European Food Safety Authority

ZOONOSES MONITORING

SPAIN

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 2008

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Spain**

Reporting Year:

Laboratory name	Description	Contribution
Subdireccion General de Sanidad de la Producción Primaria	Ministerio de Medio Ambiente y Medio Rural y Marino	Reporting Officer
Subdireccion General de Coordinacion de Alertas y Programacion de Control Oficial	Agencia Española de Seguridad Alimentaria y Nutricion	National Reporter
Centro Nacional de Epidemiologia	Instituto de Salud Carlos III Ministerio de Sanidad y Consumo	National Reporter
Subdireccion General de Explotaciones y Sistemas de Trazabilidad de los Recursos Agrícolas y Ganaderos	Ministerio de Medio Ambiente y Medio Rural y Marino	National Reporter
Subdireccion General de Consevación de Recursos y Alimentación Animal	Ministerio de Medio Ambiente y Medio Rural y Marino	National Reporter
Departamento de Sanidad Animal	Facultad de Veterinaria de la Universidad Complutense de Madrid	National Reporter
Servicios de Sanidad Animal	Consejerias de Agricultura y Ganaderia de las Comunidades Autonomas	National Reporter

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 Spain during the year 2008 .

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:

REGA (National Register for Livestock Holdings) was the source for the total number of holdings and animals in all species. The figures in this report were taken at December/31/2008.
Dta on slaughtered animlas were collected from the Livestock Statistics Report 2007 of M.A.R.M.

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

Number of holdings and animals: 31/12/2008

Definitions used for different types of animals, herds, flocks and holdings as well as

'holding' in REGA means 'Whatever place where farming animals are'. They are clasified in breeding and production holdings and special holdings (such as markets, slaugtherhouses, quarantine centers, ...)

The specific definitions adopted by REGA for diferent types of holdings are those fixed in EU or Spanish Regulations.

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	**Category of animals**		**Year**		**Year**		**Year**		**Year**
Cattle (bovine animals)	**calves (under 1 year)**					28093	2008	246	2008
	dairy cows and heifers					1280474	2008	28633	2008
	in total			2427983	2007	5554871	2008	172411	2008
	meat production animals					3450037	2008	123274	2008
	mixed herds					796267	2008	20258	2008
Deer	**farmed - in total**					8551	2008	151	2008
Ducks	**in total**					604452	2008	473	2008
Gallus gallus (fowl)	**broilers**					151205865	2008	5542	2008
	in total			615319300	2007				
	laying hens					36839762	2008	1645	2008
	parent breeding flocks for egg production line					16474111	2008	460	2008
	parent breeding flocks for meat production line					9606709	2008	639	2008
Goats	**in total**					2877611	2008	72426	2008
Pigs	**breeding animals**					4714827	2008	7180	2008

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	**Category of animals**		**Year**		**Year**		**Year**		**Year**
Pigs	**fattening pigs**					16144699	2008	48812	2008
	in total			41488545	2007	29491928	2008	93707	2008
	mixed herds					8632322	2008	24898	2008
Sheep	**in total**					22439727	2008	116309	2008
Solipeds, domestic	**horses - in total**					559598	2008	133544	2008
Turkeys	**in total**					5025568	2008	878	2008
Wild boars	**farmed - in total**					4158	2008	149	2008

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

History of the disease and/or infection in the country

Salmonellosis is the second main zoonoses (in number of human cases) in European Union, also in Spain. Salmonella is the agent more frequently involved in foodborne outbreaks in Spain.
In poultry, after the introducion in the 60's of the american production method, the especific pathology of avian salmonellosis was caused by S. pullorum and S. gallinarum. In the middle of the 80's come up a new infection in breeding flocks for meat production caused by S. enteritidis, and following it, also in laying hens and in feed S. enteritidis was isolated.

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

Nowadays the sources of infection are widespread along the food chain: feed, animals, food(eggs and ovoproducts, meat)and humans can be a source of infection.
At animal level, data in breeding flocks 2008 show an increased incidence of Salmonella spp (from 2,26% in 2007 to 3,60% in 2008)and of top 5 serovars (2,45%in 2008;2,26% in 2007;14% in 2006).
In layin hens, flock incidence increased from 27,11%(Salmonella spp.) and 11,80% (S. Enteritidis+ S. Typhimurium) in 2007 to 34,91% and 15,50% respectively in 2008. In broiler flocks, the flock prevalence decreased from 41,20% (Salmonella spp.) and 28,20% (S. Enteritidis+ S. Typhimurium) in the baseline survey 2005/2006 to 25,28% and 13,99% respectively in 2007 and 18,29% and 11,00% respectively in 2008.

Data indicate that prevalence is deceasing in poultry in Spain, with the implementation of control programmes, except in laying hens, where the situation is at a standstill

At human level salmonellosis is a notifiable disease according to Royal Decree 2210/1995, laying down Epidemiological Surveillance National Network

According to Royal Decree 328/2003, laying down the Poultry Health Plan, and Order PRE/1377/2005, all veterinarians have to notify to the Competent Authority cases of zoonoses and zoonotic agents.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

It is very difficult to establish the relevance of the data in the different steps of the food chain as sources of infection, because epidemiology of salmonellosis is very complex.

Nevertheless, human cases are mainly linked to eggs and egg derived food consumption.

Recent actions taken to control the zoonoses

Ministery of Environment and Rural and Marine Affairs and Ministry of Health and Consumer Affairs of Spain are carrying out a Control Programme of Salmonella in poultry, eggs and ovoproducts along the overall food chain, starting with monitoring systems at holdings(National Surveillance Programme).

Additional information

Spanish legislation on Salmonella in foodstuff:
Royal Decree 1254/1991 of August 2, laying down rules to preparation and conservation of mayonnaise prepared in the own stablishment and for immediat consumption foods with eggs as ingredient.
Royal Decree 3454/2000 of december 29, laying down hygiene rules to elaboration, distribution and commercialisation of ready-to-eat food
Royal Decree 202/2000 laying down rules for food handlers.
Royal Decree 640/2006, of May 26, 2006, laying down specific implementation conditions of the Communities rules concernig hygiene subjets, as well as foodstuff's production and commercialisation.

2.1.2 Salmonellosis in humans

A. Salmonellosis in humans

Reporting system in place for the human cases

In December of 1995 the National Network of Epidemiological Surveillance was created by law. This law and its development produced changes in the surveillance system. During 1997 the protocols of statutory notification of diseases were approved and implemented in Spain. In Spain the Autonomous Regions have wide powers with respect to epidemiological surveillance and national decisions are usually taken by consensus..

All practising doctors are obliged to notify, both those in the public health service and in private practice, and both those practising outside and within hospitals. On occasions the appearance of cases and outbreaks is detected by other means (from the mass media, from citizens complants, etc.) and in these cases the information is checked and if confirmed it is incorporated into the system at the corresponding level.

Microbiological Information System
The Microbiological Information System has been based since 1989 on voluntary weekly reporting by clinical microbiology laboratories (principally hospital laboratories). Currently, in order to improve the notification, this procedure is becoming compulsory for a designated group of representative laboratories. The information in these reports is based on individual cases and includes the following variables: agent, time, place, age, sex, etc.

Enter-net
Spain participates in Enter-net, an European network for the surveillance of human gastrointestinal infections. Enternet has monitored salmonellosis since 1994 and Vero cytotoxin producing Escherichia coli O157 since 1999. Each country participates with a microbiologist of the national reference laboratory (source of the data) and the epidemiologist responsible for national surveillance.

Outbreak reporting
In Spain outbreaks are the main source of information for the foodborne diseases

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC

Notification system in place

Royal Decree 2210/1995, December 25, by Epidemiological Surveillance National Net is created

2.1.3 Salmonella in foodstuffs

A. Salmonella spp. in eggs and egg products

Monitoring system

Sampling strategy

The activities are made pursuant to Regulation (EC) no 178/2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

Eggs at egg packing centres (foodstuff based approach)

Sampling distributed evenly throughout the year

Eggs at retail

Sampling distributed evenly throughout the year

Raw material for egg products (at production plant)

Sampling distributed evenly throughout the year

Egg products (at production plant and at retail)

Sampling distributed evenly throughout the year

Diagnostic/analytical methods used

Eggs at egg packing centres (foodstuff based approach)

Bacteriological method: ISO 6579:2002

Eggs at retail

Bacteriological method: ISO 6579:2002

Raw material for egg products (at production plant)

Bacteriological method: ISO 6579:2002

Egg products (at production plant and at retail)

Bacteriological method: ISO 6579:2002

Control program/mechanisms

Recent actions taken to control the zoonoses

In 2003 a workshop was organised for "Salmonella in eggs and egg products" coordinated by the Spanish Food Safety and Nutrition Agency. The result was the approval between all the competent authorities in this area of the "Programme on Salmonella spp in eggs and egg products". In 2006 we have

evaluated the actions taken and we study new proposals for improvement.

In this field the spanish order PRE 1377/2005 establishes surveillance and control messures for salmonella in holdings of laying hens for the purposes of a National Programme.

B. Salmonella spp. in broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The activities are made pursuant to Regulation (EC) no 178/2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: ISO 6579:2002

At retail

Bacteriological method: ISO 6579:2002

C. Salmonella spp. in pig meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The activities are made pursuant to Regulation (EC) no 178/2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: ISO 6579:2002

At retail

Bacteriological method: ISO 6579:2002

D. Salmonella spp. in bovine meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The activities are made pursuant to Regulation (EC) no 178/2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

Metodo

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: ISO 6579:2002

At retail

Bacteriological method: ISO 6579:2002

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Meat from broilers (Gallus gallus) - at slaughterhouse - Survey (carcasses)	L	single	25 g	389	58	22	4	32
Meat from broilers (Gallus gallus) - fresh - at processing plant	F	single	25g	91	14	3	1	10
Meat from broilers (Gallus gallus) - fresh - at retail	F	single	25g	195	7	1		6
Meat from broilers (Gallus gallus) - fresh - at slaughterhouse	F	single	25g	76	12	1		11
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at processing plant	F	single	25g	459	13			13
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at retail	F	single	25g	327	12		1	11
Meat from turkey - fresh - at processing plant	F	single	25g	88	15	3	1	11
Meat from turkey - fresh - at retail	F	single	25g	186	6	1		5
Meat from turkey - fresh - at slaughterhouse	F	single	25g	24	11	1		10

Footnote:

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES
L: NACIONAL REFERENCE LABORATORY

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Cheeses made from cows' milk - at processing plant	F	single	25g	159	5			5
Cheeses made from cows' milk - soft and semi-soft - at processing plant	F	single	25g	28	1	1		
Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - at processing plant	F	single	25g	39	2	1		1
Dairy products (excluding cheeses) - ice-cream - at processing plant	F	single	25g	230	0			
Milk, cows' - pasteurised milk - at processing plant	F	single	25g	0				
Milk, cows' - raw	F	single	25g	46	1			1

Footnote:

F:HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Derby	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Meat from bovine animals - fresh - at processing plant	F	single	25g	105	4				4
Meat from bovine animals - fresh - at retail	F	single	25g	172	3			1	2
Meat from bovine animals - fresh - at slaughterhouse	F	single	25g	892	17				17
Meat from bovine animals - meat preparation - intended to be eaten cooked - at processing plant	F	single	25g	140	8		2		6
Meat from bovine animals - meat products - cooked, ready-to-eat - at processing plant	F	single	25g	803	44		3	5	36
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail	F	single	25g	1046	52	1	11	18	22
Meat from bovine animals - minced meat - intended to be eaten cooked - at processing plant	F	single	25g	187	4				4
Meat from other animal species or not specified	F	single	25g	65	11				11
Meat from pig - fresh - at processing plant	F	single	25g	149	6	2		4	
Meat from pig - fresh - at retail	F	single	25g	236	30				30
Meat from pig - fresh - at slaughterhouse	F	single	25g	276	17				17
Meat from pig - meat products - cooked, ready-to -eat - at processing plant	F	single	25g	66	19				19
Meat from pig - meat products - cooked, ready-to -eat - at retail	F	single	25g	269	11		1		10
Meat from pig - meat products - raw but intended to be eaten cooked - at processing plant	L				16		1	8	7
Meat from pig - meat products - raw but intended to be eaten cooked - at retail [1)]	L				6			1	5

Table Salmonella in red meat and products thereof

Comments:

[1)] cured pig meat products

Footnote:

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES
L: NATIONAL REFERENCE LABORATORY

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Bakery products	F	single	25g	6339	29	13	3	13
Egg products - at processing plant	F	single	25g	715	40	20		20
Egg products - at retail	L				7	3		4
Eggs - table eggs - at packing centre	F	single	25g	207	13	13		
Fish	F	single	25g	17	2	2		
Fishery products, unspecified - at processing plant	F	single	25g	81	1	1		
Infant formula - dried - intended for infants below 6 months	F	single	25g	735	0			
Live bivalve molluscs	F	single	25g	122	2	1		1
Other food	F	single	25g	1281	8			8
Other processed food products and prepared dishes	F	single	25g	1317	31	13		18
Ready-to-eat salads	L				7	3	4	
Vegetables	F	single	25g	1876	8		1	7

Footnote:

F:HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES
L: NATIONAL REFERENCE LABORATORY

2.1.4 Salmonella in animals

A. Salmonella spp. in pigs

Monitoring system

Sampling strategy

Breeding herds

According Commission Decision 2008/55/CE

Multiplying herds

According Commission Decision 2008/55/CE

Fattening herds

Sampling has been performed at 7 slaughterhouses placed in different regions of Spain and representative of the total volume of sacrifice of the country.

Frequency of the sampling

Breeding herds

Other: According Commission Decision 2008/55/CE

Multiplying herds

Other: According Commission Decision 2008/55/CE

Fattening herds at slaughterhouse (herd based approach)

between march and december

Type of specimen taken

Breeding herds

Other: According Commission Decision 2008/55/CE

Multiplying herds

Other: According Commission Decision 2008/55/CE

Fattening herds at slaughterhouse (herd based approach)

Faeces

Methods of sampling (description of sampling techniques)

Breeding herds

According Commission Decision 2008/55/CE.

Multiplying herds

According Commission Decision 2008/55/CE.

Fattening herds at slaughterhouse (herd based approach)

Two faecal samples at colon level have been taken in all the slaughter batches in the day of sampling, with a maximun of 30 batches. Each batch belonged to different herds. Sampling has been performed in 7 slaughterhouses placed in Cuenca(2),

Barcelona,Ciudad Real, Murcia, Pontevedra and Toledo. These slaughterhouses have a high volume of activity, representing an important part of all the bovines sacrified in Spain.
A total of 342 samples have been taken, belonging to 171 slaughter batches and 171 different holdings.
Faeces were taken from the colon, refrigerated immediatly and sent to the laboratory and analyzed within 24 hours.

Case definition

Breeding herds

According Commission Decision 2008/55/CE.

Multiplying herds

According Commission Decision 2008/55/CE.

Fattening herds at slaughterhouse (herd based approach)

A slaughter batch is considered positive for the purpose of this survey if Salmonella spp. has been isolated from at least one of the two samples of each slaughter batch.

Diagnostic/analytical methods used

Breeding herds

Bacteriological method: ISO 6579:2002

Multiplying herds

Bacteriological method: ISO 6579:2002

Fattening herds at slaughterhouse (herd based approach)

Bacteriological method: ISO 6579:2002

Results of the investigation

Breeding pigs at farm:
Breeding holdings:
Number of holdings tested: 150
Number of positive holdings: 96
Prevalence: 64,00% (95% CI: 56,08; 71,38)
Production holdings:
Number of holdings tested: 212
Number of positive holdings: 111 (95% CI: 45,62; 59,03)
Prevalence: 52,36%

Fattening pigs at slaughterhouses:
Tested slaughter batches: 171
Positive: 66
Slaughter batch prevalence: 38,6% Salmonella spp.(95% CI: 31,3;46,4)

B. Salmonella spp. in bovine animals

Monitoring system

Sampling strategy

Sampling has been performed in 8 slaughterhouses placed in different regions of Spain and representative of the total volume of sacrifice of the country

Frequency of the sampling

Animals at slaughter (herd based approach)

from june to october

Type of specimen taken

Animals at slaughter (herd based approach)

Faeces

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

Two faecal samples at colon level have been taken in all the slaughter batches in the day of sampling, with a maximun of 30 batches. Each batch belonged to different holdings. Sampling has been performed in 8 slaughterhouses placed in Barcelona(2), Valencia, Huesca, Lerida, Caceres y Ciudad Real. These slaughterhouses have a high volume of activity, representing an important part of all the bovines sacrified in Spain.

A total of 336 samples have been taken, belonging to 168 slaughter batches and 168 different holdings.

Faeces were taken from the colon, refrigerated immediatly and sent to the laboratory and analyzed before 24 hours.

Case definition

Animals at slaughter (herd based approach)

A slaughter batch is positive if Salmonella spp. has been isolated from at least one of the two samples of each slaughter batch.

Diagnostic/analytical methods used

Animals at slaughter (herd based approach)

Bacteriological method: ISO 6579:2002

Results of the investigation

Number of slaughter batches analyzed: 168
Positive : 47
slaughter batch prevalence: 27,9% (CI 95%: 21,5-35,5)

C. Salmonella spp. in Gallus Gallus - breeding flocks

Monitoring system

Sampling strategy

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

Following point 2 of the Annex of Commisison Regulation (EC) 1003/2005 of 30 june, implementing Regulation (EC) 2160/2003 as regards a Community target for the reduction of the prevalence of certain Salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation (EC) 2160/2003. This sampling strategy is implemented by the Spanish National Surveillance and Control Programme on Salmonella in Breeding Flocks of Gallus gallus, approved for co-financing by Commision Decision 2007/782/EC.

Data in the tables of this report come from official controls only, then FBO controls are not included.

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

birds of 4 weeks of age and 2 weeks prior movement.

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

Other: FBO controls: every 2 weeks. Additionally to the FBO controls, during production period an official control sampling is performed, with the following frecuency: 1. within 4 weeks following moving to the laying phase or laying unit 2. towards the end of the laying phase and not earlier than 8 weeks before the end of the production cycle 3. during the production period at time distant enough from the sampling referred in points 1. and 2.

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

Following point 2 of the Annex of Commisison Regulation (EC) 1003/2005 of 30 june, implementing Regulation (EC) 2160/2003 as regards a Community target for the reduction of the prevalence of certain Salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation (EC) 2160/2003.

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

Following point 2 of the Annex of Commisison Regulation (EC) 1003/2005 of 30 june, implementing Regulation (EC) 2160/2003 as regards a Community target for the reduction of the prevalence of certain Salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation (EC) 2160/2003.

Breeding flocks: Production period

Following point 2 of the Annex of Commisison Regulation (EC) 1003/2005 of 30 june, implementing Regulation (EC) 2160/2003 as regards a Community target for the reduction of the prevalence of certain Salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation (EC) 2160/2003.

Case definition

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

If positive in FBO control and to confirm the disease, official samples must be taken. The flock is confirmed as infected if Salmonella is isolated and serotyping performed at NRL is positive to one of the five serotypes included in the programme.

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

If positive in FBO control and to confirm the disease, official samples must be taken. The flock is confirmed as infected if Salmonella is isolated and serotyping performed at NRL is positive to one of the five serotypes included in the programme.

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

If positive in FBO control and to confirm the disease, official samples must be taken. The flock is confirmed as infected if Salmonella is isolated and serotyping performed at NRL is positive to one of the five serotypes included in the programme.

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)

Voluntary

Other preventive measures than vaccination in place

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

Biosecurity measures.

Compliance with Good Practice Code.

Control program/mechanisms

The control program/strategies in place

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

Spanish National Control and Monitoring Programme on Salmonella in Breeding Flocks of Gallus gallus 2008, approved for co-financing by Commission Decision 2007/782/EC.

Recent actions taken to control the zoonoses

Compulsory National Control and Monitoring Programme on Salmonella in Breeding Flocks of Gallus gallus 2008, following criteria of Regulations (EC) 2160/2003, 1003/2005 and 1177/2006.

Measures in case of the positive findings or single cases

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

According to the compulsory National Control and Monitoring Programme on Salmonella in Breeding Flocks of Gallus gallus 2008, including:
movement of live birds forbbiden
destruction or treatment of eggs
sacrifice-depopulation of the flock
epidemiological investigations
control of biosecurity measures
control of the effectiveness of cleaning and disinfection

Notification system in place

Since 1952, at least (Epizootic Diseases Law). At the moment by Animal Health Law 8/2006, Royal Decree 328/2003 and Royal Decree 1940/2004.

Results of the investigation

Sampled flocks: 1304
Positive flocks: 47 Salmonella spp.; 32 top 5
Incidence:
- Salmonella spp: 3,60% (95% CI: 2,69; 4,72)
- Top 5: 2,45% (95% CI: 1,71; 3,40)

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

The incidence on Salmonella spp. has slightly increased from 2007 (2,26%) to 2008 (3,60%). The incidence on top 5 have increased from 2007 (2,26%) to 2008 (2,45%). Breeding flocks for egg production can be considered a very low source of infection for humans, with only 2 positive flocks to Salmonella spp. and 1 positive flock to top 5.

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

Monitoring system

Sampling strategy

Laying hens flocks

Following point 2 of the Annex of Commission Regulation (EC) 1168/2006 implementing Regulation (EC) 2160/2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) 1003/2005. This sampling strategy is implemented by the Spanish National Control and Monitoring Programme on Salmonella in Laying Hens 2008, approved for co-financing by Decision 2007/782/EC.

