ZOONOSES MONITORING

FRANCE

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

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

including information on foodborne outbreaks and antimicrobial resistance in zoonotic agents

IN 2004

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **France**

Reporting Year: **2004**

Institutions and laboratories involved in monitoring:

Laboratory name	Description	Contribution

PREFACE

This report is submitted to the European Commission in accordance with Article 5 of Council Directive 92/117/EEC[1]. The information has also been forwarded to the European Food Safety Authority (EFSA).

The report contains information on trends and sources of zoonoses and zoonotic agents in France during the year 2004. The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal bacteria as well as information on epidemiological investigations of foodborne outbreaks. Complementary data on susceptible animal populations in the country is also given.

The information given covers both zoonoses that are important for the public health in the whole European Community as well as zoonoses, which are relevant on the basis of the national epidemiological situation.

The report describes the monitoring systems in place and the prevention and control strategies applied in the country. For some zoonoses this monitoring is based on legal requirements laid down by the Community Legislation, while for the other zoonoses national approaches are applied.

The report presents the results of the examinations carried out in the reporting year. A national evaluation of the epidemiological situation, with special reference to trends and sources of zoonotic infections, is given. Whenever possible, the relevance of findings in foodstuffs and animals to zoonoses cases in humans is evaluated.

The information covered by this report is used in the annual Community Summary Report on zoonoses that is published each year by EFSA.

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1 Council Directive 92/117/ECC of 17 December 1992 concerning measures for protection against specified zoonoses and specified zoonotic agents in animals and products of animal origin in order to prevent outbreaks of foodborne infections and intoxications, OJ L 62, 15.3.1993, p. 38

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1. ANIMAL POPULATIONS

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

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

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks	Year*	Number of holdings	Year*
Cattle (bovine animals)	in total			282009	2000
Gallus gallus	laying hens (1)	5935		2841	
	grandparent birds for meat production line	366		88	
	grandparent birds for egg production line	39		9	
	parent birds for meat production line	1820		746	
	parent birds for egg production line	140		87	
Goats	in total			27286	2000
Pigs	in total			59549	2000
Sheep	in total			95665	2000

(1): include flocks and holdings of pre-laying and laying hens.

Table 14.2 Susceptible animal populations: number of animals

* Only if different than current reporting year

Animal species	Category of animals	Livestock numbers (live animals)	Year*	Number of slaughtered animals	Year*
Cattle (bovine animals)	calves (under 1 year)			1753341	
	dairy cows and heifers			2462264	
	meat production animals			1191989	
	in total	19200000	2003	5408753	
Goats	animals over 1 year			118841	
	animals under 1 year			28676	
	in total	1176000		147538	
Pigs	fattening pigs			24771552	
	in total	15046000		25543802	
Sheep	animals over 1 year			633654	
	animals under 1 year (lambs)			4827121	
	in total			5461065	
Solipeds	horses - in total			24433	
bison, buffalo	in total			148	
ratites (ostrich, emu, nandu)	in total			5937	
Farmed wild boars	in total			2931	
Farmed deer	in total			6995	

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

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

2.1. SALMONELLOSIS

2.1.1. General evaluation of the national situation

A. General evaluation

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

Salmonellosis is the most important bacterial foodborne infection in term of impact on morbidity and mortality in human in France. The monitoring of the number of cases of salmonelloses, by the CNR of Salmonellas, testifies to a fall of 33% between 1997 and 2003. A study carried out by Institut national de veille sanitaire in 2004 reports a link between the implementation of the national control programme of Salmonella in poultry and the decrease in the number of human salmonellosis cases due to S. Enteritidis and S. Typhimurium.

2.1.2. Salmonellosis in humans

A. Salmonellosis in humans

Reporting system in place for the human cases

Salmonellosis is under surveillance by National Reference Laboratory(Institut Pasteur, Paris. NRL in Salmonella surveillance consist in: microbial expertise of strains sent by medical laboratories, epidemiological surveillance, early warning and technical advisory function.
The NRL exerts a continuous monitoring of the different serotypes of Salmonella by serotyping the strains of human origin sent by the corresponding laboratories (Metropolitan France and DOM-TOM). The NRC for Salmonella receives strains of Salmonella from 1500 medical laboratories and epidemiological information of Salmonella strains isolated in laboratories performing serotyping.Each year CNR receives for serotyping 7.000 to 10.000 strains. Joined to epidemiologic information on the strains completely studied by collaborator laboratories, it is on more than 30.000 annual strains that information of CNR is based.
Data analysis according to serotype and place (department) and date of isolation allows to detect an unusual increase of the number of isolations of a serotype which may be due to the consumption of a commercialized contaminated product.
Human salmonellosis are also monitored by means of the surveillance of foodborne outbreaks due to Salmonella, whose notification is mandatory.

Case definition

A case is a patient with an isolation of Salmonella sp. from a clinical specimen (stool, blood, urins, etc.).

Results of the investigation

In 2004, 6352 cases of Salmonella infections were reported. The number of Salmonella in human is stable compared to 2003. The two most common serotypes, S. Enteritidis and S. Typhimurium, still represented 60% of all Salmonella isolates ; the number of S. Enteritidis had decreased (1%), but the number of S. Typhimurium had increased (16%).

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

Salmonellosis is the most important bacterial foodborne infection in term of impact on morbidity and mortality in human in France. The monitoring of the number of cases of salmonelloses, by the CNR of Salmonellas, testifies to a fall of 33% between 1997 and 2003. This reduction coincides with the implementation in 1998 of a national control programme in Gallus gallus of S. Enteritidis (SE) and S. Typhimurium (ST), both serotypes the most isolated in human infections. A study carried out by Institut national de veille sanitaire in 2004 reports a link between the implementation of the national control programme of Salmonella in poultry and the decrease in the number of human salmonellosis cases due to S. Enteritidis and S. Typhimurium.

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

Salmonella	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc	unknown status
	6352	0	0	0	0	0	0
S. Enteritidis	2064						
S. Typhimurium	1666						
other serovars	2622						

Table 3.4.1.B Salmonellosis in man - age distribution

Age Distribution	S. Enteritidis			S. Typhimurium			Salmonella spp.		
	All	M	F	All	M	F	All	M	F
<1 year	33	20	12	57	27	25	296	164	120
1 to 4 years	432	213	208	683	353	314	1726	871	806
5 to 14 years	378	205	159	292	164	124	940	511	409
15 to 24 years(1)	934	409	509	405	194	203	2335	1108	1176
25 to 44 years									
45 to 64 years									
65 years and older	221	87	130	176	87	87	864	379	475
Age unknown	66	25	32	53	27	22	191	83	84
Total :	2064	959	1050	1666	852	775	6352	3116	3070

(1) : (including cases from 5 to 64 years of age)

Table 3.4.2 Salmonellosis in man - seasonal distribution

Month	S. Enteritidis	S. Typhimurium	Salmonella spp.
	Cases	Cases	Cases
January	88	86	318
February	68	71	308
March	79	83	358
April	92	97	346
May	89	130	368
June	261	162	651
July	216	147	597
August	295	153	714
September	347	210	988
October	271	148	687
November	163	178	539
December	95	200	475
not known	0	1	3
Total :	2064	1666	6352

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 directive 92/117/EEC.
All the breeding flocks with more than 250 birds are tested for S. Enteritidis and S. Typhimirium.

Laying hens flocks

In the frame of the national control programme of Salmonella in Gallus gallus, testing of pre-laying flocks and laying hens flocks is mandatory. Sampling programme, including the type and the number of samples and the frequency of sampling, is specified in legal texts covering the production generation flocks in table egg sector.
All the pre-laying flocks with more than 250 birds are tested for S. Enteritidis and S. Typhimirium. All the laying hens flocks, commercialising eggs through an egg packing centre, are tested for S. Enteritidis.

Frequency of the sampling

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

Every flock is sampled

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

2 weeks prior to moving

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

Every 2nd: each flock is tested on the farm months

Laying hens: Day-old chicks

Every flock is sampled

Laying hens: Rearing period

2 weeks prior to slaughter

Laying hens: Production period

At the age of 24, 40 and 55 weeks

Type of specimen taken

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

Meconium

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

Other: 60 caecal samples and 1 environmental gauze swab

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

Other: Every 2nd week at the hatchery: 5 hatching cabinet crate linings and Every 8th week on the farm: 60 caecal samples and 1 environmental gauze swab

Laying hens: Day-old chicks

Internal linings of delivery boxes

Laying hens: Rearing period

Other: 2 pairs of socks and 1 environmental dust swab

Laying hens: Production period

Other: (60 caecal droppings or 2 equivalent faecal samples (swabs or socks)) and (1 environmental dust swab)

Case definition

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

A flock is suspected of infection when S. Enteritidis or S. Typhimurium is isolated. Suspicion is immediately investigate by means of official samples (taken by the veterinary services)in order to confirm the infection. Suspicion of infection may be lifted only after two successive official samples testing negative.

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

necessary): Rearing period

A flock is suspected of infection when S. Enteritidis or S. Typhimurium is isolated. Suspicion is immediately investigate by means of official samples (taken by the veterinary services)in order to confirm the infection. Suspicion of infection may be lifted only after two successive official samples testing negative.

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

A flock is suspected of infection when S. Enteritidis or S. Typhimurium is isolated. Suspicion is immediately investigate by means of official samples (taken by the veterinary services)in order to confirm the infection. Suspicion of infection may be lifted only after two successive official samples testing negative.

Laying hens: Day-old chicks

A flock is suspected of infection when S. Enteritidis or S. Typhimurium is isolated. Suspicion is immediately investigate by means of official samples (taken by the veterinary services)in order to confirm the infection. Suspicion of infection may be lifted only after two successive official samples testing negative.

Laying hens: Rearing period

A flock is suspected of infection when S. Enteritidis or S. Typhimurium is isolated. Suspicion is immediately investigate by means of official samples (taken by the veterinary services)in order to confirm the infection. Suspicion of infection may be lifted only after two successive official samples testing negative.

Laying hens: Production period

A flock is suspected of infection when S. Enteritidis is isolated. Suspicion is immediately investigate by means of official samples (taken by the veterinary services)in order to confirm the infection. Suspicion of infection may be lifted only after two successive official samples testing negative.

Diagnostic/analytical methods used

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

Other: AFNOR NF U 47 100 and 47 101

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

Other: AFNOR NF U 47 100 and 47 101

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

Other: AFNOR NF U 47 100 and 47 101

Laying hens: Day-old chicks

Other: AFNOR NF U 47 100 and 47 101

Laying hens: Rearing period

Other: AFNOR NF U 47 100 and 47 101

Laying hens: Production period

Other: AFNOR NF U 47 100 and 47 101

Vaccination policy

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

Vaccination of breeding flocks of the table egg sector is forbidden. Vaccination of breeding flocks of meat egg sector is auhtorised with killed vaccines only.

Laying hens flocks

Vaccination of laying hens flocks is auhtorized with killed vaccines only.

Other preventive measures than vaccination in place

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

Legal texts specify the preventive rules (hygienic and biosecurity measures) which should be observed to diminish the risk for Salmonella infection in flocks. Receiving compensation by the government in case of infection confirmed is subject to the respect of the hygienic rules.

Laying hens flocks

Legal texts specify the preventive rules (hygienic and biosecurity measures) which should be observed to diminish the risk for Salmonella infection in flocks. Receiving compensation by the government in case of infection confirmed is subject to the respect of the hygienic rules.

