillins - Ampicillin	0		0			
Quinolones - Nalidixic acid	28	16	108	56		
Tetracyclines - Tetracycline	28	22	108	67		
Fully sensitive	28	3	108	25		
Resistant to 1 antimicrobial	28	5	108	22		
Resistant to 2 antimicrobials	28	4	108	14		
Resistant to 3 antimicrobials	28	8	108	35		
Resistant to 4 antimicrobials	28	6	108	8		
Resistant to >4 antimicrobials	28	2	108	4		
Aminoglycosides - Streptomycin	28	9	108	23		
Amphenicols - Chloramphenicol	28	0	108	0		

Table Antimicrobial susceptibility testing of *C. coli* in Meat from pig - carcass - chilled - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

C. coli Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from pig - carcase - chilled - Surveillance																							
	yes																							
	50																							
Antimicrobials:	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	>2048	lowest	highest
Aminoglycosides - Gentamicin	2	50	2	0	0	0	0	0	0	0	47	1	0	0	2									
Aminoglycosides - Streptomycin	4	50	40									4	1	5	2	38								
Amphenicols - Chloramphenicol	16	50	0										32	15	3									
Fluoroquinolones - Ciprofloxacin	1	50	20								30		20											
Quinolones - Nalidixic acid	32	50	15									2	15	12		6	15							
Tetracyclines - Tetracycline	2	50	38								11	1		1	37									
Macrolides - Erythromycin	16	50	16								24	6	3	1		16								

Table Antimicrobial susceptibility testing of *C. coli* in Meat from poultry, unspecified - meat products - raw but intended to be eaten cooked - chilled - at retail - domestic production - Surveillance - Official sampling - food sample - meat - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

C. coli	Meat from poultry, unspecified - meat products - raw but intended to be eaten cooked - chilled - at retail - domestic production - Surveillance																								
	yes																								
	25																								
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides - Gentamicin	2	25	0						3	16	5	1													
Aminoglycosides - Streptomycin	4	25	12								6	5	2		12										
Amphenicols - Chloramphenicol	16	25	0									12	12	1											
Fluoroquinolones - Ciprofloxacin	1	25	18					6	1				18												
Quinolones - Nalidixic acid	32	25	11										3	4		7	11								
Tetracyclines - Tetracycline	2	25	19						3	1		2		1	18										
Macrolides - Erythromycin	16	25	9							6	7	2		1		9									

Table Antimicrobial susceptibility testing of *C. jejuni* - *C. jejuni* subsp. *jejuni* in Meat from poultry, unspecified - meat products - raw but intended to be eaten cooked - chilled - at retail - domestic production - Surveillance - Official sampling - food sample - meat - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

C. jejuni subsp. <i>jejuni</i> Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from poultry, unspecified - meat products - raw but intended to be eaten cooked - chilled - at retail - domestic production - Surveillance																							
	yes																							
	83																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	>2048	lowest	highest
Aminoglycosides - Gentamicin	1	83	2					12	36	25	8	1	1											
Aminoglycosides - Streptomycin	2	83	28								49	6	3	2	23									
Amphenicols - Chloramphenicol	16	83	1								56	22	4		1									
Fluoroquinolones - Ciprofloxacin	1	83	45					13	16	6	3		45											
Quinolones - Nalidixic acid	16	83	46										5	17	10	5	5	41						
Tetracyclines - Tetracycline	2	83	50						22	4	1	6	3	1	46									
Macrolides - Erythromycin	4	83	21							44	13	3	2	2		19								

Table Antimicrobial susceptibility testing of *C. coli* in Meat from broilers (*Gallus gallus*) - carcass - spent hens - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

C. coli Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcase - spent hens - at slaughterhouse - Surveillance																							
	yes																							
	53																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	>2048	lowest	highest
Aminoglycosides - Gentamicin	2	53	0					5	16	24	8													
Aminoglycosides - Streptomycin	4	53	15									20	14	4	1	14								
Amphenicols - Chloramphenicol	16	53	0										34	16	3									
Fluoroquinolones - Ciprofloxacin	1	53	31				6	8	5	2	1	1	30											
Quinolones - Nalidixic acid	32	53	26										4	11	3	5	4	26						
Tetracyclines - Tetracycline	2	53	37						11	4	1			1	36									
Macrolides - Erythromycin	16	53	6							26	16	5				6								

Table Antimicrobial susceptibility testing of *C. jejuni* - *C. jejuni* subsp. *jejuni* in Meat from broilers (*Gallus gallus*) - carcass - spent hens - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

C. jejuni subsp. <i>jejuni</i> Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcass - spent hens - at slaughterhouse - Surveillance																							
	yes																							
	151																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	>2048	lowest	highest
Aminoglycosides - Gentamicin	1	151	3					29	79	33	7	1	2											
Aminoglycosides - Streptomycin	2	151	23									110	18	7	1	15								
Amphenicols - Chloramphenicol	16	151	0									117	27	6	1									
Fluoroquinolones - Ciprofloxacin	1	151	43					33	55	14	3	3		43										
Quinolones - Nalidixic acid	16	151	45											32	56	9	9	9	36					
Tetracyclines - Tetracycline	2	151	60						69	11	3	8	3	4	53									
Macrolides - Erythromycin	4	151	12				2				99	27	7	4			12							

Table Antimicrobial susceptibility testing of *C. coli* in Meat from broilers (*Gallus gallus*) - carcass - chilled - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration ($\mu\text{g/ml}$), number of isolates with a concentration of inhibition equal to

C. coli Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcase - chilled - at slaughterhouse - Surveillance																						
	yes																						
	Cut-off value	N	n	≤ 0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048
Aminoglycosides - Gentamicin	2	28	1					1	6	13	6	1			1								
Aminoglycosides - Streptomycin	4	28	9								10	5	4	1	8								
Amphenicols - Chloramphenicol	16	28	0									16	11	1									
Fluoroquinolones - Ciprofloxacin	1	28	20				1	5	1	1			20										
Quinolones - Nalidixic acid	32	28	16											3	5		4	16					
Tetracyclines - Tetracycline	2	28	22						2	2	1	1			22								
Macrolides - Erythromycin	16	28	3							8	9	6	1		1	3							

Table Antimicrobial susceptibility testing of *C. jejuni* - *C. jejuni* subsp. *jejuni* in Meat from broilers (*Gallus gallus*) - carcass - chilled - at slaughterhouse - Surveillance - Official sampling - food sample - carcass swabs - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

C. jejuni subsp. <i>jejuni</i> Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Meat from broilers (<i>Gallus gallus</i>) - carcass - chilled - at slaughterhouse - Surveillance																							
	yes																							
	108																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	>2048	lowest	highest
Aminoglycosides - Gentamicin	1	108	2					10	55	32	9	1			1									
Aminoglycosides - Streptomycin	2	108	23									70	15	5	3	15								
Amphenicols - Chloramphenicol	16	108	0										64	27	16	1								
Fluoroquinolones - Ciprofloxacin	1	108	52					10	27	10	4	5		52										
Quinolones - Nalidixic acid	16	108	56											5	26	15	6	10	46					
Tetracyclines - Tetracycline	2	108	67							18	10	9	4	3		64								
Macrolides - Erythromycin	4	108	8								54	30	10	6			8							

Table Cut-off values used for antimicrobial susceptibility testing of *Campylobacter* in Food

Test Method Used		Standard methods used for testing		
Broth dilution		NCCLS/CLSI		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		1	
	Streptomycin		2	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		4	
Quinolones	Nalidixic acid		16	
Tetracyclines	Tetracycline		2	
Amphenicols	Chloramphenicol		16	

Table Cut-off values used for antimicrobial susceptibility testing of *C. coli* in Animals

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		4	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		16	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of *C. coli* in Feed

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		4	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		16	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of *C. coli* in Food

Test Method Used		Standard methods used for testing		
Broth dilution		NCCLS/CLSI		
		Concentration (microg/ml)	Zone diameter (mm)	
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin	EFSA	2	
	Streptomycin	EFSA	4	
Fluoroquinolones	Ciprofloxacin	EFSA	1	
Macrolides	Erythromycin	EFSA	16	
Quinolones	Nalidixic acid		32	
Tetracyclines	Tetracycline	EFSA	2	
Amphenicols	Chloramphenicol		16	

Table Cut-off values used for antimicrobial susceptibility testing of *C. jejuni* in Animals

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		1	
	Streptomycin		2	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		4	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of *C. jejuni* in Feed

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		1	
	Streptomycin		2	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		4	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of *C. jejuni* in Food

Test Method Used		Standard methods used for testing		
Broth dilution		NCCLS/CLSI		
		Concentration (microg/ml)	Zone diameter (mm)	
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin	EFSA	1	
	Streptomycin	EFSA	2	
Fluoroquinolones	Ciprofloxacin	EFSA	1	
Macrolides	Erythromycin	EFSA	4	
Quinolones	Nalidixic acid		16	
Tetracyclines	Tetracycline	EFSA	2	
Amphenicols	Chloramphenicol		16	

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

Listeria monocytogenes has become a major concern of the food industry and public health authorities. Ingestion of food contaminated with Listeria monocytogenes may cause either a serious invasive illness affecting people with altered or deficient immune responses, or a non-invasive febrile gastro-enteritis. Although the incidence of listeriosis is low, the high mortality rate, which often reaches as high as 30-40%, requires early diagnosis and appropriate antimicrobial therapy. Listeriosis is transmitted to humans via contact with animals, cross-infection of foetus or newborn babies and foodborne infection. Listeria is ubiquitous and widely distributed in the environment (soil, vegetables, meat, milk, fish). All food associated with Listeria monocytogenes outbreaks were consumed without further processing or after minimal heat treatment, and many of them had a suitable environment for growth.

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

A monitoring program was organized by the Federal Agency for the Safety of the Food chain. More than 100 meat cutting plants and more than 200 retail trades representative of the Belgian production of meat, were selected for this study.

The matrices were minced meat of pork, beef and poultry, cooked ham, paté, salami, smoked salmon and other foodstuff.

Recent actions taken to control the zoonoses

General food hygiene rules are essential for the prevention of human listeriosis. As some persons are at high risk (pregnant women, immunocompromised people), they are advised not to eat certain categories of food with proven elevated risk of Listeria monocytogenes contamination, such as unpasteurized milk and butter, soft cheeses and ice cream made from unpasteurized milk, any soft cheese crust, smoked fish, paté, cooked ham, salami, cooked meat in jelly, raw minced meat from beef, pork and poultry, steak tartar, raw fish and shellfish (oysters, mussels, shrimps), fish, meat and surimi salads, insufficiently rinsed raw vegetables, unpeeled fruit.

2.3.2 Listeriosis in humans

A. Listeriosis in humans

History of the disease and/or infection in the country

2.3.3 Listeria in foodstuffs

A. L. monocytogenes in food

Monitoring system

Sampling strategy

A monitoring program was organized by the Federal Agency for the Safety of the Food Chain. More than 100 meat cutting plants and more than 100 retail trades, were selected for this study. The samples assayed were minced meat from beef and pork, chicken meat preparation, cheeses, smoked salmon and other foodstuffs. Sampling was done by a specially trained staff of the Federal Agency for the Safety of the Food Chain.

Frequency of the sampling

At the production plant

every week

At retail

Samples are taken according to the national control program or in the frame of RASFF, complaints or suspicion.

Type of specimen taken

At the production plant

Minced meat of pork, beef, chicken, cooked ham, salami, pate, smoked salmon, cheeses and other

At retail

Minced meat of pork, beef, chicken, cooked ham, salami, pate, smoked salmon, chicken meat preparation, cheeses and other

Methods of sampling (description of sampling techniques)

At the production plant

The detection of Listeria monocytogenes has been assessed in 1g for beef and pork minced meat and in 25g for ready-to-eat foods. Enumeration was done in 1g of sample.

At retail

Listeria monocytogenes was quantified in ready-to-eat foods at retail level through enumeration of colony forming units.

Definition of positive finding

At the production plant

A sample is considered to be positive after confirmation of Listeria monocytogenes on chromogenic medium.

At retail

A sample is considered to be positive after confirmation of Listeria monocytogenes on chromogenic medium.

Diagnostic/analytical methods used

At the production plant

Afnor validated VIDAS LMO2 followed by a chromogenic medium (Rapid L. mono or ALOA)

At retail

Afnor validated VIDAS LMO2 followed by a chromogenic medium (Rapid L. mono or ALOA)

Control program/mechanisms

The control program/strategies in place

Controls are realized by the Federal Agency in case of notification.

Measures in case of the positive findings

Measures to be taken in the case of a non-compliant result:

- Notification of the producer or importer
- Possibility of a counter analysis
- Destruction of the non compliant batch or single sample
- Further investigation: additional sampling, possible recall, RASFF, ...

Notification system in place

Notification is mandatory since 1/3/2004 (Ministerial Decree on mandatory notification in the food chain of 22/1/2004). For Listeria monocytogenes, the criterion of 100 cfu/g in ready-to-eat food putted on the market may not be exceeded. Laboratories have to inform the Federal Agency for the Safety of the Food Chain in case of a positive sample.

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for L. monocytogenes	Units tested with detection method	Listeria monocytogenes presence in g
Milk, cows' - raw milk - intended for direct human consumption - at farm - Surveillance	DPA013	Unspecified	Official sampling	food sample > milk		Single	200ml	39	0	0	0
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		Batch	>300g	51	2	48	2
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	47	0	0	0
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant - Surveillance	TRA134	Unspecified	Official sampling	food sample		Batch	>300g	79	0	71	0
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	75	0	0	0
Cheeses made from cows' milk - fresh - made from pasteurised milk - at processing plant - Surveillance	TRA134	Unspecified	Official sampling	food sample		Batch	>300g	44	0	29	0
Cheeses made from cows' milk - fresh - made from pasteurised milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	37	0	0	0
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		Batch	200g	28	0	10	0
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	50	0	0	0

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for L. monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		Batch	200g	55	2	22	1
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at processing plant - Surveillance	TRA134	Unspecified	Official sampling	food sample		Batch	>300g	55	0	14	0
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	56	0	0	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		Batch	200g	32	0	15	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		Batch	>300g	46	2	22	2
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	45	0	0	0
Cheeses made from sheep's milk - unspecified - made from pasteurised milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	113	0	0	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		Batch	200g	22	0	5	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		Batch	>300g	4	1	4	1

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for L. monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		Batch	200g	84	0	0	0
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at farm - Surveillance	DPA009	Unspecified	Official sampling	food sample		Batch	200g	125	1	26	1
Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - at farm - Surveillance	DPA025	Unspecified	Official sampling	food sample		Batch	200g	49	0	14	0
Dairy products (excluding cheeses) - ice-cream - at farm	DPA010	Unspecified	Official sampling	food sample		Batch	100g	113	0	0	0
Dairy products (excluding cheeses) - ice-cream - at retail	DIS859	Unspecified	Official sampling	food sample		Batch	150g	114	0	0	0
Dairy products (excluding cheeses) - milk powder and whey powder - at processing plant	TRA123	Unspecified	Official sampling	food sample		Batch	>500g	45	0	0	0
Dairy products (excluding cheeses) - yoghurt - at farm	DPA007	Unspecified	Official sampling	food sample		Batch	200g	41	0	0	0
Dairy products (excluding cheeses) - yoghurt - at processing plant	TRA142	Unspecified	Official sampling	food sample		Batch	>200g	40	0	0	0
Dairy products (excluding cheeses) - yoghurt - at retail	DIS858	Unspecified	Official sampling	food sample		Batch	100g	147	0	0	0
Milk, cows' - raw milk - intended for direct human consumption - at retail - Surveillance	DIS837	Unspecified	Official sampling	food sample > milk		Batch	150ml	10	0	0	0

Table Listeria monocytogenes in milk and dairy products

	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Milk, cows' - raw milk - intended for direct human consumption - at farm - Surveillance	39	1	0
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant - Surveillance	3	1	0
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail - Surveillance	47	7	0
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant - Surveillance	8	1	0
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail - Surveillance	75	3	0
Cheeses made from cows' milk - fresh - made from pasteurised milk - at processing plant - Surveillance	15	0	0
Cheeses made from cows' milk - fresh - made from pasteurised milk - at retail - Surveillance	37	0	0
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm - Surveillance	18	2	0
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail - Surveillance	50	3	0
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm - Surveillance	33	7	1

Table Listeria monocytogenes in milk and dairy products

	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at processing plant - Surveillance	41	0	0
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at retail - Surveillance	56	1	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	17	0	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	24	3	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	45	7	0
Cheeses made from sheep's milk - unspecified - made from pasteurised milk - at retail - Surveillance	113	3	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	17	2	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	0	0	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	84	5	0

Table Listeria monocytogenes in milk and dairy products

	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at farm - Surveillance	99	9	0
Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - at farm - Surveillance	35	8	0
Dairy products (excluding cheeses) - ice-cream - at farm	113	0	0
Dairy products (excluding cheeses) - ice-cream - at retail	114	3	0
Dairy products (excluding cheeses) - milk powder and whey powder - at processing plant	45	0	0
Dairy products (excluding cheeses) - yoghurt - at farm	41	0	0
Dairy products (excluding cheeses) - yoghurt - at processing plant	40	0	0
Dairy products (excluding cheeses) - yoghurt - at retail	147	0	0
Milk, cows' - raw milk - intended for direct human consumption - at retail - Surveillance	10	0	0

Table Listeria monocytogenes in other foods

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for L. monocytogenes	Units tested with detection method	Listeria monocytogenes presence in g
Infant formula - at retail - Surveillance	DIS803	Unspecified	Official sampling	food sample		Batch	400g	289	0	289	0
Foodstuffs intended for special nutritional uses - dietary foods for special medical purposes - at retail - Surveillance	DIS862	Unspecified	Official sampling	food sample		Batch		146	0	146	0
Ready-to-eat salads	DIS807	Unspecified	Official sampling	food sample		Batch	200g	223	0	0	0
Bakery products - pastry - at processing plant	TRA515	Unspecified	Official sampling	food sample		Batch	>200g	74	0	5	0
Bakery products - pastry - at retail	DIS805	Unspecified	Official sampling	food sample		Batch	>100g	149	0	0	0
Fish - raw - at retail	DIS873	Unspecified	Official sampling	food sample		Batch	100g	294	4	0	0
Fish - smoked - at retail	DIS847	Unspecified	Official sampling	food sample		Batch	>100g	203	1	0	0
Fishery products, unspecified - ready-to-eat - at processing plant	TRA402 TRA416	Unspecified	Official sampling	food sample		Batch	>200g	154	9	103	9
Fishery products, unspecified - ready-to-eat - at retail	DIS808	Unspecified	Official sampling	food sample		Batch	100g	179	0	0	0
Fruits and vegetables - pre-cut - at processing plant - Surveillance	TRA502	Unspecified	Official sampling	food sample		Batch	>200g	94	0	52	0
Fruits and vegetables - pre-cut - at retail - Surveillance	DIS813	Unspecified	Official sampling	food sample		Batch	200g	148	0	0	0
Meat from bovine animals - meat products - cooked, ready-to-eat - at processing plant - Surveillance	TRA302 TRA317	Unspecified	Official sampling	food sample		Batch	>200g	9	0	2	0
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample		Batch	200g	5	0	0	0

