



## FRANCE

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

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

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

IN 2007

## **INFORMATION ON THE REPORTING AND MONITORING SYSTEM**

Country: **France**

Reporting Year: **2007**

## PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/99/ EC<sup>1</sup>. The information has also been forwarded to the European Food Safety Authority (EFSA).

The report contains information on trends and sources of zoonoses and zoonotic agents in France during the year 2007. The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal bacteria as well as information on epidemiological investigations of foodborne outbreaks. Complementary data on susceptible animal populations in the country is also given.

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

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

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

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

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

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## 1. ANIMAL POPULATIONS

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

### **A. Information on susceptible animal population**

#### **Sources of information:**

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

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

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

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

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

#### **Additional information**

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

## Table Susceptible animal populations

\* Only if different than current reporting year

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

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

(1): Elite = Elite + grand parents

(2): Elite = elite + grand parents

(3): Elite = elite + grand parents

(4): culled laying hens and breeders

## **2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS**

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

## **2.1. SALMONELLOSIS**

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

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

#### **2.1.3. Salmonella in foodstuffs**

#### **2.1.4. Salmonella in animals**

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

###### **Monitoring system**

###### **Sampling strategy**

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

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

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

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

###### **Frequency of the sampling**

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

At the age of 0 weeks

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

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

###### **Laying hens: Day-old chicks**

At the age of 0 weeks

###### **Laying hens: Rearing period**

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

**Laying hens: Production period**

At the age of 24 weeks and every 15 weeks weeks

**Laying hens: Before slaughter at farm**

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

**Type of specimen taken**

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

Internal linings of delivery boxes

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

Other: boot swabs and chiffs

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

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

**Laying hens: Day-old chicks**

Internal linings of delivery boxes

**Laying hens: Rearing period**

Other: boot swabs and chiffs

**Laying hens: Production period**

Other: faeces and chiffs and feed samples

**Laying hens: Before slaughter at farm**

Other: faeces and chiffs

**Case definition**

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

positivity with SE, SH, SI, ST, SV

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

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

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

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

**Laying hens: Day-old chicks**

positivity with SE, SH, SI, ST, SV

**Laying hens: Rearing period**

positivity with SE or ST (2 confirmation tests)

**Laying hens: Production period**

positivity with SE or ST (2 confirmation tests)

**Laying hens: Before slaughter at farm**

positivity with SE or ST (2 confirmation tests)

**Vaccination policy**

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

Vaccination is forbidden

**Laying hens flocks**

Vaccination is authorised

**Other preventive measures than vaccination in place**

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

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

**Laying hens flocks**

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

**Control program/ mechanisms**

**The control program/ strategies in place**

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

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

### **Laying hens flocks**

elimination/ treatment of eggs, cleaning and desinfection mandatory

### **Notification system in place**

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

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

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

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

### **Monitoring system**

#### **Sampling strategy**

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

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

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

#### **Broiler flocks**

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

#### **Frequency of the sampling**

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

At the age of 0 weeks

#### **Type of specimen taken**

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

Internal linings of delivery boxes

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

**necessary): Production period**

Other: boot swabs and chiffs

**Case definition**

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

Positivity with SE, SH, SI, ST, SV

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

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

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

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

**Vaccination policy**

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

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

**Control program/ mechanisms**

**The control program/ strategies in place**

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

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

**Notification system in place**

Notification is mandatory

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

Prevalence in breeding flocks is decreasing

**Table Salmonella in breeding flocks of Gallus gallus**

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

**Footnote**

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

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

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

**Table Salmonella in other poultry**

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

**Table Salmonella in other birds**

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

**Footnote**

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

**Table Salmonella in other animals**

Source of information	Sampling unit	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Enteritidis</i>	<i>S. Typhimurium</i>	<i>Salmonella</i> spp., unspecified	<i>S. Nagoya</i>	<i>S. enterica</i> subsp. <i>arizona</i>

**Footnote**

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

## 2.1.5. **Salmonella** in feedingstuffs

**Table Salmonella in feed material of animal origin**

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

Table *Salmonella* in other feed matter

linseed derived	CCA	batch	25g	5	0
other oil seeds derived	CCA	batch	25g	2	0
<b>Other feed material</b>					
legume seeds and similar products	CCA	batch	25g	1	0
tubers, roots and similar products	CCA	batch	25g	2	0
forages and roughages	CCA	batch	25g	4	0

Table Salmonella in compound feedingstuffs (Part A)

## Footnote

S. 1,3,19:z:- = S. 1,3,19:z:27  
Samples by feed operators ha

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

Table Salmonella in compound feedingstuffs (Part B)

- at processing plant - Surveillance (pullets)								
- at processing plant - Surveillance	1	1	2	2	2	7		
<b>Compound feedingstuffs for poultry - broilers</b>								
final product								
- at processing plant - Surveillance								
<b>Compound feedingstuffs for fish</b>								
- at processing plant - Surveillance								
<b>Compound feedingstuffs for rabbits</b>								
- at processing plant - Surveillance								
<b>Compound feedingstuffs for turkeys</b>								
final product								
- at processing plant - Surveillance								

**Footnote**

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

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

## **2.1.6. *Salmonella* serovars and phagetype distribution**

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

## 2.1.7. Antimicrobial resistance in *Salmonella* isolates

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

### A. Antimicrobial resistance in *Salmonella* in cattle

#### **Sampling strategy used in monitoring**

##### **Frequency of the sampling**

see Antimicrobial resistance in *Salmonella* in poultry

### B. Antimicrobial resistance in *Salmonella* in pigs

#### **Sampling strategy used in monitoring**

##### **Frequency of the sampling**

see Antimicrobial resistance in *Salmonella* in poultry

### C. Antimicrobial resistance in *Salmonella* in poultry

#### **Sampling strategy used in monitoring**

##### **Type of specimen taken**

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

##### **Methods used for collecting data**

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

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

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

#### **Laboratory methodology used for identification of the microbial isolates**

Salmonella isolates are serotyped by slide agglutination with antisera.

### **Laboratory used for detection for resistance**

#### **Antimicrobials included in monitoring**

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

#### **Breakpoints used in testing**

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

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

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

## **D. Antimicrobial resistance in Salmonella in foodstuff derived from cattle**

#### **Sampling strategy used in monitoring**

##### **Frequency of the sampling**

see Antimicrobial resistance in Salmonella in poultry

## **E. Antimicrobial resistance in Salmonella in foodstuff derived from pigs**

#### **Sampling strategy used in monitoring**

##### **Frequency of the sampling**

see Antimicrobial resistance in Salmonella in poultry

## **F. Antimicrobial resistance in Salmonella in foodstuff derived from poultry**

**Sampling strategy used in monitoring**

**Frequency of the sampling**

see Antimicrobial resistance in *Salmonella* in poultry

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

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

**Table Antimicrobial susceptibility testing in S. Derby**

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

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

		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																																	
		Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35
Isolates out of a monitoring programme			no																																
Number of isolates available in the laboratory					82																														
<b>Aminoglycosides</b>																																			
Gentamicin																																			
Streptomycin																																			
<b>Amphenicols</b>																																			
Chloramphenicol																																			
<b>Cephalosporins</b>																																			
Cefotaxim																																			
<b>Fluoroquinolones</b>																																			
Enrofloxacin																																			
<b>Penicillins</b>																																			
Ampicillin																																			
<b>Quinolones</b>																																			
Nalidixic acid																																			
<b>Sulfonamides</b>																																			
Sulfonamide																																			
<b>Tetracyclines</b>																																			
Tetracycline																																			

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

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

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

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

**Table Antimicrobial susceptibility testing in S. Derby**

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

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

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

#### Footnote

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

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

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

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

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

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

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

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

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

		S. Enteritidis Meat from broilers ( <i>Gallus gallus</i> ) - at slaughterhouse																															
		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																															
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35
<b>Aminoglycosides</b>																																	
Gentamicin	15	8	0																														
Streptomycin	12	8	0																														
<b>Amphenicols</b>																																	
Chloramphenicol	18	8	0																														
<b>Cephalosporins</b>																																	
Cefotaxim	14	8	0																														
<b>Fluoroquinolones</b>																																	
Enrofloxacin	16	8	0																														
<b>Penicillins</b>																																	
Ampicillin	13	8	0																														
<b>Quinolones</b>																																	
Nalidixic acid	14	8	3	3																													
<b>Sulfonamides</b>																																	
Sulfonamide	11	8	0																														
<b>Tetracyclines</b>																																	
Tetracycline	16	8	0																														

