



FRANCE

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

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

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

IN 2007

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **France**

Reporting Year: **2007**

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/99/EC¹. 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 France during the year 2007. 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.

¹ Directive 2003/99/EC of the European Parliament and of the Council of 12 December 2003 on the monitoring of zoonoses and zoonotic agents, amending Decision 90/424/EEC and repealing Council Directive 92/117/EEC, OJ L 325, 17.11.2003, p. 31

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1. ANIMAL POPULATIONS

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

A. Information on susceptible animal population

Sources of information:

The sources of data are the "Central Service of the Statistical Surveys and Studies" and the "Food Safety Departement" of the French Ministry of Agriculture and Fisheries.

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

The numbers of livestock and holdings indicated in the table correspond to animals present at the time of 1 November 2005 for the bovine, ovine, caprine and porcine species. Sources are the "surveys on livestock", surveys imposed by the Community legislation, the overall results of which are forwarded to Eurostat.

For broilers, the information of livestock comes from the survey on the "structure of the farms", which also are a survey answering Community legislation and which take place in 2003, 2005 and 2007 between the two censuses of 2000 and 2010. The raised number of broilers corresponds to those counted the day of the passage of the investigator and not those of a homogeneous reference date.

The numbers of slaughtered animals and the detailed number of flocks of fowls, distributed according to the type of birds and the production sectors, are related to 2005. The numbers of slaughtered animals indicated in the table come from the "Central Service of the Statistical Surveys and Studies", whereas detailed numbers of fowl flocks come from the "Food Safety Departement".

Additional information

Further information is given in the "Central Service of the Statistical Surveys and Studies" web site: [http:// www.agreste.agriculture.gouv.fr/](http://www.agreste.agriculture.gouv.fr/)

Table Susceptible animal populations

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
			Year*		Year*		Year*		Year*
Cattle (bovine animals)	dairy cows and heifers					5793339		91951	
	mixed herds					3563039		24687	
	meat production animals					9192517		117054	
	calves (under 1 year)			1564549		5070274			
	in total			5021289		19123724		208274	
Deer	farmed - in total			5005				409	2005
Ducks	meat production flocks			43347776					
	foie gras production flocks			35469169					
	in total			78816944		26092173	2005		
Gallus gallus (fowl)	capon production flocks			2786598					
	broilers			700153716					
	elite breeding flocks for egg production line - during rearing period (1)	14				103322		3	
	elite breeding flocks for egg production line - during production period (2)	33				156184		6	
	elite breeding flocks for meat production line - during production period	124				733138		51	
	elite breeding flocks for meat production line - during rearing period (3)	190				1168184		26	
	laying hens - during rearing period	2115				45026972		504	
	laying hens - during production period	2960				43079911		1995	
	parent breeding flocks for egg production line - during production period	114				1070013		74	
	parent breeding flocks for egg production line - during rearing period	97				1091278		28	
	parent breeding flocks for meat production line - during rearing period	855				8394264		185	
	parent breeding flocks for meat production line - during production period	906				7399142		495	

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	unspecified - before slaughter (4)			37226553				
	in total			740166867		200186122		
Geese	foie gras production flocks			344305				
	meat production flocks			134904				
	in total			479209		742947	2005	17758 2005
Goats	animals under 1 year			759766				
	milk goats					1144756		
	in total			885589		1250229		17945
Pigs	breeding animals			471395		1234610		
	fattening pigs			24457730		8267431		
	fattening pigs - unspecified - piglets			319468		5451390		
	in total			25248593		14970073		36403
Sheep	milk ewes					1653712		
	meat production animals					5058426		
	animals under 1 year (lambs)			4578251		1572372		
	in total			5177289		8284509		65436
Solipeds, domestic	horses - in total			17744		402149	2005	62508 2005
Turkeys	in total			70042228		27861696	2005	15063 2005
Wild boars	farmed - in total			1074				
Rabbits	in total			39514279				
Quails	in total			48834738				
Pigeons	in total			3447835				
Pheasants	in total			67952				
Guinea fowl	in total			28086415				

(1): Elite = Elite + grand parents

(2): Elite = elite + grand parents

(3): Elite = elite + grand parents

(4): culled laying hens and breeders

2. INFORMATION ON SPECIFIC ZOOSES 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. Salmonellosis in humans

2.1.3. Salmonella in foodstuffs

2.1.4. Salmonella in animals

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

Monitoring system

Sampling strategy

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

In the frame of the national control programme of Salmonella in Gallus Gallus, testing of breeder flocks is mandatory. Sampling programme, including the type and the number of samples and the frequency of sampling, is specified in legal texts transposing the regulations (CE) n°2160/ 2003 and n°1003/ 2005. However, complementary samples are added in France, in order to increase the sensitivity.

All the breeding flocks with more than 250 birds are tested for S. Enteritidis, S. Hadar, S. Infantis, S. Typhimurium and S. Virchow.

According to the regulation n°1168/ 2006, all the flocks with more than 250 laying hens are tested for S. Enteritidis and S. Typhimurium.

Frequency of the sampling

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

At the age of 0 weeks

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

At the age of 24, 38, 54 weeks and within 8 weeks before slaughter weeks

Laying hens: Day-old chicks

At the age of 0 weeks

Laying hens: Rearing period

At the age of 4 weeks and 2 weeks before moving weeks

Laying hens: Production period

At the age of 24 weeks and every 15 weeks

Laying hens: Before slaughter at farm

At the age of 10 weeks before slaughter for standard production, 6 weeks before slaughter for alternative production 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

Other: boot swabs and chiffs

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

Other: boot swabs and chiffs at farm, internal lining of hatching boxes/ chiffs at hatchery

Laying hens: Day-old chicks

Internal linings of delivery boxes

Laying hens: Rearing period

Other: boot swabs and chiffs

Laying hens: Production period

Other: faeces and chiffs and feed samples

Laying hens: Before slaughter at farm

Other: faeces and chiffs

Case definition

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

positivity with SE, SH, SI, ST, SV

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

positivity with SE, SH, SI, ST, SV confirmed once (2 confirmation tests)

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

positivity with SE, SH, SI, ST, SV confirmed once (2 confirmation tests)

Laying hens: Day-old chicks

positivity with SE, SH, SI, ST, SV

Laying hens: Rearing period

positivity with SE or ST (2 confirmation tests)

Laying hens: Production period

positivity with SE or ST (2 confirmation tests)

Laying hens: Before slaughter at farm

positivity with SE or ST (2 confirmation tests)

Vaccination policy

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

Vaccination is forbidden

Laying hens flocks

Vaccination is authorised

Other preventive measures than vaccination in place

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

"Charte Sanitaire": the respect of biosecurity measures is checked by Competent Authority. Financial compensation is attributed in case of contamination only for flocks under "Charte Sanitaire".

Laying hens flocks

"Charte Sanitaire": the respect of biosecurity measures is checked by Competent Authority. Financial compensation is attributed in case of contamination only for flocks under "Charte Sanitaire".

Control program/ mechanisms

The control program/ strategies in place

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

Early elimination of the positive flocks, elimination of hatching eggs, cleaning and disinfection mandatory

Laying hens flocks

elimination/ treatment of eggs, cleaning and disinfection mandatory

Notification system in place

Notification to the Competent Authority (by lab, farmers, or any stakeholder) mandatory

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

Decrease of the infection by *S. Enteritidis* in laying hens flocks; only one positive breeding flock (empty house)

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

Monitoring system

Sampling strategy

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

In the frame of the national control programme of Salmonella in Gallus Gallus, testing of breeder flocks is mandatory. Sampling programme, including the type and the number of samples and the frequency of sampling, is specified in legal texts transposing the regulations (CE) n°2160/ 2003 and n°1003/ 2005. However, complementary samples are added in France, in order to increase the sensitivity. All the breeding flocks with more than 250 birds are tested for *S. Enteritidis*, *S. Hadar*, *S. Infantis*, *S. Typhimurium* and *S. Virchow*.

Broiler flocks

The monitoring strategy will be set according to regulation n°646/ 2007 in order to begin on the 1/ 01/ 09.

Frequency of the sampling

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

At the age of 0 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): Production period

Other: boot swabs and chiffs

Case definition

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

Positivity with SE, SH, SI, ST, SV

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

Positivity with SE, SH, SI, ST, SV confirmed once (2 confirmation tests)

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

Positivity with SE, SH, SI, ST, SV confirmed once (2 confirmation tests)

Vaccination policy

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

Vaccination of elite and grand parent flocks is forbidden; vaccination of parent flocks with inactivated vaccines is authorised

Control program/ mechanisms

The control program/ strategies in place

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

Early elimination of positive breeder flocks, elimination of hatching eggs, cleaning/ disinfection mandatory

Notification system in place

Notification is mandatory

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

Prevalence in breeding flocks is decreasing

Table Salmonella in breeding flocks of Gallus gallus

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	S. Hadar	S. Infantis	S. Virchow	Salmonella spp., unspecified
Gallus gallus (fowl)										
elite breeding flocks for egg production line										
day-old chicks	CCA	flock	14	0						
during rearing period	CCA	flock	14	0						
during production period	CCA	flock	33	0						
parent breeding flocks for egg production line										
day-old chicks	CCA	flock	97	0						
during rearing period	CCA	flock	97	0						
during production period	CCA	flock	114	1	1					
elite breeding flocks for meat production line										
day-old chicks	CCA	flock	190	0						
during rearing period	CCA	flock	190	3	2	0			1	
during production period	CCA	flock	124	0						
parent breeding flocks for meat production line										
day-old chicks	CCA	flock	855	0						
during rearing period	CCA	flock	855	3	1	2	1			
during production period	CCA	flock	906	6	3		2	1		

Footnote

For each production line, "elite" and "grand parents" and mixed.

The positive case at parent level of egg production line was an empty house.

One flock of parent breeders of meat production line was positive for either Typhimurium and Hadar

Table Salmonella in other poultry

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Gallus gallus (fowl)							
laying hens							
during rearing period	CCA	flock	2115	14	7	7	
during production period	CCA	flock	2960	114	81	33	

Table Salmonella in other birds

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Indiana	S. Virchow	S. Coeln

Footnote

SAGIR is the national network for wild animal sanitary surveillance. Carcasses found in the wildlife by hunters or agents in charge of environment matters are brought to departmental laboratories. Validated results of analysis are input in a national database managed by AFSSA (LERRPAS). Data available do not allow to establish prevalences, as there is no idea on the total number of analysis performed.

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Nagoya	S. enterica subsp. arizonae

Footnote

SAGIR is the national network for wild animal sanitary surveillance. Carcasses found in the wildlife by hunters or agents in charge of environment matters are brought to departmental laboratories. Validated results of analysis are input in a national database managed by AFSSA (LERRPAS). Data available do not allow to establish prevalences, as there is no idea on the total number of analysis performed.

2.1.5. Salmonella in feedingstuffs

Table Salmonella in feed material of animal origin

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of marine animal origin								
fish meal	CCA	batch	25g	53	0			

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Venezuela	S. Tennessee	S. Lexington	S. Senftenberg
Feed material of cereal grain origin	CCA	batch	25g	10	1				1			
	CCA	batch	25g	25	0							
	CCA	batch	25g	16	0							
	CCA	batch	25g	1	0							
	CCA	batch	25g	9	0							
	CCA	batch	25g									
Feed material of oil seed or fruit origin	CCA	batch	25g	1	0							
	CCA	batch	25g	68	3			1		1		1
	CCA	batch	25g	3	0							
	CCA	batch	25g	115	2			1		1		
	CCA	batch	25g	1	0							
	CCA	batch	25g	37	1							1
	CCA	batch	25g									
	CCA	batch	25g									

[illegible]

Table Salmonella in compound feedingstuffs (Part A)

	Source of information																S. Barmbek	
	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. 1,3,19:z:-	S. Rissen	S. Montevideo	S. Indiana	S. Mbandaka	S. Yoruba	S. Anatum	S. Kotbus	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified	S. Cerro	S. Hadar	S. Derby
Compound feedingstuffs for cattle	CCA	batch	25g	13	0													
Compound feedingstuffs for pigs	CCA	batch	25g	23	0													
	Feed operator:	batch		443	5	1	1	1							1			
- at processing plant - Surveillance	Feed operator:	batch		131	1										1			
Compound feedingstuffs for poultry (non specified)	CCA	batch	25g	64	0													
	Feed operator:	batch		286	2				1									
Compound feedingstuffs for poultry -breeders																		

Footnote

S. 1,3,19:z:- = S. 1,3,19:z:27

Samples by feed operators have different weights: 100g, 50g or 25g. It was impossible to distinguish the results according to the sample weight.

Table Salmonella in compound feedingstuffs (Part B)

	S. Infantis	S. Oranienburg	S. Agona	S. Meleagridis	S. Tennessee	S. Senftenberg	S. Livingstone	S. Veneziana
Compound feedingstuffs for cattle								
final product								
Compound feedingstuffs for pigs								
final product								
- at processing plant - Surveillance								
- at processing plant - Surveillance (Piglets)								1
Compound feedingstuffs for poultry (non specified)								
final product								
- at processing plant - Surveillance (Poultry for meat production other than broilers)				1				
Compound feedingstuffs for poultry -breeders								
final product								
- at processing plant - Surveillance								
Compound feedingstuffs for poultry - laying hens								
final product								

Footnote

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2.1.6. Salmonella serovars and phagetype distribution

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

2.1.7. Antimicrobial resistance in Salmonella isolates

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

A. Antimicrobial resistance in Salmonella in cattle

Sampling strategy used in monitoring

Frequency of the sampling

see Antimicrobial resistance in Salmonella in poultry

B. Antimicrobial resistance in Salmonella in pigs

Sampling strategy used in monitoring

Frequency of the sampling

see Antimicrobial resistance in Salmonella in poultry

C. Antimicrobial resistance in Salmonella in poultry

Sampling strategy used in monitoring

Type of specimen taken

The Salmonella strains are isolated from 3 different sectors: (i) rearing or wild animals and their environment, (ii) all along the food hygiene chain or (iii) from the natural ecosystem.

Methods used for collecting data

A passive monitoring programme of antimicrobial resistance in Salmonella enterica, named "Salmonella network" is organised. The Salmonella network is a monocentric one designed for general monitoring of strains which are collected with relative epidemiological data from veterinary laboratories. Serotyping and antimicrobial resistance are commonly performed on isolates collected.

In 2007, 148 private or public laboratories, based on a volunteer participation, provided data to the managerial team in Afssa-LERQAP:

- 14048 data were collected by the network,
- 6315 strains collected have been serotyped by Afssa 7272 were serotyped by the partner laboratories
- among the 6315 collected strains, 3731 independent isolates have been tested for antimicrobial resistance. Isolates are considered to be dependent if they arrive in the same parcel, belong to the same serotype and share similar epidemiological data such as product description and geographical origin.

Laboratory methodology used for identification of the microbial isolates

Salmonella isolates are serotyped by slide agglutination with antisera.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Susceptibility to beta-lactams, aminoglycosides, quinolones, chloramphenicol, tetracyclines, and sulphamethoxazole-trimethoprim is studied using a standard disk diffusion method on Mueller-Hinton agar plates.

Breakpoints used in testing

The panel of antibiotics tested (load, breakpoints (mm)), was recommended by the "Comité de l'Antibiogramme de la Société Française de Microbiologie" (CA-SFM) in 2007:

- Ampicillin (10µg, 19-14)
- Amoxicillin + clavulanic acid (20µg + 10µg, 21-14)
- Cephalothin (30µg, 18-12)
- Cefotaxime (30µg, 21-15)
- Streptomycin (10IU, 15-13)
- Gentamicin (10IU, 18-16)
- Kanamycin (30IU, 17-15)
- Chloramphenicol (30µg, 23-19)
- Tetracycline (30IU, 19-17)
- Sulfamethoxazole + trimethoprim (23.75µg + 1.25µg, 16-10)
- Sulphonamides (200µg, 17-12)
- Nalidixic acid (30µg, 20-15)
- Ofloxacin (5µg, 25-22)
- Enrofloxacin (5µg, 22-17)
- Colistin (50µg, 15)

Zone diameters were read using the automated scanner Osiris (Bio-Rad).

D. Antimicrobial resistance in Salmonella in foodstuff derived from cattle

Sampling strategy used in monitoring

Frequency of the sampling

see Antimicrobial resistance in Salmonella in poultry

E. Antimicrobial resistance in Salmonella in foodstuff derived from pigs

Sampling strategy used in monitoring

Frequency of the sampling

see Antimicrobial resistance in Salmonella in poultry

F. Antimicrobial resistance in Salmonella in foodstuff derived from poultry

Sampling strategy used in monitoring

Frequency of the sampling

see Antimicrobial resistance in Salmonella in poultry

Table Antimicrobial susceptibility testing of S. Derby in Turkeys - at farm - quantitative data [Diffusion method]

S. Derby																																					
Turkeys - at farm																																					
Isolates out of a monitoring programme	no																																				
	33																																				
Number of isolates available in the laboratory																																					
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																					
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35				
Aminoglycosides																																					
Gentamicin	15	33	1			1														1	8	13	7	3													
Streptomycin	12	33	31	31							2																										
Amphenicols																																					
Chloramphenicol	18	33	0																		3	4	15	10	1												
Cephalosporins																																					
Cefotaxim	14	33	0																									2	5	12	0	0	14				
Fluoroquinolones																																					
Enrofloxacin	16	33	0																							2	8	9	8	6							
Penicillins																																					
Ampicillin	13	33	5	5																1	2	12	4	6	2	1											
Quinolones																																					
Nalidixic acid	14	33	0																5	15	8	3	2														
Sulfonamides																																					
Sulfonamide	11	33	32	31	0	0	1																1														
Tetracyclines																																					
Tetracyclin	16	33	32	32															1																		

Table Antimicrobial susceptibility testing in S. Derby

n = Number of resistant isolates				
	S. Derby			
	Pigs		Turkeys	
	no		no	
Isolates out of a monitoring programme				
Number of isolates available in the laboratory	82		33	
Antimicrobials:	N	n	N	n
Aminoglycosides				
Gentamicin	82	0	33	1
Streptomycin	82	68	33	31
Amphenicols				
Chloramphenicol	82	0	33	0
Cephalosporins				
Cefotaxim	82	0	33	0
Fluoroquinolones				
Enrofloxacin	82	0	33	0
Fully sensitive	82	12	33	1
Penicillins				
Ampicillin	82	0	33	5
Quinolones				
Nalidixic acid	82	0	33	0
Resistant to 1 antimicrobial	82	7	33	0
Resistant to 2 antimicrobials	82	9	33	1
Resistant to 3 antimicrobials	82	52	33	26
Resistant to 4 antimicrobials	82	2	33	2
Resistant to >4 antimicrobials	82	0	33	3
Sulfonamides				
Sulfonamide	82	59	33	32
Tetracyclines				
Tetracyclin	82	59	33	32

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[illegible]

Table Antimicrobial susceptibility testing of S. Derby in Meat from broilers (Gallus gallus) - at slaughterhouse - quantitative data [Diffusion method]

S. Derby																																					
Meat from broilers (Gallus gallus) - at slaughterhouse																																					
Isolates out of a monitoring programme	no																																				
	11																																				
Number of isolates available in the laboratory																																					
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																					
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35				
Aminoglycosides																																					
Gentamicin	15	11	0																2	3	3	2	1														
Streptomycin	12	11	7	6	0	0	0	0	0	1	0	0	0	4																							
Amphenicols																																					
Chloramphenicol	18	11	0															1	0	0	2	3	3	2													
Cephalosporins																																					
Cefotaxim	14	11	0																																		
Fluoroquinolones																																					
Enrofloxacin	16	11	0																																		
Penicillins																																					
Ampicillin	13	11	1	1																1	2	1	4	1	1												
Quinolones																																					
Nalidixic acid	14	11	0															1	4	3	2	1															
Sulfonamides																																					
Sulfonamide	11	11	6	6													1	0	0	1	1	0	0	1	1												
Tetracyclines																																					
Tetracyclin	16	11	6	6														1	1	2	1																

Table Antimicrobial susceptibility testing of S. Derby in Meat from pig - at slaughterhouse - quantitative data [Diffusion method]