Frequency of the sampling

Laying hens: Day-old chicks

Every flock is sampled

Laying hens: Rearing period

2 weeks prior to moving (FBO control).

Laying hens: Production period

Every 15 weeks (FBO control). Official control is done in one flock per year per holding comprising at least 1000 birds at the end of the production cycle; at the age of 24 +- 2weeks in flocks housed in buildings where Salmonella was detected in the preceding flock; and in any case of suspicion of Salmonella in the holding.

Type of specimen taken

Laying hens: Production period

Other: faecal material and dust samples

Methods of sampling (description of sampling techniques)

Laying hens: Day-old chicks

Following part B of Annex II of Council Regulation 2160/2003

Laying hens: Rearing period

Following part B of Annex II of Council Regulation 2160/2003

Laying hens: Production period

Following point 2 of the Annex of Commission Regulation (EC) 1168/2006 implementing Regulation (EC) 2160/2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) 1003/2005. This sampling strategy is implemented by the Spanish National Control and Monitoring Programme on Salmonella in Laying Hens 2008, approved for co-financing by Decision 2007/782/EC.

Case definition

Laying hens: Day-old chicks

A flock is considered positive if the presence of S. Enteritidis or S. Typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, including untypable serotypes.

Laying hens: Rearing period

A flock is considered positive if the presence of S. Enteritidis or S. Typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, including untypable serotypes.

Laying hens: Production period

A flock is considered positive if the presence of S. Enteritidis or S. Typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, including untypable serotypes.

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

Compulsory in rearing period against Salmonella species with impact in public health (at least S. Enteritidis should be included). It can be voluntary in a holding if preventive and biocecurity measures have been taken on the holding and absence of Salmonella Enteritidis and Typhimurium was demostrated during 12 months preceding the arrival of the animals.

Other preventive measures than vaccination in place

Laying hens flocks

Biosecurity measures
Compulsory notification
Compulsory monitoring and control programmes
Compliance with Good Practice Code

Control program/mechanisms

The control program/strategies in place

Laying hens flocks

National Control and Monitoring Programme on Salmonella in Laying Hens 2008, approved for co-financing by Decision 2007/782/EC.

Recent actions taken to control the zoonoses

National Control and Monitoring Programme on Salmonella in Laying Hens

2008, approved for co-financing by Decision 2007/782/EC,including vaccination,biosecurity measures and compliance with good practices code following criteria ofRegulations 2160/2003,1168/2006 and 1177/2006.

Measures in case of the positive findings or single cases

Laying hens flocks

According to National Control and Monitoring Programme on Salmonella in Laying Hens 2008,including movement restrictions of live birds (forbidden),destruction or treatment of eggs, sacrifice-depopulation of the flock,epidemiological investigations, control of the biosecurity measures and of the efficiency of the cleaning and disinfection.

Notification system in place

Since 1952 at least (Epizootic Diseases Law). At the moment by Animal Health Law 8/2003, Royal Decree 328/2003 and Royal Decree 1940/2004.

Results of the investigation

Number of flock tested (official controls): 845
Number of positive flocks:
- Salmonella spp.: 295
- Enteritidis+Typhimurium: 131

Incidence:
- Salmonella spp: 34,91% (95%CI: 31,75; 38,17)
- Enteritidis+Typhimurium: 15,50% (95%CI: 13,18;18,12)

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

The incidence of both Salmonella spp. and Enteritidis+Typhimurium has increased from 2007 to 2008, taking into account that only results of official controls are considered.

E. Salmonella spp. in Gallus Gallus - broiler flocks

Monitoring system

Sampling strategy

Broiler flocks

Following point 1 of the Annex of Commission Regulation (EC) 646/2007 implementing Regulation (EC) 2160/2003 as regards a Community target for the reduction of the prevalence of Salmonella Enteritidis and Salmonella Typhimurium in broilers and repealing Regulation (EC) 1091/2005.

Frequency of the sampling

Broiler flocks: Before slaughter at farm

3 weeks prior to slaughter (FBO control). Official control sampling is performed in at least one flock on 10% of the holdings with more than 5000 birds.

Type of specimen taken

Broiler flocks: Before slaughter at farm

Faeces

Methods of sampling (description of sampling techniques)

Broiler flocks: Before slaughter at farm

Following point 2 of the Annex of Commission Regulation (EC) 646/2007 implementing Regulation (EC) 2160/2003 as regards a Community target for the reduction of the prevalence of Salmonella Enteritidis and Salmonella Typhimurium in broilers and repealing Regulation (EC) 1091/2005.

Case definition

Broiler flocks: Before slaughter at farm

A flock is considerd positive if the presence of S. Enteritidis or S Typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, includind untypable serotypes.

Diagnostic/analytical methods used

Broiler flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002

Vaccination policy

Broiler flocks

Does not exist.

Other preventive measures than vaccination in place

Broiler flocks

Biosecurity measures
Compliance with Good Practice Code

Control program/mechanisms

The control program/strategies in place

Broiler flocks

National Control and Monitoring Plan on Salmonella in broiler flocks 2008, following Royal Decree 328/2003 laying down the Health Poultry Plan and Royal Decree 1084/2005 regarding the ordination of the poultry sector for meat production.

Recent actions taken to control the zoonoses

National Control and Monitoring Plan on Salmonella in broiler flocks 2008, including biosecurity measures and compliance with Good Practice Code following Regulations 2160/2003, 1177/2006 and 646/2007.

Measures in case of the positive findings or single cases

Broiler flocks: Before slaughter at farm

Verification of the compliance of biosecurity measures
Cleaning, disinfection and treatment against rodents and insects
Verification of the efficacy of cleaning and disinfection
Epidemiological investigation

Notification system in place

Since 1952, at least (Epizootic Diseases Law). At the moment by Animal Health Law 8/2003, Royal Decree 328/2003 and Royal Decree 1940/2004.

Results of the investigation

Sampled flocks: 645
Positive flocks: 118 Salmonella spp. 71 enteritidis+typhimurium
Prevalence:
Salmonella spp.: 18,29%(95% CI:15,45;21,42)
Enteritidis+Typhimurium: 11,00%(95% CI:8,76;13,60)

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

The decresing trend observed in 2007 continues in 2008.

Table Salmonella in breeding flocks of Gallus gallus

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Hadar	S. Infantis	S. Typhimurium	S. Virchow	Salmonella spp., unspecified
Gallus gallus (fowl) - parent breeding flocks for egg production line - during production period - at farm - Control and eradication programmes - official sampling (Census sampling)	112	M.A.R.M.	flock	93	2				1		1
Gallus gallus (fowl) - parent breeding flocks for meat production line - during production period - at farm - Control and eradication programmes - official sampling (Census sampling)	1301	M.A.R.M.	flock	1211	45	22	4	0	5	0	14

Table Salmonella in other poultry

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Hadar	S. Infantis	S. Mbandaka	S. Montevideo	S. Typhimurium
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes (objective sampling)	7684	M.A.R.M.	flock	645	118	65	2	1	15	3	5
Gallus gallus (fowl) - laying hens - during production period - at farm - Control and eradication programmes - official sampling (objective and suspect sampling)	1909	M.A.R.M	flock	845	295	115	7	37	8	2	17

	S. Virchow	Salmonella spp., unspecified
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes (objective sampling)	4	23
Gallus gallus (fowl) - laying hens - during production period - at farm - Control and eradication programmes - official sampling (objective and suspect sampling)	4	186

Table Salmonella in other birds

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Falcons - at hospital or care home - Survey (Convenient sampling)	Animal Helath	animal	24	0			
Partridges - in total - Survey (Convenient sampling)	Animal Helath	animal	58	0			

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Anatum	S. Derby	S. Enteritidis	S. Mbandaka	S. Montevideo	S. Rissen	S. Typhimurium
Cattle (bovine animals) - calves (under 1 year) - - faeces - Survey - national survey (Objective sampling)	M.A.R.M.	slaughter	168	47	25			2	9		2
Pigs - breeding animals - at farm - Survey - EU baseline survey (objective sampling)	M.A.R.M.	holding	359	207	34	29	4	1		57	47
Pigs - fattening pigs - at slaughterhouse - animal sample - Survey - national survey (objective samplig)	M.A.R.M.	slaughter	171	66	3	10				14	15

	Salmonella spp., unspecified
Cattle (bovine animals) - calves (under 1 year) - - faeces - Survey - national survey (Objective sampling)	9
Pigs - breeding animals - at farm - Survey - EU baseline survey (objective sampling)	151
Pigs - fattening pigs - at slaughterhouse - animal sample - Survey - national survey (objective samplig)	24

2.1.5 Salmonella in feedingstuffs

Table Salmonella in feed material of animal origin

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of land animal origin - animal fat - at processing plant - Monitoring - official sampling (Animal fat)	REGIONAL	batch	25 grs	54	0	0	0	0
Feed material of land animal origin - meat and bone meal - at processing plant - Monitoring - official sampling (Meat and bone)	REGIONAL	batch	25 grs	119	6	0	0	6
Feed material of land animal origin - meat meal - in total - Monitoring - official sampling	Animal Helath	batch	25 grs	16	2			2
Feed material of land animal origin - poultry offal meal - at processing plant - Monitoring - official sampling	Animal Helath	batch	25 grs	14	0			
Feed material of marine animal origin - fish meal - in total - Monitoring - official sampling	Animal Helath	batch	25 grs	125	4	0	0	4

Footnote:

Madrid, Cantabria

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of cereal grain origin - barley derived - at feed mill - Surveillance - official controls	Animal Helath	single	25 grs	9	0	0	0	0
Feed material of cereal grain origin - maize - at feed mill - Surveillance - official controls	Animal Helath	single	25 grs	6	0	0	0	0
Feed material of cereal grain origin - maize - derived - Surveillance - official controls	Animal Helath	single	25 grs	9	0	0	0	0
Feed material of cereal grain origin - other cereal grain derived - at feed mill - Surveillance - official controls (oat)	Animal Helath	single	25 grs	1	0			
Feed material of cereal grain origin - wheat derived - at feed mill - Surveillance - official controls	Animal Helath	single	25 grs	2	0	0	0	0
Feed material of oil seed or fruit origin - soya (bean) derived - Surveillance - official controls	Animal Helath	single	25 grs	7	0	0	0	0
Other feed material - other seeds and fruits - Surveillance - official controls [1)]	Animal Helath	single	25 grs	3	1	0	0	1
Other feed material - tubers, roots and similar products - Surveillance - official controls	Animal Helath	single	25 grs	1	0	0	0	0

Comments:

[1)] Cascarilla de cacao

Footnote:

Catalunya, Cantabria

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Agona	S. Enteritidis	S. Havana	S. Kentucky	S. Livingstone	S. Tennessee
Compound feedingstuffs for cattle - final product - in total - Surveillance - official controls	Animal Helath	single	25 grs	77	2	1	0	0	1	0	0
Compound feedingstuffs for horses - at farm - Surveillance	Animal Helath	single	25 grs	1	0	0	0	0	0	0	0
Compound feedingstuffs for pigs - final product - in total - Surveillance - official controls	Animal Helath	single	25 grs	71	1	0	0	0	0	1	0
Compound feedingstuffs for poultry (non specified) - final product - in total - Surveillance - official controls	Animal Helath	single	25 grs	9	0						
Compound feedingstuffs for poultry - laying hens - final product - at feed mill - Surveillance - official controls	Animal Helath	single	25 grs	13	2	0	0	1	0	0	0
Compound feedingstuffs for poultry -breeders - final product - at feed mill - Surveillance - official controls	Animal Helath	single	25 grs	5	1						1
Compound feedingstuffs for rabbits - in total - Monitoring - official sampling	Animal Helath	single	25 grs	3	0						
Compound feedingstuffs for sheep - in total - Monitoring - official sampling	Animal Helath	single	25 grs	2	0						
Compund feedingstuffs for poultry - broilers - final product - at farm - feed sample - Control and eradication programmes - official sampling - selective sampling	Animal Helath	single	25 grs	9	0	0	0	0	0	0	0
Pet food - dog snacks (pig ears, chewing bones) - at feed mill - Surveillance - official controls	Animal Helath	single	25 grs	6	1	1					

Table Salmonella in compound feedingstuffs

	S. Typhimurium	Salmonella spp., unspecified
Compound feedingstuffs for cattle - final product - in total - Surveillance - official controls	0	0
Compound feedingstuffs for horses - at farm - Surveillance	0	0
Compound feedingstuffs for pigs - final product - in total - Surveillance - official controls	0	0
Compound feedingstuffs for poultry (non specified) - final product - in total - Surveillance - official controls		
Compound feedingstuffs for poultry - laying hens - final product - at feed mill - Surveillance - official controls	0	1
Compound feedingstuffs for poultry -breeders - final product - at feed mill - Surveillance - official controls		
Compound feedingstuffs for rabbits - in total - Monitoring - official sampling		
Compound feedingstuffs for sheep - in total - Monitoring - official sampling		
Compund feedingstuffs for poultry - broilers - final product - at farm - feed sample - Control and eradication programmes - official sampling - selective sampling	0	0
Pet food - dog snacks (pig ears, chewing bones) - at feed mill - Surveillance - official controls		

Footnote:

Madrid, Catalunya, Extremadura, Cantabria

2.1.6 Salmonella serovars and phagetype distribution

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

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory								
Number of isolates serotyped	**47**	**0**	**385**	**0**	**491**	**0**	**0**	**0**
Number of isolates per serovar								
S. Adelaide					1			
S. Agona			1		7			
S. Albany					1			
S. Altona	6		2		3			
S. Anatum	25		35		4			
S. Bovismorbificans			5					
S. Braenderup					1			

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory								
Number of isolates serotyped	**47**	**0**	**385**	**0**	**491**	**0**	**0**	**0**
Number of isolates per serovar								
S. Brandenburg			5					
S. Bredeney	1		22		7			
S. Brikama			5		1			
S. Cerro			2		2			
S. Corvallis					8			
S. Dabou					2			
S. Derby			39		1			
S. Enteritidis			4		202			
S. Give			1		1			
S. Goldcoast	1		15		4			
S. Grumpensis					1			
S. Hadar					13			

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory								
Number of isolates serotyped	**47**	**0**	**385**	**0**	**491**	**0**	**0**	**0**
Number of isolates per serovar								
S. Havana					1			
S. Indiana					5			
S. Infantis			3		38			
S. Kapemba			9					
S. Kentucky					2			
S. Kottbus					1			
S. Lexington					1			
S. Livingstone			2		9			
S. Llandoff					1			
S. London			20		3			
S. Mbandaka	2		1		25			
S. Meleagridis			16		2			

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory								
Number of isolates serotyped	**47**	**0**	**385**	**0**	**491**	**0**	**0**	**0**
Number of isolates per serovar								
S. Mikawasima					5			
S. Montevideo	9				5			
S. Muenchen			14		7			
S. Newport					2			
S. Ohio			2		15			
S. Panama	1		3					
S. Reading			9					
S. Rissen			71		4			
S. Schwarzengrund					1			
S. Senftenberg					4			
S. Tennessee			1		1			
S. Toulon					1			

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory								
Number of isolates serotyped	**47**	**0**	**385**	**0**	**491**	**0**	**0**	**0**
Number of isolates per serovar								
S. Typhimurium	2		62		29			
S. Virchow					8			
S. Wien			14					
Salmonella spp., unspecified			22		62			

Footnote:

Gallus gallus: breeding flocks, laying hens and broilers
Pigs: breeding pigs and fattening pigs

Table Salmonella serovars in food

Serovars	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory					**58**					
Number of isolates serotyped	**0**	**0**	**0**	**0**	**58**	**0**	**0**	**0**	**0**	**0**
Number of isolates per serovar										
S. Anatum					1					
S. Blockley					5					
S. Bredeney					1					
S. Carnac					1					
S. Corvallis					1					
S. Enteritidis					22					
S. Hadar					6					
S. Infantis					2					
S. Mbandaka					4					
S. Ohio					1					
S. Senftenberg					2					
S. Thompson					1					

Table Salmonella serovars in food

Serovars	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory					**58**					
Number of isolates serotyped	**0**	**0**	**0**	**0**	**58**	**0**	**0**	**0**	**0**	**0**
Number of isolates per serovar										
S. Typhimurium					4					
S. Virchow					7					

Footnote:

Source: NATIONAL REFERENCE LABORATORY.

Table Salmonella Enteritidis phagetypes in food

Phagetype	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory					**22**					
Number of isolates phagetyped	**0**	**0**	**0**	**0**	**22**	**0**	**0**	**0**	**0**	**0**
Number of isolates per type										
PT 21					1					
PT 35					2					
PT 31					2					
1					15					
6a					1					
1b					1					

Footnote:

Source: NATIONAL REFERENCE LABORATORY.

Table Salmonella Typhimurium phagetypes in food

Phagetype	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory					**4**					
Number of isolates phagetyped	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**
Number of isolates per type										
DT 104					1					
Not typeable					1					
1					1					
193					1					

Footnote:

Source: NATIONAL REFERENCE LABORATORY.

2.1.7 Antimicrobial resistance in Salmonella isolates

A. Antimicrobial resistance in Salmonella in cattle

Sampling strategy used in monitoring

Frequency of the sampling

see text form on Salmonella spp. in bovine animals

Type of specimen taken

see text form on Salmonella spp. in bovine animals

Methods of sampling (description of sampling techniques)

see text form on Salmonella spp. in bovine animals

Procedures for the selection of isolates for antimicrobial testing

all positive samples (47)

Methods used for collecting data

national survey 2008

Laboratory methodology used for identification of the microbial isolates

see text form on Salmonella spp. in bovine animals

Laboratory used for detection for resistance

Antimicrobials included in monitoring

see table on antimicrobial resistance in Salmonella in cattle

Breakpoints used in testing

see table of breakpoints

Results of the investigation

Number of isolates tested: 47
Low or no resistance to the antimicrobials tested.

B. Antimicrobial resistance in Salmonella in pigs

Sampling strategy used in monitoring

Frequency of the sampling

There has been a specific monitoring programme for antimicrobial surveillance running from 1999 at national level in Spain. These national surveys are performed in fattening pigs at slaughterhouse. Additionally, in 2008 a EU baseline survey has been performed in breeding pigs, including the monitoring of the antimicrobial resistance of the isolates. For more information on the frequency of sampling, please, see text forms on Salmonella in pigs.

Type of specimen taken

There has been a specific monitoring programme for antimicrobial surveillance running from 1999 at national level in Spain. These national surveys are performed in fattening pigs at slaughterhouse. Additionally, in 2008 a EU baseline survey has been performed in breeding pigs, including the monitoring of the antimicrobial resistance of the isolates. For more information please, see text forms on Salmonella in pigs.

Methods of sampling (description of sampling techniques)

There has been a specific monitoring programme for antimicrobial surveillance running from 1999 at national level in Spain. These national surveys are performed in fattening pigs at slaughterhouse. Additionally, in 2008 a EU baseline survey has been performed in breeding pigs, including the monitoring of the antimicrobial resistance of the isolates. For more information on the frequency of sampling, please, see text forms on Salmonella in pigs.

Procedures for the selection of isolates for antimicrobial testing

There has been a specific monitoring programme for antimicrobial surveillance running from 1999 at national level in Spain. These national surveys are performed in fattening pigs at slaughterhouse. Additionally, in 2008 a EU baseline survey has been performed in breeding pigs, including the monitoring of the antimicrobial resistance of the isolates.

Following point 2 of the Annex of Commision Decision 2007/407/CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

All the isolates from fattening pigs (66) have been tested for antimicrobial resistance.
A total of 321 isolates from breeding pigs have been tested for antimicrobial resistance, following Decision 2008/55/EC.

Methods used for collecting data

Following point 2 of the Annex of Commision Decision 2007/407/CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Laboratory methodology used for identification of the microbial isolates

There has been a specific monitoring programme for antimicrobial surveillance running from 1999 at national level in Spain. These national surveys are performed in fattening pigs at slaughterhouse. Additionally, in 2008 a EU baseline survey has been performed in breeding pigs, including the monitoring of the antimicrobial resistance of the isolates. For more information please, see text forms on Salmonella in pigs.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Following point 2 of the Annex of Commision Decision 2007/407/CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

See tables on antimicrobial resistance.

Breakpoints used in testing

Following point 2 of the Annex of Commision Decision 2007/407/CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

See table on breakpoints.

Results of the investigation

Fattening pigs:

Number of isolates tested: 66

High levels of resistance to Tetracyclin and Sulfonamides.Low levels of resistace to Nalidixic acid, Ciprofloxacin and Ampicillin. No resistace to third generation Cephalosporins.

No ESBL has been detected.

Breeding pigs:

Number of isolates tested: 320

High level of resistance to Tetracyclin. Low level of resistance to Ciprofloxacin, Gentamicin, Nalidixic acid and third generation Cephalosporins. No resistance to Colistin.

C. Antimicrobial resistance in Salmonella in poultry

Sampling strategy used in monitoring

Frequency of the sampling

National antimicrobial resistance surveillance programme has been running from 2003 at national level. In 2008, a national control programme has been applied in laying hens and and a national control plan in broilers. Then, sampling strategies and frequency of sampling has been performed following Commission Regulation (EC) No 1168/2006 of 31 July 2006 implementing Regulation (EC) No 2160/2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/2005 and Commission Regulation (EC) No 646/2007 of 12 June 2007 implementing Regulation (EC) No 2160/2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/2005.