**Table Antimicrobial susceptibility testing in S. Enteritidis**

n = Number of resistant isolates

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

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

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

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

**Table Antimicrobial susceptibility testing in *S. Infantis***

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

**Table Antimicrobial susceptibility testing in S. Lille**

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

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

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

**Footnote**

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

## Table Antimicrobial susceptibility testing in *S. Mbandaka*

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

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

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

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

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

**Table Antimicrobial susceptibility testing in *S. Montevideo***

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

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

		S. Typhimurium															
		Pigs - at farm															
		no															
		Isolates out of a monitoring programme															
		Number of isolates available in the laboratory															
		90															
		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to															
		Antimicrobials: Break point															
		Aminoglycosides															
		Gentamicin	15	90	0												
		Streptomycin	12	90	67	52	0	0	1	3	1	10	11	12			
		Amphenicols	18	90	48	46	0	1	1								
		Chloramphenicol															
		Cephalosporins	14	90	0												
		Cefotaxim															
		Fluoroquinolones	16	90	0												
		Enrofloxacin															
		Penicillins	13	90	52	52											
		Ampicillin															
		Quinolones	14	90	0												
		Nalidixic acid															
		Sulfonamides	11	90	55	54	0	0	1								
		Sulfonamide															
		Tetracyclines	16	90	60	15	0	0	44	0	0	1	0	0	3	6	1
		Tetracyclin															

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

		S. Typhimurium												
		Turkeys - at farm												
Isolates out of a monitoring programme	no													
		10												
Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to														
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16
<b>Aminoglycosides</b>														
Gentamicin	15	10	1			1								1
Streptomycin	12	10	9	6	0	0	1	0	1	1				0
<b>Amphenicols</b>														
Chloramphenicol	18	10	5	5									1	0
<b>Cephalosporins</b>														
Cefotaxim	14	10	0											3
<b>Fluoroquinolones</b>														
Enrofloxacin	16	10	0											2
<b>Penicillins</b>														
Ampicillin	13	10	5	5									1	0
<b>Quinolones</b>														
Nalidixic acid	14	10	1	1									2	2
<b>Sulfonamides</b>														
Sulfonamide	11	10	6	6									3	0
<b>Tetracyclines</b>														
Tetracyclin	16	10	5	3	0	0	2						4	1

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

		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																																
		Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35
Antimicrobials																																		
<b>Aminoglycosides</b>																																		
Gentamicin	15	23	0																															
Streptomycin	12	22	15	3	0	0	1	0	3	8	3	4																						
<b>Amphenicols</b>																																		
Chloramphenicol	18	23	3	3																														
<b>Cephalosporins</b>																																		
Cefotaxim	14	23	0																															
<b>Fluoroquinolones</b>																																		
Enrofloxacin	16	23	0																															
<b>Penicillins</b>																																		
Ampicillin	13	23	4	4																														
<b>Quinolones</b>																																		
Nalidixic acid	14	23	1	1																														
<b>Sulfonamides</b>																																		
Sulfonamide	11	23	4	4																														
<b>Tetracyclines</b>																																		
Tetracyclin	16	23	4	3	0	0	1																											

#### Footnote

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

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

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

**Table Antimicrobial susceptibility testing of S.Typhimurium in animals**

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

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

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

		S. Typhimurium											
		Meat from broilers ( <i>Gallus gallus</i> ) - at slaughterhouse											
Isolates out of a monitoring programme	no	Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to											
		n	<=6	7	8	9	10	11	12	13	14	15	16
<b>Antimicrobials:</b>		<b>Break point</b>	<b>N</b>	<b>n</b>	<b>&lt;=6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
<b>Aminoglycosides</b>													
Gentamicin	15	9	0										
Streptomycin	12	9	9	4	0	0	2	1	0	2			
<b>Amphenicols</b>													
Chloramphenicol	18	9	4	4									
<b>Cephalosporins</b>													
Cefotaxim	14	9	0										
<b>Fluoroquinolones</b>													
Enrofloxacin	16	9	0										
<b>Penicillins</b>													
Ampicillin	13	9	5	5									
<b>Quinolones</b>													
Nalidixic acid	14	9	4	3									
<b>Sulfonamides</b>													
Sulfonamide	11	9	5	5									
<b>Tetracyclines</b>													
Tetracyclin	16	9	5	2	0	0	2						

**Table Antimicrobial susceptibility testing in *S. Typhimurium***

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

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

		S. Typhimurium													
		Meat from bovine animals - at slaughterhouse													
Isolates out of a monitoring programme	no	Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to													
		<=6	7	8	9	10	11	12	13	14	15	16	17	18	
Antimicrobials:	Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17
<b>Aminoglycosides</b>															
Gentamicin	15	17	0												
Streptomycin	12	17	15	14	0	0	0	0	1	1	1				
<b>Amphenicols</b>															
Chloramphenicol	18	17	13	13											
<b>Cephalosporins</b>															
Cefotaxim	14	17	0												
<b>Fluoroquinolones</b>															
Enrofloxacin	16	17	0												
<b>Penicillins</b>															
Ampicillin	13	17	15	15											
<b>Quinolones</b>															
Nalidixic acid	14	17	1	1											
<b>Sulfonamides</b>															
Sulfonamide	11	17	15	15											
<b>Tetracyclines</b>															
Tetracyclin	16	17	15	7	0	0	8								

**Table Antimicrobial susceptibility testing in S. IIIa41:z4z23z32**

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

**Footnote**

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

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

		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																																
		Break point	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>=35
Antimicrobials																																		
<b>Aminoglycosides</b>																																		
Gentamicin		15	24	0																														
Streptomycin	no	12	24	0																														
<b>Amphenicols</b>																																		
Chloramphenicol		18	24	0																														
<b>Cephalosporins</b>																																		
Cefotaxim		14	24	0																														
<b>Fluoroquinolones</b>																																		
Enrofloxacin		16	24	0																														
<b>Penicillins</b>																																		
Ampicillin		13	24	0																														
<b>Quinolones</b>																																		
Nalidixic acid		14	24	0																														
<b>Sulfonamides</b>																																		
Sulfonamide		11	24	0																														
<b>Tetracyclines</b>																																		
Tetracyclin		16	24	0																														

#### Footnote

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

## Table Breakpoints for antibiotic resistance testing in Animals

**Test Method Used**

Disc diffusion

**Standards used for testing**

CA\_SFM

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

## Table Breakpoints for antibiotic resistance testing in Food

**Test Method Used**

Disc diffusion

**Standards used for testing**

CA\_SFM

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

## **2.2. CAMPYLOBACTERIOSIS**

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

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

### **2.2.3. Campylobacter in foodstuffs**

**Table Campylobacter in poultry meat**

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

(1) : chicken neck skin

#### **Footnote**

One carcasse per slaughter batch was sampled.

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

## 2.2.4. **Campylobacter** in animals

**Table Campylobacter in animals**

	Source of information							
	Sampling unit		Units tested	Total units positive for thermophilic <i>Campylobacter</i> spp.				
<b>Pigs (1)</b>	AFSSA	herd	192	123		77		46
<b>Gallus gallus (fowl)</b>								
<b>broilers</b>	AFSSA	batch	192	154	56	76		22
- at slaughterhouse (2)								

(1) : 1 faeces sample/ herd

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

(2) : 1 caeca/ batch

Many strains were in non culturable form

## 2.2.5. Antimicrobial resistance in *Campylobacter* isolates

### A. Antimicrobial resistance in *Campylobacter jejuni* and *coli* in pigs

#### **Sampling strategy used in monitoring**

##### **Frequency of the sampling**

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

##### **Type of specimen taken**

192 Fecal samples at slaughterhouses

##### **Procedures for the selection of isolates for antimicrobial testing**

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

#### **Laboratory methodology used for identification of the microbial isolates**

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

#### **Laboratory used for detection for resistance**

##### **Antimicrobials included in monitoring**

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

##### **Breakpoints used in testing**

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

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

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

### B. Antimicrobial resistance in *Campylobacter jejuni* and *coli* in poultry

#### **Sampling strategy used in monitoring**

### **Frequency of the sampling**

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

### **Type of specimen taken**

Caeca at slaughterhouses (1 caeca per flock)

### **Procedures for the selection of isolates for antimicrobial testing**

All isolates were tested

### **Methods used for collecting data**

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

### **Laboratory methodology used for identification of the microbial isolates**

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

### **Laboratory used for detection for resistance**

#### **Antimicrobials included in monitoring**

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

The antimicrobials suggested by EFSA were included.

