European Food Safety Authority

ZOONOSES MONITORING

PORTUGAL

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

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

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

IN 2009

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: Portugal

Reporting Year:

Laboratory name	Description	Contribution
LNIV Laboratório Nacional de Investigação Veterinária	National Veterinary Laboratory	Data on zoonoses and zoonotic agents in food anda animals
DGV Direcção Geral de Veterinária	National Veterinary Authority	Reporting Authority Co-ordination of report production
INSA Instituto Nacional de Saude Dr. Ricardo Jorge	Reference laboratory belonging to the Ministry of Health	Data on zoonoses and zoonotic agents in humans and foodborne outbreaks
ASAE Autoridade de Segurança Alimentar e Económica	National Authority for Food Safety	Data on zoonoses and zoonotic agents in food
IBCP Instituto Bacteriológico Câmara Pestana	Scientific Institute - National Reference Laboratory for Rabies	
DGS - Direcção Geral de Saude	National Authority for Human Health	Data on zoonoses and zoonotic agents in humans and foodborne outbreaks
R.A. MADEIRA Região Autónoma da Madeira	Regional Veterinary Services Madeira	Data on zoonoses and zoonotic agents in food and animals
R.A. Açores Região Autónoma dos Açores	Regional Veterinary Services Azores	Data on zoonoses and zoonotic agents in food and animals
Laboratorio de Viseu	Regional Veterinary Laboratory	Data on zoonoses and zoonotic agents in food and animals
Laboratorio do Algarve	Regional Veterinary Laboratory	Data on zoonoses and zoonotic agents in food

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Laboratory name	Description	Contribution
FMV - Faculdade de Medicina Veterinaria	Veterinary School in Lisbon	Data on zoonoses and zoonotic agents in animals
UTAD - Universidade de Trás-os-Montes e Alto Douro	Veterinary School in Vila Real	Data on zoonoses and zoonotic agents in food
IPIMAR Instituto das Pescas da Investigação e do Mar	National Veterinary Laboratory	Data on zoonoses and zoonotic agents in food and animals

PREFACE

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

The report contains information on trends and sources of zoonoses and zoonotic agents in Portugal during the year 2009 .

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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* 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

DGV - Direcção Geral de Veterinária

Table Susceptible animal populations

* Only if different than current reporting year

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals	Data	Year*	Data	Year*	Data	Year*	Data	Year*
Cattle (bovine animals)	calves (under 1 year)			160788	2009	439621	2009		
	- in total			446402	2009	1514898	2009	66173	2009
Ducks	- in total			1560870	2009				
Gallus gallus (fowl)	parent breeding flocks, unspecified - in total [1)]							119	2009
	breeding flocks for egg production line - in total							157	2009
	broilers							2216	2008
	- in total			256502264	2009				
Goats	- in total [2)]			1075959	2009	496000	2009		
Pigs	- in total			4894208	2009	2340000	2008	12022	2009
Sheep	- in total [3)]			1075959	2009	3145000	2009		
Solipeds, domestic	horses - in total			1552	2009	46000	2007		
Turkeys	- in total			3474943	2009			385	2008

Comments:

[1)] Total parents birds

Table Susceptible animal populations

[2)] The data for Slaughtered Animals = Total number of small ruminants slaughtered (Goats and Sheeps)
[3)] The data for Slaughtered Animals = Total number of small ruminants slaughtered (Goats and Sheeps)

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

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

2.1 SALMONELLOSIS

2.1.1 General evaluation of the national situation

A. General evaluation

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

Salmonellosis in animals (other than Gallus gallus):
The animals are sampled on a voluntary basis. The data come from sick animals sent to laboratory for bacteriological analysis or to control herds.
There is a Control Programme for Gallus gallus (breeding flocks). There is also going a baseline study on the prevalence of salmonella in broilers (finished).
Control measures are been taken in positive flocks of laying hens.
There is also going on a baseline study (started on 2007), on the prevalence of salmonella in slaugherpigs and turkeys.

Additional information

Diagnostic techniques:
Foodstuffs/Feedingstuffs - Screening: VIDAS SLM (AFNOR validation). Confirmation: ISO 6579 (2002).

Serology: Rapid Plate Agglutination for S.pullorum/gallinarum.

Bacteriology: ISO 6579 (2002) and D Annex.
- Pre-enrichment in Buffered Peptone Water (for faeces, bedding, nests samples and fluffy)
- Selective enrichment in MSRV (modified semisolid Rappaport Vassiliadis) and Rappaport Vassiliadis with Soja broth.
- Plating on solid media XLD and SM2 Agar.
- Biochemical reactions by 32E or API 20E strips.

Typing of Salmonella: Serotyping by Kauffman/White technique (searching of O antigens by plate agglutination and H antigens by tube agglutination).
Serotyping of isolates is performed at LaboratÃ³rio Nacional de InvestigaÃ§Ã£o VeterinÃ¡ria (NRL).

Phagetyping for Salmonella Enteritidis and Salmonella Typhimurium has started on January 1999, see data on the tables (not in routine analyses).

Antimicrobial Susceptability testing of Salmonella: Resistance to antimicrobials is performed at LaboratÃ³rio Nacional de InvestigaÃ§Ã£o VeterinÃ¡ria (NRL for Salmonella)

Â·The resistance to antimicrobials is performed by disk diffusion Method in Mueller Hinton Plates.

Â·The antimicrobials tested are: AMP10, AMC30, CF30, CMX30, CTX30, SxT25, G10, K30, TE30, C30, S10, NA30, UB30, N30, D30, ENR5 .

Â·The zone diameters are evaluated, following NCCLS Vol.19 nÂº1, January 99.

2.1.2 Salmonellosis in humans

Table Salmonella in humans - Species/serotype distribution

Distribution Zoonotic Agent	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.	Unknown status
Salmonella	254	0	0	0	0	0	0
S. Enteritidis	159						
S. Typhimurium	95						

Table Salmonella in humans - Age distribution

Age distribution	S. Enteritidis			S. Typhimurium			Salmonella spp.		
	All	M	F	All	M	F	All	M	F
<1 year	7	6	1	3	0	3	24	12	12
1 to 4 years	41	18	23	38	25	13	104	57	47
5 to 14 years	43	25	18	20	13	7	79	47	32
15 to 24 years	8	4	4	3	2	1	12	6	6
25 to 44 years	10	5	5	8	6	2	24	14	10
45 to 64 years	18	10	8	6	3	3	37	20	17
65 years and older	24	14	10	12	8	4	49	29	20
Age unknown	8	7	1	5	4	1	16	12	4
Total :	159	89	70	95	61	34	345	197	148

Table Salmonella in humans - Seasonal distribution

Distribution Seasonal	S. Enteritidis	S. Typhimurium	Salmonella spp.
	Cases	Cases	Cases
January	6	7	16
February	5	5	13
March	5	9	15
April	8	7	19
May	7	3	18
June	16	7	36
July	24	8	44
August	22	7	41
September	31	8	51
October	21	21	50
November	8	5	25
December	6	8	17
Total :	159	95	345

2.1.3 Salmonella in foodstuffs

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Bahrenfeld	S. Heidelberg
Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - at processing plant	DGV	Single	25g	44	2			1		1
Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - at retail	ASAE	Batch	25g	316	0					
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at processing plant	DGV	Single	25g	13	0					
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at retail	ASAE	Batch	25g	32	0					
Meat from broilers (Gallus gallus) - minced meat - intended to be eaten cooked - at retail	ASAE	Batch	25g	276	0					
Meat from turkey - fresh - at processing plant	RAM	Batch	25g	1	0					
Meat from turkey - meat preparation - intended to be eaten cooked - at processing plant	DGV	Single	25g	49	2			2		
Meat from turkey - meat preparation - intended to be eaten cooked - at retail	ASAE	Batch	25g	155	12		12			
Meat from turkey - meat products - cooked, ready-to-eat - at processing plant	DGV	Single	25g	19	1			1		
Meat from turkey - meat products - cooked, ready-to-eat - at retail	ASAE	Batch	25g	130	0					
Meat, mixed meat - meat preparation - intended to be eaten cooked - chilled - at processing plant [1)]	DGV	Single	25g	2	0					

Table Salmonella in poultry meat and products thereof

Comments:

[1)] Turkey and broiler

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. 4,5:i:-	S. Brandenburg	S. Bredeney
Meat from bovine animals - meat preparation - intended to be eaten cooked - at processing plant	DGV	Single	10g	20	3			1	1		
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail	ASAE	Batch	10g	110	15			15			
Meat from bovine animals - mechanically separated meat (MSM) - at retail	RAA	Batch	25g	5	0						
Meat from bovine animals - minced meat - intended to be eaten cooked - at processing plant	DGV	Single	25g	22	0						
Meat from pig - fresh - at processing plant	DGV	Single	25g	61	2						
Meat from pig - meat preparation - intended to be eaten cooked - at processing plant	DGV	Single	10g	34	6			1	3		
Meat from pig - meat products - cooked, ready-to-eat - at processing plant	DGV	Single	25g	57	7		1	1	3		
Meat from pig - minced meat - intended to be eaten cooked - at processing plant	DGV	Single	25g	17	4			1		1	
Meat from bovine animals - carcass - chilled - at slaughterhouse - animal sample - carcass swabs	RAM	Batch		180	11			2			4
Meat from bovine animals - minced meat - intended to be eaten cooked - chilled	RAM	Single	25g	1	0						
Meat from bovine animals - minced meat - intended to be eaten cooked - chilled - at catering	INSA	Single	25g	1	1		1				
Meat from goat - carcass - chilled - at slaughterhouse - animal sample - carcass swabs	RAM	Batch		7	0						

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. 4,5:i:-	S. Brandenburg	S. Bredeney
Meat from pig - carcass - chilled - at slaughterhouse - animal sample - carcass swabs	RAM	Batch		125	3			2			
Meat from pig - meat products - raw but intended to be eaten cooked - chilled - at processing plant	RAM	Single	25g	2	0						

	S. Derby	S. Kentucky	S. London	S. Madelia	S. Mbandaka	S. Rissen
Meat from bovine animals - meat preparation - intended to be eaten cooked - at processing plant						1
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail						
Meat from bovine animals - mechanically separated meat (MSM) - at retail						
Meat from bovine animals - minced meat - intended to be eaten cooked - at processing plant						
Meat from pig - fresh - at processing plant						2
Meat from pig - meat preparation - intended to be eaten cooked - at processing plant	1					1
Meat from pig - meat products - cooked, ready-to-eat - at processing plant			1			1
Meat from pig - minced meat - intended to be eaten cooked - at processing plant	1					1

Table Salmonella in red meat and products thereof

	S. Derby	S. Kentucky	S. London	S. Madelia	S. Mbandaka	S. Rissen
Meat from bovine animals - carcass - chilled - at slaughterhouse - animal sample - carcass swabs		1		1	3	
Meat from bovine animals - minced meat - intended to be eaten cooked - chilled						
Meat from bovine animals - minced meat - intended to be eaten cooked - chilled - at catering						
Meat from goat - carcass - chilled - at slaughterhouse - animal sample - carcass swabs						
Meat from pig - carcass - chilled - at slaughterhouse - animal sample - carcass swabs		1				
Meat from pig - meat products - raw but intended to be eaten cooked - chilled - at processing plant						

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Crustaceans - at processing plant	RAM	Single	25g	9	0			
Crustaceans - unspecified - cooked - at processing plant	DGV	Single	25g	10	0			
Egg products - at retail	ASAE	Batch	25g	10	0			
Eggs - table eggs - at packing centre	DGV	Single	25g	40	0			
Eggs - table eggs - at retail	RAM	Batch	25g	12	0			
Fishery products, unspecified - at retail	ASAE	Batch	25g	55	0			
Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months	ASAE	Batch	25g	115	0			
Fruits and vegetables - precut - ready-to-eat	ASAE	Batch	25g	80	0			
Live bivalve molluscs	ASAE	Batch	25g	5	0			
Fish - raw - chilled - at processing plant	INSA	Single	25g	8	0			
Fruits and vegetables - precut - ready-to-eat - at catering - Surveillance	INSA	Single	25g	323	0			
Live bivalve molluscs - unspecified - depurated - at processing plant	DGV	Single	25g	55	0			
Other food - at catering [1)]	INSA	Single	25g	1306	0			
Other food - at catering - Clinical investigations [2)]	INSA	Single	25g	1	1	1		
Other food - at catering - Surveillance [3)]	INSA	Single	25g	373	0			
Other processed food products and prepared dishes - unspecified - containing raw egg - chilled - at catering - Clinical investigations	INSA	Single	25g	1	1	1		

Table Salmonella in other food

Comments:

[1)] Cooked mixed meal
[2)] Ready to eat mixed meal with raw vegetables
[3)] Ready to eat mixed meal with raw vegetables

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Cheeses made from cows' milk - at retail	ASAE	Batch	25g	45	0			
Cheeses made from cows' milk - soft and semi-soft - at retail	RAA	Single	25g	11	0			
Cheeses made from goats' milk - at retail	ASAE	Batch	25g	30	0			
Cheeses made from goats' milk - soft and semi-soft - made from pasteurised milk - at retail	ASAE	Batch	25g	5	0			
Cheeses made from goats' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail	ASAE	Batch	25g	25	0			
Cheeses made from sheep's milk - at retail	ASAE	Batch	25g	181	2			2
Cheeses made from sheep's milk - soft and semi-soft - made from raw or low heat-treated milk - at retail	ASAE	Batch	25g	181	2			2
Dairy products (excluding cheeses) - ice-cream - at retail	ASAE	Batch	25g	45	0			
Dairy products (excluding cheeses) - milk powder and whey powder - at processing plant	DGV	Single	25g	6	0			
Dairy products (excluding cheeses) - milk powder and whey powder - at retail	ASAE	Batch	25g	47	0			
Milk, cows' - raw	RAA	Single	25g	2	0			
Cheeses made from cows' milk - hard - made from pasteurised milk	RAA	Batch	25g	20	0			
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from pasteurised milk - at processing plant [1)]	DGV	Single	25g	10	0			

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Dairy products (excluding cheeses) - ice-cream	RAA	Batch	25g	20	0			
Milk, cows' - pasteurised milk	RAA	Single	25g	1	0			

Comments:

[1)] Fresh cheese and cottage

2.1.4 Salmonella in animals

A. Salmonella spp. in Gallus Gallus - breeding flocks

Monitoring system

Sampling strategy

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

The sampling frame shall cover all adult breeding flocks of Gallus gallus comprising at least 250 birds. Sampling is accomplished by the operator and by the official authority.