S. Derby																																					
Meat from pig - at slaughterhouse																																					
Isolates out of a monitoring programme	no																																				
	116																																				
Number of isolates available in the laboratory																																					
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																					
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35				
Aminoglycosides																																					
Gentamicin	15	116	0																2	8	27	45	25	9													
Streptomycin	12	116	104	67	0	0	3	4	14	16	8	4																									
Amphenicols																																					
Chloramphenicol	18	116	0																5	7	27	38	21	15	0	0	0	1	0	0	0	0	2				
Cephalosporins																																					
Cefotaxim	14	116	0																								2	13	28	40	0	0	33				
Fluoroquinolones																																					
Enrofloxacin	16	116	0												1	3	0	0							1	7	10	31	34	18	9	0	0	2			
Penicillins																																					
Ampicillin	13	116	0																3	8	18	28	28	27	3	0	0	1									
Quinolones																																					
Nalidixic acid	14	116	4	4											1	0	4	41	34	20	9	2	1														
Sulfonamides																																					
Sulfonamide	11	116	71	71									1	0	0	1	4	6	6	7	5	5	5	3	0	1	0	0	1	0	0	0	0				
Tetracyclines																																					
Tetracyclin	16	116	68	65	0	0	1							2	7	12	13	13	2	1																	

Table Antimicrobial susceptibility testing in S. Derby

n = Number of resistant isolates				
	S. Derby			
	Meat from broilers (Gallus gallus) - at slaughterhouse		Meat from pig - at slaughterhouse	
Isolates out of a monitoring programme	no		no	
Number of isolates available in the laboratory	11		116	
Antimicrobials:	N	n	N	n
Aminoglycosides				
Gentamicin	11	0	116	0
Streptomycin	11	7	116	104
Amphenicols				
Chloramphenicol	11	0	116	0
Cephalosporins				
Cefotaxim	11	0	116	0
Fluoroquinolones				
Enrofloxacin	11	0	116	0
Penicillins				
Ampicillin	11	1	116	0
Quinolones				
Nalidixic acid	11	0	116	4
Resistant to 1 antimicrobial	11	1	116	23
Resistant to 2 antimicrobials	11	0	116	16
Resistant to 3 antimicrobials	11	5	116	63
Resistant to 4 antimicrobials	11	1	116	3
Resistant to >4 antimicrobials	11	0	116	0
Sulfonamides				
Sulfonamide	11	6	116	71
Tetracyclines				
Tetracyclin	11	6	116	68

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

S. Enteritidis																																	
Gallus gallus (fowl) - broilers - at farm																																	
Isolates out of a monitoring programme	no																																
	48																																
Number of isolates available in the laboratory																																	
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																	
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35
Aminoglycosides																																	
Gentamicin	15	48	0																		4	12	18	13	1								
Streptomycin	12	48	0										1	9	24	11	2	1															
Amphenicols																																	
Chloramphenicol	18	48	0																1	0	1	2	7	23	6	5	2	0	0	0	0	0	1
Cephalosporins																																	
Cefotaxim	14	48	0																									4	9	14	0	0	21
Fluoroquinolones																																	
Enrofloxacin	16	48	0																					2	6	12	16	7	4	1			
Penicillins																																	
Ampicillin	13	48	1	1													1	0	0	2	16	8	8	10	2								
Quinolones																																	
Nalidixic acid	14	48	0										1	0	0	0	1	20	16	10													
Sulfonamides																																	
Sulfonamide	11	48	0															1	0	0	1	4	9	16	6	7	3	0	0	1			
Tetracyclines																																	
Tetracyclin	16	48	1	1												1	0	5	9	14	10	6	1	1									

Footnote

In fact, this table concerns *Salmonella* strains isolated in *Gallus gallus* flocks generally speaking, not only broilers!

Table Antimicrobial susceptibility testing of S. Enteritidis in Turkeys - at farm - quantitative data
[Diffusion method]

S. Enteritidis																																		
Turkeys - at farm																																		
Isolates out of a monitoring programme	no																																	
	7																																	
Number of isolates available in the laboratory																																		
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																		
Antimicrobials:	Break point	N	n	≤6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	≥35	
Aminoglycosides																																		
Gentamicin	15	7	0																		1	1	2	2	1									
Streptomycin	12	7	0											3	3	1																		
Amphenicols																																		
Chloramphenicol	18	7	0																1	0	0	0	2	2									2	
Cephalosporins																																		
Cefotaxim	14	7	0																											1	2	0	0	4
Fluoroquinolones																																		
Enrofloxacin	16	7	0															1	1	0	0	0	0	0	1	0	1	2	1					
Penicillins																																		
Ampicillin	13	7	0																		2	1	2	2										
Quinolones																																		
Nalidixic acid	14	7	2	2														1	1	0	2	1												
Sulfonamides																																		
Sulfonamide	11	7	0																		1	0	1	4	0	0	0	0	0	1	0	0	0	
Tetracyclines																																		
Tetracyclin	16	7	0														1	0	1	1	1	2	0	1										

Table Antimicrobial susceptibility testing of S. Enteritidis in Pigs - at farm - quantitative data
[Diffusion method]

S. Enteritidis																																	
Pigs - at farm																																	
Isolates out of a monitoring programme	no																																
	3																																
Number of isolates available in the laboratory																																	
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																	
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35
Aminoglycosides																																	
Gentamicin	15	3	0																				2	1									
Streptomycin	12	3	1						1					1	1																		
Amphenicols																																	
Chloramphenicol	18	3	0																						1	1	1						
Cephalosporins																																	
Cefotaxim	14	3	0																										1	0	0	0	2
Fluoroquinolones																																	
Enrofloxacin	16	3	0																							1	1	0	1				
Penicillins																																	
Ampicillin	13	3	0																	1	0	0	1	1									
Quinolones																																	
Nalidixic acid	14	3	0															2	0	0	1												
Sulfonamides																																	
Sulfonamide	11	3	0																			1	0	1	0	0	1						
Tetracyclines																																	
Tetracyclin	16	3	0													1	0	0	0	1	0	1											

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

S. Enteritidis																																		
Cattle (bovine animals) - at farm																																		
Isolates out of a monitoring programme	no																																	
	15																																	
Number of isolates available in the laboratory																																		
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																		
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35	
Aminoglycosides																																		
Gentamicin	15	15	0																		2	4	6	3										
Streptomycin	12	15	2	2										2	8	3																		
Amphenicols																																		
Chloramphenicol	18	15	2	2																			2	8	1	0	1	1						
Cephalosporins																																		
Cefotaxim	14	15	0																											1	7	0	0	7
Fluoroquinolones																																		
Enrofloxacin	16	15	0														1								1	4	3	5	1					
Penicillins																																		
Ampicillin	13	15	2	2																1	3	5	2	2										
Quinolones																																		
Nalidixic acid	14	15	1	1													1	2	4	5	2													
Sulfonamides																																		
Sulfonamide	11	15	2	2														1	0	0	0	1	4	4	2	0	1							
Tetracyclines																																		
Tetracyclin	16	15	2	2													1	0	8	2	0	1	1											

Table Antimicrobial susceptibility testing of S. Enteritidis in animals

n = Number of resistant isolates												
S. Enteritidis												
	Cattle (bovine animals)	Pigs	Gallus gallus (fowl)	Turkeys	Gallus gallus (fowl) - laying hens	Gallus gallus (fowl) - broilers						
Isolates out of a monitoring programme	no	no	no	no								
Number of isolates available in the laboratory	15	3	48	7								
Antimicrobials:	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides												
Gentamicin	15	0	3	0	48	0	7	0				
Streptomycin	15	2	3	1	48	0	7	0				
Amphenicols												
Chloramphenicol	15	2	3	0	48	0	7	0				
Cephalosporins												
Cefotaxim	15	0	3	0	48	0	7	0				
Fluoroquinolones												
Enrofloxacin	15	0	3	0	48	0	7	0				
Fully sensitive	15	12	3	2	48	47	7	5				
Penicillins												
Ampicillin	15	2	3	0	48	1	7	0				
Quinolones												
Nalidixic acid	15	1	3	0	48	0	7	2				
Resistant to 1 antimicrobial	15	0	3	1	48	0	7	1				
Resistant to 2 antimicrobials	15	1	3	0	48	1	7	1				
Resistant to 3 antimicrobials	15	0	3	0	48	0	7	0				
Resistant to 4 antimicrobials	15	0	3	0	48	0	7	0				
Resistant to >4 antimicrobials	15	2	3	0	48	0	7	0				
Sulfonamides												
Sulfonamide	15	2	3	0	48	0	7	0			48	
Tetracyclines												
Tetracyclin	15	2	3	0	48	1	7	0				

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S. Enteritidis																																			
Meat from broilers (Gallus gallus) - at slaughterhouse																																			
Isolates out of a monitoring programme	no																																		
	8																																		
Number of isolates available in the laboratory																																			
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35		
	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																		
Aminoglycosides																																			
	15	8	0																					4	4										
	12	8	0											1	2	5																			
Streptomycin																																			
Amphenicols																																			
	18	8	0																				2	5	0	1									
Cephalosporins																																			
	14	8	0																																
Fluoroquinolones																																			
	16	8	0													1	0	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
Entrofloxacin																																			
Penicillins																																			
	13	8	0																		3	1	1	0	3										
Ampicillin																																			
Quinolones																																			
	14	8	3	3													1	2	2																
Nalidixic acid																																			
Sulfonamides																																			
	11	8	0																	2	2	1	3												
Sulfonamide																																			
Tetracyclines																																			
	16	8	0														1	0	2	1	4														
Tetracycline																																			

Table Antimicrobial susceptibility testing in S. Enteritidis

n = Number of resistant isolates				
	S. Enteritidis			
	Meat from broilers (Gallus gallus) - at slaughterhouse		Meat from bovine animals - at slaughterhouse	
Isolates out of a monitoring programme	no		no	
Number of isolates available in the laboratory	8		2	
Antimicrobials:	N	n	N	n
Aminoglycosides				
Gentamicin	8	0	2	0
Streptomycin	8	0	2	0
Amphenicols				
Chloramphenicol	8	0	2	0
Cephalosporins				
Cefotaxim	8	0	2	0
Fluoroquinolones				
Enrofloxacin	8	0	2	0
Penicillins				
Ampicillin	8	0	2	0
Quinolones				
Nalidixic acid	8	3	2	0
Resistant to 1 antimicrobial	8	1	2	0
Resistant to 2 antimicrobials	8	2	2	0
Resistant to 3 antimicrobials	8	0	2	0
Resistant to 4 antimicrobials	8	0	2	0
Resistant to >4 antimicrobials	8	0	2	0
Sulfonamides				
Sulfonamide	8	0	2	0
Tetracyclines				
Tetracyclin	8	0	2	0

Table Antimicrobial susceptibility testing of S. Enteritidis in Meat from bovine animals - at slaughterhouse - quantitative data [Diffusion method]

S. Enteritidis																																					
Meat from bovine animals - at slaughterhouse																																					
Isolates out of a monitoring programme	no																																				
	2																																				
Number of isolates available in the laboratory																																					
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																					
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35				
Aminoglycosides																																					
Gentamicin	15	2	0																				1	1													
Streptomycin	12	2	0												1	1																					
Amphenicols																																					
Chloramphenicol	18	2	0																					2													
Cephalosporins																																					
Cefotaxim	14	2	0																											1	0	0	1				
Fluoroquinolones																																					
Enrofloxacin	16	2	0																					1	0	0	1										
Penicillins																																					
Ampicillin	13	2	0																				1	1													
Quinolones																																					
Nalidixic acid	14	2	0													1	0	0	0	1																	
Sulfonamides																																					
Sulfonamide	11	2	0																								2										
Tetracyclines																																					
Tetracyclin	16	2	0															1	1																		

Table Antimicrobial susceptibility testing of *S. Infantis* in Meat from pig - at slaughterhouse - quantitative data [Diffusion method]

S. Infantis																																				
Meat from pig - at slaughterhouse																																				
Isolates out of a monitoring programme	no																																			
	18																																			
Number of isolates available in the laboratory																																				
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																				
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			
Aminoglycosides																																				
Gentamicin	15	18	0																		3	6	5	4												
Streptomycin	12	18	4							4	11	3																								
Amphenicols																																				
Chloramphenicol	18	18	0														4	7	4	3																
Cephalosporins																																				
Cefotaxim	14	18	0																								1	2	3	5	6	0	0	1		
Fluoroquinolones																																				
Enrofloxacin	16	18	0																							2	4	6	2	2	1	0	0	1		
Penicillins																																				
Ampicillin	13	18	0																2	3	5	6	2													
Quinolones																																				
Nalidixic acid	14	18	0													1	0	2	5	9	0	0	0	1												
Sulfonamides																																				
Sulfonamide	11	18	0																1	1	0	0	0	8	2	6										
Tetracyclines																																				
Tetracyclin	16	18	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5	10	0	1	0															

Table Antimicrobial susceptibility testing in *S. Infantis*

n = Number of resistant isolates		
<i>S. Infantis</i>		
Meat from pig - at slaughterhouse		
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		18
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	18	0
Streptomycin	18	4
Amphenicols		
Chloramphenicol	18	0
Cephalosporins		
Cefotaxim	18	0
Fluoroquinolones		
Enrofloxacin	18	0
Penicillins		
Ampicillin	18	0
Quinolones		
Nalidixic acid	18	0
Resistant to 1 antimicrobial	18	4
Resistant to 2 antimicrobials	18	0
Resistant to 3 antimicrobials	18	0
Resistant to 4 antimicrobials	18	0
Resistant to >4 antimicrobials	18	0
Sulfonamides		
Sulfonamide	18	0
Tetracyclines		
Tetracyclin	18	0

Table Antimicrobial susceptibility testing in S. Lille

n = Number of resistant isolates						
	S. Lille					
	Gallus gallus (fowl)		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens	
	no					
Isolates out of a monitoring programme						
Number of isolates available in the laboratory	37					
Antimicrobials:	N	n	N	n	N	n
Aminoglycosides						
Gentamicin	37	0				
Streptomycin	37	1				
Amphenicols						
Chloramphenicol	37	1				
Cephalosporins						
Cefotaxim	37	0				
Fluoroquinolones						
Enrofloxacin	37	0				
Fully sensitive	37	35				
Penicillins						
Ampicillin	37	0	37	0		
Quinolones						
Nalidixic acid	37	0				
Resistant to 1 antimicrobial	37	1				
Resistant to 2 antimicrobials	37	1	37			
Resistant to 3 antimicrobials	37	0	37			
Resistant to 4 antimicrobials	37	0	37			
Resistant to >4 antimicrobials	37	0				
Sulfonamides						
Sulfonamide	37	0		0		
Tetracyclines						
Tetracyclin	37	1	37			

Table Antimicrobial susceptibility testing of S. Lille in Gallus gallus (fowl) - broilers - at farm - quantitative data [Diffusion method]

S. Lille		Gallus gallus (fowl) - broilers - at farm																																	
Isolates out of a monitoring programme	Number of isolates available in the laboratory	no																																	
		Break point	N	n	≤6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	≥35	
Antimicrobials:		Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																	
Aminoglycosides		15	37	0															1	4	5	14	11	2											
Gentamicin		12	37	1						1	3	29	3	1																					
Streptomycin																																			
Amphenicols																																			
Chloramphenicol		18	37	1											1	0	0	1	2	12	12	7												2	
Cephalosporins																																			
Cefotaxim		14	37	0																										3	7	14	0	0	13
Fluoroquinolones																																			
Enrofloxacin		16	37	0																							1	2	2	7	11	12	1	0	1
Penicillins																																			
Ampicillin		13	37	0															1	4	7	13	7	5											
Quinolones																																			
Nalidixic acid		14	37	0											1	0	0	2	4	9	8	5	5	3											
Sulfonamides																																			
Sulfonamide		11	37	0															1	0	0	0	0	0	0	1	1	3	4	9	10	5	0	0	3
Tetracyclines																																			
Tetracyclin		16	37	1								1							1	15	12	6	1	0	1										

Footnote

In fact, this table concerns Salmonella strains isolated in Gallus gallus flocks generally speaking, not only broilers!

Table Antimicrobial susceptibility testing in S. Mbandaka

n = Number of resistant isolates		
S. Mbandaka		
Cattle (bovine animals)		
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		11
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	11	0
Streptomycin	11	0
Amphenicols		
Chloramphenicol	11	0
Cephalosporins		
Cefotaxim	11	0
Fluoroquinolones		
Enrofloxacin	11	0
Fully sensitive	11	11
Penicillins		
Ampicillin	11	0
Quinolones		
Nalidixic acid	11	0
Resistant to 1 antimicrobial	11	0
Resistant to 2 antimicrobials	11	0
Resistant to 3 antimicrobials	11	0
Resistant to 4 antimicrobials	11	0
Resistant to >4 antimicrobials	11	0
Sulfonamides		
Sulfonamide	11	0
Tetracyclines		
Tetracyclin	11	0

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

S. Mbandaka																																			
Cattle (bovine animals) - at farm																																			
Isolates out of a monitoring programme	no																																		
	11																																		
Number of isolates available in the laboratory																																			
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																			
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35		
Aminoglycosides																																			
Gentamicin	15	11	0																	2	1	5	3												
Streptomycin	12	11	0								3	8																							
Amphenicols																																			
Chloramphenicol	18	11	0																	5	4	0	0	1	0	1									
Cephalosporins																																			
Cefotaxim	14	11	0																											1	3	0	0	7	
Fluoroquinolones																																			
Enrofloxacin	16	11	0																							1	0	1	4	3	0	0	2		
Penicillins																																			
Ampicillin	13	11	0																		1	4	1	4	0	1									
Quinolones																																			
Nalidixic acid	14	11	0																	1	0	5	1	1	3										
Sulfonamides																																			
Sulfonamide	11	11	0																						1	2	2	1	1	1	0	0	0	1	
Tetracyclines																																			
Tetracyclin	16	11	0														1	3	0	4	1	0	2												

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

S. Montevideo																																				
Cattle (bovine animals) - at farm																																				
Isolates out of a monitoring programme	no																																			
	18																																			
Number of isolates available in the laboratory																																				
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																				
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			
Aminoglycosides																																				
Gentamicin	15	18	0																3	5	4	4	2													
Streptomycin	12	18	3						3	7	7	1																								
Amphenicols																																				
Chloramphenicol	18	18	0																4	3	2	4	0	0	1	0	0	0	0	0	0	4				
Cephalosporins																																				
Cefotaxim	14	18	0																										5	0	0	13				
Fluoroquinolones																																				
Enrofloxacin	16	18	0																						2	1	5	2	5	3						
Penicillins																																				
Ampicillin	13	18	0																2	4	2	1	8	1												
Quinolones																																				
Nalidixic acid	14	18	0													1	4	3	6	0	0	3	1													
Sulfonamides																																				
Sulfonamide	11	18	0																						1	2	5	3	3	0	0	0	4			
Tetracyclines																																				
Tetracyclin	16	18	0														4	8	1	0	1	2	0	2												

Table Antimicrobial susceptibility testing in S. Montevideo

n = Number of resistant isolates		
S. Montevideo		
Cattle (bovine animals)		
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		18
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	18	0
Streptomycin	18	3
Amphenicols		
Chloramphenicol	18	0
Cephalosporins		
Cefotaxim	18	0
Fluoroquinolones		
Enrofloxacin	18	0
Fully sensitive	18	15
Penicillins		
Ampicillin	18	0
Quinolones		
Nalidixic acid	18	0
Resistant to 1 antimicrobial	18	3
Resistant to 2 antimicrobials	18	0
Resistant to 3 antimicrobials	18	0
Resistant to 4 antimicrobials	18	0
Resistant to >4 antimicrobials	18	0
Sulfonamides		
Sulfonamide	18	0
Tetracyclines		
Tetracyclin	18	0

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Pigs - at farm - quantitative data [Diffusion method]

S. Typhimurium		Pigs - at farm																																		
Isolates out of a monitoring programme	no																																			
	90																																			
Number of isolates available in the laboratory																																				
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																				
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			
Aminoglycosides																																				
Gentamicin	15	90	0														2	7	19	15	18	25	4													
Streptomycin	12	90	67	52	0	0	1	3	1	10	11	12																								
Amphenicols																																				
Chloramphenicol	18	90	48	46	0	1	1										1	0	0	0	0	1	8	7	5	2	0	3	2	0	0	13				
Cephalosporins																																				
Cefotaxim	14	90	0																										15	13	0	0	62			
Fluoroquinolones																																				
Enrofloxacin	16	90	0																				1	2	8	11	14	19	13	14	2	0	6			
Penicillins																																				
Ampicillin	13	90	52	52													1	0	1	0	5	4	7	12	4	2	0	2								
Quinolones																																				
Nalidixic acid	14	90	0												1	0	1	3	14	10	23	18	12	8												
Sulfonamides																																				
Sulfonamide	11	90	55	54	0	0	1										1	0	1	2	1	2	4	2	5	0	3	1	1	3	0	0	8			
Tetracyclines																																				
Tetracyclin	16	90	60	15	0	0	44	0	0	0	0	1	0	0	0	0	3	6	1	2	4	4	2	4	2	4	2	2								

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Turkeys - at farm - quantitative data [Diffusion method]

S. Typhimurium																																			
Turkeys - at farm																																			
Isolates out of a monitoring programme	no																																		
	10																																		
Number of isolates available in the laboratory																																			
Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																		
	Break point	N	n	≤6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	≥35		
Aminoglycosides																																			
Gentamicin	15	10	1			1												1	0	2	2	0	4												
Streptomycin	12	10	9	6	0	0	1	0	1	1	1																								
Amphenicols																																			
Chloramphenicol	18	10	5	5														1	0	0	1	1	1	1	0	0	0	1							
Cephalosporins																																			
Cefotaxim	14	10	0																											3	2	0	0	5	
Fluoroquinolones																																			
Enrofloxacin	16	10	0															1								1	2	5	0	1					
Penicillins																																			
Ampicillin	13	10	5	5															1	0	0	2	1	0	0	1									
Quinolones																																			
Nalidixic acid	14	10	1	1														2	2	1	2	2													
Sulfonamides																																			
Sulfonamide	11	10	6	6																							3	0	0	1					
Tetracyclines																																			
Tetracyclin	16	10	5	3	0	0	2											4	1																

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

S. Typhimurium																																		
Gallus gallus (fowl) - broilers - at farm																																		
Isolates out of a monitoring programme	no																																	
	23																																	
Number of isolates available in the laboratory																																		
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																		
Antimicrobials:	Break point	N	n	≤6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	≥35	
Aminoglycosides																																		
Gentamicin	15	23	0															1	1	4	4	10	3	0										
Streptomycin	12	22	15	3	0	0	1	0	3	8	3	4																						
Amphenicols																																		
Chloramphenicol	18	23	3	3														1	0	0	0	1	4	2	8	2	1	1						
Cephalosporins																																		
Cefotaxim	14	23	0																											3	9	0	0	11
Fluoroquinolones																																		
Enrofloxacin	16	23	0														1								1	5	5	8	2	1				
Penicillins																																		
Ampicillin	13	23	4	4															1	0	3	3	10	2										
Quinolones																																		
Nalidixic acid	14	23	1	1													1	3	7	3	7	1												
Sulfonamides																																		
Sulfonamide	11	23	4	4														2	1	2	2	1	1	2	5	1	0	1	1					
Tetracyclines																																		
Tetracyclin	16	23	4	3	0	0	1										1	1	4	8	2	1	1	0	0	1								

Footnote

In fact, this table concerns *Salmonella* strains isolated in *Gallus gallus* flocks generally speaking, not only broilers!