Table Listeria monocytogenes in other foods

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for L. monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail - Surveillance	DIS823	Unspecified	Official sampling	food sample		Batch	150g	72	0	0	0
Meat from other animal species or not specified - at retail - Surveillance	DIS883	Unspecified	Official sampling	food sample		Batch	200g	200	0	0	0
Meat from other animal species or not specified - meat preparation - intended to be eaten raw - at retail - Surveillance	DIS815	Unspecified	Official sampling	food sample		Batch	200g	590	2	1	0
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at processing plant - Surveillance	TRA300 TRA302 TRA317 TRA416	Unspecified	Official sampling	food sample		Batch	>200g	125	0	0	0
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample		Batch	200g	501	0	0	0
Meat from pig - meat products - cooked, ready-to-eat - at processing plant - Surveillance	TRA302 TRA317	Unspecified	Official sampling	food sample		Batch	>200g	109	4	51	4
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample		Batch	200g	93	0	0	0
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at processing plant - Surveillance	TRA416	Unspecified	Official sampling	food sample		Batch	>200g	160	5	91	5
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at retail - Surveillance	DIS801	Unspecified	Official sampling	food sample		Batch	200g	192	0	0	0

Table Listeria monocytogenes in other foods

	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Infant formula - at retail - Surveillance	0	0	0
Foodstuffs intended for special nutritional uses - dietary foods for special medical purposes - at retail - Surveillance	0	0	0
Ready-to-eat salads	223	15	0
Bakery products - pastry - at processing plant	69	2	0
Bakery products - pastry - at retail	149	4	0
Fish - raw - at retail	294	12	4
Fish - smoked - at retail	203	2	1
Fishery products, unspecified - ready-to-eat - at processing plant	51	0	0
Fishery products, unspecified - ready-to-eat - at retail	179	0	0
Fruits and vegetables - pre-cut - at processing plant - Surveillance	42	3	0
Fruits and vegetables - pre-cut - at retail - Surveillance	148	12	0
Meat from bovine animals - meat products - cooked, ready-to-eat - at processing plant - Surveillance	7	0	0
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail - Surveillance	5	0	0

Table Listeria monocytogenes in other foods

	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail - Surveillance	72	0	0
Meat from other animal species or not specified - at retail - Surveillance	200	6	0
Meat from other animal species or not specified - meat preparation - intended to be eaten raw - at retail - Surveillance	589	14	2
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at processing plant - Surveillance	125	2	0
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at retail - Surveillance	501	0	0
Meat from pig - meat products - cooked, ready-to-eat - at processing plant - Surveillance	58	3	0
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance	93	4	0
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at processing plant - Surveillance	69	1	0
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at retail - Surveillance	192	3	0

2.4 E. COLI INFECTIONS

2.4.1 General evaluation of the national situation

2.4.2 Escherichia coli, pathogenic in foodstuffs

A. Verotoxigenic E. coli (VTEC) in food

Monitoring system

Sampling strategy

A monitoring program was organized by the Federal Agency for the Safety of the Food Chain. More than 200 Belgian slaughterhouses, more than 100 meat cutting plants and more than 100 retail trades representative of the Belgian production, were selected for this study. The samples assayed were carcasses, cuts and minced meat from beef and other foodstuffs. Sampling was done by a specially trained staff of the Federal Agency for the Safety of the Food Chain.

Frequency of the sampling

Samples have been taken every week from the first to the 52nd week, except during the 30th week.

Type of specimen taken

Other: Meat, sprouted seeds, cheeses and other dairy products, pre-cut fruits and vegetables and vegetables.

Methods of sampling (description of sampling techniques)

Sampling of beef carcasses was done by means of swabs (4 areas from the same half carcass constituting 1600 cm² were putted in the same stomacher bag).

The samples were putted in a cool box and transported to a dispatching center of the Federal Agency for the Safety of the Food Chain and the laboratory take the samples at the dispatching center for analyses. The other samples were about 200g of meat. The detection of enterohemorrhagic E. coli has been assessed in 1600 cm² for beef carcasses and in 25g for beef minced meat and beef cuts.

No pooling has been done.

Definition of positive finding

A sample is considered positive after isolation and genetic confirmation of the pathogenicity of the O157 E. coli strain in the sample. In case of isolation and genetic confirmation of the top 5 VTEC in dairy products, the sample is considered positive. In sprouted seeds, pre-cut fruits and vegetables and (non-pre-cut) vegetables a samples is also considered positive after isolation and genetic confirmation of E. coli O104:H4.

Diagnostic/analytical methods used

For detection of Escherichia coli O157, the Belgian official SP-VG-M001 method, according to the ISO 16654 (2001) was used :

- pre-enrichment in m-TSB + novobiocin at 42°C for 7 hours,
- enrichment in CT-Mac Conkey at 37°C for 16-18 hours;
- immunoassay O157 (VIDAS ECO, bioMÃ©rieux),
- selective immunomagnetic enrichment (Dynabeads, Dynal or VIDAS ICE, bioMÃ©rieux),
- isolation on sorbitol-Mac Conkey and incubation at 42°C for 18 h,
- isolation and confirmation (agglutination of latex particles, Oxoid),

- search for genes encoding for virulence factors in national reference laboratory.

Preventive measures in place

Controls are in place by the Federal Agency in case of notification.

Control program/mechanisms

The control program/strategies in place

Notification is mandatory since 1/3/2004 (Ministerial Decree on mandatory notification in the food chain of 22/1/2004). For enterohemorrhagic E. coli, absence in 25g in ready-to-eat food putted on the market is mandatory. Laboratories have to inform the Federal Agency in case of positive sample.

Measures in case of the positive findings or single cases

Meat from positive carcasses is traced back, destroyed or transformed into cooked meat products.

Measures to be taken in the case of a non-compliant result:

- Notification of the producer or importer
- Possibility of a counter analysis
- Destruction of the non compliant batch or single sample
- Further investigation: additional sampling, possible recall, RASFF, ...

Table VT E. coli in food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Analytical Method	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O157
Meat from bovine animals - carcase - at slaughterhouse - Surveillance	PRI 001	Unspecified	Official sampling	food sample > carcass swabs		ISO 16654:2001	Batch	600cm2	427	18	3
Meat from bovine animals - fresh - at processing plant - Surveillance	TRA 305	Unspecified	Official sampling	food sample > meat		ISO 16654:2001	Batch	25g	294	1	1
Meat from bovine animals - minced meat - intended to be eaten raw - at processing plant - Surveillance	TRA 304	Unspecified	Official sampling	food sample > meat		ISO 16654:2001	Batch	25g	296	0	
Milk, cows' - raw milk - intended for direct human consumption - at farm - Surveillance	DPA013	Unspecified	Official sampling	food sample > milk		ISO 16654:2001	Batch	200ml	39	1	1
Seeds, sprouted - ready-to-eat - at retail - Surveillance	DIS841	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	150g	31	0	
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	26	0	
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	51	0	
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	48	0	
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	>200g	50	0	
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	51	0	

Table VT E. coli in food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Analytical Method	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC) - VTEC O157
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	25	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	>200g	44	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	45	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance	DPA008	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	19	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance	TRA133	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	>200g	4	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance	DIS818	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	86	0
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at farm - Surveillance	DPA009	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	116	0
Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - at farm - Surveillance	DPA025	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	45	0
Fruits and vegetables - pre-cut - at processing plant - Surveillance	TRA502	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	>200g	49	0
Fruits and vegetables - pre-cut - at retail - Surveillance	DIS813	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	200g	97	0

Table VT E. coli in food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Analytical Method	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC) - VTEC O157
Milk, cows' - raw milk - intended for direct human consumption - at retail - Surveillance	DIS837	Unspecified	Official sampling	food sample > milk		ISO 16654:2001	Batch	200ml	10	0
Vegetables - non-pre-cut - at processing plant - Surveillance	TRA508	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	>200g	6	0
Vegetables - non-pre-cut - at retail - Surveillance	DIS841	Unspecified	Official sampling	food sample		ISO 16654:2001	Batch	150g	815	0
									Verotoxigenic E. coli (VTEC) - VTEC non-O157	
Meat from bovine animals - carcase - at slaughterhouse - Surveillance	15									
Meat from bovine animals - fresh - at processing plant - Surveillance										
Meat from bovine animals - minced meat - intended to be eaten raw - at processing plant - Surveillance										
Milk, cows' - raw milk - intended for direct human consumption - at farm - Surveillance										
Seeds, sprouted - ready-to-eat - at retail - Surveillance										
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm - Surveillance										

Table VT *E. coli* in food

	Verotoxigenic <i>E. coli</i> (VTEC) - VTEC non- O157	Verotoxigenic <i>E. coli</i> (VTEC) - VTEC, unspecified
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail - Surveillance		
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm - Surveillance		
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant - Surveillance		
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail - Surveillance		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance		
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance		
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance		

Table VT *E. coli* in food

	Verotoxigenic <i>E. coli</i> (VTEC) - VTEC non- O157	Verotoxigenic <i>E. coli</i> (VTEC) - VTEC, unspecified
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance		
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at farm - Surveillance		
Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - at farm - Surveillance		
Fruits and vegetables - pre-cut - at processing plant - Surveillance		
Fruits and vegetables - pre-cut - at retail - Surveillance		
Milk, cows' - raw milk - intended for direct human consumption - at retail - Surveillance		
Vegetables - non-pre-cut - at processing plant - Surveillance		
Vegetables - non-pre-cut - at retail - Surveillance		

Footnote:

From the 15 non VTEC O157 strains, the serotypes of the isolates were O26 (4), O103 (3), O111 (5), O103 & O111 (1), O145 (2).

2.4.3 *Escherichia coli*, pathogenic in animals

A. Verotoxigenic *Escherichia coli* in cattle (bovine animals)

Monitoring system

Sampling strategy

There was no sampling strategy for VTEC in cattle in 2011. Diagnostic veterinary laboratories send *E. coli* strains to the NRL *E. coli*, AH for diagnostic reasons (antimicrobial susceptibility testing, pathotyping) and on a voluntary basis.

Results of the investigation

A total of 545 *E. coli* from cattle were sent to the NRL for analysis. Ten isolates were identified as VTEC: 4 VT1 / eae, 2 VT1, 1 VT1 / VT2 / eae, 2 VT2 and 1 VT2 / eae. One isolate was VT2 / STa. No serotype data are available.

Table VT *E. coli* in animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Analytical Method	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic <i>E. coli</i> (VTEC)	Verotoxigenic <i>E. coli</i> (VTEC) - VTEC O157			
Cattle (bovine animals) - at farm - Monitoring		Unspecified	Official sampling	animal sample		ISO 16654:2001	Animal		545	10				
										Verotoxigenic <i>E. coli</i> (VTEC) - VTEC non-O157	Verotoxigenic <i>E. coli</i> (VTEC) - VTEC, unspecified			
Cattle (bovine animals) - at farm - Monitoring				10										

Footnote:

Ten isolates of cattle were identified as VTEC:four VT1/Eae, two VT1, one VT1/VT2/Eae, two VT2 and one VT2/Eae. One strain was VT2/STa. No serotype data are available.

2.5 TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1 General evaluation of the national situation

A. Tuberculosis general evaluation

History of the disease and/or infection in the country

Zoonotic tuberculosis (*Mycobacterium bovis*).

Tuberculosis in humans caused by *M. bovis* is clinically indistinguishable from tuberculosis caused by *M. tuberculosis*.

In the past, the most important way of transmission of *M. bovis* for humans was the consumption of raw milk or raw milk products from infected cattle. Industrial heat treated production methods or pasteurization of raw milk did stop this way of transmission to humans.

Nowadays tuberculosis in humans caused by *M. bovis* is rare. In regions where *M. bovis* infections in cattle are largely eliminated, only few residual cases occur among elderly persons as a result of the reactivation of dormant *M. bovis* within old lesions. Also among migrants from high-prevalence countries, infections with *M. bovis* are diagnosed.

Agricultural workers may acquire infection by *M. bovis* by inhaling cough aerosols from infected cattle and may subsequently develop typical pulmonary or genito-urinary tuberculosis. Cervical lymphadenopathy, intestinal lesions, chronic skin tuberculosis (*lupus vulgaris*) and other non-pulmonary forms are also particularly common as clinical symptoms.

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

Recent actions taken to control the zoonoses

The surveillance program of tuberculosis is based on Directive 64/432/EEC, which is implemented and adapted in National legislation since 1963 and last modified by Royal Decree of 17 October 2002.

The control implies skin testing of animals at the occasion of trade and intensive testing of infected and contact farms in consequence of a confirmation of a bovine TB suspicious case (tracing-on and tracing-back of all contact animals).

Systematic post mortem examinations at the slaughterhouse are performed with special attention.

The Federal Agency for the Safety of the Food chain is informed about any doubtful or positive result of the skin test of bovines and may decide to re-examine (additional tests e.g. comparative tuberculin test, interferon-gamma test) the animals or to kill them for additional analysis (test slaughter). In case a "TB suspicious" lesion is detected, a tissue sample is sent to the National Reference Laboratory for analysis. Consequently, if *Mycobacterium bovis* suspicion is confirmed by analysis, all animals in the herd of origin are skin tested and a complete epidemiological investigation is made. The total herd is considered as the 'epidemiological unit'.

Isolation of *M. bovis* and biochemical testing is exclusively performed in the National Reference Laboratory where also IFN-gamma, PCR and molecular typing by means of RFLP, spoligotyping or more recently MIRU-VNTR are done to support the epidemiological investigations and to eventually prove the link between different cases.

Suggestions to the Community for the actions to be taken

In case a holding is infected and if by epidemiological investigation and tracing-back, animals were found to be exported to another country, the Chief Veterinary Officer of the country of destination has to be

informed about the outbreak in the country of origin. This alert can help to rapidly detect an infection in the concerned holding of destination.

Monitoring of the type of strains circulating in each country could have a valuable contribution to the understanding of the spread of specific strains among the community and could probably bear evidence of epidemiological links between outbreaks.

2.5.2 Tuberculosis, mycobacterial diseases in humans

A. Tuberculosis due to *Mycobacterium bovis* in humans

Results of the investigation

2.5.3 *Mycobacterium* in animals

A. *Mycobacterium bovis* in bovine animals

Status as officially free of bovine tuberculosis during the reporting year

The entire country free

Belgium is officially free of bovine tuberculosis since the 25th of June 2003 (Commission Decision 2003/467/EC)

Free regions

All regions are officially free of bovine tuberculosis for the reporting year.

Monitoring system

Sampling strategy

Surveillance system.

The control of tuberculosis is based on Council Directive 64/432/EEC, which is implemented and adapted in National legislation since 1963 and last modified by Royal Decree of 17 October 2002.

The surveillance program implies:

- skin testing of animals at purchase by the veterinarian responsible for the epidemiological surveillance of the holding (contract between farmer and veterinarian);
- skin testing in case of a suspected/infected bovine of all animals of the holding
- skin testing of all 'contact' animals and herds (tracing-on and tracing-back);
- systematic post-mortem examinations at the slaughterhouse, transmission to the National Reference Laboratory of all "TB suspicious" lesions for further analysis.

Isolation of *M. bovis* and biochemical testing is exclusively performed at the National Reference Laboratory where also IFN-gamma, PCR and molecular typing by means of RFLP, spoligotyping and more recently MIRU-VNTR are done.

Frequency of the sampling

Frequency of testing depends on:

- the introduction of new animals into a herd (mandatory examination at purchase)
- the results of tuberculin testing
- the detection of suspected bovines
- the detection of infected bovines
- the epidemiological investigation related to suspected or infected animals or herds (tracing-on and tracing-back)
- the follow-up testing of infected and/or eradicated herds during 5 years.

Type of specimen taken

Organs/tissues: lesions, lymph nodes, lungs

Blood

Methods of sampling (description of sampling techniques)

Tuberculin skin testing: single (bovine tuberculin) or comparative (bovine/avian tuberculin) testing.

Blood sampling: interferon-gamma tests

Laboratory examination of all suspicious lesions

Organs: lymph nodes, lungs, ...

Case definition

- A 'bovine' is defined as infected with bovine tuberculosis if the animal is positive by skin testing or if *Mycobacterium bovis* is isolated by culture or confirmed by laboratory analysis (PCR).
- A 'holding' is defined as infected if *Mycobacterium bovis* was isolated from an animal of the holding.

Diagnostic/analytical methods used

- Simple skin test with bovine tuberculin
- Comparative skin test with bovine and avian tuberculin
- Ziehl-Neelsen coloration
- Culture for isolation
- Interferon-gamma
- PCR on lesions / organs
- PCR on culture
- RFLP typing
- Spoligotyping
- MIRU-VNTR

Vaccination policy

Vaccination is prohibited by Royal Decree of 17 October 2002.

Control program/mechanisms

The control program/strategies in place

National surveillance program by the Competent Authority (FASFC) on mandatory legal base.

Recent actions taken to control the zoonoses

In case of suspicion by tuberculin testing of live animals, complementary blood sampling is performed to improve the detection or to earlier confirm infection by gamma-Interferon test;

Draw special attention and focus on the post-mortem examination of slaughtered animals;

Transmission for further analysis of any lesion that could be 'suspected' of tuberculosis to the National Reference Laboratory;

Culture of *M. bovis*, biochemical testing, PCR are performed on these 'suspicious' lesions;

Molecular typing by means of RFLP, Spoligotyping and more recently MIRU-VNTR are done systematically on all isolates to support the epidemiological investigations and to eventually prove the link between different cases or outbreaks.

Suggestions to the Community for the actions to be taken

In case of export of bovines, inform the Chief Veterinary Officer of the Member state of destination if tuberculosis has been detected in a holding of the Member State of origin after the date of export. This information can result in an early detection or can avoid a possible further contamination in the Member State of destination.

Measures in case of the positive findings or single cases

If *M. bovis* is suspected, all animals in the herd of origin are skin tested, the herd is considered as the epidemiological unit. A complete epidemiological investigation is performed. By tracing-back and tracing-on all animals of 'contact' holdings are examined by skin testing. If any doubtful or positive result of the skin test is detected, the FASFC may decide to re-examine the animals (additional tests e.g. comparative skin testing with avian and bovine tuberculin and/or Interferon-gamma testing) or to kill the reactors (test

slaughter) for additional analysis. In case a suspicious lesion is detected at post-mortem examination, a sample is sent to the National reference laboratory for analysis. Consequently, if *Mycobacterium bovis* is isolated, all skin test positive animals during successive testing are mandatory slaughtered. If many bovines are reacting positive to skin testing, the FASFC can decide that all animals of the holding must be slaughtered compulsory. After stamping-out, new restocked animals are tested during 5 years by annually skin testing to prove the TB free status of the holding.

Notification system in place

Animal Health Law of 24 March 1987 Chapter III and Royal Decree of 25 April 1988 (list of all notifiable animal diseases).

Results of the investigation

In 2001, a total of 23 infected holdings were notified. In total 792 animals reacted after tuberculinisation.

In 2002, a total of 13 infected holdings were notified. A total of 799 animals reacted after tuberculinisation. Stamping-out was performed in 6 herds.

In 2003, a total of 7 infected holdings were notified. Stamping out was done in 5 herds. A total of 409 animals reacted after tuberculinisation. This number corresponds to the intensive testing of infected and contact farms. In total 3.799 herds and 337.260 animals were included in epidemiological investigations. The Federal Agency for the Safety of the Food Chain, the Competent Authority, instructed the slaughter of 1014 animals.