At the initiative of the operator sampling is done at the holding.
Samples will be taken at day old, 4 weeks old birds, 2 weeks before laying phase and during the laying period, every two weeks.

At 4 weeks old and at two weeks before the laying phase sampling shall consist of pooled faeces made up of separate samples of fresh faeces each weighing no less than 1 g taken at random from a number of sites in the building in which the birds are kept.

During the laying phase sampling will consist of boot swabs representative of all parts of the house; all separate pens will be included.

In cage breeding flocks, sampling consists of naturally mixed faeces from dropping belts, scrapers or deep pits 2 samples of at least 150 g will be collected to be tested individually.
The operator may also sample every two weeks at the hatchery. For each breeding flock the sample consists of one composite sample of a visibly soiled hatcher basket liners taken at random from five separate hatcher baskets to reach a total of at least 1 m2.

In cases where hatchers basket liners are not used 10 g broken eggshells shall be taken from 25 separate hatcher baskets, crushed, mixed and a 25 g sub sample taken)
Meconium of 250 birds
50 dead birds in the shell

At the initiative of the official services sampling is done at
Within four weeks following moving to laying phase or laying unit (24 weeks)
during the production (44 weeks) towards the end of the laying phase
not earlier than 8 weeks before the end of the production cycle (64 weeks)

Frequency of the sampling

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

Every flock is sampled

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

At the age of 4 weeks and 2 weeks before moving to the laying phase

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

Every 2 weeks

Type of specimen taken

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

Other: Internal linings of delivery boxes and dead chicks

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

Faeces

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

Faeces

Methods of sampling (description of sampling techniques)

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

The sample shall consist of a minimum of one composite sample of visibly soiled hatcher basket liners
He must sample all dead birds at arrival

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

At 4 weeks old and 2 weeks before the laying phase the sampling will consist of faecal samples
Pooled faeces made up of separate samples of fresh faeces each weighing no less than 1 g taken at random from a number of sites in the building in which the birds are kept

Breeding flocks: Production period

During the laying phase 5 Pairs of boot swabs – walking around to be done in a way which will sample representatively all parts of the sector. All separate pens within a house will be included in sampling.
In cage breeding flocks, sampling consists of naturally mixed faeces from dropping
belts, scrapers or deep pits 2 samples of at least 150 g will be collected to be tested individually.

Case definition

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

At least one positive sample to S. Enteritidis, S. Typhimurium, S. Hadar, S. Virchow and / or S. Infantis

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

At least one positive sample to S. Enteritidis, S. Typhimurium, S. Hadar, S. Virchow and / or S. Infantis

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

At least one positive sample to S. Enteritidis, S. Typhimurium, S. Hadar, S. Virchow and / or S. Infantis

Diagnostic/analytical methods used

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

Bacteriological method: ISO 6579:2002

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

Bacteriological method: ISO 6579:2002

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

Bacteriological method: ISO 6579:2002

Vaccination policy

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

Compulsive vaccination against Salmonella Enteritidis is done in the restocking, after the destruction of a positive flock.

Control program/mechanisms

The control program/strategies in place

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

The strategy is to reinforce surveillance, reinforce biosecurity measures, slaughter the positive flocks and restocking only when environmental samples are negative for Salmonella, with birds from flocks or herds that have undergone controls according to the legislation requirements. All birds must be vaccinated against Salmonella Enteritidis.
The strategy includes also a close cooperation with the associations of producers to implement different means to raise awareness of the producers.
The Official Services have developed guidelines for the producer, as a tool in order to guide the implementation of the national programme.

Measures in case of the positive findings or single cases

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

When there is a positive case in a flock = Salmonella sp detection
Notification of the operator
Keep the flock in sanitary surveillance
Forcing to keep the update records
Evaluate the production records
Forcing to incubate their eggs separately

Whenever the results from serotyping are diferent from the serotypes relevant to the national programme , than:
Additional biosecurity measures
Free practice – The official control measures are withdrawn.

When the result is serotype S. Enteritidis, S. Typhimurium, S. Hadar, S. Virchow and/ or S.Infantis than the flock will be under official restriction:
Flock surveillance (under official control)
Compulsory sanitary slaughter
Non incubated eggs must be destroyed or be treated
Compensation for owners about all destroyed eggs and animals.
After the destruction of the positive flock the holding and the environment must be cleaned and disinfected;
The operator must collect environmental samples;
The restocking of animals must take place from flocks or herds that have undergone controls according to the legislation requirements;
All birds must be vaccinated against Salmonella enteritidis.

B. Salmonella spp. in Gallus Gallus - broiler flocks

Monitoring system

Sampling strategy

Broiler flocks

The programme is implemented only in 2009

Methods of sampling (description of sampling techniques)

Broiler flocks: Day-old chicks

The programme is implemented only in 2009

Broiler flocks: Rearing period

The programme is implemented only in 2009

Broiler flocks: Before slaughter at farm

The programme is implemented only in 2009

Case definition

Broiler flocks: Before slaughter at farm

The programme is implemented only in 2009

Control program/mechanisms

The control program/strategies in place

Broiler flocks

The programme is implemented only in 2009

Recent actions taken to control the zoonoses

The programme is implemented only in 2009

Measures in case of the positive findings or single cases

Broiler flocks: Before slaughter at farm

The programme is implemented only in 2009

Notification system in place

The programme is implemented only in 2009

Results of the investigation

The programme is implemented only in 2009

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

Monitoring system

Sampling strategy

Laying hens flocks

The sampling frame shall cover all flocks of laying hens of Gallus gallus

Sampling is accomplished by the food business operator and by the competent authority.
The sampling is done at the holding.
At the initiative of the operator samples will be taken at day old, 2 weeks before moving to laying phase and during the laying period, every fifteen weeks. The first sampling at the laying period will take place at the age of 24 ± 2 weeks.

At the initiative of the official services sampling is done:
•in one flock per year per holding comprising at least 1 000 birds;
•at the age of 24 ± 2 weeks in laying flocks housed in buildings where salmonella was detected in the preceding
•flock;
•in any case of suspicion of Salmonella Enteritidis or Salmonella Typhimurium infection, as a result of the epidemiological
•investigation of food-borne outbreaks in accordance with Article 8 of Directive 2003/99/EC of the
•European Parliament and of the Council
•in all other laying flocks on the holding in case Salmonella Enteritidis or Salmonella Typhimurium are detected in
•one laying flock on the holding;
•in cases where the competent authority considers it appropriate

Sampling protocol
•In cage flocks, 2 × 150 grams of naturally pooled faeces taken from all belts or scrapers in the house after running the manure removal system.
•In step cage houses without scrapers or belts: 2 × 150 grams of mixed fresh faeces collected from 60 different places beneath the cages in the dropping pits.
•In barn or free-range houses, two pairs of boot swabs or socks, without changing overboots between boot swabs.

In the case of sampling by the competent authority, it will be collected 250 ml containing at least 100 gram of dust from prolific sources of dust throughout the house. If there is not sufficient dust, an additional sample of 150 grams naturally pooled faeces or an additional pair of boot swabs or socks will be taken.

Frequency of the sampling

Laying hens: Day-old chicks

Other: Internal linings of delivery boxes and dead chicks

Laying hens: Rearing period

At the age of ± 18 weeks

Laying hens: Production period

Every 15 weeks

Type of specimen taken

Laying hens: Day-old chicks

Dead chicks

Laying hens: Rearing period

Faeces

Laying hens: Production period

Environmental sample: faeces and dust

Methods of sampling (description of sampling techniques)

Laying hens: Day-old chicks

The sample shall consist of a minimum of one composite sample of visibly soiled hatcher basket liners
He must sample all dead birds at arrival

Laying hens: Rearing period

* In cage flocks, 2 × 150 grams of naturally pooled faeces taken from all belts or scrapers in the house after running the manure removal system.
* In step cage houses without scrapers or belts: 2 × 150 grams of mixed fresh faeces collected from 60 different places beneath the cages in the dropping pits.
* In barn or free-range houses, two pairs of boot swabs or socks, without changing overboots between boot swabs.

Laying hens: Production period

* In cage flocks, 2 × 150 grams of naturally pooled faeces taken from all belts or scrapers in the house after running the manure removal system.
* In step cage houses without scrapers or belts: 2 × 150 grams of mixed fresh faeces collected from 60 different places beneath the cages in the dropping pits.
* In barn or free-range houses, two pairs of boot swabs or socks, without changing overboots between boot swabs.

In the case of sampling by the competent authority, it will be collected 250 ml containing at least 100 gram of dust from prolific sources of dust throughout the house. If there is not sufficient dust, an additional sample of 150 grams naturally pooled faeces or an additional pair of boot swabs or socks will be taken.

Case definition

Laying hens: Day-old chicks

At least one positive sample to S. Enteritidis and/or S. Typhimurium

Laying hens: Rearing period

At least one positive sample to S. Enteritidis and/or S. Typhimurium

Laying hens: Production period

At least one positive sample to S. Enteritidis and/or S. Typhimurium

Diagnostic/analytical methods used

Laying hens: Day-old chicks

Bacteriological method: ISO 6579:2002

Laying hens: Rearing period

Bacteriological method: ISO 6579:2002

Laying hens: Production period

Bacteriological method: ISO 6579:2002

Vaccination policy

Laying hens flocks

Vaccination programmes against Salmonella Enteritidis are applied during the rearing phase.

Control program/mechanisms

The control program/strategies in place

Laying hens flocks

The strategy is to reinforce surveillance, reinforce biosecurity measures, slaughter the positive flocks and restocking only when environmental samples are negative for Salmonella, with birds from flocks or herds that have undergone controls according to the legislation requirements.
The eggs of the positive flock will be destructed or send to heat treated egg-products

All birds must be vaccinated against Salmonella Enteritidis.
The strategy includes also a close cooperation with the associations of producers to implement different means to raise awareness of the producers.
The Official Services have developed guidelines for the producer, as a tool in order to guide the implementation of the national programme.

Measures in case of the positive findings or single cases

Laying hens flocks

When there is a positive case in a flock = Salmonella sp detection
Notification of the operator
Keep the flock in sanitary surveillance
Forcing to keep the update records
Evaluate the production records
Keep the eggs in the holding or send them to eggs products

Whenever the results from serotyping are diferent from the serotypes relevant to the national programme , than:
Additional biosecurity measures
Free practice – The official control measures are withdrawn.

When the result is serotype S. Enteritidis and/or S. Typhimurium than the flock will be under official restriction:
Flock surveillance (under official control)
Eggs must be destroyed or be treated
After the destruction of the positive flock the holding and the environment must be cleaned and disinfected;
The operator must collect environmental samples;
The restocking of animals must take place from flocks or herds that have undergone controls according to the legislation requirements;
All birds must be vaccinated against Salmonella enteritidis.