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

S. Typhimurium																																					
Cattle (bovine animals) - at farm																																					
Isolates out of a monitoring programme	no																																				
	28																																				
Number of isolates available in the laboratory																																					
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																					
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35				
Aminoglycosides																																					
Gentamicin	15	28	0																	6	10	7	3	2													
Streptomycin	12	28	19	10	0	0	0	0	1	8	7	2																									
Amphenicols																																					
Chloramphenicol	18	28	9	9																			1	10	4	0	2	2									
Cephalosporins																																					
Cefotaxim	14	28	0																									4	5	10	0	0	9				
Fluoroquinolones																																					
Enrofloxacin	16	28	0																					1	5	6	9	7									
Penicillins																																					
Ampicillin	13	28	9	9																4	4	4	3	2	2												
Quinolones																																					
Nalidixic acid	14	28	0											1	0	0	1	3	7	8	7	1															
Sulfonamides																																					
Sulfonamide	11	28	10	10																1	3	1	3	3	3	2	1	0	0	0	1						
Tetracyclines																																					
Tetracyclin	16	28	10	2	0	0	8									1	4	3	7	2	0	0	1														

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

n = Number of resistant isolates												
S. Typhimurium												
	Cattle (bovine animals)	Pigs	Gallus gallus (fowl)	Turkeys	Gallus gallus (fowl) - laying hens	Gallus gallus (fowl) - broilers						
Isolates out of a monitoring programme	no	no	no	no								
Number of isolates available in the laboratory	28	90	23	10								
Antimicrobials:	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides												
Gentamicin	28	0	90	0	23	0	10	1				
Streptomycin	28	19	90	67	23	15	10	9				
Amphenicols												
Chloramphenicol	28	9	90	48	23	3	10	5			23	
Cephalosporins												
Cefotaxim	28	0	90	0	23	0	10	0				
Fluoroquinolones												
Enrofloxacin	28	0	90	0	23	0	10	0				
Fully sensitive	28	8	90	17	23	7	10	1				
Penicillins												
Ampicillin	28	9	90	52	23	4	10	5				
Quinolones												
Nalidixic acid	28	0	90	0	23	1	10	1			23	
Resistant to 1 antimicrobial	28	10	90	17	23	12	10	3				
Resistant to 2 antimicrobials	28	1	90	1	23	1	10	0				
Resistant to 3 antimicrobials	28	0	90	3	23	0	10	0			23	
Resistant to 4 antimicrobials	28	0	90	4	23	0	10	1				
Resistant to >4 antimicrobials	28	9	90	48	23	0	10	5				
Sulfonamides												
Sulfonamide	28	10	90	55	23	4	10	6				
Tetracyclines												
Tetracyclin	28	10	90	60	23	4	10	5				

Table Antimicrobial susceptibility testing of *S. Typhimurium* in Meat from pig - at slaughterhouse - quantitative data [Diffusion method]

S. Typhimurium																																					
Meat from pig - at slaughterhouse																																					
Isolates out of a monitoring programme	no																																				
	91																																				
Number of isolates available in the laboratory																																					
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																					
Antimicrobials:	Break point	N	n	≤6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	≥35				
Aminoglycosides																																					
Gentamicin	15	91	0													1	2	4	15	27	24	16	2														
Streptomycin	12	91	71	59	0	0	1	0	3	8	13	6	1																								
Amphenicols																																					
Chloramphenicol	18	91	46	44	0	1	1											2	0	2	12	21	5	0	2	1											
Cephalosporins																																					
Cefotaxim	14	91	0																								2	10	26	33	0	0	20				
Fluoroquinolones																																					
Enrofloxacin	16	91	0													1	0	2	0	0	0	0	4	13	30	30	11										
Penicillins																																					
Ampicillin	13	91	60	60														1	6	3	7	6	8														
Quinolones																																					
Nalidixic acid	14	91	3	3												1	4	37	23	21	1	1															
Sulfonamides																																					
Sulfonamide	11	91	64	64															2	1	2	3	3	4	2	3	4	2	1	0	0	0	0				
Tetracyclines																																					
Tetracyclin	16	91	82	53	0	0	28								1	1	2	1	4	1																	

Table Antimicrobial susceptibility testing of S. Typhimurium in Meat from broilers (Gallus gallus) - at slaughterhouse - quantitative data [Diffusion method]

S. Typhimurium																																				
Meat from broilers (Gallus gallus) - at slaughterhouse																																				
Isolates out of a monitoring programme	no																																			
	9																																			
Number of isolates available in the laboratory																																				
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																				
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35			
Aminoglycosides																																				
Gentamicin	15	9	0															2	2	2	0	1	2													
Streptomycin	12	9	9	4	0	0	2	1	0	2																										
Amphenicols																																				
Chloramphenicol	18	9	4	4														1	0	0	0	0	2	0	0	1	1									
Cephalosporins																																				
Cefotaxim	14	9	0																									2	3	1	0	0	3			
Fluoroquinolones																																				
Enrofloxacin	16	9	0													1	2	0	0	0	0	0	1	0	0	2	3									
Penicillins																																				
Ampicillin	13	9	5	5																2	0	0	2													
Quinolones																																				
Nalidixic acid	14	9	4	3								1	0	0	0	1	1	2	1																	
Sulfonamides																																				
Sulfonamide	11	9	5	5																						1	2						1			
Tetracyclines																																				
Tetracyclin	16	9	5	2	0	0	2						1	0	0	0	0	1	0	2	0	0	1													

Table Antimicrobial susceptibility testing in S. Typhimurium

n = Number of resistant isolates						
	S. Typhimurium					
	Meat from broilers (Gallus gallus)		Meat from pig - at slaughterhouse		Meat from bovine animals - at slaughterhouse	
Isolates out of a monitoring programme	no		no		no	
Number of isolates available in the laboratory	9		91		17	
Antimicrobials:	N	n	N	n	N	n
Aminoglycosides						
Gentamicin	9	0	91	0	17	0
Streptomycin	9	9	91	71	17	15
Amphenicols						
Chloramphenicol	9	4	91	46	17	13
Cephalosporins						
Cefotaxim	9	0	91	0	17	0
Fluoroquinolones						
Enrofloxacin	9	0	91	0	17	0
Penicillins						
Ampicillin	9	5	91	60	17	15
Quinolones						
Nalidixic acid	9	4	91	3	17	1
Resistant to 1 antimicrobial	9	4	91	14	17	1
Resistant to 2 antimicrobials	9	0	91	11	17	0
Resistant to 3 antimicrobials	9	0	91	4	17	0
Resistant to 4 antimicrobials	9	0	91	13	17	1
Resistant to >4 antimicrobials	9	5	91	46	17	14
Sulfonamides						
Sulfonamide	9	5	91	64	17	15
Tetracyclines						
Tetracyclin	9	5	91	82	17	15

Table Antimicrobial susceptibility testing of S. Typhimurium in Meat from bovine animals - at slaughterhouse - quantitative data [Diffusion method]

S. Typhimurium																																			
Meat from bovine animals - at slaughterhouse																																			
Isolates out of a monitoring programme	no																																		
	17																																		
Number of isolates available in the laboratory																																			
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																			
Antimicrobials:	Break point	N	n	≤6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	≥35		
Aminoglycosides																																			
Gentamicin	15	17	0															2	4	1	7	1	2												
Streptomycin	12	17	15	14	0	0	0	0	0	1	1	1																							
Amphenicols																																			
Chloramphenicol	18	17	13	13																			1	1	1	1									
Cephalosporins																																			
Cefotaxim	14	17	0																									1	0	4	6	0	0	6	
Fluoroquinolones																																			
Enrofloxacin	16	17	0																1	0	0	1	2	1	2	3	3	2	2						
Penicillins																																			
Ampicillin	13	17	15	15																		1	1												
Quinolones																																			
Nalidixic acid	14	17	1	1											1	1	0	1	2	4	4	0	3												
Sulfonamides																																			
Sulfonamide	11	17	15	15																						1	0	0	1						
Tetracyclines																																			
Tetracyclin	16	17	15	7	0	0	8									1	1																		

Table Antimicrobial susceptibility testing in S. IIIa41:z4z23z32

n = Number of resistant isolates						
S. IIIa41:z4z23z32						
	Gallus gallus (fowl)		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens	
Isolates out of a monitoring programme	no		no			
Number of isolates available in the laboratory	24		24			
Antimicrobials:	N	n	N	n	N	n
Aminoglycosides						
Gentamicin	24	0				
Streptomycin	24	0				
Amphenicols						
Chloramphenicol	24	0				
Cephalosporins						
Cefotaxim	24	0	24			
Fluoroquinolones						
Enrofloxacin	24	0				
Fully sensitive	24	0				
Penicillins						
Ampicillin	24	0				
Quinolones						
Nalidixic acid	24	0				
Resistant to 1 antimicrobial	24	0				
Resistant to 2 antimicrobials	24	0				
Resistant to 3 antimicrobials	24	0				
Resistant to 4 antimicrobials	24	0				
Resistant to >4 antimicrobials	24	0				
Sulfonamides						
Sulfonamide	24	0	24			
Tetracyclines						
Tetracyclin	24	0				

Footnote

In fact, S. IIIa 48:z4,z23:-

Table Antimicrobial susceptibility testing of S. IIIa41:z4z23z32 in Gallus gallus (fowl) - broilers - at farm - quantitative data [Diffusion method]

S. IIIa41:z4z23z32			Gallus gallus (fowl) - broilers - at farm																																		
Isolates out of a monitoring programme	no																																				
		24																																			
Number of isolates available in the laboratory																																					
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																					
Antimicrobials:	Break point	N	n	≤6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35				
Aminoglycosides																																					
	15	24	0																			3	8	12	1												
	12	24	0													13	9	2																			
Streptomycin																																					
Amphenicols																																					
	18	24	0																			1	1	7	4	0	0	6	0	0	0	5					
Chloramphenicol																																					
Cephalosporins																																					
	14	24	0																											8	0	0	16				
Cefotaxim																																					
Fluoroquinolones																																					
	16	24	0																								4	11	4	4	0	0	1				
Enrofloxacin																																					
Penicillins																																					
	13	24	0																		1	8	2	6	5	2											
Ampicillin																																					
Quinolones																																					
	14	24	0																		2	12	5	2	3												
Nalidixic acid																																					
Sulfonamides																																					
	11	24	0																							1	4	2	7	2	1	0	0	7			
Sulfonamide																																					
Tetracyclines																																					
	16	24	0																			1	5	3	5	7	3										
Tetracyclin																																					

Footnote

In fact, this table concerns Salmonella strains isolated in Gallus gallus flocks generally speaking, not only broilers!

Table Breakpoints for antibiotic resistance testing in Animals

Test Method Used

Disc diffusion

Standards used for testing

CA_SFM

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content microg	Breakpoint Zone diameter (mm)		
		Susceptible ≤	Intermediate	Resistant ≥	lowest	highest		Susceptible ≥	Intermediate	Resistant ≤
Amphenicols										
Chloramphenicol							30	23		18
Florfenicol										
Tetracyclines										
Tetracyclin							30	19		16
Cephalosporins										
Cephalothin							30	18		11
Cefotaxim							30	21		14
Ceftazidim							30	21		14
3rd generation cephalosporins										
Fluoroquinolones										
Ciprofloxacin										
Enrofloxacin							5	22		16
Quinolones										
Nalidixic acid							30	20		14
Trimethoprim										
Sulfonamides										
Sulfonamide							200	17		11
Aminoglycosides										
Streptomycin							10	15		12
Gentamicin							15	18		15
Neomycin										
Kanamycin							30	17		14
Trimethoprim + sulfonamides							23.75	16		9
Penicillins										
Ampicillin							10	19		13

Table Breakpoints for antibiotic resistance testing in Food

Test Method Used

Disc diffusion

Standards used for testing

CA_SFM

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content microg	Breakpoint Zone diameter (mm)		
		Susceptible ≤	Intermediate	Resistant ≥	lowest	highest		Susceptible ≥	Intermediate	Resistant ≤
Amphenicols										
Chloramphenicol							30	23		18
Florfenicol										
Tetracyclines										
Tetracyclin							30	19		16
Cephalosporins										
Cephalothin							30	18		11
Cefotaxim							30	21		14
Ceftazidim							30	21		14
3rd generation cephalosporins										
Fluoroquinolones										
Ciprofloxacin										
Enrofloxacin							5	22		16
Quinolones										
Nalidixic acid							30	20		14
Trimethoprim										
Sulfonamides										
Sulfonamide							200	17		11
Aminoglycosides										
Streptomycin							10	15		12
Gentamicin							15	18		15
Neomycin										
Kanamycin							30	17		14
Trimethoprim + sulfonamides							23.75	16		9
Penicillins										
Ampicillin							10	19		13

2.2. CAMPYLOBACTERIOSIS**2.2.1. General evaluation of the national situation****2.2.2. Campylobacteriosis in humans****2.2.3. Campylobacter in foodstuffs****Table Campylobacter in poultry meat**

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. lari	C. upsaliensis	C. jejuni	Thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus)										
fresh										
- at slaughterhouse (1)	AFSSA	batch	10g	192	166	98			114	

(1) : chicken neck skin

Footnote

One carcasse per slaughter batch was sampled.

Some carcasses are positive either for C. coli and C. jejuni.

2.2.4. Campylobacter in animals

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic Campylobacter spp.	C. jejuni	C. coli	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Pigs (1)	AFSSA	herd	192	123		77			46
Gallus gallus (fowl)									
broilers									
- at slaughterhouse (2)	AFSSA	batch	192	154	56	76			22

(1) : 1 faeces sample/ herd

Many strains were in non culturable form (only 77 strains could be identified as C. coli)

(2) : 1 caeca/ batch

Many strains were in non culturable form

2.2.5. Antimicrobial resistance in Campylobacter isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in pigs

Sampling strategy used in monitoring

Frequency of the sampling

Sampling and analysis of samples collected in national monitoring plans were established by the Food Directorate of the Ministry of agriculture. Campylobacter were isolated from fecal samples from different production type in slaughter houses, according to a national monitoring plan. Sampling was organized within French departments in order to be representative of national productions. Samples were collected in 2006 by official veterinary services

Type of specimen taken

192 Fecal samples at slaughterhouses

Procedures for the selection of isolates for antimicrobial testing

Isolates collected from local laboratories were tested for AST in one central laboratory
All viable isolates were tested

Laboratory methodology used for identification of the microbial isolates

Campylobacter were identified by the central laboratory by PCR (Denis et al, 1999)

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Campylobacter sensitivity are tested by agar dilution according to CA-SFM (2006). Antibiotics tested are those suggested by the CRL and EFSA The laboratory performing the test works under quality assurance and participates to the EQAS organized by the CRL.
The antimicrobials suggested by EFSA were included.

Breakpoints used in testing

The breakpoints used are those defined for C. jejuni or C. coli by EUCAST or the CA-SFM 2006 breakpoints for ampicillin

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

Resistance to ciprofloxacin in C. coli isolates from pigs has significantly increased since 2000 (less than 15% in 2000-2001, more than 25% since 2003). For this production, resistance to erythromycin decreased significantly from 2002-2003 (54% of resistance for these years, 20% in 2005) but increased to 32% in 2006

B. Antimicrobial resistance in Campylobacter jejuni and coli in poultry

Sampling strategy used in monitoring

Frequency of the sampling

Sampling and analysis of samples collected in national monitoring plans were established by the Food Directorate of the Ministry of agriculture. *Campylobacter* were isolated from different animal productions in slaughter houses, according to a national monitoring plan. Sampling was organized within French départements in order to be representative of national productions. Samples were collected in 2006 by official veterinary services. For poultry production, caecal samples from “Standard”, “Label”, and “Export” type productions were collected from 10 slaughter houses (1 caecal sample per batch).

Type of specimen taken

Caeca at slaughterhouses (1 caeca per flock)

Procedures for the selection of isolates for antimicrobial testing

All isolates were tested

Methods used for collecting data

Isolates collected from local laboratories were tested for AST in one central laboratory

Laboratory methodology used for identification of the microbial isolates

Campylobacter are identified by the central laboratory by PCR (Denis et al, 1999)

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Campylobacter sensitivity are tested by agar dilution according to CA-SFM (2006). The laboratory performing the test works under quality assurance and participates to the EQAS organized by the CRL.

The antimicrobials suggested by EFSA were included.

Breakpoints used in testing

The breakpoints used are those defined for *C. jejuni* or *C. coli* by EUCAST or the CA-SFM 2006 breakpoints for ampicillin

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

Since 1999, the percentage of *C. coli* isolates has increased in poultry compared with *C. jejuni*.

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

Sampling strategy used in monitoring

Frequency of the sampling

Sampling and analysis of samples collected in national monitoring plans were established by

the Food Directorate of the Ministry of agriculture. *Campylobacter* were isolated from different animal productions in slaughter houses, according to a national monitoring plan. Sampling was organized within French départements in order to be representative of national productions. Samples were collected in 2006 by official veterinary services. For poultry production, caecal samples from “Standard”, “Label”, and “Export” type productions have been collected from 10 slaughter houses each year sampled (1 caecal sample per batch).