In 2004, a total of 8 infected holdings were detected. In total 229 bovines were slaughtered in consequence of the stamping-out of 3 infected herds.

In 2005, a total of 5 infected holdings were detected. All these herds were eradicated by stamping-out in execution of a TB sanitation plan. In total 752 animals were slaughtered. The carcasses of only 2 animals did have to be destroyed due to general dispersed TB lesions.

In 2006, a total of 8 infected holdings were detected. Seven of these were eradicated by stamping out. In total 1102 animals were slaughtered. A follow-up of the other infected holding is performed after test-slaughter of a few positive reactors, since then all results of tuberculin tests on all the animals of the herd at regular intervals are negative.

In 2007, a total of 5 infected holdings were detected. Three of these were eradicated by stamping-out. In total 487 animals were slaughtered. In the other two infected holdings, partial slaughter and intense follow-up by tuberculin testing was performed.

In 2008, a total of 12 infected holdings were detected. In total 812 animals were slaughtered. Finally 66 animals were detected positive in bacteriological examination.

In 2009, 2 infected holdings were detected. One holding was eradicated by stamping-out. On the other holding, partial slaughter and intense follow-up by tuberculin testing was performed.

In 2010 no infected holding was detected.

In 2011, 1 infected holding was discovered. All animals were slaughtered.

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

Number of infected herds since 2000

2000 : 24

2001 : 23

2002 : 13

2003 : 7

2004 : 8

2005 : 5

2006 : 8

2007 : 5

2008 : 12

2009 : 2

2010 : 0

Additional information

B. Mycobacterium bovis in farmed deer

Monitoring system

Sampling strategy

Sampling in case of suspicious TB lesions during post-mortem examinations of "wild" and "farmed" deer at slaughterhouse/ at game handling establishment.

Frequency of the sampling

Depends on the number of hunted/slaughtered animals and the detection of suspicious lesions at post-mortem examination.

Type of specimen taken

Suspicious lesions of lungs, lymph nodes, ...

Methods of sampling (description of sampling techniques)

TB suspicious tissues: lymph nodes, lungs, ...

Case definition

An animal is positive if *Mycobacterium bovis* is isolated by culture or confirmed by laboratory analysis.

Diagnostic/analytical methods used

- Ziehl-Neelsen coloration
- Culture for isolation
- Interferon-gamma
- PCR on lesions / organs
- PCR on culture

Control program/mechanisms

The control program/strategies in place

Monitoring is done by:

- systematic post-mortem examination at the slaughterhouses/game handling establishment
- post-mortem examination at autopsy of hunted or killed "wild" deer by accident in the University Center of Liège, Veterinary Medicine Faculty.

In case of suspected TB lesions, tissue samples are sent to the National Reference Laboratory for additional analysis to confirm the suspicion.

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

No *Mycobacterium bovis* was detected in "hunted" or "farmed" deer.

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

If present, the row "Total -1" refers to analogous data of the previous year.

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/432/EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests	Number of animals tested			
Belgique-België	34540	2682370	34539	100	1	0	others, please specify Official	234996	395000	225	19
¹⁾ Total :	34540	2682370	34539	100	1	0	N.A.	234996	395000	225	19

Comments:

¹⁾ N.A.

Footnote:

All bacteriological positive animals (19) belonged to the tuberculosis breakdown herd.

2.6 BRUCELLOSIS

2.6.1 General evaluation of the national situation

2.6.2 Brucella in foodstuffs

Table Brucella in food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Units tested	Total units positive for Brucella	B. abortus	B. melitensis	B. suis
Milk, cows' - raw milk for manufacture - intended for manufacture of raw or low heat-treated products - at processing plant - Surveillance		Census	Industry sampling	animal sample > milk		Batch	9460	0	0		
Brucella spp., unspecified											
Milk, cows' - raw milk for manufacture - intended for manufacture of raw or low heat-treated products - at processing plant - Surveillance											

Footnote:

In consequence of a brucellosis breakdown by the end of 2010, all dairy herds were tested by an ELISA of tankmilk in the beginning of 2011. All results were finally negative.

2.6.3 Brucella in animals

A. Brucella abortus in bovine animals

Status as officially free of bovine brucellosis during the reporting year

The entire country free

Belgium is officially free from bovine brucellosis since the 25th of June 2003 (Commission Decision 2003/467/EC)

Free regions

Belgium remained officially free of bovine brucellosis during this reporting year.

Additional information

End 2010 a brucellosis breakdown herd was detected by analyzing an abortion. The infected herd was totally depopulated. Extensive epidemiological investigations and important serological follow-up of contact herds in 2010 and 2011 could not give any indication on the origin of the infection neither could detect any additional other infected herd.

Monitoring system

Sampling strategy

Since Belgium is officially free from bovine brucellosis, the eradication program has been changed in a surveillance program. Beef cattle older than 2 years were monitored once every three years by means of serological tests. The herds for serological sampling and examination were selected by their geographical localization. Dairy cattle were checked at least 4 times a year via tank milk (milk ring test).

Furthermore, all animals were tested at trade (purchase) on the herd of arrival.

Each abortion or premature birth in animals at risk must be subject to compulsory notification to the Federal Agency for the Safety of the Food Chain, and testing for brucellosis is obligatory. Aborting females should be kept in isolation until the results of the analysis and the investigation exclude a Brucella infection.

Pooled tank milk was examined by means of the milk ring test.

For animals older than 2 years, serology (i.e. micro-agglutination as screening test; in case of a positive result, an indirect ELISA test is performed) is used if no sufficient milk ring tests were performed (at least 4 ring tests a year).

Bacteriological examination is done when serological and/or epidemiological suspicion is present.

An animal is legally suspected of brucellosis in case of a positive ELISA. If, according to the epidemiology and the results of the blood test, an animal or herd is found to be at risk, a bacteriological investigation always takes place. Hence, a brucellosis animal is defined as an animal in which *Brucella abortus* has been isolated, and a cattle holding is considered as an outbreak herd if one of the animals is positive for brucellosis by bacteriological examination.

In 2009, a study was realized to evaluate the current national surveillance program of bovine brucellosis. If a Member State has maintained the officially free status of brucellosis for at least 5 consecutive years, the existing surveillance program can be re-evaluated and some modifications on the sampling design are allowed on condition of further proof of freedom of disease (Council Directive 64/432/EEC). The scientific veterinary experts used risk-based models to evaluate different scenarios within the current surveillance program and the study was also based on a statistical confidence level approach. This methodology has underlined a few important features of the current brucellosis surveillance program. The study showed that in order to obtain a 99% confidence level to prove freedom of disease consistently an important

decrease in total number of tested animals can be proposed (500.000 to 30.000 tests a year). The study also clearly indicated that the best approach is to test bovines imported from officially free or non-officially free Member States of *Brucella* spp., to test animals at purchase in consequence of national trade as well as to analyze aborting animals in order to early detect infection. Regarding the passive surveillance (abortions), the study indicated there is a need to increase the number of analyzed abortions. A new surveillance program will be applied for the winterscreening at the end of 2009.

In 2011 surveillance was focused on following risk categories:

- import of non officially free MSs or Third Countries at the moment of trade and follow-up testing during winterscreening
- at random selection of 1100 bovine herds for serological investigation
- number of analysis of bovines of national trade at purchase
- abortions

Frequency of the sampling

- import of non officially free MSs or Third Countries at the moment of trade: all imported animals over 12 months of age
- import of non officially free MSs or Third Countries follow-up testing during winterscreening for 3 consecutive years of all imported animals over 24 months of age
- at random selection of 1100 bovine herds: at random selection of female animals over 24 months of age
- bovines of national trade at purchase: at random selection, limited number of analysis
- abortions

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Blood sampling

Case definition

An animal is defined as infected if *Brucella abortus* has been isolated and identified by culture.

A herd is defined as infected if one of its animals is positive by bacteriological examination for brucellosis.

Diagnostic/analytical methods used

- Micro agglutination test
- ELISA
- Culture for isolation

Vaccination policy

Vaccination is prohibited in Belgium since 1992.

Control program/mechanisms

The control program/strategies in place

National mandatory surveillance program organized by the Competent Authority.

Measures in case of the positive findings or single cases

In case of a positive result in the micro-agglutination test the same blood sample is tested with an ELISA. If this indirect ELISA is positive, this result has to be confirmed by a blocking ELISA at the NRL. If this confirmatory test is positive, the animal is considered as infected and is compulsory slaughtered (test

slaughter) for additional analysis to detect a possible Brucella infection.

Notification system in place

Animal Health Law of 24 March 1987 Chapter III, Royal Decree of 25 April 1988 (list of all notifiable diseases)

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

An intensified bovine brucellosis control program started in Belgium in 1988. In case of active brucellosis, i.e. excretion of Brucella, the plan consisted in the culling of all animals of the infected herd (total depopulation). Culled bovines were compensated for based on the replacement value of the animals.

In March 2000, the last case of bovine brucellosis was identified before obtaining the officially brucellosis free status in 2003.

In case of positive serological reactors the Federal Agency for the Safety of the Food Chain instruct follow-up testing or 'test slaughter' for additional analyses. These analyses could not confirm brucellosis. To reduce the number of FPSR (False positive serological reactors) to be slaughtered, the micro-agglutination test has been used as for routine testing whereas the indirect Elisa is accepted as a confirmatory test. This approach avoids the undeserved test slaughter of false positive reacting animals. End November 2010 a breakdown of bovine brucellosis was detected at a herd in the province of Liège. Bovine brucellosis was detected by analysis of an abortion and serology. On 17 November 2010 a cow had aborted. Serological examination of the cow and bacteriological examination of the fetus indicated a Brucella infection that was confirmed and typed as Brucella abortus biovar 3 at the NRL on 30 November. Serological screening indicated 9 positive results on 68 sampled bovines. All 104 bovines were mandatory slaughtered. Culture of slaughtered animals was positive for 22 bovines.

Extensive epidemiological investigation designated 146 contact herds for follow-up by serology. Analyze of 12.917 samples by Agglutination and 9.285 samples by ELISA finally resulted in 13 suspected bovines of 12 different herds. All animals were mandatory slaughtered for supplementary bacteriological examination. None of the animals was positive by culture. Serological analyzes were realized partly in 2010 but mostly in 2011.

In addition to the follow-up of the contact herds, all Belgian dairy herds were tested by an ELISA of tank milk in 2011. Of 9.460 dairy herds, 13 were positive by this ELISA. These dairy herds were followed up by serological examination. In consequence of this surveillance, one bovine was mandatory slaughtered for examination by culture. Finally no positive case could be detected in the Belgian dairy herds. Despite all investigations and extensive follow-up by serology and culture, the origin of the infection could not be detected neither could be detected another brucellosis infected bovine or breakdown herd.

Additional information

B. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

The entire country free

Belgium is officially free of *B. melitensis* since 29 March 2001 (Commission Decision 2001/292/EC).

Free regions

Belgium is officially free of caprine brucellosis during the reporting year.

Monitoring system

Sampling strategy

Serum samples taken in the framework of a national monitoring program for Visna-Maedi/CAE and at export were examined for *Brucella melitensis* specific antibodies by means of an ELISA.

Sheep and goats were tested for brucellosis by indirect ELISA(iELISA) at the NRL (Veterinary and Agrochemical Research Center). All positive samples in the ELISA were supplementary tested by the Rose Bengal Test (RBT) and Complement Fixation Test (CFT) as confirmatory tests. Animals that were positive in the two confirmatory tests or that could not be analyzed and/or interpreted in RBT and/or CFT were sampled a second time.

All brucellosis tests performed at VAR are officially accredited (ISO 17025).

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Blood samples

Case definition

A goat is defined as infected with brucellosis if positive in all three tests: iElisa, Rose Bengal test and Complement Fixation test and isolation of *Brucella melitensis* by culture after test slaughter.

Diagnostic/analytical methods used

Complement Fixation Test CFT

Rose Bengal Test RBT

Indirect ELISA

Culture for isolation

Notification system in place

Animal Health Law of 24 March 1987 Chapter III and Royal Decree of 25 April 1988 (list of notifiable animal diseases)

Results of the investigation

At the National Reference Laboratory, 5.028 caprine/ovine serum samples were tested. The results confirmed those of previous years, i.e. the absence of any epidemiological or bacteriological evidence of caprine/ovine brucellosis in Belgium.

C. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

The entire country free

Belgium is officially free from *B. melitensis* since 29 March 2001 (Commission Decision 2001/292/EC).

Free regions

Belgium is officially free of ovine brucellosis during the reporting year.

Monitoring system

Sampling strategy

Serum samples taken in the framework of a national monitoring program for Visna-Maedi/CAE and at export were examined for *Brucella melitensis* specific antibodies by means of an iELISA. Positive samples were subsequently tested in Rose Bengal and in complement fixation test.

Sheep and goats sera were tested for brucellosis by indirect ELISA (iELISA) at the National Reference Laboratory (Veterinary and Agrochemical Research Center). All positive samples in the ELISA were then tested by the Rose Bengal Test (RBT) and Complement Fixation Test (CFT) as confirmatory tests.

Animals that were positive in the two confirmatory tests or that could not be analyzed and/or interpreted in RBT and/or CFT were sampled a second time.

All brucellosis tests performed at VAR are officially accredited (ISO 17025).

Type of specimen taken

Blood

Case definition

A sheep is defined as infected with brucellosis if positive in all three tests: the Elisa, the Rose Bengal test and the Complement Fixation test and isolation of *Brucella melitensis* by culture.

Diagnostic/analytical methods used

- Indirect ELISA
- Rose Bengal Test RBT
- Complement Fixation Test CFT
- Culture for isolation
- Brucellin skin test (BST)

Notification system in place

Animal Health Law of 24 March 1987 Chapter III and Royal Decree of 25 April 1988 (list of notifiable animal diseases).

Results of the investigation

At the National Reference Laboratory, 5.028 caprine/ovine serum samples were tested. The results confirmed those of previous years, i.e. the absence of any epidemiological or bacteriological evidence of caprine/ovine brucellosis in Belgium.

D. B. suis in animal

Monitoring system

Sampling strategy

Serological screening for *Brucella* is done for breeding pigs that are gathered (at a fair for example), at artificial insemination centers and in animals intended for trade. The methods used are Rose Bengal test (RBT), Slow Agglutination test (SAT) according to Wright, Complement Fixation test (CFT) and ELISA. Bacteriological examination for *Brucella* and *Yersinia* is done in case of positive serology.

Regularly, false positive serological reactions are reported. These are due to a *Yersinia enterocolitica* O9 infection and are confirmed by *Yersinia enterocolitica* O9 isolation in the absence of *Brucella* spp. isolation. *B. suis* biovar 2 may be isolated from wild boars (*Sus scrofa*). The infection seems to be enzootic in wild boar in Europe. *B. suis* biovar 2, circulating among wild boars, shows only limited pathogenicity for humans, if pathogenic at all.

The domestic pig population is free of brucellosis (last *Brucella* isolation in pigs in Belgium was in 1969).

Methods of sampling (description of sampling techniques)

Blood sampling

Tonsils

Spleen

Case definition

An animal is positive if *Brucella suis* is isolated by culture or typed by additional laboratory analysis.

Diagnostic/analytical methods used

Rose Bengal test RBT

Complement fixation test CFT

Indirect ELISA

Bacteriological examination

Control program/mechanisms

The control program/strategies in place

Regional monitoring program.

Since 2002, an annual surveillance program is organized by the veterinary faculty of the University of Liège (Walloon Region funds) in collaboration with the National Reference Laboratory (Veterinary and Agrochemical Research Center) with the aim to analyze brucellosis in wild boars (*Sus scrofa*) and lagomorphs in the south of Belgium. Blood samples and organs of hunted and/or dead animals were analysed in order to follow the seroprevalence and to identify bacteriological isolates of *Brucella* in these species.

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

If present, the row "Total -1" refers to analogous data of the previous year.

	Total number of existing		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases				
	Herds	Animals	Number of herds	%	Number of herds	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbiologically	Number of animals positive microbiologically	Number of suspended herds
Region														
Belgique-België	40860	253117	40860	100	0	0		7903	0	0	0	0	0	0
Total :	¹⁾ 40860	253117	40860	100	0	0	0	7903	0	0	0	0	0	0

Comments:

1) N.A.

Footnote:

Official Brucella melitensis free status by Decision 2001/292/EC

The number of herds tested is not available by the Information and Management System database of the NRL.

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

If present, the row "Total -1" refers to analogous data of the previous year.

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance					Investigations of suspect cases									
							Serological tests			Examination of bulk milk		Information about			Epidemiological investigation						
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Number of positive animals	Sero logically	BST	Number of animals examined microbiologically
Belgique-België	34540	2682370	34540	100	0	0	9838	47647	0	9460	9460	0	8164	0	0	12917	13	14	0	14	0
Total :	¹⁾ 34540	2682370	34540	100	0	0	9838	47647	0	9460	9460	0	8164	0	0	12917	13	14	0	14	0

Comments:

¹⁾ N.A.

Footnote:

In consequence of one brucellosis breakdown herd by the end of 2010, all dairy herds were tested by an ELISA of tankmilk in the beginning of 2011. All results were finally negative.

2.7 YERSINIOSIS

2.7.1 General evaluation of the national situation

A. *Yersinia enterocolitica* general evaluation

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

Only a few strains of *Y. enterocolitica* cause illness in humans. The major animal reservoir for *Y. enterocolitica* strains that cause human illness are pigs but other strains are also found in many other animals including rodents, rabbits, sheep, cattle, horses, dogs, and cats. In pigs, the bacteria are most likely to be found on the tonsils. Infection is most often acquired by eating contaminated food, especially raw or undercooked pork products. Drinking contaminated unpasteurized milk or untreated water can also transmit the infection.

2.7.2 Yersiniosis in humans

A. Yersiniosis in humans

Relevance as zoonotic disease

Y. enterocolitica is a relatively infrequent cause of diarrhea and abdominal pain. Infection with *Y. enterocolitica* occurs most often in young children. Common symptoms in children are fever, abdominal pain, and diarrhea, which is often bloody. Symptoms typically develop 4 to 7 days after exposure and may last 1 to 3 weeks or longer. In older children and adults, right-sided abdominal pain and fever may be the predominant symptoms, and may be confused with appendicitis. In a small proportion of cases, complications such as skin rash, joint pains or spread of bacteria to the bloodstream can occur.

Only a few strains of *Y. enterocolitica* cause illness in humans. The major animal reservoir for *Y. enterocolitica* strains that cause human illness are pigs but other strains are also found in many other animals including rodents, rabbits, sheep, cattle, horses, dogs, and cats. In pigs, the bacteria are most likely to be found on the tonsils. Infection is most often acquired by eating contaminated food, especially raw or undercooked pork products. Drinking contaminated unpasteurized milk or untreated water can also transmit the infection.