#### **Breakpoints used in testing**

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

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

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

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

### **Sampling strategy used in monitoring**

#### **Frequency of the sampling**

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

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

**Type of specimen taken**

broiler neck skin at slaughterhouse

**Procedures for the selection of isolates for antimicrobial testing**

All isolates were tested

**Methods used for collecting data**

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

**Laboratory methodology used for identification of the microbial isolates**

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

**Laboratory used for detection for resistance**

**Antimicrobials included in monitoring**

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

**Breakpoints used in testing**

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

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

<i>C. coli</i>		Gallus gallus (fowl) - broilers - at farm - Monitoring																					
		yes																					
Isolates out of a monitoring programme		76																					
Number of isolates available in the laboratory																							
Antimicrobials:	Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
<b>Aminoglycosides</b>																							
Gentamicin	2	76	0																				
Streptomycin	4	76	12	0	0	0	0	0	4	23	37	0	1	0	2	9							
<b>Fluoroquinolones</b>																							
Ciprofloxacin	1	76	42	0	6	13	14	1	0	0	0	0	9	33									
<b>Macrolides</b>																							
Erythromycin	16	76	10																				
<b>Penicillins</b>																							
Ampicillin	16	76	35	0	0	0	2	4	7	11	6	10	1	6	4	25							
<b>Tetracyclines</b>																							
Tetracyclin	2	76	60	0	0	2	7	4	3	0	0	0	1	59									

**Table Antimicrobial susceptibility testing in *C. coli***

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

**Table Antimicrobial susceptibility testing in *C. coli***

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

**Table Antimicrobial susceptibility testing in *C. coli***

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

**Table Antimicrobial susceptibility testing in *C. coli***

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

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

		C. coli																						
		Pigs - at farm																						
		yes																						
Isolates out of a monitoring programme		77																						
Number of isolates available in the laboratory																								
Antimicrobials:		Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
<b>Aminoglycosides</b>																								
Gentamicin		2	77	2	0	1	16	46	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
Streptomycin		4	77	61						3	13	4	0	4	53									
<b>Fluoroquinolones</b>																								
Ciprofloxacin		1	77	27	0	13	20	14	1	2	1	7	4	15										
<b>Macrolides</b>																								
Erythromycin		16	77	25					5	30	14	3	0	0	0	0	0	0	0	0	0	0	0	
<b>Penicillins</b>																								
Ampicillin		16	77	19					1	3	16	15	19	2	2	2	1	1	4	4	14			
<b>Tetracyclines</b>																								
Tetracyclin		2	77	73					0	1	3	0	0	0	0	0	1	72						

**Table Antimicrobial susceptibility testing in C. coli**

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

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

<i>C. coli</i>		Meat from broilers ( <i>Gallus gallus</i> ) - carcass - at slaughterhouse - Monitoring (Chicken neck skin)											
Isolates out of a monitoring programme	Number of isolates available in the laboratory	yes											
Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to													
Antimicrobials:	Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16
<b>Aminoglycosides</b>													
Gentamicin	2	98	0	0	0	7	4	22	58	7	0		
Streptomycin	4	98	26	0	0	0	0	11	15	40	6	3	1
<b>Fluoroquinolones</b>													
Ciprofloxacin	1	98	50	0	15	13	15	2	3	0	0	14	36
<b>Macrolides</b>													
Erythromycin	16	98	8	0	0	0	0	12	29	34	12	1	2
<b>Penicillins</b>													
Ampicillin	16	98	39	0	0	1	3	9	15	14	12	5	6
<b>Tetracyclines</b>													
Tetracyclin	2	98	76	0	0	5	2	6	6	3	0	0	76

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

C. jejuni		Gallus gallus (fowl) - broilers - at farm - Monitoring																					
		yes																					
Isolates out of a monitoring programme		56																					
Number of isolates available in the laboratory																							
Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																							
Antimicrobials:	Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides																							
Gentamicin	2	56	0						4	10	23	19	0										
Streptomycin	4	56	1	0	0	0	0	0	8	27	19	1	0	0	0	0	0	0	0	0	1		
Fluoroquinolones																							
Ciprofloxacin	1	56	17	0	11	15	9	4	0	1	0	2	14										
Macrolides																							
Erythromycin	16	56	0						14	20	22												
Penicillins																							
Ampicillin	16	56	26	0	0	0	2	0	1	5	12	7	3	9	1	16							
Tetracyclines																							
Tetracyclin	2	56	28	0	0	4	10	11	2	1	0	0	0	3	25								

**Table Antimicrobial susceptibility testing in *C. jejuni***

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

**Table Antimicrobial susceptibility testing in *C. jejuni***

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

**Table Antimicrobial susceptibility testing in *C. jejuni***

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

**Table Antimicrobial susceptibility testing in *C. jejuni***

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

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

## Table Breakpoints used for antimicrobial susceptibility testing in Animals

**Test Method Used**

Broth dilution

**Standards used for testing**

eucast/ CA-SFM

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

## Table Breakpoints used for antimicrobial susceptibility testing in Food

**Test Method Used**

Broth dilution

**Standards used for testing**

eucast/ CA-SFM

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

## **2.3. LISTERIOSIS**

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

### **2.3.2. Listeriosis in humans**

### **2.3.3. Listeria in foodstuffs**

### **2.3.4. Listeria in animals**

#### **Table Listeria in animals**

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

#### **Footnote**

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

## **2.4. E. COLI INFECTIONS**

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

### **2.4.2. E. Coli Infections in humans**

### **2.4.3. Escherichia coli, pathogenic in foodstuffs**

**Table VT E. coli in food**

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

(1) : monitoring programme

#### **Footnote**

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

#### **2.4.4. *Escherichia coli*, pathogenic in animals**

## **2.5. TUBERCULOSIS, MYCOBACTERIAL DISEASES**

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

### **2.5.2. Tuberculosis, Mycobacterial Diseases in humans**

### **2.5.3. *Mycobacterium* in animals**

#### **A. *Mycobacterium bovis* in bovine animals**

##### **Status as officially free of bovine tuberculosis during the reporting year**

###### **The entire country free**

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

##### **Monitoring system**

###### **Sampling strategy**

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

###### **Frequency of the sampling**

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

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

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

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

###### **Type of specimen taken**

Blood

###### **Case definition**

An infected animal is an animal :

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

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

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

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

Routine tuberculin tests

Single intradermal test

Intradermal comparative test

### **Control program/ mechanisms**

#### **The control program/ strategies in place**

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

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

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

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

### **Measures in case of the positive findings or single cases**

Suspended herds:

Sale of animals forbidden (except to slaughterhouse)

Sale of raw milk forbidden

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

Infected herds:

Same measures as in suspended herds

And

All animal slaughtered

Equipment cleaned and desinfected

Epidemiological enquiry to determine origin and consequences of infection

### **Notification system in place**

Notification is mandatory

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

The situation is favorable in France

France has officially tuberculosis free status since 2000

Very low prévalence

Distribution of cases are not homogeneous

## **B. *Mycobacterium bovis* in farmed deer**

### **Monitoring system**

#### **Sampling strategy**

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

## Table Tuberculosis in other animals

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

(1) : vet practitioner

(2) : vet practitioner

### Footnote

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

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

Region	Total number of existing bovine herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(1)(2)(c) third indent (1) of Directive 64/432/EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herd	Animals	Number of herds	Number of % herds	Interval between routine tuberculin tests (*)	Number of animals tested			
FRANCE	246019	19900256	245907	99 954	112	0.046	535554	115595	170
Total	246019	19900256	245907	99 954	112	0.046	535554	115595	170

**Footnote**

- (0): 59 départements
- (1): 6
- (2): 7
- (3): 14
- (4): 5
- (5): 1
- (6: test every 4 years for bovine animals over 24 months of age): 4

**(\*) Legend:**

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

## **2.6. BRUCELLOSIS**

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

#### **A. Brucellosis general evaluation**

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

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

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

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

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

## **2.6.2. Brucellosis in humans**

## **2.6.3. Brucella in foodstuffs**

## **2.6.4. Brucella in animals**

### **A. Brucella abortus in bovine animals**

#### **Status as officially free of bovine brucellosis during the reporting year**

##### **The entire country free**

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

#### **Monitoring system**

##### **Sampling strategy**

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

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

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

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

##### **Case definition**

A case is an animal:

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

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

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

#### **Vaccination policy**

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

#### **Control program/ mechanisms**

### **The control program/ strategies in place**

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

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

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

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

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

### **Measures in case of the positive findings or single cases**

Suspended herds:

Sale of animals forbidden (except to slaughterhouse)

Sale of raw milk forbidden

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

Infected herds:

Same measures as in suspended herds

And

All animal slaughtered

Equipment cleaned and desinfected

Epidemiological enquiry to determine origin and consequences of infection

### **Notification system in place**

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

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

The situation is favorable in France

France has officially bovine brucellosis free status since 2005

Last case of bovine brucellosis : 2002

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

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

## **B. Brucella melitensis in sheep**

### **Status as officially free of ovine brucellosis during the reporting year**

#### **Free regions**

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

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

## **C. Brucella melitensis in goats**

### **Status as officially free of caprine brucellosis during the reporting year**

#### **Free regions**

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

#### **Monitoring system**

##### **Sampling strategy**

On serum (Rose Bengale Test, Complement fixation Test)

Notification and investigation of cases of abortion – Bacteriological examination

##### **Case definition**

An infected animal is an animal :

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

#### **Vaccination policy**

Vaccination of bovines, sheep and goats against brucellosis is forbidden

#### **Measures in case of the positive findings or single cases**

Suspended herds:

Sale of animals forbidden (except to slaughterhouse)

Sale of raw milk forbidden

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

Infected herds:

Same measures as in suspended herds

And

All animal slaughtered

Equipment cleaned and disinfected

Epidemiological enquiry to determine origin and consequences of infection

### **Notification system in place**

Notification is mandatory.