Type of specimen taken

broiler neck skin at slaughterhouse

Procedures for the selection of isolates for antimicrobial testing

All isolates were tested

Methods used for collecting data

Isolates collected from local laboratories were tested for AST in one central laboratory

Laboratory methodology used for identification of the microbial isolates

Campylobacter were identified by the central laboratory by PCR (Denis et al, 1999)

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Campylobacter sensitivity are tested by agar dilution according to CA-SFM (2006). The laboratory performing the test works under quality assurance and participates to the EQAS organized by the CRL

Breakpoints used in testing

The breakpoints used are those defined for *C. jejuni* or *C. coli* by EUCAST or the CA-SFM 2006 breakpoints for ampicillin

Table Antimicrobial susceptibility testing of *C. coli* in Gallus gallus (fowl) - broilers - at farm - Monitoring - quantitative data [Dilution method]

C. coli																							
Gallus gallus (fowl) - broilers - at farm - Monitoring																							
Isolates out of a monitoring programme	yes																						
	76																						
Number of isolates available in the laboratory																							
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																							
Antimicrobials:	Break point	N	n	<=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	76	0			4	4	22	44	2													
Streptomycin	4	76	12	0	0	0	0	4	23	37	0	1	0	2	9								
Fluoroquinolones																							
Ciprofloxacin	1	76	42	0	6	13	14	1	0	0	0	9	33										
Macrolides																							
Erythromycin	16	76	10					11	21	25	7	2	0	0	1	9							
Penicillins																							
Ampicillin	16	76	35	0	0	0	2	4	7	11	6	10	1	6	4	25							
Tetracyclines																							
Tetracyclin	2	76	60	0	0	2	7	4	3	0	0	0	1	59									

Table Antimicrobial susceptibility testing in *C. coli*

n = Number of resistant isolates				
	C. coli			
	Pigs		Gallus gallus (fowl) - broilers - at farm - Monitoring	
Isolates out of a monitoring programme	yes		yes	
Number of isolates available in the laboratory	77		76	
Antimicrobials:	N	n	N	n
Aminoglycosides				
Gentamicin	77	2	76	0
Streptomycin	77	61	76	12
Fluoroquinolones				
Ciprofloxacin	77	27	76	42
Fully sensitive	77	0	76	7
Macrolides				
Erythromycin	77	25	76	10
Penicillins				
Ampicillin	77	19	76	35
Resistant to 1 antimicrobial	77	11	76	18
Resistant to 2 antimicrobials	77	26	76	21
Resistant to 3 antimicrobials	77	21	76	22
Resistant to 4 antimicrobials	77	14	76	7
Resistant to >4 antimicrobials	77	5	76	1
Tetracyclines				
Tetracyclin	77	73	76	60

Table Antimicrobial susceptibility testing in *C. coli*

n = Number of resistant isolates				
	C. coli			
	Pigs		Gallus gallus (fowl) - broilers - at farm - Monitoring	
Isolates out of a monitoring programme	yes		yes	
Number of isolates available in the laboratory	77		76	
Antimicrobials:	N	n	N	n
Aminoglycosides				
Gentamicin	77	2	76	0
Streptomycin	77	61	76	12
Fluoroquinolones				
Ciprofloxacin	77	27	76	42
Fully sensitive	77	0	76	7
Macrolides				
Erythromycin	77	25	76	10
Penicillins				
Ampicillin	77	19	76	35
Resistant to 1 antimicrobial	77	11	76	18
Resistant to 2 antimicrobials	77	26	76	21
Resistant to 3 antimicrobials	77	21	76	22
Resistant to 4 antimicrobials	77	14	76	7
Resistant to >4 antimicrobials	77	5	76	1
Tetracyclines				
Tetracyclin	77	73	76	60

Table Antimicrobial susceptibility testing in *C. coli*

n = Number of resistant isolates				
	C. coli			
	Pigs		Gallus gallus (fowl) - broilers - at farm - Monitoring	
Isolates out of a monitoring programme	yes		yes	
Number of isolates available in the laboratory	77		76	
Antimicrobials:	N	n	N	n
Aminoglycosides				
Gentamicin	77	2	76	0
Streptomycin	77	61	76	12
Fluoroquinolones				
Ciprofloxacin	77	27	76	42
Fully sensitive	77	0	76	7
Macrolides				
Erythromycin	77	25	76	10
Penicillins				
Ampicillin	77	19	76	35
Resistant to 1 antimicrobial	77	11	76	18
Resistant to 2 antimicrobials	77	26	76	21
Resistant to 3 antimicrobials	77	21	76	22
Resistant to 4 antimicrobials	77	14	76	7
Resistant to >4 antimicrobials	77	5	76	1
Tetracyclines				
Tetracyclin	77	73	76	60

Table Antimicrobial susceptibility testing in *C. coli*

n = Number of resistant isolates				
	C. coli			
	Pigs		Gallus gallus (fowl) - broilers - at farm - Monitoring	
Isolates out of a monitoring programme	yes		yes	
Number of isolates available in the laboratory	77		76	
Antimicrobials:	N	n	N	n
Aminoglycosides				
Gentamicin	77	2	76	0
Streptomycin	77	61	76	12
Fluoroquinolones				
Ciprofloxacin	77	27	76	42
Fully sensitive	77	0	76	7
Macrolides				
Erythromycin	77	25	76	10
Penicillins				
Ampicillin	77	19	76	35
Resistant to 1 antimicrobial	77	11	76	18
Resistant to 2 antimicrobials	77	26	76	21
Resistant to 3 antimicrobials	77	21	76	22
Resistant to 4 antimicrobials	77	14	76	7
Resistant to >4 antimicrobials	77	5	76	1
Tetracyclines				
Tetracyclin	77	73	76	60

Table Antimicrobial susceptibility testing of *C. coli* in Pigs - at farm - quantitative data [Dilution method]

C. coli																							
Pigs - at farm																							
Isolates out of a monitoring programme		yes																					
Number of isolates available in the laboratory		77																					
		Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																					
Antimicrobials:	Break point	N	n	<=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																							
	2	77	2			0	1	16	46	12	2	0	0	0									
	4	77	61							3	13	4	0	4	53								
Fluoroquinolones																							
	1	77	27	0	13	20	14	1	2	1	7	4	15										
Macrolides																							
	16	77	25					5	30	14	3	0	0	1	0	24							
Penicillins																							
	16	77	19				1	3	16	15	19	2	2	1	4	14							
Tetracyclines																							
	2	77	73			0	1	3	0	0	0	0	1	72									

Table Antimicrobial susceptibility testing in *C. coli*

n = Number of resistant isolates		
<i>C. coli</i>		
Meat from broilers (<i>Gallus gallus</i>) - carcass - at slaughterhouse - Monitoring		
Isolates out of a monitoring programme		yes
Number of isolates available in the laboratory		98
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	98	0
Streptomycin	98	8
Fluoroquinolones		
Ciprofloxacin	98	50
Fully sensitive	98	7
Macrolides		
Erythromycin	98	8
Penicillins		
Ampicillin	98	39
Resistant to 1 antimicrobial	98	26
Resistant to 2 antimicrobials	98	31
Resistant to 3 antimicrobials	98	26
Resistant to 4 antimicrobials	98	6
Resistant to >4 antimicrobials	98	2
Tetracyclines		
Tetracyclin	98	76

Table Antimicrobial susceptibility testing of *C. coli* in Meat from broilers (*Gallus gallus*) - carcass - at slaughterhouse - Monitoring (Chicken neck skin) - quantitative data [Dilution method]

C. coli		Meat from broilers (Gallus gallus) - carcass - at slaughterhouse - Monitoring (Chicken neck skin)																					
Isolates out of a monitoring programme	yes																						
	98																						
Number of isolates available in the laboratory																							
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																							
Antimicrobials:	Break point	N	n	<=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	98	0	0	0	7	4	22	58	7	0												
Streptomycin	4	98	26	0	0	0	0	11	15	40	6	3	1	4	18								
Fluoroquinolones																							
Ciprofloxacin	1	98	50	0	15	13	15	2	3	0	0	14	36	0	0	0							
Macrolides																							
Erythromycin	16	98	8	0	0	0	0	12	29	34	12	1	2	0	0	8							
Penicillins																							
Ampicillin	16	98	39	0		0	1	3	9	15	14	12	5	6	2	31							
Tetracyclines																							
Tetracyclin	2	98	76	0	0	5	2	6	6	3	0	0	0	0	76								

Table Antimicrobial susceptibility testing of *C. jejuni* in Gallus gallus (fowl) - broilers - at farm - Monitoring - quantitative data [Dilution method]

C. jejuni																							
Gallus gallus (fowl) - broilers - at farm - Monitoring																							
Isolates out of a monitoring programme		yes																					
Number of isolates available in the laboratory		56																					

Table Antimicrobial susceptibility testing in *C. jejuni*

n = Number of resistant isolates		
<i>C. jejuni</i>		
Gallus gallus (fowl) - broilers - at farm - Monitoring		
Isolates out of a monitoring programme		yes
Number of isolates available in the laboratory		56
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	56	0
Streptomycin	56	1
Fluoroquinolones		
Ciprofloxacin	56	17
Fully sensitive	56	16
Macrolides		
Erythromycin	56	0
Penicillins		
Ampicillin	56	26
Resistant to 1 antimicrobial	56	18
Resistant to 2 antimicrobials	56	13
Resistant to 3 antimicrobials	56	8
Resistant to 4 antimicrobials	56	1
Resistant to >4 antimicrobials	56	0
Tetracyclines		
Tetracyclin	56	28

Table Antimicrobial susceptibility testing in *C. jejuni*

n = Number of resistant isolates		
<i>C. jejuni</i>		
Gallus gallus (fowl) - broilers - at farm - Monitoring		
Isolates out of a monitoring programme		yes
Number of isolates available in the laboratory		56
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	56	0
Streptomycin	56	1
Fluoroquinolones		
Ciprofloxacin	56	17
Fully sensitive	56	16
Macrolides		
Erythromycin	56	0
Penicillins		
Ampicillin	56	26
Resistant to 1 antimicrobial	56	18
Resistant to 2 antimicrobials	56	13
Resistant to 3 antimicrobials	56	8
Resistant to 4 antimicrobials	56	1
Resistant to >4 antimicrobials	56	0
Tetracyclines		
Tetracyclin	56	28

Table Antimicrobial susceptibility testing in *C. jejuni*

n = Number of resistant isolates		
<i>C. jejuni</i>		
Gallus gallus (fowl) - broilers - at farm - Monitoring		
Isolates out of a monitoring programme		yes
Number of isolates available in the laboratory		56
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	56	0
Streptomycin	56	1
Fluoroquinolones		
Ciprofloxacin	56	17
Fully sensitive	56	16
Macrolides		
Erythromycin	56	0
Penicillins		
Ampicillin	56	26
Resistant to 1 antimicrobial	56	18
Resistant to 2 antimicrobials	56	13
Resistant to 3 antimicrobials	56	8
Resistant to 4 antimicrobials	56	1
Resistant to >4 antimicrobials	56	0
Tetracyclines		
Tetracyclin	56	28

Table Antimicrobial susceptibility testing in *C. jejuni*

n = Number of resistant isolates		
<i>C. jejuni</i>		
Meat from broilers (<i>Gallus gallus</i>) - carcass - at slaughterhouse - Monitoring		
Isolates out of a monitoring programme		yes
Number of isolates available in the laboratory		114
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	114	0
Streptomycin	114	2
Fluoroquinolones		
Ciprofloxacin	114	26
Fully sensitive	114	27
Macrolides		
Erythromycin	114	3
Penicillins		
Ampicillin	114	3
Resistant to 1 antimicrobial	114	48
Resistant to 2 antimicrobials	114	30
Resistant to 3 antimicrobials	114	7
Resistant to 4 antimicrobials	114	2
Resistant to >4 antimicrobials	114	0
Tetracyclines		
Tetracyclin	114	65

Table Antimicrobial susceptibility testing of *C. jejuni* in Meat from broilers (*Gallus gallus*) - carcass - at slaughterhouse - quantitative data [Dilution method]

C. jejuni																							
Meat from broilers (Gallus gallus) - carcass - at slaughterhouse																							
Isolates out of a monitoring programme		yes																					
Number of isolates available in the laboratory		114																					

Table Breakpoints used for antimicrobial susceptibility testing in Animals

Test Method Used

Broth dilution

Standards used for testing

eucast/ CA-SFM

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content microg	Breakpoint Zone diameter (mm)		
		Susceptible ≤	Intermediate	Resistant ≥	lowest	highest		Susceptible ≥	Intermediate	Resistant ≤
Tetracyclines										
Tetracyclin	eucast			2	0.125	16				
Fluoroquinolones										
Ciprofloxacin	eucast			1	0.03	8				
Quinolones										
Nalidixic acid	eucast			16	1	128				
Aminoglycosides										
Streptomycin	eucast			4	0.5	32				
Gentamicin	eucast			2	0.125	16				
Macrolides										
Erythromycin	eucast			16	0.5	64				
Penicillins										
Ampicillin	CA-SFM			16	0.25	64				

Table Breakpoints used for antimicrobial susceptibility testing in Food

Test Method Used

Broth dilution

Standards used for testing

eucast/ CA-SFM

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content microg	Breakpoint Zone diameter (mm)		
		Susceptible ≤	Intermediate	Resistant >	lowest	highest		Susceptible ≥	Intermediate	Resistant ≤
Tetracyclines										
Tetracyclin	eucast			2	0.125	16				
Fluoroquinolones										
Ciprofloxacin	eucast			1	0.03	8				
Quinolones										
Nalidixic acid	eucast			16	1	128				
Aminoglycosides										
Streptomycin	eucast			4	0.5	32				
Gentamicin	eucast			2	0.125	16				
Macrolides										
Erythromycin	eucast			16	0.5	64				
Penicillins										
Ampicillin	CA-SFM			16	0.25	64				

2.3. LISTERIOSIS**2.3.1. General evaluation of the national situation****2.3.2. Listeriosis in humans****2.3.3. Listeria in foodstuffs****2.3.4. Listeria in animals****Table Listeria in animals**

	Source of information	Sampling unit	Units tested	Total units positive for Listeria spp.	L. monocytogenes	Listeria spp., unspecified	L. innocua

Footnote

SAGIR is the national network for wild animal sanitary surveillance. Carcasses found in the wildlife by hunters or agents in charge of environment matters are brought to departmental laboratories. Validated results of analysis are input in a national database managed by AFSSA (LERRPAS). Data available do not allow to establish prevalences, as there is no idea on the total number of analysis performed.

2.4. E. COLI INFECTIONS**2.4.1. General evaluation of the national situation****2.4.2. E. Coli Infections in humans****2.4.3. Escherichia coli, pathogenic in foodstuffs****Table VT E. coli in food**

	Source of information	Sampling unit	Sample weight	Units tested	Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC non-O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified
Meat from bovine animals								
minced meat								
intended to be eaten raw								
- at processing plant (1)	CCA	single	50g	3605	11	5	6	
Cheeses made from cows' milk								
soft and semi-soft								
made from raw or low heat-treated milk								
- at processing plant - Monitoring	CCA	single	25g	392	0			

(1) : monitoring programme

Footnote

The 6 non O157 isolates found in minced meat are: 3 O103, 2 O26 and 1 O111

2.4.4. Escherichia coli, pathogenic in animals

2.5. TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1. General evaluation of the national situation

2.5.2. Tuberculosis, Mycobacterial Diseases in humans

2.5.3. Mycobacterium in animals

A. Mycobacterium bovis in bovine animals

Status as officially free of bovine tuberculosis during the reporting year

The entire country free

France is recognised officially tuberculosis free (OTF) since December 2000 in accordance with the Community legislation (decision CE/ 2003/ 467).

Monitoring system

Sampling strategy

All bovines animals slaughtered examined for lesions of tuberculosis – Histopathological and bacteriological examination

Frequency of the sampling

The frequency of the skin-testing depends on the geographical location of herds and area history excepted for herds considered at risk and for moving animals.

Compulsory tuberculin testing of cattle herds takes place every one to five years according to the proportion of herds in a specific area (département) sustaining a confirmed TB breakdown over the previous years. At the end of 2005, regular skin testing has been stopped in 50 "départements". The testing frequency is every five years in 1 "département", every four years in 5 "départements", every three years in 21 "départements", every two years in 14 "départements" and annual in 5 "départements". TB testing intervals are reviewed nationally once a year, for compliance with 64/ 432/ EEC.

Furthermore, individual herds situated in 1-, 2-, 3- and 4-yearly testing areas are subjected to annual testing if they represent a high public or animal health risk (e.g. herds infected less than 10 years ago). Animals moving from a herd to another are also individually skin tested whenever the herd of origine is considered at risk.

The programme of regular tuberculin herd testing is supplemented by veterinary inspection of cattle during routine meat production at slaughterhouses. Animals with suspect tuberculous lesions (granulomas) are traced back to the herd of origin, which is then subjected to tuberculin check testing.

Type of specimen taken

Blood

Case definition

An infected animal is an animal :

From which *Mycobacterium Bovis* or *Mycobacterium tuberculosis* has been isolated

With a positive result to a comparative skin test and with tuberculosis evoking histopathological lesions

With a positive result to a comparative skin test and with isolation of mycobacteria from tuberculosis group

Diagnostic/ analytical methods used

Routine tuberculin tests

Single intradermal test

Intradermal comparative test

Control program/ mechanisms

The control program/ strategies in place

In 1963, at the time of the implementation of the national control programme, the aim was the fight against tuberculosis, and consequently testing herds. Since 2003, the priority is given to the protection of the free herds, which corresponds better to the situation currently met in France, a situation of end of prophylaxis and very low prevalence.

The epidemiological unit of the programme is the herd. The program takes into account the diversity of the epidemiological cycles by the inclusion of the Bovinae (*Bos taurus*, *Bos indicus*, *Bison bison*, *Bison bonasus* and *Bubalus bubalus*) and of the Capra.

The testing of tuberculous animals in herds is founded on the clinical or allergic diagnosis of the disease. The diagnosis of certainty is based on the bacteriological isolation of *M. bovis* and *M. tuberculosis*. The frequency of herd testings can be reduced in certain départements if the annual prevalence rate of cattle herds infected is particularly low. The monitoring system is centred on the herds at risk. The bovine herds tested negative are qualified "officially tuberculosis free".

The reduction of the frequency of tuberculin-test is combined with the control of the risks of infection of herds. Whenever a new herd is created, the tests of tuberculosis qualification are carried out. The free status is also subject to the respect of the preventive measures against the risks related to the introduction of an animal.

Measures in case of the positive findings or single cases

Suspended herds:

Sale of animals forbidden (except to slaughterhouse)

Sale of raw milk forbidden

Testing and epidemiological enquiry to establish if herd is infected or free

Infected herds:

Same measures as in suspended herds

And

All animal slaughtered

Equipment cleaned and disinfected

Epidemiological enquiry to determine origin and consequences of infection

Notification system in place

Notification is mandatory

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

The situation is favorable in France

France has officially tuberculosis free status since 2000

Very low prévalence

Distribution of cases are not homogeneous

B. Mycobacterium bovis in farmed deer

Monitoring system

Sampling strategy

Farmed deer and goats : examination of lesions in slaughterhouse (no routine tuberculin tests)

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium spp.	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified	M. avium complex	M. tuberculosis - complex
Sheep	AFSSA	flock	2	0	0	0	0	0	
Goats	AFSSA	flock	6	3	2	0	0	1	
Pigs	AFSSA	animal	27	27	2	0	0	25	
Zoo animals, all	AFSSA	animal	5	4	0	0	1	0	3
Badgers	AFSSA	animal	2	2	0	0	2		
Cats (1)	AFSSA	animal	3	3				1	2
Dogs (2)	AFSSA	animal	5	2	1			1	
Deer									
wild									
red deer	AFSSA	animal	1	1			1		
roe deer	AFSSA	animal	17	12			8	4	
Wild boars	AFSSA	animal	264	240	145		71	24	

(1) : vet practitioner

(2) : vet practitioner

Footnote

Prevalences cannot be established thanks to those results, as investigations are mostly performed in an infectious context.

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/ 432/ EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests (*)	Number of animals tested			
FRANCE	246019	19900256	245907	99.954	112	0.046		535554	115595	170	54
Total	246019	19900256	245907	99.954	112	0.046		535554	115595	170	54

Footnote

(0): 59 départements

(1): 6

(2): 7

(3): 14

(4): 5

(5): 1

(6: test every 4 years for bovine animals over 24 months of age): 4

(*) Legend:

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

2.6. BRUCELLOSIS

2.6.1. General evaluation of the national situation

A. Brucellosis general evaluation

History of the disease and/ or infection in the country

Bovine brucellosis: last outbreak reported in 2003, France was declared officially free in 2005 (Commission decision of 28 October 2005 amending Decision 93/ 52/ EEC as regards the declaration that the province of Grosseto in the Region of Toscana in Italy is free of brucellosis (*B. melitensis*) and Decision 2003/ 467/ EC as regards the declaration that France is free of bovine brucellosis)

Ovine and Caprine brucellosis: last outbreak reported in 2003.

Porcine brucellosis: sporadic outbreaks in free-ranged farms due to *Brucella suis* biovar 2. The source is the wild boar and hares population where *B. suis* biovar 2 is enzootic. This biovar is classically considered as non-pathogenic to humans, but two human cases were reported in France in 2004 and 2005 in patients with comorbidity and due to regular and important exposure to wild boars and/ or hares.

Human brucellosis: 14 cases notified in 2007. All cases probably represent imported disease, acquired through direct contact with infected animals or consumption of infected food products in or from an enzootic country. In previous years, some cases were laboratory-acquired.

Brucellosis in marine mammals: infection present in at least some species (*Tursiops truncatus*) on the Atlantic coasts of France. The strains isolated are potentially pathogenic to humans. No human case linked to that particular source reported up to now in France..