2.7.3 Yersinia in foodstuffs

Table Yersinia in food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Yersinia	Y. enterocolitica	Y. pseudotuberculosis
Meat from pig - carcase - at slaughterhouse	PRI 002	Unspecified	Official sampling	food sample > carcass swabs		Batch	600cm2	384	9	9	
Meat from pig - minced meat - intended to be eaten cooked - at retail	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	16	0		
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	19	0		
Meat from bovine animals - minced meat - intended to be eaten raw - at retail	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	31	0		
Meat from bovine animals and pig - minced meat - intended to be eaten cooked - at retail	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	8	0		
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	4	0		
Meat from pig - minced meat - intended to be eaten raw - at retail	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	9	0		
Meat from pig - minced meat - intended to be eaten cooked - at processing plant	TRA 303	Unspecified	Official sampling	food sample > meat		Batch	1g	81	2		

Yersinia spp., unspecified	Y. enterocolitica - O:3	Y. enterocolitica - O:9	Y. enterocolitica - unspecified
Meat from pig - carcase - at slaughterhouse			9

Table Yersinia in food

	Yersinia spp., unspecified	Y. enterocolitica - O:3	Y. enterocolitica - O:9	Y. enterocolitica - unspecified
Meat from pig - minced meat - intended to be eaten cooked - at retail				
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail				
Meat from bovine animals - minced meat - intended to be eaten raw - at retail				
Meat from bovine animals and pig - minced meat - intended to be eaten cooked - at retail				
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail				
Meat from pig - minced meat - intended to be eaten raw - at retail				
Meat from pig - minced meat - intended to be eaten cooked - at processing plant	2			

2.7.4 Yersinia in animals

A. Yersinia enterocolitica in pigs

Monitoring system

Frequency of the sampling

Animals at slaughter (herd based approach)

Sampling distributed evenly throughout the year

Type of specimen taken

Animals at slaughter (herd based approach)

Surface of carcasses

2.8 TRICHINELLOSIS

2.8.1 General evaluation of the national situation

A. Trichinellosis general evaluation

History of the disease and/or infection in the country

Since 1940, the Competent Authority did organize analysis for *Trichinella* in pigs at the slaughterhouses. The analysis is generalized since 1991. *Trichinella* has not been detected in carcasses of pigs and horses produced for human consumption in Belgium. One autochthonous human case, probably caused by a home raised wild boar occurred in 1979.

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

Trichinellosis is virtually absent in Belgian domestic livestock. Since systematic controls of pigs and horses are done at slaughter (EU Directive 92/45/EEC) no positive case was found. The last outbreak in humans in Belgium occurred in 1979 following the consumption of meat from wild boar.

Increased monitoring in the last decade has shown that *Trichinella* spp. still circulate amongst wildlife, although both the prevalence and the intensities of infection are low.

EU Directive requires that also wild boars hunted in the EU for commercial purpose are examined for *Trichinella*. In Belgium each year about 10000 sport-hunted wild boars were tested, and recently those numbers are rising. Until now, one animal, in 2004, originating from Mettet (province of Namur), was found to harbour a light infection. The larvae, isolated by artificial digestion were identified by PCR to be *Trichinella britovi*, a species previously not demonstrated in Belgium. *T. britovi* has sylvatic carnivores as main hosts. Even if wild boars are not the preferred host they can acquire the infection and consequently pass it to humans. Both *T. spiralis* and *T. britovi* have been associated with human infection. One larva was recovered from a pooled sample (originating from three wild boars from a hunting party from Alle-sur-Semois) in 2007. Consecutive digestions could not reveal the causative animal, and unfortunately PCR failed to identify the *Trichinella* species.

The routine examination of wild boars devoted to the market has proved to be a good measure to protect the consumer against sylvatic trichinellosis. In addition, monitoring of infection through examining sentinel animals, such as the fox, is recommended to access the prevalence of trichinellosis and to follow trends in time. In December 2010, 318 foxes were examined by pooled digestion, they were all negative for *Trichinella* spp. Winter 2011-2012 524 wild animals were examined (507 foxes, 11 badgers, 2 cats, 1 raccoon and 3 marten) were examined. One larva was recovered from a pool of 20 animals (18 foxes and 2 badgers). Unfortunately the larva could not be identified to the *Trichinella* species level by PCR. Serological examination might be an alternative for muscle digestion but needs further evaluation. An extra measure to protect the consumer is to eat meat of wild boar "well done", or to freeze the meat at -20°C for 4 weeks. An important measure to avoid spreading of the infection among wildlife is not to leave offal of animal carcasses in the field after skinning.

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

The last outbreak in humans in Belgium occurred in 1979 following the consumption of meat from wild boar.

Recent actions taken to control the zoonoses

Monitoring of wildlife.

Routine examination of wild boars destined for human consumption

Monitoring of infection through examining sentinel animals such as the fox.

Recommendation to consume wild boar meat after freezing at -20°C for 4 weeks.

Recommendation to travellers not to import raw meats of unknown origin and of susceptible animals, e.g. home made sausages, and not to consume meats of unknown quality abroad.

Additional information

The status "negligible risk for *Trichinella* in slaughterpigs kept under industrial housing conditions" was granted by the EC to Belgium end December 2010.

2.8.2 Trichinellosis in humans

A. Trichinellosis in humans

Reporting system in place for the human cases

Trichinellosis is a notifiable disease in humans in Belgium

History of the disease and/or infection in the country

The only human case of *Trichinella* infection was in 1978. A person who had fattened two wild boars for his own consumption got infected by *Trichinella*. The two boars captured as wild piglets were enclosed for fattening. This person most probably was infected after consumption of the meat of his wild boars.

Epidemiological investigations in this case did not reveal the source of infection. All possible infectious 'sources' were taken into account (e.g. rodents etc.).

Description of the positive cases detected during the reporting year

No positive human case was detected during the reporting year.

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

There are no reports of autochtonously acquired *Trichinella* infections in Belgium

2.8.3 Trichinella in animals

A. Trichinella in horses

Monitoring system

Sampling strategy

Permanent surveillance at the slaughterhouses.

Frequency of the sampling

Every slaughtered animal is sampled.

Type of specimen taken

Diaphragm, tongue or masseter muscle.

Methods of sampling (description of sampling techniques)

Horse: 5 gram of diaphragm (or tongue, or masseter) for routine diagnosis, analyses on pooled samples, 10 to 25 gram for examination of individual samples.

Case definition

An animal is considered positive in case of detection and identification of *Trichinella* larvae in the muscle sample.

Diagnostic/analytical methods used

Artificial digestion method of collective or individual samples. The magnetic stirrer method for digestion of pooled samples as described in Commission Regulation (EC) No 2075/2005 was used on samples of 5 gram of muscles from horses.

Results of the investigation including the origin of the positive animals

No positive animals were detected this year.

Control program/mechanisms

The control program/strategies in place

Commission Regulation (EC) No 2075/2005 imposes systematic *Trichinella* examination of all slaughtered pigs, horses and wild boar and other wildlife animals by artificial digestion method of muscle before marketing.

Notification system in place

Notification to the Federal Agency for the Safety of the Food Chain is compulsory for any positive test result.

B. Trichinella in pigs

Officially recognised regions with negligible Trichinella risk

Belgium was granted the status of negligible Trichinella risk at the end of 2010

Monitoring system

Sampling strategy

General

Permanent surveillance of all slaughtered pigs at the slaughterhouses in implementation of Commission Regulation (EC) No 2075/2005. Derogation for fattening pigs who do apply for the criteria set in the definition 'Region with negligible risk'

For regions with negligible Trichinella risk

Testing of wildlife (mainly foxes)

Frequency of the sampling

General

Systematic Trichinella examinations of all slaughtered pigs, with the exception of some fattening pigs who do apply for the criteria set in the definition 'Region with negligible risk'.

For regions with negligible Trichinella risk

Systematic Trichinella examinations of all slaughtered pigs, with the exception of some fattening pigs who do apply for the criteria set in the definition 'Region with negligible risk'.

Type of specimen taken

General

Diaphragm muscle, 1 gram for fattening pigs, 2 grams for sows and boars.

For regions with negligible Trichinella risk

Diaphragm muscle, 1 gram for fattening pigs, 2 grams for sows and boars. No samples are examined from some fattening pigs who do apply to the criteria set in the definition of Region with negligible risk'.

Methods of sampling (description of sampling techniques)

General

Fattening pigs: 1 gram of diaphragm muscle to be pooled (up to 100 animals in 1 pool)

Sows and boars: 2 grams of diaphragm muscle to be pooled (up to 50 animals in 1 pool)

For regions with negligible Trichinella risk

Still almost all pigs are sampled and tested

Case definition

General

An animal is considered positive in case of detection and identification of Trichinella larvae in the muscle sample.

For regions with negligible Trichinella risk

Same as general

Diagnostic/analytical methods used

General

Artificial digestion method of collected samples.(Reference method, annex I, chapter I) and Magnetic stirrer method for pooled sample digestion/'on filter isolation' and larva detection by a latex agglutination

test (equivalent method)

The analysis is done by artificial digestion: the magnetic stirrer method of pooled 100 gram sample as described in Commission Regulation (EC) No 2075/2005, reference method, 1 gram per fattening pig, 2 grams per sow and boar, and 5 grams per horse and wild boar.

Serology may be done in live pigs and for epidemiological studies and monitoring on wildlife.

For regions with negligible *Trichinella* risk

see general

Measures in case of the positive findings or single cases

Carcasses found positive are declared unfit for human consumption.

Notification system in place

Notification to the Federal Agency for the Safety of the Food chain is compulsory for any positive test result.

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

Since 1992, when the European Union Council Directive requires that wild boars (*Sus scrofa*) hunted in EU for commercial purpose should be examined for *Trichinella*, the infection has only been detected twice in wild boars from Belgium.

In November 2004, *Trichinella* larvae were detected in a wild boar hunted near Mettet, Namur province (Southern Belgium). Larvae were identified as *Trichinella britovi* by two different polymerase chain reaction methods. This is the first report of the identification of *Trichinella* larvae from Belgium at the species level. The detection of *T. britovi* in wildlife in Belgium is consistent with findings of this parasite in other European countries and confirms the need to test game meat for *Trichinella* to avoid its transmission to humans.

In December 2007 one *Trichinella* larva was recovered from a pooled sample, originating from 3 hunted wild boars from Alle-sur-Semois (Southern Belgium). Consecutive testing could not reveal the causative animal, and unfortunately PCR failed to identify the species of this larva.

There is serological evidence of the presence of anti-*Trichinella* antibodies in wildlife.

Wildlife monitoring did not reveal any larvae in winter 2010 (318 foxes examined), but yielded a larva from a pool of 20 wild animals (18 foxes and 2 badgers) in winter 2011-2012. Unfortunately, the larvae could not be identified to the species level by PCR, nor could the individual animal be identified. During that winter 2011-2012, 524 wild animals were examined, mostly foxes.

Table Trichinella in animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Units tested	Total units positive for Trichinella	T. spiralis	Trichinella spp., unspecified
Pigs - fattening pigs			Official sampling	animal sample > organ/tissue		Animal		0		
Pigs - fattening pigs - raised under controlled housing conditions - at slaughterhouse - Surveillance			Official sampling	animal sample > organ/tissue		Animal		0		
Pigs - fattening pigs - not raised under controlled housing conditions - at slaughterhouse - Surveillance			Official sampling	animal sample > organ/tissue		Animal		0		
Pigs - breeding animals			Official sampling	animal sample > organ/tissue		Animal		0		
Solipeds, domestic - horses - at slaughterhouse - Surveillance			Official sampling	animal sample > organ/tissue		Animal	9669	0		
Wild boars - farmed - Surveillance			Official sampling	animal sample > organ/tissue		Animal		0		
Wild boars - wild - Surveillance			Official sampling	animal sample > organ/tissue		Animal	10169	0		
Foxes - Monitoring	¹⁾		Official sampling	animal sample > organ/tissue		Animal	507	1		
Badgers - wild - unspecified - Monitoring (badgers shot/found dead were included in the winter monitoring of wild animals)	²⁾		Official sampling	animal sample > organ/tissue		Animal	11	1		
Cats - stray cats - unspecified - Monitoring - active			Official sampling	animal sample > organ/tissue		Animal	2	0		

Table Trichinella in animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Units tested	Total units positive for Trichinella	T. spiralis	Trichinella spp., unspecified
Marten - wild - from hunting - Monitoring - active			Official sampling	animal sample > organ/tissue		Animal	3	0		
Raccoons - wild - from hunting - Monitoring - active			Official sampling	animal sample > organ/tissue		Animal	1	0		

Comments:

¹⁾ see footnote below

²⁾ see footnote below

Footnote:

1 pool of 18 foxes and 2 badgers yielded 1 larva. The causative animal could not be identified. The larva could not be identified to the Trichinella species level.

2.9 ECHINOCOCCOSIS

2.9.1 General evaluation of the national situation

A. Echinococcus spp. general evaluation

History of the disease and/or infection in the country

At the slaughterhouses, a small number of carcasses showing lesions of Echinococcus (cysts) are sometimes detected and notified to the Federal Agency for the Safety of the Food Chain. In case of positive findings, carcasses are partially or totally rejected and declared unfit for human consumption.

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

Echinococcosis is caused either by *Echinococcus granulosus* or *Echinococcus multilocularis*.

Echinococcus granulosus produces unilocular human hydatidosis. It is a small tapeworm (6 mm) that lives in the small intestine of domestic and wild canids. Sheep and cattle serve as intermediate hosts for the infection. Humans acquire infection by ingestion of typical taeniid eggs, which are excreted in the faeces of infected dogs: the oncospheres liberated from the eggs migrate via the bloodstream to the liver, lungs and other tissues to develop in hydatid cysts. Indigenous unilocular hydatidosis in man has been reported in Belgium.

Echinococcus multilocularis causes alveolar (multilocular) echinococcosis in humans.

Foxes and dogs are the definitive hosts of this parasite and small rodents the intermediate hosts. In the liver of rodents the invasive larval stage has a multi-compartmented appearance containing many protoscolices. Ingestion of the eggs by humans can result in the development of invasive cysts in the liver. In Belgium, the percentage of infected foxes varies with the region, with a decreasing rate from the South-East to the North-West: e.g 33% in the Ardennes, 13% in the Condroz region and 2% in Flanders. The endemic region is situated under the river Meuse, on the heights of the Ardennes.

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

Post mortem visual examination is performed at the slaughterhouses in the domestic intermediate hosts: cattle, sheep, horses and pigs. Whole carcasses or parts are rejected in case *Echinococcus granulosus* cysts are found.

Recent actions taken to control the zoonoses

Consumption of berries is discouraged by warning messages, displayed to visitors of Parks and Woodlands.

2.10 TOXOPLASMOSIS

2.10.1 General evaluation of the national situation

A. Toxoplasmosis general evaluation

History of the disease and/or infection in the country

The majority of grazing animals seem to be inapparent carriers of tissue cysts.

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

Man is infected with *Toxoplasma gondii* through ingestion of undercooked infected meat or upon accidental ingestion of sporulated oocysts from the environment. The cat is the final host, man and most warm-blooded animals are intermediate hosts.

Most infections with *T. gondii* are asymptomatic, however mild (flu-like symptoms), moderate (lymphadenopathy, chronic fatigue) to severe disease (disseminated toxoplasmosis, encephalitis) may occur, the latter mainly in immunocompromized hosts.

Moreover, when infection occurs in pregnant women, toxoplasmosis may cause abortion and congenital disorders. If a woman acquires primary infection during pregnancy, *Toxoplasma* can be transmitted through the placenta to the foetus and lead to congenital toxoplasmosis.

A percentage of young children (1 to 14-year-old age group) may get post-natal infections with *T. gondii* and develop symptomatic toxoplasmosis (e.g. ocular disease). A number of cases of the disease in a 15 to 24-year-old age group may be referred to as acquired toxoplasmosis in immunocompetent patients, which may present with a range of signs, from lymphadenopathy to retinitis and uveitis. Immunocompetent individuals may often develop clinical toxoplasmosis. The majority of adult persons have acquired a degree of immunity to re-infection but can remain carrier.

Recent actions taken to control the zoonoses

Screening for toxoplasmosis during pregnancy is common. The seroprevalence in women tested before pregnancy is about 50%.

Prevention of congenital toxoplasmosis by specific hygienic measures seems to have limited impact.

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

Since the last indigenously acquired case of rabies occurred in Belgium in a bovine coming from Bastogne (province of Luxembourg) in July 1999, Belgium obtained the official status of rabies-free country in July 2001 according to the WHO recommendations (1992) and the Office Internationale des Epizooties (OIE) guidelines (1997).

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

In October 2007, Belgium lost temporary its official status of rabies free country due to a positive case of rabies in a dog, illegally imported from Morocco. The clinical diagnosis was confirmed after euthanasia of the dog.

Belgium regained its official free status of rabies on 28 October 2008.

Recent actions taken to control the zoonoses

Surveillance system and methods used.

Domestic animals with nervous symptoms that are suspected of rabies have to be notified to the Federal Agency for the Safety of the Food chain. Wildlife found dead or shot should also be declared for analysis to the Scientific Institute of Public Health, the National Reference laboratory of rabies.

Collection of dead-found bats is recommended for rabies surveillance.

Live suspected animals are killed and their brain is examined by immunofluorescence and virus cultivation in neuroblasts at the Scientific Institute of Public Health.

The high percentage of examinations of cattle is in consequence of the surveillance system for TSE in cattle: all suspected BSE cases were first examined for rabies. Rabies must be considered in the differential diagnosis of BSE, although the clinical course of rabies is usually quicker than the evolution of clinical nervous symptoms in case of BSE.

Vaccine baits (Raboral, Rhône Mérieux) were dispersed for the oral vaccination of foxes. During last vaccination campaign in April and October 2003, a zone of approximately 1.800 km² along the German border was covered by spreading 32 000 baits by means of a helicopter (17.78 baits per km²). Since there were no more cases of rabies for the last years, vaccination of foxes by baits was stopped (end of 2003). In the southern part of the country, below the rivers Sambre and Meuse, vaccination of dogs and cats is compulsory. In addition, all pets staying on any Belgian public camping must be vaccinated.

Suggestions to the Community for the actions to be taken

It is highly recommended to report on the rabies virus type detected to be able to differentiate between the classical rabies type (genotype 1) and the European bat Lyssa virus types (unspecified or EBL 1 or EBL 2).

Bat rabies is of public health concern. The public should be made aware of the danger of human exposure to bats, especially in case of abnormal behavior of bats. Rabies is transmitted to humans and other animals through saliva, usually by a bite. Any person exposed to bats should be previously vaccinated

against rabies. Nobody should handle diseased or dead bats without protection such as gloves. Any person finding a bat behaving abnormally, in an unusual place, or under unusual circumstances, should not attempt to handle or to move the animal but should contact official authority. Education and recommendations should be given to travelers in order to reduce their risk of infection. Although dogs represent a more serious threat in many countries, yet the risk of rabies infection by bat bites also exists.

Pre-exposure vaccination should be offered to persons at risk, such as laboratory workers, veterinarians, animal handlers, international travelers. Currently available vaccines are safe and effective against both the classical rabies virus and the bat Lyssa viruses.

2.11.2 Lyssavirus (rabies) in animals

A. Rabies in dogs

Monitoring system

Sampling strategy

The brain of dogs with nervous symptoms suspected of rabies are examined by direct immunofluorescence test and virus cultivation in neuroblasts at the Scientific Institute of Public Health, the National Reference Laboratory for rabies.