Measures in case of the positive findings or single cases

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

When Salmonella infection is suspected in breeding flock, official restricions are immediately impose by the Vet. services, including a prohibition of moving any bird to or

from the holding except for destruction. No eggs may be transported from the holding. Epidemiological investigations are carried out to trace the source and the putative spreading of infection. Official samples are taken in all the poultry houses on the farm concerned.
When Salmonella infection is confirmed in breeding flock, the following measures shall be taken:
- breeders may leave the holding for sanitary slaughter only under supervision of the veterinary services;
- hatching-eggs form the infected flock are destroyed;
- the poultry house or hatchery must be cleaned and disinfected under supervision of the Vet. services;
- environmental samples are taken after cleaning and disinfection to test the result of the cleaning and disinfection procedure;
- Further measures are taken to investigate the source of infection and to eliminate the occurence of rodents, birds and insects.

Laying hens flocks

When Salmonella infection is suspected in breeding flock, official restricions are immediately impose by the Vet. services, including a prohibition of moving any bird to or from the holding except for destruction. No table eggs may be transported from the holding. Epidemiological investigations are carried out to trace the source and the putative spreading of infection. Official samples are taken in all the poultry houses on the farm concerned.
When Salmonella infection is confirmed in breeding flock, the following measures shall be taken:
- laying hens may leave the holding for sanitary slaughter only under supervision of the veterinary services;
- eggs are heat treated;
- the poultry house or hatchery must be cleaned and disinfected under supervision of the Vet. services;
- environmental samples are taken after cleaning and disinfection to test the result of the cleaning and disinfection procedure;
- Further measures are taken to investigate the source of infection and to eliminate the occurence of rodents, birds and insects.

Notification system in place

Farmers, veterinarians and laboratories have to notify to the LCA (Director of Veterinary Services)isolation of S. Enteritidis or S. Typhimurium from any samples (mandatory samples or self-samples).

Results of the investigation

Cf. Table

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

Elite and GP flocks are free of Salmonella. Parent flocks of egg sector are free of S. Enteritidis

and S. Typhimurium. Parent flocks of meat sector are practically free of S. Enteritidis and S. Typhimurium.

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)

Cf. Breeding flocks for egg production.

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

	Source of information	Remarks	Epidemiological unit	Flocks tested	Flocks positive	S. Enteritidis	S. Typhimurium
Gallus gallus							
grandparent breeding flocks for egg production line (1)			flock	39	0	0	0
parent breeding flocks for egg production line			flock	140	0	0	0
- during production period			flock	83	0	0	0
- during rearing period			flock	57	0	0	0
grandparent breeding flocks for meat production line (2)			flock	366	0	0	0
parent breeding flocks for meat production line			flock	1820	3	2	1
- during rearing period			flock	845	0	0	0
- during production period			flock	975	3	2	1

(1) : The 39 grandparent breeding flocks for egg production line include the elite breeding flocks for egg production line.
(2) : The 366 grandparent breeding flocks for meat production line include elite breeding flocks for meat production line.

Table 3.2.2 Salmonella sp. in other commercial poultry

	Source of information	Remarks	Epidemiological unit	Flocks tested	Flocks positive	S. Enteritidis	S. Typhimurium
Gallus gallus							
laying hens							
- during rearing period	DGAL		flock	2576	7	2	5
- during production period	DGAL		flock	3359	92	92	

2.1.5. Salmonella in feedstuffs

Table 3.1.1 Salmonella sp. in feed material of animal origin

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium
Feed material of marine animal origin								
Fish meal	CCA		batch	100g	41	0		

Footnote

The CCA is the Directorate for Food of the Ministry of Agriculture and Fisheries

Table 3.1.2 Salmonella sp. in feed of vegetable origin

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium	S. 6,7:d:-	S. Rissen	S. Tennessee	S. Senftenberg	S. Mbandaka	S. Altona	S. Montevideo
Feed material of cereal grain origin															
Barley derived	CCA		batch	100g	9	0									
Wheat derived	CCA		batch	100g	31	1	1								
Maize	CCA		batch	100g	21	1	1								
other cereal grain derived	CCA		batch	100g	15	0									
Feed material of oil seed or fruit origin															
Groundnut derived	CCA		batch	100g	1	0									
Rape seed derived	CCA		batch	100g	68	4				1	2	1			
Soya (bean) derived	CCA		batch	100g	134	2		1					1		
Cotton seed derived	CCA		batch	100g	3	1								1	
Sunflower seed derived	CCA		batch	100g	73	6	1	1	1		2				
Linseed derived	CCA		batch	100g	9	1									1
other oil seeds derived	CCA		batch	100g	24	1					1				
other feed material															
Legume seeds and similar products	CCA		batch	100g	4	1									
Tubers, roots and similar products	CCA		batch	100g	1	1	1								

Other plants	CCA		batch	100g	53	0						

Footnote

The CCA is the Directorate General for Competition, Consumption and Fraude Control.

Table 3.1.3 Salmonella sp. in compound feedingstuff

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium
Compound feedingstuffs for cattle								
Final product	CCA		batch	100 g	5	0		
Compound feedingstuffs for pigs								
Final product	CCA		batch	100 g	4	0		

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 poultry

Sampling strategy used in monitoring

Frequency of the sampling

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 antibioresistance are commonly performed on isolates collected.
In 2004, 151 private or public laboratories, based on a volunteer participation, provided the data collected by this Salmonella network:
- 14725 data were collected by the network,
- 4903 strains collected have been serotyped by Afssa-LERQAP and 9822 were serotypes by the partners laboratories
- Among the 4903 collected strains, 3403 independent isolates has been tested for antimicrobial resistance.
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.

Type of specimen taken

The Salmonella strains are isolated from rearing animals and their environment in poultry, cattle and pig sector.

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 (Bio-Rad, Marne la coquette, France).

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) : ampicillin (10 µg, 19-14), amoxicillin + clavulanic acid (20 µg, 21-14), cephalothin (30 µg, 18-12), cefotaxime (30 µg, 21-15), ceftazidime (30 µg, 21-15), streptomycin (10 IU, 15-13), gentamicin (10 IU, 16-14), kanamycin (30 IU, 17-15), chloramphenicol (30 µg,

23-19), tetracycline (30 IU, 19-17), sulfamethoxazole-trimethoprim (23.75 µg + 1.25 µg, 16-10), sulphonamides (200 µg, 17-12), nalidixic acid (30 µg, 20-15), ofloxacin (5 µg, 22-16), enrofloxacin (5 µg, 22-17) and colistin (50 µg, 15). Zone diameters were read using the automated scanner Osiris (BioRad).

B. Antimicrobial resistance in Salmonella in foodstuff derived from poultry

Sampling strategy used in monitoring

Frequency of the sampling

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 antibioresistance are commonly performed on isolates collected.
In 2004, 151 private or public laboratories, based on a volunteer participation, provided the data collected by this Salmonella network:
- 14725 data were collected by the network,
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- Among the 4903 collected strains, 3403 independent isolates has been tested for antimicrobial resistance.
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.

Type of specimen taken

The Salmonella strains are isolated from the food hygiene chain in poultry, pigs and cattle sectors.

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 (Bio-Rad, Marne la coquette, France).

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) : ampicillin (10 µg, 19-14), amoxicillin + clavulanic acid (20 µg, 21-14), cephalothin (30 µg, 18-12), cefotaxime (30 µg, 21-15), ceftazidime (30 µg, 21-15), streptomycin (10 IU, 15-13), gentamicin (10 IU, 16-14), kanamycin (30 IU, 17-15), chloramphenicol (30 µg, 23-19), tetracycline (30 IU, 19-17), sulfamethoxazole-trimethoprim (23.75 µg + 1.25 µg, 16-10), sulphonamides (200 µg, 17-12), nalidixic acid (30 µg, 20-15), ofloxacin (5 µg, 22-16), enrofloxacin (5 µg, 22-17) and colistin (50 µg, 15). Zone diameters were read

using the automated scanner Osiris (BioRad).

Table 3.2.5.2 Antimicrobial susceptibility testing of S.Enteritidis in animals

	S. Enteritidis							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus**		**Turkeys**	
Isolates out of a monitoring program (1)	yes		yes		yes		yes	
Number of isolates available in the laboratory	12		0		73		0	
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	12	16.7%			73	26%		
Amphenicols								
Chloramphenicol	12	0%			73	0%		
Cephalosporin								
Cefotaxim	12	0%			73	0%		
Ceftazidim	12	0%			73	0%		
Fluoroquinolones								
Enrofloxacin	12	0%			73	0%		
Quinolones								
Nalidixic acid	12	0%			73	17.8%		
Sulfonamides								
Sulfonamide	12	0%			73	12.3%		
Aminoglycosides								
Streptomycin	12	0%			73	5.3%		
Gentamicin	12	0%			73	4.1%		
Kanamycin	12	0%			73	0%		
Trimethoprim + sulfonamides	12	0%			73	8.2%		
Penicillins								
Ampicillin	12	0%			73	8.2%		
Number of multiresistant isolates								
fully sensitives	4	33.3%			17	23.3%		
resistant to 1 antimicrobial	2	16.7%			23	31.5%		
resistant to 2 antimicrobials	0	0%			1	1.4%		
resistant to 3 antimicrobials	0	0%			0	0%		
resistant to 4 antimicrobials	0	0%			5	6.9%		
resistant to >4 antimicrobials	0	0%			3	4.1%		

(1) : The passive monitoring programme, named "Salmonella", collects Salmonella strains in animal species, feed, food and environment sent by a network of 151 voluntary laboratories.

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

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Enteritidis
	Cattle (bovine animals) - at farm - monitoring programme - passive monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	12

Antimicrobials:	**N**	**%R**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracycline	12	16.7%									8.33		8.33	25	25	16.67	8.33	8.33														
Cephalosporin																																
Cefotaxim	12	0																							8.33			16.67	41.67			33.33
Ceftazidim	12	0																			8.33		25	8.33	25	25		8.33				
Fluoroquinolones																																
Enrofloxacin	12	0																					8.33	8.33	8.33	33.33	25	16.67				
Quinolones																																
Nalidixic acid	12	0																25	50	25												
Sulfonamides																																
Sulfonamide	12	0																		8.33	8.33		16.67	25	33.33	8.33						
Aminoglycosides																																
Streptomycin	12	0										8.33	16.67	33.33	41.67																	
Gentamicin	12	0															25	33.33	33.33	8.33												
Kanamycin	12	0														8.33	8.33	41.67	41.67														
Trimethoprim + sulfonamides	12	0%																				8.33		8.33	16.67	33.33	8.33	16.67	8.33				
Penicillins																																
Ampicillin	12	0																	25	25	25	25										

Table Antimicrobial susceptibility testing of S. Enteritidis in Poultry - in total - monitoring programme - passive monitoring - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Enteritidis
	Poultry - in total - monitoring programme - passive monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	93