Notification and investigation of cases of abortion

## Table Brucellosis in other animals

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

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

Region	Total number of existing bovine herds	Officially free herds	Infected herds	Surveillance				Investigations of suspect cases				
				Serological tests		Examination of bulk milk samples		Information about abortions		Epidemiological investigation		
	Herds	Animals	Number of herds	%	Number of herds tested	Number of animals tested	Number of infected herds tested or pools tested	Number of animals with a history of infection	Number of herds with a history of infection	Number of abortions due to microbial infection	Serologically	BSI
FRANCE	246019	1990256	246019	100	0	0	84489	1013619	0	29380	0	0
Total	246019	1990256	246019	100	0	0	84489	1013619	0	29380	0	0

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

Region	Total number of herds	Total number of herds under the programme	Number of herds checked	Number of positive herds	Number of new positive herds	Number of herds depopulated	% positive herds depopulated	Indicators		
								% herd coverage	% positive herds - period herd prevalence	% new positive herds - herd incidence
Pyrénées-Athlantiques	4756	4756	4464	0	0	0	0	93.86	0	0
Haute-Garonne	1981	1981	1344	0	0	0	0	67.345	0	0
Hautes-Pyrénées	2089	2089	2001	0	0	0	0	95.787	0	0
Drôme	1434	1434	1210	0	0	0	0	84.379	0	0
Pyrénées-Orientales	469	469	210	0	0	0	0	44.776	0	0
Alpes-de-Haute-Provence	872	872	748	0	0	0	0	85.78	0	0
Hautes-Alpes	972	972	972	0	1	0	100	0	0	0
Alpes-Maritimes	500	500	390	0	0	0	0	78	0	0
Bouches-du-Rhône	572	572	398	0	0	0	0	69.58	0	0
Var	472	472	338	0	0	0	0	71.61	0	0
Vaucluse	391	391	314	0	0	0	0	80.307	0	0
Corse-du-Sud	436	436	370	0	0	0	0	84.862	0	0
Haute-Corse	605	605	586	0	0	0	0	96.86	0	0
Total	15549	15549	13345	0	1	0	0	85.825	0	0
Total - 1	14982	14982	13766	0	0	0	0	91.384	0	0

**Footnote**

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

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

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
					Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Pyrénées-Atlantiques	623900		184469	184469	0	0	0	0
Haute-Garonne	73900		31193	31193	3	3	0	0
Hautes-Pyrénées	106000		47549	47549	0	0	0	0
Drome	98900		65573	65573	5	5	0	0.009
Pyrénées-Orientales	44940		9374	9374	0	0	0	0
Alpes-de-Haute-Provence	127423		120949	120949	45	43	0	0.037
Hautes-Alpes	199600		174218	174218	82	82	1060	0.047
Alpes-Maritimes	62016		52635	52635	6	6	0	0.011
Bouches-du-Rhône	161505		131813	131813	25	25	0	0.019
Var	48550				8	8		
Vaucluse	38910		26338	26338	6	5	0	0.023
Corse-du-Sud	47056		38321	38321	3	2	0	0.008
Haute-Corse	95000		96000	96000			0	0
Total	1725000	0	978432	978432	181	179	1157	0.018
Total - 1	1721534		1021460	1021460	183	173	450	0.018

**Footnote**

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

suspicion was not confirmed afterwards.

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

Region	Total number of existing ovine / caprine		Officially free herds		Infected herds		Surveillance		Investigations of suspect cases			
	Herd	Animals	Number of herds	%	Number of herds	%	Number of herds tested	Number of infected herds	Number of animals tested with biological blood tests	Number of animals examined with biological blood tests	Number of animals positive serologically	Number of animals positive serologically logically
Paris	4	70	4	100	0	0	0	0	0	0	0	0
Seine-et-Marne	270	5600	270	100	0	0	30	1200	0	0	1	0
Yvelines	190	3914	190	100	0	0	29	3028	0	957	2	0
Essonne	70	70	70	100	0	0	15	0	0	0	0	0
Hauts-de-Seine	7	75	7	100	0	0	2	55	0	0	0	0
Seine-Saint-Denis	6	45	6	100	0	0	2	0	15	2	0	0
Val-de-Marne	14	190	14	100	0	0	4	149	0	0	0	0
Val-d'Oise	85	1920	85	100	0	0	13	0	0	0	0	2
Ardennes	665	29620	665	100	0	0	114	2578	0	10	0	0
Aube	329	12850	329	100	0	0	131	0	19	2	0	2
Marne	414	13700	414	100	0	0	164	0	0	49	0	0
Haute-Marne	1244	34175	1244	100	0	0	351	6613	0	0	0	0
Aisne	1175	14513	1175	100	0	0	536	2770	0	2	2	2
Oise	1594	35967	1594	100	0	0	166	3031	0	2	2	0
Somme					0	0	4565	0	0	70	0	0
Eure	2290		2290	100	0	0	441	5534	0	164	4	0
Seine-Maritime	4151	57265	4151	100	0	0	1763	9894	0	86	8	0
Cher	1300	26200	1300	100	0	0	538	34530	0	333	1	0
Eure-et-Loir	694	950	694	100	0	0	15	0	12	0	0	0
Indre	2182	118594	2182	100	0	0	105	34719	0	0	0	0
Indre-et-Loire	858	30270	858	100	0	0	34	30247	0	7	0	0

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			0	62	10375	0	211	4	0	2
Loir-et-Cher	734	734	100	0	0	0	0	0	0	0
Loiret	349	16748	349	100	0	42	6060	0	0	0
Calvados	4663		4663	100	0	623	0	0	0	1
Manche	2246	11000	2246	100	0	298	7555	0	0	0
Orne	2534	38400	2534	100	0	0	0	0	0	611
Côte-d'Or	850	45000	850	100	0	114	0	300	38	0
Nièvre	1700		1700	100	0	83	7335	0	0	2
Saône-et-Loire	2914	108000	2914	100	0	1376	37701	0	165	58
Yonne	270	9000	270	100	0	0	0	0	0	0
Nord	2373	26309	2373	100	0	1219	16806	0	1	0
Pas-de-Calais	1691		1691	100	0	111	0	72	1	0
Meurthe-et-Moselle	1242		1242	100	0	393	0	5	0	0
Meuse				0	0	0	0	63	0	0
Moselle				0	0	0	0	57	0	0
Vosges	903	61345	903	100	0	175	5014	0	0	2
Bas-Rhin	1022		1022	100	0	796	0	8	0	0
Haut-Rhin	534		534	100	0	287	3963	0	0	0
Doubs	950	11700	950	100	0	103	0	1	0	1
Jura	691	13000	691	100	0	41	1885	0	0	2
Haute-Saône	1700	41000	1700	100	0	149	0	45	0	0
Territoire de Belfort	228	2000	228	100	0	12	154	0	22	0
Loire-Atlantique	1800	41700	1800	100	0	276	0	67	0	0
Maine-et-Loire	2200		2200	100	0	0	0	0	0	0
Mayenne	3491	27860	3491	100	0	480	5216	0	11	0
Sarthe	2894	29000	2894	100	0	123	3565	0	83	0
Vendée	2675	88523	2675	100	0	122	0	26	212	0
Côtes-d'Armor	3700	25700	3700	100	0	277	2876	0	9	0
Finistère	1800	10300	1800	100	0	0	0	0	0	0