Frequency of the sampling

All suspected dogs with clinical nervous symptoms are tested.

Type of specimen taken

brain

Methods of sampling (description of sampling techniques)

Small animals: head / carcass

Huge animals: brain (CNS)

Shipping and packaging conditions:

Brains are transported as soon as possible (refrigerated if possible) in a tightly sealed packet to the National Reference Laboratory. In case of carcass transportation an authorization is required.

The storage period of samples at the National Reference Laboratory for further analysis is one year.

Case definition

An animal is considered positive in case of a positive direct immunofluorescence test (Antigen detection) confirmed by cell cultivation of the virus or detection by RT-PCR or (rarely performed) by mice inoculation test (clinical observation of rabies symptoms).

Diagnostic/analytical methods used

Direct immunofluorescence for the detection of viral antigen, virus isolation in neuroblastoma cell culture, detection by RT-PCR, mouse inoculation test

Vaccination policy

In the Southern part of the country, below the rivers Sambre and Meuse, vaccination of dogs and cats is compulsory. In addition, all pets staying on any Belgian public camping must be vaccinated.

Oral vaccination of foxes by baits started in 1989.

Since there were no more cases of rabies for the last years, oral vaccination of foxes by baits was stopped by the end of 2003.

Measures in case of the positive findings or single cases

In case of positive findings national legislation has to be applied (Royal Decree of 10 February 1967, Royal Decree of 22 May 2005 and Ministerial Decree of 23 February 1967).

Notification system in place

Royal Decree of 10 February 1967, Animal Health Law of 24 March 1987 Chapter III and Royal Decree of 25 April 1988 (list of all notifiable animal diseases)

Notification of all laboratory confirmed cases to the competent Authority is mandatory.

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

In October 2007, there was a suspicion of rabies on clinical symptoms in a dog illegally imported from Morocco. The clinical diagnosis was confirmed by laboratory testing after euthanasia of the animal. Finally 32 persons and 18 pet owners with possible contact with the rabid animal were detected. Medical information and follow-up by experts of the Scientific Institute of Public Health of all 'contact' persons was realized.

Belgium regained its official free rabies status on 28 October 2008.

Table Rabies in animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Region	Units tested	Total units positive for Lyssavirus (rabies)	Rabies virus (RABV)	EBLV-1
Cattle (bovine animals)		Selective sampling	Official sampling	animal sample		Animal	Belgique-België	194	0		
Sheep		Selective sampling	Official sampling	animal sample		Animal	Belgique-België	196	0		
Goats		Selective sampling	Official sampling	animal sample		Animal	Belgique-België	74	0		
Solipeds, domestic		Selective sampling	Official sampling	animal sample		Animal	Belgique-België	1	0		
Dogs - stray dogs		Selective sampling	Official sampling	animal sample		Animal	Belgique-België	5	0		
Cats - stray cats		Selective sampling	Official sampling	animal sample		Animal	Belgique-België	16	0		
Bats - wild - Monitoring		Selective sampling	Official sampling	animal sample		Animal	Belgique-België	16	0		
Foxes - wild - Monitoring		Selective sampling	Official sampling	animal sample		Animal	Belgique-België	40	0		
Deer - wild - Clinical investigations		Unspecified	Official sampling	animal sample		Animal	Belgique-België	1	0		
Other mustelides - wild		Unspecified	Official sampling	animal sample		Animal	Belgique-België	1	0		

	EBLV-2	Lyssavirus (unspecified virus)
Cattle (bovine animals)		
Sheep		
Goats		
Solipeds, domestic		

Table Rabies in animals

	EBLV-2	Lyssavirus (unspecified virus)
Dogs - stray dogs		
Cats - stray cats		
Bats - wild - Monitoring		
Foxes - wild - Monitoring		
Deer - wild - Clinical investigations		
Other mustelides - wild		

2.12 STAPHYLOCOCCUS INFECTION

2.12.1 General evaluation of the national situation

2.12.2 Staphylococcus in foodstuffs

A. Staphylococcus in Food

Monitoring system

Sampling strategy

Tests for Staphylococcus were performed in minced meat, dairy products, shellfish and bakery products.

Frequency of the sampling

Samples are taken according to the national control program or in the frame of RASFF, complaints or suspicion.

Type of specimen taken

minced meat, milk, shellfish and bakery products

Methods of sampling (description of sampling techniques)

The samples were taken according to Regulation (EC) No 2073/2005.

Definition of positive finding

To determine the conformity of a sample or a batch, the criteria laid down in the Regulation (EC) No 2073/2005 are applied.

Diagnostic/analytical methods used

The method is used according to Regulation (EC) No 2073/2005.

Measures in case of the positive findings or single cases

Measures to be taken in the case of a non-compliant result:

- Notification of the producer or importer
- Possibility of a counter analysis
- Destruction of the non compliant batch or single sample
- Further investigation: additional sampling, possible recall, RASFF, ...

Table Staphylococcus in Food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcus	S. aureus, meticillin resistant (MRSA) - spa-type t011	S. aureus, meticillin resistant (MRSA) - spa-type t011
Meat from pig - minced meat - intended to be eaten raw - at retail - Monitoring	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	9	0		
Meat from bovine animals - minced meat - intended to be eaten raw - at retail - Monitoring	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	43	0		
Milk, cows' - raw milk - intended for direct human consumption - at farm - Monitoring	DPA013	Unspecified	Official sampling	food sample > milk		Batch	200ml	39	2		
Bakery products - pastry - at processing plant	TRA515	Unspecified	Official sampling	food sample		Batch	>200g	40	0		
Bakery products - pastry - at retail	DIS805	Unspecified	Official sampling	food sample		Batch	>100g	78	0		
Cheeses made from cows' milk - fresh - made from pasteurised milk - at processing plant	TRA134	Unspecified	Official sampling	food sample		Batch	>300g	20	0		
Cheeses made from cows' milk - fresh - made from pasteurised milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	18	0		
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	24	3		
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	22	2		
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant	TRA134	Unspecified	Official sampling	food sample		Batch	>300g	43	0		
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	44	0		
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	29	0		

Table Staphylococcus in Food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcus	S. aureus, meticillin resistant (MRSA)	S. aureus, meticillin resistant (MRSA) - spa-type t011
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant	TRA133	Unspecified	Official sampling	food sample		Batch	>300g	29	0		
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	25	0		
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at processing plant	TRA134	Unspecified	Official sampling	food sample		Batch	>300g	46	0		
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	45	0		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	25	2		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant	TRA133	Unspecified	Official sampling	food sample		Batch	>300g	32	2		
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	30	0		
Cheeses made from sheep's milk - unspecified - made from pasteurised milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	88	0		
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	19	3		
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant	TRA133	Unspecified	Official sampling	food sample		Batch	>300g	4	0		
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	62	1		

Table Staphylococcus in Food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcus	S. aureus, meticillin resistant (MRSA)	S. aureus, meticillin resistant (MRSA) - spa-type t011
Crustaceans - unspecified - cooked - at farm	DPA021	Unspecified	Official sampling	food sample		Batch		88	0		
Crustaceans - unspecified - cooked - at processing plant	TRA401 TRA403	Unspecified	Official sampling	food sample		Batch	>200g	45	0		
Crustaceans - unspecified - cooked - at retail	DIS852	Unspecified	Official sampling	food sample		Batch	100g	47	0		
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at farm	DPA009	Unspecified	Official sampling	food sample		Batch	200g	68	0		
Dairy products (excluding cheeses) - ice-cream - at farm	DPA010	Unspecified	Official sampling	food sample		Batch	100g	45	0		
Dairy products (excluding cheeses) - ice-cream - at retail	DIS859	Unspecified	Official sampling	food sample		Batch	150g	46	0		
Dairy products (excluding cheeses) - milk powder and whey powder - at processing plant	TRA123	Unspecified	Official sampling	food sample		Batch	>500g	45	0		
Dairy products (excluding cheeses) - yoghurt - at farm	DPA007	Unspecified	Official sampling	food sample		Batch	200g	22	0		
Dairy products (excluding cheeses) - yoghurt - at processing plant	TRA142	Unspecified	Official sampling	food sample		Batch	>200g	23	0		
Dairy products (excluding cheeses) - yoghurt - at retail	DIS858	Unspecified	Official sampling	food sample		Batch	100g	46	0		
Fish - raw - at retail	DIS873	Unspecified	Official sampling	food sample		Batch	100g	94	0		
Fishery products, unspecified - ready-to-eat - at processing plant	TRA402 TRA416	Unspecified	Official sampling	food sample		Batch	>200g	44	0		
Fishery products, unspecified - ready-to-eat - at retail	DIS808	Unspecified	Official sampling	food sample		Batch	200g	58	0		

Table Staphylococcus in Food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcus	S. aureus, meticillin resistant (MRSA)	S. aureus, meticillin resistant (MRSA) - spa-type t011
Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months - at retail	DIS862	Unspecified	Official sampling	food sample		Batch	200g	59	0		
Meat from bovine animals - meat preparation - intended to be eaten raw - at processing plant	TRA 304	Unspecified	Official sampling	food sample > meat		Batch	1g	94	2		
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Monitoring	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	30	0		
Meat from bovine animals and pig - minced meat - intended to be eaten cooked - at retail - Monitoring	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	9	0		
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail - Monitoring	DIS823	Unspecified	Official sampling	food sample > meat		Batch	150g	5	0		
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at processing plant	TRA416	Unspecified	Official sampling	food sample > meat		Batch	>200g	90	0		
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at retail	DIS801	Unspecified	Official sampling	food sample > meat		Batch	200g	64	0		
Meat from other animal species or not specified - meat preparation - intended to be eaten raw - at retail	DIS815	Unspecified	Official sampling	food sample > meat		Batch	200g	237	0		
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at processing plant	TRA317 TRA416	Unspecified	Official sampling	food sample > meat		Batch	>200g	104	0		
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at retail	DIS801	Unspecified	Official sampling	food sample > meat		Batch	200g	115	0		

Table Staphylococcus in Food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcus	S. aureus, meticillin resistant (MRSA) - spa-type t011	S. aureus, meticillin resistant (MRSA) - spa-type t011
Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - at processing plant	TRA317	Unspecified	Official sampling	food sample > meat		Batch	>200g	45	0		
Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - at retail	DIS801	Unspecified	Official sampling	food sample > meat		Batch	200g	46	0		
Meat from pig - minced meat - intended to be eaten cooked - at retail - Monitoring	DIS888	Unspecified	Official sampling	food sample > meat		Batch	100g	17	0		
Milk, cows' - raw milk - intended for direct human consumption - at retail - Monitoring	DIS837	Unspecified	Official sampling	food sample > milk		Batch	150ml	10	2		
Molluscan shellfish - cooked - at processing plant	TRA401	Unspecified	Official sampling	food sample		Batch	>200g	45	0		
Molluscan shellfish - cooked - at retail	DIS806	Unspecified	Official sampling	food sample		Batch	>2,5kg	46	0		

	S. aureus, meticillin resistant (MRSA) - spa-type t108	S. aureus, meticillin resistant (MRSA) - spa-type t034	S. aureus, meticillin resistant (MRSA) - MRSA, unspecified	Staphylococcus spp., unspecified
Meat from pig - minced meat - intended to be eaten raw - at retail - Monitoring				
Meat from bovine animals - minced meat - intended to be eaten raw - at retail - Monitoring				
Milk, cows' - raw milk - intended for direct human consumption - at farm - Monitoring				2
Bakery products - pastry - at processing plant				

Table Staphylococcus in Food

	S. aureus, meticillin resistant (MRSA) - spa -type t108	S. aureus, meticillin resistant (MRSA) - spa -type t034	S. aureus, meticillin resistant (MRSA) - MRSA, unspecified	Staphylococc us spp., unspecified
Bakery products - pastry - at retail				
Cheeses made from cows' milk - fresh - made from pasteurised milk - at processing plant				
Cheeses made from cows' milk - fresh - made from pasteurised milk - at retail				
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm				3
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail				2
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant				
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail				
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm				
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant				
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail				
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at processing plant				

Table Staphylococcus in Food

	S. aureus, meticillin resistant (MRSA) - spa -type t108	S. aureus, meticillin resistant (MRSA) - spa -type t034	S. aureus, meticillin resistant (MRSA) - MRSA, unspecified	Staphylococc us spp., unspecified
Cheeses made from goats' milk - unspecified - made from pasteurised milk - at retail				
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm				2
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant				2
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at retail				
Cheeses made from sheep's milk - unspecified - made from pasteurised milk - at retail				
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm				3
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant				
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail				1
Crustaceans - unspecified - cooked - at farm				
Crustaceans - unspecified - cooked - at processing plant				
Crustaceans - unspecified - cooked - at retail				
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at farm				

Table Staphylococcus in Food

	S. aureus, meticillin resistant (MRSA) - spa -type t108	S. aureus, meticillin resistant (MRSA) - spa -type t034	S. aureus, meticillin resistant (MRSA) - MRSA, unspecified	Staphylococc us spp., unspecified
Dairy products (excluding cheeses) - ice-cream - at farm				
Dairy products (excluding cheeses) - ice-cream - at retail				
Dairy products (excluding cheeses) - milk powder and whey powder - at processing plant				
Dairy products (excluding cheeses) - yoghurt - at farm				
Dairy products (excluding cheeses) - yoghurt - at processing plant				
Dairy products (excluding cheeses) - yoghurt - at retail				
Fish - raw - at retail				
Fishery products, unspecified - ready-to-eat - at processing plant				
Fishery products, unspecified - ready-to-eat - at retail				
Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months - at retail				
Meat from bovine animals - meat preparation - intended to be eaten raw - at processing plant				2
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Monitoring				

Table Staphylococcus in Food

	S. aureus, meticillin resistant (MRSA) - spa -type t108	S. aureus, meticillin resistant (MRSA) - spa -type t034	S. aureus, meticillin resistant (MRSA) - MRSA, unspecified	Staphylococc us spp., unspecified
Meat from bovine animals and pig - minced meat - intended to be eaten cooked - at retail - Monitoring				
Meat from bovine animals and pig - minced meat - intended to be eaten raw - at retail - Monitoring				
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at processing plant				
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at retail				
Meat from other animal species or not specified - meat preparation - intended to be eaten raw - at retail				
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at processing plant				
Meat from other animal species or not specified - meat products - cooked, ready-to-eat - at retail				
Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - at processing plant				
Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - at retail				
Meat from pig - minced meat - intended to be eaten cooked - at retail - Monitoring				

Table Staphylococcus in Food

	S. aureus, meticillin resistant (MRSA) - spa -type t108	S. aureus, meticillin resistant (MRSA) - spa -type t034	S. aureus, meticillin resistant (MRSA) - MRSA, unspecified	Staphylococc us spp., unspecified
Milk, cows' - raw milk - intended for direct human consumption - at retail - Monitoring				2
Molluscan shellfish - cooked - at processing plant				
Molluscan shellfish - cooked - at retail				

2.12.3 Antimicrobial resistance in *Staphylococcus* isolates

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - MRSA, unspecified in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

MRSA, unspecified	Gallus gallus (fowl) - broilers																										
	unknown																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	2	1	0																								
Aminoglycosides - Kanamycin	8	1	1																								1
Aminoglycosides - Streptomycin	16	1	1																								1
Amphenicols - Chloramphenicol	16	1	1																								1
Fluoroquinolones - Ciprofloxacin	1	1	0														1										
Tetracyclines - Tetracycline	1	1	1																								1
Trimethoprim	2	1	0																								1
Antimycobacterial drugs - Rifampicin	0.032	1	1															1									
Cephalosporins - Cefoxitin	4	1	1																								1
Fusidanes - Fusidic acid	0.5	1	0															1									
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	2	1	0																1								
Lincosamides - Clindamycin	0.25	1	0														1										
Macrolides - Erythromycin	1	1	1																								1
Oxazolidines - Linezolid	4	1	0																	1							
Penicillins - Penicillin	0.12	1	1																		1						
Pleuromutilins - Tiamulin	2	1	0																	1							

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - MRSA, unspecified in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

MRSA, unspecified	Gallus gallus (fowl) - broilers																									
	Isolates out of a monitoring program (yes/no)																									
	Number of isolates available in the laboratory																									
Antimicrobials:	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Streptogramins - Quinupristin/Dalfopristin	1	1	0											1												
Sulfonamides - Sulfamethoxazol	128	1	1																					1		

MRSA, unspecified	Gallus gallus (fowl) - broilers	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	1	16
Aminoglycosides - Kanamycin	4	64
Aminoglycosides - Streptomycin	4	32
Amphenicols - Chloramphenicol	4	64
Fluoroquinolones - Ciprofloxacin	0.25	8
Tetracyclines - Tetracycline	0.5	16
Trimethoprim	2	32
Antimycobacterial drugs - Rifampicin	0.016	0.5
Cephalosporins - Cefoxitin	0.5	16
Fusidanes - Fusidic acid	0.5	4
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	1	16
Lincosamides - Clindamycin	0.12	4

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - MRSA, unspecified in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

MRSA, unspecified	Gallus gallus (fowl) - broilers	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Macrolides - Erythromycin	0.25	8
Oxazolidines - Linezolid	1	8
Penicillins - Penicillin	0.12	2
Pleuromutilins - Tiamulin	0.5	4
Streptogramins - Quinupristin/Dalfopristin	0.5	4
Sulfonamides - Sulfamethoxazol	64	512

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - MRSA, unspecified in *Gallus gallus* (fowl) - breeding flocks for egg production line - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

MRSA, unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl) - breeding flocks for egg production line																												
	unknown																												
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048			
Aminoglycosides - Gentamicin	2	2	0													2													
Aminoglycosides - Kanamycin	8	2	2																			2							
Aminoglycosides - Streptomycin	16	2	2																			2							
Amphenicols - Chloramphenicol	16	2	2																				2						
Fluoroquinolones - Ciprofloxacin	1	2	0													2													
Tetracyclines - Tetracycline	1	2	2																			2							
Trimethoprim	2	2	0																2										
Antimycobacterial drugs - Rifampicin	0.032	2	2													2													
Cephalosporins - Cefoxitin	4	2	2																			2							
Fusidanes - Fusidic acid	0.5	2	0													2													
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	2	2	0														2												
Lincosamides - Clindamycin	0.25	2	0												2														
Macrolides - Erythromycin	1	2	2																			2							
Oxazolidines - Linezolid	4	2	0															1	1										
Penicillins - Penicillin	0.12	2	2															2											
Pleuromutilins - Tiamulin	2	2	0													2													
Streptogramins - Quinupristin/Dalfopristin	1	2	0													2													
Sulfonamides - Sulfamethoxazol	128	2	2																								2		

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - MRSA, unspecified in *Gallus gallus* (fowl) - breeding flocks for egg production line - quantitative data [Dilution method]

MRSA, unspecified	Gallus gallus (fowl) - breeding flocks for egg production line	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	1	16
Aminoglycosides - Kanamycin	4	64
Aminoglycosides - Streptomycin	4	32
Amphenicols - Chloramphenicol	4	64
Fluoroquinolones - Ciprofloxacin	0.25	8
Tetracyclines - Tetracycline	0.5	16
Trimethoprim	2	32
Antimycobacterial drugs - Rifampicin	0.016	0.5
Cephalosporins - Cefoxitin	0.5	16
Fusidanes - Fusidic acid	0.5	4
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	1	16
Lincosamides - Clindamycin	0.12	4
Macrolides - Erythromycin	0.25	8
Oxazolidines - Linezolid	1	8
Penicillins - Penicillin	0.12	2
Pleuromutilins - Tiamulin	0.5	4
Streptogramins - Quinupristin/Dalfopristin	0.5	4
Sulfonamides - Sulfamethoxazol	64	512