Antimicrobials:	**N**	**%R**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracycline	93	24.7%	15.05					1.08			1.08	1.08	6.45	13.98	20.43	11.83	18.28	5.38	3.23	2.15												
Amphenicols																																
Chloramphenicol	93	1.1									1.08							1.08	1.08	5.38	12.9	38.71	26.88	6.45	3.23	2.15						1.08
Cephalosporin																																
Ceftazidim	93	0																	1.08	3.23	24.73	20.43	17.2	22.58	9.68	1.08						
Fluoroquinolones																																
Enrofloxacin	93	0														2.15	8.6	4.3	1.08	1.08	1.08	2.15	11.83	18.28	21.51	10.75	10.75	4.3				
Quinolones																																
Nalidixic acid	93	18.3	17.2								1.08				1.08	2.15	26.88	24.73	6.45	11.83	6.45	1.08	1.08									
Sulfonamides																																
Sulfonamide	93	11.8		11.83															1.08	3.23	2.15	8.6	30.11	12.9	11.83	10.75	5.38	1.08	1.08			
Aminoglycosides																																
Streptomycin	93	5.4	1.08			2.15		1.08	1.08	2.15	5.38	7.53	24.73	26.88	21.51	4.3	2.15															
Gentamicin	93	3.2			1.08	1.08			0.08							2.15	26.88	31.18	19.35	15.05	1.08	1.08										
Kanamycin	93	0												1.08		3.23	32.26	34.41	22.58	4.3	1.08	1.08										
Penicillins																																
Ampicillin	93	7.5	7.53										1.08				3.23	9.68	18.28	21.51	15.05	15.05	7.53	1.08								

Table 3.2.5.3 Antimicrobial susceptibility testing of S.Typhimurium in animals

	S. Typhimurium							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus**		**Turkeys**	
Isolates out of a monitoring program (1)	yes		yes		yes		yes	
Number of isolates available in the laboratory	27		6		43		15	
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	27	85.2%	6	83.3%	43	44.2%	15	86.7%
Amphenicols								
Chloramphenicol	27	59.3%	6	33.3%	43	16.3%	15	26.7%
Florfenicol	27	3%						
Cephalosporin								
Cefotaxim	27	0%	6	0%	43	0%	15	0%
Ceftazidim	27	0%	6	0%	43	0%	15	0%
Fluoroquinolones								
Enrofloxacin	27	3.7%	6	0%	43	2.3%	15	0%
Quinolones								
Nalidixic acid	27	14.8%	6	0%	43	16.3%	15	0%
Sulfonamides								
Sulfonamide	27	66.7%	6	50%	43	32.6%	15	26.7%
Aminoglycosides								
Streptomycin	27	74.1%	6	50%	43	55.8%	15	53.3%
Gentamicin	27	0%	6	0%	43	0%	15	0%
Kanamycin	27	0%	6	0%	43	0%	15	0%
Trimethoprim + sulfonamides	27	7.4%	6	16.7%	43	7%	15	6.7%
Penicillins								
Ampicillin	27	66.7%	6	33.3%	43	30.2%	15	26.7%
Number of multiresistant isolates								
fully sensitives	0	0%	0	0%	0	0%	0	0%
resistant to 1 antimicrobial	3	11.1%	3	50%	9	21%	9	60%
resistant to 2 antimicrobials	3	11.1%	0	0%	6	14%	2	13.3%
resistant to 3 antimicrobials	1	3.7%	1	16.7%	0	0%	0	0%
resistant to 4 antimicrobials	1	3.7%	0	0%	1	2.3%	0	0%
resistant to >4 antimicrobials	16	59.3%	2	33.3%	12	27.9%	4	26.7%

(1) : The passive monitoring programme, named "Salmonella", collects Salmonella strains in animal species, feed, food and environment sent by a network of 151 voluntary laboratories.

Table Antimicrobial susceptibility testing of S. Typhimurium in Cattle (bovine animals) - in total - monitoring programme - passive monitoring - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Typhimurium
	Cattle (bovine animals) - in total - monitoring programme - passive monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	27

Antimicrobials:	**N**	**%R**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracycline	27	85.2%	25.93			40.74					11.11		7.41	3.7	3.7	7.41																
Amphenicols																																
Chloramphenicol	27	59.3	59.3																	3.7	7.41	3.7	14.81	7.41							3.7
Cephalosporin																																
Ceftazidim	27	0																				3.7	25.93	29.63	22.22	11.11	3.7	3.7				
Fluoroquinolones																																
Enrofloxacin	27	3.7										3.7					11.11						7.41	18.52		22.22	22.22	11.11	3.7			
Quinolones																																
Nalidixic acid	27	14.8	14.81														25.93	14.81	18.52	25.93												
Sulfonamides																																
Sulfonamide	27	66.7																	3.7	7.41		11.11	3.7			7.41						
Aminoglycosides																																
Streptomycin	27	74.1	62.96						11.11	7.41	14.81	3.7																				
Gentamicin	27	0															55.56	37.04	7.41													
Kanamycin	27	0														14.81	66.67	11.11	7.41													
Trimethoprim + sulfonamides	27	7.4%	7.41								3.7					18.52	11.11	14.81	3.7	14.81	3.7		11.11	3.7	3.7	3.7						
Penicillins																																
Ampicillin	27	66.67																7.41	7.41	7.41	7.41	3.7										

Table Antimicrobial susceptibility testing of S. Typhimurium in Poultry - in total - monitoring programme - passive monitoring - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Typhimurium
	Poultry - in total - monitoring programme - passive monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	233

Antimicrobials:	**N**	**%R**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracycline	233	53.7%	5.58			4.72		0.43	1.29	3.43	12.45	12.02	13.73	112.45	15.02	6.87	6.87	1.72	0.86	0.86	0.86		0.43	0.43								
Amphenicols																																
Chloramphenicol	233	7.3	7.3													0.43	1.29	6.44	3.86	6.87	7.3	17.6	24.03	13.3	4.29	2.15	1.29					3.86
Cephalosporin																																
Ceftazidim	233	0																			0.86	3	28.76	26.18	18.88	12.02	6.01	3	0.86			0.43
Fluoroquinolones																																
Enrofloxacin	233	3.4						0.43			0.86	1.72	0.43	0.43	3.43	1.72	3.43	1.72	0.43	0.43	0.43		6.87	13.73	21.89	18.45	13.73	3.86	2.58			3.43
Quinolones																																
Nalidixic acid	233	15.9	14.59			0.86				0.43		0.43	2.58	9.01	18.88	11.16	18.88	9.01	6.44	2.15	1.29	1.72	2.58									
Sulfonamides																																
Sulfonamide	233	18.9	18.88																0.43	1.29	2.58	4.72	16.31	13.73	9.01	9.44	6.44	6.87	5.15			5.15
Aminoglycosides																																
Streptomycin	233	53.2		7.3			0.86	3	7.73	34.33	31.33	14.16	0.86					0.43														
Gentamicin	233	0.4		0.43											0.43	7.73	48.07	24.89	9.87	3.86	2.15	1.29	0.86	0.43								
Kanamycin	233	0											0.86	0.43	2.58	12.88	54.95	18.03	4.29	2.15	1.29	1.29	1.29									
Trimethoprim + sulfonamides	233	8.2%	8.15										0.86			0.43	3.86	3	1.72	1.29	1.72	4.72	25.32	12.45	10.3	9.01	7.73	3	4.29	0.43		1.72
Penicillins																																
Ampicillin	233	18.5	18.45												0.43	1.29	5.15	121.45	13.3	21.89	11.16	8.15	5.15	1.72	0.43		0.43					

Table Antimicrobial susceptibility testing of S. Typhimurium in Pigs - in total - monitoring programme - passive monitoring - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Typhimurium
	Pigs - in total - monitoring programme - passive monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	6

Antimicrobials:	**N**	**%R**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracycline	6	83.3%	66.67			16.67								16.67																		
Amphenicols																																
Chloramphenicol	6	33.3	33.33																	16.67	16.67	16.67										
Cephalosporin																																
Cefotaxim	6	0																								33.33	16.67	50.00				
Ceftazidim	6	0																				16.67	33.33	50.00								
Fluoroquinolones																																
Enrofloxacin	6																							16.67	33.33	33.33	16.67					
Quinolones																																
Nalidixic acid	6	16.7	16.67														33.33				16.67	16.67		16.67								
Sulfonamides																																
Sulfonamide	6	50	50																			16.67	16.67						16.67			
Aminoglycosides																																
Streptomycin	6	50	33.33					16.67		33.33	16.67																					
Gentamicin	6	0															50.00	33.33		16.67												
Kanamycin	6	0														33.33	33.33	16.67		16.67												
Penicillins																																
Ampicillin	6	33.3	33.3															16.67	33.33		16.67	100										

Table Antimicrobial susceptibility testing of S. Typhimurium in Pig meat - monitoring programme - passive monitoring - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Typhimurium
	Pig meat - monitoring programme - passive monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	54

Antimicrobials:	**N**	**%R**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracycline	54	94.4%	50			33.33					3.7	3.7	3.7	1.85			1.85	1.85														
Amphenicols																																
Chloramphenicol	54	53.7	51.85			1.85												1.85			12.96	14.81	9.26	1.85	3.70							1.85
Cephalosporin																																
Ceftazidim	54	0																		1.85	1.85	5.56	38.89	25.93	11.11	9.26	5.56					
Fluoroquinolones																																
Enrofloxacin	54	0														1.85	1.85	1.85	1.85				3.70	12.96	20.37	22.22	16.67	11.11	5.56			
Quinolones																																
Nalidixic acid	54	5.6	3.7			1.85						1.85			1.85	1.85	33.33	16.67	27.78	7.41	1.85	1.85										
Sulfonamides																																
Sulfonamide	54	66.7	66.7																	1.85		5.56	7.41	7.41	5.56		1.85	3.7				
Aminoglycosides																																
Streptomycin	54	63	53.7			3.7		1.85	3.7	12.96	20.37						3.7															
Gentamicin	54	0													1.85	7.41	57.41	18.52	11.11	1.85	1.85											
Kanamycin	54	0													7.41	9.26	61.11	12.96	7.41		1.85											
Trimethoprim + sulfonamides	54	11.1%	11.1													1.85	14.81	12.96	9.26	12.96	3.70	1.85	9.26	9.26	7.41	3.70	1.85					
Penicillins																																
Ampicillin	54	63	62.96															3.7	11.11	9.26	7.41	1.85	3.7								

Table Antimicrobial susceptibility testing of S. Typhimurium in Poultry meat - monitoring programme - passive monitoring - quantitative data [Diffusion method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Typhimurium
	Poultry meat - monitoring programme - passive monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	53

Antimicrobials:	**N**	**%R**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracycline	53	73.6%	110.32			15.09					18.87	7.55	20.75	5.66	7.55	7.55	5.66															
Amphenicols																																
Chloramphenicol	53	20.8	20.75																		11.32	13.21	35.85	3.77	1.89	5.66		1.89				5.66
Cephalosporin																																
Ceftazidim	53	0																				3.77	32.08	33.96	15.09	9.43	5.66					
Fluoroquinolones																																
Enrofloxacin	53	1.9											1.89	5.66	5.66	9.43	11.32	3.77					7.55	9.43	9.43	15.09	9.43	7.55	3.77			
Quinolones																																
Nalidixic acid	53	37.7												3.77	18.87	9.43	15.09	5.66	3.77	3.77		1.89										
Sulfonamides																																
Sulfonamide	53	35.9	35.9																		1.89	3.77	18.87	13.21	3.77	9.43	3.77	1.89	3.77			3.77
Aminoglycosides																																
Streptomycin	53	67.9	20.75			1.89	1.89	11.32	32.08	20.75	11.32																					
Gentamicin	53	1.9	1.89											3.77	3.77	3.77	52.83	18.87	13.21		1.89											
Kanamycin	53	0										1.89		3.77	3.77	16.98	58.49	11.32	3.77													
Trimethoprim + sulfonamides	53	7.6%	5.66			1.89							1.89			1.89	11.32	3.77	1.89	5.66	1.89	7.55	20.75	11.32	3.77	9.43	1.89	5.66	3.77			
Penicillins																																
Ampicillin	53	43.4	43.4										1.89					5.66	7.55	11.32	15.09	7.55	7.55									