2.6.2. Brucellosis in humans

2.6.3. Brucella in foodstuffs

2.6.4. Brucella in animals

A. Brucella abortus in bovine animals

Status as officially free of bovine brucellosis during the reporting year

The entire country free

France is officially brucellosis free (OBF) since Septembre 2005 in accordance with the Community legislation (decision CE/ 2003/ 467).

Monitoring system

Sampling strategy

Bovine brucellosis is a notifiable disease under the domestic animal health legislation. All abortions are required to be notified. Aborting animals and abortion material are sampled and tested both serologically and bacteriologically.

The epidemiological unit of the monitoring system is the herd. Before September 2005, herds were monitored either by an annual serological testing of animals more than 12 months old, or by bulk milk testing (Ring-Test or ELISA test) four times per year. Since September 2005, herds are monitored either by an annual serological testing of 20 % animals more than 24 months old, or by bulk milk testing (Ring-Test or ELISA test) once a year. Furthermore, brucellin skin tests are performed in herds where reactors are suspected as false positive.

Methods of sampling (description of sampling techniques)

Blood, milk and organ/ tissues are sampled as appropriate (see sampling strategy).

Case definition

A case is an animal:

- from which *Brucella* sp has been isolated,
- with a positive result to serological tests associated with abortion or orchitis,
- with a positive result to a brucellin skin-test.

Diagnostic/ analytical methods used

The diagnostic methodes are serology (serum testing by: RBT, CFT, Bulk ELISA, Individual ELISA and milk testing by : ring-Test, ELISA), bacteriology and brucellin skin-test.

Vaccination policy

Vaccination of animals against brucellosis is expressly forbidden by animal health legislation.

Control program/ mechanisms

The control program/ strategies in place

Bovine brucellosis control is based on technical collaboration between the veterinary services, the sanitary veterinarians, the veterinary or the dairy interprofessional laboratories and the Animal Health Groups (AHG). In each department, an AHG brings together the stockbreeders, the veterinary services, the agricultural organisations, the veterinary practitioners and veterinary laboratories.

The regulation stipulates that any cattle herd shall acquire and preserve the "officially bovine brucellosis free" status. The regulation lays down that vaccination is forbidden. Herd testing and introduction tests for movements considered at risk are mandatory. Abortions, which are notifiable mandatory, have to be officially investigated. Slaughtering of infected animals is mandatory. The total depopulation of an infected herd can be proposed by the local director of the veterinary services.

The AHG created for more than 40 years inform the stockbreeders and share out the costs of the fight among the stockbreeders (members of AHG). Under the supervision of the DDSV (local directions of veterinary services), the sanitary veterinarians take the official blood samples, which are analysed by the departmental (public) veterinary laboratories.

The interprofessional dairy laboratories perform the routine test on milk. These laboratories are approved for testing brucellosis and are regularly involved in interlaboratory ring-tests organised by the National Reference Laboratory for brucellosis (Afssa). The DDSV receive the results of the analyses, ensure the follow-up of the herd status, perform the procedures for differential diagnosis of the disease as well as supervise the cleaning and disinfection of herds infected.

The CCA (Food Safety Directorate) works out the regulation and collects the epidemiological data. Afssa (Unit zoonoses bacterial - national Laboratory and OIE/ FAO of reference for animal brucellosis), brings a scientific and technical support to CCA, identifies the strains of *Brucella* isolated in France and validates the reagents.

Measures in case of the positive findings or single cases

Suspended herds:

Sale of animals forbidden (except to slaughterhouse)

Sale of raw milk forbidden

Testing and epidemiological enquiry to establish if herd is infected or free

Infected herds:

Same measures as in suspended herds

And

All animal slaughtered

Equipment cleaned and disinfected

Epidemiological enquiry to determine origin and consequences of infection

Notification system in place

Bovine brucellosis is a notifiable disease under animal health legislation. Notification of abortion is compulsory. Aborting animals and abortion material are sampled for serological and bacteriological examinations.

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

The situation is favorable in France

France has officially bovine brucellosis free status since 2005

Last case of bovine brucellosis : 2002

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

The risk of humans contracting brucellosis from bovine animals is assumed to be extremely low.

B. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

Free regions

Sixty-four "départements" of France are recognised officially free for ovine and caprine brucellosis (*B. melitensis*) since 2001 (decision CE/ 93/ 52).

See "Brucella melitensis in goats" for all other parts.

C. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

Free regions

Sixty-four "départements" of France are recognised officially free for ovine and caprine brucellosis (*B. melitensis*) since 2001 (decision CE/ 93/ 52).

Monitoring system

Sampling strategy

On serum (Rose Bengale Test, Complement fixation Test)

Notification and investigation of cases of abortion – Bacteriological examination

Case definition

An infected animal is an animal :

From which *Brucella* sp has been isolated (except *B. ovis*). *B. abortus*, *B. melitensis*

Vaccination policy

Vaccination of bovines, sheep and goats against brucellosis is forbidden

Measures in case of the positive findings or single cases

Suspended herds:

Sale of animals forbidden (except to slaughterhouse)

Sale of raw milk forbidden

Testing and epidemiological enquiry to establish if herd is infected or free

Infected herds:

Same measures as in suspended herds

And

All animal slaughtered

Equipment cleaned and disinfected

Epidemiological enquiry to determine origin and consequences of infection

Notification system in place

Notification is mandatory.

Notification and investigation of cases of abortion

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. melitensis	B. abortus	B. suis	Brucella spp., unspecified
Wild boars								
- Survey	AFSSA	animal	100	2			2	

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance				Investigations of suspect cases													
							Serological tests				Examination of bulk milk samples				Information about abortions				Epidemiological investigation					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of infected herds tested	Number of animals tested	Number of infected herds tested	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with blood tests	Number of suspended herds	Number of positive animals		Number of animals examined biologically	Number of animals positive microbiologically			
FRANCE	246019	19900256	246019	100	0	0	84489	1013619	0	50051	41745	0	29380	0	0	6883	472	312	0	1050	0			
Total	246019	19900256	246019	100	0	0	84489	1013619	0	50051	41745	0	29380	0	0	6883	472	312	0	1050	0			

Table Ovine or Caprine brucellosis - data on herds - Community co-financed eradication programmes

Region	Total number of herds	Total number of herds under the programme	Number of herds checked	Number of positive herds	Number of new positive herds	Number of herds depopulated	% positive herds depopulated	Indicators		
								% herd coverage	% positive herds - period herd prevalence	% new positive herds - herd incidence
Pyrénées-Atlantiques	4756	4756	4464	0	0	0	0	93.86	0	0
Haute-Garonne	1981	1981	1344	0	0	0	0	67.845	0	0
Hautes-Pyrénées	2089	2089	2001	0	0	0	0	95.787	0	0
Drôme	1434	1434	1210	0	0	0	0	84.379	0	0
Pyrénées-Orientales	469	469	210	0	0	0	0	44.776	0	0
Alpes-de-Haute-Provence	872	872	748	0	0	0	0	85.78	0	0
Hautes-Alpes	972	972	972	0	0	1	0	100	0	0
Alpes-Maritimes	500	500	390	0	0	0	0	78	0	0
Bouches-du-Rhône	572	572	398	0	0	0	0	69.58	0	0
Var	472	472	338	0	0	0	0	71.61	0	0
Vaucluse	391	391	314	0	0	0	0	80.307	0	0
Corse-du-Sud	436	436	370	0	0	0	0	84.862	0	0
Haute-Corse	605	605	586	0	0	0	0	96.86	0	0
Total	15549	15549	13345	0	0	1	0	85.825	0	0
Total - 1	14982	14982	13766	0	0	0	0	91.884	0	0

Footnote

In Hautes-Alpes, a herd was depopulated because of numerous positive serological tests without bacteriological confirmation. Depopulation allowed to solve two problems: first, the herd could not be maintained indoor anymore, and deep bacteriological examination on all the animals' lymph nodes could be performed. The suspicion was not confirmed afterwards.

Table Ovine or Caprine brucellosis - data on animals - Community co-financed eradication programmes

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Pyrénées-Atlantiques	623000		184469	184469		0	0	0	0
Haute-Garonne	73000		31193	31193		3	3	0	0
Hautes-Pyrénées	106000		47549	47549		0	0	0	0
Drôme	98000		65573	65573	6	5	5	0	0.009
Pyrénées-Orientales	44940		9374	9374	0	0	0	0	0
Alpes-de-Haute-Provence	127423		120949	120949	45	43	43	0	0.037
Hautes-Alpes	199600		174218	174218	82	82	1060	0	0.047
Alpes-Maritimes	62016		52635	52635	6	6	6	0	0.011
Bouches-du-Rhône	161505		131813	131813	25	25	25	0	0.019
Var	48550				8	8	8		
Vaucluse	38910		26338	26338	6	5	5	0	0.023
Corse-du-Sud	47056		38321	38321	3	2	2	0	0.008
Haute-Corse	95000		96000	96000				0	0
Total	1725000	0	978432	978432	181	179	1157	0	0.018
Total - 1	1721534		1021460	1021460	183	173	450	0	0.018

Footnote

In Hautes-Alpes, a herd was depopulated because of numerous positive serological tests without bacteriological confirmation. Depopulation allowed to solve two problems: first, the herd could not be maintained indoor anymore, and deep bacteriological examination on all the animals' lymph nodes could be performed. The

suspicion was not confirmed afterwards.

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

Region	Total number of existing ovine / caprine		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbiologically	Number of animals positive microbiologically	Number of suspected herds	
Paris	4	70	4	100	0	0	0	0	0				0	0	
	270	5600	270	100	0	0	30	1200	0			1	0	0	
Yvelines	190	3914	190	100	0	0	29	3028	0	957	2	0	0	1	
Essonne	70		70	100	0	0	15		0			0	0	0	
Hauts-de-Seine	7	75	7	100	0	0	2	55	0			0	0	0	
Seine-Saint-Denis	6	45	6	100	0	0	2		0	15	2	0	0	0	
Val-de-Marne	14	190	14	100	0	0	4	149	0			0	0	0	
Val-d'Oise	85	1920	85	100	0	0	13		0			0	0	2	
Ardennes	665	29620	665	100	0	0	114	2578	0		10	0	0	0	
Aube	329	12850	329	100	0	0	131		0	19	2	0	0	2	
Marne	414	13700	414	100	0	0	164		0		49	0	0	0	
Haute-Marne	1244	34175	1244	100	0	0	351	6613	0			0	0	0	
Aisne	1175	14513	1175	100	0	0	536	2770	0	2	2	0	0	2	
Oise	1594	35967	1594	100	0	0	166	3031	0	2	2		0	0	
Somme					0	0	4565		0		70		0	0	
Eure	2290		2290	100	0	0	441	5534	0	164	4		0	4	
Seine-Maritime	4151	57265	4151	100	0	0	1763	9894	0	86	8	0	0	6	
Cher	1300	26200	1300	100	0	0	538	34550	0		333	1	0	0	
Eure-et-Loir	694	950	694	100	0	0	15		0	12		0	0	0	
Indre	2182	118594	2182	100	0	0	105	34719	0			0	0	0	
Indre-et-Loire	858	30270	858	100	0	0	34	30247	0	7		0	0	0	

Loir-et-Cher	734		734	100		0	0	62	10375	0	211	4		0	0	2
Loiret	349	16748	349	100	0	0	0	42	6060	0			0	0	0	0
Calvados	4663		4663	100	0	0	0	623		0			0	0	0	1
Manche	2246	11000	2246	100	0	0	0	298	7555	0			0	0	0	0
Orne	2534	38400	2534	100	0	0	0			0			0	0	0	611
Côte-d'Or	850	45000	850	100	0	0	0	114		0	300	38	0	0	0	0
Nièvre	1700		1700	100	0	0	0	83	7335	0	1		0	0	0	2
Saône-et-Loire	2914	108000	2914	100	0	0	0	1376	37101	0	165		0	0	0	58
Yonne	270	9000	270	100	0	0	0			0				0	0	0
Nord	2373	26309	2373	100	0	0	0	1219	16806	0		1	0	0	0	29
Pas-de-Calais	1691		1691	100	0	0	0	111		0	72		1	0	0	3
Meurthe-et-Moselle	1242		1242	100	0	0	0	393		0		5		0	0	0
Meuse					0	0	0			0		63		0	0	0
Moselle					0	0	0			0		57	0	0	0	0
Vosges	903	61345	903	100	0	0	0	175	5014	0			0	0	0	2
Bas-Rhin	1022		1022	100	0	0	0	796		0		8		0	0	0
Haut-Rhin	534		534	100	0	0	0	287	3963	0				0	0	0
Doubs	950	11700	950	100	0	0	0	103		0		1	0	0	0	1
Jura	691	13000	691	100	0	0	0	41	1885	0			0	0	0	2
Haute-Saône	1700	41000	1700	100	0	0	0	149		0		45	0	0	0	0
Territoire de Belfort	228	2000	228	100	0	0	0	12	154	0	22		0	0	0	1
Loire-Atlantique	1800	41700	1800	100	0	0	0	276		0		67	0	0	0	0
Maine-et-Loire	2200		2200	100	0	0	0			0			0	0	0	0
Mayenne	3491	27860	3491	100	0	0	0	480	5216	0	11		0	0	0	0
Sarthe	2894	29000	2894	100	0	0	0	123	3565	0		83	0	0	0	0
Vendée	2675	88523	2675	100	0	0	0	122		0		26	212	0	0	0
Côtes-d'Armor	3700	25700	3700	100	0	0	0	277	2876	0		9	0	0	0	0
Finistère	1800	10200	1800	100	0	0	0			0			0	0	0	0

Ille-et-Vilaine	3900	38000	3900	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morbihan	1300	26300	1300	100	0	0	0	400	9080	0	8	5	0	0	0	0	0	0	0
Charente	2334		2334	100	0	0	0	84		0	19	0	0	0	0	0	0	0	0
Charente-Maritime	1982	26279	1982	100	0	0	0	30		0		0	0	0	0	0	0	0	0
Deux-Sèvres	3200	441300	3200	100	0	0	0	550	79626	0		399	0	0	0	0	0	0	0
Vienne	2948	373800	2948	100	0	0	0	334	34654	0	497	151	5	0	0	0	6	6	6
Dordogne	2593	89417	2593	100	0	0	0	591	29605	0	462	1	26	0	0	0	4	4	4
Gironde	2500	31000	2500	100	0	0	0	299		0		38	0	0	0	0	0	0	0
Landes	669		669	100	0	0	0	552		0			0	0	0	0	3	3	3
Lot-et-Garonne	1552		1552	100	0	0	0	452		0			0	0	0	0	2	2	2
Ariège	1819		1819	100	0	0	0	987	39956	0		7	1	0	0	0	53	53	53
Aveyron	3800	100000	3800	100	0	0	0			0			0	0	0	0	0	0	0
Gers	951	28901	951	100	0	0	0	150		0			0	0	0	0	0	0	0
Lot	1741	58000	1741	100	0	0	0	584	37369	0		208	0	0	0	0	0	0	0
Tarn	2391	266633	2391	100	0	0	0	1166	35159	0		53	40	0	0	0	397	397	397
Tarn-et-Garonne	684		684	100	0	0	0	427		0			0	0	0	0	52	52	52
Corrèze	2000	70000	2000	100	0	0	0			0			0	0	0	0	0	0	0
Creuse	2296	101000	2296	100	0	0	0	510	18422	0		89	0	0	0	0	0	0	0
Haute-Vienne	4087	451790	4087	100	0	0	0	659	32542	0	9	9	0	0	0	0	9	9	9
Ain	809	20073	809	100	0	0	0	133	10238	0			0	0	0	0	42	42	42
Ardèche	3259	119200	3259	100	0	0	0	439	35093	0	504	8	2	0	0	0	5	5	5
Isère					0	0	0			0			0	0	0	0	0	0	0
Loire	2379	64416	2379	100	0	0	0	396	26656	0	8		5	0	0	0	50	50	50
Rhône	1326	37080	1326	100	0	0	0	172	19996	0	4		0	0	0	0	4	4	4
Savoie	949	38500	949	100	0	0	0	888	22962	0		6	15	0	0	0	6	6	6
Haute-Savoie	1073		1073	100	0	0	0	436		0		1	2	0	0	0	19	19	19
Allier	2649	200000	2649	100	0	0	0	498		0	5			0	0	0	219	219	219
Cantal	1429	39000	1429	100	0	0	0	294	8783	0	205	2		0	0	0	2	2	2

Haute-Loire	2081	142352	2081	100		0	389	24588	0		7	1	0	6
Puy-de-Dôme	2367	79000	2367	100	0	0	686	22154	0		169	0	0	0
Aude					0	0			0		58	0	0	0
Gard	1137		1137	100	0	0			0		212	10	0	0
Hérault	602	25953	602	100	0	0	348	15572	0		1	0	0	15
Lozère	1000	150000	1000	100	0	0	248	17981	0		57	19	0	0
Total	127503	4010497	127503	100	0	0	28882	762689	0	3767	2367	346	0	1623

Table Ovine or Caprine brucellosis - data on status of herds at the end of the period - Community co-financed eradication programmes

Region	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Alpes-de-Haute-Provence	872	127423	115						9	503			237	11200
Hautes-Alpes	972	199600	46	500	0	0	0	0	8	1891			270	20000
Alpes-Maritimes	500	62016	0	0	4	1977	32	443	5	1977	121	44157	233	12560
Bouches-du-Rhône	572	161505	47		0	0	0	0	0	0	331	153418	67	3528
Corse-du-Sud	436	47056	19	1043	0				34	0	0	0	331	37003
Haute-Corse	605	95000								0	0	0		
Drôme	1434	98000	496		0		538		6	37			1023	60000
Haute-Garonne	1981	73000								0		0	1500	69400
Pyrénées-Atlantiques	4756	623000								0		0	4400	600000
Hautes-Pyrénées	2089	106000								0		0	2000	100000
Var	472	48550	48		0		108		58	145			145	
Vaucluse	391	38910	41	85	5	2471	9	151	64	5047	78	19486	208	8785
Pyrénées-Orientales	469	44940	0	0	0	0	0	0	0	0	0	0	358	34014
Total	15549	1725000	812	1628	9	4448	687	594	184	8915	1761	389061	10772	956490
Total - 1	14982	1721534	1108	8341	9	2602	410	15255	178	5955	2723	624736	10833	976125

2.7. YERSINIOSIS

2.7.1. General evaluation of the national situation

2.7.2. Yersiniosis in humans

2.7.3. Yersinia in foodstuffs

2.7.4. Yersinia in animals

Table Yersinia in animals

	Source of information	Sampling unit	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica - O:9	Y. enterocolitica - O:3	Y. enterocolitica - unspecified

2.8. TRICHINELLOSIS

2.8.1. General evaluation of the national situation

A. Trichinellosis general evaluation

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

Since 1998, no outbreak of trichinosis following consumption of horse meat was reported in France. Since 1983, no case of trichinosis due to consumption of pig meat was reported in France.

Recent actions taken to control the zoonoses

Animals of the species sensitive to *Trichinella*, in particular domestic Solipedal, pigs and wild boars, in a systematic way or by survey, have to be tested for larvae of *Trichinella* before marketing meat. In order to reinforce the monitoring for *Trichinella* in wild boar carcasses, a campaign was carried out in collaboration with the National Federation of Hunters to increase hunters awareness of the risk of trichinosis related to consumption of wild boar meat not tested. The hunters are encouraged to have tests for *Trichinella* performed by peptic digestion in an approved laboratory. The approved laboratories are involved in a ring-test performed by the NRL for *Trichinella* (Afssa). Control measures by freezing (-25°C/ 10 days) or cooking (80°C/ 10 min) meat were also mentioned.

2.8.2. Trichinellosis in humans

2.8.3. Trichinella in animals

A. Trichinella in pigs

Number of officially recognised Trichinella-free holdings

No Trichinella-free holdings has been recognised in France for the moment. That's why we are still testing 1 / 1000 of fattenings pigs.

Categories of holdings officially recognised Trichinella-free

This categorisation system has not been retained in France.

Officially recognised regions with negligible Trichinella risk

No region with negligible Trichinella risk has been recognised in France.

Monitoring system

Sampling strategy

General

Systematic sampling (outdoor pigs and breeding pigs)

For Trichinella free holdings

All breeding pigs are tested.

For categories of holdings officially recognised Trichinella-free

This categorisation system has not been retained in France.

For regions with negligible Trichinella risk

This categorisation system has not been retained in France.

Frequency of the sampling

General

Systematic (outdoor pigs and breeding pigs)

For Trichinella free holdings

All breeding pigs are tested

For categories of holdings officially recognised Trichinella-free

This categorisation system has not been retained in France.