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - MRSA, unspecified in *Gallus gallus* (fowl) - breeding flocks for egg production line - quantitative data [Dilution method]

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - spa-type t899 in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

spa-type t899 Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl) - broilers																											
	unknown																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	2	1	1															1										
Aminoglycosides - Kanamycin	8	1	1																			1						
Aminoglycosides - Streptomycin	16	1	0																		1							
Amphenicols - Chloramphenicol	16	1	0															1										
Fluoroquinolones - Ciprofloxacin	1	1	1														1											
Tetracyclines - Tetracycline	1	1	1																		1							
Trimethoprim	2	1	1																			1						
Antimycobacterial drugs - Rifampicin	0.032	1	0						1																			
Cephalosporins - Cefoxitin	4	1	1																			1						
Fusidanes - Fusidic acid	0.5	1	1													1												
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	2	1	0													1												
Lincosamides - Clindamycin	0.25	1	1																1									
Macrolides - Erythromycin	1	1	1																1									
Oxazolidines - Linezolid	4	1	0														1											
Penicillins - Penicillin	0.12	1	1															1										
Pleuromutilins - Tiamulin	2	1	1																1									
Streptogramins - Quinupristin/Dalfopristin	1	1	0														1											
Sulfonamides - Sulfamethoxazol	128	1	0																				1					

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - spa-type t899 in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

spa-type t899	Gallus gallus (fowl) - broilers	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	1	16
Aminoglycosides - Kanamycin	4	64
Aminoglycosides - Streptomycin	4	32
Amphenicols - Chloramphenicol	4	64
Fluoroquinolones - Ciprofloxacin	0.25	8
Tetracyclines - Tetracycline	0.5	16
Trimethoprim	2	32
Antimycobacterial drugs - Rifampicin	0.016	0.5
Cephalosporins - Cefoxitin	0.5	16
Fusidanes - Fusidic acid	0.5	4
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	1	16
Lincosamides - Clindamycin	0.12	4
Macrolides - Erythromycin	0.25	8
Oxazolidines - Linezolid	1	8
Penicillins - Penicillin	0.12	2
Pleuromutilins - Tiamulin	0.5	4
Streptogramins - Quinupristin/Dalfopristin	0.5	4
Sulfonamides - Sulfamethoxazol	64	512

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - spa-type t899 in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - spa-type t011 in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

spa-type t011 Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl) - broilers																											
	unknown																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	2	4	3													1			3									
Aminoglycosides - Kanamycin	8	4	3															1			3							
Aminoglycosides - Streptomycin	16	4	2																2		2							
Amphenicols - Chloramphenicol	16	4	2															1	1	1	1							
Fluoroquinolones - Ciprofloxacin	1	4	3													1		2		1								
Tetracyclines - Tetracycline	1	4	4																	4								
Trimethoprim	2	4	4																		4							
Antimycobacterial drugs - Rifampicin	0.032	4	1						3							1												
Cephalosporins - Cefoxitin	4	4	4																		4							
Fusidanes - Fusidic acid	0.5	4	1													3		1										
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	2	4	0														4											
Lincosamides - Clindamycin	0.25	4	4																4									
Macrolides - Erythromycin	1	4	4																	4								
Oxazolidines - Linezolid	4	4	0														2	2										
Penicillins - Penicillin	0.12	4	4															4										
Pleuromutilins - Tiamulin	2	4	1														1	1	1	1								
Streptogramins - Quinupristin/Dalfopristin	1	4	1														1	2		1								
Sulfonamides - Sulfamethoxazol	128	4	2																			2		2				

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - spa-type t011 in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

spa-type t011	Gallus gallus (fowl) - broilers	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	1	16
Aminoglycosides - Kanamycin	4	64
Aminoglycosides - Streptomycin	4	32
Amphenicols - Chloramphenicol	4	64
Fluoroquinolones - Ciprofloxacin	0.25	8
Tetracyclines - Tetracycline	0.5	16
Trimethoprim	2	32
Antimycobacterial drugs - Rifampicin	0.016	0.5
Cephalosporins - Cefoxitin	0.5	16
Fusidanes - Fusidic acid	0.5	4
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	1	16
Lincosamides - Clindamycin	0.12	4
Macrolides - Erythromycin	0.25	8
Oxazolidines - Linezolid	1	8
Penicillins - Penicillin	0.12	2
Pleuromutilins - Tiamulin	0.5	4
Streptogramins - Quinupristin/Dalfopristin	0.5	4
Sulfonamides - Sulfamethoxazol	64	512

Table Antimicrobial susceptibility testing of *S. aureus*, meticillin resistant (MRSA) - spa-type t011 in *Gallus gallus* (fowl) - broilers - quantitative data [Dilution method]

2.13 Q-FEVER

2.13.1 General evaluation of the national situation

A. Coxiella burnetii (Q-fever) general evaluation

History of the disease and/or infection in the country

In 2011, the monitoring of tankmilk continued. The farms with milkgoats and milksheep were tested every 2 months.

For cattle, sheep and goats, in case of abortion, samples are tested against a number of possible infectious agents including Coxiella burnetii.

The circulation of Coxiella burnetii on cattle farms is known due to the presence of antibodies against Coxiella burnetii in the milk.

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

Of the 13 RT-PCR positive milkgoatfarms in 2010, 9 were still/again positive in 2011. In addition, one farm was positive for the first time due to the introduction of french goats.

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

There is a steady state in the number of reported cases of human Q-fever in Belgium.

Recent actions taken to control the zoonoses

Milk from goats or sheep herds where Coxiella burnetii was found has to be pasteurized before human consumption. The location of positive herds is reported to the public health services for the purpose of warning the medical doctors.

B. Coxiella general evaluation

History of the disease and/or infection in the country

2.13.2 Coxiella (Q-fever) in animals

Table Coxiella burnetii (Q fever) in animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Analytical Method	Sampling unit	Units tested	Total units positive for Coxiella (Q-fever)	C. burnetii	No of clinically affected herds
Cattle (bovine animals) - at farm - Clinical investigations ¹⁾	DGZ/ARSIA	Suspect sampling	Industry sampling	animal sample > foetus/stillbirth		Real-Time PCR	Animal	7120	108	108	
Cattle (bovine animals) - at farm - Monitoring	CODA	Objective sampling	Official sampling	animal sample > blood		ELISA	Herd	1052	756	756	
Sheep - at farm - Clinical investigations ²⁾	DGZ/ARSIA	Suspect sampling	Industry sampling	animal sample > foetus/stillbirth		Real-Time PCR	Animal	143	1	1	
Goats - at farm - Clinical investigations ³⁾	DGZ/ARSIA	Suspect sampling	Industry sampling	animal sample > foetus/stillbirth		Real-Time PCR	Animal	39	2	2	

Comments:

¹⁾ Mandatory sampling in case of abortion

²⁾ Mandatory sampling in case of abortion

³⁾ Mandatory in case of abortion

Footnote:

Clinical investigation: a unit is considered positive when the RT-PCR is positive.

Monitoring: a unit is considered positive when the S/P > 40%.

2.14 CYSTICERCOSIS, TAENIOSIS

2.14.1 General evaluation of the national situation

A. Cysticerci general evaluation

History of the disease and/or infection in the country

Cattle

Taenia saginata:

2002	total 3.336 (3.317 lightly, 18 heavily contaminated)
2003	total 3.886 (3.859 lightly, 25 heavily contaminated)
2004	total 3.002 (2.981 lightly, 21 heavily contaminated)
2005	total 2.392 (2.376 lightly, 16 heavily contaminated)
2006	total 1.824 (1.796 lightly, 28 heavily contaminated)
2007	total 1.527 (1.517 lightly, 10 heavily contaminated)
2008	total 2.374 (2.356 lightly, 18 heavily contaminated)
2009	total 1.820 (1.811 lightly, 9 heavily contaminated)
2010	total 1.766 (1.756 lightly, 10 heavily contaminated)
2011	total 1.347 (1.336 lightly, 11 heavily contaminated)

Pigs

The Belgian pig population is free from *Cysticercus cellulosae*. *Taenia solium* (and *Cysticercus cellulosae*) is not autochthonous in Belgium.

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

Cysticercus bovis in muscular tissue of cattle is the larval stage of the tapeworm, *Taenia saginata*, a parasitic cestode of the human gut (taeniasis). Cattle can become infected by ingestion of vegetation contaminated with *T. saginata* eggs shed in human faeces. Risk factors are access to streams and flooding of pastures.

Humans contaminate themselves by the ingestion of raw or undercooked beef containing the larval form (cysticerci). Usually pathogenetic for humans is low. The tapeworm eggs contaminate the environment directly or through surface waters. Human carriers should be treated promptly. Strict rules for the hygienic disposal or sanitation of human faeces with a method that inactivates *T. saginata* eggs should be developed. The spreading of human excrement on land should not be allowed.

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

Post-mortem, macroscopic examination of carcasses of adult cattle as well as calves is routinely done in all slaughterhouses. Serological examination is possible and confirmation of the lesions by PCR or DNA-test can be done.

Lightly contaminated carcasses are treated by freezing at -18°C for 10 days before declared fit for human consumption. Heavily contaminated carcasses are unfit for human consumption and are destroyed.

Suggestions to the Community for the actions to be taken

The introduction of serological analyzes for the detection of cysticerci antigens in the serum of animals (cattle) should be developed. This would allow the detection of more cases than by visual inspection of carcasses at slaughterhouse.

2.14.2 Cysticerci in animals

Table Cysticerci in Animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Cysticerci	Cysticerci of <i>Taenia saginata</i>
Cattle (bovine animals) - at slaughterhouse - Surveillance	AFSCA	Suspect sampling	Official sampling	animal sample > organ/tissue		Animal		859390	1347	1347

Footnote:

1336 lightly and 11 heavily contaminated carcasses

2.15 SARCOCYSTOSIS

2.15.1 General evaluation of the national situation

A. Sarcocystis general evaluation

History of the disease and/or infection in the country

At the slaughterhouses, a small number of carcasses showing myositis eosinophilica (green coloring spots of the carcass) are detected and notified to the Federal Agency for the Safety of the Food Chain. In case of positive findings, carcasses are totally rejected and declared unfit for human consumption. In 2010, 37 cases and in 2011 44 cases of sarcosporidiosis in cattle were reported.

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

Sarcocystis bovihominis (bovine as intermediate host) and *Sarcocystis suis* (porcine intermediate host) occur sporadically. Domestic carnivores are hosts of the adult stage.

Humans can be a definitive host for sarcosporidiosis by ingestion of infected meat or excreted oocysts and develop symptoms like diarrhea, headache, eosinophilia, abortion, congenital disorder.

For human sarcosporidiosis there is no immunity development.

The majority of grazing animals are inapparent carriers of tissue cysts.

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

Carcasses are entirely condemned when myositis eosinophilica lesions are apparent. Myositis eosinophilica is commonly associated with sarcosporidiosis but this is still not proven!

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1 ESCHERICHIA COLI, NON-PATHOGENIC

3.1.1 General evaluation of the national situation

A. Escherichia coli general evaluation

History of the disease and/or infection in the country

The antimicrobial resistance of non-pathogenic E. Coli was monitored for the first time in 2011 in poultry, pigs and bovines.

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

There was a high level of resistance in all species. However resistance in strains from bovine origin is lower compared to the strains from pigs and poultry.

Recent actions taken to control the zoonoses

3.1.2 Escherichia coli, non-pathogenic in foodstuffs

A. E. coli in food

Monitoring system

Sampling strategy

The hygiene of slaughtering and cutting process is watched via the evaluation of the contamination of carcasses and cutting meat by indicators of faecal contamination.

Frequency of the sampling

every week

Type of specimen taken

Meat

Methods of sampling (description of sampling techniques)

Broilers and laying hens carcasses are taken at slaughterhouses. At cutting plants about 200g of meat were taken.

Definition of positive finding

Action limits were established for every matrix.

Diagnostic/analytical methods used

ISO method was used to count E. coli in food.

Measures in case of the positive findings or single cases

Monitoring/Not favorable results are sent to the FBO.

3.1.3 Antimicrobial resistance in Escherichia coli, non-pathogenic

Table Antimicrobial susceptibility testing of E.coli, non-pathogenic, unspecified in Cattle (bovine animals) - calves (under 1 year) - for slaughter - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E.coli, non-pathogenic, unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals) - calves (under 1 year) - for slaughter																												
	unknown																												
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048			
Aminoglycosides - Gentamicin	1	154	6									2	117	29	2			3	1										
Aminoglycosides - Kanamycin	8	154	8														146								8				
Aminoglycosides - Streptomycin	32	154	36														31	72	9	6	11	25							
Amphenicols - Chloramphenicol	16	154	22													7	64	59	2	7	15								
Amphenicols - Florfenicol	16	154	10													10	82	48	4		10								
Cephalosporins - Cefotaxime	0.25	154	7							138	7	2	1	2	2	2													
Fluoroquinolones - Ciprofloxacin	0.06	154	17			16	107		11	3	5	7	1					4											
Penicillins - Ampicillin	4	154	41													1	4	59	49	2		39							
Quinolones - Nalidixic acid	8	154	19															132	3	1	1	17							
Tetracyclines - Tetracycline	8	154	30													32	91		1	1	2	27							
Trimethoprim	2	154	30													120	3	1	4			26							
Cephalosporins - Ceftazidim	2	154	6									148						2	3	1									
Polymyxins - Colistin	2	154	1													153	1												
Sulfonamides - Sulfamethoxazol	256	154	44														36	36	29	6	3						44		

Table Antimicrobial susceptibility testing of E.coli, non-pathogenic, unspecified in Cattle (bovine animals) - calves (under 1 year) - for slaughter - quantitative data [Dilution method]

E.coli, non-pathogenic, unspecified	Cattle (bovine animals) - calves (under 1 year) - for slaughter	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of E.coli, non-pathogenic, unspecified in *Gallus gallus* (fowl) - broilers - sampling in the framework of the broiler baseline study - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E.coli, non-pathogenic, unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study																											
	unknown																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	1	418	21									9	304	84	4	1	9	3	4									
Aminoglycosides - Kanamycin	8	418	29														386	3	3		2	24						
Aminoglycosides - Streptomycin	32	418	251														23	86	21	37	31	220						
Amphenicols - Chloramphenicol	16	418	101														5	158	121	33	28	73						
Amphenicols - Florfenicol	16	418	3														12	224	137	42	2	1						
Cephalosporins - Cefotaxime	0.25	418	79									319	19	1	5	6	12	56										
Fluoroquinolones - Ciprofloxacin	0.06	418	263			35	103		12	5	47	134	37	11	5	6	23											
Penicillins - Ampicillin	4	418	355														11	41	11	1	1	353						
Quinolones - Nalidixic acid	8	418	264															151	3	1	11	252						
Tetracyclines - Tetracycline	8	418	270														47	89	11	1		28	242					
Trimethoprim	2	418	263														153		2	1		4	258					
Cephalosporins - Ceftazidim	2	418	41														335	12	22	8	6	20	15					
Polymyxins - Colistin	2	418	2															416	2									
Sulfonamides - Sulfamethoxazol	256	418	310																37	34	27	7	3		1		309	

Table Antimicrobial susceptibility testing of E.coli, non-pathogenic, unspecified in *Gallus gallus* (fowl) - broilers - sampling in the framework of the broiler baseline study - quantitative data [Dilution method]

E.coli, non-pathogenic, unspecified	Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	unknown	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of E.coli, non-pathogenic, unspecified in Pigs - fattening pigs - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E.coli, non-pathogenic, unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - fattening pigs																										
	unknown																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	1	156	7									7	110	32	1	2	2	1	1								
Aminoglycosides - Kanamycin	8	156	5														147	4	1			4					
Aminoglycosides - Streptomycin	32	156	67														18	41	13	17	17	50					
Amphenicols - Chloramphenicol	16	156	41														4	58	48	5	22	19					
Amphenicols - Florfenicol	16	156	7														5	75	55	14		7					
Cephalosporins - Cefotaxime	0.25	156	7									146	1	2	1	1	1	4									
Fluoroquinolones - Ciprofloxacin	0.06	156	22			21	103		8	2	12	7	1	1				1									
Penicillins - Ampicillin	4	156	80														9	28	39	3	1	76					
Quinolones - Nalidixic acid	8	156	20																134	2	2	6	12				
Tetracyclines - Tetracycline	8	156	88														19	46	1	2	2	5	81				
Trimethoprim	2	156	78														76		2				78				
Cephalosporins - Ceftazidim	2	156	4														147	2	1	2	3	1					
Polymyxins - Colistin	2	156	1															155	1								
Sulfonamides - Sulfamethoxazol	256	156	91																22	26	15	2		2		89	

Table Antimicrobial susceptibility testing of E.coli, non-pathogenic, unspecified in Pigs - fattening pigs - quantitative data [Dilution method]

E.coli, non-pathogenic, unspecified	Pigs - fattening pigs	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Antimicrobial susceptibility testing of E.coli, non-pathogenic, unspecified in Cattle (bovine animals) - calves (under or around 1 year) - veal calves (at or above 1 year) - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E.coli, non-pathogenic, unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals) - calves (over 1 year) - veal calves																									
	unknown																									
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048
Aminoglycosides - Gentamicin	1	34	7									2	18	7				1	6							
Aminoglycosides - Kanamycin	8	34	10														23	1	1			9				
Aminoglycosides - Streptomycin	32	34	18														2	9	4	1	3	15				
Amphenicols - Chloramphenicol	16	34	17													1	4	12		5	12					
Amphenicols - Florfenicol	16	34	5													1	11	15	2		5					
Cephalosporins - Cefotaxime	0.25	34	0							34																
Fluoroquinolones - Ciprofloxacin	0.06	34	14			3	15		1	1	1	4	1					8								
Penicillins - Ampicillin	4	34	24													1	4	5			24					
Quinolones - Nalidixic acid	8	34	14															20			2	12				
Tetracyclines - Tetracycline	8	34	25													4	5					25				
Trimethoprim	2	34	24											10				1			23					
Cephalosporins - Ceftazidim	2	34	0									34														
Polymyxins - Colistin	2	34	5														29	5								
Sulfonamides - Sulfamethoxazol	256	34	27															5	1	1			1		26	

Table Antimicrobial susceptibility testing of E.coli, non-pathogenic, unspecified in Cattle (bovine animals) - calves (under or around 1 year) - veal calves (at or above 1 year) - quantitative data [Dilution method]

E.coli, non-pathogenic, unspecified	Cattle (bovine animals) - calves (over 1 year) - veal calves	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	0.25	32
Aminoglycosides - Kanamycin	4	128
Aminoglycosides - Streptomycin	2	128
Amphenicols - Chloramphenicol	2	64
Amphenicols - Florfenicol	2	64
Cephalosporins - Cefotaxime	0.06	4
Fluoroquinolones - Ciprofloxacin	0.008	8
Penicillins - Ampicillin	0.5	32
Quinolones - Nalidixic acid	4	64
Tetracyclines - Tetracycline	1	64
Trimethoprim	0.5	32
Cephalosporins - Ceftazidim	0.25	16
Polymyxins - Colistin	2	4
Sulfonamides - Sulfamethoxazol	8	1024

Table Cut-off values used for antimicrobial susceptibility testing of *Escherichia coli*, non-pathogenic in Animals

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		16	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.25	
Fluoroquinolones	Ciprofloxacin		0.03	
Penicillins	Ampicillin		8	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

Table Cut-off values used for antimicrobial susceptibility testing of *Escherichia coli*, non-pathogenic in Feed

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		16	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.25	
Fluoroquinolones	Ciprofloxacin		0.03	
Penicillins	Ampicillin		8	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

Table Cut-off values used for antimicrobial susceptibility testing of *Escherichia coli*, non-pathogenic in Food

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		16	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.25	
Fluoroquinolones	Ciprofloxacin		0.03	
Penicillins	Ampicillin		8	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

3.2 ENTEROCOCCUS, NON-PATHOGENIC

3.2.1 General evaluation of the national situation

3.2.2 Enterococcus, non-pathogenic in animals

A. Enterococcus spp., unspecified in Animals

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

The antimicrobial resistance of non-pathogenic enterococci was monitored for the first time in 2011 in poultry, pigs and bovines. There was a high level of resistance in all species. However resistance in strains from bovine origin is lower compared to the strains from pigs and poultry.