Table Salmonella in breeding flocks of Gallus gallus

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Hadar	S. Infantis	S. Typhimurium	S. Virchow	Salmonella spp., unspecified
Gallus gallus (fowl) - parent breeding flocks for egg production line - during rearing period	0	DGV	Flock	0							
Gallus gallus (fowl) - parent breeding flocks for egg production line - adult	15	DGV	Flock	15	0						
Gallus gallus (fowl) - parent breeding flocks for broiler production line - during rearing period	17	DGV	Flock	17	0						
Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult	204	DGV	Flock	204	9	1					8

Table Salmonella in other poultry

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - official and industry sampling	283	DGV	Flock	251	46	14	2	30
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - sampling by industry	283	DGV	Flock	157	5	1	0	4
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - official sampling - objective sampling	283	DGV	Flock	152	41	13	2	26
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes - official and industry sampling	12888	DGV	Flock	654	35	8	4	23
Ducks - unspecified		LNIV	Animal	8	2		2	
Gallus gallus (fowl)		LNIV	Animal	27	1	1		
Turkeys - unspecified		LNIV	Animal	4	0			

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. 38:z4,z23:-	S. Bovismorbificans	S. Braenderup	S. Give
Cattle (bovine animals)	LNIV	Animal	54	0							
Cattle (bovine animals) - adult cattle over 2 years	RAA	Animal	1	0							
Goats	LNIV	Animal	24	0							
Pigs	LNIV	Animal	43	1		1					
Pigs - fattening pigs	RAA	Animal	1	0							
Sheep	LNIV	Animal	49	3							
Solipeds, domestic	LNIV	Animal	36	0							
Cats - pet animals	RAM	Animal	1	0							
Cattle (bovine animals) - others [1)]	RAA	Animal	1	0							
Deer - wild	LNIV	Animal	1	0							
Dogs - pet animals	LNIV	Animal	23	0							
Dogs - pet animals - Clinical investigations	RAM	Animal	3	0							
Dolphin - zoo animals	LNIV	Animal	18	0							
Kangaroos - zoo animal	LNIV	Animal	1	0							
Monkeys - zoo animal	LNIV	Animal	5	0							
Pigs - fattening pigs - unspecified - at farm - environmental sample [2)]	FMV	Holding	48	14		4			3		2
Rabbits - farmed	LNIV	Animal	5	0							
Snakes - zoo animal	LNIV	Animal	5	2				1			
Turtles - zoo animals	LNIV	Animal	21	1						1	

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. 38:z4,z23:-	S. Bovismorbificans	S. Braenderup	S. Give
Wild boars - wild	LNIV	Animal	2	0							
Zoo animals, all	LNIV	Animal	64	0							

	S. IIIb 50:k:z	S. IIIb 61:c:1,5,(7)	S. Rissen	S. Tennessee
Cattle (bovine animals)				
Cattle (bovine animals) - adult cattle over 2 years				
Goats				
Pigs				
Pigs - fattening pigs				
Sheep		3		
Solipeds, domestic				
Cats - pet animals				
Cattle (bovine animals) - others [1)]				
Deer - wild				
Dogs - pet animals				
Dogs - pet animals - Clinical investigations				
Dolphin - zoo animals				
Kangaroos - zoo animal				

Table Salmonella in other animals

	S. IIIb 50:k:z	S. IIIb 61:c:1,5,(7)	S. Rissen	S. Tennessee
Monkeys - zoo animal				
Pigs - fattening pigs - unspecified - at farm - environmental sample [2)]			4	1
Rabbits - farmed				
Snakes - zoo animal	1			
Turtles - zoo animals				
Wild boars - wild				
Zoo animals, all				

Comments:

[1)] Fetus
[2)] Feaces

Table Salmonella in other birds

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Partridges	LNIV	Animal	1	0			
Pheasants	LNIV	Animal	1	0			
Pigeons	LNIV	Animal	82	20		20	
Birds - zoo animal	LNIV	Animal	22	0			
Canary - wild	LNIV	Animal	2	0			
Parrots - zoo animals	LNIV	Animal	7	0			
Pigeons - Clinical investigations	FMV	Animal	2	2			2
Pigeons - Monitoring - official sampling	RAM	Animal	2	0			
Psittacidae	RAM	Animal	2	0			

2.1.5 Salmonella in feedingstuffs

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Compound feedingstuffs for cattle - final product	RAA	Batch	25g	11	0			
Compound feedingstuffs for pigs - final product	RAA	Batch	25g	2	0			
Compound feedingstuffs for poultry - laying hens - process control	RAA	Batch	25g	1	0			
Compound feedingstuffs for poultry - broilers - final product	RAA	Batch	25g	1	0			
Compound feedingstuffs for cattle - final product - Surveillance - official controls	LNIV	Batch	25g	24	0			
Compound feedingstuffs for fish - final product - Monitoring - industry sampling	LNIV	Batch	25g	52	0			
Compound feedingstuffs for fish - final product - Surveillance - official controls	LNIV	Batch	25g	2	0			
Compound feedingstuffs for horses - final product - Surveillance - official controls	LNIV	Batch	25g	8	0			
Compound feedingstuffs for pigs - final product - Surveillance - official controls	LNIV	Batch	25g	25	0			
Compound feedingstuffs for poultry (non specified) - final product - Surveillance - official controls	LNIV	Batch	25g	2	0			
Compound feedingstuffs for poultry - broilers - final product - Surveillance - official controls	LNIV	Batch	25g	15	0			

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Compound feedingstuffs for poultry - laying hens - final product - Surveillance - official controls	LNIV	Batch	25g	13	0			
Compound feedingstuffs for rabbits - final product - Surveillance - official controls	LNIV	Batch	25g	9	0			
Compound feedingstuffs for sheep - final product - Surveillance - official controls	LNIV	Batch	25g	7	0			
Compound feedingstuffs for turkeys - final product - Surveillance - official controls	LNIV	Batch	25g	3	0			
Compound feedingstuffs, not specified - final product [1)]	RAA	Batch	25g	1	0			
Pet food - final product - Surveillance - official controls	LNIV	Batch	25g	4	0			

Comments:

[1)] Quines

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of cereal grain origin - maize - Surveillance - official controls	LNIV	Batch	25g	4	0			
Feed material of cereal grain origin - other cereal grain derived - Surveillance - official controls	LNIV	Batch	25g	16	0			

2.1.6 Antimicrobial resistance in Salmonella isolates

Table Antimicrobial susceptibility testing of Salmonella in Pigs

Salmonella	S. Enteritidis		S. Typhimurium		Salmonella spp.		S. Bovismorbificans		S. Give		S. Rissen		S. Tennessee	
Isolates out of a monitoring program (yes/no)			yes				yes		yes		yes		yes	
Number of isolates available in the laboratory			4				3		2		4		1	
Antimicrobials:	N	n	N	n	N	n	N	n	N	n	N	n	N	n
Amphenicols - Chloramphenicol			4	4			3	0	2	0	4	0	1	0
Fluoroquinolones - Enrofloxacin			4	0			3	0	2	0	4	0	1	0
Quinolones - Nalidixic acid			4	1			3	0	2	0	4	4	1	0
Aminoglycosides - Streptomycin			4	0			3	0	2	0	4	0	1	0
Tetracyclines - Tetracycline			4	4			3	0	2	0	4	4	1	0
Fully sensitive			4	0			3	3	2	2	4	0	1	1
Resistant to 1 antimicrobial			4	0			3	0	2	0	4	1	1	0
Resistant to 2 antimicrobials			4	0			3	0	2	0	4	0	1	0
Resistant to 3 antimicrobials			4	3			3	0	2	0	4	0	1	0
Resistant to 4 antimicrobials			4	1			3	0	2	0	4	0	1	0
Resistant to >4 antimicrobials			4	0			3	0	2	0	4	2	1	0

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

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

S. Enteritidis	Gallus gallus (fowl) - broilers																							
Isolates out of a monitoring program (yes/no)	no																							
Number of isolates available in the laboratory	8																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	8	0										4	4									2	256
Amphenicols - Florfenicol	16	8	0								1		3	4									1	128
Tetracyclines - Tetracycline	8	8	0								3	4	1										0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	8	8					1	4	3													0.008	8
Quinolones - Nalidixic acid	16	8	8																8				2	256
Trimethoprim	2	8	0						1	6	1												0.25	32
Aminoglycosides - Streptomycin	32	8	0								1	6	1										2	256
Aminoglycosides - Gentamicin	2	8	0						3	4	1												0.25	32
Penicillins - Ampicillin	4	8	1									3	4	1									0.5	64
Cephalosporins - Cefotaxim		8	0				2	6															0.06	8
Sulfonamides - Sulfamethoxazol	256	8	0													3	5						8	1024

Footnote:

Nalidixic acid - 7 isolates with a concentration >= 256;
Trimethoprim - 1 isolate with a concentration <= 0.25;
Streptomycin - 6 isolates with a concentration <= 2;
Gentamicin - 3 isolates with a concentration <= 0.25;
Cefotaxim - 2 isolates with a concentration <= 0.06.

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

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

S. Typhimurium	Gallus gallus (fowl) - broilers																							
Isolates out of a monitoring program (yes/no)	no																							
Number of isolates available in the laboratory	4																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	4	1									1	1	1			1							2	256
Amphenicols - Florfenicol	2	4	0									1	1	1	1									1	128
Tetracyclines - Tetracycline	8	4	3							1						3								0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	4	0	1	3																			0.008	8
Quinolones - Nalidixic acid	16	4	0									2	2											2	256
Trimethoprim		4	0						4															0.25	32
Aminoglycosides - Streptomycin	32	4	2										1			1			2					2	256
Aminoglycosides - Gentamicin	2	4	0						1	2	1													0.25	32
Penicillins - Ampicillin	4	4	3							1				1			2							0.5	64
Cephalosporins - Cefotaxim	0.5	4	0				4																	0.06	8
Sulfonamides - Sulfamethoxazol	256	4	3													1					3			8	1024

Footnote:

Cloranfenicol - 1 isolate with a concentration <= 2;
Tetracycline - 1 isolate with a concentration <= 0.5 and 3 isolates with a concentration >= 64;
Nalidixic acid - 2 isolates with a concentration <= 2;
Trimethoprim - 4 isolate with a concentration <= 0.25;
Streptomycin - 1 isolate with a concentration >= 256;
Gentamicin - 1 isolate with a concentration <= 0.25;
Ampicilin - 2 isolates with a concentration >= 64;
Cefotaxim - 4 isolates with a concentration <= 0.06;
Ampicilin - 2 isolates with a concentration >= 64;

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

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

S. Enteritidis	Gallus gallus (fowl) - breeding flocks, unspecified																								
Isolates out of a monitoring program (yes/no)	no																								
Number of isolates available in the laboratory	2																								
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	2	0										2											2	256
Amphenicols - Florfenicol	2	2	0										1		1									1	128
Tetracyclines - Tetracycline	8	2	0									2												0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	2	2						1	1														0.008	8
Quinolones - Nalidixic acid	16	2	2																	2				2	256
Trimethoprim		2	0						2															0.25	32
Aminoglycosides - Streptomycin	32	2	0									2												2	256
Aminoglycosides - Gentamicin	2	2	0						1	1														0.25	32
Penicillins - Ampicillin	4	2	0										2											0.5	64
Cephalosporins - Cefotaxim	0.5	2	0				1	1																0.06	8
Sulfonamides - Sulfamethoxazol	256	2	0													1	1							8	1024

Footnote:

Nalidixic acid - 2 isolates with a concentration >= 512;
Trimethoprim - 2 isolates with a concentration <= 0.25;
Streptomycin - 2 isolates with a concentration <= 2;
Gentamicin - 1 isolate with a concentration <= 0.25;
Cefotaxim - 1 isolate with a concentration <= 0.06.

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

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

S. Enteritidis	Gallus gallus (fowl) - laying hens																							
Isolates out of a monitoring program (yes/no)	no																							
Number of isolates available in the laboratory	17																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	17	0										12	5									2	256
Amphenicols - Florfenicol	2	17	0										9	2	6								1	128
Tetracyclines - Tetracycline	8	17	0							1	6	9	1										0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	17	3		7	6	1	1		2													0.008	8
Quinolones - Nalidixic acid	16	17	3									3	9	2					2	1			2	256
Trimethoprim		17	0						11	5	1												0.25	32
Aminoglycosides - Streptomycin	32	17	0									14	2	1									2	256
Aminoglycosides - Gentamicin	2	17	1						4	11	1				1								0.25	32
Penicillins - Ampicillin	4	17	3								1	7	6	3									0.5	64
Cephalosporins - Cefotaxim	0.5	17	0				14	3															0.06	8
Sulfonamides - Sulfamethoxazol	256	17	0												3	11	2	1					8	1024

Footnote:

Tetracycline - 1 isolate with a concentration <=0.5;
Nalidixic acid - 3 isolates with a concentration <=2 and 1 isolate with a concentration >=512;
Trimethoprim - 11 isolates with a concentration <=0.25;
Steptomycin - 14 isolates with a concentration <=2;
Gentamicin - 4 isolates with a concentration <=0.25;
Cefotaxim - 14 isolates with a concentration <=0.06.