Table 3.2.5.1 Antimicrobial susceptibility testing of Salmonella spp. in animals

	Salmonella spp.							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus**		**Turkeys**	
Isolates out of a monitoring program (1)	yes		yes		yes		yes	
Number of isolates available in the laboratory	120		16		609		115	
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	120	44.2%	16	62.5%	609	41.7%	115	64.3%
Amphenicols								
Chloramphenicol	120	15.8%	16	18.8%	609	3.9%	115	10.4%
Cephalosporin								
Cefotaxim	120	0.0%	16	0.0%	609	0.0%	115	0.0%
Ceftazidim	120	0.0%	16	0.0%	609	0.0%	115	0.0%
Fluoroquinolones								
Enrofloxacin	120	0.8%	16	0.0%	609	0.3%	115	1.7%
Quinolones								
Nalidixic acid	120	3.3%	16	0.0%	609	9.5%	115	13.9%
Sulfonamides								
Sulfonamide	120	39.17%	16	37.5%	609	12.8%	115	22.6%
Aminoglycosides								
Streptomycin	120	43.3%	16	37.5%	609	28.6%	115	36.5%
Gentamicin	120	0.0%	16	6.3%	609	2%	115	0.0%
Kanamycin	120	0.0%	16	0.0%	609	0.5%	115	0.9%
Trimethoprim + sulfonamides	120	1.7%	16	25%	609	7.4%	115	16.5%
Penicillins								
Ampicillin	120	17.5%	16	18.8%	609	10.5%	115	26.1%
Number of multiresistant isolates								
fully sensitives	6	5.0%	0	0.0%	52	8.5%	6	5.2%
resistant to 1 antimicrobial	25	20.8%	4	25.0%	182	30.0%	40	34.8%
resistant to 2 antimicrobials	18	15.0%	1	6.3%	57	9.4%	12	10.4%
resistant to 3 antimicrobials	11	9.2%	2	12.5%	25	4.1%	10	8.7%
resistant to 4 antimicrobials	1	0.8%	1	6.3%	32	5.3%	3	2.6%
resistant to >4 antimicrobials	20	16.7%	3	18.8%	43	7.1%	22	19.1%

(1) : The passive monitoring programme, named "Salmonella", collects Salmonella strains in animal species, feed, food and environment sent by a network of 151 voluntary laboratories.

Table 3.2.5.5 Antimicrobial susceptibility testing of Salmonella spp. in food

	Salmonella spp.							
	Broiler meat		**Other poultry meat**		**Pig meat**		**Bovine meat**	
Isolates out of a monitoring program (1)	yes		yes		yes		yes	
Number of isolates available in the laboratory	62		23		166		69	
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	62	51.6%	23	60.9%	166	78.9%	69	44.9%
Amphenicols								
Chloramphenicol	62	8.1%	23	4.4%	166	24.1%	69	5.8%
Cephalosporin								
Cefotaxim	62	3.2%	23	0.0%	166	0.0%	69	0.0%
Ceftazidim	62	3.2%	23	0.0%	166	0.0%	69	0.0%
Fluoroquinolones								
Enrofloxacin	62	0.0%	23	4.4%	166	0.0%	69	0.0%
Quinolones								
Nalidixic acid	62	9.7%	23	13.0%	166	3.1%	69	0.0%
Sulfonamides								
Sulfonamide	62	12.9%	23	17.4%	166	49.4%	69	15.9%
Aminoglycosides								
Streptomycin	62	33.9%	23	60.9%	166	57.2%	69	34.8%
Gentamicin	62	0.0%	23	0.0%	166	0.6%	69	1.5%
Kanamycin	62	6.5%	23	0.0%	166	0.6%	69	0.0%
Trimethoprim + sulfonamides	62	8.1%	23	8.7%	166	12.7%	69	2.9%
Penicillins								
Ampicillin	62	12.9%	23	21.7%	166	27.1%	69	4.4%
Number of multiresistant isolates								
fully sensitives	6	9.7%	3	13.0%	0	0.0%	4	5.8%
resistant to 1 antimicrobial	21	33.9%	5	21.7%	35	21%	24	34.8%
resistant to 2 antimicrobials	6	9.7%	6	26.1%	19	11.4%	5	7.3%
resistant to 3 antimicrobials	1	1.6%	1	4.4%	37	22.2%	6	8.7%
resistant to 4 antimicrobials	4	6.5%	1	4.4%	12	7.2%	2	2.9%
resistant to >4 antimicrobials	8	12.9%	4	17.4%	36	21.6%	3	4.4%

(1) : The passive monitoring programme, named "Salmonella", collects Salmonella strains in animal species, feed, food and environment sent by a network of 151 voluntary laboratories.

Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Animals

Test Method Used

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

Standards used for testing

- NCCLS
- CASFM

Subject to quality control

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracycline(1)							30	19		16
Amphenicols										
Chloramphenicol							30	23		18
Florfenicol										
Fluoroquinolones										
Ciprofloxacin										
Enrofloxacin							5	22		16
Quinolones										
Nalidixic acid							30	20		14
Trimethoprim										
Sulfonamides										
Sulfonamide							200	17		11
Aminoglycosides										
Streptomycin(2)							10	15		12
Gentamicin							15	16		13
Neomycin										
Kanamycin(3)							30	17		14
Trimethoprim + sulfonamides(4)								16		9
Cephalosporin										
Cefotaxim							30	21		14
Ceftazidim							30	21		14
3rd generation cephalosporins										
Penicillins										
Ampicillin							10	19		13

(1) : Disk content is given in U.I.
(2) : Disk content is given in U.I.
(3) : Disk content is given in U.I.
(4) : Disk content: 23.75 + 1.25

Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Food

Test Method Used

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

Standards used for testing

- NCCLS
- CASFM

Subject to quality control

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracycline							30	19		16
Amphenicols										
Chloramphenicol							30	23		18
Florfenicol										
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	16		13
Neomycin										
Kanamycin							30	17		14
Trimethoprim + sulfonamides								16		9
Cephalosporin										
Cefotaxim							30	21		14
Ceftazidim							30	21		14
3rd generation cephalosporins										
Penicillins										
Ampicillin							10	19		13

2.2. CAMPYLOBACTERIOSIS

2.2.1. General evaluation of the national situation

2.2.2. Campylobacteriosis in humans

A. Thermophilic Campylobacter in humans

Reporting system in place for the human cases

Campylobacter surveillance is based on a network of voluntary medical laboratories that send their isolates to the National Reference Centre for Campylobacter. A surveillance system based on private laboratories was set up in 2002 to complement the hospital laboratories based system : up to 325 private laboratories and up to 92 hospital laboratories participated.

Case definition

A case is a patient with an isolation of Campylobacter sp. from a clinical specimen (stool, blood, urine, etc.).

History of the disease and/or infection in the country

2004 is the second year that the surveillance network for Campylobacter is operational. Therefore an analysis of trends cannot be made because of lack of comparable data from previous years.

Results of the investigation

In 2004, 2127 cases were reported. Of the 2127 which have been speciated so far, 1482 (70%) were C. jejuni and 335 (16%) C. coli. Quinolone resistance was higher in C. coli (42%) than in C. jejuni (29%). Ampicillin resistance was present in 32% of C. coli and 25% of C. jejuni.

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

The 2004 data are marked by a relatively high proportion of Campylobacter coli (16%) isolates compared to other European countries, and the high frequency of resistance to quinolones and ampicilline.

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

Campylobacter	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc	unknown status
	2127	0	506	0	77	0	1544
C. coli	335		71		16		248
C. jejuni	1482		346		52		1084
C. upsaliensis	0		0		0		0
Campylobacter spp.	310		89		9		212

Table 6.3.B Campylobacteriosis in man - age distribution

Age Distribution	C. coli			C. jejuni			Campylobacter spp.		
	All	M	F	All	M	F	All	M	F
<1 year	10	6	3	45	25	19	62	35	25
1 to 4 years	71	37	32	341	214	123	459	283	170
5 to 14 years	35	17	18	293	156	134	357	186	168
15 to 24 years	36	8	28	168	76	92	223	96	127
25 to 44 years	64	28	36	243	132	110	347	183	162
45 to 64 years	54	28	26	175	117	57	269	171	97
65 years and older	62	35	27	179	111	68	359	218	141
Age unknown	3	2	1	38	22	12	51	30	15
Total :	335	161	171	1482	853	615	2127	1202	905

Table 6.3.C Campylobacteriosis in man - seasonal distribution

Month	C. coli	C. jejuni	C. upsaliensis	Campylobacter spp.
	Cases	Cases	Cases	Cases
January	27	92	0	136
February	25	88	0	143
March	28	121	0	178
April	25	134	0	198
May	36	141	0	198
June	31	205	0	264
July	28	139	0	197
August	41	167	0	241
September	37	141	0	199
October	16	70	0	106
November	17	106	0	139
December	24	78	0	128
not known	0	0	0	0
Total :	335	1482	0	2127

2.2.3. Campylobacter in foodstuffs

A. Thermophilic Campylobacter in Broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

A monitoring plan of Campylobacter in broiler carcasses was carried out during April and Novembre 2004. 142 Randomly selected batches were sampled throughout the period by the veterinary services. The random selection is stratified upon the production of the slaughterhouses included in the plan.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling takes place during the months from April to Novembre

Type of specimen taken

At slaughterhouse and cutting plant

Other: neck skin

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

For each batch, 10g of neck skin from each of the 5 different carcasses sampled per batch(5*10g per batch) were taken and pooled to check for Campylobacter spp. Sampling was carried out after refrigeration. Each isolate was identified as C. jejuni or Campylobacter spp.

Definition of positive finding

At slaughterhouse and cutting plant

A batch was considered positive when samples tested positive for Campylobacter spp.

Table 6.2 Thermophilic Campylobacter spp. in food

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	C. coli	C. lari	C. upsaliensis	C. jejuni	Campylobacter spp.
Pig meat										
fresh										
- at slaughter	lnra/envn		carcasses after refrigeration	8*25cmÂ²	226	27				
Poultry meat										
fresh										
- at slaughter	FSD		batch	5*10g	142				48	116

Footnote

Food Safety Department of the Ministry of Agriculture

2.2.4. Campylobacter in animals

A. Thermophilic Campylobacter in Gallus gallus

Monitoring system

Sampling strategy

A programme monitors the prevalence and the antibiotic resistance of Campylobacter spp. from healthy broilers slaughtered. It is an active programme based on a random selection of healthy animals at the slaughterhouses. At least 150 samples from 150 different flocks randomly selected are tested per year. The random selection is stratified on the annual production of slaughter.

Frequency of the sampling

At slaughter

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughter

Other: caecal content

Methods of sampling (description of sampling techniques)

At slaughter

Samples are performed in 10 slaughterhouses by veterinary services previously trained. One caecal sample from one animal per flock or batch is taken. On each sample of caecal content tested positive, one strain of Campylobacter is isolated.

Diagnostic/analytical methods used

At slaughter

PCR Multiplex PCR

Table 6.1.1 Thermophilic Campylobacter spp. in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	C. jejuni	C. coli	C. lari	C. upsaliensis
Pigs (1)	Afssa		batch	176	124	0	105		
Gallus gallus									
broilers									
- at slaughter (2)	Afssa		flock	183	152	62	63		

(1) : One pig is sampled by batch (coming from the same herd). One sample of feces is taken from the pig sampled. One strain of Campylobacter is tested for antimicrobial resistance. Thus, 176 independant samples are tested.
(2) : One carcasse is sampled by batch (coming from the same flock). One caecal sample is taken from the carcasse sampled. One strain of Campylobacter is tested for antimicrobial resistance. Thus, 183 independant samples are tested.