3.2.3 Antimicrobial resistance in Enterococcus, non-pathogenic isolates

Table Antimicrobial susceptibility testing of Enterococcus spp., unspecified in Cattle (bovine animals) - calves (under or around 1 year) - veal calves (at or above 1 year) - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

Enterococcus spp., unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals) - calves (over 1 year) - veal calves																											
	unknown																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	32	4	0														1		3									
Aminoglycosides - Streptomycin	512	4	1																	1	1	1					1	
Amphenicols - Chloramphenicol	32	4	0															3	1									
Amphenicols - Florfenicol	8	4	0														2	2										
Fluoroquinolones - Ciprofloxacin	4	4	0													4												
Penicillins - Ampicillin	4	4	0														4											
Tetracyclines - Tetracycline	4	4	2													2						2						
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	4	0													2	2											
Ionophores - Salinomycin	4	4	1													2	1		1									
Macrolides - Erythromycin	4	4	1													3									1			
Oxazolidines - Linezolid	4	4	0														4											
Streptogramins - Quinupristin/Dalfopristin	1	4	3													1		3										

Table Antimicrobial susceptibility testing of *Enterococcus* spp., unspecified in Cattle (bovine animals) - calves (under or around 1 year) - veal calves (at or above 1 year) - quantitative data [Dilution method]

Enterococcus spp., unspecified	Cattle (bovine animals) - calves (over 1 year) - veal calves	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	4	512
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Antimicrobial susceptibility testing of *E. faecium* in Cattle (bovine animals) - calves (under or around 1 year) - veal calves (at or above 1 year) - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E. faecium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals) - calves (over 1 year) - veal calves																										
	unknown																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	32	3	0														2	1									
Aminoglycosides - Streptomycin	512	3	1																					1		1	
Amphenicols - Chloramphenicol	32	3	0															1	2								
Amphenicols - Florfenicol	8	3	0														3										
Fluoroquinolones - Ciprofloxacin	4	3	0													1	2										
Penicillins - Ampicillin	4	3	0													2	1										
Tetracyclines - Tetracycline	4	3	2												1								2				
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	3	0												2	1											
Ionophores - Salinomycin	4	3	0												3												
Macrolides - Erythromycin	4	3	2												1								2				
Oxazolidines - Linezolid	4	3	0												3												
Streptogramins - Quinupristin/Dalfopristin	1	3	3														3										

Table Antimicrobial susceptibility testing of *E. faecium* in Cattle (bovine animals) - calves (under or around 1 year) - veal calves (at or above 1 year) - quantitative data [Dilution method]

E. faecium	Cattle (bovine animals) - calves (over 1 year) - veal calves	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	4	512
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Antimicrobial susceptibility testing of *Enterococcus* spp., unspecified in *Gallus gallus* (fowl) - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

Enterococcus spp., unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	unknown																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	32	128	1														42	53	30	2				1			
Aminoglycosides - Streptomycin	512	128	52																	26	26	14	6	4		52	
Amphenicols - Chloramphenicol	32	128	5													2	71	42	3	5	3	2					
Amphenicols - Florfenicol	8	128	1												3	62	60	2				1					
Fluoroquinolones - Ciprofloxacin	4	128	12											20	46	33	17	8	4								
Penicillins - Ampicillin	4	128	23												74	13	18	7	2	1	2	11					
Tetracyclines - Tetracycline	4	128	119											8		1				3	116						
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	128	7											52	52	16	1	1	1		5						
Ionophores - Salinomycin	4	128	39											3	10	9	67	32		1	6						
Macrolides - Erythromycin	4	128	104												22	2		3	9	5	4	83					
Oxazolidines - Linezolid	4	128	6											3	53	65	1			6							
Streptogramins - Quinupristin/Dalfopristin	1	128	119											6	3	7	62	31	12	7							

Enterococcus spp., unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)	
	unknown	
	lowest	highest
Aminoglycosides - Gentamicin	4	512

Table Antimicrobial susceptibility testing of *Enterococcus* spp., unspecified in *Gallus gallus* (fowl) - quantitative data [Dilution method]

Enterococcus spp., unspecified	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Antimicrobial susceptibility testing of *E. faecium* in *Gallus gallus* (fowl) - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E. faecium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)																										
	unknown																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	32	33	0														5	12	15	1							
Aminoglycosides - Streptomycin	512	33	18																	2	4	7	2			18	
Amphenicols - Chloramphenicol	32	33	3														8	19		3	3						
Amphenicols - Florfenicol	8	33	0												1	7	25										
Fluoroquinolones - Ciprofloxacin	4	33	6												3	4	10	10	3	3							
Penicillins - Ampicillin	4	33	8												13	3	9	3				1	4				
Tetracyclines - Tetracycline	4	33	28											4			1	1			27						
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	33	3											11	10	9						3					
Ionophores - Salinomycin	4	33	17											3	5	8	14		1	2							
Macrolides - Erythromycin	4	33	24											5	3	1					1	23					
Oxazolidines - Linezolid	4	33	2											3	28					2							
Streptogramins - Quinupristin/Dalfopristin	1	33	33											3	13	12	2	3									

E. faecium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Gallus gallus (fowl)	
	unknown	
	lowest	highest
Aminoglycosides - Gentamicin	4	512

Table Antimicrobial susceptibility testing of *E. faecium* in *Gallus gallus* (fowl) - quantitative data [Dilution method]

E. faecium	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Antimicrobial susceptibility testing of *E. faecalis* in Cattle (bovine animals) - calves (under or around 1 year) - veal calves (at or above 1 year) - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E. faecalis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals) - calves (over 1 year) - veal calves																												
	unknown																												
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048			
Aminoglycosides - Gentamicin	32	4	0															1	3										
Aminoglycosides - Streptomycin	512	4	4																								4		
Amphenicols - Chloramphenicol	32	4	2															1	1					1	1				
Amphenicols - Florfenicol	8	4	0													1	1	2											
Fluoroquinolones - Ciprofloxacin	4	4	1													2	1		1										
Penicillins - Ampicillin	4	4	0													3	1												
Tetracyclines - Tetracycline	4	4	3											1							3								
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	4	0												3	1													
Ionophores - Salinomycin	4	4	1															3	1										
Macrolides - Erythromycin	4	4	4																					4					
Oxazolidines - Linezolid	4	4	0												1		3												
Streptogramins - Quinupristin/Dalfopristin	32	4	0																1	3									

Table Antimicrobial susceptibility testing of *E. faecalis* in Cattle (bovine animals) - calves (under or around 1 year) - veal calves (at or above 1 year) - quantitative data [Dilution method]

E. faecalis	Cattle (bovine animals) - calves (over 1 year) - veal calves	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	4	512
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Antimicrobial susceptibility testing of *Enterococcus* spp., unspecified in Cattle (bovine animals) - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

Enterococcus spp., unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals)																											
	unknown																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048		
Aminoglycosides - Gentamicin	32	48	0														5	18	25									
Aminoglycosides - Streptomycin	512	48	8																	4	26	5	1	4		8		
Amphenicols - Chloramphenicol	32	48	2															35	9	1	1	2						
Amphenicols - Florfenicol	8	48	0														24	24										
Fluoroquinolones - Ciprofloxacin	4	48	0													31	9	6	2									
Penicillins - Ampicillin	4	48	6														32	8	2	2	2				2			
Tetracyclines - Tetracycline	4	48	18													24	3	1	2	3	3	1	11					
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	48	3													17	23	3	2						3			
Ionophores - Salinomycin	4	48	4													20	19	5		1		3						
Macrolides - Erythromycin	4	48	15													24	6	3		1		2	12					
Oxazolidines - Linezolid	4	48	5													3	40		1		4							
Streptogramins - Quinupristin/Dalfopristin	1	48	39													9		8	21	6	1	3						

Enterococcus spp., unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals)	
	unknown	
	lowest	highest
Aminoglycosides - Gentamicin	4	512

Table Antimicrobial susceptibility testing of *Enterococcus* spp., unspecified in Cattle (bovine animals) - quantitative data [Dilution method]

Enterococcus spp., unspecified	Cattle (bovine animals)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E. faecium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals)																										
	unknown																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	32	29	0													6	13	10									
Aminoglycosides - Streptomycin	512	29	13																6	6	4					13	
Amphenicols - Chloramphenicol	32	29	5														17	3	4			5					
Amphenicols - Florfenicol	8	29	0													8	21										
Fluoroquinolones - Ciprofloxacin	4	29	4												4	13	6	2	4								
Penicillins - Ampicillin	4	29	4													17	7	1	2	1					1		
Tetracyclines - Tetracycline	4	29	19												10				1			18					
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	29	0												12	9	8										
Ionophores - Salinomycin	4	29	6												8	12	3	6									
Macrolides - Erythromycin	4	29	17												6	4	2	1	1	2		13					
Oxazolidinones - Linezolid	4	29	0												6	23											
Streptogramins - Quinupristin/Dalfopristin	1	29	28											1		3	13	11	1								

E. faecium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Cattle (bovine animals)	
	unknown	
	lowest	highest
Aminoglycosides - Gentamicin	4	512

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

E. faecium	Cattle (bovine animals)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Antimicrobial susceptibility testing of *E. faecalis* in *Gallus gallus* (fowl) - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E. faecalis	Gallus gallus (fowl)																										
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory																										
Antimicrobials:																											
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	32	81	3														20	58				2	1				
Aminoglycosides - Streptomycin	512	81	48																1	4	24	1	3		48		
Amphenicols - Chloramphenicol	32	81	8														18	52	2	1	6	2					
Amphenicols - Florfenicol	8	81	0												1	30	50										
Fluoroquinolones - Ciprofloxacin	4	81	3											9	52	13	4		3								
Penicillins - Ampicillin	4	81	9											59	6	7	5	1				3					
Tetracyclines - Tetracycline	4	81	73										7	1			1		11	61							
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	81	3										1	39	35	3			1	2							
Ionophores - Salinomycin	4	81	11										4	19	12	35	6		2	3							
Macrolides - Erythromycin	4	81	62										14	5		3	4	2	1	52							
Oxazolidines - Linezolid	4	81	5										1	42	32	1	1	1	3								
Streptogramins - Quinupristin/Dalfopristin	32	81	0										1		5	31	40	4									

E. faecalis	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
	lowest	highest
Antimicrobials:		
Aminoglycosides - Gentamicin	4	512

Table Antimicrobial susceptibility testing of *E. faecalis* in *Gallus gallus* (fowl) - quantitative data [Dilution method]

E. faecalis	Gallus gallus (fowl)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Antimicrobial susceptibility testing of *Enterococcus* spp., unspecified in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

Enterococcus spp., unspecified Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																										
	unknown																										
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	32	51	0														6	27	16	2							
Aminoglycosides - Streptomycin	512	51	25																3	14	5	3	1			25	
Amphenicols - Chloramphenicol	32	51	2														37	6	2	4			2				
Amphenicols - Florfenicol	8	51	0													28	22	1									
Fluoroquinolones - Ciprofloxacin	4	51	4											28	9	4	6	1	2	1							
Penicillins - Ampicillin	4	51	14												25	4	8	3	3				8				
Tetracyclines - Tetracycline	4	51	46											5					1	4	41						
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	51	2											22	15	8	4					2					
Ionophores - Salinomycin	4	51	4											2	8	22	15	2				2					
Macrolides - Erythromycin	4	51	32												15	2	2	1	2	1	4	24					
Oxazolidines - Linezolid	4	51	2												5	44				2							
Streptogramins - Quinupristin/Dalfopristin	1	51	48											2	1	7	27	9	2	3							

Table Antimicrobial susceptibility testing of *Enterococcus* spp., unspecified in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Enterococcus spp., unspecified	Pigs - breeding animals - raised under controlled housing conditions	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	unknown	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	4	512
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Antimicrobial susceptibility testing of *E. faecium* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E. faecium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory	Pigs - breeding animals - raised under controlled housing conditions																													
	unknown																													
	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048				
Aminoglycosides - Gentamicin	32	8	0														1	7												
Aminoglycosides - Streptomycin	512	8	1																		5	1		1		1				
Amphenicols - Chloramphenicol	32	8	1														4	3			1									
Amphenicols - Florfenicol	8	8	0													3	5													
Fluoroquinolones - Ciprofloxacin	4	8	1											1	5	1			1											
Penicillins - Ampicillin	4	8	0											6			2													
Tetracyclines - Tetracycline	4	8	4											3		1				1	3									
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	8	1										6	1			1													
Ionophores - Salinomycin	4	8	0											1	5	2														
Macrolides - Erythromycin	4	8	2											4		2					2									
Oxazolidines - Linezolid	4	8	1											1	6		1													
Streptogramins - Quinupristin/Dalfopristin	1	8	8													1	6		1											

Table Antimicrobial susceptibility testing of *E. faecium* in Pigs - breeding animals - raised under controlled housing conditions - quantitative data [Dilution method]

E. faecium	Pigs - breeding animals - raised under controlled housing conditions	
Isolates out of a monitoring program (yes/no)		
Number of isolates available in the laboratory	unknown	
Antimicrobials:	lowest	highest
Aminoglycosides - Gentamicin	4	512
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfénicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

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

Concentration (µg/ml), number of isolates with a concentration of inhibition equal to

E. faecalis	Cattle (bovine animals)																										
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory																										
Antimicrobials:	Cut-off value	N	n	<=0.002	<=0.004	0.008	0.015	0.016	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	>4096	1024	2048	
Aminoglycosides - Gentamicin	32	24	1														4	6	13					1			
Aminoglycosides - Streptomycin	512	24	15																1		2	4	1	1		15	
Amphenicols - Chloramphenicol	32	24	2													1	1	13	7				2				
Amphenicols - Florfenicol	8	24	0												3	13	8										
Fluoroquinolones - Ciprofloxacin	4	24	0												7	10	4	3									
Penicillins - Ampicillin	4	24	2													19	3					1		1			
Tetracyclines - Tetracycline	4	24	18												5	1				3	4	11					
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	4	24	0												2	10	12										
Ionophores - Salinomycin	4	24	1												6	12	2	3	1								
Macrolides - Erythromycin	4	24	15													6	2	1		1		1	13				
Oxazolidines - Linezolid	4	24	0												1	1	9	13									
Streptogramins - Quinupristin/Dalfopristin	32	24	0												3				5	10	5	1					

E. faecalis	Cattle (bovine animals)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
	lowest	highest
Antimicrobials:		
Aminoglycosides - Gentamicin	4	512

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

E. faecalis	Cattle (bovine animals)	
	Isolates out of a monitoring program (yes/no)	
	Number of isolates available in the laboratory	
Antimicrobials:	lowest	highest
Aminoglycosides - Streptomycin	8	1024
Amphenicols - Chloramphenicol	1	128
Amphenicols - Florfenicol	1	64
Fluoroquinolones - Ciprofloxacin	0.5	64
Penicillins - Ampicillin	1	128
Tetracyclines - Tetracycline	0.5	64
Glycopeptides (Cyclic peptides, Polypeptides) - Vancomycin	0.5	64
Ionophores - Salinomycin	0.5	64
Macrolides - Erythromycin	1	128
Oxazolidines - Linezolid	0.25	32
Streptogramins - Quinupristin/Dalfopristin	0.25	32

Table Cut-off values for antibiotic resistance of *E. faecalis* in Animals

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		512	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		32	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of *E. faecalis* in Feed

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		512	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		32	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of *E. faecalis* in Food

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		512	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		32	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of *E. faecium* in Animals

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		128	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		1	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of *E. faecium* in Feed

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		128	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		1	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of *E. faecium* in Food

Test Method Used		Standard methods used for testing		
		Standard	Concentration (microg/ml)	Zone diameter (mm)
			Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		128	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		1	
Tetracyclines	Tetracycline		2	

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1 ENTEROBACTER SAKAZAKII

4.1.1 General evaluation of the national situation

4.1.2 Cronobacter in foodstuffs

A. Enterobacter sakazakii in foodstuffs

Monitoring system

Sampling strategy

Tests for Enterobacter sakazakii were performed in foodstuff intended for special nutritional uses, infant formula and milk.

Frequency of the sampling

Samples are taken according to the national control program or in the frame of RASFF, complaints or suspicion.

Type of specimen taken

Foodstuff intended for special nutritional uses, infant formula and milk

Methods of sampling (description of sampling techniques)

The samples were taken according to Regulation (EC) No 2073/2005.

Definition of positive finding

To determine the conformity of a sample or a batch, the criteria laid down in the Regulation (EC) No 2073/2005 are applied.

Diagnostic/analytical methods used

The method is used according to Regulation (EC) No 2073/2005.

Measures in case of the positive findings or single cases

Measures to be taken in the case of a non-compliant result:

- Notification of the producer or importer
- Possibility of a counter analysis
- Destruction of the non compliant batch or single sample
- Further investigation: additional sampling, possible recall, RASFF, ...

Table Enterobacter sakazakii in food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Cronobacter	Cronobacter spp, unspecified
Infant formula - dried - at processing plant - Surveillance	TRA171	Unspecified	Official sampling	food sample		---	>400g	5	0	0
Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months - at retail - Surveillance	DIS862	Unspecified	Official sampling	food sample		---	200g	146	0	0
Milk from other animal species or unspecified - at hospital or care home - Surveillance (Milk prepared in bottles for infants)	DIS839	Unspecified	Official sampling	food sample		---	200 ml	108	0	0

4.2 HISTAMINE

4.2.1 General evaluation of the national situation

4.3 STAPHYLOCOCCAL ENTEROTOXINS

4.3.1 General evaluation of the national situation

4.3.2 Staphylococcal enterotoxins in foodstuffs

A. Staphylococcal enterotoxins in foodstuffs

Monitoring system

Sampling strategy

Tests of Staphylococcal enterotoxins were performed in samples with more than 10⁽⁶⁾ cfu/g of *Staphylococcus* present.