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

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

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

Region	Status of herds and animals under the programme										Officially free	
	Total number of herds and animals under the programme			Not free or not officially free			Free or officially free suspended					
	Last check positive		Last check negative		Animals		Animals		Animals			
Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	
Alpes-de-Haute-Provence	872	127423	115					9		503	237	
Hautes-Alpes	972	199600	46	500	0	0	0	8	1891	546	11200	
Alpes-Maritimes	500	62016	0	0	4	1977	32	443	5	1977	270	
Bouches-du-Rhône	572	161505	47		0	0	0	0	0	121	20000	
Corse-du-Sud	436	47056	19	1043	0			34		331	233	
Haute-Corse	605	95000								0	12560	
Drôme	1434	98000	496	0		538		6		37	67	
Haute-Garonne	1981	73000								0	3528	
Pyrénées-Atlantiques	4756	623000								0	331	
Hautes-Pyrénées	2089	106000								0	37003	
Var	472	48550	48	0		108		58		145	145	
Vaucluse	391	38910	41	85	5	2471	9	151	64	5047	8785	
Pyrénées-Orientales	469	44940	0	0	0	0	0	0	0	0	34014	
Total	15549	172500	812	1628	9	4448	687	594	184	8915	10772	
Total - 1	14982	1721534	1108	8341	9	2602	410	15255	178	5955	976125	
Total - 1										2723	10833	

## **2.7. YERSINIOSIS**

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

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

### **2.7.3. Yersinia in foodstuffs**

### **2.7.4. Yersinia in animals**

**Table Yersinia in animals**

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

## **2.8. TRICHINELLOSIS**

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

#### **A. Trichinellosis general evaluation**

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

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

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

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

## 2.8.2. Trichinellosis in humans

## 2.8.3. Trichinella in animals

### A. Trichinella in pigs

#### **Number of officially recognised Trichinella-free holdings**

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

#### **Categories of holdings officially recognised Trichinella-free**

This categorisation system has not been retained in France.

#### **Officially recognised regions with negligible Trichinella risk**

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

#### **Monitoring system**

##### **Sampling strategy**

###### **General**

Systematic sampling (outdoor pigs and breeding pigs)

###### **For Trichinella free holdings**

All breeding pigs are tested.

###### **For categories of holdings officially recognised Trichinella-free**

This categorisation system has not been retained in France.

###### **For regions with negligible Trichinella risk**

This categorisation system has not been retained in France.

##### **Frequency of the sampling**

###### **General**

Systematic (outdoor pigs and breeding pigs)

###### **For Trichinella free holdings**

All breeding pigs are tested

###### **For categories of holdings officially recognised Trichinella-free**

This categorisation system has not been retained in France.

**For regions with negligible *Trichinella* risk**

Not relevant

**Type of specimen taken**

**General**

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

**For *Trichinella* free holdings**

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

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

**General**

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

**For *Trichinella* free holdings**

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

**Case definition**

**General**

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

**For *Trichinella* free holdings**

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

**Diagnostic/ analytical methods used**

**General**

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

**For *Trichinella* free holdings**

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

**Preventive measures in place**

Carcasses are consigned until analysis results are obtained.

**Control program/ mechanisms**

### **The control program/ strategies in place**

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

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

A surveillance program is in force regarding wild game :

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

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

The trichinella free holdings inspections have not started yet.

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

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

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

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

### **Measures in case of the positive findings or single cases**

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

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

### **The contingency plan in place**

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

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

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

the out-door breeding.

### **Additional information**

Development of a quality control system has been set up in France since 1998. At first, theoretical and practical trainings for analysts were organised by the French National Reference Laboratory. Then (in 2003) ring trials were initiated with two sessions per year for each routine diagnostic laboratory. The sensitivity of larvae detection increased significantly for all routine laboratories (a total of 72 labs in France) and reach to date an average of 80% of larvae detection.

## **B. Trichinella in horses**

### **Monitoring system**

#### **Sampling strategy**

Sampling is performed systematically at the slaughterhouse by competent authorities.

#### **Frequency of the sampling**

100%

#### **Type of specimen taken**

Muscle from tongue or diaphragm

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

A sample of 10 g of muscle is analysed. Another sample ( $\geq 10$  g) is frozen ( $18^{\circ}\text{C}$ ) and stored for 8 weeks.

#### **Case definition**

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

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

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

### **Control program/ mechanisms**

#### **The control program/ strategies in place**

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

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

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

### **Measures in case of the positive findings or single cases**

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

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

No positive horse for *Trichinella* since 5 years.

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

### **Additional information**

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

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

## Table Trichinella in animals

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

## **2.9. ECHINOCOCCOSIS**

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

#### **A. Echinococcus spp. general evaluation**

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

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

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

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

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

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

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

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

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

## 2.9.2. Echinococcosis in humans

## 2.9.3. Echinococcus in animals

**Table Echinococcus in animals**

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

(1) : faeces sample

(2) : faeces sample

(3) : liver samples

(4) : intestine sample

## **2.10. TOXOPLASMOSIS**

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

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

### **2.10.3. Toxoplasma in animals**

**Table Toxoplasma in animals**

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

(1) : at slaughterhouse

#### **Footnote**

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

## **2.11. RABIES**

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

#### **A. Rabies general evaluation**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## 2.11.2. Lyssavirus (rabies) in animals

### A. Rabies in dogs

#### Control program/ mechanisms

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

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

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

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

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

##### Measures taken

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

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

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

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

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

## Results of the investigation

### Investigations of the human contacts with positive cases

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

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

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

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

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

## Table Rabies in animals

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

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

## **2.12. Q-FEVER**

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

#### **A. Coxiella burnetii (Q-fever) general evaluation**

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

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

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

##### **Additional information**

###### **Sampling strategy:**

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

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

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

###### **Type of specimen taken:**

###### **Blood samples**

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

###### **Antibodies-ELISA**

###### **Results of the investigation**

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

## 2.12.2. *Coxiella* (Q-fever) in animals

**Table *Coxiella burnetii* (Q fever) in animals**

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

## **2.13. TULARAEMIA**

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

### **2.13.2. Francisella in animals**

**Table Francisella in animal**

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

## **2.14. CHLAMYDIOSIS**

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

### **2.14.2. Chlamydia/ Chlamydophila in animals**

#### **A. Cp. psittaci in animal**

##### **Monitoring system**

###### **Sampling strategy**

Sampling strategies is not organized and not systematic:

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

###### **Frequency of the sampling**

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

###### **Type of specimen taken**

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

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

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

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

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

###### **Case definition**

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

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

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

Complement fixation test

Inoculation into chicken eggs  
Semi quantitative real time PCR

### **Vaccination policy**

No vaccine is available

### **Other preventive measures than vaccination in place**

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

### **Control program/ mechanisms**

#### **The control program/ strategies in place**

No control program in France

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

No recent action taken in France

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

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

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

### **Measures in case of the positive findings or single cases**

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

### **Notification system in place**

Animal disease is notifiable since 2006.

### **Results of the investigation**

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

1 chicken flock investigated (0 positive)

5- Additional analyses on influenza samples collected in duck flocks

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

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

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

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

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

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

**Table Chlamydia/ Chlamydophila in animal**

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

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

### **3.1. ENTEROCOCCUS, NON-PATHOGENIC**

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

### **3.1.2. Antimicrobial resistance in *Enterococcus*, non-pathogenic isolates**

#### **A. Antimicrobial resistance of *E. faecium* in animal**

##### **Sampling strategy used in monitoring**

###### **Frequency of the sampling**

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

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

###### **Type of specimen taken**

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

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

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

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

###### **Procedures for the selection of isolates for antimicrobial testing**

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

###### **Methods used for collecting data**

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

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

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

## **Laboratory methodology used for identification of the microbial isolates**

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

## **Laboratory used for detection for resistance**

### **Antimicrobials included in monitoring**

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

9 antibiotics are included in the Sensititre plate :

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

### **Breakpoints used in testing**

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

Ampicillin: >16 µg/ ml

Avilamycin: >8 µg/ ml

Chloramphenicol: >16 µg/ ml

Erythromycin: >4 µg/ ml

Gentamicin: >128 µg/ ml

Pristinamycin: >2 µg/ ml

Streptomycin: >512 µg/ ml

Tetracycline: >8 µg/ ml

Vancomycin: >8 µg/ ml

## **Preventive measures in place**

*Enterococcus faecalis* ATCC 29212 have been used as quality control.