Footnote

The 2004 data correspond to samples taken in 2003.

2.2.5. Antimicrobial resistance in *Campylobacter* isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in poultry

Sampling strategy used in monitoring

Frequency of the sampling

A programme monitors the prevalence and the antibiotic resistance of Campylobacter spp. from healthy broilers slaughtered. It is an active programme based on a random selection of healthy animals at the slaughterhouses. At least 150 samples from 150 different flocks randomly selected are tested per year. The random selection is stratified on the annual production of slaughter. Sampling at slaughter is distributed evenly throughout the year.

Type of specimen taken

One caecal sample from one animal per flock or batch is taken.

Methods of sampling (description of sampling techniques)

Samples are performed at 10 slaughterhouses by veterinary services previously trained.

Procedures for the selection of isolates for antimicrobial testing

On each sample of caecal content positive for Campylobacter, one strain isolated is randomly selected and submitted to antibiotic susceptibility determination.

Laboratory methodology used for identification of the microbial isolates

The presence of the absence of Campylobacter in each sample is tested by selective envirchment in Preston broth. Plating on Karmali and virion is then performed. Agar plates were incubated at 42°C for 48hours in microaerophilic conditions. One Campylobacter colony per sample (when present)is randomly selected for genetic typing and antibiotic susceptibility determination.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Agar dilution method is used for Campylobacter. (Cf. Table)

Breakpoints used in testing

Breakpoints used are, as in other programmes, those from the CA-SFM: antibiogramme committee of the French society for Microbiology. (Cf. Table).

Table Antimicrobial susceptibility testing of C. coli - qualitative data

	C. coli			
	Pigs		**Poultry**	
Isolates out of a monitoring program	yes		yes	
Number of isolates available in the laboratory	105		63	
Antimicrobials:	**N**	**%R**	**N**	**%R**
Tetracycline	97	96%	46	61%
Fluoroquinolones				
Ciprofloxacin	97	24%	45	13%
Quinolones				
Nalidixic acid	97	38%	46	28%
Aminoglycosides				
Gentamicin	97	0%	46	0%
Macrolides				
Erythromycin	97	78%	46	4%
Penicillins				
Ampicillin	96	13%	46	35%

Footnote

The 2004 data correspond to samples taken in 2003.

Table Antimicrobial susceptibility testing of C. coli in Pigs - monitoring programme - active monitoring - quantitative data [Dilution method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. coli
	Pigs - monitoring programme - active monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	63

Antimicrobials:	**N**	**%R**	**<=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**
Tetracycline				0	0	1	1	1	0	0	1	7	6	20	40	20	0					
Fluoroquinolones																						
Ciprofloxacin				1	24	29	17	2	1	1	5	9	7	1	0	0	0					
Quinolones																						
Nalidixic acid				0	0	0	0	1	1	10	34	14	10	5	11	11	0					
Aminoglycosides																						
Gentamicin				0	2	1	32	57	4	1	0	0	0	0	0	0	0					
Macrolides																						
Erythromycin				0	0	0	0	5	5	11	19	5	2	1	49	0	0					
Penicillins																						
Ampicillin				0	0	1	2	4	22	135	12	7	8	5	0	0	0					

Table Antimicrobial susceptibility testing of C. coli in Poultry - at slaughter - monitoring programme - active monitoring - quantitative data [Dilution method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. coli Poultry - at slaughter - monitoring programme - active monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	63

Antimicrobials:	**N**	**%R**	**<=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**
Tetracycline				0	0	1	0	0	0	1	0	0	3	16	17	0	23					
Fluoroquinolones																						
Ciprofloxacin				3	11	13	7	2	0	0	3	18	4	0	0	0	0					
Quinolones																						
Nalidixic acid				0	0	0	0	0	3	11	17	4	2	5	13	4	2					
Aminoglycosides																						
Gentamicin				0	2	19	37	1	1	0	1	0	0	0	0	0	0					
Macrolides																						
Erythromycin				0	2	19	37	1	1	0	1	0	0	0	0	0	0					
Penicillins																						
Ampicillin				0	0	0	4	3	16	19	8	1	2	0	8	0	0					

Footnote

The 2004 data correspond to samples taken in 2003.

Table Antimicrobial susceptibility testing of C. jejuni - qualitative data

	C. jejuni	
	Poultry	
Isolates out of a monitoring program	yes	
Number of isolates available in the laboratory	62	
Antimicrobials:	**N**	**%R**
Tetracycline	46	61%
Fluoroquinolones		
Ciprofloxacin	45	13%
Quinolones		
Nalidixic acid	46	28%
Aminoglycosides		
Gentamicin	46	0%
Macrolides		
Erythromycin	46	4%
Penicillins		
Ampicillin	46	35%

Footnote

The 2004 data correspond to samples taken in 2003.

Table Antimicrobial susceptibility testing of C. jejuni in Poultry - at slaughter - monitoring programme - active monitoring - quantitative data [Dilution method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. jejuni Poultry - at slaughter - monitoring programme - active monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	62

Antimicrobials:	**N**	**%R**	**<=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**
Tetracycline				1	0	2	3	7	3	1	1	3	1	0	4	20	0					
Fluoroquinolones																						
Ciprofloxacin				1	14	8	9	5	2	0	0	1	0	5	0	0	0					
Quinolones																						
Nalidixic acid				0	0	0	0	0	2	6	19	6	1	1	3	2	6					
Aminoglycosides																						
Gentamicin				0	1	27	14	2	1	0	1	0	0	0	0	0	0					
Macrolides																						
Erythromycin				0	0	1	4	22	14	3	1	0	0	0	1	0	0					
Penicillins																						
Ampicillin				0	0	0	0	0	4	13	3	10	4	6	6	0	0					

Footnote

The 2004 data correspond to samples taken in 2003.

Table 6.1.3 Antimicrobial susceptibility testing of Campylobacter in humans

	Campylobacter spp.	
	humans	
Isolates out of a monitoring program	yes	
Number of isolates available in the laboratory (1)	5088	
Antimicrobials:	**N**	**%R**
Tetracycline	1621	31.9%
Quinolones		
Nalidixic acid(2)	1405	28.1%
Aminoglycosides		
Gentamicin	12	0.2%
Macrolides		
Erythromycin	176	3.4%
Penicillins		
Ampicillin	2001	39.3%

(1) : Isolates received during the 2002-2004 period by the NRC.
(2) : Only tested for C. jejuni, C. coli and C. fetus.

Table 6.1.6 Breakpoints used for antimicrobial susceptibility testing of Campylobacter in Animals

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

NCCLS
CASFM

Subject to quality control

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracycline	CA SFM	4	8	8	0,125	128				
Fluoroquinolones										
Ciprofloxacin	CA SFM	1	2	2	0.03	16				
Quinolones										
Nalidixic acid	CA SFM	8	16	16	1	256				
Aminoglycosides										
Gentamicin	CA SFM	4	8	8	0.03	16				
Macrolides										
Erythromycin	CA SFM	1	24	4	0.25	64				
Penicillins										
Ampicillin	CA SFM	4	8	16	0.25	64				

2.3. LISTERIOSIS

2.3.1. General evaluation of the national situation

2.3.2. Listeriosis in humans

A. Listeriosis in humans

Reporting system in place for the human cases

Listeriosis are notifiable even for a single case. Notifications are done by general practitioners, hospital physicians and medical laboratories to the local public health authorities (Ddass = Direction départementale des affaires sanitaires et sociales). Cases are reported, by means of standardized reports, to the French public health institute (Institut de Veille Sanitaire, InVS). Mandatory notification allows to analyse and follow the trends of the disease within the population in order to better target the local and national actions of prevention.

Case definition

A case is a patient with an isolate of Listeria monocytogenes from a clinical specimen.

Results of the investigation

In 2004, 236 cases of listeriosis were reported (versus 209 cases in 2003). Annual incidence rate is 3.06/1 000 000 inhabitants.

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

Listeria	Cases	Cases Inc
	0	0
L. monocytogenes		
Listeria spp.		
congenital cases		
deaths(1)	16	
Cases not associated with pregnancy(2)	187	
Cases associated with pregnancy	49	

(1) : (stillbirth, newborn and avortion)
(2) : (due to L. monocytogenes)

Table 7.2.B Listeriosis in man - age distribution

Age Distribution	L. monocytogenes			Listeria spp.		
	All	M	F	All	M	F
<1 year	0	0	0			
1 to 4 years(1)	1	0	1			
5 to 14 years(2)	4	2	2			
15 to 24 years(3)	0	0	0			
25 to 44 years(4)	7	5	2			
45 to 64 years(5)	55	30	25			
65 years and older(6)	120	70	50			
Age unknown						
Total :	187	107	80	0	0	0

(1) : (Cases non associated with pregnancy.)
(2) : (Cases non associated with pregnancy.)
(3) : (Cases non associated with pregnancy.)
(4) : (Cases non associated with pregnancy.)
(5) : (Cases non associated with pregnancy.)
(6) : (Cases non associated with pregnancy.)

2.3.3. Listeria in foodstuffs

2.4. VEROCYTOTOXIC ESCHERICHIA COLI

2.4.1. General evaluation of the national situation

2.4.2. Verocytotoxic Escherichia coli in humans

A. Verotoxigenic Escherichia coli infections in humans

Reporting system in place for the human cases

In France, the majority of medical laboratories do not routinely examine stools for Shiga-toxin producing Escherichia coli (STEC), and STEC infections are not mandatory notifiable.
Since 1996, a surveillance system based on a national network of 31 pediatric nephrology departments has been established for the surveillance of Haemolytic uraemic syndrome (HUS) in children under 15 years and is coordinated by the InVS.

Case definition

An HUS case was defined as a patient < 15 years of age with evidence of renal failure (serum creatinine >60 ï•-mol/l if patients <2 years old, >70 µmol/l if patients > 2 years old) and microangiopathic haemolytic anemia (haemoglobin level <10g/100ml and schizocyte ï‚³ 2%)
A case of STEC infection was defined as a patient with gene sequences encoding Stx production by PCR or STEC isolation in stools specimens, or antibodies to the lipopolysaccharide of 7 STEC serogroups (O157, O26, O103, O111, O145, O91, and O128) in serum samples.

Results of the investigation

In 2004, 86 autochtone cases of HUS were reported (versus 90 cases in 2003). 69% cases (59/86) had evidence of STEC infection; 81% of whom were positive for the O157 serogroup.

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

Since 1996, annual incidence rate of HUS is stable and still less than 1/100 000 children < 15 years of age.

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

Pathogenic Escherichia coli	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
HUS	90		86		4	
- clinical cases	29		27		2	
- lab. confirmed cases	61		59		2	
- caused by O157 (VT+)	50		48		2	
- caused by other VTEC	11		11		0	
E.coli infect. (except HUS)(1)						
- laboratory confirmed(2)						
- caused by 0157 (VT+) (3)						
- caused by other VTEC (4)						

(1) : (Not available)
(2) : (Not available)
(3) : (Not available)
(4) : (Not available)

Table 11.3.B Verocytotoxic Escherichia coli infections in man - age distribution

Age Distribution	Verotoxigenic E. coli (VTEC)			VTEC O 157:H7			VTEC non-O 157		
	All	M	F	All	M	F	All	M	F
<1 year	10	4	6						
1 to 4 years	47	23	24						
5 to 14 years	23	12	11						
15 to 24 years									
25 to 44 years									
45 to 64 years									
65 years and older									
Age unknown	10								
Total :	90	39	41	0	0	0	0	0	0

Footnote

(1) The cases refered in this table are all HUS cases.