Frequency of the sampling

Samples are taken according to the national control program or in the frame of RASFF, complaints or suspicion.

Type of specimen taken

Cheeses

Methods of sampling (description of sampling techniques)

The samples were taken according to Regulation (EC) No 2073/2005.

Definition of positive finding

To determine the conformity of a sample or a batch, the criteria laid down in the Regulation (EC) No 2073/2005 are applied.

Table Staphylococcal enterotoxins in food

	Source of information	Sampling strategy	Sampler	Sample type	Sample Origin	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcal enterotoxins
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	2	0
Cheeses made from cows' milk - fresh - made from raw or low heat-treated milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	2	0
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	2	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	2	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - at processing plant	TRA133	Unspecified	Official sampling	food sample		Batch	>300g	2	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at farm	DPA008	Unspecified	Official sampling	food sample		Batch	200g	2	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at retail	DIS818	Unspecified	Official sampling	food sample		Batch	200g	1	0

5. FOODBORNE

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

A. Foodborne outbreaks

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

In Belgium different authorities are dealing with food-borne outbreaks:

- The Federal Agency for the Safety of the Food chain FASFC deals with safety of foodstuffs, epidemiological investigation on foodstuffs and animal health issues in case of a food-borne outbreak.
- The Communities (Flemisch, French and German speaking Community) are dealing with person related matters as human health and can start an epidemiological investigation by Public health medical inspectors in case of a food-borne outbreak.
- The Scientific Institute of Public Health IPH (National Reference Laboratory on Food-borne Outbreaks) analyses all suspected food samples, collects all data on food-borne outbreaks and gives scientific support to the FASFC officers and the Public Health Inspectors.

A national "Platform Food-borne outbreaks", approved by the National Conference of Ministers of Public Health, brings together the different competent authorities on food safety, animal health and public health. Furthermore in 2007, for a better communication, a protected web application was made available to exchange outbreak data and laboratory results in real time between the different authorities dealing with FBO. In this web-application a common file is created for each individual outbreak, and the data and laboratory results are shared between food inspectors and human health inspectors.

Data in this report came from the Federal Agency for the Safety of the Food Chain, the Flemish Community , the sentinel laboratories network for human microbiology, and the Federal Reference Centres for Food-borne outbreaks, for Clostridium botulinum, for Salmonella and Shigella and for Listeria.

Description of the types of outbreaks covered by the reporting:

A food-borne outbreak is defined as an incidence, observed under given circumstances, of two or more human cases of the same disease and/or infection, or a situation in which the observed number of human cases exceeds the expected number and where the cases are linked, or are probably linked, to the same food source (Directive 2003/99/EC, Article 2(d)). Data are collected from FASFC, the Flemish Community, the French community, the Brussels Common Community Committee, the sentinel laboratories network for human clinical microbiology, and the Federal Reference Centers for Food-borne outbreaks, Salmonella and Shigella, Listeria and C. botulinum.

The reporting includes both general and household outbreaks.

The causative agents covered are Salmonella spp., Shigella spp., Campylobacter spp., Verotoxigenic E.coli, Listeria monocytogenes, Clostridium botulinum, Staphylococcus aureus, Bacillus cereus, Clostridium perfringens, Giardia, Norovirus, enterotoxins of Staphylococcus aureus and Bacillus cereus and histamine

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

During 2011, a total of 281 outbreaks of food-borne infections and intoxications were recorded in Belgium. More than 1539 people were ill, at least 57 persons were hospitalized and 4 people died. The latter was due to a Listeria monocytogenes outbreak. The number of reported outbreaks increased as compared to previous years, which might be due to an adapted Outbreak investigation procedure and the FASFC and/or increased sensibility by consumers, especially after the death of an adolescent in a French fastfood restaurant and the German E. coli O104:H4 outbreak involving many deaths. The numbers of people

involved are similar as in previous years as is the percentage of hospitalized cases due to a collective food borne outbreak.

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

In 2011 in total 15 verified outbreaks were reported. In these outbreaks the causative agent was found in the implicated food and or it was clear by analytical epidemiology. All other outbreaks were classified as possible outbreaks were the agent was unknown or the agent could be only detected at human level.

Bacillus cereus was the most frequently detected food borne pathogen in eight food borne outbreaks and 87 persons became ill. In 7 outbreaks, an enterotoxin producing strain could be confirmed in the food and in one outbreak the emetic toxin producing strain could be isolated, which corresponds with the rapid onset of the vomiting symptoms observed in the patients. *Bacillus cereus* was also present in two co-infections. One co-infection occurred with *Clostridium perfringens* in a Chinese meal and the second was with *Staphylococcus aureus* in milk. Whilst enterotoxin production was observed for all isolates in both co-infections, one emetic strain was isolated in the latter outbreak.

The second most reported agent was thermotolerant *Campylobacter* (in 5 outbreaks) with 103 reported cases. *Campylobacter* was confirmed at human level for all 5 outbreaks. The suspected foodstuff for these outbreaks were bovine meat (2), a mixed meal (1) and well water (2), the latter from which in one outbreak *Campylobacter* could be isolated.

E. coli O157:H7 was responsible for 3 reported foodborne outbreaks where 8 cases showed typical symptoms such as (bloody) diarrhea and fever. Two persons also developed HUS. Raw bovine meat was suspected to be the food origin of these outbreaks.

Contaminated cheese was epidemiologically linked to a *Listeria monocytogenes* outbreak and led to 11 disseminated cases over the whole country. All patients were hospitalized and 4 of them died.

One outbreak was probably due to lectin presence in insufficiently cooked bean soup and was at the origin of 178 cases. In this outbreak, enterotoxin producing *Bacillus cereus* was also isolated from different soup samples.

Food borne viruses especially Norovirus was reported in only 2 outbreaks and caused 13 ill persons. In both outbreaks Norovirus was detected at human level, including the food handler of a Chinese restaurant for one outbreak. The other outbreak concerned disseminated cases and was presumably caused by contaminated tap water.

Salmonella was responsible for only 2 outbreaks where the food origin were probably eggs and bovine meat products. *Shigella* is epidemiologically linked to an outbreak where this pathogen was isolated within the foodhandlers family that prepared a barbecue meal (including fresh vegetables). Travelling to a foreign country of the foodhandler family was followed by a gastro-enteritis. In total 37 cases out of 80 exposed persons suffered from shigellosis.

Coagulase positive *Staphylococcus* spp caused 2 of the outbreaks in 2011. Enterotoxin producing strains were detected in leftovers of lasagna and chocolat mousse.

In one outbreak histamine was responsible for 3 ill persons after the consumption of butterfish. High levels of histamine were detected in fish of the same batch.

In 90% of the outbreaks no causative agent could be identified. An important reason for this is the absence of leftovers of the suspected meal in most of those outbreaks. Only in 40% of the outbreaks, samples (human and/or food) were send for analysis of which 10% resulted in the detection of a causative

pathogen.

Most food-borne outbreaks (50%) were due to the consumption of meals composed of different ingredients. Meat and meat based products were responsible for 17 % of the outbreaks. In 8% of the outbreaks the suspected food was unknown.

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

In most food-borne outbreaks (99%) the setting was known. Restaurants and take away or fast food outlets outlets were the most important location of exposure, being the setting of 51 % and 14%, respectively, of food-borne outbreaks in Belgium in 2011. Catering at work or institutional catering are reported in respectively 6% and 2 % of the food-borne outbreaks. 20% of the outbreaks happened at home.

Descriptions of single outbreaks of special interest

During the summer of 2011, 64 out of 130 exposed children at a youth camp became ill. The children arrived at the camp place on July 14th, and the first cases were reported on July 21st. The symptoms reported were fever, vomiting and diarrhea and *Campylobacter jejuni* was isolated from the stool of 2 children. The evening before the first cases were reported, the children themselves prepared turkey meat on a camp fire. Undercooked turkey meat was therefore suspected to be at the origin of the *Campylobacter* outbreak, but there were no leftovers. On the other hand, water originating from a water source in the fields nearby the camp place was supplied by the farmer and was considered to be for 'all use'. The water was transported with the water tank which was also used by the farmer to provide cattle from water and collected in a water tank at the camp location. After the first cases were reported, tap water from in the stables was provided to the children. Water samples from 3 different locations were send for analysis: water from the water source in the field, water from a dirty hose connected to the transport tank and tap water from a dirty hose connected to the sink at the stable. *Campylobacter jejuni* was detected in the first two water samples.

The antibiotic resistance of the strain isolated from the water samples corresponded to that observed in the human isolates.

There were different reasons for the farmer to question the results obtained from the water and that it would be at the origin of this outbreak.

Firstly, the water of the source was tested one year before and stated as 'safe for all use'. Secondly, no cattle was present during the whole month of July. And thirdly, at a youth camp which took place in the beginning of July, no cases were reported. However, the week before the outbreak, it started raining which might have caused cattle feces contaminated with *Campylobacter* to get into the water source, or which made that the water in the source was stirred, allowing the pathogen to spread in the water.

Altogether, the bad hygiene practices from the farmer using contaminated water, dirty hoses and a dirty transport tank was probably at the origin of this waterborne *Campylobacter* outbreak.

Control measures or other actions taken to improve the situation

Logistic slaughtering is applied for poultry which means that poultry with a *Salmonella*-free certificate are slaughtered before other poultry. The vaccination of laying hens against salmonellosis, started in 2003 and is mandatory for *Salmonella enteritidis* and is strongly recommended for *Salmonella typhimurium*.

Table Foodborne Outbreaks: summarised data

Weak evidence or no vehicle outbreaks						
	Number of outbreaks	Human cases	Hospitalized	Deaths	Strong evidence Number of Outbreaks	Total number of outbreaks
Salmonella - S. Typhimurium	0	unknown	unknown	unknown	0	0
Salmonella - S. Enteritidis	1	4	2	0	0	1
Salmonella - Other serovars	1	3	0	0	0	1
Campylobacter	3	35	1	0	2	5
Listeria - Listeria monocytogenes	0	unknown	unknown	unknown	1	1
Listeria - Other Listeria	0	unknown	unknown	unknown	0	0
Yersinia	0	unknown	unknown	unknown	0	0
Escherichia coli, pathogenic - Verotoxigenic E. coli (VTEC)	3	8	6	0	0	3
Bacillus - B. cereus	2	9	9	0	9	11
Bacillus - Other Bacillus	0	unknown	unknown	unknown	0	0
Staphylococcal enterotoxins	0	unknown	unknown	unknown	2	2
Clostridium - Cl. botulinum	0	unknown	unknown	unknown	0	0
Clostridium - Cl. perfringens	0	unknown	unknown	unknown	0	0

	Weak evidence or no vehicle outbreaks					Total number of outbreaks
	Number of outbreaks	Human cases	Hospitalized	Deaths	Strong evidence Number of Outbreaks	
Clostridium - Other Clostridia	0	unknown	unknown	unknown	0	0
Other Bacterial agents - Brucella	0	unknown	unknown	unknown	0	0
Other Bacterial agents - Shigella	0	unknown	unknown	unknown	1	1
Other Bacterial agents - Other Bacterial agents	0	unknown	unknown	unknown	0	0
Parasites - Trichinella	0	unknown	unknown	unknown	0	0
Parasites - Giardia	0	unknown	unknown	unknown	0	0
Parasites - Cryptosporidium	0	unknown	unknown	unknown	0	0
Parasites - Anisakis	0	unknown	unknown	unknown	0	0
Parasites - Other Parasites	0	unknown	unknown	unknown	0	0
Viruses - Norovirus	2	13	0	0	0	2
Viruses - Hepatitis viruses	0	unknown	unknown	unknown	0	0
Viruses - Other Viruses	0	unknown	unknown	unknown	0	0
Other agents - Histamine	0	unknown	unknown	unknown	1	1
Other agents - Marine biotoxins	0	unknown	unknown	unknown	0	0
Other agents - Other Agents	0	unknown	unknown	unknown	0	0

Weak evidence or no vehicle outbreaks						
	Number of outbreaks	Human cases	Hospitalized	Deaths	Strong evidence Number of Outbreaks	Total number of outbreaks
Unknown agent	253	1074	21	0	0	253

Table Foodborne Outbreaks: detailed data for *Bacillus*

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B. cereus**Value**

FBO Code	
Number of outbreaks	1
Number of human cases	24
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Bakery products
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	General
Setting	Disseminated cases
Place of origin of problem	Retail sale outlet
Origin of food vehicle	Unknown
Contributory factors	Unknown
Mixed Outbreaks (Other Agent)	
Additional information	

B. cereus

Value

FBO Code	
Number of outbreaks	1
Number of human cases	8
Number of hospitalisations	1
Number of deaths	0
Food vehicle	Mixed food
More food vehicle information	chinese meal
Nature of evidence	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans
Outbreak type	Household / domestic kitchen
Setting	Household / domestic kitchen
Place of origin of problem	Take-away or fast-food outlet
Origin of food vehicle	Unknown
Contributory factors	Unknown
Mixed Outbreaks (Other Agent)	Clostridium perfringens
Additional information	Both C. perfringens and B. cereus detected in food vehicle and human cases

B. cereus

Value

FBO Code	
Number of outbreaks	1
Number of human cases	3
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Mixed food
More food vehicle information	stew with vegetables
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	General
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Restaurant/Café/Pub/Bar/Hotel/Catering service
Origin of food vehicle	Unknown
Contributory factors	Unknown
Mixed Outbreaks (Other Agent)	
Additional information	

B. cereus

Value

FBO Code	
Number of outbreaks	1
Number of human cases	2
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Mixed food
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	Household / domestic kitchen
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Restaurant/Café/Pub/Bar/Hotel/Catering service
Origin of food vehicle	Unknown
Contributory factors	Other contributory factor
Mixed Outbreaks (Other Agent)	
Additional information	

B. cereus

Value

FBO Code	
Number of outbreaks	1
Number of human cases	178
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Vegetables and juices and other products thereof
More food vehicle information	bean soup
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	General
Setting	School, kindergarten
Place of origin of problem	Canteen or workplace catering
Origin of food vehicle	Unknown
Contributory factors	Inadequate heat treatment
Mixed Outbreaks (Other Agent)	lectins
Additional information	Only human cases reported for batch of insufficiently boiled soup

B. cereus

Value

FBO Code	
Number of outbreaks	1
Number of human cases	25
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Other, mixed or unspecified poultry meat and products thereof
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	General
Setting	Canteen or workplace catering
Place of origin of problem	Canteen or workplace catering
Origin of food vehicle	Unknown
Contributory factors	Unknown
Mixed Outbreaks (Other Agent)	
Additional information	

B. cereus

Value

FBO Code	
Number of outbreaks	1
Number of human cases	4
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Pig meat and products thereof
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	General
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Restaurant/Café/Pub/Bar/Hotel/Catering service
Origin of food vehicle	Unknown
Contributory factors	Other contributory factor
Mixed Outbreaks (Other Agent)	
Additional information	

B. cereus

Value

FBO Code	
Number of outbreaks	1
Number of human cases	20
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Other, mixed or unspecified poultry meat and products thereof
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	General
Setting	Canteen or workplace catering
Place of origin of problem	Restaurant/Café/Pub/Bar/Hotel/Catering service
Origin of food vehicle	Unknown
Contributory factors	Unknown
Mixed Outbreaks (Other Agent)	
Additional information	

B. cereus

Value

FBO Code	
Number of outbreaks	1
Number of human cases	3
Number of hospitalisations	3
Number of deaths	0
Food vehicle	Milk
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	Household / domestic kitchen
Setting	Household / domestic kitchen
Place of origin of problem	Unknown
Origin of food vehicle	Domestic market
Contributory factors	Cross-contamination
Mixed Outbreaks (Other Agent)	coagulase positive <i>Staphylococcus aureus</i> detected in food vehicle and in humans
Additional information	

Table Foodborne Outbreaks: detailed data for Campylobacter

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Campylobacter spp., unspecified**Value**

FBO Code	
Number of outbreaks	1
Number of human cases	4
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Broiler meat (<i>Gallus gallus</i>) and products thereof
More food vehicle information	
Nature of evidence	Descriptive epidemiological evidence
Outbreak type	Household / domestic kitchen
Setting	Household / domestic kitchen
Place of origin of problem	Unknown
Origin of food vehicle	Unknown
Contributory factors	Unknown
Mixed Outbreaks (Other Agent)	
Additional information	

C. jejuni

Value

FBO Code	
Number of outbreaks	1
Number of human cases	64
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Tap water, including well water
More food vehicle information	
Nature of evidence	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans
Outbreak type	General
Setting	Temporary mass catering (fairs, festivals)
Place of origin of problem	Water source
Origin of food vehicle	Unknown
Contributory factors	Unprocessed contaminated ingredient
Mixed Outbreaks (Other Agent)	
Additional information	

Table Foodborne Outbreaks: detailed data for Listeria

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L. monocytogenes - L. monocytogenes serovar 1/2a

Value

FBO Code	
Number of outbreaks	1
Number of human cases	11
Number of hospitalisations	11
Number of deaths	4
Food vehicle	Cheese
More food vehicle information	
Nature of evidence	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans
Outbreak type	General
Setting	Disseminated cases
Place of origin of problem	Unknown
Origin of food vehicle	Domestic market
Contributory factors	Cross-contamination
Mixed Outbreaks (Other Agent)	
Additional information	

Table Foodborne Outbreaks: detailed data for Other Bacterial agents

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Shigella - S. sonnei**Value**

FBO Code	
Number of outbreaks	1
Number of human cases	37
Number of hospitalisations	2
Number of deaths	0
Food vehicle	Buffet meals
More food vehicle information	
Nature of evidence	Descriptive epidemiological evidence
Outbreak type	General
Setting	Temporary mass catering (fairs, festivals)
Place of origin of problem	Temporary mass catering (fairs, festivals)
Origin of food vehicle	Unknown
Contributory factors	Infected food handler
Mixed Outbreaks (Other Agent)	
Additional information	

Table Foodborne Outbreaks: detailed data for Other agents

Please use CTRL for multiple selection fields

Histamine**Value**

FBO Code	
Number of outbreaks	1
Number of human cases	3
Number of hospitalisations	1
Number of deaths	0
Food vehicle	Fish and fish products
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	Household / domestic kitchen
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Restaurant/Café/Pub/Bar/Hotel/Catering service
Origin of food vehicle	Unknown
Contributory factors	Unprocessed contaminated ingredient
Mixed Outbreaks (Other Agent)	
Additional information	

Table Foodborne Outbreaks: detailed data for Staphylococcal enterotoxins

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Enterotoxin, unspecified**Value**

FBO Code	
Number of outbreaks	1
Number of human cases	5
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Mixed food
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	General
Setting	Canteen or workplace catering
Place of origin of problem	Canteen or workplace catering
Origin of food vehicle	Unknown
Contributory factors	Unknown
Mixed Outbreaks (Other Agent)	
Additional information	

Enterotoxin B

Value

FBO Code	
Number of outbreaks	1
Number of human cases	2
Number of hospitalisations	0
Number of deaths	0
Food vehicle	Mixed food
More food vehicle information	
Nature of evidence	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent
Outbreak type	Household / domestic kitchen
Setting	Household / domestic kitchen
Place of origin of problem	Unknown
Origin of food vehicle	Unknown
Contributory factors	Unknown
Mixed Outbreaks (Other Agent)	
Additional information	