Type of specimen taken

Laying hens: following point 2.2. of the Annex of Commission Regulation (EC) No 1168/2006 of 31 July 2006 implementing Regulation (EC) No 2160/2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/2005.

Broilers: point 2 of the Annex of Commission Regulation (EC) No 646/2007 of 12 June 2007 implementing Regulation (EC) No 2160/2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/2005

Methods of sampling (description of sampling techniques)

Laying hens: following point 2.2. of the Annex of Commission Regulation (EC) No 1168/2006 of 31 July 2006 implementing Regulation (EC) No 2160/2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/2005.

Broilers: point 2 of the Annex of Commission Regulation (EC) No 646/2007 of 12 June 2007 implementing Regulation (EC) No 2160/2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/2005

Procedures for the selection of isolates for antimicrobial testing

Following ponit 2 of the Annex of Commision Decision 2007/407/CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Methods used for collecting data

Following article 2 of Commision Decision 2007/407/CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Laboratory methodology used for identification of the microbial isolates

Laying hens: following point 3 of the Annex of Commission Regulation (EC) No 1168/2006 of 31 July 2006 implementing Regulation (EC) No 2160/2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/2005.

Broilers: point 3 of the Annex of Commission Regulation (EC) No 646/2007 of 12 June 2007 implementing Regulation (EC) No 2160/2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/2005

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Following point 4 of the Annex of Commision Decision 2007/407/CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Breakpoints used in testing

Following point 4 of the Annex of Commision Decision 2007/407/CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Preventive measures in place

Article 2 of Commission Regulation (EC) No 1177/2006 of 1 August 2006 implementing Regulation (EC) No 2160/2003 of the European Parliament and of the Council as regards requirements for the use of specific control methods in the framework of the national programmes for the control of salmonella in poultry.

Control program/mechanisms

The control program/strategies in place

Spanish control programmes on Salmonella in breeding flocks of Gallus gallus, laying hens and broilers 2008.

Recent actions taken to control the zoonoses

Spanish control programmes of Salmonella in breeding flocks of Gallus gallus, laying hens and broilers 2008.

Measures in case of the positive findings or single cases

Spanish control programmes of Salmonella in breeding flocks of Gallus gallus, laying hens and broilers 2008.

Notification system in place

Spanish control programmes of Salmonella in breeding flocks of Gallus gallus, laying hens and broilers 2008.

Results of the investigation

Laying hens:
Number of isolates tested: 196
Low levels of reistance in general, the highest ones to Ciprofloxacin (25%) and Nalidixic acid (23,47%).No resistance to Colistin and third generation Cephalosporins.

Broilers:
Number of isolates tested: 56
High level of resistance to Ciprofloxacin and Nalidixic acid (>50%).

Table Antimicrobial susceptibility testing of S. Derby in Pigs - breeding animals - at farm - animal sample - faeces - Survey - EU baseline survey - quantitative data [Dilution method]

S. Derby		Pigs - breeding animals - - faeces - Survey - EU baseline survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		29																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	29	1							21	5	2					1								
	Kanamycin	8	29	1										25	3		1									
	Neomycin		0	0																						
	Streptomycin	32	29	16											4	8	1	1	8	7						
Amphenicols	Chloramphenicol	16	29	1											23	5			1							
	Florfenicol	16	29	0										8	21											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	28	0					20	7	1															
	Ceftazidim	2	29	0						1	25	3														
Fluoroquinolones	Ciprofloxacin	0.06	29	0		22	7																			
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	29	3								15	11					3								
Quinolones	Nalidixic acid	16	29	0										27	2											
Sulfonamides	Sulfonamide	256	29	18													1	6	3	1			18			
Tetracyclines	Tetracyclin	8	29	26									3			1	1	9	15							
Trimethoprim	Trimethoprim	2	29	2							27							2								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

Multiresistance is calculated using only the 10 antimicrobials mentioned in Commission Decision of 12/06/2007

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

S. Enteritidis		Gallus gallus (fowl) - laying hens - at farm - Survey - national survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		78																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	78	1						38	36	2	1					1								
	Kanamycin	8	78	0										78												
	Neomycin		0	0																						
	Streptomycin	32	78	2									23	47	6			1		1						
Amphenicols	Chloramphenicol	16	78	0										39	39											
	Florfenicol	16	78	0										72	6											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	78	0				40	37	1																
	Ceftazidim	2	78	0						70	7	1														
Fluoroquinolones	Ciprofloxacin	0.06	78	40		19	18	1	14	25	1															
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	78	5							1	48	22	2				5								
Quinolones	Nalidixic acid	16	78	38										37	3				38							
Sulfonamides	Sulfonamide	256	78	1													10	38	28	1			1			
Tetracyclines	Tetracyclin	8	78	4								21	53				1	1	2							
Trimethoprim	Trimethoprim	2	78	1							69	6	2					1								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S. Enteritidis in Gallus gallus (fowl) - broilers - at farm - environmental sample - boot swabs - Survey - national survey - quantitative data [Dilution method]

S. Enteritidis		Gallus gallus (fowl) - broilers - at farm - environmental sample - boot swabs - Survey - national survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		26																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	26	0						9	14	2	1													
	Kanamycin	8	26	0										26												
	Neomycin		0	0																						
	Streptomycin	32	26	0									7	15	4											
Amphenicols	Chloramphenicol	16	26	0									1	4	20	1										
	Florfenicol	16	26	0									1	22	3											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	26	0				12	12	2																
	Ceftazidim	2	26	0						19	7															
Fluoroquinolones	Ciprofloxacin	0.06	26	22			3	1	2	19	1															
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	26	0								19	5	2												
Quinolones	Nalidixic acid	16	26	22										3	1				22							
Sulfonamides	Sulfonamide	256	26	0													4	17	3	2						
Tetracyclines	Tetracyclin	8	26	1								5	18	2				1								
Trimethoprim	Trimethoprim	2	26	0							24	2														
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S. Infantis in Gallus gallus (fowl) - laying hens - at farm - Survey - national survey - quantitative data [Dilution method]

S. Infantis		Gallus gallus (fowl) - laying hens - at farm - Survey - national survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		17																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	17	0						3	6	5	3													
	Kanamycin	8	17	0										13	4											
	Neomycin		0	0																						
	Streptomycin	32	17	0										1	9	6	1									
Amphenicols	Chloramphenicol	16	17	0											16	1										
	Florfenicol	16	17	0										4	13											
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	17	0				1	12	4																
	Ceftazidim	2	17	0						1	15		1													
Fluoroquinolones	Ciprofloxacin	0.06	17	2	1	2	12		1	1																
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	17	0								11	6													
Quinolones	Nalidixic acid	16	17	2										13	2				2							
Sulfonamides	Sulfonamide	256	17	1													1	3	9	3		1				
Tetracyclines	Tetracyclin	8	17	2								1	12	2			2									
Trimethoprim	Trimethoprim	2	17	2							11	3	1					2								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S. Rissen in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - quantitative data [Dilution method]

S. Rissen		Pigs - fattening pigs - - faeces - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		14																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	13	1						1	7	3	1		1											
	Kanamycin	8	14	0										11	3											
	Neomycin		0	0																						
	Streptomycin	32	14	1									1		2	6	4	1								
Amphenicols	Chloramphenicol	16	14	1											12	1		1								
	Florfenicol	16	13	0										4	8	1										
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	14	0					8	6																
	Ceftazidim	2	14	0							11	3														
Fluoroquinolones	Ciprofloxacin	0.06	14	1		3	9	1				1														
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	14	1								9	4					1								
Quinolones	Nalidixic acid	16	14	0										14												
Sulfonamides	Sulfonamide	256	14	5												1		5	3				5			
Tetracyclines	Tetracyclin	8	14	11									3					4	7							
Trimethoprim	Trimethoprim	2	14	5							9							5								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

Multiresistance is calculated using only the 10 antimicrobials mentioned in Commission Decision of 12/06/2007

Table Antimicrobial susceptibility testing of S. Typhimurium in Pigs - breeding animals - at farm - animal sample - faeces - Survey - EU baseline survey - quantitative data [Dilution method]

S. Typhimurium		Pigs - breeding animals - - faeces - Survey - EU baseline survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		47																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	37	1						5	29	1	1			1										
	Kanamycin	8	47	0										43	4											
	Neomycin		0	0																						
	Streptomycin	32	47	26											6	2	13	7	11	8						
Amphenicols	Chloramphenicol	16	47	31										2	14			4	27							
	Florfenicol	16	47	6										30	4	7	3	3								
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	47	7				14	13	7	6	6	1													
	Ceftazidim	2	47	0						31	15	1														
Fluoroquinolones	Ciprofloxacin	0.06	47	3		10	34			2	1															
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	47	35								7	4	1				35								
Quinolones	Nalidixic acid	16	47	3										36	8				3							
Sulfonamides	Sulfonamide	256	47	39												1	2	5					39			
Tetracyclines	Tetracyclin	8	47	36								1	10				4	2	30							
Trimethoprim	Trimethoprim	2	47	11							35	1						11								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

Multiresistance is calculated using only the 10 antimicrobials mentioned in Commission Decision of 12/06/2007

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

S. Typhimurium		Gallus gallus (fowl) - laying hens - at farm - Survey - national survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		17																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	17	0						5	10	1	1													
	Kanamycin	8	17	1										16		1										
	Neomycin		0	0																						
	Streptomycin	32	17	4									1	1	7	3	1	4								
Amphenicols	Chloramphenicol	16	17	4										2	11				4							
	Florfenicol	16	17	4										9	4		2	1	1							
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	17	0				12	4	1																
	Ceftazidim	2	17	0						13	3	1														
Fluoroquinolones	Ciprofloxacin	0.06	17	1		9	7		1																	
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	13	5							1		7					5								
Quinolones	Nalidixic acid	16	17	0										15	2											
Sulfonamides	Sulfonamide	256	17	4											2		1	6	3	1			4			
Tetracyclines	Tetracyclin	8	17	5								1	11			1	2	2								
Trimethoprim	Trimethoprim	2	17	1							15	1			1											
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S. Typhimurium in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - quantitative data [Dilution method]

S. Typhimurium		Pigs - fattening pigs - - faeces - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		14																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	14	0						3	7	4														
	Kanamycin	8	13	0										11	2											
	Neomycin		0	0																						
	Streptomycin	32	14	11												1	2	4	4	3						
Amphenicols	Chloramphenicol	16	14	10										1	3			1	9							
	Florfenicol	16	14	5										6	1	2	3	1	1							
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	14	0				2	9	1	2															
	Ceftazidim	2	14	0						4	10															
Fluoroquinolones	Ciprofloxacin	0.06	14	1		1	12			1																
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	14	12								2					1	11								
Quinolones	Nalidixic acid	16	14	1										13					1							
Sulfonamides	Sulfonamide	256	14	13														1				2	11			
Tetracyclines	Tetracyclin	8	14	13									1			1	3	3	6							
Trimethoprim	Trimethoprim	2	14	3							10	1						3								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

Multiresistance is calculated using only the 10 antimicrobials mentioned in Commission Decision of 12/06/2007

Table Antimicrobial susceptibility testing of Salmonella spp. in food

Salmonella spp.		**Meat from bovine animals**		**Meat from pig**		**Meat from broilers (Gallus gallus)**		**Meat from other poultry species**		**Other food**		**Meat, mixed meat**	
Isolates out of a monitoring program (yes/no)													
Number of isolates available in the laboratory		8		43		42		5		89		15	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides	**Amikacin**	3	0	31	0	32	0			14	0		
	Gentamicin	7	0	43	1	42	0	5	0	89	0	15	2
	Kanamycin	7	0	40	2	33	0	5	0	74	0	15	6
	Neomycin			3	0					15	4	12	7
	Streptomycin	8	5	43	27	42	2	5	0	89	36	15	13
	Tobramycin	3	0	28	1	32	0			14	0		
Amphenicols	**Chloramphenicol**	8	0	40	8	42	1	5	0	89	11	15	5
	Florfenicol	1	0	3	0					10	0		
Carbapenems	**Imipenem**	3	0	31	0	33	0			14	0		
Cephalosporins	**3rd generation cephalosporins**	5	0	34	0	42	0	5	0	74	0	12	0
	Cefazolin	3	0	31	0	33	0			14	0		
	Cefepime	3	0	31	0	33	0			14	0		
	Cefoxitin	3	0	28	0	33	0			14	0		
	Cefuroxim	3	0	28	1	33	1			14	0		
Fluoroquinolones	**Ciprofloxacin**	5	0	34	0	42	1	5	0	89	7	12	0
	Enrofloxacin	1	0					2	0	10	0	12	0
Fully sensitive	**Fully sensitive**	4	0	39	9	42	4	1	0	74	17		
Penicillins	**Amoxicillin / Clavulanic acid**	3	0	31	3	33	1			14	0		
	Ampicillin	8	0	43	15	42	3	5	0	89	29	15	9
	Piperacillin	3	0	28	9	33	1			14	2		

Table Antimicrobial susceptibility testing of Salmonella spp. in food

Salmonella spp.		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Meat from other poultry species		Other food		Meat, mixed meat	
Isolates out of a monitoring program (yes/no)													
Number of isolates available in the laboratory		8		43		42		5		89		15	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n	N	n
Quinolones	Nalidixic acid	8	0	43	4	42	37	5	4	89	14	15	2
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	3	2	38	3	42	33	4	1	73	40	3	3
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	4	2	31	0	42	1			73	6		
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	3	0	31	8	42	2			73	7	12	2
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	6	3	39	4	33	1			73	2	12	2
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	3	0	31	13	33	1			73	8	12	8
Sulfonamides	Sulfonamide	8	4	40	23	42	4	5	0	74	12	15	15
Tetracyclines	Tetracyclin	8	5	40	25	42	1	5	0	74	28	15	15
Trimethoprim	Trimethoprim									64	4		
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides	4	0	34	7	42	0	3	0	77	4	12	9

Footnote:

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Table Antimicrobial susceptibility testing of Other serotypes in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - quantitative data [Dilution method]

Other serotypes		Pigs - fattening pigs - - faeces - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		38																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	38	0						4	17	13	4													
	Kanamycin	8	38	3										31	4					3						
	Neomycin		0	0																						
	Streptomycin	32	38	14										1	11	8	4	3	5	6						
Amphenicols	Chloramphenicol	16	38	6										17	15			4	2							
	Florfenicol	16	38	1										28	8	1			1							
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	38	0				8	26	4																
	Ceftazidim	2	38	0						14	24															
Fluoroquinolones	Ciprofloxacin	0.06	38	3		9	23	3		2	1															
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	38	8							5	22	3					8								
Quinolones	Nalidixic acid	16	38	3										32		3			3							
Sulfonamides	Sulfonamide	256	38	19											1		4	7	7				19			
Tetracyclines	Tetracyclin	8	38	18								3	14	3		1	4	13								
Trimethoprim	Trimethoprim	2	38	9							28	1						9								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

This table includes results of all the serotypes except Typhimurium and Rissen that are reported separately (10 Derby strains are included).
Multiresistance is calculated using only the 10 antimicrobials mentioned in Commission Decision of 12/06/2007

Table Antimicrobial susceptibility testing of Other serotypes in Pigs - breeding animals - at farm - animal sample - faeces - quantitative data [Dilution method]

Other serotypes		Pigs - breeding animals - - faeces																								
Isolates out of a monitoring program (yes/no)																										
Number of isolates available in the laboratory																										
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	0	0																						
	Kanamycin	8	0	0																						
	Neomycin		0	0																						
	Streptomycin	32	0	0																						
Amphenicols	Chloramphenicol	16	0	0																						
	Florfenicol	16	0	0																						
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	0	0																						
	Ceftazidim	2	0	0																						
Fluoroquinolones	Ciprofloxacin	0.06	0	0																						
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	0	0																						
Quinolones	Nalidixic acid	16	0	0																						
Sulfonamides	Sulfonamide	256	0	0																						
Tetracyclines	Tetracyclin	8	0	0																						
Trimethoprim	Trimethoprim	2	0	0																						
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of Other serotypes in Pigs - breeding animals - at farm - animal sample - faeces - Survey - EU baseline survey - quantitative data [Dilution method]

Other serotypes		Pigs - breeding animals - - faeces - Survey - EU baseline survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		244																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	244	10						29	142	58	5	2	2	3		3								
	Kanamycin	8	244	18										194	32	4	1			13						
	Neomycin		0	0																						
	Streptomycin	32	244	42										26	87	54	35	10	7	25						
Amphenicols	Chloramphenicol	16	244	35										15	182	12	2	4	29							
	Florfenicol	16	244	4									5	123	98	14	2		2							
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	243	2				81	148	12					2											
	Ceftazidim	2	244	2						89	149	4					2									
Fluoroquinolones	Ciprofloxacin	0.06	243	19		87	131	6	1	8	9	1														
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	244	67								121	54	2		1	1	65								
Quinolones	Nalidixic acid	16	244	21										204	11	8	3		18							
Sulfonamides	Sulfonamide	256	243	84												2	26	97	31	3	1	8	75			
Tetracyclines	Tetracyclin	8	244	137								9	94	1	3	12	16	34	75							
Trimethoprim	Trimethoprim	2	244	65							162	12	5		1	2	1	61								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

This table include results of all the serotypes except Typhimurium and Derby that are reported separately.
Multiresistance is calculated using only the 10 antimicrobials mentioned in Commission Decision of 12/06/2007

Table Antimicrobial susceptibility testing of Other serotypes in Gallus gallus (fowl) - laying hens - at farm - Survey - national survey - quantitative data [Dilution method]

Other serotypes		Gallus gallus (fowl) - laying hens - at farm - Survey - national survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		84																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	84	0						18	45	19	2													
	Kanamycin	8	84	0										73	11											
	Neomycin		0	0																						
	Streptomycin	32	84	5									1	15	38	17	8	3	2							
Amphenicols	Chloramphenicol	16	84	1										19	63	1			1							
	Florfenicol	16	84	0									3	63	17	1										
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	84	0				46	32	4	2															
	Ceftazidim	2	84	0						49	30	5														
Fluoroquinolones	Ciprofloxacin	0.06	84	5	1	32	45	1	2	1					1	1										
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	84	6								59	18	1		1		5								
Quinolones	Nalidixic acid	16	84	6										73	5		1		5							
Sulfonamides	Sulfonamide	256	84	10												2	7	41	19	5		1	9			
Tetracyclines	Tetracyclin	8	84	12								13	59					9	3							
Trimethoprim	Trimethoprim	2	84	6							69	7	2	1				5								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

This table include results of all the serotypes except Enteritidis, Typhimurium and Infantis that are reported separately.
Multiresistance is calculated using only the 10 antimicrobials mentioned in Commission Decision of 12/06/2007

Table Antimicrobial susceptibility testing of Other serotypes in Gallus gallus (fowl) - broilers - at farm - environmental sample - boot swabs - Survey - national survey - quantitative data [Dilution method]

Other serotypes		Gallus gallus (fowl) - broilers - at farm - environmental sample - boot swabs - Survey - national survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		30																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	30	1						6	18	5						1								
	Kanamycin	8	30	5										24	1			1		4						
	Neomycin		0	0																						
	Streptomycin	32	30	5									1	2	14	7	1	2	3							
Amphenicols	Chloramphenicol	16	30	1										3	25	1		1								
	Florfenicol	16	30	0									1	24	3	2										
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	30	2				14	12	1	1				2											
	Ceftazidim	2	30	3						13	13	1					2	1								
Fluoroquinolones	Ciprofloxacin	0.06	30	9		18	2	1	3	3	1	2														
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	30	4							2	20	4					4								
Quinolones	Nalidixic acid	16	30	8										20		2			8							
Sulfonamides	Sulfonamide	256	30	3											2		4	13	8				3			
Tetracyclines	Tetracyclin	8	30	7								4	19				1	5	1							
Trimethoprim	Trimethoprim	2	30	2							27	1						2								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

This table include results of all the serotypes except Enteritidis that is reported separately.
Multiresistance is calculated using only the 10 antimicrobials mentioned in Commission Decision of 12/06/2007

Table Breakpoints for antibiotic resistance testing

Test Method Used	
Disc diffusion	○
Agar dilution	◉
Broth dilution	○
E-test	○

Standards used for testing
EU

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**				2	0.25	32				
	Kanamycin				8	4	128				
	Streptomycin				32	2	128				
Amphenicols	**Chloramphenicol**				16	2	64				
	Florfenicol				16	2	64				
Cephalosporins	**Cefotaxim**				0.5	0.06	4				
	Ceftazidim				2	0.25	16				
Fluoroquinolones	**Ciprofloxacin**				0.06	0.008	8				
Penicillins	**Ampicillin**				4	05	32				
Quinolones	**Nalidixic acid**				16	4	64				
Sulfonamides	**Sulfonamide**				256	8	1024				
Tetracyclines	**Tetracyclin**				8	1	64				
Trimethoprim	**Trimethoprim**				2	0.5	32				

Table Breakpoints for antibiotic resistance testing

Test Method Used	
Disc diffusion	◉
Agar dilution	○
Broth dilution	○
E-test	○

Standards used for testing
NCCLS

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Amikacin**							30	17	15	14
	Gentamicin							10	15	13	12
	Kanamycin							30	18	15	13
	Streptomycin							10	15	13	11
	Tobramycin							10	15	14	12
Amphenicols	**Chloramphenicol**	M100						30	18	15	12
Carbapenems	**Imipenem**							10	16	15	13
Cephalosporins	**3rd generation cephalosporins**							30	23	19	14
	Cefazolin							30	18	16	14
	Cefepime							30	18	16	14
	Cefoxitin							30	18	16	14
	Cefuroxim							30	18	16	14
Fluoroquinolones	**Ciprofloxacin**							5	21	18	15
Penicillins	**Amoxicillin / Clavulanic acid**	M100						30	18	15	13

Table Breakpoints for antibiotic resistance testing

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Penicillins	**Ampicillin**	M100						10	17	15	13
	Piperacillin							100	21	19	17
Quinolones	**Nalidixic acid**							30	19	16	13
Sulfonamides	**Sulfonamide**							300	17	15	12
Tetracyclines	**Tetracyclin**	M100						30	15	13	11
Trimethoprim	**Trimethoprim**							5	16	13	10
Trimethoprim + sulfonamides	**Trimethoprim + sulfonamides**							25	16	13	10

Footnote:

HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES
NATIONAL REFERENCE LABORATORY

2.2 CAMPYLOBACTERIOSIS

2.2.1 General evaluation of the national situation

A. Thermophilic Campylobacter general evaluation

History of the disease and/or infection in the country

Campylobacter spp. is at the moment one of the most frequent causes of gastroenteritis in humans.Poultry are the main reservoir, and infection happens usually by consume of poultry meat.
Until the end of the 60's importance of Campylobacter spp. was not valued.