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

E. faecium		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																								
Cattle (bovine animals) - at farm		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																								
Antimicrobials:	Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest			
<b>Aminoglycosides</b>																						0.5	512			
Gentamicin	128	76	3						0	3	13	45	12	0	0	0	0	0	0	0	0	3	5	4	2048	
Streptomycin	512	76	11						0	0	7	45	10	0	0	0	0	3	3	3	3	2	64			
<b>Amphenicols</b>									2	29	40	5	0	0	0	0	0	0	0	0	0	0	0	0		
Chloramphenicol	16	76	0						0	0	47	20	9	0	0	0	0	0	0	0	0	0	0	0		
<b>Glycopeptides (Cyclic peptides, Polypeptides)</b>																										
Vancomycin	8	76	0																				0.12	128		
<b>Macrolides</b>																										
Erythromycin	4	76	25	0	1	4	8	2	1	15	20	11	0	0	0	0	0	0	0	0	0	0	0.03	128		
<b>Orthosomycins</b>																										
Avilamycin	8	76	0						0	0	4	42	23	7	0	0	0	0	0	0	0	0	0.25	128		
<b>Penicillins</b>																										
Ampicillin	16	76	4						0	2	3	29	27	10	1	0	0	1	3	0	0	0	0.06	64		
Streptogramins	2	76	1						1	10	5	20	37	2	0	0	1	0	0	0	0	0	0.06	64		
Tetracyclines	8	76	20						0	0	28	28	0	0	0	0	0	3	17	0	0	0	0.06	128		

#### Footnote

Those strains were collected in 2006

**Table Antimicrobial susceptibility testing in *E. faecium***

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

**Footnote**

All those strains were isolated in 2006. Streptogramins = pristinamycin

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

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

**Footnote**

Those strains were collected in 2006

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

Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to															
Antimicrobials:	Break point	N	n	Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to								>2048	lowest	highest	
				<=0.03	0.06	0.12	0.25	0.5	1	2	4				
<b>Aminoglycosides</b>															
Genamicin	128	97	0						0	0	1	48	48	0	0
Streptomycin	512	97	31						0	0	0	27	27	4	4
<b>Amphenicols</b>															
Chloramphenicol	16	97	3						5	11	55	23	3	0	0
<b>Glycopeptides (Cyclic peptides, Polypeptides)</b>															
Vancomycin	8	97	0					1	1	83	6	6	0		
<b>Macrolides</b>															
Erythromycin	4	97	66	0	3	9	2	3	8	2	4	3	4	1	0
<b>Orthosomycins</b>															
Avilamycin	8	97	21					0	2	5	34	30	5	0	2
<b>Penicillins</b>															
Ampicillin	16	97	5	5	12	12	18	13	21	10	0	1	1	3	1
<b>Streptogramins</b>															
Tetracyclines	8	97	91	0	0	2	4	0	0	0	0	1	4	26	60
														0.12	128
														0.25	128
														0.06	64
														0.06	64
														0.06	128

## Footnote

Those strains were isolated in 2006

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

### Test Method Used

Broth dilution

### Standards used for testing

eucast/ CA-SFM

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

(1) : = Pristinamycin

### **3.2. *ESCHERICHIA COLI, NON-PATHOGENIC***

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

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

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

##### **Sampling strategy used in monitoring**

###### **Frequency of the sampling**

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

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

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

###### **Type of specimen taken**

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

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

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

###### **Procedures for the selection of isolates for antimicrobial testing**

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

###### **Methods used for collecting data**

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

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

###### **Laboratory methodology used for identification of the microbial isolates**

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

Identification is then confirmed by PCR.

## **Laboratory used for detection for resistance**

### **Antimicrobials included in monitoring**

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

11 antibiotics are included in the Sensititre plate :

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

### **Breakpoints used in testing**

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

Ampicillin: >16 µg/ ml,

Apramycin: >16 µg/ ml,

Chloramphenicol: >16 µg/ ml,

Ciprofloxacin: >1 µg/ ml,

Florfenicol: >16 µg/ ml,

Gentamicin: >4 µg/ ml,

Nalidixic acid: >16 µg/ ml,

Neomycin: >16 µg/ ml,

Streptomycin: >16 µg/ ml,

Tetracycline: >8 µg/ ml,

Trimethoprim: >8 µg/ ml.

## **Preventive measures in place**

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

## **B. Antimicrobial resistance of *E.coli* in animal**

### **Sampling strategy used in monitoring**

#### **Frequency of the sampling**

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

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

#### **Type of specimen taken**

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

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

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

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

### **Procedures for the selection of isolates for antimicrobial testing**

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

### **Methods used for collecting data**

The samples are kept cold quickly transported to the laboratory in charge of isolation. Upon receipt, samples are diluted to 1/ 10th peptone glycerol water at 25% and then spread on selective media. After isolation, one characteristic strain is kept in peptone glycerol -70 ° C until antimicrobial susceptibility testing.

### **Laboratory methodology used for identification of the microbial isolates**

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

### **Laboratory used for detection for resistance**

#### **Antimicrobials included in monitoring**

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

23 antibiotics are included in 2 Sensititre plates :

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

#### **Breakpoints used in testing**

Results interpretations have been expressed according to EUCAST recommendations when

they exist or according to the CA-SFM. Strains are resistant if MIC value:  
Amikacin: >16 µg/ ml,  
Amoxicillin/ Clavulanic acid: >16/ 8 µg/ ml,  
Ampicillin: >16 µg/ ml,  
Apramycin: >16 µg/ ml,  
Cefotaxime: >2 µg/ ml,  
Cefoxitine: >32 µg/ ml,  
Ceftazidime: >8 µg/ ml,  
Ceftiofur: >4 µg/ ml,  
Cefuroxime: >8 µg/ ml,  
Chloramphenicol: >16 µg/ ml,  
Ciprofloxacin: >1 µg/ ml,  
Colistin: >2 µg/ ml,  
Florfenicol: >16 µg/ ml,  
Gentamicin: >4 µg/ ml,  
Kanamycin: >16 µg/ ml,  
Nalidixic acid: >16 µg/ ml,  
Neomycin: >16 µg/ ml,  
Streptomycin: >16 µg/ ml,  
Sulfamethoxazole: >256 µg/ ml,  
Tetracycline: >8 µg/ ml,  
Tobramycin: >4 µg/ ml,  
Trimethoprim: >8 µg/ ml,  
Trimethoprim/ Sulfamethoxazole: >8/ 152 µg/ ml.

### **Preventive measures in place**

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

**Table Antimicrobial susceptibility testing of *E. coli* in animals**

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

**Footnote**

All those strains were isolated in 2006

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

		E. coli		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																
		Cattle (bovine animals) - at farm		<=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																
Antimicrobials:	Break point	N	n																	
Aminoglycosides				0	42	55	5	0	1	0	0	0	0	0	0	0	0	0	0.5	16
Amikacin	16	103	0					0	15	76	12	0	0	0	0	0	0	0	1	32
Aptanycin	16	103	0					10	70	18	3	1	0	1	0	0	0	0	0.25	32
Gentamicin	4	103	1																	
Kanamycin	16	103	20					0	0	29	46	7	1	0	0	0	0	20	0.25	128
Neomycin	16	103	17					10	66	7	1	1	1	6	6	5	5	5	0.5	64
Streptomycin	16	103	32						0	19	47	5	6	7	11	6	2	0	2	512
Tobramycin	4	103	1					0	41	56	5	0	0	1	0	0	0	0	0.25	16
<b>Amphenicols</b>																				
Chloramphenicol	16	103	20						0	18	58	7	2	0	1	10	7	0	2	512
Florfenicol	16	103	4						1	21	68	9	2	2	2	2	2	2	2	32
<b>Cephalosporins</b>																				
Cefotaxim	2	103	0	16	66	20	0	0	0	1	0	0	0	0	0	0	0	0.016	8	
Cefotixitin	32	103	1					0	0	0	14	62	22	4	0	1	0	0	0.25	128
Ceftriaxim	8	103	0	0	11	60	27	4	0	0	0	0	1	0	0	0	0	0.03	16	
Cefazidim	4	103	0					45	54	3	1	0	0	0	0	0	0	0.25	8	
Ceftiofur	8	103	3					0	1	13	58	28	2	0	1	0	0	0.5	32	
<b>Fluoroquinolones</b>																				
Ciprofloxacin	1	103	2	96	3	0	2	0	0	1	0	0	1	0	0	0	0	0.008	8	
<b>Penicillins</b>																				
Amoxicillin / Clavulanic acid	16	103	2						1	19	50	27	4	1	1	1	1	1	1	512
Ampicillin	16	103	29						3	29	40	2	0	0	0	0	0	0	0	
<b>Polymyxins</b>																				
Colistin	2	103	0	0	0	0	0	0	102	1	0	0	0	0	0	0	0	0.03	16	
<b>Quinolones</b>																				