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

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

S. Typhimurium	Gallus gallus (fowl) - laying hens																								
Isolates out of a monitoring program (yes/no)	no																								
Number of isolates available in the laboratory	3																								
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	3	0										3											2	256
Amphenicols - Florfenicol	2	3	0										2		1									1	128
Tetracyclines - Tetracycline	8	3	0							2	1													0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	3	0		2	1																		0.008	8
Quinolones - Nalidixic acid	16	3	0										3											2	256
Trimethoprim	2	3	0						3															0.25	32
Aminoglycosides - Streptomycin	32	3	2											1					2					2	256
Aminoglycosides - Gentamicin	2	3	0							1	2													0.25	32
Penicillins - Ampicillin	4	3	2										1				2							0.5	64
Cephalosporins - Cefotaxim	0.5	3	0				2	1																0.06	8
Sulfonamides - Sulfamethoxazol	256	3	2													1					2			8	1024

Footnote:

Tetracycline - 2 isolates with a concentration <= 0.5;
Trimethoprim - 3 isolates with a concentration <= 0.25;
Ampicilin - 2 isolates with a concentration >= 64;
Cefotaxim - 2 isolates with a concentration <= 0.06;
Sulfamnethoxazol - 2 isolates with a concentration >= 1024.

Table Antimicrobial susceptibility testing of S. Typhimurium in Pigs - breeding animals - quantitative data [Dilution method]

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

S. Typhimurium	Pigs - breeding animals																								
Isolates out of a monitoring program (yes/no)	no																								
Number of isolates available in the laboratory	8																								
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	5	1										2	2				1						2	256
Amphenicols - Florfenicol	2	8	4											1	3	1	2	1						1	128
Tetracyclines - Tetracycline	8	8	7								1						7							0.5	64
Quinolones - Nalidixic acid	16	8	0										7	1										2	256
Trimethoprim		8	1						6	1							1							0.25	32
Aminoglycosides - Streptomycin	32	8	7											1			2	2	3					2	256
Aminoglycosides - Gentamicin	2	8	1							6	1					1								0.25	32
Penicillins - Ampicillin	4	8	8														8							0.5	64
Cephalosporins - Cefotaxim	0.5	8	0				2	6																0.06	8
Sulfonamides - Sulfamethoxazol	256	8	7													1					7			8	1024

Footnote:

Tetracycline - 7 isolates with a concentration >= 64;
Trimethoprim - 6 isolates with a concentration <= 0.25 and 1 isolate with a concentration >= 32;
Gentamicin - 1 isolate with a concentration >= 32;
Ampicilin - 8 isolates with a concentration >= 64;
Cefotaxim - 2 isolates with a concentration <= 0.06;
Sulfamethoxazol - 7 isolates with a concentration >= 1024.

Table Antimicrobial susceptibility testing of S. Derby in Pigs - breeding animals - quantitative data [Dilution method]

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

S. Derby	Pigs - breeding animals																							
Isolates out of a monitoring program (yes/no)	no																							
Number of isolates available in the laboratory	1																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	1	0											1										2	256
Amphenicols - Florfenicol	2	1	0												1									1	128
Tetracyclines - Tetracycline	8	1	1														1							0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	1	0			1																		0.008	8
Quinolones - Nalidixic acid	16	1	0										1											2	256
Trimethoprim		1	0						1															0.25	32
Aminoglycosides - Streptomycin	32	1	0											1										2	256
Aminoglycosides - Gentamicin	4	1	0									1												0.25	32
Penicillins - Ampicillin	4	1	0								1													0.5	64
Cephalosporins - Cefotaxim	0.5	1	0					1																0.06	8
Sulfonamides - Sulfamethoxazol	256	1	0														1							8	1024

Footnote:

Tetracycline - 1 isolate with a concentration >= 64;
Trimethoprim - 1 isolate with a concentration <= 0.25.

Table Antimicrobial susceptibility testing of S. Typhimurium in Meat from pig - meat products - quantitative data [Dilution method]

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

S. Typhimurium	Meat from pig - meat products																							
Isolates out of a monitoring program (yes/no)	no																							
Number of isolates available in the laboratory	6																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	6	4											2					4					2	256
Amphenicols - Florfenicol	16	6	3										1	1	1		2	1						1	128
Tetracyclines - Tetracycline	8	6	6													3	3							0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	6	2		3	1			2															0.008	8
Quinolones - Nalidixic acid	16	6	2									1	1	2					2					2	256
Trimethoprim	2	6	1						5							1								0.25	32
Aminoglycosides - Streptomycin	32	6	5												1		2	1	2					2	256
Aminoglycosides - Gentamicin	2	6	1						1	2	2					1								0.25	32
Penicillins - Ampicillin	4	6	5										1				5							0.5	64
Cephalosporins - Cefotaxim	0.5	6	0				2	4																0.06	8
Sulfonamides - Sulfamethoxazol	256	6	6																		6			8	1024

Footnote:

Chloramphenicol - 1 isolate with a concentration >= 256;
Florfenicol - 1 isolate with a concentration >= 128;
Tetracycline - 3 isolates with a concentration >= 64;
Nalidixic acid - 1 isolate with a concentration <= 2;
Trimethoprim - 5 isolates with a concentration <= 0.25 and 1 isolate >= 32;
Gentamicin - isolate with a concentration <= 0.25 and 1 isolate with a concentration >= 32;
Ampicilin - 5 isolates with a concentration >= 64;
Cefotaxim - 2 isolates with a concentration <= 0.06;
Sulfamethoxazol - 6 isolates with a concentration >= 1024.

Table Antimicrobial susceptibility testing of S. Typhimurium in Meat from bovine animals - meat products - quantitative data [Dilution method]

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

S. Typhimurium	Meat from bovine animals - meat products																								
Isolates out of a monitoring program (yes/no)	no																								
Number of isolates available in the laboratory	2																								
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	2	2															1	1					2	256
Amphenicols - Florfenicol	16	2	0										1	1										1	128
Tetracyclines - Tetracycline	8	2	2													1	1							0.5	64
Fluoroquinolones - Ciprofloxacin	0.12	2	0	1	1																			0.008	8
Quinolones - Nalidixic acid	16	2	0										1	1										2	256
Trimethoprim	2	2	0						2															0.25	32
Aminoglycosides - Streptomycin	32	2	1												1		1							2	256
Aminoglycosides - Gentamicin	4	2	0							1	1													0.25	32
Penicillins - Ampicillin	4	2	2														2							0.5	64
Cephalosporins - Cefotaxim	0.5	2	0				1	1																0.06	8
Sulfonamides - Sulfamethoxazol	256	2	2																		2			8	1024

Footnote:

Tetracycline - 1 isolate with a concentration >= 64;
Ciprofloxacin - 1 isolate with a concentration <= 0.008;
Trimethoprim - 2 isolates with a concentration <= 0.25;
Ampicilin - 2 isolates with a concentration >= 64;
Cefotaxim - 1 isolate with a concentration <= 0.06;
Sulfamethoxazol - 2 isolates with a concentration >= 1024.

Table Antimicrobial susceptibility testing of S. Derby in Meat from pig - meat products - quantitative data [Dilution method]

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

S. Derby	Meat from pig - meat products																							
Isolates out of a monitoring program (yes/no)	no																							
Number of isolates available in the laboratory	1																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	1	0										1											2	256
Amphenicols - Florfenicol	16	1	0											1										1	128
Tetracyclines - Tetracycline	8	1	1														1							0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	1	0		1																			0.008	8
Quinolones - Nalidixic acid	16	1	0										1											2	256
Trimethoprim	2	1	0						1															0.25	32
Aminoglycosides - Streptomycin	32	1	1															1						2	256
Aminoglycosides - Gentamicin	2	1	0							1														0.25	32
Penicillins - Ampicillin	4	1	0									1												0.5	64
Cephalosporins - Cefotaxim	0.5	1	0				1																	0.06	8
Sulfonamides - Sulfamethoxazol	256	1	1																		1			8	1024

Footnote:

Tetracycline - 1 isolate with a concentration >= 64;
Trimethoprim - 1 isolate with a concentration <= 0.25;
Cefotaxim - 1 isolate with a concentration <= 0.06;
Sulfamethoxazol - 1 isolate with a concentration >= 1024.

Table Antimicrobial susceptibility testing of S. Dublin in Meat from bovine animals - meat products - quantitative data [Dilution method]

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

S. Dublin	Meat from bovine animals - meat products																								
Isolates out of a monitoring program (yes/no)	no																								
Number of isolates available in the laboratory	1																								
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Amphenicols - Chloramphenicol	16	1	0										1											2	256
Amphenicols - Florfenicol	16	1	0										1											1	128
Tetracyclines - Tetracycline	8	1	0									1												0.5	64
Fluoroquinolones - Ciprofloxacin	0.06	1	0	1																				0.008	8
Quinolones - Nalidixic acid	16	1	0										1											2	256
Trimethoprim	2	1	0						1															0.25	32
Aminoglycosides - Streptomycin	32	1	0												1									2	256
Aminoglycosides - Gentamicin	2	1	0							1														0.25	32
Penicillins - Ampicillin	4	1	0								1													0.5	64
Cephalosporins - Cefotaxim	0.5	1	0				1																	0.06	8
Sulfonamides - Sulfamethoxazol	256	1	0												1									8	1024

Footnote:

Trimethoprim - 1 isolate with a concentration <= 0.25;
Cefotaxim - 1 isolate with a concentration <= 0.06.

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

Test Method Used
Agar dilution

Standard methods used for testing
NCCLS/CLSI

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Amphenicols	Chloramphenicol	EUCAST	16	
	Florfenicol	EUCAST	16	
Tetracyclines	Tetracycline	EUCAST	8	
Fluoroquinolones	Ciprofloxacin	EUCAST	0.06	
Quinolones	Nalidixic acid	EUCAST	16	
Trimethoprim	Trimethoprim	EUCAST	2	
Sulfonamides	Sulfonamides		256	
Aminoglycosides	Streptomycin	EUCAST	32	
	Gentamicin		2	
Cephalosporins	Cefotaxim		0.5	
Penicillins	Ampicillin		4	

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

Test Method Used	Standard methods used for testing

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

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

Test Method Used	Standard methods used for testing

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

2.2 CAMPYLOBACTERIOSIS

2.2.1 General evaluation of the national situation

A. Thermophilic Campylobacter general evaluation

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

There is no official program for this zoonosis.

Additional information

There is no official program for this zoonosis.

Diagnostic techniques:

Foodstuffs - Screening: VIDAS CAM. Confirmation: Internal method based on ISO 10272.
- Typing of isolates by Lior method.

Other than foodstuffs:
- Samples from sheathwashings, semen, intestinal scrapings and feces are plated in Campylobacter agar or Brucella agar supplemented with: SR 69, SR84, SR 85 (C. foetus), SR 117 (all from Oxoid) and selective media Campylosel (BiomÃ©rieux)and skirrow Campylobacter selective Agar (Merck).
- Biochemical identification by API system.

2.2.2 Campylobacteriosis in humans

Table Campylobacter in humans - Species/serotype distribution

Distribution Zoonotic Agent	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.	Unknown status
Campylobacter	104	0	104	0	0	0	0
C. jejuni	104		104				

2.2.3 Campylobacter in foodstuffs

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Campylobacter	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - at processing plant	DGV	Single	25g	44	8	1	1			6
Meat from turkey - meat preparation - intended to be eaten cooked - at processing plant	DGV	Single	25g	49	3	1	2			
Meat, mixed meat - meat preparation - intended to be eaten cooked - chilled - at processing plant [1)]	DGV	Single	25g	2	0					

Comments:

[1)] Turkey and broilers

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Campylobacter	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Meat from bovine animals - meat preparation - intended to be eaten cooked - chilled - at processing plant	DGV	Single	10g	20	0					
Meat from bovine animals - minced meat - intended to be eaten cooked - chilled - at processing plant	DGV	Single	25g	22	0					
Meat from pig - meat preparation - intended to be eaten cooked - chilled - at processing plant	DGV	Single	10g	33	0					
Meat from pig - minced meat - intended to be eaten cooked - chilled - at processing plant	DGV	Single	25g	17	0					

2.2.4 Campylobacter in animals

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for Campylobacter	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Goats	LNIV	Animal	3	1		1			
Gallus gallus (fowl) - broilers - unspecified	LNIV	Animal	6	3	2	1			
Zoo animals, all	LNIV	Animal	25	0					

2.2.5 Antimicrobial resistance in Campylobacter isolates

Table Antimicrobial susceptibility testing of C. coli in Meat from broilers (Gallus gallus) - meat products - raw but intended to be eaten cooked - Surveillance - quantitative data [Dilution method]

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

C. coli	Meat from broilers (Gallus gallus) - meat products - raw but intended to be eaten cooked - Surveillance																							
Isolates out of a monitoring program (yes/no)	no																							
Number of isolates available in the laboratory	12																							
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Tetracyclines - Tetracycline	2	6	2					4									2							0.125	16
Fluoroquinolones - Ciprofloxacin	1	6	6										1	5										0.06	8
Quinolones - Nalidixic acid	16	6	6														5	1						2	256
Aminoglycosides - Streptomycin	2	6	0								3	3												0.5	32
Aminoglycosides - Gentamicin	1	6	0							2	4													0.125	16
Macrolides - Erythromycin	4	6	5								1						5							0.5	64

Footnote:

Tetracycline - 2 isolates with a concentration >= 64;
Ciprofloxacin - 3 isolates with a concentration >= 8;
Erythromycin - 5 isolates with a concentration >= 64.