Notification of the disease is also infravaluated in surveillance systems.Epidemiology investigations associated cases to poultry meat consume and a deficient handle of food.
The number of human cases in Spain is at the moment supported in the notifications made to Microbiology Information System (SIM).

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

Poultry meat is the main source of infection.Another food implicated are red meat, raw milk, non pasteurized cheese, and water.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

More studies need to de developed. In 2008, surveys have been performed in broilers (EU-baseline survey), cattle and pigs (national surveys).

Recent actions taken to control the zoonoses

Surveillance of the zoonoses according to Council Directive 2003/99/EEC.
EU-baseline survey following Commission Decision 2007/516/EC.

2.2.2 Campylobacteriosis in humans

A. Thermophilic Campylobacter in humans

Reporting system in place for the human cases

In December of 1995 the National Network of Epidemiological Surveillance was created by law. This law and its development produced changes in the surveillance system. During 1997 the protocols of statutory notification of diseases were approved and implemented in Spain. In Spain the Autonomous Regions have wide powers with respect to epidemiological surveillance and national decisions are usually taken by consensus..

- Microbiological Information System
The Microbiological Information System has been based since 1989 on voluntary weekly reporting by clinical microbiology laboratories (principally hospital laboratories). Currently, in order to improve the notification, this procedure is becoming compulsory for a designated group of representative laboratories. The information in these reports is based on individual cases and includes the following variables: agent, time, place, age, sex, etc.

- Enter-net
Spain participates in Enter-net, an European network for the surveillance of human gastrointestinal infections. Enternet has monitored salmonellosis since 1994 and Vero cytotoxin producing Escherichia coli O157 since 1999. Each country participates with a microbiologist of the national reference laboratory (source of the data) and the epidemiologist responsible for national surveillance.

- Outbreak reporting
In Spain outbreaks are the main source of information for the foodborne diseases

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Notification system in place

Microbiological Information System
Outbreak reporting System

History of the disease and/or infection in the country

Campylobacter is the second most common cause of bacterial foodborne disease notified to public health authorities in Spain Despite this, outbreaks of Campylobacter illness are rare in Spain.

Relevance as zoonotic disease

Campylobacter may be transmitted by food, particularly poultry, unpasteurised milk and contaminated water.

2.2.3 Campylobacter in foodstuffs

A. Thermophilic Campylobacter in Broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The activities are made according to Regulation (EC) no 178/2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs) must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Other: fresh meat and skin

At meat processing plant

Other: fresh meat and skin

At retail

Other: fresh meat and skin

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Other: bacteriological method: ISO 10272:2006

At meat processing plant

Other: Bacteriological method:ISO10272:2006

At retail

Other: Bacteriological method: ISO 10272:2006

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus) - at slaughterhouse - Survey (carcass)	L	single	25 g	389	349	165	94			90
Meat from broilers (Gallus gallus) - fresh - at processing plant	F	single	25g	50	29	7	15			7
Meat from broilers (Gallus gallus) - fresh - at retail	F	single	25g	165	22	0	6			16
Meat from broilers (Gallus gallus) - fresh - at slaughterhouse	F	single	25g	31	13	2	1			10
Meat from poultry, unspecified - Monitoring (poultry and cooked poultry carcasses)	L				25	11	14			
Meat from poultry, unspecified - at slaughterhouse	F	single	25g	76	48	2	1			45

Footnote:

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L: NATIONAL REFERENCE LABORATORY

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Meat from bovine animals - fresh - at retail	F	single	25g	3	0					
Meat from bovine animals - minced meat - intended to be eaten raw - at retail	F	single	25g	61	1					1
Meat from other animal species or not specified	F	single	25g	26	5		4			1
Meat from pig - fresh - at processing plant	F	single	25g	96	6					6
Meat from pig - fresh - at retail	F	single	25g	33	2					2
Meat from pig - fresh - at slaughterhouse	F	single	25g	50	0					
Milk, cows' - raw	F	single	25g	1	0					

Footnote:

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

2.2.4 Campylobacter in animals

A. Thermophilic Campylobacter in Gallus gallus

Monitoring system

Sampling strategy

Following Commission Decision 2007/516/EC.

Frequency of the sampling

At slaughter

Following Commission Decision 2007/516/EC.

Type of specimen taken

At slaughter

Following Commission Decision 2007/516/EC.

Methods of sampling (description of sampling techniques)

At slaughter

Following Commission Decision 2007/516/EC.

Case definition

At slaughter

Following Commission Decision 2007/516/EC.

Diagnostic/analytical methods used

At slaughter

Following Commission Decision 2007/516/EC.

Vaccination policy

doesn't exist

Other preventive measures than vaccination in place

biosecurity measures, implementation of good higyene practises

Control program/mechanisms

The control program/strategies in place

doesn't exist

Results of the investigation

Number of slaughter batches tested: 389
Number of slaughter batches positive: 341
Slaughter batch prevalence: 87,7% Campylobacter spp. (95% CI: 84.11; 90.66)

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

More studies need to be performed

Relevance of the findings in animals to findings in foodstuffs and to human cases

More studies need to be performed

B. thermophilic Campylobacter spp., unspecified in animal - Pigs - fattening pigs

Monitoring system

Sampling strategy

Samples have been taken randomly in 7 representative slaughterhouses of Spain, placed in Cuenca(2), Barcelona, Ciudad Real, Murcia, Pontevedra and Toledo.

Samples have been taken only if the slaughter batch had 10 or more animals, and belonging to different herds.

Samples taken between march and december

Number of samples: 342, belonging to 171 slaughter batches (different herds)

Frequency of the sampling

2 faecal samples by slaughter batch with 10 animals or more, with a maximun of 30 slaughter batches by slaughterhouse and day and mounth of sampling.

Type of specimen taken

Faeces

Methods of sampling (description of sampling techniques)

2 faecal material samples by slaughter batch and by herd

Case definition

a slaughter batch is considered as positive if isolation by bacteriological method and PCR identification

Diagnostic/analytical methods used

isolation in agar CCDA and identification by PCR

Vaccination policy

Doesn't exist

Results of the investigation

Number of slaughter batches tested: 171
Number of slaughter batches positive: 112
Slaughter batch prevalence: 65,5% Campylobacter spp. (95% CI: 57,80;72,50)

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

More studies need to be developed

Relevance of the findings in animals to findings in foodstuffs and to human cases

More studies need to be developed

C. thermophilic Campylobacter spp., unspecified in animal - Cattle (bovine animals)

Monitoring system

Sampling strategy

Sampling has been performed in 8 slaughterhouses placed in different regions of Spain and representative of the total volume of sacrifice of the country.
Samples have been taken from june to october

Frequency of the sampling

Two faecal samples have been taken in all the slaughter batches in the day of sampling, with a maximun of 30 batches. Each batch belonged to different holdings.
Sampling has been performed in 8 slaughterhouses placed in Barcelona(3), Valencia, Huesca, Lerida, Caceres and Ciudad Real. These slaughterhouses have a high volume of activity, representing an important part of all the bovines sacrified in Spain.

A total of 336 samples have been taken, belonging to 168 slaughter batches and 168 different holdings.

Faeces were taken from the colon, refrigerated inmediatly and sent to the laboratory and analyzed before 24 hours.

Type of specimen taken

Faeces

Methods of sampling (description of sampling techniques)

Faeces were taken from the colon, refrigerated inmediatly and sent to the laboratory and analyzed before 24 hours.

Case definition

One slaughter batch was considered as positive if isolation of Campylobacter spp. by culture and identification by PCR

Diagnostic/analytical methods used

Isolation in agar CCDA and PCR

Results of the investigation

Number of slaughter batches analyzed: 168
Number of slaughter batches positive: 63
Slaughter batch prevalence: 37,5% (95% CI: 30,3;45,3)

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Cattle (bovine animals) - calves (under 1 year) - - faeces - Survey - national survey (Objective sampling)	M.A.R.M.	slaughter	168	63	10	52			1
Gallus gallus (fowl) - broilers - at slaughterhouse - Survey - EU baseline survey (Objective sampling) [1)]	M.A.R.M.	slaughter	389	341	239	154	1		2
Pigs - - faeces - Survey - national survey (Objective sampling)	M.A.R.M.	slaughter	171	112	93	0			19

Comments:

[1)] 55 slaughter batches positive both C. jejuni and C. coli

2.2.5 Antimicrobial resistance in Campylobacter isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in cattle

Sampling strategy used in monitoring

Frequency of the sampling

see text form on thermophilic Campylobacter spp. in cattle

Type of specimen taken

see text form on thermophilic Campylobacter spp. in cattle

Methods of sampling (description of sampling techniques)

see text form on thermophilic Campylobacter spp. in cattle

Procedures for the selection of isolates for antimicrobial testing

62/63 of the isolates of the national survey 2008.

Methods used for collecting data

National survey 2008.

Laboratory methodology used for identification of the microbial isolates

see text form on thermophilic Campylobacter spp. in cattle

Laboratory used for detection for resistance

Antimicrobials included in monitoring

see table

Breakpoints used in testing

see table

Results of the investigation

Number of isolates tested:
C. coli: 10
C. jejuni:52
High level of resistance of C. coli to Tetraciclyn, Ciprofloxacyn, Kanamicyn, Streptomicyn, Amoxicilyn and Nalidixic acid. No resistance to Gentamicyn and Chloranfenicol.
High level of resistance of C. jejuni to Tetraciclyn, Ciprofloxacyn and Nalidixic acid. No resistance to Chloranfenicol.

B. Antimicrobial resistance in Campylobacter jejuni and coli in pigs

Sampling strategy used in monitoring

Frequency of the sampling

see text form on thermophilic Campylobacter in pigs

Type of specimen taken

see text form on thermophilic Campylobacter in pigs

Methods of sampling (description of sampling techniques)

see text form on thermophilic Campylobacter in pigs

Procedures for the selection of isolates for antimicrobial testing

93/112 of the isolates of the national survey 2008

Methods used for collecting data

National survey 2008.

Laboratory methodology used for identification of the microbial isolates

see text form on thermophilic Campylobacter in pigs

Laboratory used for detection for resistance

Antimicrobials included in monitoring

see tables of results

Breakpoints used in testing

see table of breakpoints

Results of the investigation

Number of isolates tested: 93 (all C. coli)
High level of resistance to Nalidixic acid, Ciprofloxacyn, Tetraciclyn and Streptomicyn.Low level or no resistance to Chloranfenicol and Amoxicilyn.

C. Antimicrobial resistance in Campylobacter jejuni and coli in poultry

Sampling strategy used in monitoring

Frequency of the sampling

see text form on thermophilic Campylobacter in Gallus gallus

Type of specimen taken

see text form on thermophilic Campylobacter in Gallus gallus

Methods of sampling (description of sampling techniques)

see text form on thermophilic Campylobacter in Gallus gallus

Procedures for the selection of isolates for antimicrobial testing

339 isolates of the EU baseline survey, following Commision Decision 2007/516/EC.

Methods used for collecting data

Following Commision Decision 2007/516/EC.

Laboratory methodology used for identification of the microbial isolates

see text form on thermophilic Campylobacter in Gallus gallus

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Following Commision Decision 2007/516/EC.

Breakpoints used in testing

Following Commision Decision 2007/516/EC.

Results of the investigation

Number of isolates tested:
C. jejuni: 126
C. coli: 215

High level of resistance of C. jejuni to Ampicilyn and Kanamicyn. Low level of resistance to Chloranfenicol and Eritromicyn.
High level of resistance of C. coli to Kanamicyn. Low levels of resistance to Eritromicyn and Gentamicyn. No resistance to Chloranfenicol.

Table Antimicrobial susceptibility testing of C. coli in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey - quantitative data [Dilution method]

C. coli		Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey																							
Isolates out of a monitoring program (yes/no)		yes																							
Number of isolates available in the laboratory		214																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	214	13					1	6	78	116	7	1			5									
	Streptomycin	2	214	73							56	55	30	25	8	9	8	23								
Amphenicols	Chloramphenicol	16	214	0							4	26	74	104	4	2										
Fluoroquinolones	Ciprofloxacin	1	214	86				2	36	84	4	2	1	7	31	47										
Macrolides	Erythromycin	4	214	30						28	123	30	3		1	1	1	7	20							
Penicillins	Ampicillin	8	214	52							26	55	46	14	21	17	7	28								
Quinolones	Nalidixic acid	16	214	93									3	5	28	85	23	46	24							
Sulfonamides	Sulfonamides		214	214									2	5					19	26	38	124				
Tetracyclines	Tetracyclin	2	214	93					59	49	8	4	1	3	1	14	75									

Footnote:

Different breakpoints for erythromycin (R>16), streptomycin (R>4), and gentamicin (R>2) were applied instead of those mentioned into campylobacter breakpoint table (C. jejuni breakpoints).
Multiresistance is calculated using only the 5 antimicrobials and specific breakpoints for C. jejuni and C. coli mentioned in Commission Decision of 19 July 2007 (2007/516/EC)

Table Antimicrobial susceptibility testing of C. coli in Pigs - fattening pigs - at slaughterhouse - animal sample - caecum - Monitoring - quantitative data [Dilution method]

C. coli		Pigs - fattening pigs - at slaughterhouse - animal sample - caecum - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		93																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	93	64							3	26	50	3		1	10									
	Streptomycin	2	93	92									1	6	1		3	82								
Amphenicols	Chloramphenicol	16	93	1							1	11	48	27	5			1								
Fluoroquinolones	Ciprofloxacin	1	93	86				2	2	1	1	1		2	42	42										
Macrolides	Erythromycin	4	93	51							7	26	8	1	1	1		5	44							
Penicillins	Ampicillin	8	93	57							6	8	11	6	5	13	2	42								
Quinolones	Nalidixic acid	16	93	88											5		3	25	60							
Sulfonamides	Sulfonamides		93	93														1		1	7	84				
Tetracyclines	Tetracyclin	2	93	93											1	5	87									

Footnote:

Multiresistance is calculated using only the 5 antimicrobials and specific breakpoints for C. jejuni and C. coli mentioned in Commission Decision of 19 July 2007 (2007/516/EC)

Table Antimicrobial susceptibility testing of C. jejuni in Cattle (bovine animals) - meat production animals - at slaughterhouse - animal sample - caecum - Monitoring - quantitative data [Dilution method]

C. jejuni		Cattle (bovine animals) - meat production animals - at slaughterhouse - animal sample - caecum - Monitoring																							
Isolates out of a monitoring program (yes/no)		yes																							
Number of isolates available in the laboratory		52																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	51	2						7	31	11					2									
	Streptomycin	2	51	3							21	23	4	1	1	1										
Amphenicols	Chloramphenicol	16	52	0							3	17	24	5	2	1										
Fluoroquinolones	Ciprofloxacin	1	52	28				3	17	4				3	9	16										
Macrolides	Erythromycin	4	52	2						21	26	2	1						2							
Penicillins	Ampicillin	8	52	22							6	1	2	10	11	12		10								
Quinolones	Nalidixic acid	16	52	29										8	12	3	3	5	21							
Sulfonamides	Sulfonamides		52	52														1	4	4	5	38				
Tetracyclines	Tetracyclin	2	51	37					10	3	1				1	3	33									

Footnote:

Multiresistance is calculated using only the 5 antimicrobials and specific breakpoints for C. jejuni and C. coli mentioned in Commission Decision of 19 July 2007 (2007/516/EC)

Table Antimicrobial susceptibility testing of C. jejuni in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey - quantitative data [Dilution method]

C. jejuni		Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		125																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	125	21					1	4	45	54	17	1			3									
	Streptomycin	2	125	27							37	44	17	6	3	3	5	10								
Amphenicols	Chloramphenicol	16	125	2							7	31	52	27	5	1	1	1								
Fluoroquinolones	Ciprofloxacin	1	125	47				3	8	48	17	2	1	3	22	21										
Macrolides	Erythromycin	4	125	8						63	47	7				1			7							
Penicillins	Ampicillin	8	125	72							8	5	7	9	24	28	21	23								
Quinolones	Nalidixic acid	16	125	52									1	11	48	13	8	17	27							
Sulfonamides	Sulfonamides		125	125											1		1	3	7	31	35	47				
Tetracyclines	Tetracyclin	2	125	47					40	32	2	1	3		4	7	36									

Footnote:

Multiresistance is calculated using only the 5 antimicrobials and specific breakpoints for C. jejuni and C. coli mentioned in Commission Decision of 19 July 2007 (2007/516/EC)

Table Antimicrobial susceptibility testing of Campylobacter in food

Campylobacter spp., unspecified		Meat from other poultry species		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Eggs	
Isolates out of a monitoring program (yes/no)											
Number of isolates available in the laboratory		9						246		1	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	1	0							1	0
Cephalosporins	Cephalothin	6	6					217	212		
Fluoroquinolones	Ciprofloxacin	9	9					234	193	1	0
Fully sensitive	Fully sensitive	8	0					246	3	1	0
Macrolides	Erythromycin	9	0					231	28		
Penicillins	Ampicillin									1	0
Quinolones	Nalidixic acid	9	9					245	216	1	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	8	0					246	26		
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	8	0					246	22		
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	8	8					246	174		
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	8	0					246	21		
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	7	0								
Sulfonamides	Sulfonamides	1	1								
Tetracyclines	Tetracyclin	1	1					1	1	1	0

Footnote:

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NATIONAL REFERENCE LABORATORY

Table Breakpoints used for antimicrobial susceptibility testing

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
EU

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**				1	0.125	16				
	Streptomycin				2	0.5	32				
Amphenicols	**Chloramphenicol**				16	0.5	32				
Fluoroquinolones	**Ciprofloxacin**				1	0.06	8				
Macrolides	**Erythromycin**				4	0.25	64				
Penicillins	**Ampicillin**				8	0.5	32				
Quinolones	**Nalidixic acid**				16	2	64				
Tetracyclines	**Tetracyclin**				2	0.125	16				

Footnote:

This table contains breakpoints for C. jejuni. For C. coli they are different for erythromycin (R>16), streptomycin (R>4) and gentamicin (R>2)

Table Breakpoints used for antimicrobial susceptibility testing

Test Method Used	
Disc diffusion	◉
Agar dilution	○
Broth dilution	○
E-test	○

Standards used for testing
NCCLS

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Cephalosporins	**Cephalothin**	NCCLS						30			6
Fluoroquinolones	**Ciprofloxacin**	NCCLS						5			6
Macrolides	**Erythromycin**	NCCLS						15			6
Quinolones	**Nalidixic acid**							30			6

Footnote:

HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES
NATIONAL REFERENCE LABORATORY

2.3 LISTERIOSIS

2.3.1 General evaluation of the national situation

A. Listeriosis general evaluation

History of the disease and/or infection in the country

Listeria monocytogenes has been recognised as a human pathogen for more than 50 years. It causes invasive illness mainly in certain well defined high-risk groups, including immunocompromised persons, pregnant women and neonates. However listeriosis can occur in otherwise healthy individuals, particularly in the setting of an outbreak. The public health importance of listeriosis is not always recognised particularly because listeriosis is a relatively rare disease compared to other common food-borne illnesses such as salmonellosis. Also listeriosis is a disease that clinically affects cattle, but mainly ewes in Spain.

Recent actions taken to control the zoonoses

The activities are made according to Regulation (EC) 178/2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs). must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Sampling is distributed evenly throughout the year.

Additional information

Diagnostic methods used in food : Bacteriological method: ISO 11290-2_:2004.

2.3.2 Listeriosis in humans

A. Listeriosis in humans

Reporting system in place for the human cases

Microbiological Information System
The Microbiological Information System has been based since 1989 on voluntary weekly reporting by clinical microbiology laboratories (principally hospital laboratories). Currently, in order to improve the notification, this procedure is becoming compulsory for a designated group of representative laboratories. The information in these reports is based on individual cases and includes the following variables: agent, time, place, age, sex, etc.

Outbreak reporting
In Spain outbreaks are the main source of information for the foodborne diseases

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Notification system in place

Microbiological Information System
Outbreak reporting System

History of the disease and/or infection in the country

Listeria monocytogenes has been recognised in Spain as a human pathogen for more than 50 years. It causes invasive illness mainly in certain well defined high-risk groups, including immunocompromised persons, pregnant women and neonates. However listeriosis can occur in otherwise healthy individuals, particularly in the setting of an outbreak.