	16	32	64	103	205	409	819	1638	3276	6553	13107	26214	52428	104857	209714	419428	838857	1677714	3355428	6710857	13421714	26843428	53686857	107373714	214747428	429494857	858989714	1717979428	3435958857	6871917714	13743835428	27487670857	54975341714	109950683428	219901366857	439802733714	879605467428	1759210934857	3518421869142	7036843738284	14073687476568	28147374953136	56294749856272	11258949772544	22517899545088	45035799090176	90071598180352	180143196360704	360286392721408	720572785442816	1441145570885632	2882291141771264	5764582283542528	1152916456708556	2305832913417112	4611665826834224	9223331653668448	18446663317336896	36893326634673792	73786653269347584	147573306538695168	295146613077390336	590293226154780672	1180586452309561344	2361172904619122688	4722345809238245376	9444691618476490752	18889383236952981504	37778766473855963008	75557532947711926016	15111506589443852032	30223013178887704064	60446026357775408128	120892052715550816256	241784105431101632512	483568210862203265024	967136421724406530048	193427284344813106096	386854568689626212192	773709137379252424384	1547418274758504848768	3094836549517009697536	618967309903401939512	1237934619806803878024	2475869239613607756048	4951738479227215512096	9903476958454431024192	19806953916858862048384	39613907833717724096768	79227815667435448193536	15845563133487089638708	31691126266974179277416	63382252533948358554832	126764505067896717109664	253529010135793434219328	507058020271586868438656	101411604054317373687712	202823208108634747375424	405646416217269494750848	811292832434538989501696	162258566486907797903392	324517132973815595806784	649034265947631191613568	1298068531895262383227136	2596137063790524766454272	5192274127581049532908544	10384548255162099065817088	20769096510324198131634176	41538193020648396263268352	83076386041296792526536704	16615277208259398505314344	33230554416518797010628688	66461108833037594021257376	13292221766607518804254416	26584443533215037608508832	53168887066430075217017664	106337774132860150434035328	212675548265720300868070656	425351096531440601736141312	850702193062881203472282624	170140438612576240694456528	340280877225152481388913056	680561754450304962777826112	136112350890608992555565224	272224701781217985111130448	544449403562435970222260896	108889880712487954044452176	217779761424975908088904352	435559522849951816177808704	871119045699879632355617408	1742238091399759264711234816	3484476182799518529422469632	6968952365599037058844939264	13937904731198074117689878528	27875809462396148235379757056	55751618924792296470759514112	11150323784958559294159028224	22300647569857118588318056448	44601295139714237176636112896	89202587279428474353272225792	17840517455885694870654445584	35681034911771389741308891168	71362069823542779482617782336	142724139647085558965235614672	285448279294171117930471229344	570896558588342235860942458688	1141793117176684471721884973376	2283586234353368943443769946752	4567172468706737886887539893504	9134344937413475773775079787008	1826868987482695154755015957016	3653737974965390309510031914032	7307475949930780618520063828064	14614951899614561237040127656128	29229903799229122474080255312256	58459807598458244948160510624512	11691961519691648989632102124924	23383923039383297979264204249848	46767846078766595958528408497696	93535692157533191917056816995392	187071384315066383834113633990784	374142768630132767668227267981568	748285537260265535336454535963136	149657107452053107067290907186672	299314214904106214134581814373344	598628429808212428269163628746688	1197256859616424556538327254893376	2394513719232849113076654509786752	4789027438465698226153309019573504	9578054876931396452306618039147008	1915610973386279290661323607829416	3831221946772558581322647215658832	7662443893545117162645294431317664	15324887787090234325294888626535328	30649775574180468650589777253070656	61299551148360937301179554506141312	12259910229672187460235910901228264	24519820459344374920471821802456528	4903964091868874984094364360491312	9807928183737749968188728720982624	1961585636747549993637445744196528	3923171273495099987274891488393056	7846342546985199974549782976786112	1569268509397039994909956595357224	3138537018794079989819913190714448	6277074037588159979639826381428896	1255414807517631995887965276285776	2510829615035263991775930552571552	5021659230070527983551861105143104	1004331846014105596710372221028552	200866369202821059342074444205704	401732738405642158684148888411408	803465476811284257368297776822816	1606930953622564514736595553645632	3213861907245129029473191107291264	6427723814490258058946382214582528	1285544762898051611789276442916556	2571089525796103223578552885833112	5142178551592206447157105771666224	1028435710318403284351421154332448	2056871420636806568702842308664896	4113742841273613137405684617329792	8227485682547226274811369234659584	1645497136589445254822678446931912	3290994273178890509645356893863824	6581988546357781019290713787727648	13163977092715562038581427575455296	26327954185431124077162855150910592	5265590837086224815432571030182188	10531181674172449630865420602643776	21062363348344899261730841205287552	4212472669668979852346168241057504	8424945339337959704692336482115008	16849890678675919409384672964230016	33699781357351838818769345928460032	67399562714703677637538691856920064	134799125429407355275077383713840128	269598250858814710550154767427680256	538196501717629421100309534855360512	107639300343525884220061866971072024	215278600687051768440123733942144048	43055720137410353688024746788428816	86111440274820707376049493576857632	17222288054964141475209898755375264	34444576109928282950419797510750528	68889152219856565900839595021501056	137778304439713131801679980423020112	275556608879426263603359960846040224	551113217758852527206719921692080448	110222643551770505401343884338160896	220445287103541010802687768676321792	440890574207082021605375537352643584	881781148414164043210751074705287168	176356229682832808642150214941056336	352712459365665617284300429882112672	705424918731331234568600859764225344	1410849837462662469137001795328450688	2821699674925324938274003590656901376	5643399349850649876548007181313802752	11286798699701299753096014362627605504	22573597399402599506192028725255211008	45147194798805199012384057450510422016	90294389597610398024768014901020844032	18058877919522079604953602980204168064	36117755839044159209887205960408336128	72235511678088318419774411920816672656	14447102335617663683954822384163344512	28894204671235327367909644768326689024	57788409342470654735819289536653378048	115576818684941309471638579073306556096	231153637369882618943277158146613112192	462307274739765237886554316293226224384	924614549479530475773108632586452448768	184922909895906095154621726577294897536	369845819791812190309243453154589795072	739691639583624380618486906309179590144	1479383279167248761236938012618359180288	2958766558334497522473876025236793560576	5917533116668995044947752050473587121152	1183506623333798758985504025094714242204	2367013246667597517971008050188528484408	4734026493335195035942001600377056968816	946805298667038757188400320075411393632	1893610597334077514376800640150822787264	3787221194668154728753601280301645574528	7574442389336309457507202560603291149056	15148884778672618915014405121206482298112	30297769557345237830028810242412964596224	60595539114690475660057620484825929192448	12119107822938095132011524096965185838496	24238215645876190264023048193930371676992	48476431291752380528046096387860743353984	96952862583504761056092192775721486707968	193905725167009522112184385551442933415936	387811450334019044224368771102885866831872	775622900668038088448737542205771733663744	1551245801336076176895471844411543467335584	3102491602672152353790943688823086934671168	6204983205344304707581887377646173869342336	1240996641068860941516375675529234773868464	2481993282137721883032751351058468555736928	4963986564275443766065502702116937111473856	9927973128550887532131005404233874222947712	19855946257101775064265010808467548445895424	3971189251420355012853002161693509689179048	7942378502840710025706004323387047378358096	1588475700568142005141200864677409475677692	3176951401136284002572401729354818913355384	6353902802272568005144803458709637826710768	12707805604545136002578468117419275653415344	25415611209090272005156836234838551306830688	50831222418180544002536672469677102613661376	10166244483636138800511334493935420522732272	20332488967272277600252668987870841045465544	40664977934544555200505337975741682090931088	81329955869089110400250675951483364181862176	16265981173817822080502635190296672836374352	32531962347635644160251270380593345672747704	65063924695271288320502540761186681345495408	13012784939054257664101088152237336269098816	26025569878108515328202176304474672538197632	52051139756217030656404352608949345076395264	10410227951243406131280865241789489015279056	20820455902486812262561730483578978030558112	41640911804973624525123460967157956061116224	83281823609947249050246921934315912122232448	16656364721989449810049384386863824244446896	33312729443978899620098768773727648488893792	66625458887957799240049337547455296977787584	13325091775911559840098665109491059395557168	26650183551823039680197330218982118791114336	53300367103646079360394660437964237582228672	10660073420729019680789330875982447516445744	21320146841458039361578661751964895032891488	42640293682916078723157333503929790065782976	85280587365832157446314667007859580131565952	17056117473166235489262933401579160263133904	34112234946332470978525866803158320526267808	68224469892664941957051733606316641052535616	13644893978532988391410346721263328210507123	27289787957065976782820693442526656421014246	54579575914131953565641386885053312842028492	10915915182826386713128277377010662568415984	21831830365652773426256554754021325136831968	4366366073130554685251