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

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

C. jejuni	Meat from broilers (Gallus gallus) - Surveillance																								
Isolates out of a monitoring program (yes/no)	no																								
Number of isolates available in the laboratory	6																								
Antimicrobials:	Cut-off value	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Tetracyclines - Tetracycline	2	6	2					4									2								
Fluoroquinolones - Ciprofloxacin	1	6	6										1	5											
Quinolones - Nalidixic acid	16	6	6														5	1							
Aminoglycosides - Streptomycin	2	6	0								3	3													
Aminoglycosides - Gentamicin	1	6	0							2	4														
Macrolides - Erythromycin	4	6	5								1						5								

Footnote:

Tetracycline - 2 isolates with a concentration >= 64;
Ciprofloxacin - 3 isolates with a concentration >= 8;
Erythromycin - 5 isolates with a concentration >= 64.

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

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Tetracyclines	Tetracycline		2	
Fluoroquinolones	Ciprofloxacin		1	
Aminoglycosides	Gentamicin		1	
	Streptomycin		2	
Macrolides	Erythromycin		4	

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

Test Method Used
Agar dilution

Standard methods used for testing
NCCLS/CLSI

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Tetracyclines	Tetracycline	EUCAST	2	
Fluoroquinolones	Ciprofloxacin	EUCAST	1	
Quinolones	Nalidixic acid	EUCAST	32	
Aminoglycosides	Gentamicin	EUCAST	2	
	Streptomycin	EUCAST	4	
Macrolides	Erythromycin	EUCAST	16	

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

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Tetracyclines	Tetracycline		2	
Fluoroquinolones	Ciprofloxacin		1	
Aminoglycosides	Gentamicin		1	
	Streptomycin		2	
Macrolides	Erythromycin		4	

2.3 LISTERIOSIS

2.3.1 General evaluation of the national situation

A. Listeriosis general evaluation

Additional information

* The searching of Listeria started on 1996 for raw milk and milk cheese (Portaria nÂº 533/93 from 21st of May has been updated by Portaria 56/96).

Diagnostic tecnhiques:

Foodstuffs/Feedingstuffs -Screening: VIDAS LMO2 (AFNOR validation). Detection:ISO 11290-1 (1996) and Amendment 1 (2004). Enumeration: ISO 11290-2 (1998) and Amendment 1 (2004).

Other than foodstuffs - Internal method - culture on:
- Palcam agar, Oxford agar and Blood agar.
- Biochemical reactions by API Coryne or API Listeria strips.

2.3.2 Listeriosis in humans

Table Listeria in humans - Age distribution

Age distribution	L. monocytogenes			Listeria spp., unspecified		
	All	M	F	All	M	F
15 to 24 years	7	6	1			
25 to 44 years	33	13	20			
45 to 64 years	10	7	3			
65 years and older	8	4	4			
Age unknown	6	3	3			
Total :	64	33	31	0	0	0

2.3.3 Listeria in foodstuffs

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Listeria	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Crustaceans - unspecified - cooked - at processing plant	DGV	Single	25g	10	0	10	0			
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at processing plant	DGV	Single	25g	13	2	13	2	13	2	0
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at retail	ASAE	Batch	25g	165	0	0		165	0	0
Meat from pig - meat products - cooked, ready-to-eat - at processing plant	DGV	Single	25g	78	15	78	15	78	14	1
Meat from pig - meat products - cooked, ready-to-eat - at retail	ASAE	Batch	25g	886	14	10	8	876	0	6
Fruits and vegetables - precut - ready-to-eat - at catering	INSA	Single	25g	324	6	324	6	324	0	0
Meat from pig - meat products - cooked, ready-to-eat	RAA	Batch	25g	45	0	45	0	0	0	0
Meat from turkey - meat products - cooked, ready-to-eat - chilled - at processing plant	DGV	Single	25g	18	0	18	0	18	0	0
Other food - at catering [1)]	INSA	Single	25g	373	10	373	10	373	0	0
Other food - at catering - Surveillance [2)]	INSA	Single	25g	1306	9	1306	9	1306	1	0

Comments:

[1)] Ready to eat mixed meal with raw vegetables

[2)] Ready to eat cooked mixed meal

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Listeria	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant	DGV	Single	25g	14	0	14	0	14	0	0
Cheeses made from goats' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant	DGV	Single	25g	12	0	12	0	12	0	0
Cheeses made from sheep's milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant	DGV	Single	25g	32	0	32	0	32	0	0
Dairy products (excluding cheeses) - cream - at processing plant	RAA	Batch	25g	20	0	20	0	0	0	0
Milk, cows'	RAA	Single	25g	2	0	2	0	0	0	0
Milk, cows' - pasteurised milk - at processing plant	RAA	Single	25g	1	0	1	0	0	0	0
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at processing plant [1)]	DGV	Single	25g	10	0	8	0	8	0	0
Cheeses made from sheep's milk - unspecified - made from raw or low heat-treated milk - at processing plant [2)]	DGV	Single	25g	12	1	12	1	12	0	1
Cheeses, made from mixed milk from cows, sheep and/or goats - soft and semi-soft - made from raw or low heat-treated milk - at processing plant [3)]	DGV	Single	25g	4	0	4	0	4	0	0

Comments:

[1)] Fresh Cheese and cottage cheese

[2)] Fresh Cheese and cottage cheese

Table Listeria monocytogenes in milk and dairy products

[3)] Fresh cheese and cottage cheese

2.3.4 Listeria in animals

Table Listeria in animals

	Source of information	Sampling unit	Units tested	Total units positive for Listeria	L. monocytogenes	Listeria spp., unspecified
Cattle (bovine animals) [1)]	RAA	Animal	1	0		
Cattle (bovine animals) - dairy cows	RAA	Animal	1	0		
Goats	LNIV	Animal	1	0		
Sheep	LNIV	Animal	4	1	1	
Zoo animals, all	LNIV	Animal	6	0		

Comments:

[1)] Fetus

2.4 E. COLI INFECTIONS

2.4.1 General evaluation of the national situation

A. Verotoxigenic Escherichia coli infections general evaluation

Additional information

At LNIV the following procedures are performed in E. coli isolates of cattle, swine, sheep and goats (strains that are serotyped).
At poultry isolates, serotyping is not being done.

Diagnostic Techniques:
Internal method.
1 - Culture:

Platting in: Tryptose Blood Agar
MacConkey Agar
Minca Agar

To different E. coli colonies, the following biochemical reactions are done:
Simmons Citrate
MR-VP
Adonitol
Dulcitol
Inositol
Mannitol
Sorbitol
Glucose
Sucrose
Raffinose
Malonate
Urease

2 - Serology:
Serotyping by searching somatic (O) and capsular (K) antigens.

3 - Searching of enterotoxins:
- ST (by PCR)
- LT (by Biken test, CHO cells and PCR)

4 - Searching of citotoxins:
- in Vero and HeLa cells.

5 - Adesin detection:
- F5, F6, F41

6 - Antibiotic susceptibility testing

2.4.2 E. coli infections in humans

Table Escherichia coli, pathogenic in humans - Species/serotype distribution

Distribution Zoonotic Agent	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
Escherichia coli, pathogenic	0	0	0	0	0	0
- laboratory confirmed	98					
- caused by 0157 (VT+)	4					
- caused by other VTEC	16					

Table Escherichia coli, pathogenic in humans - Age distribution

Age distribution	Verotoxigenic E. coli (VTEC)			VTEC O157:H7			VTEC non-O157		
	All	M	F	All	M	F	F	M	All
<1 year	0	0	0	0	0	0	0	0	0
1 to 4 years	2	1	1	1	0	1	0	1	1
5 to 14 years	1	1	0	0	0	0	0	1	1
15 to 24 years	1	1	0	0	0	0	0	1	1
25 to 44 years	4	2	2	0	0	0	2	2	4
45 to 64 years	5	2	3	1	1	0	3	1	4
65 years and older	3	0	3	2	0	2	1	0	1
Age unknown	4	3	1	0	0	0	1	3	4
Total :	20	10	10	4	1	3	7	9	16

2.4.3 Escherichia coli, pathogenic in foodstuffs

Table VT E. coli in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC non-O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at processing plant	DGV	Single	25g	14	0			
Cheeses made from goats' milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant	DGV	Single	25g	12	0			
Cheeses made from sheep's milk - soft and semi-soft - made from raw or low heat-treated milk - at processing plant	DGV	Single	25g	32	0			
Meat from bovine animals - meat preparation - intended to be eaten cooked - chilled - at processing plant	DGV	Single	25g	20	1	1		
Meat from bovine animals - minced meat - intended to be eaten cooked - chilled - at processing plant	DGV	Single	25g	22	1	1		
Meat from pig - meat preparation - intended to be eaten cooked - chilled - at processing plant	DGV	Single	25g	34	0			
Meat from pig - minced meat - intended to be eaten cooked - chilled - at processing plant	DGV	Single	25g	17	1	1		
Other food - at catering [1)]	INSA	Single	10g	45	3		3	

Comments:

[1)] Ready to eat mixed meal with raw vegetables

2.4.4 Escherichia coli, pathogenic in animals

Table VT E. coli in animals

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC non-O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified	Verotoxigenic E. coli (VTEC) - VTEC O139:K82
Cattle (bovine animals)	LNIV	Animal		54	0				
Dogs	LNIV	Animal		23	0				
Pigs	LNIV	Animal		43	1		1		1
Goats	LNIV	Animal		24	0				
Sheep	LNIV	Animal		49	0				

2.5 TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1 General evaluation of the national situation

2.5.2 Tuberculosis, mycobacterial diseases in humans

Table Mycobacterium in humans - Age distribution

Age distribution	M. bovis		
	All	M	F
Age unknown	0	0	0
Total :	0	0	0

2.5.3 Mycobacterium in animals

A. Mycobacterium bovis in bovine animals

Monitoring system

Sampling strategy

Tuberculosis testing is performed in all bovine, older than 6 weeks of age, using the intra-dermal comparative test.

The herds are classified and sampled according to Council Directive 64/432/EEC and National Dec. Lei nº 272/2000, November 8th.

Frequency of the sampling

The herds are classified and sampled according to Council Directive 64/432/EEC and National Dec. Lei nº 272/2000, November 8th.

Type of specimen taken

intra-dermal comparative test, blood (gama-IFN), organs

Diagnostic/analytical methods used

The National Reference Laboratory (NRL) is Laboratório Nacional de Investigação Veterinária (LNIV) which is also responsible for production and distribution of tuberculins.

Diagnostic techniques:
- Internal method.
- direct smear
- solid media: stonebrink and Lowenstein-Jensen.
- liquid media: bactec.

The classification of Mycobacterium is based on: BM techniques.

LNIV is responsible for the Mycobacterium isolation on the tuberculin reactors animals and others, following the procedures above mentioned.

Vaccination policy

Vaccination is forbidden.

Other preventive measures than vaccination in place

Pre-movement tests are mandatory for breeding animals.

Control program/mechanisms

The control program/strategies in place

An Eradication Plan for Bovine Tuberculosis is carried out and supervised by DGV.

Measures in case of the positive findings or single cases

- Herd under official restrictions;
- Isolation of suspected or infected animals in the herd;

- Positive animals compulsory slaughtered, under official supervision, with sample collection for laboratory diagnosis;
- Animal mouvements are forbiden from and to the herd;
- Desinfection of all premises, equipment and materials;
- Testing of all remaining animals;
- Thermic treatment of the milk.

Notification system in place

Tuberculosis is a notifiable disease.

B. Mycobacterium bovis in farmed deer

Monitoring system

Sampling strategy

There is no national surveillance plan in place, but there is target surveillance in certain areas.
Sampling collection is done during hunting and all carcasses intended to human consumption undergo a post-mortem examination.

Vaccination policy

Vaccination is forbiden

Notification system in place

Tuberculosis is a notifiable disease in all species.