2.4.3. Pathogenic Escherichia coli in foodstuffs

2.4.4. Pathogenic Escherichia coli in animals

2.5. TUBERCULOSIS

2.5.1. General evaluation of the national situation

2.5.2. Tuberculosis in humans

A. Tuberculosis due to Mycobacterium bovis in humans

Reporting system in place for the human cases

Tuberculosis is notifiable mandatory even for a single case. Notifications are done by general practitioners, hospital physicians and medical laboratories to the local public health authorities (Ddass: Direction départementale des affaires sanitaires et sociales). Confirmed cases are reported, by means of standardized report, to the French public health institute (Institut de Veille sanitaire, InVS). Mandatory notification allows to analyze and follow the trends of the disease within the population in order to better target the local and national actions of prevention.

Results of the investigation

Man tuberculosis is a mandatory disease but it is not possible to know if the infection was due to Mycobacterium bovis or to Mycobacterium tuberculosis. Thus, human infection data due to M. bovis are not available.

Table 1.2.A Tuberculosis in man - species/serotype distribution

Mycobacterium	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
	0	0	0	0	0	0
M. bovis						
M. tuberculosis						
reactivation of previous cases						

Footnote

Man tuberculosis is a mandatory disease but it is not possible to know if the infection was due to Mycobacterium bovis or to Mycobacterium tuberculosis. Thus, human infection data due to M. bovis are not available.

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 according to the decision CE/2001/26.

Monitoring system

Sampling strategy

Infection with M. bovis or M. tuberculosis is notifiable in all animal species.
According to annex A of Council Directive 64/432/EEC, France has the status of OTF Member State since 2000 and bovine herds are tested according to the rules set out in annex B of this directive.
All animals slaughtered for human consumption are officially inspected post-mortem by a veterinarian. Suspicious lesions are sampled for histological 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.
Regular skin testing has been stopped in 23 départements. The testing frequency is every four years in 8 départements, every three years in 32 départements, every two years in 24 départements and annual in 7 départements.
Whatever the département, herds considered at risk (for example, herds having been infected less than 10 years ago) are tested yearly and animals moving from a herd to another are skin tested.

Case definition

A case is an animal:
- from which M. bovis or M. 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 mycobacterias from tuberculosis group,
- with a positive result to any test and belonging to an infected herd.

Diagnostic/analytical methods used

- Single intra-dermal skin test used for routine testing,
- Comparative intra-dermal skin test,
- Inspection of carcasses at slaughterhouses,
- Histological examination,

- Bacteriological examination,
- Gamma interferon 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

In case of isolation of M. bovis or M. tuberculosis from cattle, the herd of origin is considered as infected. Total depopulation of this herd is compulsory.

Results of the investigation

In 2004, more than 283000 herds, housing nearly 11 million bovines old of more than 6 weeks were covered by the French programme of prophylaxis against bovine tuberculosis (Cf. Table 1.1.1.).
The geographical distribution of the outbreaks of bovine tuberculosis on the last years shows that the residual outbreaks are located mainly in the south of the country.

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

The annual herd prevalence rate, which was 0.9% in 1984, decreased to 0.03% in 2003. The annual herd incidence rate, which was 0.16% in 1992, decreased to 0.015% in 2004.
The downward trend of the annual herd rates of prevalence and incidence confirms the favorable evolution of the situation.

Table 1.1.3 Tuberculosis in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	M. bovis	M. tuberculosis
Zoo animals	CCA	(1)	animal	1	1		1

Footnote

CCA: competent central authority is the Food Department of the Ministry of Agriculture.
(1)elephant (female) from Sweden tested at the introduction on a zoo in France.

1.1.1 Bovine tuberculosis

MANDATORY	**CATTLE**		
Number of herds under official control:	283124	Number of animals under official control:	10656500
	OTF bovine herds	**OTF bovine herds with status suspended**	**Bovine herds infected with tuberculosis**
Status of herds at year end (a):	249672	322	65
New cases notified during the year (b):		322	43
	Units tested	**Units suspected**	**Units positive**
Routine tuberculin test (c) - data concerning herds:	118563		43
Routine tuberculin test (c) - data concerning animals:	4315693		7004
	Animals slaughtered	**Animals suspected**	**Animals positive**
Routine post-mortem examination (d):	6739	38	34
		Herds suspected	**Herds confirmed**
Follow up of suspected cases in post-mortem examination (e):			
Follow-up investigation of suspected cases: trace, contacts (f):			
	Animals tested	**Animals suspected**	**Animals positive**
Other routine investigations: exports (g):			
Other routine investigations: tests at AI stations (h):	4000	15	0
	All animals	**Positives**	**Contacts**
Animals destroyed (i):		34	
Animals slaughtered (j):	6739	34	

VOLUNTARY	**CATTLE**		
	Animals tested	**Animals suspected**	**Animals positive**
Other investigations: imports (k):			
	Herds tested	**Herds suspected**	**Herds positive**
Other investigations: farms at risk (l):			
	Samples tested	***M. bovis*isolated**	
Bacteriological examination (m):			

2.6. BRUCELLOSIS

2.6.1. General evaluation of the national situation

2.6.2. Brucellosis in humans

A. Brucellosis in humans

Reporting system in place for the human cases

Brucellosis is notifiable mandatory even for a single case. Notifications are done by general practitioners, hospital physicians and medical laboratories to the local public health authorities (Ddass: Direction départementale des affaires sanitaires et sociales). Confirmed cases are reported, by means of standardized report, to the French public health institute (Institut de Veille sanitaire, InVS). Mandatory notification allows to analyze and follow the trends of the disease within the population in order to better target the local and national actions of prevention.

Case definition

A case is a patient with clinical features compatible with brucellosis and for confirmed cases, isolation of Brucella sp. from a clinical specimen or demonstration of a seroconversion by agglutination test or a fourfold increase of the antibody titre in agglutination, and for probable cases, a single high antibody titre in agglutination.

Results of the investigation

In 2004, 19 cases of brucellosis were notified; 16 were imported. Most imported cases were due to exposure occured abroad or due to consumption of foreign food products. One autochtone case was an occupational cases (veterinary assistant) due to a relapse of a disease diagnosed 13 years before. Two cases of B. suis biovar1 were also identified in Wallis & Futuna (overseas French Territories).

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

In France, annual incidence rate is low (0,04 /100 000 inhabitants) and stable since 1996.

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
Brucella	19	0	3	0	16	0
B. abortus	0		0		0	
B. melitensis	12		0		12	
B. suis	1		1		0	
Brucella spp.	6		2		4	
occupational cases	1		1		0	

Table 2.3.B Brucellosis in man - age distribution

Age Distribution	B. abortus			B. melitensis			Brucella spp.		
	All	M	F	All	M	F	All	M	F
<1 year	0	0	0	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0	0	0	0
5 to 14 years	0	0	0	1	0	1	2	0	2
15 to 24 years	0	0	0	1	1	0	1	1	0
25 to 44 years	0	0	0	3	2	1	4	2	2
45 to 64 years	0	0	0	2	1	1	6	2	4
65 years and older	0	0	0	2	2	0	5	4	1
Age unknown	0	0	0	1	1	0	1	1	0
Total :	0	0	0	10	7	3	19	10	9

2.6.3. Brucella in foodstuffs

2.6.4. Brucella in animals

A. Brucella abortus in Bovine Animals

Monitoring system

Sampling strategy

Bovine brucellosis is a notifiable disease and notification of abortion is compulsory.
Aborting animals and abortion material are sampled for serological and bacteriological examination.
Herds are normally monitored either by an annual serological testing of animals more than 12 months old, or by bulk milk testing (Ring-Test or ELISA) four times per year.
Herd is the epidemiological unit of the monitoring system.

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.

(Brucellin skin tests are performed in herds where reactors are suspected as false positive.)

Diagnostic/analytical methods used

Serology:
- Serum : RBT, CFT, Bulk ELISA, Individual ELISA
- Milk : Ring-Test, ELISA

Bacteriology
Brucellin skin-test

Vaccination policy

Vaccination against brucellosis is forbidden.

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 practicioners 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 are mandatory. Abortions, which are notifiable

mandatory, have to be officially investigated. Slaughtering of infected animals is mandatory. The 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

In case of isolation of Brucella from cattle, the herd of origin is considered as infected. All animals of the herd are checked serologically and positive animals to any test are slaughtered. If the prevalence rate of positive animals is high, total depopulation of the herd is prescribed.

Results of the investigation

In 2004, more than 283000 herds, housing nearly 9.2 million bovines more than 12 month old were included in the prophylaxis against bovine brucellosis (Cf. Table 2.1.1.). In 2004, 271 645 herds were tested for brucellosis and 36 262 abortions were reported.

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

The annual herd prevalence rate, which was 1.65% in 1984, decreased to 0.001% in 2003. The annual herd incidence rate, which was 0.5% in 1985, decreased to 0.001% in 2003. The downward trend of the annual herd rates of prevalence and incidence confirms the favorable evolution of the situation.
The last abortion case caused by Brucella in cattle occurred in June 2002. The last case of bovine brucellosis was reported in May 2003 and no case occured in 2004. Therefore, bovine brucellosis could be considered quite eradicated from France.

Additional information

Taking into account the favorable situation relative to bovine brucellosis, France has asked for the officially brucellosis free (OBF)status to the Commission in July 2005.

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/26/2001).

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

The annual herd prevalence rate, which was 2.8% in 1994, decreased to 0.015% in 2003. The annual herd incidence rate, which was 0.98% in 1991, decreased to 0.005% in 2003.

C. Brucella melitensis in Goat

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/26/2001).

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

The annual herd prevalence rate, which was 0.4% in 1993, decreased to 0.004% in 2003. The annual herd incidence rate, which was 0.24% in 1991, decreased to 0.0% in 2003.

2.1.1 Bovine brucellosis

MANDATORY	CATTLE		
Number of herds under official control:	283124	Number of animals under official control:	9195756
	OBF bovine herds	**OBF bovine herds with status suspended**	**Bovine herds infected with brucellosis**
Status of herds at year end (a):	279118	1324	1
New cases notified during the year (b):			0
	Animals tested	**Animals suspected**	**Animals positive**
Notification of clinical cases, including abortions (c):	36262	0	0
	Units tested	**Units suspected**	**Units positive**
Routine testing (d1) - data concerning herds:	271645	96	0
Routine testing (d2) - number of animals tested:	8822923	30771	0
Routine testing (d3) - number of animals tested individually:			0
		Herds suspected	**Herds confirmed**
Follow-up investigation of suspected cases: trace, contacts (e):		215	0
	Animals tested	**Animals suspected**	**Animals positive**
Other routine investigations: exports (f):			
Other routine investigations: tests at AI stations (g):	4000	0	0
	All animals	**Positives**	**Contacts**
Animals destroyed (h):	59	0	0
Animals slaughtered (i):	59	0	0

VOLUNTARY	CATTLE		
	Animals tested	**Animals suspected**	**Animals positive**
Other investigations: imports (k):			
	Herds tested	**Herds suspected**	**Herds positive**
Other investigations: farms at risk (l):			
	Samples tested	**Brucella isolated**	
Bacteriological examination (m):			

2.1.2 Ovine and caprine brucellosis

MANDATORY	SHEEP AND GOATS		
Number of holdings under official control:	93233	Number of animals under official control:	4419615
	OBF ovine and caprine holdings	**OBF ovine and caprine holdings with status suspended**	**OBF ovine and caprine holdings infected with brucellosis**
Status of herds at year end (a):	71113	4259	0
New cases notified during the year (b):			
	Animals tested	**Animals suspected**	**Animals positive**
Notification of clinical cases, including abortions (c):	4419615	0	0
	Units tested	**Units suspected**	**Units positive**
Routine testing (d) - data concerning holdings:			0
Routine testing (d) - data concerning animals:			0
		Holdings suspected	**Holdings confirmed**
Follow-up investigation of suspected cases: trace, contacts (e):		0	0
	Animals tested	**Animals suspected**	**Animals positive**
Other routine investigations: exports (f):			
	All animals	**Positives**	**Contacts**
Animals destroyed (g):	452	0	0
Animals slaughtered (h):	0	0	0

VOLUNTARY	SHEEP AND GOATS		
	Animals tested	**Animals suspected**	**Animals positive**
Other investigations: imports (i):			
	Holdings tested	**Holdings suspected**	**Holdings positive**
Other investigations: farms at risk (j):			
	Samples tested	**Brucella isolated**	
Bacteriological examination (k):			

2.7. YERSINIOSIS

2.7.1. General evaluation of the national situation

2.7.2. Yersiniosis in humans

A. Yersinosis in humans

Reporting system in place for the human cases

Yersinia surveillance is based on a network of voluntary medical laboratories that send their isolates to the National Reference Laboratory for Yersinia

Case definition

A case is a patient with an isolation of Yersinia sp. from a clinical specimen (stool, blood, urine, etc.).