For regions with negligible Trichinella risk

Not relevant

Type of specimen taken

General

Muscle (diaphragm) (in accordance with regulation 2075/ 2005)

For Trichinella free holdings

Muscle (diaphragm) (in accordance with regulation 2075/ 2005)

Methods of sampling (description of sampling techniques)

General

Manual technique with scalpels and tongs. We are looking for calibrated tongs.

For Trichinella free holdings

Manual technique with scalpels and tongs. We are looking for calibrated tongs.

Case definition

General

A sample is considered positive when at least one larvae of Trichinella have been identified and confirmed as positive by AFSSA (french food safety agency)

For Trichinella free holdings

A sample is considered positive when at least one larvae of Trichinella have been identified and confirmed as positive by AFSSA (french food safety agency)

Diagnostic/ analytical methods used

General

EU Reference method of detection according to Commission Regulation (2075/ 2005):
Magnetic stirrer method for pooled sample digestion.

For Trichinella free holdings

EU Reference method of detection according to Commission Regulation (2075/ 2005):
Magnetic stirrer method for pooled sample digestion.

Preventive measures in place

Carcasses are consigned until analysis results are obtained.

Control program/ mechanisms

The control program/ strategies in place

Each routine laboratory participates to a national ring trial (two session per year) organised by the National Reference Laboratory for Food borne parasites (NRL Parasites). Analysts also participate to two-days of theoretical and practical formation also organised by the NRL Parasites.

Routine laboratories receive an agreement for *Trichinella* diagnosis by the Ministry of Agriculture every year.

A surveillance program is in force regarding wild game :

- all wild boars which are admitted in game-handling establishments are tested
- all wild boars which are directly supplied to a local retail establishments directly supplying the final consumer
- all farmed wild boars are tested
- we are also preparing a national surveillance plan for foxes

Summary results of the inspections of *Trichinella*-free holdings including information on farmer compliance

The *trichinella* free holdings inspections have not started yet.

Recent actions taken to control the zoonoses

A quality assurance system has been developed since 1999 including analysts training and since 2003 organisation of national ring trials.

Suggestions to the Community for the actions to be taken

- a solution should be found for live pigs circulating between member states before slaughtering, in order to know whether these animals have to be tested or not at the slaughterhouse of destination.
- the freezing treatment of the carcasses is defined in regulation 2075/ 2005 as an alternative to compulsory analysis, BUT this process is not able to destroy all the *trichinella* species in a contaminated meat.

Measures in case of the positive findings or single cases

When a positive result is found in a pooled sample analysis, individual digestions are performed to identify the positive animal.

Epidemiological studies are also carried on in the breeding and area where the positive animal is originated. These epidemiological studies concern other animals within the breeding and wildlife.

The contingency plan in place

The carcass is quarantined and destroyed. The holding of origin is put under sanitary surveillance. Epidemiologic investigation is conducted.

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

Out-door pigs were found positive for *Trichinella britovi* in 2004 in Corsica. Epidemiological investigations were performed and a fox was detected as positive for *T. britovi* in the same area than

the out-door breeding.

Additional information

Development of a quality control system has been set up in France since 1998. At first, theoretical and practical trainings for analysts were organised by the French National Reference Laboratory. Then (in 2003) ring trials were initiated with two sessions per year for each routine diagnostic laboratory.

The sensitivity of larvae detection increased significantly for all routine laboratories (a total of 72 labs in France) and reach to date an average of 80% of larvae detection.

B. Trichinella in horses

Monitoring system

Sampling strategy

Sampling is performed systematically at the slaughterhouse by competent authorities.

Frequency of the sampling

100%

Type of specimen taken

Muscle from tongue or diaphragm

Methods of sampling (description of sampling techniques)

A sample of 10 g of muscle is analysed. Another sample (≥ 10 g) is frozen (18°C) and stored for 8 weeks.

Case definition

A sample is considered positive when at least one larvae of *Trichinella* have been identified and confirmed by AFSSA (food safety agency, reference lab)

Diagnostic/ analytical methods used

EU Reference method of detection: Magnetic stirrer method for pooled sample digestion.

Control program/ mechanisms

The control program/ strategies in place

Each routine laboratory participates to a national ring trial (two session per year) organised by the National Reference Laboratory for Food borned parasites (NRL Parasites). Analysts also participate to two-days of theoretical and practical formation also organised by the NRL Parasites. Routine laboratories receive an agreement for *Trichinella* diagnosis by the Ministry of Agriculture every year.

Recent actions taken to control the zoonoses

A quality assurance system has been developed since 1999 including analysts training and since 2003 organisation of national ring trials. (See above paragraph).

Measures in case of the positive findings or single cases

Positive carcasses are destroyed. A veterinary investigation is also carried on to identify the origin of the positive animal (country, area, breeding conditions, epidemiological data within the area).

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

No positive horse for *Trichinella* since 5 years.

(2001: one positive horse coming from Serbia; 1999: one positive horse coming from Poland).

Additional information

Development of a quality control system has been set up in France since 1998. At first, theoretical and practical trainings for analysts were organised by the French National Reference Laboratory. Then (in 2003) ring trials were initiated with two sessions per year for each routine diagnostic laboratory.

The sensitivity of larvae detection increased significantly for all routine laboratories (a total of 72 labs in France) and reach to date an average of 80% of larvae detection.

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	Trichinella spp., unspecified	T. britovi
Pigs							
fattening pigs							
raised under controlled housing conditions in integrated production system	AFSSA	animal	45735	0			
not raised under controlled housing conditions in integrated production system	AFSSA	animal	249535	1	1		
breeding animals unspecified							
sows and boars	AFSSA	animal	228244	0			
Solipeds, domestic							
horses	AFSSA	animal	12609	0			
Wild boars							
wild	AFSSA	animal	947	0			
farmed	AFSSA	animal	12025	1			1
Foxes	AFSSA	animal	82	4			4
Rodents	CCA	animal	143	0			

2.9. ECHINOCOCCOSIS

2.9.1. General evaluation of the national situation

A. Echinococcus spp. general evaluation

History of the disease and/ or infection in the country

The presence of the parasite was reported in the fox since 1970 in several French départements of the North-East of France: Meurthe-et-Moselle, Meuse, Bas-Rhin, Haut-Rhin, Vosges, Haute-Saône and Doubs. Since this date, the presence of the parasite was reported in several départements. In 1988, the distribution of the parasite in the final host covered a great north-eastern quarter of France as well as the Massif Central area.

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

Recent results suggest that the parasite spreads on the French territory. In France as in Europe, the reasons of this new distribution of the parasite are not clearly elucidated. It can be due to a more active research of the parasite or a real extension of the parasite.

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

For ten years, the population of red foxes has been constantly increasing in France as in Europe. The progression of foxes in urban zones is currently observed. Foxes live now in contact with population and their presence was reported in different cities.

Recent actions taken to control the zoonoses

The infection rate in foxes is currently assessed in 39 French départements and specific studies are carried out on urban foxes. Moreover, domestic dogs and cats were checked for parasite in 2004.

An information leaflet presenting preventive measures in general population was devised by the public health authorities and disseminate in the decentralised services of the ministries in charge of health and agriculture.

2.9.2. Echinococcosis in humans**2.9.3. Echinococcus in animals****Table Echinococcus in animals**

	Source of information	Sampling unit	Units tested	Total units positive for Echinococcus spp.	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Dogs (1)	AFSSA	animal	497	1	0	1	
Foxes (2)	AFSSA	animal	25	0			
- in total - Surveillance (intestine sample)	AFSSA	animal	40	4	0	4	
- in total - Surveillance (Intestine samples, collected by ERZ (Entente R�ge et Zoonoses))	ERZ	animal	876	144	0	144	
Muskrats							
- in total - Surveillance (3)	AFSSA	animal	5	1	0	1	
Marten							
wild							
- in total - Surveillance (4)	AFSSA	animal	6	0			

(1) : faeces sample

(2) : faeces sample

(3) : liver samples

(4) : intestine sample

2.10. TOXOPLASMOSIS**2.10.1. General evaluation of the national situation****2.10.2. Toxoplasmosis in humans****2.10.3. Toxoplasma in animals****Table Toxoplasma in animals**

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma	T. gondii
Sheep (1)					
- at slaughterhouse - Monitoring (425 animals, including 336 lambs were sampled (diaphragm))	CCA	animal	425	102	102
mixed herds					
- at slaughterhouse - Monitoring (409 animals were sampled (heart for detection of alive parasites after mouse inoculation and xenodiagnostic))	CCA	animal	409	48	48

(1) : at slaughterhouse

Footnote

Tests on diaphragm consist on a serological method (ELISA and High sensitivity direct agglutination) implemented on muscle's thawing juice

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

In contrast to the type that prevailed at the start of the last century, which was maintained in dogs, the type of rabies that has occurred in France during the second part of the twentieth century has been maintained essentially in red foxes. The vulpine rabies reappeared in France in 1968 spreading from an outbreak, which is thought to have started in 1939-1940 at the Polish/ Russian border and advanced westwards.

From 1968 to 1989, the front of the vulpine rabies included the north-eastern quarter of France (approximately 1000 to 2500 cases were annually diagnosed during this period, including domestic animals and foxes). During this period, no case of indigenous human rabies were reported (the last case was reported in 1924). The success of the programmes of oral vaccination of the foxes against rabies, performed with the collaboration of the veterinary services, of Afssa Nancy, resulted in the eradication of the rabies in red foxes. On April 30, 2001, France was recognised officially free of rabies according to the criteria of OIE (which excludes the European Bat Lyssavirus).

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

Taking account of the importance of exotic tourism, North-South and East-West exchanges, and the growing passion for the pets, the entry of the canine rabies is particularly to fear at the time of the holidays. It relates to the illegally imported infected dogs (22 case from 1968 to 2005). The last case in August 2004 was particularly alarming because of the multiplicity of the contacts between the rabid dog "Tikki" and the population at the time of the cultural festivals in summer in the south-west of France.

In 1989, it was recognised that France bats may carry a rabies-like virus, European Bat Lyssavirus 2 (EBL2). Since 1998, except dogs imported clandestinely, only bats have been diagnosed rabid in France. The emergence of the disease in bats, whereas it disappeared in the foxes, could pose new problems of public health.

For the travellers, the rabies can be contracted abroad in a country where canine rabies is maintained. According to the data of National Reference Centre (Pasteur Institute, Paris), 20 imported cases of rabies occurred in France between 1970 and 2003. The last imported case was reported in October 2003 in a 3 year old child going back from Gabon.

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

The risk of exposure for humans is very low. Since EBL is found in the French bat population, people being in contact with bats should be aware of the risk. Concerning the risk of introduction of canine rabies from abroad, travellers should be dissuaded from bringing back animals from endemic areas into France and the EU. Large prevention campaigns are performed by the Ministry of Agriculture in summer to inform the travellers of the risk of entry of the urban dog-mediated rabies in France and in UE.

Recent actions taken to control the zoonoses

The risk of transmission of the bat rabies to the man is regarded as low. The bats are protected in France. It is thus recommended not to approach them and capture, transport, sale, purchase or destruction of bats are prohibited. Information campaigns on the bat rabies were carried out in the schools, urgency medical centres, antirabies treatment centres, the decentralised services of the youth and sports Ministry. These campaigns aim to make public (in particular young people) more aware of the danger in touching a bat or handling a sick, injured or died animal. It was in addition recommended to perform preventive rabies vaccination and a specific serological follow-up of the bat handlers (approximately 300 in France).

A large prevention campaign on the topic "Do not bring back the rabies among your memories of holidays !" was performed in 2004 and 2005 by the Ministry of Agriculture to inform the travellers of the risk of entry of the urban dog-mediated rabies in France and in UE. Posters and leaflets were widely disseminated in the veterinary clinics, in the DDSV, at the border posts, in the railway stations and the airports. Travellers are dissuaded from bringing back animals with them (or at least, if they must, then sternly urged to conform to the health regulations imposed) and encouraged to avoid a contact with any domestic carnivores, particularly strays. The campaign will be performed again during summer in 2006.

Preventive rabies vaccination is recommended for travellers who stay in the high-risk countries (in Asia, Africa, the Middle East, South America).

Suggestions to the Community for the actions to be taken

The alert that was given following the case of rabies in a dog imported illegally from Morocco shows up the necessity for a certain number of measures to be taken at the Community level. The UE is actually free from canine rabies and whe should take all appropriate steps to keep it so. More information campaigns to travellers and to sea and air transport companies are needed. In accordance with CE 998/ 2003, stricter controls on the community borders (in particular at the borders with countries not free from dog-mediated rabies) should be implemented to fight against animal trafficking. UE could also support the efforts of the Maghreb countries in their fight against this serious enzootic.

2.11.2. Lyssavirus (rabies) in animals

A. Rabies in dogs

Control program/ mechanisms

Recent actions taken to control the zoonoses

A case of canine rabies was confirmed on 26 August 2004 by the Pasteur Institute laboratory in a 4 month-old female mongrel puppy called Tikki, imported illegally into France from Morocco on 11 July 2004, unidentified and not properly vaccinated against rabies, and transported by road. This is the third case in 2004 of rabies imported into France from Morocco by road.

Given the knowledge we now have on canine rabies, we determined the period of risk with saliva excretion of the rabies virus between 2 and 21 August 2004. But during this time, the animal had been in several public places with her owner (around Bordeaux) and to cultural events in the South West of France. The dog came into contact with numerous adults and children (including foreigners) and pets.

Daily regional press releases were intended to urge people who may have been in contact with this animal to contact health services.

This information was also given to the European Commission and to O.I.E., and to the veterinary services of the 25 member States, who immediately sent on this rabies alert.

Measures taken

As from 28 August 2004, orders of the prefect with a declaration of urban rabies infection in regions free from rabies were implemented in Bordeaux, as well as Libourne, Hostens, Léognan and Gradignan (Gironde), Périgueux (Dordogne) and Miramont de Guyenne (Lot et Garonne).

On 3 September 2004, in view of the first results of the epidemiological investigations, these measures were extended by order of the minister to the three "departments" in order to reinforce the plan of attack against the appearance of rabies in south west France.

This was updated on 28 September 2004 on certain criteria by order of the ministry:

- Free circulation of identified and properly rabies-vaccinated dogs, under the direct supervision of their owner;
- Dogs not properly vaccinated and cats (even vaccinated) to be tethered or kept indoors, dogs on a leash and muzzled;
- Pet-owners are forbidden to part with domestic carnivores not properly vaccinated;
- Epidemiological investigation of any sick or dead domestic carnivore;
- Reinforcement of measures to be taken against stray animals (updated by order of the ministry on 28/ 09/ 2004);
- Any show or gathering of pet carnivores forbidden in the zone (apart from hunting events, which remain authorised only with properly identified and rabies-vaccinated dogs);
- The participation of domestic carnivores from the zone in shows or gatherings outside the zone is forbidden (except for those properly identified and rabies-vaccinated, with an antirabies antibody titration over or equal to 0.5 U.I./ ml - dispensation defined by order of the ministry 28/ 09/ 2004).

Moreover, all the Regional Veterinary Services and the French veterinary surgeons were alerted : reinforcement of the supervision of animals that bite, claw or are suspected of having rabies, reinforced vigilance in stopping the illegal entry of dogs into France.

Results of the investigation

Investigations of the human contacts with positive cases

Following publication in the press of warning messages with a picture of the dog and information on the dates and places where there could have been contamination, about 4000 telephone calls were received by the emergency committee at the Gironde préfecture. For most of these there was found to be no serious risk.

More thorough epidemiological investigations are under way on 300 persons, half of whom have been sent to an antirabies treatment centre. Forty-six dogs and 8 cats certain to have been in contact with the rabid animal during the saliva excretion risk period (from 2 to 21 August 2004) were sacrificed for analysis. Twelve dogs have still not been found.

Furthermore, public opinion having become sensitive to the problem with this crisis has enabled the veterinary and veterinary services network to take charge of more than three hundred animals (cats and dogs) illegally brought into France (not properly identified and/ or not properly vaccinated against rabies) namely from Morocco, Algeria, Tunisia, and Turkey, countries that are not free from canine rabies.

The health inquiries which are held for each individual animal in order to determine their past have led to them being either sacrificed in the search for rabies on the encephalon of a non-conforming animal at great risk, or put under close health supervision for one year.

All the samples analysed for rabies have been found to be negative up till now.

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	Unspecified Lyssavirus	European Bat Lyssavirus - unspecified	Classical rabies virus (genotype 1)	European Bat Lyssavirus 1 (EBL 1)
Cattle (bovine animals)	AFSSA	animal	1	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	16	0				
Sheep	Pasteur	animal	3	0				
Solipeds, domestic	Pasteur	animal	5	0				
Dogs	AFSSA	animal	31	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	613	0				
Cats	AFSSA	animal	21	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	398	1	0	0	0	1
Bats								
wild	AFSSA	animal	128	2			0	2
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	15	1	0	0	0	1
Foxes								
wild	AFSSA	animal	187	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	33	0				
Wolves								
wild	Pasteur	animal	1	0				
Badgers								
wild	AFSSA	animal	1	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	1	0				
Marten								
wild	AFSSA	animal	1	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	7	0				
Wild boars								
wild	AFSSA	animal	1	0				

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- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	1	0				
Deer								
wild								
roe deer	Pasteur	animal	2	0				
Squirrels								
- in total - Surveillance	AFSSA	animal	1	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	10	0				
Rats								
- in total - Surveillance	AFSSA	animal	1	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	13	0				
Ferrets								
- in total - Surveillance	AFSSA	animal	1	0				
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	12	0				
Weasel								
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	1	0				
Otter								
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	1	0				
Rabbits								
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	2	0				
Hamsters								
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	2	0				
Mice								
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	2	0				
Octodons								
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	1	0				
Monkeys								
- in total - Surveillance (Pasteur Institute surveillance)	Pasteur	animal	7	0				

2.12. Q-FEVER

2.12.1. General evaluation of the national situation

A. Coxiella burnetii (Q-fever) general evaluation

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

Human data: In France, human cases of Q-fever are not notifiable. Yet there is a Reference National Centre (CNR Rickettsia, Marseille) which receives samples for first diagnostic or confirmation of diagnostic. In this context, cases detected in the CNR represent only a part of the diagnosed cases in France. The incidence of this bacterial infection in public health is largely underestimated.

Animal Data: The Q-fever can reach a large number of animal species, domestic and wild, including mammals (ruminants, dogs, cats, rabbits, small rodents), birds and arthropods. The bacteria are excreted in milk, urine, faeces and birth products of ruminants. In epidemiological matter, the rate of infection of animals or herds is very variable. In France, Q fever in ruminants is not a notifiable disease. However, the French Food Safety Agency conducts some reference activities such as proficiency ring tests.

Additional information

Sampling strategy:

There is no obligation to declare abortion due to Q fever infection. Sampling of cattle, sheep or goats is usually performed in case of clinical suspicion of Q fever and after abortion. The data of these investigations are not collected. For research studies, some flocks can be tested and followed.

A recent study (2006) in the south east of France has been investigated on 14 goat herds which have no cases of Q fever abortion. The results showed that in total, 34 % (121/ 359) of the tested animals were positive in Q-fever using a sensitive commercial ELISA, which explains this level of positive animals in contrast to other data. Only one flock out of 14 was negative. In 2008, a new investigation will be performed in the same area in order to assess the progress of the Q-fever prevalence.

In the case of the occurrence of human Q-fever cases, an epidemiological investigation can be managed by the animal health professionals.

Type of specimen taken:

Blood samples

Diagnostic / analytical methods used:

Antibodies-ELISA

Results of the investigation

The present results are a focus on a small area and were obtained after a human Q-fever episode during the spring 2007 in Lozère (48). A total of 447 blood samples were collected within a 5 km area around of Florac on a representative number of animals. Sera from cattle, goat and sheep were analysed with a commercial ELISA kit.

2.12.2. Coxiella (Q-fever) in animals**Table Coxiella burnetii (Q fever) in animals**

	Source of information	Sampling unit	Units tested	Total units positive for Coxiella (Q-fever)	C. burnetii
Cattle (bovine animals)	AFSSA	animal	7	0	
Sheep	AFSSA	animal	330	133	133
Goats	AFSSA	animal	110	33	33

2.13. TULARAEMIA**2.13.1. General evaluation of the national situation****2.13.2. Francisella in animals****Table Francisella in animal**

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Francisella	F. tularensis
Hares						
wild	SAGIR	animal		86	45	45

2.14. CHLAMYDIOSIS

2.14.1. General evaluation of the national situation

2.14.2. Chlamydia/ Chlamydophila in animals

A. Cp. psittaci in animal

Monitoring system

Sampling strategy

Sampling strategies is not organized and not systematic:

- 1- Veterinary practitioner order for diagnosis (molecular biology and/ or isolation)
- 2- Sanitary controls of EOPS hens and turkeys (serology only)
- 3- Sampling in suspect plants after human cases (molecular biology and/ or isolation and/ or serology)
- 4- Sampling in duck and turkey flocks not linked to human contaminations (molecular biology and/ or isolation and/ or serology)
- 5- Additional analyses on influenza samples collected in duck flocks.