Results of the investigation

Listeriosis is most often found in young children 0-1 years old, especially babies

and elder people. Reported Listeria spp. cases concerned Listeria monocytogenes.

Relevance as zoonotic disease

The public health importance of listeriosis is not always recognised particularly because listeriosis is a relatively rare disease compared to other common food-borne illnesses such as salmonellosis. .

2.3.3 Listeria in foodstuffs

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	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 unspecified milk or other animal milk	F	single	25g	779	83	641	39	138	44	0
Dairy products (excluding cheeses) (ice-cream)	F	single	25g	1947	22	1598	16	349	6	0

Footnote:

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Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	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
Egg products	F	single	25g	401	45	318	38	83	2	5
Fishery products, unspecified	F	single	25g	890	48	732	11	153	37	0
Meat from bovine animals - fresh	F	single	25g	645	2	36	1	609	1	0
Meat from bovine animals - meat products - cooked, ready-to-eat - at retail	F	single	25g	1	0	1	0	0	0	0
Meat from broilers (Gallus gallus) - fresh	F	single	25g	116	12	106	2	10	10	0
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - at retail	F	single	25g	3	0	3	0	0	0	0
Meat from other animal species or not specified	F	single	25g	12	4	11	3	1	1	0
Meat from other poultry species	F	single	25g	1183	312	885	71	298	240	1
Meat from pig - fresh	F	single	25g	445	1	373	0	72	1	0
Meat from pig - meat products - cooked, ready-to -eat - at retail	F	single	25g	860	157	713	94	131	57	6
Meat, mixed meat (minced meat)	F	single	25g	98	5	96	3	2	2	0
Other food	F	single	25g	527	98	435	16	82	82	0
Other processed food products and prepared dishes (ready to eat, rte after treatment and salads)	F	single	25g	6651	108	3191	75	3073	21	12
Vegetables	F	single	25g	141	45	49	0	92	45	0

Footnote:

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES.

2.4 E. COLI INFECTIONS

2.4.1 General evaluation of the national situation

A. Verotoxigenic Escherichia coli infections general evaluation

History of the disease and/or infection in the country

Verotoxigenic Escherichia coli have emerged as foodborne pathogens which can cause severe and potencially fatal illness.Rumiants,specially cattle and sheep, have been implicated as the principal reservoir of VTEC.Transmission happened through consumption of undercooked meat, unpasteurized dairy products, vegetables or water contaminated by rumiant faeces.

Studies about VTEC in Spain was firstly developed by Laboratory of E. coli of Veterinary University of Lugo.

Between 1980 and 1995, 90% of cattle farms tested in region of Galicia were positive to VTEC, with 26% of animals coloniozed by VTEC no-O157 and 0,9% colonized by ECVT O157:H7. In 1999, 20% of farms and 10% of animals were colonized by ECVT O157:H7.In 1998, 15% of calves tested of others regions of Spain were carrier of ECVT O157:H7.

In sheeps,36% of lambs of region of Extremadura tested in 1997 were carrier of ECVT, but only 0,4% were colonized by strain O157:H7.Similar results have been obtained in studies carried out between 2000 and 2001.

In 2007 and 2008 a national survey has been performed in cattle for meat production at slaughterhouse under a herd based approach.

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

In cattle, the percentage of animals colonized by strain O157:H7 has been lower in last surveys.Raw beef products are the main source of infection.

Small rumiants may also represent a source of transmision of VTEC to humans.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

The high percentage of animals colonized by strain O157:H7 in last years agree with growing of human incidence, but outbreaks of the disease are lower at the moment.

Recent actions taken to control the zoonoses

Surveillance of the disease according to Directive 2003/99/EEC. National surveys 2007 and 2008 in cattle for meat production.

Compulsory and voluntary monitoring programmes in raw meat of different species of animals, minced meat and meat products, other animal origin products, vegetables and others products.

Additional information

Diagnostic methods used in food:
- Bacteriological method: ISO 16654:2001.
- Method ELISA
- PCR-Bax

2.4.2 E. coli infections in humans

A. Verotoxigenic Escherichia coli infections in humans

Reporting system in place for the human cases

Microbiological Information System
Enter-net
Outbreak reporting

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC

Notification system in place

Microbiological Information System
The Microbiological Information System has been based since 1989 on voluntary weekly reporting by clinical microbiology laboratories (principally hospital laboratories). Currently, in order to improve the notification, this procedure is becoming compulsory for a designated group of representative laboratories. The information in these reports is based on individual cases and includes the following variables: agent, time, place, age, sex, etc.

Enter-net (ECDC)
Spain participates in Enter-net, an European network for the surveillance of human gastrointestinal infections. Enternet has monitored salmonellosis since 1994 and Vero cytotoxin producing Escherichia coli O157 since 1999. Each country participates with a microbiologist of the national reference laboratory (source of the data) and the epidemiologist responsible for national surveillance.

Outbreak reporting
In Spain outbreaks are the main source of information for the foodborne diseases.

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 unspecified milk or other animal milk	F	single	25g	51	0			
Dairy products (excluding cheeses)	F	single	25g	1	1		1	
Eggs	F	single	25g	48	0			
Fishery products, unspecified	F	single	25g	23	2			2
Meat from bovine animals - fresh - at processing plant	F	single	25g	83	0			0
Meat from bovine animals - fresh - at retail	F	single	25g	138	8			8
Meat from bovine animals - fresh - at slaughterhouse	F	single	25g	14	1			1
Meat from broilers (Gallus gallus) - fresh [1)]	F	single	25g	22	1	0	1	0
Meat from goat [2)]	F	single	25g	90	0			
Meat from pig - fresh [3)]	F	single	25g	247	5			5
Meat from sheep - fresh - at processing plant	F	single	25g	4	0			
Meat from sheep - fresh - at retail	F	single	25g	1	0			
Meat from sheep - fresh - at slaughterhouse	F	single	25g	8	0			
Other food	F	single	25g	8	0			
Vegetables	F	single	25g	23	2			2

Comments:

[1)] at slaughterhouse, cutting plant and retail

[2)] t slaughterhouse, cutting plant and retail

Table VT E. coli in food

[3)] at slaughterhouse, cutting plant and retail

Footnote:

F:HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES.

2.4.4 Escherichia coli, pathogenic in animals

A. Verotoxigenic Escherichia coli in cattle (bovine animals)

Monitoring system

Sampling strategy

Sampling has been performed in 8 slaughterhouses placed in different regions of Spain and representative of the total volume of sacrifice of the country

Frequency of the sampling

Animals at slaughter (herd based approach)

between june and october

Type of specimen taken

Animals at slaughter (herd based approach)

Faeces

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

Two faecal samples at colon level have been taken in all the slaughter batches in the day of sampling, with a maximun of 30 batches. Each batch belonged to different holdings. Sampling has been performed in 8 slaughterhouses placed in Barcelona(3), Valencia, Huesca, Lerida, Caceres and Ciudad Real. These slaughterhouses have a high volume of activity, representing an important part of all the bovines sacrified in Spain.

A total of 334 samples have been taken, belonging to 167 slaughter batches and 167 different holdings.

Faeces were taken from the colon, refrigerated inmediatly and sent to the laboratory and analyzed before 24 hours.

Case definition

Animals at slaughter (herd based approach)

isolation of VTEC and PCR (Johnson,2001;Desmarcheiler,1998)

Diagnostic/analytical methods used

Animals at slaughter (herd based approach)

Other: detection of VTEC by Bacteriological method ISO 16654:2001 and identification by PCR (Johnson,2001;Desmarcheiler,1998), only for VTEC

Vaccination policy

In Spain a vaccination policy does not exist.
At farm, vaccines can be used by private veterinarians to control neonatal

septicemia in calves.

Control program/mechanisms

The control program/strategies in place

Does not exist

Recent actions taken to control the zoonoses

National survey in cattle at slaughterhouse

Results of the investigation

Number os slaughter batches tested: 167
Number of slaughter batches positive: 29
Slaughter batch (herd) prevalence: 17,4% (95% CI: 12,1;24,2)

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

Described in General Evaluation

Relevance of the findings in animals to findings in foodstuffs and to human cases

Described in General Evaluation

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
Cattle (bovine animals) - meat production animals - - faeces - Survey - national survey (Objective sampling)	M.A.R.M.	slaughter		167	29	29		

2.5 TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1 General evaluation of the national situation

A. Tuberculosis general evaluation

History of the disease and/or infection in the country

Sanitary importance of bovine tuberculosis has been based in the spread of the disease to humans. Human infection has been linked historically to raw milk consumption. At human level the surveillance of the disease is included in National Net of Epidemiological Surveillance, according with Royal Decree 2210/1995, december 25, by Epidemiological Surveillance National Net is created.

In Spain, control of milk was carried out at council town's level since 1908, but monitoring and eradication programmes in cattle didn't start systematically until begining of 90's, focused mainly in dairy cows. At the moment the programme is being applied to cattle over six weeks of age,and to goats living close to cattle, according to Directive 64/432/EEC.
Control of milk and control of fresh meat production is carried out by Autonomous Communities according to European legislation in force (hygiene package).

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

Spanish programmes for eradication on bovine tuberculosis in last years show the continous decrease of the disease prevalence in cattle. In 2008 herd prevalence was 1.59%(2.14% in 2003, 1.80% in 2004, 1,54% in 2005, 1.76% in 2006 and 1,68% in 2007), with 97.21% of herds qualified as officially free(95.77% in 2003, 96,56% in 2004, 97.34% in 2005, 96.94% in 2006 and 97,20% in 2007). Animal prevalence in 2008 was 0.48%(0.47% in 2003, 0.40% in 2004, 0.31% in 2005, 0.42% in 2006 and 0,49% in 2007).Raw milk only can be consumed if produced in herds OTF.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Only few human cases had been identify as tuberculosis by Mycobacterium bovis in the last years. The risk of transmission from animals to humans is very low.

Recent actions taken to control the zoonoses

Spanish Programme on Eradication of Bovine Tuberculosis 2008.
Milk control and fresh meat control production are developed according to european legislation in force (Hygiene Package).

Additional information

M. caprae has been isolated in 2005-2008 from cattle, goats, wild boards,foxes,

wild ruminants.

2.5.2 Tuberculosis, mycobacterial diseases in humans

A. Tuberculosis due to Mycobacterium bovis in humans

Reporting system in place for the human cases

Royal Decree 2210/1995, december 25, by Epidemiological Surveillance National Net is created

The Microbiological Information System has been based since 1989 on voluntary weekly reporting by clinical microbiology laboratories (principally hospital laboratories). Currently, in order to improve the notification, this procedure is becoming compulsory for a designated group of representative laboratories. The information in these reports is based on individual cases and includes the following variables: agent, time, place, age, sex, etc

Case definition

Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Notification system in place

Microbiological Information System

History of the disease and/or infection in the country

Only a few cases of infection by M bovis was reported in the last years

Results of the investigation

3 human cases of M.bovis infection has been reported during 2008 in Spain.

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

The risk of obtaining tuberculosis from animal sources is lower than human to human transmision due to the VIH+/AIDS epidemic

Relevance as zoonotic disease

The risk of obtaining tuberculosis from animal sources is negligible

2.5.3 Mycobacterium in animals

A. Mycobacterium bovis in bovine animals

Monitoring system

Sampling strategy

Sampling strategy is defined in Spanish Programme on Eradication on Bovine Tuberculosis 2008, covering cattle according Directive 64/432/EEC(animals over six weeks of age)and goats living close to cattle. Testing is performed under supervision of competent authorities of Autonomous Comunities.At slaughterhouses samples are taken in suspicius animals and in animals with suspicius injures.Strategic use on gamma-interferon assay has been implemented in 2008 and consequently, an increase in the sensivity at animal level (intra-herd) has been applied. A total of 159.918 gamma-interferon tests have been performed in 2008.
Additionally, severe interpretation of skin test(SIT)has been applied in high prevelence areas, with 2 skin tests in OTF herds and at least 3 skin tests in non-OTF herds during 2008. These measures have increased the sensitivity at herd level as well.
More than 103.000 pre-movement tests have been performed in 2008.

Frequency of the sampling

Once a year at least, more frequent testing in not officially free herds (at least 3 tests)and in OTF herds in high prevalence areas (2 at least).
Pre-movement test in movements except if animals go to a closed fattening unit that exclusively send animals to a slaughterhouse.

Type of specimen taken

Other: skin test, blood, organs/tissues

Methods of sampling (description of sampling techniques)

In herds, intradermal skin test (SIT) is used in animals over 6 weeks of age. In infected herds, gamma interferon assay is used in parallel as supplementary test in animals over six mounths of age. In low prevalence areas, SICCT can be used if specificity problems are detected.
At slaughterhouses organs/tissues are taken from suspicius animals (mainly from herds with OTF status suspended)and from injures found in routine post-mortem examination of animals slaughtered, according to the European legislation in force (Hygiene Package).

Case definition

skin test: positive and inconclusive results. In OTF herds also M. bovis isolation.
Gamma-interferon: positive results, cut-off value 0,05.
Organs/tissues:compatible lesions,auramine+, isolation or positive PCR

Diagnostic/analytical methods used

SIT, SICCT, agent isolation, PCR and gamma-interferon assay following criteria laying down by Annex B of Directive 64/432/EEC.

compatible lesions,auramine+, isolation or positive PCR, spoligotyping,VTNR

Vaccination policy

Forbidden

Other preventive measures than vaccination in place

Premovement test; Cleaning and disinfecting of positive holdings; Control of common grazing areas; Investigation of wildlife in some regions; Epidemiological investigations in breakdowns; inspections and official control of the field veterinarians.

Control program/mechanisms

The control program/strategies in place

Spain has an Eradication Programme approved for co-financing according to Decision 2007/782/EEC and Decision 90/424/EEC
Legal basis of the programme measures is Council Directive 64/432/EEC,but with increased measures like:

- more frequent tests in high prevalence areas
- strategic use of gamma-interferon assay
- pre-movement test
- severe interpretation of SIT

Recent actions taken to control the zoonoses

More frequent testing and pre-movement test
Compulsory slaughtering of all animals in herds with high incidence or repeating positive results
Severe interpretation of tuberculin test
Research into other test methodologies
Reinforce over herd registers at farm level
Epidemiological studies
Surveillance of wildlife
Inspections in restricted herds
Inspection of field veterinarians

Suggestions to the Community for the actions to be taken

Research into other test methodologies and improve the existing ones.

Measures in case of the positive findings or single cases

Confirmation by isolation/PCR of M. bovis. If confirmed, withdrawal of OTF status by holding. Epidemiological studies, spoligotyping of the strain and

inclusion in the National Database micoDB.es.

Notification system in place

Since 1952, at least (Epizootic Diseases Law).At the moment by Animal Health Law 8/2003

Results of the investigation

Herd prevalence: 1,59%
Animal prevalence: 0,48%
Herd incidence: 0,87%
Status of herds: 97,21% OTF

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

Data obtained by applying of Spanish Tuberculosis Eradication and Monitoring Programme show a moderate decrease of the disease in the country,following the trends of last years.

Disease is close to eradication in dairy herds (0.65% of herd prevalence in 2008).In conclusion, milk consumption can not be considered as a current source of infection in Spain,even more if it is assumed that cow milk is thermally treated.

In herds for meat production, herd prevalence is 1,84%. Explanation of this higher prevalence can be found in special managemment of this kind of herds: common grazing, ranching systems, fighting bulls, trashumance... Wildlife and goats can also be a source of infection in these holdings.

The increase in the diagnostic sensitivity in 2007 and 2008 has important influence in the herd prevalence and incidence, that are higher than other programmes that use less sensitivity diagnostic strategies. Then, comparations between programmes with different diagnostic strategies have to be carefully explained and interpreted.

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium spp.	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified	M. caprae	M. avium complex-M. avium subsp. hominissuis
Deer - from hunting - Monitoring (Regional surveys) [1)]	Animal Health	animal	747	66	66	0	0		
Deer - wild - fallow deer - from hunting - Monitoring (Regional surveys) [2)]	Animal Health	animal	93	36	36				
Deer - wild - roe deer - from hunting - Monitoring (Regional surveys) [3)]	Animal Health	animal	128	0					
Goats - at farm - Control and eradication programmes	Animal Health	animal	11970	43	8		35		
Pigs - - lymph nodes - Clinical investigations (samples subbited to Laboratory) [4)]	M.A.R.M	animal	27	18	2				16
Wild boars - wild - from hunting - Monitoring (Regional surveys) [5)]	Animal Health	animal	1223	294	293	0	0	1	

Comments:

[1)] culture/PCR
[2)] culture/PCR
[3)] culture/PCR
[4)] culture/PCR
[5)] culture/PCR

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
Galicia	48866	42729	42729	48	36	14	29.17	100	.11	.08
Asturias	20342	20071	20071	45	38	13	28.89	100	.22	.19
Cantabria	8333	8306	8306	130	74	32	24.62	100	1.57	.89
País Vasco	7490	6547	6547	13	12	2	15.38	100	.2	.18
Navarra	1873	1746	1738	7	4	2	28.57	99.54	.4	.23
La Rioja	339	275	275	4	4	0	0	100	1.45	1.45
Aragón	3475	2298	1994	15	6	4	26.67	86.77	.75	.3
Madrid	1547	1452	1452	83	62	7	8.43	100	5.72	4.27
Castilla y León	18635	16049	16049	596	360	22	3.69	100	3.71	2.24
Castilla-La Mancha	3681	2237	2237	260	120	27	10.38	100	11.62	5.36
Extremadura	10527	9825	9825	331	144	26	7.85	100	3.37	1.47
Cataluña	5991	4458	4236	36	14	9	25	95.02	.85	.33
Valencia	666	666	640	9	9	0	0	96.1	1.41	1.41
Baleares	606	514	495	0	0	0	0	96.3	0	0
Andalucía	8756	7760	6775	393	198	44	11.2	87.31	5.8	2.92
Murcia	351	334	334	11	7	0	0	100	3.29	2.1
Canarias	1253	1253	1253	3	2	2	66.67	100	.24	.16

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
Total	142731	126520	124956	1984	1090	204	10.28	98.76	1.59	0.87
Total - 1	165682	133294	130063	2121	1329	167	7.87	97.58	1.63	1.02

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	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Valencia	48707	38283	37031	37031	92	92	93	.01	.02
Castilla-La Mancha	376180	254811	254811	254811	4984	4984	6313	0	0
Madrid	109691	101894	101894	101894	602	602	823	0	.01
Asturias	397749	379645	379645	379645	165	165	859	0	0
Cataluña	556439	323538	294255	294255	222	222	335	0	0
Andalucía	605998	571359	550511	550511	6879	6879	9533	0	0
Aragón	237959	171780	147985	147985	274	274	278	0	0
Baleares	32929	24945	24003	24003	0	0	7	.01	0
Canarias	17482	17482	17482	17482	87	38	117	.01	.05
Cantabria	292039	285540	285540	285540	1288	1288	2272	0	0
Castilla y León	1269071	1052900	1052900	1052900	4612	4010	4784	0	0
País Vasco	126003	122623	96401	96401	33	33	55	.01	0
Navarra	109152	97941	88239	88239	260	260	268	.01	0
Murcia	55311	47306	47306	47306	92	91	91	.01	.02
Galicia	945735	751166	751166	751166	193	193	828	0	0
Extremadura	1037740	803917	719328	719328	3359	2942	4068	0	0
La Rioja	37130	24757	24757	24757	29	29	29	100	.12
Total	6255315	5069887	4873254	4873254	23171	22102	30753	96.12	0.48
Total - 1	6396563	4822713	4654071	4654071	22772	22264	30440	96.5	.49

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 positive							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Murcia	351	37412	1	236	1	141	9	1085	5	911	0	0	335	35039
Navarra	1746	97941	0	0	4	791	3	631	46	2683	0	0	1693	93836
Aragón	4381	306889	0	0	2	66	0	0	26	1472	0	0	4353	305351
Galicia	42729	751166	0	0	0	0	35	1523	17	520	0	0	42677	749123
Extremadura	9824	1033046	0	0	105	29304	439	60596	78	12318	0	0	9202	930928
Andalucía	7469	537254	133	2610	204	27399	572	31595	0	0	0	0	6560	475650
Castilla-La Mancha	2362	287767	0	0	180	38139	188	22172	12	3246	0	0	1982	224210
Valencia	666	48707	5	37	3	49	13	643	0	0	0	0	645	48333
La Rioja	275	24757	0	0	0	0	2	465	0	0	0	0	273	24292
Madrid	1547	108307	95	6687	45	1537	2	208	4	143	0	0	1401	99732
Cataluña	4593	410936	13	1871	23	2265	24	1914	211	13048	0	0	4322	391838
Asturias	20071	379645	0	0	14	650	31	1296	18	823	0	0	20008	376876
Castilla y León	16049	1052900	0	0	168	28790	486	35965	194	18553	0	0	15201	969592
Cantabria	8306	285540	26	968	21	1664	14	641	0	0	0	0	8245	282267
Baleares	503	27186	17	152	0	0	37	423	15	981	0	0	434	25630
Canarias	1253	17482	0	0	2	385	0	0	6	512	0	0	1245	16585
País Vasco	7490	145038	24	3380	5	65	2	17	2	7	0	0	7457	141569

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 positive							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Total	129615	5551973	314	15941	777	131245	1857	159174	634	55217	0	0	126033	5190851
Total - 1	129155	5175642	325	8096	764	116941	2719	195921	459	41108	0	0	125535	4843319

2.6 BRUCELLOSIS

2.6.1 General evaluation of the national situation

A. Brucellosis general evaluation

History of the disease and/or infection in the country

Sanitary importance of brucellosis has been based in the spread of the disease to humans.At the moment brucellosis is still the main direct transmission zoonoses in the world, and in Spain as well, mainly linked to Brucella melitensis.The more frecuent source of infection for human beins have been contacts with goats and sheeps, but raw milk products consumption have had historical importance as well.Nowadays brucellosis is considered as a proffesional disease.
In Spain, milk control was carried out at council town's level since 1908. At the moment milk control and control of fresh meat production is carried out by Autonomous Communities according to the european legislation in force (Hygiene Package).
Monitoring and Eradication Programmes in cattle, goats and sheep didn't start systematically until beginig of 90's.Before, human cases had the higest incidence in last thirty years, with arround 8500 cases in middle 80´s.The sistematic application of national programmes has resulted in a continous decrease of the disease in humans.At the moment the Programmes are being applied according to Directive 64/432/EEC and Directive 91/68/EEC.