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified	M. avium complex	M. avium complex - M. avium subsp. avium	M. caprae
Goats	LNIV	Animal	2	1	1					
Pigs	LNIV	Animal	24	7				7		
Sheep	LNIV	Animal	4	0						
Zoo animals, all	LNIV	Animal	5	1	1					
Deer - wild	LNIV	Animal	87	82	81			1		
Wild boars - wild	LNIV	Animal	83	59	55			3		1

Table Bovine tuberculosis - 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
Continente	54805	39713	37584	76	59	4	5.26	94.64	.2	.16
Região Autónoma dos Açores	11939	2985	1223	0	0	0	N.A.	40.97	0	0
Total : [1)]	66744	42698	38807	76	59	4	5.26	90.89	.2	.15
Total - 1	54260	43896	40274	43	30	3	6.98	91.75	.11	.07

Comments:

[1)] N.A.

Table Bovine tuberculosis - data on animals - Community co-financed eradication programmes

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Continente	1266586	1172867	1060831	816204	885	663	763	90.45	.08
Região Autónoma dos Açores	268096	67025	32696	32696	0	0	0	48.78	0
Total : [1)]	1534682	1239892	1093527	848900	885	663	763	88.2	.08
Total - 1	1473419	1205031	1067750	812627	264	225	312	88.61	.02

Comments:

[1)] N.A.

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/432/EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests	Number of animals tested			
Região Autónoma da Madeira	1524	5355	0	0	0	0	no routine test	28	0	0	0
Total : [1)]	1524	5355	0	0	0	0	N.A.	28	0	0	0

Comments:

[1)] N.A.

Table Bovine tuberculosis - data on status of herds at the end of the period - Community co-financed eradication programmes

	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Continente	39713	1172867	0	0	23	2236	156	12564	85	3735	0	0	54541	1248051
Região Autónoma dos Açores	2985	67025	0	0	0	0	0	0	1	24	0	0	11938	268072
Total : [1)]	42698	1239892	0	0	23	2236	156	12564	86	3759	0	0	66479	1516123
Total - 1	43896	1205031	0	0	7	2157	207	11572	75	2485	0	0	53971	1457205

Comments:

[1)] N.A.

2.6 BRUCELLOSIS

2.6.1 General evaluation of the national situation

A. Brucellosis general evaluation

Additional information

Foodstuffs
Brucella isolation:
- Samples are plated in 6 petri dishes of FarrelÂ´s medium (3 incubated in CO2 atmosphere (CO2) and the others are incubated at normal atmosphere (N));
- Incubation at 37 degrees Celsius (+-1 degree celsius) for 10 days;
- 1st reading of the plates on the 4/5th day of incubation;
- 2nd reading on the 10th day of incubation;
- Suspected colonies are streaked on 2 agar slopes (one for (CO2) and the other for (N)for typing.

Brucella typing:
- Biochemical tests (urease, catalase and oxidase);
- CO2 requirement;
- H2S production;
- Dye sensitivity (Thionin, Basic Fucsin and Safrinin O);
- Agglutination with acriflavine and monospecific A and M antisera;
- Lysis by phages;
- Differentiation of vaccine and field strains.

For each set of plating and typing, reference strains are used.

2.6.2 Brucellosis in humans

Table Brucella in humans - Age distribution

Age distribution	B. abortus			B. melitensis			Brucella spp., unspecified		
	All	M	F	All	M	F	All	M	F
<1 year							0	0	0
1 to 4 years							0	0	0
5 to 14 years							4	4	0
15 to 24 years							1	1	0
25 to 44 years							13	10	3
45 to 64 years							8	4	4
65 years and older							5	3	2
Age unknown							5	5	0
Total :	0	0	0	0	0	0	36	27	9

2.6.3 Brucella in foodstuffs

Table Brucella in food

	Source of information	Sampling unit	Units tested	Total units positive for Brucella	B. abortus	B. melitensis	B. suis	Brucella spp., unspecified
Cheeses made from sheep's milk [1)]	DGV	Single	12	0				
Milk, cows' - raw milk for manufacture - intended for manufacture of pasteurised/UHT products	DGV	Single	10	0				
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at processing plant [2)]	DGV	Single	10	0				
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from pasteurised milk - at processing plant [3)]	DGV	Single	4	0				

Comments:

[1)] Fresh cheese and cottage
[2)] Fresh cheese and cottage
[3)] Fresh cheese and cottage

2.6.4 Brucella in animals

A. Brucella abortus in bovine animals

Status as officially free of bovine brucellosis during the reporting year

Free regions

In the Açores, there are 4 islands (Graciosa, Pico, Flores and Corvo) that are Officially Bovine Brucellosis Free, according to Comission Decision 2002/588/CE of the 11 July 2002.

Monitoring system

Sampling strategy

Serology is performed in cattle older than 12 months of age.
The herds are classified and sampled according to Council Directive 64/432/EEC and Decreto-Lei nº244/2000 (Sep. 27th).

Frequency of the sampling

The herds are sampled according to Council Directive 64/432/EEC and Decreto-Lei nº244/2000 (Sep. 27th) for cattle, sheep and goats.

Type of specimen taken

Blood, milk, organs,vaginal mucus, semen,aborted foetus, placenta.

Diagnostic/analytical methods used

Diagnostic techniques:

Serology:
- Rose Bengal Test (RBT);
- Complement Fixation Test (CFT);
If RBT is positive CFT is performed.

Bacteriology - Samples from:
- live animals (milk, vaginal mucus, semen, aborted foetus, placenta;
- dead animals (liver, spleen, lymph nodes, udder and uterus)
are plated in Farrel medium (Difco Tryptose Agar + SR209 Oxoid supplement + 5% horse serum).

- Biochemical reactions (urease, catalase and oxidase).

Typing of isolates:
- CO2 requirement;
- H2S production;
- Agglutination with monospecific antisera (anti-A, anti-M and anti-R or acriflavine test);
- Growth on dyes:
  1/50.000 and 1/100.000 of basic fucsin
  1/50.000 and 1/100.000 of thionin.
- Lysis by phages;
- Differentiation of vaccine and field strains.

Vaccination policy

Vaccination is forbidden but if an exceptional sanitary situation occurs, vaccination can be allowed with specific protocols between the National Veterinary Authority, the Regional Veterinary Authority and the owner(s) of the cattle.

Other preventive measures than vaccination in place

Pre-movement tests are mandatory for breeding animals.

Control program/mechanisms

The control program/strategies in place

An Eradication Plan for cattle is carried out and supervised by DGV.

Measures in case of the positive findings or single cases

Suspected Herd:
- Herd under oficial surveillance;
- Epidemiological questionaire;
- Animal mouvements are forbiden from and to the herd;
- Isolation of suspected animals in the herd;
- Sample collection for laboratory diagnosis.

Positive Herd:
- Herd under official restrictions;
- Compulsory slaughter of all positive animals, under official supervision with sample collection for laboratory diagnosis;
- Animal mouvements are forbiden from and to the herd;
- Serological control of all remaining animals;
- Thermic treatment of the milk.

Infected Herd:
- All mesures mencioned for positive herds;
- Desinfection of all premises, equipment and materials.

Notification system in place

Brucelosis is a notifiable disease.

B. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

Free regions

Região Autónoma dos Açores is officially free of ovine and caprine brucellosis, according to Comission Decision 2003/44/CE of the 17th January 2003.

Monitoring system

Sampling strategy

Serology is performed in sheep and goats older than 6 months of age.
The herds are classified and sampled according to Council Directive 64/432/EEC and Decreto-Lei nº244/2000 (Sep. 27th) for sheep and goats.

Frequency of the sampling

The herds are classified and sampled according to Council Directive 64/432/EEC and Decreto-Lei nº244/2000 (Sep. 27th) for sheep and goats

Type of specimen taken

Blood, milk, organs,vaginal mucus, semen,aborted foetus, placenta.

Diagnostic/analytical methods used

Diagnostic techniques:

Serology:
Sheep and goats
Rose Bengal Test (RBT);
Complement Fixation Test (CFT).

Bacteriology - Samples from:
- live animals (milk, vaginal mucus, semen, aborted foetus, placenta);
- dead animals (liver, spleen and lymph nodes)
are plated in Farrel medium (Difco Tryptose Agar + SR209 Oxoid supplement + 5% horse serum)

Biochemical reactions - urease, catalase and oxidase.

Typing of isolates:
- CO_2 requirement;
- H_2S production;
- Agglutination with monospecific antisera (anti-A, anti-M and anti-R);
- Growth on dyes:
  1/50.000 and 1/100.000 of basic fucsin
  1/50.000 and 1/100.000 of thionin.
- Lysis by phages;
- Differentiation of vaccine and field strains.

Vaccination policy

Vaccination of goats and sheeps with ReV1 is beeing done in some regions: In Entre-Douro e Minho, Beira Litoral, Beira Interior and Algarve only in young animals and in Trás-Os-Montes in adults and youngs.

Other preventive measures than vaccination in place

Pre-movement tests are mandatory for breeding animals and for the replacement in depopulated herds.

Control program/mechanisms

The control program/strategies in place

An Eradication Plan for sheep and goats, is carried out and supervised by DGV.

Measures in case of the positive findings or single cases

Suspected Herd:
- Herd under oficial surveillance;
- Epidemiological questionaire;
- Animal mouvements are forbiden from and to the herd;
- Isolation of suspected animals in the herd;
- Sample collection for laboratory diagnosis.

Positive Herd:
- Herd under official restrictions;
- Compulsory slaughter of all positive animals, under official supervision with sample collection for laboratory diagnosis;
- Animal mouvements are forbiden from and to the herd;
- Serological control of all remaining animals;
- Thermic treatment of the milk.

Infected Herd:
- All mesures mencioned for positive herds;
- Desinfection of all premises, equipment and materials.

Notification system in place

Brucelosis is a notifiable disease.

C. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

Free regions

See Brucella melitensis in goats.

Monitoring system

Sampling strategy

See Brucella melitensis in goats.

Type of specimen taken

Blood, milk, organs,vaginal mucus, semen,aborted foetus, placenta.

Diagnostic/analytical methods used

See Brucella melitensis in goats.

Vaccination policy

See Brucella melitensis in goats.

Control program/mechanisms

The control program/strategies in place

See Brucella melitensis in goats.

Measures in case of the positive findings or single cases

See Brucella melitensis in goats.

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella	B. abortus	B. melitensis	B. suis	Brucella spp., unspecified
Pigs	LNIV	Animal	56	3			3	
Solipeds, domestic - horses	LNIV	Animal	1	0				
Wild boars - wild	LNIV	Animal	48	0				
Zoo animals, all	LNIV	Animal	6	1		1		

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
Continente	72249	72249	68252	919	348	31	3.37	94.47	1.35	.51
Total : [1)]	72249	72249	68252	919	348	31	3.37	94.47	1.35	.51

Comments:

[1)] N.A.

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

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Continente	2638268	2638238	2330683	1950610	7940	7505	10204	88.34	.34
Total : [1)]	2638268	2638238	2330683	1950610	7940	7505	10204	88.34	.34
Total - 1	2662080	2662080	2677579	2067169	8292	6837	7351	100.58	.31

Comments:

[1)] N.A.

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

Region	Total number of existing		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases				
	Herds	Animals	Number of herds	%	Number of herds	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbio logically	Number of animals positive microbio logically	Number of suspended herds
Região Autónoma da Madeira	289	4414	0	0	0	0	56	361	0	0	0	0	0	0
Total : [1)]	289	4414	0	0	0	0	56	361	0	0	0	0	0	0

Comments:

[1)] N.A.

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance						Investigations of suspect cases								
							Serological tests			Examination of bulk milk			Information about			Epidemiological investigation					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Number of positive animals		Number of animals examined microbio logically	Number of animals positive microbio logically
																		Sero logically	BST		
Região Autónoma da Madeira	1524	5355	0	0	0	0	13	33	0	0	0	0	0	0	0	0	0	0	0	0	0
Região Autónoma dos Açores	2708	59341	2708	100	0	0		35053	0	317	6023	0	7	0	0	0	0	0	0	0	0
Total : [1)]	4232	64696	2708	63.99	0	0	13	35086	0	317	6023	0	7	0	0	0	0	0	0	0	0

Comments:

[1)] N.A.

Table Bovine 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
Continente	54805	39324	40443	246	173	13	5.28	102.85	.61	.43
Região Autónoma dos Açores	11939	6692	8566	105	81	0	0	128	1.23	.95
Total : [1)]	66744	46016	49009	351	254	13	3.7	106.5	.72	.52
Total - 1	54260	46990	50685	351	220	26	7.41	107.86	.69	.43

Comments:

[1)] N.A.