Results of the investigation

In 2004, 249 cases of Y. enterocolitica infections were reported (versus 218 cases in 2003).

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

Yersinia	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
	399	0	398	0	1	0
Y. enterocolitica(1)	249		248		1	
Y. enterocolitica O:3	105		105		0	
Y. enterocolitica O:9	45		45		0	

(1) : (pathogenic and non-pathogenic)

Table 8.3.B Yersiniosis in man - age distribution

Age Distribution	Y. enterocolitica			Yersinia spp.		
	All	M	F	All	M	F
<1 year	8	6	2	8	6	2
1 to 4 years	45	22	23	47	23	24
5 to 14 years	33	22	11	34	23	11
15 to 24 years	4	2	2	5	2	3
25 to 44 years	12	6	6	12	6	6
45 to 64 years	28	22	6	32	26	6
65 years and older	23	18	5	27	21	6
Age unknown	2	1	1	2	1	1
Total :	155	99	56	167	108	59

Footnote

(1)Y.enterocolitica cases reported in this table are due to pathogenic Y. enterocolitica (i.e. strains of biotype 1B,2,3,4,5).

Table 8.3.C Yersiniosis in man - seasonal distribution

Month	Y. enterocolitica	Y. pseudotuberculosis	Yersinia spp.
	Cases	Cases	Cases
January	5	1	6
February	15	1	16
March	16	4	20
April	9	1	10
May	9	0	9
June	15	3	18
July	11	0	11
August	7	0	7
September	21	1	22
October	7	0	7
November	17	1	18
December	23	0	23
not known	0	0	0
Total :	155	12	167

Footnote

(1) Y.enterocolitica cases reported in this table are due to pathogenic Y. enterocolitica (i.e. strains of biotype 1B,2,3,4,5).

2.7.3. Yersinia in foodstuffs

2.7.4. Yersinia in animals

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

Family outbreaks of trichinosis are reported in the south-eastern part of France following consumption of insufficiently cooked wild boar meat. Wild boar are usually hunted animals and meat is eaten by hunters, without veterinary control. Since 1988, 7 outbreaks affected 38 consumers in this area. The species of trichine responsible for the epidemics related to wild boar were typed: T. spiralis in 1952, T. britovi in 1993 and 2003, and T. pseudospiralis in 1998. T. britovi is a mountain species, which infects foxes and wild boars primarily in biotopes of altitude higher than 500 m. The presence of T britovi in wild boar in the south of France is reported. It is necessary to point out its relative resistance to congelation.
Since 1998, no outbreak of trichinosis following consumption of horse meat was reported in France. The principal reason lies without any doubt in the reinforcement of the veterinary controls practised in the slaughter-houses on the carcasses of horses and by the staff training in charge of these controls. For example, in October 1999 and March 2001, carcasses of imported horses infected by larvae of Trichinella were intercepted in French slaughter-houses, avoiding several hundreds of case. There is necessary to remain vigilant because the trichinellose always prevails in epidemic form in Europe.
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

A. Trichinellosis in humans

Reporting system in place for the human cases

Trichinosis surveillance is based on a network of 42 voluntary medical laboratories including 37 hospital laboratories and 5 private laboratories of parasitology. The surveillance system, set up in 2000, is leaded by a National Reference Centre (NRC) for Trichinellas (Cochin Hospital, Paris).
Contribution of the NRC for Trichinellas surveillance consists in :
- typing of strains sent by medical laboratories
- epidemiological surveillance,
- early warning in case of trichinosis outbreaks,
- technical advisory function.

Case definition

A case is:
- a patient with a Trichinella-positive muscle biopsy and with recent signs and symptoms suggestive of trichinosis (eosinophilia, fever, myalgia, and/or periorbital edema) or
- a patient with positive indirect immunofluorescence test (titer greater than 1:100) for Trichinella antibodies, and at least three of signs and symptoms suggestive of trichinosis.

History of the disease and/or infection in the country

Trichinosis outbreaks from 1975 to 2002 in France

Year	Sources	# of cases	Species
1975	Horse*	125	
1977	Wild boar	4	
1979	Wild boar	3	
1982	Wild boar	5	
1983	pig	21	T. spiralis
1984	Wild boar	13	
1985	Horse*	431	T. murrelli
1985	Horse*	642	T. spiralis
1985	Wild boar	39	
1988	Wild boar	11	
1991	Horse*	21	
1992	Wild boar	4	
1993	Wild boar	8	T. britovi
1993	Wild boar	4	
1993	Horse*	538	T. spiralis
1994	Horse*	7	T. spiralis
1994	Wild boar	3	
1998	?	3	
1998	Horse*	126	T. spiralis
1998	Horse*	404	T. spiralis

1998	Wild boar	4	T. pseudospiralis
1998	Wild boar	4	
2002	Wild boar*	4	
2003	Wild boar	6	T. britovi

(* imported meat.)

Results of the investigation

In 2004, 3 cases were identified (versus 6 cases in 2003).

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

From 1999 to 2001, only 4 imported cases were reported. In 2002, an epidemic of 4 cases related to the wild boar meat consumption was observed in the Aude département and no sporadic imported case was notified. In 2003, an epidemic of 6 cases related to the wild boar meat consumption was observed in the Alpes-Maritimes département and no sporadic imported cases was notified.

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
Trichinella	3	0	0	0	3	0
Trichinella spp.	3		0		3	

Table 4.2.B Trichinellosis in man - age distribution

Age Distribution	Trichinella spp.		
	All	M	F
<1 year	0	0	0
1 to 4 years	0	0	0
5 to 14 years	0	0	0
15 to 24 years	1	1	0
25 to 44 years	0	0	0
45 to 64 years	1	1	0
65 years and older	1	1	0
Age unknown	0	0	0
Total :	3	3	0

2.8.3. Trichinella in animals

Table 4.1 Trichinella in animals

	Source of information	Remarks	Epidemiological unit	Animals tested	Animals positive
Pigs	LCA and Afssa			271100	10
Solipeds	LCA and Afssa			23619	0
Wildlife					
wild boars	LCA and Afssa			26287	0
foxes	LCA and Afssa			70	1
other	LCA and Afssa			112	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.

Additional information

A study relating to the infection of the domestic dogs and cats was carried out in 2004 in a strongly endemic zone of alveolar echinococcosis in order to evaluate the role of dogs and cats in the transmission of the parasite to the man. Faecal materials from 130 dogs and 70 cats were collected and analysed by means of an ELISA test and techniques of molecular biology. Infection of foxes from the zone studied was confirmed but the parasite was not isolated in domestic animals tested.
In 2004, two wild boars (aberrant host) were also detected positive.

2.9.2. Echinococcosis in humans

A. Echinococcus spp in humans

Reporting system in place for the human cases

Surveillance of echinococcosis is based on a voluntary multidisciplinary national network coordinated by the WHO collaborating center for prevention and treatment of human Echinococcosis. Cases are identified through regional referral centers for the treatment of Echinococcosis, university hospital pharmacists and pathologists and parasitology laboratories carrying out echoninococcosis serodiagnosis.

History of the disease and/or infection in the country

Between 1982 and 2000, nearly 300 cases of alveolar echinococcosis were reported in France. The geographical distribution is mainly located in the East of the country and the Massif-Central mountains. The Franche-Comté region reports 40% of the human cases. In France, on average 10 to 15 new cases are reported each year.

Results of the investigation

In 2004, 17 cases of alveolar echinococcosis were reported.

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

For a few years, the number of human cases has increased. From 1948 to 1983, 200 cases were reported whereas 260 cases were recorded from 1983 to 2000. It is however difficult to determine if this increase is due to a better diagnostic vigilance and/or a real increase in the incidence.

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
Echinococcus	17	0	17	0	0	0
E. granulosus						
E. multilocularis(1)	17		17			
Echinococcus spp.						

(1) : Alveolar echinococcosis.

Table 9.2.B Echinococcosis in man - age distribution

Age Distribution	E. granulosus			E. multilocularis			Echinococcus spp.		
	All	M	F	All	M	F	All	M	F
<1 year	0	0	0	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0	0	0	0
5 to 14 years	0	0	0	1	0	1	1	0	1
15 to 24 years	0	0	0	1	0	1	1	0	1
25 to 44 years	0	0	0	2	1	1	2	1	1
45 to 64 years	0	0	0	4	1	3	4	1	3
65 years and older	0	0	0	9	6	3	9	6	3
Age unknown	0	0	0	0	0	0	0	0	0
Total :	0	0	0	17	8	9	17	8	9

2.9.3. Echinococcus in animals

Table 9.1 Echinococcus sp. in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Echinococcus spp.	E. multilocularis	E. granulosus
Pet animals							
dogs	Afssa		1	130	0		
cats	Afssa		1	70	0		
Wildlife							
foxes	Afssa/SAGIR		1	986	75	75	
Wild boar	SAGIR		1	2	2	2	

Footnote

(1) The epidemiological unit is the animal.

2.10. TOXOPLASMOSIS

2.10.1. General evaluation of the national situation

2.10.2. Toxoplasmosis in humans

2.10.3. Toxoplasma in animals

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 dogs (22 case from 1968 to 2004). 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.

Recent actions taken to control the zoonoses

Today, the return of the vulpine rabies by the East is always possible starting from German outbreaks in red foxes (in particular in Hesse). Since the end 2004, the oral vaccination programme of the foxes were started again in the border départments of Luxembourg and Germany. New campaigns were planned, the first ones started in April and May 2005, the others are scheduled to be processed in September 2005.
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 leaflet were widely disseminated in the veterinary clinics, in the DDSV, at the border posts, in the 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.
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. Rabies in humans

A. Rabies in humans

Reporting system in place for the human cases

Rabies is notifiable mandatory. Notifications are done by general practitioners, hospital physicians and medical laboratories to the local public health authorities (Ddass: Direction départementale des affaires sanitaires et sociales).
Mandatory notifications allow to analyse and follow the trends of the disease within the population in order to better target the local and national actions of prevention.

Case definition

A suspected case has to be notify on the basis of clinical and epidemiological presumptive features.
A confirmed case is a patient with a clinical features compatible with rabies confirmed by the National Reference Center (CNR) for rabies (Institut Pasteur, Paris).