At human level disease brucellosis is a mandatory notifiable disease since 1943. It is included in National Network of Epidemiology Surveillance, (Royal Decree 2210/1995, december 25), by Epidemiological Surveillance National Net is created.

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

Spanish Programmes for eradication and monitoring of Brucellosis in cattle, goats and sheeps show the continous decreasing, in general, of the disease prevalence in domestic animals. In 2008 herd prevalence was 0.40%(1.45% in 2003; 1.54% in 2004; 1.25% in 2005;0,84% in 2006; 0,57% in 2007)in cattle and 2.11%(5.58% in 2003; 5.12% in 2004; 4.43% in 2005; 3.20% in 2006: 2,79% in 2007) in goats and sheep.Animal prevalence was 0.09%(0.45% in 2003; 0,59% in 2004; 0.37% in 2005;0.22% in 2006; 0,13% in 2007)in cattle and 0.15%(0.87% in 2003; 0,62% in 2004; 0.45% in 2005; 0,34% in 2006; 0,25% in 2007) in goats and sheep.
Raw milk only can be consumed if produced in herds free or officially free.

Recent actions taken to control the zoonoses

Spanish Programme on eradication of bovine brucellosis 2008.
Spanish Programme on eradication of brucellosis in goats and sheep 2008.
Milk control and control of the production of fresh meat in accordance to european legislation in force (Hygiene Package).
Furthermore, the Spanish Royal Decree 640/2006, of May 26, 2006, laying down specific implementation conditions of the Community rules concernig hygiene subjets, as well as foodstuff's production and commercialisation, establishes specific conditions regarding to milk and dairy milk.

2.6.2 Brucellosis in humans

A. Brucellosis in humans

Reporting system in place for the human cases

Notifiable Disease Surveillance System (NDSS)

In December of 1995 the National Network of Epidemiological Surveillance was created by law. This law and its development produced changes in the surveillance system. During 1997 the protocols of statutory notification of diseases were approved and implemented in Spain. In Spain the Autonomous Regions have wide powers with respect to epidemiological surveillance and national decisions are usually taken by consensus. All practising doctors are obliged to notify, both those in the public health service and in private practice, and both those practising outside and within hospitals. On occasions the appearance of cases and outbreaks is detected by other means (from the mass media, from citizens complants, etc.) and in these cases the information is checked and if confirmed it is incorporated into the system at the corresponding level.
The notification may be carried out using a variety of systems: mail, fax, telephone, e-mail, etc. Presently all the regions (and in many cases levels below) transmit the data by e-mail. A network is being developed for the National Epidemiological Surveillance Network which will permit the flow of data from the local level.
In Spain the main source of information of these diseases is the notification of outbreaks. This notification has been compulsory by law for all doctors since 1982. It includes disease outbreaks of any origin, not only those related to food

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Notification system in place

Royal Decree 2210/1995, december 25, by Epidemiological Surveillance National Net is created.

Notifiable Disease Surveillance System (NDSS)

History of the disease and/or infection in the country

As the single zoonotic disease accountable for the greatest number of cases in Spain, brucellosis has been a statutorily notifiable disease since 1943.

The disease is distributed throughout all of Spain's regions, albeit in varying degrees, there being disease-free regions (Canary Islands), regions with low incidence rates (Mediterranean and Cantabrian seaboards) and regions where incidence can be considered high or very high (central and southern mainland Spain). This pattern is linked to a tradition of sheep- and goat-ranching in these areas.

The disease constitutes a problem, not only from a public health but also from a socio-economic stance. Herein lies the sensitivity surrounding its surveillance, demonstrated by the different Administrations and reflected from the highest echelons in the form of specific legislation designed to control the disease and comply with international commitments

Results of the investigation

From 1943 onwards, the disease time series describes 3 well-differentiated multi-annual waves: the first being from 1943 to 1959, with a maximum incidence rate in 1949 (19,83x100,000 population); the second, a seven-year cycle terminating in 1977, marked by a maximum peak in 1973 with an incidence rate of 20,32x100,000 population; and the last and third cyclical wave, registering a maximum peak in 1984 with a rate of 22.69 per 100,000 population

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

In 2008, we observed a period marked by sustained historical minimum values. Epidemic outbreaks of brucellosis aetiology were reported in the last years The predominant transmission mechanism was direct contact with animals followed by foodftuffs. The foodstuff most frequently associated with the outbreaks was cottage-style cheese.

Relevance as zoonotic disease

High

2.6.3 Brucella in foodstuffs

Table Brucella in food

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. abortus	B. melitensis	B. suis	Brucella spp., unspecified
Milk, cows' - raw - Control and eradication programmes		single	34	0				

2.6.4 Brucella in animals

A. Brucella abortus in bovine animals

Monitoring system

Sampling strategy

Sampling strategy is defined in Spanish Programme for Eradication of Bovine Brucellosis, covering cattle according to Directive 64/432/EEC(animals over 12 months of age). Test are carried out by competent authorities of Autonomous Communities.At slaughterhouses samples are taken in suspicius animals, mainly in positive animals coming from free or officially free herds (suspended estatus) to confirm the disease.

Frequency of the sampling

Twice a year at least. Only regions with herd prevalence=0 can apply a reduction of the frequency in herds for milk production following Annex A.II.2 of Council Directive 64/432/CEE.
Pre-movement test.

Type of specimen taken

serum, blood, milk, organs/tissues,swabs

Methods of sampling (description of sampling techniques)

In animals over one year of age Rose Bengal as screening test or i-ELISA in milk; and Complement Fixation test or i-ELISA in serum as confirmatory test.As complementary test competition ELISA has been used as well.
At slaughterhouses swabs, organs and tissues are taken in suspicius animals,mainly from herds with free or officially free status suspended, to isolate Brucella and confirm the infection.

Case definition

Positive result to Rose Bengal test confirmed by positive result to Complement Fixation test or ELISA. In high prevalence areas, positive result to any official test. In free or officially free herds Brucella abortus isolation as well.
Positive result of i-Elisa in milk confirmed by serological methods.

Diagnostic/analytical methods used

Rose Bengal test ,agent isolation,serum i-ELISA, milk i-ELISA, c-ELISA and Complement Fixation test, following criteria laying down by Annex B of Directive 64/432/EEC

Vaccination policy

Forbidden in general, but in high prevalence areas vaccination can be authorised with vaccine B-19 or other authorised vaccines(RB-51)according to Directive 64/432/EEC.

Other preventive measures than vaccination in place

Pre-movement test
Cleaning and disinfecting of positive holdings
Control of common grazing areas
Investigation of possible wildlife reservoirs in some regions
Epidemiological investigations in breakdowns
Inspections and official control of field veterinarians
Inspections of restricted herds.

Control program/mechanisms

The control program/strategies in place

Spain has an Eradication and Monitoring Programme approved for co-financing according to Decision 2007/782/EC.
Legal basis of the programme measures is Directive 64/432/EEC and Royal Decree 2611/1996, at last ammended. Increased measures have been implemented:

pre-movement test
stamping out in low prevalence areas
vaccination in high prevalence areas
more frequent testing
inspections and official controls of field veterinarians
inspections of restricted herds

Recent actions taken to control the zoonoses

More frecuent testing and pre-movement test
Compulsory slaughter of all animals in herds with high incidence or repeating positive results, and in low prevalence areas if infection is confirmed
Research into other test methodologies
Reinforce over herd registers at farm level
Epidemiological studies

Suggestions to the Community for the actions to be taken

Research into other test methodologies and improve existing ones.

Measures in case of the positive findings or single cases

Confirmation of the infection by complement fixation test and culture, and if herd is free or officially free,status is suspended and if isolation of Brucella abortus is confirmed, lost of status by holding and, if the herd is placed in a low plevalence area, depopulation.

Notification system in place

Since 1952, at least(Epizootic Diseases Law)
At the moment by Animal Health Law 8/2003

Results of the investigation

Herd prevalence: 0,40%
Animal prevalence: 0,09%
Herd incidence: 0,27%
Herd status: 95,06% OBF; 2,93 BF

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

Data obtained by the implementation of Spanish Eradication and Monitoring Programme on Bovine Brucellosis show a moderate increase of the disease in the country in 2004, following by an important decrease in 2005, 2006 and mainly in 2007 and 2008.
Herd prevalence: 2,30%(2002);1,45%(2003);1,54(2004); 1,25%(2005); 0,84%(2006); 0,57 (2007); 0,40 in 2008.
Animal prevalence: 0,39%(2002);0,45%(2003);0,59%(2004); 0,37% (2005); 0,22(2006); 0,13(2007); 0,09 in 2008.
Disease is close to eradication in dairy herds.Herd prevalence is below 1%(0,14%).In conclusion, milk consumption can't be considered as a current source of infection in Spain, even more if it is assumed that almost all the cow milk is thermally treated.
In herds for meat production, herd prevalence is below 1% as well (0,47%).

Relevance of the findings in animals to findings in foodstuffs and to human cases

Brucellosis in humans is linked in Spain mainly to B. melitensis.

B. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

Free regions

Canary Islands by Decision 2001/292/EC

Monitoring system

Sampling strategy

Sampling strategy is defined in Spanish Programme on eradication and monitoring of brucellosis in sheep and goats, according to Directive 91/68/EEC:
- animals over 6 months of age if not vaccined
- animals over 18 months of age if vaccined

Tests are carried out by competent authorities of Autonomous Communities. At slaughterhouse samples are taken in suspicius animals, mainly in positive animals coming from free or oficially free herds(suspended status)to confirm de disease.

Frequency of the sampling

Once a year at least in herd free or officially free.
Twice a year at least in non qualified herds.

Type of specimen taken

serum, blood, milk, organs/tissues

Methods of sampling (description of sampling techniques)

At herd level, in animals over 6 or 18 months of age Rose Bengal as screening test and Complement Fixation as confirmatory test.
At slaugterhouses or at holdings, swabs, milk, organs or tissues are taken in suspicious animals, mainly from herds with free or officially free status suspended, to isolate Brucella and confirm the infection.

Case definition

Positive result to Rose Bengal confirmed by positive result to Complement Fixation.
In free or officially free herds Brucella melitensis isolation as well.

Diagnostic/analytical methods used

Rose Bengal test, agent isolation, Complement Fixation test following criteria laying down by Annex C of Directive 91/68/EEC

Vaccination policy

Animals between 3 and 6 months of age (not in officially free herds or free herds that are on the way to gain oficially free status in low prevalence areas)
In high incidence areas adults can be vaccined exceptionally to control the spread of the disease to other herds or humans.

Other preventive measures than vaccination in place

Pre-movement test in trashumance in certain areas

Cleaning and desinfecting of positive holdings
Control of common grazing areas
Epidemiological investigations in breakdowns
Inspections and official control of the field veterinarians

Control program/mechanisms

The control program/strategies in place

Spain has an Eradication Programme approved for co-financing according to Decision 2007/782/EC
Legal basis of the programme measures are Directive 91/68/EEC and Royal Decree 1941/2004.

Recent actions taken to control the zoonoses

More frequent testing in non qualified herds
Compulsory slaughter of all animals in herds with high incidence or repeating positive results
Research in other test methodologies
Reinforce over herd register at farm level
Epidemiological studies

Suggestions to the Community for the actions to be taken

Research into other test methologies ant into other vaccines. Authoritation of new tests (ELISA,FPA)

Measures in case of the positive findings or single cases

Confirmation by complement fixation test, and if herd free or officially free, status is suspended and if isolation of Brucella melitensis, lost of status by holding and depopulation if herd is placed in low prevalence area

Notification system in place

Since 1952, at least(Epizootic Diseases Law)
At the moment by Animal Helth Law 8/2003

Results of the investigation

Herd prevalence: 2,11%
Animal prevalence: 0,15%
Herd incidence: 1,53%
Herd status: 55,18% OMF; 37,46% free

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

Data obtained by implementation of Spanish Programme for Eradication and Monitoring of Brucellosis in Sheep and Goats show continous decrease of the disease in the country, following the trends of previous years:
Herd prevalence:7,18%(2002);5,58%(2003);5,12%(2004);4,43%(2005);3,20%(2006); 2,79%(2007); 2,11%(2008).
Animal prevalence:0,98%(2002);0,87%(2003);0,61%(2004);0,45%(2005);0,34%(2006);0,25%(2007); 0,15%(2008).

this type of animals: ranching systems, common grazing, trashumance...Wildlife can also be a source of infection in these holdings. Relative high influence have the limitations of the diagnostic tests used in sheep and goats.

Relevance of the findings in animals to findings in foodstuffs and to human cases

The human cases have been identified mainly as Brucella melitensis, caused by direct contact between humans and infected herds, as a professional disease (farmers, veterinary surgeons...).

C. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

Free regions

Canarias by Decision 2001/292/EC

Monitoring system

Sampling strategy

see brucella melitensis in sheep

Frequency of the sampling

see brucella melitensis in sheep

Methods of sampling (description of sampling techniques)

see brucella melitensis in sheep

Case definition

see brucella melitensis in sheep

Diagnostic/analytical methods used

see brucella melitensis in sheep

Vaccination policy

see brucella melitensis in sheep

Other preventive measures than vaccination in place

see brucella melitensis in sheep

Control program/mechanisms

The control program/strategies in place

see brucella melitensis in sheep

Recent actions taken to control the zoonoses

see brucella melitensis in sheep

Suggestions to the Community for the actions to be taken

see brucella melitensis in sheep

Measures in case of the positive findings or single cases

see brucella melitensis in sheep

Notification system in place

see brucella melitensis in sheep

Results of the investigation

see brucella melitensis in sheep

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

see brucella melitensis in sheep

Relevance of the findings in animals to findings in foodstuffs and to human cases

see brucella melitensis in sheep

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. abortus	B. melitensis	B. suis	B. ovis	Brucella spp., unspecified
Alpine chamois - wild - from hunting - Monitoring (regional surveys) [1)]	Animal Helath	animal	486	6					6
Deer - wild - fallow deer - from hunting - Monitoring (regional surveys) [2)]	Animal Health	animal	72	1					1
Deer - wild - red deer - from hunting - Monitoring (regional surveys) [3)]	Animal Helath	animal	1814	9					9
Deer - wild - roe deer - from hunting - Monitoring (regional surveys) [4)]	Animal Helath	animal	389	9					9
Foxes - from hunting - Monitoring (regional surveys) [5)]	Animal Health	animal	12	0					
Mouflons - from hunting - Monitoring (regional surveys) [6)]	Animal Helath	animal	128	8					8
Pigs - - blood - Survey (regional surveys) [7)]	Animal Helath	animal	497	0	0	0	0		0
Pigs - at farm - Clinical investigations [8)]	Animal Helath	herd	284	2			2		
Pyrenean chamois - from hunting - Clinical investigations (regional surveys) [9)]	Animal Health	animal	200	1					1
Wild boars - wild - from hunting - Clinical investigations (regional surveys) [10)]	Animal Helath	animal	1642	251					251

Comments:

[1)] serology
[2)] serology
[3)] serology
[4)] serology
[5)] serology
[6)] serology
[7)] serology
[8)] serology/PCR
[9)] serology

Table Brucellosis in other animals

[10)] serology

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
Castilla-La Mancha	3681	2210	2210	16	4	5	31.25	100	.72	.18
Valencia	666	666	666	0	0	0	0	100	0	0
La Rioja	339	275	275	0	0	0	0	100	0	0
Madrid	1547	1452	1452	15	11	6	40	100	1.03	.76
Cataluña	5991	4461	4328	7	4	2	28.57	97.02	.16	.09
Asturias	20342	20071	20071	3	3	3	100	100	.01	.01
Castilla y León	18677	16049	16049	184	123	24	13.04	100	1.15	.77
País Vasco	7056	5915	5915	0	0	0	0	100	0	0
Navarra	1873	1746	1738	1	1	1	100	99.54	.06	.06
Murcia	351	351	149	0	0	0	0	42.45	0	0
Andalucía	8756	7750	6730	24	14	2	8.33	86.84	.36	.21
Aragón	3475	2298	1719	0	0	0	0	74.8	0	0
Cantabria	8333	8306	8306	81	69	18	22.22	100	.98	.83
Baleares	606	514	495	0	0	0	0	96.3	0	0
Canarias	1253	1253	1111	0	0	0	0	88.67	0	0
Galicia	48866	42545	42545	27	20	10	37.04	100	.06	.05
Extremadura	10527	9825	9825	137	81	8	5.84	100	1.39	.82

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
Total	142339	125687	123584	495	330	79	15.96	98.33	0.4	0.27
Total - 1	165682	132336	128504	728	455	99	13.6	97.1	.57	.35

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	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Castilla-La Mancha	376180	177066	177066	177066	141	141	823	100	.08
Valencia	48707	26379	26379	26379	0	0	0	100	0
La Rioja	37130	20611	20611	20611	0	0	0	100	0
Madrid	109701	75355	75355	75355	71	71	373	100	.09
Cataluña	556438	208751	191294	191294	86	85	536	91.64	.04
Asturias	397749	292502	292502	292502	5	5	56	100	0
Castilla y León	1269171	1052900	1052900	764020	1789	1675	4249	100	.17
País Vasco	98896	95516	57859	57859	0	0	0	60.58	0
Navarra	109152	68704	68589	68457	2	54	55	99.83	0
Murcia	55311	11373	11373	11373	0	0	0	100	0
Aragón	237959	83253	83253	83253	0	0	15	100	0
Andalucía	605998	565787	544342	544342	218	223	330	96.21	.04
Cantabria	292039	285540	234317	234317	129	127	1525	82.06	.06
Baleares	32929	19878	19685	7655	0	0	0	99.03	0
Canarias	17482	12951	12951	12951	0	0	0	100	0
Galicia	945735	669498	669498	669498	116	116	488	100	.02
Extremadura	1116227	659267	537979	537979	983	974	1312	81.6	.18
Total	6306804	4325331	4075953	3774911	3540	3471	9762	94.23	0.09
Total - 1	6453387	4156640	3739860	3723493	4959	4956	11338	89.97	.13

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 positive							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
La Rioja	275	20611	0	0	0	0	0	0	0	0	0	0	275	20611
Valencia	666	48707	0	0	6	10	10	78	0	0	0	0	650	49289
Madrid	1547	109686	95	6687	3	204	1	93	0	0	0	0	1448	102702
Cataluña	4470	413519	12	791	0	0	18	1824	204	13041	0	0	4236	397863
Asturias	20071	292502	0	0	3	46	308	2003	3	25	0	0	19757	290428
Castilla-La Mancha	2201	176772	0	0	7	944	27	1022	9	1465	1	1172	2157	172169
Castilla y León	16049	1052900	0	0	87	12311	470	33817	189	18307	1936	156517	13367	831948
País Vasco	3961	98896	24	3380	0	0	0	0	0	0	0	0	3937	95516
Navarra	1428	34072	0	0	0	0	0	0	32	1346	0	0	1396	32726
Murcia	171	11714	0	0	0	0	7	384	0	0	0	0	164	11330
Cantabria	8306	285540	26	968	24	1346	21	1351	0	0	1	60	8234	281815
Canarias	1253	12951	0	0	0	0	0	0	0	0	0	0	1253	12951
Baleares	503	27186	17	152	0	0	32	348	6	138	0	0	448	26548
Aragón	2298	86246	0	0	0	0	0	0	0	0	470	35339	1828	50907
Andalucía	7334	527486	130	2374	43	4604	276	12245	0	0	1	364	6884	507899
Galicia	42545	669498	0	0	0	0	35	610	1	31	0	0	42509	668857
Extremadura	9825	1088638	0	0	40	8467	199	21158	109	18844	1183	121129	8294	919040

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 positive							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Total	122903	4956924	304	14352	213	27932	1404	74933	553	53197	3592	314581	116837	4472599
Total - 1	125032	4807384	325	7673	293	30903	1328	88973	364	33681	3603	310436	119075	4331163