Table Bovine brucellosis - data on animals - Community co-financed eradication programmes

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Continente	1266586	989148	857139	857139	1268	1342	1679	86.65	.15
Região Autónoma dos Açores	268096	153361	195433	150126	571	576	705	127.43	.29
Total : [1)]	1534682	1142509	1052572	1007265	1839	1918	2384	92.13	.17
Total - 1	1473419	952698	1091664	983957	2183	2155	3165	114.59	.2

Comments:

[1)] N.A.

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

	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Continente	39324	989148	0	0	46	5270	1075	15620	170	5533	2571	42034	50939	1178002
Região Autónoma dos Açores	6692	153361	0	0	20	31	18	881	64	1536	6999	143666	4838	121982
Total : [1)]	46016	1142509	0	0	66	5301	1093	16501	234	7069	9570	185700	55777	1299984
Total - 1	46990	952698	0	0	119	4352	1124	20236	226	10707	10803	233079	41988	1205045

Comments:

[1)] N.A.

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

	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Continente	72249	2638268	0	0	355	38604	3175	130341	617	39316	7346	432808	60756	1997199
Total : [1)]	72249	2638268	0	0	355	38604	3175	130341	617	39316	7346	432808	60756	1997199
Total - 1	69549	2662080	0	0	483	53694	4092	153665	706	45378	5928	287278	58340	2122065

Comments:

[1)] N.A.

2.7 YERSINIOSIS

2.7.1 General evaluation of the national situation

A. Yersinia enterocolitica general evaluation

Additional information

Diagnostic techniques:

Bacteriology: Internal method.
- Samples are plated on Yersinia CIN Agar, or Yersinia Selective Agar (Oxoid) supplemented with Yersinia Selective supplement (Oxoid).
- Biochemical reactions by API 20E strips or 32E.

2.7.2 Yersiniosis in humans

Table Yersinia in humans - Age distribution

Age distribution	Y. enterocolitica			Yersinia spp., unspecified		
	All	M	F	All	M	F
15 to 24 years	3	1	2			
25 to 44 years	2	1	1			
45 to 64 years	1	0	1			
65 years and older	2	1	1			
Total :	8	3	5	0	0	0

Table Yersinia in humans - Seasonal distribution

Distribution Seasonal	Y. enterocolitica	Yersinia spp., unspecified
	Cases	Cases
January	0	
February	1	
March	0	
April	2	
May	3	
June	0	
July	0	
August	1	
September	0	
October	1	
November	0	
December	0	
Total :	8	0

2.7.3 Yersinia in foodstuffs

Table Yersinia in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Yersinia	Y. enterocolitica	Y. pseudotuberculosis	Yersinia spp., unspecified	Y. enterocolitica - O:3	Y. enterocolitica - O:9	Y. enterocolitica - Y. enterocolitica, unspecified
Meat from pig - fresh [1)]	DGV	Single	25g	61	1	1					1
Meat from pig - meat products [2)]	DGV	Single	25g	33	0						
Meat from pig - minced meat [3)]	INSA	Single	25g	25	10	10					10
Meat from pig - meat preparation - intended to be eaten cooked - chilled - at processing plant	DGV	Single	25g	5	0						
Other food - at catering - Clinical investigations [4)]	INSA	Single	25g	1	1	1			1		

Comments:

[1)] At processing plant
[2)] At processing plant
[3)] At retail
[4)] Ready to eat mixed meal

2.7.4 Yersinia in animals

Table Yersinia in animals

	Source of information	Sampling unit	Units tested	Total units positive for Yersinia	Y. enterocolitica	Y. pseudotuberculosis	Yersinia spp., unspecified	Y. enterocolitica - O:3	Y. enterocolitica - O:9	Y. enterocolitica - Y. enterocolitica, unspecified
Sheep	LNIV	Animal	1	1	1					1
Birds - zoo animal	LNIV	Animal	6	0						
Zoo animals, all	LNIV	Animal	6	0						

2.8 TRICHINELLOSIS

2.8.1 General evaluation of the national situation

2.8.2 Trichinella in animals

A. Trichinella in horses

Monitoring system

Type of specimen taken

Tongue, masseter and diaphragm.

Case definition

Detection of one larvae of Trichinella.

Diagnostic/analytical methods used

Mechanical digestion of pooled samples with magnetic stirrer (Comission Regulation (EC) N.Âº 2075/2005).

B. Trichinella in pigs

Monitoring system

Sampling strategy

General

Priority given to wild boars, breeding animals and animals not raised under controlled housing conditions.

Type of specimen taken

General

Pigs: diaphragm pillars, tongue, masseter
Wild boars: tongue, diaphragm pillars, masseter

Methods of sampling (description of sampling techniques)

General

As determined in Comission Regulation (EC) N.Âº 2075/2005 of 5 December.

Case definition

General

Detection of one larvae of Trichinella.

Diagnostic/analytical methods used

General

Mechanical digestion of pooled samples with magnetic stirrer (Comission Regulation (EC) N.Âº 2075/2005).

Notification system in place

Notifiable since 1953 by national law (Decreto-Lei nÂº 39209, de 14 de Maio).

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

All results negative.

Fattening pigs raised under controlled housing conditions in integrated production system

All results negative.

Fattening pigs not raised under controlled housing conditions in integrated production system

All results negative.

Breeding sows and boars

All results negative.

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

Cases of trichinelosis are not reported since < 1960.

Additional information

Special training in Trichinella detection on slaughterhouses and game activities is given to the meat inspection team.

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella	T. spiralis	Trichinella spp., unspecified
Foxes	FMV	Animal	12	2		2
Pigs - breeding animals - unspecified - sows and boars	RAA	Animal	224	0		
Pigs - fattening pigs - not raised under controlled housing conditions in integrated production system	RAA	Animal	3078	0		
Pigs - fattening pigs - raised under controlled housing conditions in integrated production system	RAM	Animal	20674	0		
Solipeds, domestic - horses	DGV	Animal	30	0		
Wild boars - wild	LNIV	Animal	1250	0		
Pigs - fattening pigs - not raised under controlled housing conditions in integrated production system - at slaughterhouse - animal sample - meat	DGV	Animal	27305	0		
Pigs - fattening pigs - raised under controlled housing conditions in integrated production system - at slaughterhouse - Monitoring - official sampling	DGV	Animal	725371	0		
Pigs - fattening pigs - raised under controlled housing conditions in integrated production system - at slaughterhouse - animal sample	RAA	Animal	10187	0		
Wild boars - wild - at processing plant	DGV	Animal	602	0		
Wolves - wild	FMV	Animal	10	0		

2.9 ECHINOCOCCOSIS

2.9.1 General evaluation of the national situation

A. Echinococcus spp. general evaluation

Additional information

Â§Diagnostic techniques:
Direct examination test.

Â§On 1996 a program supervised by DGV was implemented in Alentejo (DRAAAL) (approved by Decision 96/67/CE). On 1998, besides Alentejo the same program was extended to Beira Interior (DRA BI).
The program was extended, in 2000, to the Algarve (DRAALG).

This program consisted on:
-deworming of all dogs present at rabies vaccination , by injection, performed by Municipality Veterinarians.
-deworming tablets were given for a further deworming, in 2-3 weeks time.
-deworming of dogs not present at rabies vaccination, but belonging to farms where sheep and goats with hidatidosis lesions were observed (the information of lesions in farm animals comes through the abattoir).
-educational actions have been taken place, close to people (dog owners and farmers).

The program is still in place in the 3 referred regions.

2.9.2 Echinococcosis in humans

Table Echinococcus in humans - Species/serotype distribution

Distribution Zoonotic Agent	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
Echinococcus	27	0	0	0	0	0
E. granulosus	19					
Echinococcus spp., unspecified	8					

Table Echinococcus in humans - Age distribution

Age distribution	E. granulosus			E. multilocularis			Echinococcus spp., unspecified		
	All	M	F	All	M	F	All	M	F
<1 year	0	0	0				0	0	0
1 to 4 years	0	0	0				0	0	0
5 to 14 years	0	0	0				0	0	0
15 to 24 years	0	0	0				0	0	0
25 to 44 years	5	5	0				0	0	0
45 to 64 years	6	1	5				0	0	0
65 years and older	8	3	5				4	1	3
Age unknown	0	0	0				4	1	3
Total :	19	9	10	0	0	0	8	2	6

2.9.3 Echinococcus in animals

Table Echinococcus in animals

	Source of information	Sampling unit	Units tested	Total units positive for Echinococcus	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Cattle (bovine animals)	RAA	Animal	1	0			

2.10 TOXOPLASMOSIS

2.10.1 General evaluation of the national situation

A. Toxoplasmosis general evaluation

Additional information

Diagnostic techniques:

- Direct examination test.
- Serology - direct aglutination.
- PCR.

2.10.2 Toxoplasmosis in humans

Table Toxoplasma in humans - Species/serotype distribution

Distribution Zoonotic Agent	Cases	Cases Inc.
Toxoplasma	0	0
Congenital cases	1	

Table Toxoplasma in humans - Age distribution

Age distribution	Toxoplasma spp., unspecified		
	All	M	F
<1 year	1	0	1
1 to 4 years	0	0	0
5 to 14 years	4	0	4
15 to 24 years	32	0	32
25 to 44 years	66	0	66
45 to 64 years	1	1	0
65 years and older	1	1	0
Age unknown	21	0	21
Total :	126	2	124

2.10.3 Toxoplasma in animals

Table Toxoplasma in animals

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma	T. gondii
Cats	LNIV	Animal	219	60	60
Cattle (bovine animals)	LNIV	Animal	4	0	
Dogs	LNIV	Animal	1	0	
Goats	LNIV	Animal	9	0	
Sheep	LNIV	Animal	12	7	7
Solipeds, domestic	LNIV	Animal	2	0	
Birds - wild	LNIV	Animal	20	0	
Pigeons - wild	LNIV	Animal	1153	13	13

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

Portugal is free from Rabies since 1961.

In August 1984, the national authorities detected a case of rabies in a 2 months old puppy that came from Maputo (Mozambique) and entered illegally in Portugal the10th August 1984. The animal was isolated and euthanized. The disease was confirmed by direct immunofluorescence the 31st August of 1984. The veterinary authorities implemented sanitary and prophylactic measures and since then, no further cases were detected and Portugal could maintain its free situation.

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

Portugal is free from Rabies since 1961.
The vaccination of dogs is compulsory.
Rabies is a notifiable disease in animals and in humans.

Additional information

By national law (Decreto-Lei nÂº314/2003, December the 17th and Portaria nÂº 81/2002, January the 24th), the annual dog rabies vaccination is compulsory.
Most of this vaccination is performed by the Municipality Veterinarians and the remaining by the small animal practitioners in their private clinics.

Since 1988, the National Veterinary Authority keeps collaboration with a National Laboratory: Instituto BacteriolÃ³gico CÃ¢mara Pestana, where foxes heads collected during the hunting period are analysed for Rabies and all the results have been found negative.

2.11.2 Lyssavirus (rabies) in animals

A. Rabies in dogs

Monitoring system

Case definition

Laboratorial confirmation (positive result at the direct immunofluorescence test).

Vaccination policy

By national law (Decreto-Lei nÂº314/2003, December the 17th and Portaria nÂº 81/2002, January the 24th), the annual dog rabies vaccination for animals older than 3 months is compulsory.

Other preventive measures than vaccination in place

The other preventive measures are included in the National Control programme.

Control program/mechanisms

The control program/strategies in place

The control Program is defined in the national law (Decreto Lei nÂº314/2003, December the 17th) and consists in Vaccination and Surveillance Measures for epidemiological survey with definition of specific rules for owners, for commercial purposes, for exhibits and for animal entrance in the country.

Measures in case of the positive findings or single cases

The measures are defined in the national and EU legislation.

Notification system in place

Rage is a national notifiable disease since 1953.

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

Portugal is free from Rabies since 1961.

Additional information

In Portugal the annual rabies vaccination is compulsory since 1925.