History of the disease and/or infection in the country

The last case of human rabies of indigenous origin goes back to 1924 and the observations of imported human rabies remain rare.
According to the National Reference Centre for rabies in France (Institut Pasteur, Paris), 20 cases of human rabies occurred in France from 1970 to 2003. All were contracted abroad: 8/20 (40%) in a Maghreb country, 8/20 (40%) in sub-Saharan Africa (including Madagascar), 2 in Egypt, 1 in India, 1 in Mexico. Fifty percent of the observations concerned children of age equal or lower than 10 years and children of age lower or equal to 5 years represented 40% (8/20) of the total number of cases. Dogs were at the origin of 85% (17/20) of the contaminations.

Results of the investigation

In 2004, no case of human rabies was identified in France. A case of human rabies was diagnosed in France in October 2003. It was a child contaminated at the time of a stay in Gabon in August 2003.

2.11.3. 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 intented 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 5.1 Rabies in animals

	Source of information	Remarks	Animals tested	Animals positive
Cattle (bovine animals)	Afssa		25	0
Sheep	Afssa		1	0
Goats	Afssa		2	0
Pigs	Afssa		0	0
Solipeds	Afssa		9	0
Wildlife				
bats	Afssa		223	4
foxes	Afssa		379	0
other (1)	Afssa		11	0
all	Afssa		690	4
Pet animals				
dogs (2)	Afssa		1476	3
cats	Afssa		1175	0
other	Afssa		34	0

(1) : (Roe deers)
(2) : imported cases

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1. E. COLI INDICATORS

3.1.1. General evaluation of the national situation

3.1.2. Antimicrobial resistance in *Escherichia coli* isolates

Table 13.1 Antimicrobial susceptibility testing of E.coli in animals

	E.coli							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus**		**Turkeys**	
Isolates out of a monitoring program	yes		yes		yes			
Number of isolates available in the laboratory	308		101		102			
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	303	41.6%	101	81.2%	99	77.8%		
Amphenicols								
Chloramphenicol	301	17.6%	98	21.4%	101	6.9%		
Florfenicol	307	4.2%	101	2.0%	102	3.9%		
Fluoroquinolones								
Ciprofloxacin	302	3.3%	101	0%	100	0%		
Quinolones								
Nalidixic acid	305	9.8%	99	7.1%	102	22.5%		
Trimethoprim	296	20.9%	100	48%	99	25.3%		
Aminoglycosides								
Streptomycin	306	38.6%	100	67%	101	36.6%		
Gentamicin	301	5%	98	3.1%	100	5%		
Neomycin	299	20.4%	101	5.9%	101	10.9%		
Apramycin	308	3.2%	99	9.1%	102	4.9%		
Penicillins								
Ampicillin	298	27.5%	98	26.5%	101	33.7%		
Number of multiresistant isolates								
fully sensitives	169	54.9%	16	15.8%	19	18.6%		
resistant to 1 antimicrobial	18	5.8%	7	6.9%	26	25.5%		
resistant to 2 antimicrobials	27	8.8%	24	23.8%	16	15.7%		
resistant to 3 antimicrobials	12	3.9%	23	22.8%	14	13.7%		
resistant to 4 antimicrobials	24	7.8%	13	12.9%	15	14.7%		
resistant to >4 antimicrobials	58	18.8%	18	17.8%	12	11.8%		

Footnote

The 2004 data correspond to samples taken in 2003.

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

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	E.coli
	Cattle (bovine animals) - at slaughter - monitoring programme - active monitoring
Isolates out of a monitoring program	yes
Number of isolates available in the laboratory	308

Antimicrobials:	**N**	**%R**	**<=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**
Tetracycline	126	42%				0	0	24	23	11	0	1	0	7	20	13	1					
Amphenicols																						
Chloramphenicol	53	18							0	7	60	15	1	1	0	6	9	1				
Florfenicol	13	4							0	13	72	10	1	3								
Fluoroquinolones																						
Ciprofloxacin	10	3	86	4	1	3	3	1	0	0	1	2										
Quinolones																						
Nalidixic acid	30	10						2	54	30	2	2	0	1	2	1	5					
Trimethoprim	62	21%			1	10	32	29	5	2	0	0	0	1	20							
Aminoglycosides																						
Streptomycin	118	39							0	9	49	3	4	9	8	10	6	2				
Gentamicin	15	5				5	64	22	4	1	0	2	2	1								
Neomycin	61	20					11	58	7	3	0	1	3	7	10							
Apramycin	10	3							16	75	6	2	0	2								
Penicillins																						
Ampicillin	82	28							41	29	1	1	0	1	2	7	10	7				

Footnote

The 2004 data correspond to samples taken in 2003.

Table Antimicrobial susceptibility testing of E.coli in Pigs - at slaughter - monitoring programme - active monitoring - quantitative data [Dilution method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	E.coli																					
	Pigs - at slaughter - monitoring programme - active monitoring																					
Isolates out of a monitoring program	yes																					
Number of isolates available in the laboratory	101																					
Antimicrobials:	**N**	**%R**	**<=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**
Tetracycline	82	81%				0	0	5	7	7	0	1	2	22	42	12	3					
Amphenicols																						
Chloramphenicol	21	21							0	5	55	18	4	6	2	6	3	0				
Florfenicol	2	2							0	11	66	21	2	0								
Fluoroquinolones																						
Ciprofloxacin		0	91	2	1	2	4	0	0	0	0	0										
Quinolones																						
Nalidixic acid	7	7						2	44	43	2	1	1	0	2	4	0					
Trimethoprim	48	48%			2	8	17	22	1	2	0	0	0	0	48							
Aminoglycosides																						
Streptomycin	67	67							0	2	23	8	14	15	17	10	10	1				
Gentamicin	3	3				3	53	32	8	1	0	1	0	2								
Neomycin	6	6					7	70	14	3	0	0	1	4	1							
Apramycin	9	9							10	65	16	7	0	2								
Penicillins																						
Ampicillin	26	27							50	19	4	0	0	0	1	9	10	6				

Footnote

The 2004 data correspond to samples taken in 2003.

Table Antimicrobial susceptibility testing of E.coli in Poultry - at slaughter - monitoring programme - active monitoring - quantitative data [Dilution method]

Percentage of resistant isolates (R%) and percentage of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	E.coli																					
	Poultry - at slaughter - monitoring programme - active monitoring																					
Isolates out of a monitoring program	yes																					
Number of isolates available in the laboratory	102																					
Antimicrobials:	**N**	**%R**	**<=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**
Tetracycline	77	78%				0	0	6	8	8	0	1	3	22	43	8	0					
Amphenicols																						
Chloramphenicol	7	7							2	14	57	20	0	0	0	4	3	0				
Florfenicol	4	4							2	16	70	9	4	0								
Fluoroquinolones																						
Ciprofloxacin	1	1	77	1	2	12	6	1	0	0	0	1										
Quinolones																						
Nalidixic acid	23	23						5	43	27	1	1	3	4	5	9	2					
Trimethoprim	25	25%			0	8	32	27	6	1	0	0	0	0	25							
Aminoglycosides																						
Streptomycin	37	37							0	4	49	11	8	5	10	6	7	1				
Gentamicin	5	5				6	48	33	6	1	1	0	3	2								
Neomycin	11	11					9	66	12	1	1	0	0	3	8							
Apramycin	5	5							9	66	21	5	0	0								
Penicillins																						
Ampicillin	34	34							40	20	6	1	0	0	2	12	15	5				

Footnote

The 2004 data correspond to samples taken in 2003.

Table 13.7 Breakpoints used for antibiotic resistance testing of E.coli in Animals

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

NCCLS
CASFM

Subject to quality control

Escherichia coli	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracycline		4	8	8						
Amphenicols										
Chloramphenicol		8	16	16						
Florfenicol		16		16						
Fluoroquinolones										
Ciprofloxacin		1	2	2						
Enrofloxacin										
Quinolones										
Nalidixic acid		8	16	16						
Trimethoprim		4	8	8						
Sulfonamides										
Sulfonamide										
Aminoglycosides										
Streptomycin		8	16	16						
Gentamicin		4	8	8						
Neomycin		8		8						
Kanamycin										
Apramycin		8		8						
Trimethoprim + sulfonamides										
Cephalosporin										
3rd generation cephalosporins										
Penicillins										
Ampicillin(1)		4	8	16						

(1) : Intermediate: [8-16]

4. FOODBORNE OUTBREAKS

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

A. Foodborne outbreaks

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

A foodborne outbreak is defined as "the occurrence of at least two cases of a similar illness, usually gastro-intestinal, due to the consumption of a common food product".
Notifications of foodborne outbreaks are done by general practitioners, hospital physicians and medical laboratories. Food-borne outbreaks can also be notified by the head of the establishment (schools, restaurants, etc.) or the head of the family where the cases occur. Outbreaks are investigated by the local public health authorities (Ddass = Direction départementale des affaires sanitaires et sociales) and veterinary officers (Ddsv = Direction départementale des services vétérinaires). Standardized reports are sent to the French public health institute (Institut de Veille Sanitaire, InVS) and to the ministry of Agriculture. These reports are pooled and analyzed on an annual basis after checking for double notifications. The results are annually published in the Bulletin Epidémiologique Hebdomadaire.

Description of the types of outbreaks covered by the reporting:

The following results include foodborne outbreaks notified in the framework of mandatory notification. Data from outbreaks of salmonellosis and campylobacteriosis reported by the National Reference Laboratories can't be pooled with data collected from mandatory notification for two main reasons:
- there is actually no way to identify common notifications between the two systems.
- the NRL provides data only for salmonellosis and campylobacteriosis outbreaks. The foodborne origin of these outbreaks is not confirmed.

Salmonellosis outbreaks notified by the NRL are used to assess the sensitivity of the mandatory notification framework for salmonellosis outbreaks. The sensitivity of the mandatory notification system for salmonellosis outbreaks has been estimated to 20% in 1995 and to 26% in 2000.
Because of these reasons, only epidemiological characteristics of foodborne outbreaks reported through the mandatory notification system are presented in this report. Since no data is yet available for the year 2004, the results presented below correspond to the year 2003.

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

In 2003, a total number of 584 foodborne outbreaks (6620 cases) were reported under the mandatory notification system. In 47% of these outbreaks, the causative agent was laboratory confirmed. The causative agent was identified based on epidemiological

findings in 26% of the outbreaks.

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

The causative agent was isolated in the incriminated foodstuff or epidemiologically suspected in 71% of the outbreaks (table).
Salmonella was the most frequently identified agent in foodborne disease outbreaks followed by Bacillus cereus. In a large proportion of salmonellosis outbreaks (71%) the serotype was identified; the predominant serotype was S. Enteritidis, followed by S. Typhimurium as in previous years.

Relevance of the different type of places of food production and preparation in outbreaks

More than 60% of the outbreaks were reported to be linked to mass catering facilities. Salmonellosis outbreaks occurred mainly in private homes and commercial restaurants as a result of control measures implemented to reduce salmonellosis hazards in the restoration/public sector. In other collectives, this different frequency distribution reflects the efficacy of the control measures that have been implemented to reduce salmonellosis hazards in the restoration/public sector. In private homes, education programs (e.g. storage and cooking) may, therefore, be needed as complementary measures to limit the transmission of salmonellosis.
The most important factors contributing to foodborne disease outbreaks reported were contamination of food through equipment (52%), inadequate cooling or heating (42%) and use of contaminated raw material (24%).