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
Castilla-La Mancha	7578	7108	7108	150	63	18	12	100	2.11	.89
Valencia	1743	1685	1487	85	24	5	5.88	88.25	5.72	1.61
Madrid	587	573	573	23	12	1	4.35	100	4.01	2.09
La Rioja	475	432	426	3	3	0	0	98.61	.7	.7
Cataluña	3559	3422	3413	107	51	3	2.8	99.74	3.14	1.49
Asturias	6498	6498	6498	0	0	0	0	100	0	0
Castilla y León	11495	11495	11495	173	147	7	4.05	100	1.51	1.28
Galicia	23506	23506	23506	0	0	0	0	100	0	0
Extremadura	17129	15981	15654	149	38	4	2.68	97.95	.95	.24
País Vasco	7047	6479	6476	10	10	1	10	99.95	.15	.15
Cantabria	3066	3066	3066	24	18	0	0	100	.78	.59
Navarra	2523	2523	2414	0	0	0	0	95.68	0	0
Aragón	4731	4731	4731	33	20	4	12.12	100	.7	.42
Andalucía	19197	19195	16480	1406	1191	48	3.41	85.86	8.53	7.23
Baleares	3804	3783	3685	0	0	0	0	97.41	0	0
Murcia	2641	2401	2401	168	95	0	0	100	7	3.96
Canarias	4272	4272	1031	0	0	0	0	24.13	0	0

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

Region	Total number of herds	Total number of herds under the programme	Number of herds checked	Number of positive herds	Number of new positive herds	Number of herds depopulated	% positive herds depopulated	Indicators		
								% herd coverage	% positive herds Period herd prevalence	% new positive herds Herd Incidence
Total	119851	117150	110444	2331	1672	91	3.9	94.28	2.11	1.51
Total - 1	124758	117672	111604	3117	1630	130	4.17	94.84	2.79	1.46

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	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Baleares	373866	369840	360238	144856	0	0	0	97.4	0
Andalucía	3416647	3323123	2925046	2925046	12833	12833	25105	88.02	.44
Murcia	1147908	577826	577826	577826	1274	1089	1089	100	.22
Canarias	397865	139787	139787	44168	0	0	0	100	0
Castilla-La Mancha	3439877	2853883	2853883	2853883	3341	3341	9968	100	.12
Valencia	521359	417990	417980	417980	640	640	1785	100	.15
La Rioja	137655	131434	131310	131310	4	4	4	99.91	0
Madrid	102171	93360	93360	93360	371	371	552	100	.4
Cataluña	701683	574181	552727	551887	1160	1123	1490	96.26	.21
Asturias	100484	87944	87944	87944	0	0	0	100	0
Castilla y León	3929676	3520456	3520456	3520456	1862	1267	3845	100	.05
Galicia	277469	277469	277469	277469	0	0	5	100	0
Cantabria	74900	74900	74900	74900	52	49	97	100	.07
País Vasco	227338	227338	149351	110042	14	14	14	65.7	.01
Navarra	715400	715400	710405	243285	0	0	56	99.3	0
Aragón	2011387	1568090	1568720	1568720	562	532	1591	100.04	.04
Extremadura	4802767	3613660	1515810	1515810	2761	2744	4236	41.95	.18
Total	22378452	18566681	15957212	15138942	24874	24007	49837	85.95	0.16
Total - 1	23895607	19504820	16943066	16255357	41536	43127	89850	86.87	.25

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 positive							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Valencia	1627	504236	4	414	7	6761	64	16838	20	14271	1172	376269	360	89683
La Rioja	432	131434	0	0	3	1803	5	2472	6	124	0	0	418	127035
Madrid	587	102171	14	8816	7	46	10	1645	1	2	508	85674	47	5990
Cataluña	3408	785734	6	77	35	12127	149	28321	30	12366	2596	495641	592	237202
Asturias	6498	87944	0	0	0	0	426	5258	0	0	0	0	6072	82686
Castilla y León	11495	3520456	0	0	60	29353	372	65503	97	26616	1690	443594	9276	2955390
Castilla-La Mancha	7108	2853113	0	0	69	114233	161	102255	49	31481	2964	1028981	3865	1576163
Galicia	23506	277469	0	0	0	0	0	0	0	0	0	0	23506	277469
Cantabria	3066	74900	2	0	14	1288	735	9885	0	0	0	0	2317	63727
País Vasco	3949	277338	0	0	5	311	0	0	0	0	0	0	3944	227027
Navarra	2523	715400	0	0	0	0	29	1382	25	6300	598	448788	1871	258930
Aragón	4730	2011387	0	0	4	2746	13	9544	10	9989	4703	1989108	0	0
Extremadura	15981	4707730	0	0	70	63052	1417	206414	134	10116	14253	4332310	107	95838
Baleares	3771	368979	0	0	0	0	110	3509	112	5618	0	0	3549	359852
Andalucía	19195	3619143	748	55819	622	268183	2323	373426	110	42935	12457	2459753	2935	419027
Murcia	2401	570981	0	0	53	45479	251	72461	53	24879	1967	394885	77	33277
Canarias	4272	397865	0	0	0	0	0	0	0	0	0	0	4272	397865

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 positive							
Region	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Total	114549	21006280	774	65126	949	545382	6065	898913	647	184697	42908	12055003	63208	7207161
Total - 1	119219	21444586	711	74525	1256	741527	6438	1217744	1056	327012	42232	12118639	65604	7004870

2.7 YERSINIOSIS

2.7.1 General evaluation of the national situation

A. Yersinia enterocolitica general evaluation

History of the disease and/or infection in the country

Microbiolgical Surveillance System was the Spanish surveillance system for epidemiological surveillance of yersinia infection in humans. It is based on the number of incident cases sent by hospital laboratories to Microbiological Information System (National Centre of Epidemiology).

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Animals are the main source of Yersinia. Fecal wastes from animals (particularly pigs) may contaminate water, milk and foods and become a source of infection for people or other animals.

Recent actions taken to control the zoonoses

The activities are made according to Regulation (EC) no 178/2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs). must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

At animal level, national surveys have been performed in pigs at slaugtherhouse in 2007 and 2008.

2.7.2 Yersiniosis in humans

A. Yersinosis in humans

Reporting system in place for the human cases

In December of 1995 the National Network of Epidemiological Surveillance was created by law. This law and its development produced changes in the surveillance system.

In Spain the Autonomous Regions have wide powers with respect to epidemiological surveillance and national decisions are usually taken by consensus.

- Microbiological Information System
The Microbiological Information System has been based since 1989 on voluntary weekly reporting by clinical microbiology laboratories (principally hospital laboratories). Currently, in order to improve the notification, this procedure is becoming compulsory for a designated group of representative laboratories. The information in these reports is based on individual cases and includes the following variables: agent, time, place, age, sex, etc.

- Outbreak reporting System
In Spain outbreaks are the main source of information for the foodborne diseases.

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC

Notification system in place

Microbiological Information System
Outbreak Reporting System

History of the disease and/or infection in the country

Yersinia is the third most common cause of bacterial gastrointestinal infection in Spain

Results of the investigation

The number of cases of Y. enterocolitica reported has increased steadily since it was made notifiable in 1989.

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

Infants and young adults are particularly likely to be infected. More than 50% are in the groups less of five years.

Information about place of infection is not given in the notifications.

Relevance as zoonotic disease

Enteric yersiniosis can be transmitted between animals and humans. It is usually transmitted to humans via consumption of food contaminated with animal feces.

Yersiniosis have a high relevance as zoonotic disease.

2.7.3 Yersinia in foodstuffs

Table Yersinia in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica-O:3	Y. enterocolitica-O:9	Y. enterocolitica-unspecified
Meat from bovine animals - fresh	F	single	25g	8	3		2			1
Meat from bovine animals - meat products	F	single	25g	44	10					10
Meat from broilers (Gallus gallus)	F	single	25g	17	4		2			2
Meat from other animal species or not specified	F	single	25g	11	3					3
Meat from pig - fresh	F	single	25g	91	4		2			2

Footnote:

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES.

2.7.4 Yersinia in animals

A. Yersinia enterocolitica in pigs

Monitoring system

Sampling strategy

Animals at slaughter (herd based approach)

Samples have been taken randomly in 7 representative slaughterhouses of Spain, placed in Cuenca(2), Barcelona, Ciudad Real, Murcia, Pontevedra and Toledo.

Samples have been taken only if the slaughter batch had 10 or more animals, and belonging to different herds.

Samples have been taken between march and december

Number of samples: 290, belonging to 145 slaughter batches (different herds)

Frequency of the sampling

Animals at slaughter (herd based approach)

between march and december

Type of specimen taken

Animals at slaughter (herd based approach)

Faeces

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

2 faecal material samples by slaughter batch and by herd, with a maximum of 30 slaughter batches by day and month of sampling.

Case definition

Animals at slaughter (herd based approach)

a slaughter batch is considered as positive if isolation by bacteriological method in at least one of the samples of the slaughter batch

Diagnostic/analytical methods used

Animals at slaughter (herd based approach)

Bacteriological method: ISO 10273:2003

Results of the investigation

Number of slaughter batches analyzed: 145
Number of slaughter batches positive: 29
Slaughter batch prevalence: 20% (CI 95%: 14,0-27,6)

Table Yersinia in animals

	Source of information	Sampling unit	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica-O:3	Y. enterocolitica-O:9	Y. enterocolitica-unspecified	Y. enterocolitica-biotype 4
Pigs - - faeces - Survey - national survey (Objective sampling)	M.A.R.M.	slaughter	145	29	29					29

2.8 TRICHINELLOSIS

2.8.1 General evaluation of the national situation

A. Trichinellosis general evaluation

History of the disease and/or infection in the country

Trichinellosis is a notifiable zoonosis, which causes two to three outbreaks per year in Spain. In 1995, the National Network of Epidemiological Surveillance (NNES) developed a standard protocol to detect every single case of trichinellosis, and notify the health authorities as quickly as possible when an outbreak occurs

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

Sources of infection are mainly associated to the consume of meat and raw meat products of wild boars killed in hunting or pigs slaughtered at home and which carcasses has not been examinated post-mortem.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Most cases are caused by Trichinella spiralis. Trichinella britovi has previously been associated with outbreaks due to the consumption of boar meat, and meat from other wild animals but in the last years T britovi was associated with pork meat and transmitted through the consumption of meat from a domestic pig.

Recent actions taken to control the zoonoses

The activities against this zoonoses are the Official Control:
Examination of fresh meat and killed in hunting according to European legislation in force:
Commission Regulation (EC) Number 2075/2005 of December 5, 2005 laying down specific rules on official controls for trichinella in meat and Commission Regulation (EC) Number 1665/2006 amending Comission Regulation (EC) Number 2075/2005)

Domestic killing for self consumption and wild game meat to be sold at retail is regulated by the Spanish Royal Decree 640/2006, of May 26, 2006, laying down specific implementation conditions of the Communities rules concerning hygiene subjets, as well as foodstuff's production and commercialisation.

According to article seven of the Commission Regulation (EC) Number 2075/2005 of December 5, 2005, laying down specific rules on official controls for Trichinella in meat, Spain has prepared a contingency plan outlining all action to be taken when samples referred to in articles 2 and 16 test are positive to Trichinella. This plan includes details covering:

(a) traceability of infested carcass(s);
(b) measures for dealing with infested carcass(s) and parts thereof;
(c) investigation of the source of investigation and any spreading among wildlife;
(d) any measures to be taken at retail or consumer level;
(e) measures to be taken where the infested carcass(s) cannot be identified at the slaughterhouse;
(f) determination of the Triquinella species involved.

In Spain the Triquinella examination is compulsory for meat from trichinella susceptible species, including domestic killing for self-consumption.

2.8.2 Trichinellosis in humans

A. Trichinellosis in humans

Reporting system in place for the human cases

- Outbreak reporting
In Spain outbreaks are the main source of information for the foodborne diseases.
The notification of outbreaks is mandatory and standardised.

The results of the statistical and epidemiological analysis are disseminated in annual reports. In addition they are published in epidemiological bulletins (national, regional and other). The weekly national epidemiological bulletin can be found at: http://cne.isciii.es/bes/bes.htm.

Outbreak investigations as well as necessary control measures are carried out by the health authorities of the autonomous regions.

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC

Notification system in place

Outbreak Reporting System Notifiable Disease Surveillance System (NDSS)

In Spain the main source of information of trichinellosis is the notification of outbreaks. This notification has been compulsory by law for all doctors since 1982. It includes disease outbreaks of any origin, not only those related to foodOutbreak reporting
In Spain outbreaks are the main source of information for trichinellosis.
The notification of outbreaks is mandatory and standardised. All the outbreaks must be reported immediately at the regional level. At the national level it is obligatory to report immediately only those outbreaks which, by law, are defined as being supra-communitary (considered to be of national interest) in order to facilitate their rapid control, where as the rest of the outbreaks are reported quarterly.
The results of the statistical and epidemiological analysis are disseminated in annual reports. In addition they are published in epidemiological bulletins (national, regional and other). The weekly national epidemiological bulletin.

Outbreak investigations as well as necessary control measures are carried out by the health authorities of the autonomous regions.
Training courses and guidelines on outbreak investigation addressed to doctors dealing with these problems have been set up in all regions.

History of the disease and/or infection in the country

Trichinellosis is a notifiable zoonosis, which causes two to three outbreaks per year in Spain. Most outbreaks are caused by Trichinella spiralis. Trichinella britovi has been associated with outbreaks due to the consumption of pig meat, boar meat, and meat from other wild animals.

Results of the investigation

One outbreak have been reporting in 2008. This outbreak was caused by consumption wild boar products.

Description of the positive cases detected during the reporting year

One outbreak of trichinellosis was reporting in 2008, 4 people was illness.

The majority of human trichinellosis is linked to the consumption of undercooked or raw pig or wild boar meat products

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

In the last years most Spanish outbreaks were due to consumption of pork or wild boar meat. Outbreaks from wild boar meat are increasingly frequent in certain regions of Spain and could be explained by ecological modifications in rural areas

Relevance as zoonotic disease

high

2.8.3 Trichinella in animals

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	Trichinella spp., unspecified
Deer - at game handling establishment	F	animal	121655	8		8
Pigs [1)]	f	animal	90889	2		2
Pigs - fattening pigs - not raised under controlled housing conditions in integrated production system - at slaughterhouse	F	animal	38806715	75		75
Solipeds, domestic - horses	F	animal	25820	0		
Wild boars - wild - at game handling establishment	F	animal	81248	182		182

Comments:

[1)] domestic production

Footnote:

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES (RESULTS OF RUTINE POSTMORTEM EXAMINATION AT SLAUGHTERHOUSE).
f: domestic killing for self-consumption.

2.9 ECHINOCOCCOSIS

2.9.1 General evaluation of the national situation

A. Echinococcus spp. general evaluation

History of the disease and/or infection in the country

Hydatidosis is an endemic disease in Spain, mainly in regions with extensive systems of animal production.

Human hydatidosis has been a Mandatory Notifiable disease since 1982, year in which were comunicated around 2000 cases.Royal Decree 2210/1995, laying down the National Epidemiologyc Surveillance Network, classify hydatidosis as an endemic disease at regional frame.

In 80´s many regions started to set up a control programme based in control of animal hydatidosis and in general people´s health education and focused in professionals related with animals and at school level. Similar control programmes have been developed in other Authonomous Communities.

The implementation of these control programmes got good results in the decrease of the incidence of the disease.
Routine post-mortem examination at slaughterhouse has being carried out according to european legislation in force (Hygiene Package).

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

Control programmes in endemic regions got good results in the dicrease of the disease at human level.Main source of infection in Spain is cycle between sheep,dog and humans.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Higher incidence values of human cases are situated in regions with the highest census of sheep and goats.

Recent actions taken to control the zoonoses

Surveillance according to Directive 2003/99/EEC.
Control programmes in endemic regions.
Inclusion in National Epidemiologyc Surveillance Network according to Royal Decree 2210/1996.

The activities against this zoonoses are the Official Control in fresh meat according to european Legislation in force (Hygiene package).

2.9.2 Echinococcosis in humans

A. Echinococcus spp. in humans

Reporting system in place for the human cases

Notifiable Disease Surveillance System (NDSS)

In December of 1995 the National Network of Epidemiological Surveillance was created by law. This law and its development produced changes in the surveillance system. During 1997 the protocols of statutory notification of diseases were approved and implemented in Spain. In Spain the Autonomous Regions have wide powers with respect to epidemiological surveillance and national decisions are usually taken by consensus. All practising doctors are obliged to notify, both those in the public health service and in private practice, and both those practising outside and within hospitals. On occasions the appearance of cases and outbreaks is detected by other means (from the mass media, from citizens complants, etc.) and in these cases the information is checked and if confirmed it is incorporated into the system at the corresponding level.

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Notification system in place

In 1982, Notifiable Disease Surveillance System list was enhanced, and it was introduced the hydatidosis numerical notification. The health system collected the information from the medical consultations where the diagnosis was performed, the notification of suspect cases and incidents.

History of the disease and/or infection in the country

In Spain, E. granulosus is endemic in various regions, the trend curve showed a significant decrease from 1986 to 2008.

The geographical distribution remains heterogeneous, with more cases in the

peninsular plateau regions. The analysis of the demographic variables shows that, although the disease affects all age groups, the older age groups are the most affected. There are not significant sex differences.

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

There is a notable decrease in human echinococcosis. This decrease is most likely a result of a continued control programme, particularly in endemic regions with extensive animal production

Relevance as zoonotic disease

Hidatidosis is the first parasitic disease in Spain

2.9.3 Echinococcus in animals

Table Echinococcus in animals

	Source of information	Sampling unit	Units tested	Total units positive for Echinococcus spp.	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Cattle (bovine animals) - at slaughterhouse	F	animal	2071978	10686			10686
Deer - at game handling establishment	F	animal	121655	66			66
Foxes	F	animal	5	2			2
Pigs - at slaughterhouse	F	animal	38806715	9927			9927
Pigs - at slaughterhouse (domestic production)	F,f	animal	90889	341			341
Sheep and goats - at slaughterhouse	F	animal	12217824	449343			449343
Solipeds, domestic - at slaughterhouse [1)]	F	animal	25820	0			0
Wild boars - at game handling establishment	F,f	animal	81248	141			141

Comments:

[1)] horses

Footnote:

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES (RESULTS OF RUTINE POSTMORTEM EXAMINATION AT SLAUGHTERHOUSE)
f: domestic killing for self-consumption.

2.10 TOXOPLASMOSIS

2.10.1 General evaluation of the national situation

A. Toxoplasmosis general evaluation

History of the disease and/or infection in the country

Toxoplasmosis in production animals has been associated classically to the production of miscarriage.The main source of infection is linked to the contamination of feed by cat faeces, although the use of dung in pasture natural fertilitation has to be considered as an important source of infection for adults.
For humans, there are two main sources of infection: contact with cats and comsumption of vegetables, water or animal products, mainly sheep and pig meat.
In 60's and 70's studies in some regions of Spain detected prevalences between 12-45% in sheep; between 11- 42% in pig;and between 14-36%in cattle.
More recent studies seem prevalences between 30-57% in sheep;between 41-62% in pig;and between 25-43% in cattle.
In cats, the incidence founded by private clinics are close to 30%.

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

In 2003, data comunicated by Autonomous Comunities about toxoplasmosis in production animals showed incidence in sheep of 35,4%;19% in cattle and 18% in goats.

Main sources of infection for humans are cats and comsumption of meat insufficientment cooked.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

More studies need to be developed.

Recent actions taken to control the zoonoses

Surveillance according to Directive 2003/99/EC
Primary prevention of the disease with recommendations to prevent infection during pregnance in humans

2.10.2 Toxoplasmosis in humans

A. Toxoplasmosis in humans

Reporting system in place for the human cases

Royal Decree 2210/1995, december 25, by Epidemiological Surveillance National Net is created.

Microbiological Information System

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Notification system in place

Microbiological Information System
The Microbiological Information System has been based since 1989 on voluntary weekly reporting by clinical microbiology laboratories (principally hospital laboratories). Currently, in order to improve the notification, this procedure is becoming compulsory for a designated group of representative laboratories. The information in these reports is based on individual cases and includes the following variables: agent, time, place, age, sex, etc

2.10.3 Toxoplasma in animals

Table Toxoplasma in animals

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma	T. gondii
Sheep - at farm - animal sample - Clinical investigations	Animal Helath	animal	19	4	4

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

Paralytic and furious forms of rabies are described in the second book of the Hunting Agreement in the time of King Alfonso XI(1312-1350).The Royal Assembly of Health publication of 23 November 1786 adopted measures to avoid transmission of rabies controlling movement of dogs and cats.Royal Order of 1863 describes "measures of preservation that one has to follow in each case where the bite has been from a supposed rabid animal" and also set down the measures against rabies in animals, which were to be adopted by Local Authorities.At the beginning of the 20th century the Law of 18 December 1914 and Regulation of 4 June 1915 are approved to prevent the transmission of human rabies.During the 1940s the first statistics on animal rabies appeared(513 dog cases in 1944 and 24 human cases).On 12 May 1947 the Ministry of Agriculture issued a General Order establishing the measures to be taken against rabies and a second Order of 1948 established the norms for animal vaccination and control.During the 1950s the first mass dog vaccination campaigns took place.The Epizootics Law of 20 December 1952 established the general regulations of the anti-rabies programme.

Urban rabies has been the main epidemiologycal form in the history of the disease in Spain, with dogs as reservoir of the infection.

Spain is free of land rabies since 1966, with exception of Ceuta and Melilla, that have a regular notification of cases of rabies by their situation in North Africa, where rabies is endemic.

In peninsular territory an imported outbreak was reported in 1975 in the province of Malaga by introduction of dogs coming from North Africa. This outbreak ended in 1977 with 122 animals infected(dogs and cats, and 2 foxes) and one case of human rabies.