Frequency of the sampling

Excepted sanitary controls of EOPS hens and turkey flocks, sampling strategies are not organized.

Type of specimen taken

Other: From live animal, conjunctival, pharyngeal and cloacal swabs, as well as blood samples, could be collected.

Methods of sampling (description of sampling techniques)

For pet birds, when possible all birds are submitted to cloacal swabs, when it's not possible, a sampling (about 20% of the birds) is analyzed as well as fecal samples collected in cages.

For poultry birds, 20 animals per flock are most of the time analyzed.

Sera samples are stored at -20°C before analysis. Dry swabs collected for molecular purposes are stored at -80°C before DNA extraction. Swabs put in conservative buffer are stored at -80°C before inoculation into chicken eggs.

Case definition

When strain is isolated or when a positive signal is obtained by PCR from a sample, this one is considered to be positive.

When following the normalized procedure, if sera generate a positive reaction by the complement fixation test,, the case is considered as positive.

Diagnostic/ analytical methods used

Complement fixation test

Inoculation into chicken eggs
Semi quantitative real time PCR

Vaccination policy

No vaccine is available

Other preventive measures than vaccination in place

Antibiotic treatment is effective in treating the symptoms of chlamydiosis, but does not always eliminate infections in birds.

Control program/ mechanisms

The control program/ strategies in place

No control program in France

Recent actions taken to control the zoonoses

No recent action taken in France

Suggestions to the Community for the actions to be taken

More studies are needed, particularly on the human aspect, but also at vet level in order to have a better idea of the true number of human cases and then, set up programs that will protect humans against this infection.

Isolation and typing of the strains (human and animal) / investigation of the most involved bird species.

Measures in case of the positive findings or single cases

Positive cases have to be notified to the veterinary services for decision of the measure to be taken (complementary analysis, treatment, euthanasia...).

Notification system in place

Animal disease is notifiable since 2006.

Results of the investigation

- 1- Veterinary practitioner order for diagnosis (molecular biology and/ or isolation)
18 exotic birds were diagnosed positive out of 57 received for analysis
- 2- Sanitary controls of EOPS hens and turkeys (serology only)
60 EOPS hens and 510 turkeys were diagnosed negative by CF test.
- 3- Sampling in suspect farms after human cases (molecular biology and/ or isolation and/ or serology)
- 4- Sampling in duck and turkey flocks not linked to human contamination (molecular biology and/ or isolation and/ or serology)
5 mallard duck flocks investigated (3 positive)
4 barbarie duck flocks investigated (1 positive)
5 reproduction turkey flocks investigated (0 positive)
4 meat turkey flocks investigated (0 positive)

1 chicken flock investigated (0 positive)

5- Additional analyses on influenza samples collected in duck flocks

132 duck flocks were investigated by PCRq. 75% of them have at least one positive sample.

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

In 2005, 2006 and 2007, 17, 15 and 28 cases were respectively reported to French National Public Health Surveillance Centre (InVS) by the National Reference Centre (NRC). The NRC performs a passive surveillance for psittacosis based on received requests for diagnosis.

During this period, several human psittacosis outbreaks – linked to ducks or to psittacines– were investigated by the InVS and the NRC (human aspects), and by Veterinary Services and Afssa (animal aspects). Medical and veterinary epidemiological surveys and serological and/ or PCR diagnosis confirmation were carried out. Whenever possible, samples were typed by PCR-RFLP and by MLVA, and animal and human samples were compared.

Few data are available concerning this zoonotic disease. Therefore, considering the potential seriousness of the human disease and the recurrence of epidemic episodes in various professional contexts, a 2-year prospective descriptive study of human psittacosis, coordinated by the InVS, was started in January 2008.

The aim of this study is to determine the incidence of hospitalised human cases as well as the frequency of grouped cases and to describe risk exposures for the patients. Additionally, the analysis of the strains isolated from humans and animals and the description of breeding characteristics and working conditions should improve the knowledge of risk factors for animal-to-human transmission. This would allow a reinforcement of prevention and control measures.

Table Chlamydia/ Chlamydophila in animal

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Chlamydia/ Chlamydophila	Cp. psittaci
Ducks	AFSSA	animal		141	103	103
Birds						
pet animals						
- Clinical investigations (exotic birds)	AFSSA	animal		57	18	18
Poultry, unspecified						
(sanitary controls of SPF hens and turkeys)	AFSSA	animal		570	0	
Turkeys	AFSSA	flock		9	0	
Gallus gallus (fowl)						
broilers	AFSSA	flock		1	0	

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1. ENTEROCOCCUS, NON-PATHOGENIC

3.1.1. General evaluation of the national situation

3.1.2. Antimicrobial resistance in Enterococcus, non-pathogenic isolates

A. Antimicrobial resistance of E. faecium in animal

Sampling strategy used in monitoring

Frequency of the sampling

A national monitoring plan is established each year from different animal productions in slaughterhouses to isolate the times indicator bacteria, *E. coli* and *Enterococcus*, and *Campylobacter* from the same samples. Sampling has been organized within French departments in order to be representative of national productions. Sampling are of a permanent monitoring scheme and have been collected by official veterinary services.

- For poultry production, caecal samples from “Standard”, “Label”, and “Export” type productions have been collected from 10 slaughter houses on a full year.
- For pig production, fecal samples of pigs have been collected from 10 slaughter houses on a full year.
- For cattle production, fecal samples were collected from calves (1/ 3), young cattle (1/ 3) and milk producing cull (1/ 3) from 9 slaughterhouses on a full year.

Type of specimen taken

- For poultry production, 2 caecae from the same broiler per batch of broilers.
- For pig production, 1 fecal sample by pig representing a batch of animals from a single source, slaughtered in the same place to the same date.
- For cattle production, 1 fecal sample by breeding of calves, young cattle or milk producing cull.

Methods of sampling (description of sampling techniques)

- For poultry production, each sample consists of 2 caecae from the same broiler taken before the post of evisceration with sterile gloves in a sterile bag.
- For pig production, about 25 grams of faeces are collected in the rectum of a pig with sterile gloves in a sterile bag.
- For cattle production, about 25 grams of faeces are collected in the rectum with sterile gloves in a sterile bag.

Each sample is identified with the code of the slaughterhouse and the number of the animal with a self-adhesive label affixed to the sterile plastic bag containing the sample.

Procedures for the selection of isolates for antimicrobial testing

All strains isolated from the national monitoring plan are usually tested.

Methods used for collecting data

The samples are kept cold quickly transported to the laboratory in charge of isolation.

Upon receipt, samples are diluted to 1/ 10th peptone glycerol water at 25% and then spread on selective media.

After isolation, one characteristic strain is kept in peptone glycerol -70 ° C until antimicrobial susceptibility testing.

Laboratory methodology used for identification of the microbial isolates

E. faecium isolation and identification have been directly conducted on Slanetz and Bartley agar plates incubated at 42°C. identification is then confirmed by PCR.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Antimicrobial susceptibility of indicator bacteria has been tested by MIC determination, according to standardized methods: broth microdilution susceptibility test by Sensititre method based on CLSI M7-A7 standard.

9 antibiotics are included in the Sensititre plate :

Ampicillin, Avilamycin, Chloramphenicol, Erythromycin, Gentamicin, Pristinamycin, Streptomycin, Tetracycline and Vancomycin.

Breakpoints used in testing

Results interpretations have been expressed according to EUCAST recommendations when they exist or according to the CA-SFM. Strains are resistant if MIC value:

Ampicillin: >16 µg/ ml

Avilamycin: >8 µg/ ml

Chloramphenicol: >16 µg/ ml

Erythromycin: >4 µg/ ml

Gentamicin: >128 µg/ ml

Pristinamycin: >2 µg/ ml

Streptomycin: >512 µg/ ml

Tetracycline: >8 µg/ ml

Vancomycin: >8 µg/ ml

Preventive measures in place

Enterococcus faecalis ATCC 29212 have been used as quality control.

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

E. faecium																							
Cattle (bovine animals) - at farm																							
Isolates out of a monitoring programme	no																						
	76																						
Number of isolates available in the laboratory																							
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																							
Antimicrobials:	Break point	N	n	<=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	128	76	3					0	3	13	45	12	0	0	0	0	0	0	3	3	3	5	4
Streptomycin	512	76	11								0	0	7	45	10	0	0	3	3	3	5	4	
Amphenicols																							
Chloramphenicol	16	76	0							2	29	40	5	0	0	0						2	64
Glycopeptides (Cyclic peptides, Polypeptides)																							
Vancomycin	8	76	0			0	0	47	20	9	0	0	0	0	0	0	0					0.12	128
Macrolides																							
Erythromycin	4	76	25	0	1	4	8	2	1	15	20	11	0	0	0	0	14					0.03	128
Orthosomycins																							
Avilamycin	8	76	0				0	0	4	42	23	7	0	0	0	0	0					0.25	128
Penicillins																							
Ampicillin	16	76	4		0	2	3	29	27	10	1	0	0	1	3	0						0.06	64
Streptogramins	2	76	1	1	10	5	20	37	2	0	0	0	1	0	0	0						0.06	64
Tetracyclines	8	76	20	0	0	28	28	0	0	0	0	0	0	0	3	17	0					0.06	128

Footnote

Those strains were collected in 2006

Table Antimicrobial susceptibility testing in *E. faecium*

n = Number of resistant isolates						
	<i>E. faecium</i>					
	Gallus gallus (fowl) - broilers - at farm		Cattle (bovine animals) - at farm		Pigs - at farm	
Isolates out of a monitoring programme	no		no		no	
Number of isolates available in the laboratory	97		76		92	
Antimicrobials:	N	n	N	n	N	n
Aminoglycosides						
Gentamicin	97	0	76	3	92	0
Streptomycin	97	31	76	11	92	28
Amphenicols						
Chloramphenicol	97	3	76	0	92	4
Fully sensitive	97	3	76	46	92	17
Glycopeptides (Cyclic peptides, Polypeptides)						
Vancomycin	97	0	76	0	92	4
Macrolides						
Erythromycin	97	66	76	25	92	51
Orthosomycins						
Avilamycin	97	21	76	0	92	4
Penicillins						
Ampicillin	97	5	76	4	92	0
Resistant to 1 antimicrobial	97	20	76	15	92	25
Resistant to 2 antimicrobials	97	37	76	6	92	20
Resistant to 3 antimicrobials	97	25	76	5	92	21
Resistant to 4 antimicrobials	97	10	76	1	92	6
Resistant to >4 antimicrobials	97	2	76	3	92	3
Streptogramins	97	2	76	1	92	9
Tetracyclines						
Tetracyclin	97	91	76	20	92	70

Footnote

All those strains were isolated in 2006. Streptogramins = pristinamycin

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

E. faecium																								
Pigs																								
Isolates out of a monitoring programme	no																							
Number of isolates available in the laboratory	92																							
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																								
Antimicrobials:	Break point	N	n	<=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	128	92	0					0	1	12	65	13	1	0									0.5	512
Streptomycin	512	92	28								0	0	1	38	13	1	4	7	6	11	11	4	2048	
Amphenicols																								
Chloramphenicol	16	92	4							1	7	67	13	4	0	0							2	64
Glycopeptides (Cyclic peptides, Polypeptides)																								
Vancomycin	8	92	4			0	0	73	9	6	0	0	0	0	0	0	4					0.12	128	
Macrolides																								
Erythromycin	4	92	51	0	1	6	2	0	0	20	12	5	1	0	0	0	45					0.03	128	
Orthosomycins																								
Avilamycin	8	92	4				0	0	5	37	45	1	0	0	0	0	4					0.25	128	
Penicillins																								
Ampicillin	16	92	0		0	2	11	15	17	14	31	1	1	0	0	0						0.06	64	
Streptogramins	2	92	9		0	7	10	12	32	22	6	0	0	0	0	3						0.06	64	
Tetracyclines	8	92	70		0	0	6	15	0	0	0	1	1	2	16	50	1					0.06	128	

Footnote

Those strains were collected in 2006

Table Antimicrobial susceptibility testing of E. faecium in Gallus gallus (fowl) - broilers - quantitative data [Dilution method]

E. faecium																								
Gallus gallus (fowl) - broilers																								
Isolates out of a monitoring programme		no																						
Number of isolates available in the laboratory		97																						
		Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
Antimicrobials:	Break point	N	n	<=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	128	97	0					0	0	1	48	48	0	0									0.5	512
Streptomycin	512	97	31								0	0	0	27	27	4	4	4	10	11	10	4	2048	
Amphenicols																								
Chloramphenicol	16	97	3							5	11	55	23	3	0	0							2	64
Glycopeptides (Cyclic peptides, Polypeptides)																								
Vancomycin	8	97	0			1	1	83	6	6	0											0.12	128	
Macrolides																								
Erythromycin	4	97	66	0	3	9	2	3	8	2	4	3	4	1	1	0	57					0.12	128	
Orthosomycins																								
Avilamycin	8	97	21				0	2	5	34	30	5	0	0	2	1	18					0.25	128	
Penicillins																								
Ampicillin	16	97	5		5	12	12	18	13	21	10	0	1	1	3	1						0.06	64	
Streptogramins	2	97	2		0	3	22	31	28	11	1	1	0									0.06	64	
Tetracyclines	8	97	91		0	0	2	4	0	0	0	0	1	4	26	60						0.06	128	

Footnote

Those strains were isolated in 2006

Table Breakpoints for antibiotic resistance of *Enterococcus*, non-pathogenic in Animals

Test Method Used

Broth dilution

Standards used for testing

eucast/ CA-SFM

Enterococcus, non-pathogenic	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content microg	Breakpoint Zone diameter (mm)		
		Susceptible ≤	Intermediate	Resistant >	lowest	highest		Susceptible ≥	Intermediate	Resistant ≤
Tetracyclines		4	8	8	0.06	128				
Amphenicols										
Chloramphenicol		8	16	16	2	64				
Aminoglycosides										
Streptomycin		256	512	512	4	2048				
Gentamicin		128		128	0.5	512				
Macrolides										
Erythromycin		1		4	4	0.03	128			
Streptogramins (1)		1	2	2	0.06	64				
Glycopeptides (Cyclic peptides, Polypeptides)										
Vancomycin		4	8	8	0.12	128				
Orthosomycins										
Avilamycin		8		8	0.25	128				
Penicillins										
Ampicillin		4		16	0.06	64				

(1) : = Pristinamycin

3.2. *ESCHERICHIA COLI, NON-PATHOGENIC*

3.2.1. General evaluation of the national situation

3.2.2. Antimicrobial resistance in *Escherichia coli*, non-pathogenic isolates

A. Antimicrobial resistance of *E.coli* in food

Sampling strategy used in monitoring

Frequency of the sampling

In continuation of the monitoring programme set up on the animals to the slaughterhouse, surveillance has been extended to the animal food chain swine and poultry (chicken and turkey).

In order to be representative of national animal productions, sampling has been organized within 36 French departments for poultry production, 22 French departments for turkey production and 30 French departments for pig production.

Sampling are of a permanent monitoring scheme and have been collected in cutting by official veterinary services on a full year. The departments that do not have cutting for the productions concerned have been collected samples of meat in one or more slaughterhouses in the department.

Type of specimen taken

Meat samples consist of meat cutting poultry (chicken and turkey) with or without skin, and product type escalope or "coast" for pigs, taken from cutting.

Methods of sampling (description of sampling techniques)

Each sample is made up of minimum 40 grams of meat chosen as much as possible randomly, collected with sterile gloves in a sterile bag numbered.

Procedures for the selection of isolates for antimicrobial testing

The number of samples required was fixed at 1000 in order to isolate approximately 600 strains of *Escherichia coli*. Finally, for poultry production 260 samples (out of 300 scheduled) were carried and 208 strains were isolated. For turkey production, 168 samples (out of 200 scheduled) were carried out and 139 strains were isolated. For pig production, 457 samples (out of 500 scheduled) were carried and only 112 strains were isolated. So all 459 were analyzed.

Methods used for collecting data

The samples are kept cold (or frozen) quickly transported to the laboratory in charge of isolation.

10 grams of meat sample are diluted to 1/ 10th peptone glycerol water at 25% and spread on selective media. After isolation, one characteristic strain is kept in microvial in agar conservation until the confirmation of the identification and antimicrobial susceptibility testing.

Laboratory methodology used for identification of the microbial isolates

Escherichia coli strains have been directly isolated on TBX agar plates or after pre-enrichment (1 strain per sample meat).

Identification is then confirmed by PCR.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Antimicrobial susceptibility of indicator bacteria has been tested by MIC determination, according to standardized methods: broth microdilution susceptibility test by Sensititre method based on CLSI M7-A7 standard.

11 antibiotics are included in the Sensititre plate :

Ampicillin, Apramycin, Chloramphenicol, Ciprofloxacin, Florfenicol, Gentamicin, Nalidixic acid, Neomycin, Streptomycin, Tetracycline, Trimethoprim.

Breakpoints used in testing

Results interpretations have been expressed according to EUCAST recommendations when they exist or according to the CA-SFM. Strains are resistant if MIC value:

Ampicillin: >16 µg/ ml,

Apramycin: >16 µg/ ml,

Chloramphenicol: >16 µg/ ml,

Ciprofloxacin: >1 µg/ ml,

Florfenicol: >16 µg/ ml,

Gentamicin: >4 µg/ ml,

Nalidixic acid: >16 µg/ ml,

Neomycin: >16 µg/ ml,

Streptomycin: >16 µg/ ml,

Tetracycline: >8 µg/ ml,

Trimethoprim: >8 µg/ ml.

Preventive measures in place

E. coli ATCC 25922 have been used as quality control.

B. Antimicrobial resistance of E.coli in animal

Sampling strategy used in monitoring

Frequency of the sampling

A national monitoring plan is established each year from different animal productions in slaughterhouses to isolate the times indicator bacteria, E. coli and Enterococcus, and Campylobacter from the same samples. Sampling has been organized within French departments in order to be representative of national productions. Sampling are of a permanent monitoring scheme and have been collected by official veterinary services.

- For poultry production, caecal samples from “Standard”, “Label”, and “Export” type productions have been collected from 10 slaughter houses on a full year.

- For pig production, fecal samples of pigs have been collected from 10 slaughter houses on a full year.

- For cattle production, fecal samples were collected from calves (1/ 3), young cattle (1/ 3) and milk producing cull (1/ 3) from 9 slaughterhouses on a full year.

Type of specimen taken

- For poultry production, 2 caecae from the same broiler per batch of broilers.
- For pig production, 1 fecal sample by pig representing a batch of animals from a single source, slaughtered in the same place to the same date.
- For cattle production, 1 fecal sample by breeding of calves, young cattle or milk producing cull.

Methods of sampling (description of sampling techniques)

- For poultry production, each sample consists of 2 caecae from the same broiler taken before the post of evisceration with sterile gloves in a sterile bag.
- For pig production, about 25 grams of faeces are collected in the rectum of a pig with sterile gloves in a sterile bag.
- For cattle production, about 25 grams of faeces are collected in the rectum of a pig with sterile gloves in a sterile bag.

Each sample is identified with the code of the slaughterhouse and the number of the animal with a self-adhesive label affixed to the sterile plastic bag containing the sample.

Procedures for the selection of isolates for antimicrobial testing

All strains isolated from the national monitoring plan are usually tested. But if too many strains are isolated, a random draw is conducted to obtain the desired number of strains.

Methods used for collecting data

The samples are kept cold quickly transported to the laboratory in charge of isolation.

Upon receipt, samples are diluted to 1/ 10th peptone glycerol water at 25% and then spread on selective media.

After isolation, one characteristic strain is kept in peptone glycerol -70 ° C until antimicrobial susceptibility testing.

Laboratory methodology used for identification of the microbial isolates

E. coli strains have been directly isolated on MacConkey agar plates. Strains identification are based on standard criteria : glucose, lactose, H₂S, gas, urease, indole, beta-galactosidase, citrate.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Antimicrobial susceptibility of indicator bacteria has been tested by MIC determination, according to standardized methods: broth microdilution susceptibility test by Sensititre method based on CLSI M7-A7 standard.