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	Lyssavirus, unspecified	Classical rabies virus (genotype 1)	European Bat Lyssavirus - unspecified
Cats	RAM	Animal	2	0			
Dogs	RAM	Animal	14	0			

2.12 Q-FEVER

2.12.1 General evaluation of the national situation

A. Coxiella general evaluation

History of the disease and/or infection in the country

*

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

*

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

*

Recent actions taken to control the zoonoses

*

Suggestions to the Community for the actions to be taken

*

Additional information

*

2.12.2 Coxiella (Q-fever) in animals

Table Coxiella burnetii (Q fever) in animals

	Source of information	Sampling unit	Units tested	Total units positive for Coxiella (Q-fever)	C. burnetii
Cattle (bovine animals) [1)]	LNIV	Animal	1	0	
Goats [2)]	LNIV	Animal	4	0	
Sheep [3)]	LNIV	Animal	3	0	
Dogs - pet animals [4)]	LNIV	Animal	1	0	
Zoo animals, all [5)]	LNIV	Animal	3	0	

Comments:

[1)] Diagnostic methods: PCR
[2)] Diagnostic methods: PCR
[3)] Diagnostic methods: PCR
[4)] Diagnostic methods: PCR
[5)] Diagnostic methods: PCR

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1 ESCHERICHIA COLI, NON-PATHOGENIC

3.1.1 General evaluation of the national situation

3.1.2 Antimicrobial resistance in Escherichia coli, non-pathogenic

Table Antimicrobial susceptibility testing of E. coli in Pigs

Escherichia coli, non-pathogenic	E.coli, non-pathogenic, unspecified	
Isolates out of a monitoring program (yes/no)	yes	
Number of isolates available in the laboratory	1	
Antimicrobials:	N	n
Amphenicols - Chloramphenicol	1	1
Fluoroquinolones - Enrofloxacin	1	1
Quinolones - Nalidixic acid	1	1
Aminoglycosides - Streptomycin	1	1
Aminoglycosides - Gentamicin	1	0
Trimethoprim + sulfonamides	1	1
Penicillins - Ampicillin	1	1
Tetracyclines - Tetracycline	1	1
Resistant to >4 antimicrobials	1	1
Cephalosporins - Cefalexin	1	0
Cephalosporins - Cefotaxim	1	0

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals)

Escherichia coli, non-pathogenic	E.coli, non-pathogenic, unspecified	
Isolates out of a monitoring program (yes/no)	yes	
Number of isolates available in the laboratory	3	
Antimicrobials:	N	n
Amphenicols - Chloramphenicol	3	2
Fluoroquinolones - Ciprofloxacin	3	2
Quinolones - Nalidixic acid	3	2
Sulfonamides - Sulfonamide	3	2
Aminoglycosides - Streptomycin	3	2
Aminoglycosides - Gentamicin	3	1
Penicillins - Ampicillin	3	3
Tetracyclines - Tetracycline	3	2

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl)

Escherichia coli, non-pathogenic	E.coli, non-pathogenic, unspecified	
Isolates out of a monitoring program (yes/no)	yes	
Number of isolates available in the laboratory	1	
Antimicrobials:	N	n
Amphenicols - Chloramphenicol	1	1
Fluoroquinolones - Enrofloxacin	1	0
Quinolones - Nalidixic acid	1	0
Aminoglycosides - Streptomycin	1	1
Aminoglycosides - Gentamicin	1	0
Trimethoprim + sulfonamides	1	0
Penicillins - Ampicillin	1	1
Resistant to >4 antimicrobials	1	1
Cephalosporins - Cefalexin	1	1
Cephalosporins - Cefotaxim	1	1

Table Cut-off values used for antimicrobial susceptibility testing of Escherichia coli, non-pathogenic in Animals

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Amphenicols	Chloramphenicol		16	
Tetracyclines	Tetracycline		8	
Fluoroquinolones	Ciprofloxacin		0.03	
Quinolones	Nalidixic acid		16	
Trimethoprim	Trimethoprim		2	
Sulfonamides	Sulfonamides		256	
Aminoglycosides	Streptomycin		16	
	Gentamicin		2	
Cephalosporins	Cefotaxim		0.25	
Penicillins	Ampicillin		8	

Table Cut-off values used for antimicrobial susceptibility testing of Escherichia coli, non-pathogenic in Food

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Amphenicols	Chloramphenicol		16	
Tetracyclines	Tetracycline		8	
Fluoroquinolones	Ciprofloxacin		0.03	
Quinolones	Nalidixic acid		16	
Trimethoprim	Trimethoprim		2	
Sulfonamides	Sulfonamides		256	
Aminoglycosides	Streptomycin		16	
	Gentamicin		2	
Cephalosporins	Cefotaxim		0.25	
Penicillins	Ampicillin		8	

Table Cut-off values used for antimicrobial susceptibility testing of Escherichia coli, non-pathogenic in Feed

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Amphenicols	Chloramphenicol		16	
Tetracyclines	Tetracycline		8	
Fluoroquinolones	Ciprofloxacin		0.03	
Quinolones	Nalidixic acid		16	
Trimethoprim	Trimethoprim		2	
Sulfonamides	Sulfonamides		256	
Aminoglycosides	Streptomycin		16	
	Gentamicin		2	
Cephalosporins	Cefotaxim		0.25	
Penicillins	Ampicillin		8	

3.2 ENTEROCOCCUS, NON-PATHOGENIC

3.2.1 General evaluation of the national situation

3.2.2 Antimicrobial resistance in Enterococcus, non-pathogenic isolates

Table Cut-off values for antibiotic resistance of Enterococcus, non-pathogenic in Animals

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Streptomycin		512	
	Gentamicin		32	
Amphenicols	Chloramphenicol		32	
Penicillins	Ampicillin		4	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Streptogramins	Quinupristin/Dalfopristin		32	
Tetracyclines	Tetracycline		2	
Oxazolidines	Linezolid		4	

Table Cut-off values for antibiotic resistance of Enterococcus, non-pathogenic in Food

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Streptomycin		512	
	Gentamicin		32	
Amphenicols	Chloramphenicol		32	
Penicillins	Ampicillin		4	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Streptogramins	Quinupristin/Dalfopristin		32	
Tetracyclines	Tetracycline		2	
Oxazolidines	Linezolid		4	

Table Cut-off values for antibiotic resistance of Enterococcus, non-pathogenic in Feed

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Streptomycin		512	
	Gentamicin		32	
Amphenicols	Chloramphenicol		32	
Penicillins	Ampicillin		4	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Streptogramins	Quinupristin/Dalfopristin		32	
Tetracyclines	Tetracycline		2	
Oxazolidines	Linezolid		4	

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1 ENTEROBACTER SAKAZAKII

4.1.1 General evaluation of the national situation

4.1.2 Enterobacter sakazakii in foodstuffs

Table Enterobacter sakazakii in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Enterobacter sakazakii	E. sakazakii
Infant formula - dried	ASAE	Batch	10g	170	3	3

4.2 HISTAMINE

4.2.1 General evaluation of the national situation

4.2.2 Histamine in foodstuffs

Table Histamine in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units in non-conformity	<= 100 mg/kg	>100 - <= 200 mg/kg	>200 - <= 400 mg/kg	> 400 mg/kg
Fish - Fishery products from fish species associated with a high amount of histidine - not enzyme maturated	IPIMAR	Batch	25g	146	1	145		1	
Fish - Fishery products which have undergone enzyme maturation treatment in brine	IPIMAR	Batch	25g	5	0	5			
Fish - Fishery products from fish species associated with a high amount of histidine - not enzyme maturated - at processing plant	DGV	Single	25g	41	1	40		1	
Fish - Fishery products which have undergone enzyme maturation treatment in brine - at processing plant	DGV	Single	25g	10	0	10			

4.3 STAPHYLOCOCCAL ENTEROTOXINS

4.3.1 General evaluation of the national situation

4.3.2 Staphylococcal enterotoxins in foodstuffs

A. Staphylococcal enterotoxins in foodstuffs

Additional information

Analytical method:
Milk and dairy products - VIDAS SET2 (European screening method of CRL, Milk and Milk Products, version 3, 2006 May).
Other products - VIDAS SET2 (AOAC validation).

Table Staphylococcal enterotoxins in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcal enterotoxins
Cheeses made from cows' milk [1)]	DGV	Single	25g	10	0
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk	DGV	Single	25g	14	0
Cheeses made from goats' milk - soft and semi-soft - made from raw or low heat-treated milk	DGV	Single	25g	12	0
Cheeses made from sheep's milk [2)]	DGV	Single	25g	12	0
Cheeses made from sheep's milk - soft and semi-soft - made from raw or low heat-treated milk	DGV	Single	25g	32	0
Dairy products (excluding cheeses) - milk powder and whey powder	DGV	Single	25g	6	0
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from pasteurised milk - at processing plant [3)]	DGV	Single	25g	4	0

Comments:

[1)] Fresh cheese and cottage

[2)] Fresh cheese and cottage

[3)] Fresh cheese and cottage

5. FOODBORNE

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

A. Foodborne outbreaks

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

*

Description of the types of outbreaks covered by the reporting:

*

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

*

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

*

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

*

Evaluation of the severity and clinical picture of the human cases

*

Descriptions of single outbreaks of special interest

*

Control measures or other actions taken to improve the situation

*

Suggestions to the community for the actions to be taken

*

Additional information

*

Table Foodborne Outbreaks: summarised data

	Total number of outbreaks	Outbreaks	Human cases	Hospitalized	Deaths	Number of verified outbreaks
Bacillus	1	0	unknown	unknown	unknown	1
Campylobacter	0	0	unknown	unknown	unknown	0
Clostridium	4	0	unknown	unknown	unknown	4
Escherichia coli, pathogenic	0	0	unknown	unknown	unknown	0
Foodborne viruses	0	0	unknown	unknown	unknown	0
Listeria	0	0	unknown	unknown	unknown	0
Other agents	0	0	unknown	unknown	unknown	0
Parasites	0	0	unknown	unknown	unknown	0
Salmonella	3	0	unknown	unknown	unknown	3
Staphylococcus	2	0	unknown	unknown	unknown	2
Unknown	0	0	unknown	unknown	unknown	0
Yersinia	1	0	unknown	unknown	unknown	1

Table Verified Foodborne Outbreaks: detailed data for Bacillus

Please use CTRL for multiple selection fields

Bacillus spp., unspecified

	Value
Code	
Outbreaks	1
Human cases	120
Hospitalized	50
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff information	Roasted fishg with mashed
Type of evidence	Laboratory detection in implicated food
Outbreak type	General
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	

Table Verified Foodborne Outbreaks: detailed data for Clostridium

Please use CTRL for multiple selection fields

C. botulinum

	Value
Code	
Outbreaks	1
Human cases	1
Hospitalized	1
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff information	Raw Cured Ham
Type of evidence	Laboratory detection in implicated food
Outbreak type	Household
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	Type B

C. perfringens

	Value
Code	
Outbreaks	1
Human cases	5
Hospitalized	unknown
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff information	Cooked duck rice
Type of evidence	Laboratory detection in implicated food
Outbreak type	General
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	

C. botulinum

	Value
Code	
Outbreaks	1
Human cases	2
Hospitalized	2
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff information	Raw Cured Ham
Type of evidence	Laboratory detection in human cases;Laboratory detection in implicated food
Outbreak type	Household
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	Type B

C. botulinum

	Value
Code	
Outbreaks	1
Human cases	1
Hospitalized	1
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff information	Honey and Chamomile
Type of evidence	Laboratory detection in human cases;Laboratory detection in implicated food
Outbreak type	Household
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Imported from outside EU
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	Type B

Table Verified Foodborne Outbreaks: detailed data for Salmonella

Please use CTRL for multiple selection fields

S. Enteritidis

	Value
Code	
Outbreaks	1
Human cases	11
Hospitalized	1
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff information	Home made mayonnaise
Type of evidence	Laboratory detection in implicated food
Outbreak type	Household
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	

S. Typhimurium

	Value
Code	
Outbreaks	1
Human cases	4
Hospitalized	4
Deaths	0
Foodstuff implicated	Bovine meat and products thereof
More Foodstuff information	Minced meat
Type of evidence	Laboratory detection in implicated food
Outbreak type	General
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	raw meat

S. Enteritidis

	Value
Code	
Outbreaks	1
Human cases	30
Hospitalized	30
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff information	Boiled codfish and potatoes
Type of evidence	Laboratory detection in human cases;Laboratory detection in implicated food
Outbreak type	General
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	

Table Verified Foodborne Outbreaks: detailed data for Staphylococcus

Please use CTRL for multiple selection fields

S. enterotoxins

	Value
Code	
Outbreaks	1
Human cases	16
Hospitalized	unknown
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff information	Cooked pasta with chiken
Type of evidence	Laboratory detection in implicated food
Outbreak type	Household
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	Enterotoxin B

S. enterotoxins

	Value
Code	
Outbreaks	1
Human cases	40
Hospitalized	unknown
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff information	Chiken and vegetables
Type of evidence	Laboratory detection in implicated food
Outbreak type	General
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	

Table Verified Foodborne Outbreaks: detailed data for Yersinia

Please use CTRL for multiple selection fields

Y. enterocolitica - O:3

	Value
Code	
Outbreaks	1
Human cases	21
Hospitalized	1
Deaths	1
Foodstuff implicated	Other foods
More Foodstuff information	Cooked codfish rice
Type of evidence	Laboratory detection in implicated food
Outbreak type	Household
Setting	unknown
Place of origin of problem	unknown
Origin of foodstuff	Domestic
Contributory factors	
Other Agent (Mixed Outbreaks)	
Comment	