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

E. coli		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																						
Pigs - at farm		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																						
Antimicrobials	Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest	
<b>Aminoglycosides</b>																						0.5	16	
Amikacin	16	126	0						3	50	57	15	1	0	0									
Apriamycin	16	126	1						1	26	85	12	1	0	1								1	32
Gentamicin	4	126	2						21	82	21	0	0	0	1	1	0						0.25	32
Kanamycin	16	126	5						0	0	1	39	71	10	0	0	0	0	5				0.25	128
Neomycin	16	126	5						19	83	18	1	0	0	3	2	0						0.5	64
Streptomycin	16	126	76						1	15	24	10	16	18	20	13	8	1					2	512
Tobramycin	4	126	1						2	60	59	3	1	0	0	1							0.25	16
<b>Amphenicols</b>										0	20	68	6	6	7	8	11	0	0				2	512
Chloramphenicol	16	126	32							2	22	80	17	2	3								2	32
Florfenicol	16	126	5																					
<b>Cephalosporins</b>																						0.016	8	
Cefotaxim	2	126	1	47	72	6							1	19	87	18	1							
Cefoxitin	32	126	0																			0.25	128	
Ceftriaxim	8	126	0	0	22	73	30	0	0	1												0.03	16	
Cefazidim	4	126	1						71	54	0	0	0	0	1							0.25	8	
Ceftiofur	8	126	2						0	0	20	81	23	1	0	1						0.5	32	
<b>Fluoroquinolones</b>																								
Ciprofloxacin	1	126	0	122	1	0	1	2															0.008	8
<b>Penicillins</b>																								
Amoxicillin / Clavulanic acid	16	126	0																					
Ampicillin	16	126	38																				1	512
<b>Polymyxins</b>																								
Colistin	2	126	0	0	0	0	0	0	18	107	1	0	0									0.03	16	
<b>Quinolones</b>																								

	16	126	3	6	100	17	3	3	1	256
<b>Sulfonamides</b>	16	126	3	6	100	17	3	3	1	256
Sulfonamide	256	126	109				0	1	104	
<b>Tetracyclines</b>							0	1	5	
Tetracyclin	8	126	105				8	4	0	
Trimethoprim	8	126	65				31	15	51	
Trimethoprim + sulfonamides	0						2	10	5	
							0	0	0	
							0	1	64	

**Footnote**

Those strains were isolated in 2006

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

E. coli		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																						
Gallus gallus (fowl) - broilers - at farm		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to																						
Antimicrobials	Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest	
<b>Aminoglycosides</b>																						0.5	16	
Amikacin	16	101	0						1	26	51	21	2	0	0									
Apriamycin	16	101	0						0	15	64	19	3	0	0								1	32
Gentamicin	4	101	0						3	63	33	2	0	0	0	0							0.25	32
Kanamycin	16	101	6						0	0	1	20	56	16	2	0	0	0	0	0	0	6		
Neomycin	16	101	5						2	68	25	1	0	0	3	2	0	0	0	0	0	0.25	128	
Streptomycin	16	101	36						0	12	38	15	5	7	6	13	5	0	0	0	0	0.5	64	
Tobramycin	4	101	0						1	37	55	8											2	512
<b>Amphenicols</b>																						0.25	16	
Chloramphenicol	16	101	4																				2	512
Florfenicol	16	101	0																				2	32
<b>Cephalosporins</b>																						0.016	8	
Cefotaxim	2	101	2																					
Cefotaxim	32	101	0																					
Cefoxitin	8	101	0																					
Cefazidim	4	101	2																					
Ceftiofur	8	101	7																					
Ceftriaxime																								
<b>Fluoroquinolones</b>																								
Ciprofloxacin	1	101	1																					
<b>Penicillins</b>																								
Amoxicillin / Clavulanic acid	16	101	0																					
Ampicillin	16	101	47																					
<b>Polymyxins</b>																								
Colistin	2	101	0																					
<b>Quinolones</b>																								

	16	16	101	19	7	60	13	1	1	3	5	8	0	3	0	3	1	256
<b>Sulfonamides</b>	16	16	101	19	7	60	13	1	1	3	5	8	0	3	0	3	1	256
Sulfonamide	256	101	93					0	1	2	1	1	3	0	4	89		4
<b>Tetracyclines</b>	8	101	79					0	4	9	7	2	0	9	27	38	5	0
Tetracyclin	8	101	44			2	10	24	15	5	1	0	0	0	0	44		0.5
<b>Trimethoprim</b>	0																	256
Trimethoprim + sulfonamides																	0.12	64

#### Footnote

Those strains were isolated in 2006

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

E. coli		Meat from broilers ( <i>Gallus gallus</i> ) - at slaughterhouse											
Isolates out of a monitoring programme	no												
Number of isolates available in the laboratory	208												
Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to													
Antimicrobials:	Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16
Aminoglycosides													
Aptamycin	16	208	0					0	54	134	14	6	0
Gentamicin	4	208	3					23	153	24	5	0	1
Neomycin	16	208	4					24	165	10	5	0	2
Streptomycin	16	208	70					3	56	64	15	8	15
Amphenicols									2	40	132	19	0
Chloramphenicol	16	208	15					6	43	144	14	1	0
Florfenicol	16	208	1										
Fluoroquinolones													
Ciprofloxacin	1	208	9	148	1	14	19	13	4	1	0	5	3
Penicillins													
Ampicillin	16	208	86					9	62	45	5	1	0
Quinolones													
Nalidixic acid	16	208	57					13	101	31	3	3	4
Tetracyclines													
Tetracyclin	8	208	157					0	24	22	5	0	2
Trimethoprim	8	208	83					5	26	65	24	3	2

**Footnote**

Those strains were collected in 2006

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

E. coli		Meat from turkey - at slaughterhouse																					
Isolates out of a monitoring programme		no																					
Number of isolates available in the laboratory		138																					
<b>Antimicrobials:</b>																							
	Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
<b>Aminoglycosides</b>																							
Apramycin	16	138	1						0	34	84	18	1	0	1							1	32
Gentamicin	4	138	2						10	99	26	1	0	0	1	1	0					0.25	32
Neomycin	16	138	4						8	108	16	1	0	1	3	0	1					0.5	64
Streptomycin	16	138	62						2	26	37	11	9	12	8	23	7	3				2	512
<b>Ampicenics</b>										1	23	85	9	2	4	1	7	6	0			2	512
Chloramphenicol	16	138	20							0	35	88	12	1	2							2	32
Florfenicol	16	138	3																				
<b>Fluoroquinolones</b>																							
Ciprofloxacin	1	138	10	101	3	3	13	6	2	0	0	3	3	7								0.008	8
<b>Penicillins</b>																							
Ampicillin	16	138	78							2	32	23	3	0	0	1	4	27	27	19		1	512
<b>Quinolones</b>																							
Nalidixic acid	16	138	34							5	72	24	3	0	1	3	8	7	15			1	256
<b>Tetracyclines</b>																							
Tetracyclin	8	138	135							0	1	1	1	0	0	8	44	63	20	0		0.5	256
Trimethoprim	8	138	74						0	17	38	8	0	0	0	0						0.125	64

## Footnote

Those strains were collected in 2006

## Table Antimicrobial susceptibility testing of *E. coli* in food

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

### Footnote

all the strains were isolated in 2006

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

		E. coli									
		Meat from pig - at slaughterhouse									
		no									
Isolates out of a monitoring programme		112									
Number of isolates available in the laboratory											
		Number of resistant isolates (n) and number of isolates with the concentration (u/ml) or zone (mm) of inhibition equal to									
Antimicrobials:		Break point	N	n	<=0.03	0.06	0.12	0.25	0.5	1	2
Aminoglycosides											
Aptamycin	16	112	0								
Gentamicin	4	112	1								
Neomycin	16	112	6								
Streptomycin	16	112	60								
Amphenicols											
Chloramphenicol	16	112	27								
Florfenicol	16	112	9								
Fluoroquinolones											
Ciprofloxacin	1	112	1	105	0	5	1	0	0	0	1
Penicillins											
Ampicillin	16	112	41								
Quinolones											
Nalidixic acid	16	112	2								
Tetracyclines											
Tetracyclin	8	112	74								
Trimethoprim	8	112	49								

**Footnote**

Those strains were collected in 2006

## Table Breakpoints used for antimicrobial susceptibility testing in Animals

**Test Method Used**

Broth dilution

**Standards used for testing**

eucast/ CA-SFM

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

## Table Breakpoints used for antimicrobial susceptibility testing in Food

**Test Method Used**

Broth dilution

**Standards used for testing**

eucast/ CA-SFM

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

## **4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS**

## **4.1. HISTAMINE**

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

### **4.1.2. Histamine in foodstuffs**

## **4.2. *ENTEROBACTER SAKAZAKII***

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

### **4.2.2. *Enterobacter sakazakii* in foodstuffs**

#### **4.3. STAPHYLOCOCCAL ENTEROTOXINS**

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

##### **4.3.2. Staphylococcal enterotoxins in foodstuffs**

## 5. FOODBORNE OUTBREAKS

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

**Foodborne Outbreaks: summarized data**

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