23 antibiotics are included in 2 Sensititre plates :

Amikacin, Amoxicillin/ Clavulanic acid, Ampicillin, Apramycin, Cefotaxime, Cefoxitin, Ceftazidime, Ceftiofur, Cefuroxime, Chloramphenicol, Ciprofloxacin, Colistin, Florfenicol, Gentamicin, Kanamycin, Nalidixic acid, Neomycin, Streptomycin, Sulfamethoxazole, Tetracycline, Tobramycin, Trimethoprim, Trimethoprim/ Sulfamethoxazole.

Breakpoints used in testing

Results interpretations have been expressed according to EUCAST recommendations when

they exist or according to the CA-SFM. Strains are resistant if MIC value:

Amikacin: >16 µg/ ml,
Amoxicillin/ Clavulanic acid: >16/ 8 µg/ ml,
Ampicillin: >16 µg/ ml,
Apramycin: >16 µg/ ml,
Cefotaxime: >2 µg/ ml,
Cefoxitine: >32 µg/ ml,
Ceftazidime: >8 µg/ ml,
Ceftiofur: >4 µg/ ml,
Cefuroxime: >8 µg/ ml,
Chloramphenicol: >16 µg/ ml,
Ciprofloxacin: >1 µg/ ml,
Colistin: >2 µg/ ml,
Florfenicol: >16 µg/ ml,
Gentamicin: >4 µg/ ml,
Kanamycin: >16 µg/ ml,
Nalidixic acid: >16 µg/ ml,
Neomycin: >16 µg/ ml,
Streptomycin: >16 µg/ ml,
Sulfamethoxazole: >256 µg/ ml,
Tetracycline: >8 µg/ ml,
Tobramycin: >4 µg/ ml,
Trimethoprim: >8 µg/ ml,
Trimethoprim/ Sulfamethoxazole: >8/ 152 µg/ ml.

Preventive measures in place

E. coli ATCC 25922 have been used as quality control.

Table Antimicrobial susceptibility testing of E. coli in animals

n = Number of resistant isolates										
	E. coli									
	Cattle (bovine animals)	Pigs	Gallus gallus (fowl)	Turkeys	Gallus gallus (fowl) - broilers - at farm					
Isolates out of a monitoring programme	no	no			no					
Number of isolates available in the laboratory	103	126			101					
Antimicrobials:	N	n	N	n	N	n	N	n	N	n
Aminoglycosides										
Amikacin	103	0	126	0					101	0
Apramycin	103	0	126	1					101	0
Gentamicin	103	1	126	2					101	0
Kanamycin	103	20	126	5					101	6
Neomycin	103	17	126	5					101	5
Streptomycin	103	32	126	76					101	36
Tobramycin	103	1	126	1					101	0
Amphenicols										
Chloramphenicol	103	20	126	32					101	4
Florfenicol	103	4	126	5					101	0
Cephalosporins										
Cefotaxim	103	0	126	1					101	2
Cefoxitin	103	1	126	0					101	0
Ceftazidim	103	0	126	0					101	0
Ceftiofur	103	0	126	1					101	2
Cefuroxim	103	3	126	2					101	7
Fluoroquinolones										
Ciprofloxacin	103	2	126	0					101	1
Fully sensitive	103	42	126	2					101	3
Penicillins										
Amoxicillin / Clavulanic acid	103	2	126	0					101	0
Ampicillin	103	29	126	38					101	47
Polymyxins										
Colistin	103	0	126	0					101	0
Quinolones										
Nalidixic acid	103	4	126	3					101	19
Resistant to 1 antimicrobial	103	23	126	21					101	9
Resistant to 2 antimicrobials	103	2	126	14					101	24
Resistant to 3 antimicrobials	103	8	126	19					101	16
Resistant to 4 antimicrobials	103	6	126	11					101	7
Resistant to >4 antimicrobials	103	22	126	59					101	42
Sulfonamides										
Sulfonamide	103	53	126	109					101	93
Tetracyclines										
Tetracyclin	103	36	126	105					101	79
Trimethoprim	103	14	126	65					101	44
Trimethoprim + sulfonamides										

Footnote

All those strains were isolated in 2006

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

E. coli		Cattle (bovine animals) - at farm																					
Isolates out of a monitoring programme	no																						
		103																					
Number of isolates available in the laboratory																							
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																							
Antimicrobials:	Break point	N	n	<=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																							
Amikacin	16	103	0					0	42	55	5	0	1	0								0.5	16
Apramycin	16	103	0					0	15	76	12	0	0	0								1	32
Gentamicin	4	103	1				10	70	18	3	1	0	1	0	0							0.25	32
Kanamycin	16	103	20				0	0	0	29	46	7	1	0	0	0	20					0.25	128
Neomycin	16	103	17					10	66	7	1	1	1	6	6	5						0.5	64
Streptomycin	16	103	32							0	19	47	5	6	7	11	6	2	0			2	512
Tobramycin	4	103	1				0	41	56	5	0	0	1	0								0.25	16
Amphenicols																							
Chloramphenicol	16	103	20							0	18	58	7	2	0	1	10	7	0			2	512
Florfenicol	16	103	4							1	21	68	9	2	2							2	32
Cephalosporins																							
Cefotaxim	2	103	0	16	66	20	0	0	0	1	0	0	0									0.016	8
Cefoxitin	32	103	1				0	0	0	14	62	22	4	0	1	0	0					0.25	128
Ceftazidim	8	103	0	0	11	60	27	4	0	0	0	1	0	0								0.03	16
Ceftiofur	4	103	0				45	54	3	1	0	0	0									0.25	8
Cefuroxim	8	103	3					0	1	13	58	28	2	0	1							0.5	32
Fluoroquinolones																							
Ciprofloxacin	1	103	2	96	3	0	2	0	0	1	0	0	1									0.008	8
Penicillins																							
Anoxiicillin / Clavulamic acid	16	103	2						1	19	50	27	4	1	1								
Ampicillin	16	103	29						3	29	40	2	0	0	0	0	8	13	8			1	512
Polymyxins																							
Colistin	2	103	0	0	0	0	0	102	1	0	0											0.03	16
Quinolones																							

16	103	4					6	71	22	0	0	0	0	0	1	1	2					1	256
Sulfonamides																							
256	103	53							2	2	18	20	7	0	1	4	49					4	512
Tetracyclines																							
8	103	36					0	16	31	20	0	0	3	11	16	6	0					0.5	256
8	103	14				3	12	34	27	11	2	0	0	0	14							0.12	64
0																							
Trimethoprim + sulfonamides																							

Footnote

Those strains were isolated in 2006

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

E. coli		Pigs - at farm																								
Isolates out of a monitoring programme	Number of isolates available in the laboratory	no																								
		126																								
		Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																								
Antimicrobials:	Break point	N	n	<=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																										
Amikacin	16	126	0					3	50	57	15	1	0	0								0.5	16			
Apramycin	16	126	1					1	26	85	12	1	0	1								1	32			
Gentamicin	4	126	2				21	82	21	0	0	0	1	1	0							0.25	32			
Kanamycin	16	126	5				0	0	1	39	71	10	0	0	0	0	5					0.25	128			
Neomycin	16	126	5						19	83	18	1	0	0	3	2	0					0.5	64			
Streptomycin	16	126	76						1	15	24	10	16	18	20	13	8	1				2	512			
Tobramycin	4	126	1				2	60	59	3	1	0	0	1								0.25	16			
Amphenicols																										
Chloramphenicol	16	126	32							0	20	68	6	6	7	8	11	0	0			2	512			
Florfenicol	16	126	5							2	22	80	17	2	3							2	32			
Cephalosporins																										
Cefotaxim	2	126	1	47	72	6							1									0.016	8			
Cefoxitin	32	126	0						1	19	87	18	1									0.25	128			
Ceftazidim	8	126	0	0	22	73	30	0	0	1												0.03	16			
Ceftiofur	4	126	1				71	54	0	0	0	0	1									0.25	8			
Cefuroxim	8	126	2					0	0	20	81	23	1	0	1							0.5	32			
Fluoroquinolones																										
Ciprofloxacin	1	126	0	122	1	0	1	2														0.008	8			
Penicillins																										
Amoxicillin / Clavulanic acid	16	126	0						5	38	60	22	1	0	0											
Ampicillin	16	126	38						9	55	24	0	0	0	0	3	20	13	2			1	512			
Polymyxins																										
Colistin	2	126	0	0	0	0	18	107	1	0	0											0.03	16			
Quinolones																										

[illegible]

Footnote

Those strains were isolated in 2006

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl) - broilers - at farm - quantitative data [Dilution method]

E. coli		Gallus gallus (fowl) - broilers - at farm																						
Isolates out of a monitoring programme	Number of isolates available in the laboratory	no																						
		101																						
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																								
Antimicrobials:	Break point	N	n	<=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																								
Amikacin	16	101	0					1	26	51	21	2	0	0								0.5	16	
Apramycin	16	101	0						0	15	64	19	3	0	0							1	32	
Gentamicin	4	101	0				3	63	33	2	0	0	0	0	0							0.25	32	
Kanamycin	16	101	6				0	0	1	20	56	16	2	0	0	0	6					0.25	128	
Neomycin	16	101	5					2	68	25	1	0	0	3	2	0						0.5	64	
Streptomycin	16	101	36								12	38	15	5	7	6	13	5	0			2	512	
Tobramycin	4	101	0				1	37	55	8												0.25	16	
Amphenicols																								
Chloramphenicol	16	101	4							1	14	60	22	0	0	0	4	0	0			2	512	
Florfenicol	16	101	0							2	20	69	10	0	0							2	32	
Cephalosporins																								
Cefotaxim	2	101	2	26	56	17	0	0	0	0	0	0	2									0.016	8	
Cefoxitin	32	101	0				0	0	0	12	62	20	7	0	0	0						0.25	128	
Ceftazidim	8	101	0	0	14	57	24	4	0	1	1	0	0	0								0.03	16	
Ceftiofur	4	101	2				45	48	6	0	0	0	2									0.25	8	
Cefuroxim	8	101	7					0	2	11	54	27	5	0	2							0.5	32	
Fluoroquinolones																								
Ciprofloxacin	1	101	1	80	2	4	7	7	0	1	0	0	0									0.008	8	
Penicillins																								
Amoxicillin / Clavulanic acid	16	101	0						2	23	44	32	0	0	0									
Ampicillin	16	101	47						6	26	14	7	1	0	0	5	16	21	5			1	512	
Polymyxins																								
Colistin	2	101	0	0	0	0	12	88	1													0.03	16	
Quinolones																								

[illegible]

Footnote

Those strains were isolated in 2006

Table Antimicrobial susceptibility testing of E. coli in Meat from broilers (Gallus gallus) - at slaughterhouse - quantitative data [Dilution method]

E. coli		Meat from broilers (Gallus gallus) - at slaughterhouse																					
Isolates out of a monitoring programme	Number of isolates available in the laboratory	no																					
		208																					
		Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																					
Antimicrobials:	Break point	N	n	<=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																							
	Apramycin	16	208	0					0	54	134	14	6	0	0							1	32
	Gentamicin	4	208	3			23	153	24	5	0	0	1	2	0							0.25	32
	Neomycin	16	208	4				24	165	10	5	0	0	2	1	1						0.5	64
	Streptomycin	16	208	70						3	56	64	15	8	15	13	22	8	4			2	512
Amphenicols																							
	Chloramphenicol	16	208	15						2	40	132	19	0	0	6	4	4	1			2	512
	Florfenicol	16	208	1						6	43	144	14	1	0							2	32
Fluoroquinolones																							
	Ciprofloxacin	1	208	9	148	1	14	19	13	4	1	0	5	3								0.008	8
Penicillins																							
	Ampicillin	16	208	86					9	62	45	5	1	0	1	2	30	42	11			1	512
Quinolones																							
	Nalidixic acid	16	208	57					13	101	31	3	3	4	11	14	11	17				1	256
Tetracyclines																							
	Tetracyclin	8	208	157				0	24	22	5	0	2	10	59	77	9	0				0.5	256
	Trimethoprim	8	208	83			5	26	65	24	3	2	0	0	0	83						0.125	64

Footnote

Those strains were collected in 2006

Table Antimicrobial susceptibility testing of E. coli in Meat from turkey - at slaughterhouse - quantitative data [Dilution method]

E. coli		Meat from turkey - at slaughterhouse																						
Isolates out of a monitoring programme	no																							
	138																							
Number of isolates available in the laboratory																								
Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																								
Antimicrobials:	Break point	N	n	<=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																								
Apramycin	16	138	1						0	34	84	18	1	0	1							1	32	
Gentamicin	4	138	2			10	99	26	1	0	0	0	1	1	0							0.25	32	
Neomycin	16	138	4				8	108	16	1	0	0	1	3	0	1						0.5	64	
Streptomycin	16	138	62						2	26	37	11	9	12	8	23	7	3				2	512	
Amphenicols																								
Chloramphenicol	16	138	20						1	23	85	9	2	4	1	7	6	0				2	512	
Florfenicol	16	138	3						0	35	88	12	1	2								2	32	
Fluoroquinolones																								
Ciprofloxacin	1	138	10	101	3	3	13	6	2	0	0	3	7									0.008	8	
Penicillins																								
Ampicillin	16	138	78						2	32	23	3	0	0	1	4	27	27	19			1	512	
Quinolones																								
Nalidixic acid	16	138	34						5	72	24	3	0	1	3	8	7	15				1	256	
Tetracyclines																								
Tetracyclin	8	138	135					0	1	1	1	0	0	8	44	63	20	0				0.5	256	
Trimethoprim	8	138	74			0	17	38	8	0	1	0	0	0	1	73						0.125	64	

Footnote

Those strains were collected in 2006

Table Antimicrobial susceptibility testing of E. coli in food

n = Number of resistant isolates										
	E. coli									
	Meat from turkey - at slaughterhouse	Meat from pig		Meat from bovine animals		Meat from broilers (Gallus gallus)		Meat from other poultry species		
Isolates out of a monitoring programme	no	no				no				
Number of isolates available in the laboratory	138	112				208				
Antimicrobials:	N	n	N	n	N	n	N	n	N	n
Aminoglycosides										
Apramycin	138	1	112	0			208	0		
Gentamicin	138	2	112	1			208	3		
Neomycin	138	4	112	6			208	4		
Streptomycin	138	62	112	60			208	70		
Amphenicols										
Chloramphenicol	138	20	112	27			208	15		
Florfenicol	138	3	112	9			208	1		
Fluoroquinolones										
Ciprofloxacin	138	10	112	1			208	9		
Fully sensitive	138	2	112	24			208	25		
Penicillins										
Ampicillin	138	78	112	41			208	86		
Quinolones										
Nalidixic acid	138	34	112	2			208	57		
Resistant to 1 antimicrobial	138	29	112	19			208	46		
Resistant to 2 antimicrobials	138	24	112	21			208	49		
Resistant to 3 antimicrobials	138	24	112	12			208	43		
Resistant to 4 antimicrobials	138	34	112	15			208	26		
Resistant to >4 antimicrobials	138	25	112	21			208	19		
Tetracyclines										
Tetracyclin	138	135	112	74			208	157		
Trimethoprim	138	74	112	49			208	83		

Footnote

all the strains were isolated in 2006

Table Antimicrobial susceptibility testing of E. coli in Meat from pig - at slaughterhouse - quantitative data [Dilution method]

E. coli		Meat from pig - at slaughterhouse																					
Isolates out of a monitoring programme		no																					
Number of isolates available in the laboratory		112																					
		Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																					
Antimicrobials:	Break point	N	n	<=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																							
Apramycin	16	112	0						5	26	64	14	3	0	0							1	32
Gentamicin	4	112	1				15	75	21	0	0	0	1	0	0							0.25	32
Neomycin	16	112	6					17	77	4	3	0	5	4	2	0						0.5	64
Streptomycin	16	112	60							4	22	19	7	12	11	17	15	5	0			2	512
Amphenicols																							
Chloramphenicol	16	112	27							1	13	48	23	1	6	5	4	11	0			2	512
Florfenicol	16	112	9							3	12	71	17	2	7							2	32
Fluoroquinolones																							
Ciprofloxacin	1	112	1	105	0	5	1	0	0	0	0	0	1									0.008	8
Penicillins																							
Ampicillin	16	112	41						3	37	25	2	4	1	0	1	16	15	8			1	512
Quinolones																							
Nalidixic acid	16	112	2						9	64	37	0	0	0	0	0	1	1				1	256
Tetracyclines																							
Tetracyclin	8	112	74					1	18	12	7	0	3	5	14	41	10	1				0.5	256
Trimethoprim	8	112	49			2	13	37	8	1	0	2	0	0	0	49						0.125	64

Footnote

Those strains were collected in 2006

Table Breakpoints used for antimicrobial susceptibility testing in Animals

Test Method Used

Broth dilution

Standards used for testing

eucastr/ CA-SFM

Escherichia coli, non-pathogenic	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol		8	16	16	2	512				
Florfenicol		16		16	2	32				
Tetracyclines										
Tetracyclin		4	8	8	0.5	256				
Fluoroquinolones										
Ciprofloxacin		0.5	1	1	0.008	8				
Enrofloxacin										
Quinolones										
Nalidixic acid		8	16	16	1	256				
Trimethoprim		4	8	8	0.125	64				
Sulfonamides										
Sulfonamide		64		256	4	512				
Aminoglycosides										
Streptomycin		8	16	16	2	512				
Gentamicin		2	4	4	0.25	32				
Neomycin		8	16	16	0.5	64				
Kanamycin		8	16	16	0.25	128				
Amikacin		8	16	16	0.5	16				
Apramycin		16		16	1	32				
Tobramycin		2	4	4	0.25	16				
Trimethoprim + sulfonamides										
Trimethoprim + Sulfonamide		2		8	1	16				
Cephalosporins										
Cefotaxim		1	2	2	0.016	8				
Cefoxitin		8		32	0.25	128				
Ceftazidim		1		8	0.03	16				
Ceftiofur		2		4	0.25	8				
Cefuroxim		8		8	0.5	32				
3rd generation cephalosporins										
Penicillins										
Amoxicillin / Clavulanic acid		4		16	1	32				
Ampicillin		4		16	1	512				
Polymyxins										
Colistin		2		2	0.03	16				

Table Breakpoints used for antimicrobial susceptibility testing in Food

Test Method Used

Broth dilution

Standards used for testing

eucastr/ CA-SFM

Escherichia coli, non-pathogenic	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol		8	16	16	2	512				
Florfenicol		16		16	2	32				
Tetracyclines										
Tetracyclin		4	8	8	0.5	256				
Fluoroquinolones										
Ciprofloxacin		0.5	1	1	0.008	8				
Enrofloxacin										
Quinolones										
Nalidixic acid		8	16	16	1	256				
Trimethoprim		4	8	8	0.125	64				
Sulfonamides										
Sulfonamide		64		256	4	512				
Aminoglycosides										
Streptomycin		8	16	16	2	512				
Gentamicin		2	4	4	0.25	32				
Neomycin		8	16	16	0.5	64				
Kanamycin		8	16	16	0.25	128				
Amikacin		8	16	16	0.5	16				
Apramycin		16		16	1	32				
Tobramycin		2	4	4	0.25	16				
Trimethoprim + sulfonamides										
Trimethoprim + Sulfonamide		2		8	1	16				
Cephalosporins										
Cefotaxim		1	2	2	0.016	8				
Cefoxitin		8		32	0.25	128				
Ceftazidim		1		8	0.03	16				
Ceftiofur		2		4	0.25	8				
Cefuroxim		8		8	0.5	32				
3rd generation cephalosporins										
Penicillins										
Amoxicillin / Clavulanic acid		4		16	1	32				
Ampicillin		4		16	1	512				
Polymyxins										
Colistin		2		2	0.03	16				

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1. HISTAMINE

4.1.1. General evaluation of the national situation

4.1.2. Histamine in foodstuffs

4.2. *ENTEROBACTER SAKAZAKII*

4.2.1. General evaluation of the national situation

4.2.2. Enterobacter sakazakii in foodstuffs

4.3. STAPHYLOCOCCAL ENTEROTOXINS

4.3.1. General evaluation of the national situation

4.3.2. Staphylococcal enterotoxins in foodstuffs

5. FOODBORNE OUTBREAKS

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

Foodborne Outbreaks: summarized data

	Total number of outbreaks	Number of possible outbreaks	Number of verified outbreaks
Bacillus	69	0	69
Campylobacter	10	0	10
Clostridium	54	0	54
Escherichia coli, pathogenic	12	0	12
Foodborne viruses	46	0	46
Listeria	0	0	0
Other agents	86	0	86
Parasites	0	0	0
Salmonella	142	0	142
Staphylococcus	178	0	178
Unknown	387	0	387
Yersinia	0	0	0