Since 1979 only have beed notificated cases of rabies in peninsular territory by EBLV1 in bats(Eptesicus serotinus) of the south and east.

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

Since 1978 Spainsh mainland and islands remains free of rage in terrestrial mammals. Only a few cases of EBL1 has been reported in bats.

These data show that the main source and risk for the apparition of cases of rabies in Spain is the importation of animals with the infection from Morocco and other countries of North Africa.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

Since 1975 no human cases has been reported in peninsular territory and islands.

Recent actions taken to control the zoonoses

Compulsory surveillance of the disease according to article 4 of Directive 2003/99/EEC,came into force by Royal Decree 1940/2004.
Compulsory vaccination of dogs in 10 autonomous comunities and Ceuta y Melilla. Voluntary in the rest.
Studies including active surveillance of LB-1 in bats.
Information to the citizens about no manipulation of bats.

2.11.2 Rabies in humans

A. Rabies in humans

Reporting system in place for the human cases

Notifiable Disease Surveillance System (NDSS)
Royal Decree 2210/1995, december 25, by Epidemiological Surveillance National Net is created

Royal Decree 1940/2004, september 27, about zoonoses disease and zoonoses agents surveillance

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Notification system in place

Notifiable Disease Surveillance System (NDSS)

In December of 1995 the National Network of Epidemiological Surveillance was created by law. This law and its development produced changes in the surveillance system. During 1997 the protocols of statutory notification of diseases were approved and implemented in Spain. In Spain the Autonomous Regions have wide powers with respect to epidemiological surveillance and national decisions are usually taken by consensus. All practising doctors are obliged to notify, both those in the public health service and in private practice, and both those practising outside and within hospitals. On occasions the appearance of cases and outbreaks is detected by other means (from the mass media, from citizens complants, etc.) and in these cases the information is checked and if confirmed it is incorporated into the system at the corresponding level.
This notification has been compulsory by law for all doctors since 1901.

History of the disease and/or infection in the country

Spain remained free of human cases from 1975

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

Spain is free of rabies.
In 1987 bat rabies was reported. The description of the illness amongst bats lead to an immediate reaction by the health authorities, who had already brought together a group of experts in 1987 to work out recommendations and establish lines of research.

The Ministry of Health and Consume Affairs backed the study about the distribution of EBL1 in the bat population, as well as studies of aetiology and the distribution of bat populations in different regions of Spain. They established serum prevalence towards EBL1 in different species such as Myotis myotis, Miniopterus schreibersii, Tadarida teniotis and Rhinolophus ferrumequinum, and several origins

The studies carried out in the Instituto de Salud Carlos III of the Ministry of Health, in collaboration with the Biological station in Doñaana, allow the perfecting of highly sensitive diagnostic techniques, such polymerase chain reaction (PCR), to understand the distribution, natural history and pathogenesis of the disease in insectivorous bats.

Relevance as zoonotic disease

High

2.11.3 Lyssavirus (rabies) in animals

A. Rabies in dogs

Monitoring system

Sampling strategy

Sampling strategy is targeted at 3 levels:
1. apparently healthy dogs that injure a person and die into the quarantine(kept under observation) period of 14 days or if the animal is suspected to be rabid(euthanasia).Samples are taken by competent authority
2.dogs and cats imported from third countries not included in part C of Annex II of Council Regulation(EC) 998/2003)need negative results to enter into Spain.If theses animals belong to spanish citizens coming from these third countries samples are taken when arrival to Spain.
3.dogs and cats that are going to travel to United Kingdom, Ireland, Sweeden, Norwey and Malta.Samples are taken by private clinics and analisys performed by National Reference Laboratory

Frequency of the sampling

indeterminated

Type of specimen taken

Other: Brain, Blood

Methods of sampling (description of sampling techniques)

Brain of dead or sacrified animals have to be sent to National Reference Laboratory following a protocol of sending.The sample has to be taken with sterility, be submerged in salinum serum and glicerine in 50% solution and envoided refrigerated quickly.
Blood are taken by private clinics and serum(0,5 ml minimun) have to be sent following a protocol, by a quick transport service refrigerated or frozen.

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC and Commission Decision 2002/543/EC

Diagnostic/analytical methods used

Other: FAT, ELISA

Vaccination policy

Compulsory vaccination of dogs in 10 regions, Ceuta and Melilla.
Voluntary vaccination of dogs in 5 regions.

Other preventive measures than vaccination in place

Control of animals coming from third countries not included in part C of Annex II of Council Regulation(EC) 998/2003
Identication and registration of dogs.
Pick up of stray dogs by council town authorities.

Control program/mechanisms

The control program/strategies in place

Different regional prevention programmes.
Control of imports and exports according to Council Regulation(EC) 998/2003.

Recent actions taken to control the zoonoses

Imports of third countries not included in part C of Annex II of Council Regulation(EC) 998/2003)

Measures in case of the positive findings or single cases

Mandatory Notifiable disease Royal Decree 2210/1995, december 25, by Epidemiological Surveillance National Net is created.
Oficcial Notification of the disease
Epidemiologic survey
Cases in Spain (Ceuta and Melilla) are imported from third countries

Notification system in place

Since 1952, at least, by Epizootic Law.
At the moment by Animal Health Law 8/2003.

Results of the investigation

Not cases.

Investigations of the human contacts with positive cases

All the people bitten by an suspected animal are investigated and complete treatment (vaccine and Ig) against rage is offered to them.

Relevance of the findings in animals to findings in foodstuffs and to human cases

High

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	European Bat Lyssavirus 1 (EBL 1)	Unspecified Lyssavirus	Classical rabies virus (genotype 1)	European Bat Lyssavirus - unspecified
Bats - wild - in total - Surveillance (EDO)	M.S.P.S.	animal	45	1	1			
Cats - in total - Surveillance (EDO)	M.S.P.S.	animal	21	0				
Dogs - stray dogs - in total - Surveillance (EDO)	M.S.P.S.	animal	66	1			1	
Other animals - in total - Surveillance (EDO)	M.S.P.S.	animal	37	0				

Footnote:

M.S.P.S.: Ministry of Health
1 dog from Ceuta spanish city of North Africa. Spain (mainland and islands) is free of rabies.

2.12 Q-FEVER

2.12.1 General evaluation of the national situation

2.12.2 Q-fever in humans

A. C. burnetii in humans

Reporting system in place for the human cases

- Microbiological Information System

The Microbiological Information System has been based since 1989 on voluntary weekly reporting by clinical microbiology laboratories (principally hospital laboratories). Currently, in order to improve the notification, this procedure is becoming compulsory for a designated group of representative laboratories. The information in these reports is based on individual cases and includes the following variables: agent, time, place, age, sex, etc.

Case definition

According to Decision No. 2119/98/EC of the European Parliament and of the Council, Commission Decision 2002/253/EC

Notification system in place

Microbiological Information System
Outbreak reporting system

History of the disease and/or infection in the country

Q fever is a zoonosis with widely extended in the world. In Spain the first cases were documented in 1949.

The most common animal reservoirs are livestock and the main form of infection is by inhalation of contaminated aerosols.

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

Most of cases and outbreaks are related to care of sheep , other form of an occupational nature such as abattoirs were presents.

In 2008, 116 cases of Q fever has been comunicate to the Microbiological Information System

Relevance as zoonotic disease

important

2.12.3 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) - at farm - animal sample - Clinical investigations	Animal Helath	herd	7	2	2

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1 ENTEROCOCCUS, NON-PATHOGENIC

3.1.1 General evaluation of the national situation

3.1.2 Antimicrobial resistance in Enterococcus, non-pathogenic isolates

A. Antimicrobial resistance of E. faecium in animal

Sampling strategy used in monitoring

Frequency of the sampling

Samples from pigs : between the months of march and december 2008
Samples from poultry: between the months of june and november 2008
Samples from cattle: between the months of june and october 2008

Type of specimen taken

faeces taken at colon (pigs and cattle) and caecum (poultry) level

Methods of sampling (description of sampling techniques)

Pigs: sampling at 7 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
2 samples have been taken from each slaughter batch, belonging to different herds.
342 samples belonging to 171 slaughter batches have been taken in 2008.

Poultry: sampling at 7 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
3 samples have been taken from each slaughter batch, belonging to different flocks.
339 samples belonging to 113 slaughter batches have been taken in 2008.

Cattle: sampling at 8 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
2 samples have been taken from each slaughter batch, belonging to different herds.
336 samples belonging to 168 slaughter batches have been taken in 2008.

Procedures for the selection of isolates for antimicrobial testing

All the isolates have been selected for antimicrobial testing.

Methods used for collecting data

National survey 2008.Data are collected at national level.

Laboratory methodology used for identification of the microbial isolates

Culture and isolation in agar M-enterococcus.
Identification by Rapid ID32 Strep.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Following The EFSA Journal(2008) 141: 1-44.
See tables of results.

Breakpoints used in testing

Following The EFSA Journal(2008) 141: 1-44.
See table of breakpoints

Results of the investigation

Pigs:
number of isolates tested: 82
high level of antimicrobial resistance to Lincomycin (96,3), Erythromycin (64,6%), Tetracyclin (75,6%), Bacitracin (84,1%) and Quinupristin/Dalfopristin (98,8%).Low level of resistance to Trimethoprim, Gentamicin, Amoxicillin, Ciprofloxacin and Vancomycin. No resistance to Chloranfenicol and Avilamicin.

Poultry (Gallus gallus):
number of isolates tested: 69
high level of resistance to Lincomycin (91,3,2%), Tetracyclin (79,7%), Erythromicin (82,6%), Bacitracin (81,2%) and Quinupristin/Dalfopristin (91,3%). Low level of resistance to Amoxicillin, Gentamicin and Streptomicin.No resistance to Chloranfenicol and Vancomicin.

Cattle:
number of isolates tested: 18
high level of resistance to Lincomycin (72,2%), Bacitracin (94,4%) and Quinupristin/Dalfopristin (77,8%).
low level of resistance to Vancomicyn, Chloranfenicol, Trimetoprim and Streptomicin.
No resistance to Avilamicin, Penicillin,Amoxicillin and Gentamicin.

Table Antimicrobial susceptibility testing of E. faecium in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - caecum - Monitoring - quantitative data [Dilution method]

E. faecium		Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - caecum - Monitoring																							
Isolates out of a monitoring program (yes/no)		yes																							
Number of isolates available in the laboratory		69																							
Antimicrobials:		break points	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	32	69	0										3	37	26	3									
Fluoroquinolones	Ciprofloxacin	8	69	3							1	5	17	25	18	3										
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	69	51										2	5	4	2	5	10	8	33					
	Vancomycin	4	139	0							27	99	8	5												
Macrolides	Erythromycin	4	69	57						3		2	4	3	6	1		1	49							
Orthosomycins	Avilamycin	8	69	17							1	6	11	24	10	3		14								
Penicillins	Amoxicillin	4	69	16									33	20	5	3	4	4								
	Ampicillin		0	0																						
	Penicillin	8	69	49								2	2	7	9	18	31									
Streptogramins	Quinupristin/Dalfopristin	1	69	63							1	5	13	26	15	5	3	1								
Tetracyclines	Tetracyclines	2	69	55								13	1				1	13	41							

Footnote:

Multiresistance is calculated using only 6 of the 10 antimicrobials and their breakppoints mentioned in EFSA J (2008) 141: 1-44 (chloramphenicol, vancomycin, erythromycin, quinupristin/dalfopristin, tetracycline and amoxicillin instead of amplicillin)

Table Antimicrobial susceptibility testing of E. faecium in Cattle (bovine animals) - meat production animals - at slaughterhouse - animal sample - faeces - Monitoring - quantitative data [Dilution method]

E. faecium		Cattle (bovine animals) - meat production animals - - faeces - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		18																								
Antimicrobials:		break points	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	32	18	1											10	7		1								
Fluoroquinolones	Ciprofloxacin	8	18	4							3	1	5	2	3	4										
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	18	13													1	4	8	4	1					
	Vancomycin	4	18	1							7	7	3			1										
Macrolides	Erythromycin	4	13	3						2	2	3		3	2	1										
Orthosomycins	Avilamycin	8	18	5								2	1	5	5	5										
Penicillins	Amoxicillin	4	18	1									17		1											
	Ampicillin		0	0																						
	Penicillin	8	18	2								2	5	5	4	2										
Streptogramins	Quinupristin/Dalfopristin	1	18	14							1	3	6	8												
Tetracyclines	Tetracyclines	2	18	10								8					2	2	6							

Footnote:

Multiresistance is calculated using only 6 the 10 antimicrobials and their breakpoints mentioned in EFSA J (2008) 141: 1-44 (chloramphenicol, vancomycin, erythromycin, quinupristin/dalfopristin, tetracycline and amoxicillin instead of amplicillin)

Table Antimicrobial susceptibility testing of E. faecium in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - quantitative data [Dilution method]

E. faecium		Pigs - fattening pigs - - faeces - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		82																								
Antimicrobials:		break points	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	32	82	0										1	37	38	6									
Fluoroquinolones	Ciprofloxacin	8	82	1							10	27	30	13	1	1										
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	82	63										8	1	2	2	6	17	14	32					
	Vancomycin	4	82	4							29	43	3	3	4											
Macrolides	Erythromycin	4	82	53					1	11	5	2	5	5	11			1	41							
Orthosomycins	Avilamycin	8	82	3									14	44	21	3										
Penicillins	Amoxicillin	4	82	4									66	12	2	2										
	Ampicillin		0	0																						
	Penicillin	8	82	44								3	6	11	18	27	17									
Streptogramins	Quinupristin/Dalfopristin	1	82	81							1		15	36	17	11	2									
Tetracyclines	Tetracyclines	2	82	62								20			2		3	12	45							

Footnote:

Multiresistance is calculated using only 6 the 10 antimicrobials and their breakpoints mentioned in EFSA J (2008) 141: 1-44 (chloramphenicol, vancomycin, erythromycin, quinupristin/dalfopristin, tetracycline and amoxicillin instead of amplicillin)

Table Breakpoints for antibiotic resistance of Enterococcus, non-pathogenic

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
EU

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols	**Chloramphenicol**				32	2	32				
Fluoroquinolones	**Ciprofloxacin**				8	0.25	8				
Glycopeptides (Cyclic peptides, Polypeptides)	**Bacitracin**				64	4	256				
	Vancomycin				4	0.5	64				
Macrolides	**Erythromycin**				4	0.12	64				
Orthosomycins	**Avilamycin**				8	0.5	32				
Penicillins	**Amoxicillin**				4	2	32				
	Penicillin				8	0.03	16				
Streptogramins	**Quinupristin/Dalfopristin**				1	0.5	32				
Tetracyclines	**Tetracyclines**				2	1	64				

3.2 ESCHERICHIA COLI, NON-PATHOGENIC

3.2.1 General evaluation of the national situation

A. Escherichia coli general evaluation

History of the disease and/or infection in the country

E. coli cause many infections in humans, with intestinal and extra-intestinal forms. In production animals E. coli diseases are very frequent, mainly in newborns or animals few days old of cattle, pork and sheep.Problems are often too in farms of poultry and rabbits. Several cases and outbreaks of diarrhea for Enteropatogenic E. coli have been detected since 60´s, but these focus have reduced importantly in last decades.Serotypes in rabbits or rumiants are different than human ones.In Spain, the main serotype in rabbits is O103:H2.

E. coli Enterotoxicogenic are more frecuent associated with focus of gastroenteritis in humans, by consume of water and animal products.But predominant human serotypes in Spain(O25:H-;O153:H45;O169:H41) are different than the ones that causes diarrohea in animals. In piglets predominat serotypes are O138:K81:H14;O141:K85ab:H-;O149:K91:H10;O157:H-.

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

In production animals diseases by E. coli are very frequent. Although E. coli strains that cause infections in humans and animals can share many virulence factors, they often show different serotypes.Therefore, E.coli strains patogenic for animals are infrequent to produce infections in humans, but it is proved that animals can be a reservoir of Enteropathogenic E. coli for humans.

Environment and water can also be a source of infecction.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases

It is very difficult to establish the relevance of findings as sources of infection, because E. coli is a very ubiquitous agent and strains patogenic for animals are infrequent to produce infections in humans.

3.2.2 Antimicrobial resistance in Escherichia coli, non-pathogenic

A. Antimicrobial resistance of E.coli in animal

Sampling strategy used in monitoring

Frequency of the sampling

Samples from pigs : between the months of march and december 2008
Samples from poultry: between the months of june and november 2008
Samples from cattle: between the months of june and october 2008

Type of specimen taken

faeces taken at colon (pigs and cattle) and caecum (poultry) level

Methods of sampling (description of sampling techniques)

Pigs: sampling at 7 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
2 samples have been taken from each slaughter batch, belonging to different herds.
342 samples belonging to 171 slaughter batches have been taken in 2008.

Poultry: sampling at 7 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
3 samples have been taken from each slaughter batch, belonging to different flocks.
339 samples belonging to 113 slaughter batches have been taken in 2008.

Cattle: sampling at 8 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
2 samples have been taken from each slaughter batch, belonging to different herds.
336 samples belonging to 168 slaughter batches have been taken in 2008.

Procedures for the selection of isolates for antimicrobial testing

All the isolates have been selected for antimicrobial testing.

Methods used for collecting data

National survey 2008.Data are collected at national level.

Laboratory methodology used for identification of the microbial isolates

Culture and isolation in selective medium (agar McConkey).
Confirmation by biochemical test API 20E

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Following The EFSA Journal(2008) 141: 1-44.

See tables of results.

Breakpoints used in testing

Following The EFSA Journal(2008) 141: 1-44.
See table of breakpoints.

Results of the investigation

Pigs:
number of isolates tested: 168
high level of antimicrobial resistance to Tetracyclin (84,5%),Sulfonamides (61,3%),Streptomycin (64,3%),Trimethoprim (55,4%)and Ampicillin (57,7%). Low levels of resistance to Quinolones and Fluoroquinolones and no resistance to 3rd generation Cephalosporins.
ESBL have been detected in 1 isolate by the synergy test.

Poultry (Gallus gallus):
number of isolates tested: 113
high level of antimicrobial resistance to Quinolones (Nalidixic acid: 81,4%), Fluoroquinolones (Ciprofloxacin: 87,6%),Tetracyclin (72,6%),Streptomycin (54,9%) and Ampicillin (75,2%). Moderate level of resistance to Cephalosporins (20-30%).
ESBL have been detected in 12 isolates by the synergy test.

Cattle:
number of isolates tested: 167
high level of antimicrobial resistance to Tetracyclin (44,3),Sulfonamides (36,5%), trimetoprim (40,1%)and Streptomycin (32,3%). Low levels of resistance to Quinolones and Fluoroquinolones, Fenicols, Gentamicin and Kanamicin, and no resistance to Cephalosporins.

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals) - meat production animals - at slaughterhouse - animal sample - faeces - Monitoring - quantitative data [Dilution method]

E. coli		Cattle (bovine animals) - meat production animals - - faeces - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		167																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	166	7						14	87	47	11	1		2	2	2								
	Kanamycin	8	167	6										147	14			2		4						
	Neomycin		0	0																						
	Streptomycin	16	167	54									5	75	25	8	11	14	13	16						
Amphenicols	Chloramphenicol	16	167	19									3	79	66		2	3	14							
	Florfenicol	16	167	8									2	93	60	4	1		7							
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.25	167	0				135	30	2																
	Ceftazidim	1	167	0						162	5															
Fluoroquinolones	Ciprofloxacin	0.03	167	7	4	110	46	1	1	4	1															
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	8	167	21								9	68	69				21								
Quinolones	Nalidixic acid	16	167	4										162	1				4							
Sulfonamides	Sulfonamide	256	167	61											57	41	7	1				2	59			
Tetracyclines	Tetracyclin	8	167	74								55	29	1	8	4	9	35	26							
Trimethoprim	Trimethoprim	2	167	37							124	5	1					37								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

Multiresistance is calculated using only the 10 antimicrobials mentioned in EFSA J (2008) 141: 1-44

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - caecum - Monitoring - quantitative data [Dilution method]

E. coli		Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - caecum - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		113																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	113	17						1	45	44	6	1	1	4	3	8								
	Kanamycin	8	113	16										77	20	4	1		2	9						
	Neomycin		0	0																						
	Streptomycin	16	113	62										28	12	11	13	11	12	26						
Amphenicols	Chloramphenicol	16	113	25									5	57	24	2	8	6	11							
	Florfenicol	16	113	3									6	58	40	6	1	2								
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.25	113	34				48	26	5		1	2	5	26											
	Ceftazidim	1	113	29						70	11	3	4	3	7	12	3									
Fluoroquinolones	Ciprofloxacin	0.03	113	99		8	6		1	14	10	5	11	7	24	27										
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	8	113	85									11	16	1			85								
Quinolones	Nalidixic acid	16	113	92										17	3	1	2	1	89							
Sulfonamides	Sulfonamide	256	113	65											21	17	8	1	1			1	64			
Tetracyclines	Tetracyclin	8	113	82								18	13			2	7	40	33							
Trimethoprim	Trimethoprim	2	113	54							57	2		1	2			51								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

Multiresistance is calculated using only the 10 antimicrobials mentioned in EFSA J (2008) 141: 1-44

Table Antimicrobial susceptibility testing of E. coli in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - quantitative data [Dilution method]

E. coli		Pigs - fattening pigs - - faeces - Monitoring																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		168																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	168	9						8	70	64	17		3		4	2								
	Kanamycin	8	168	17										137	14	3			2	12						
	Neomycin		0	0																						
	Streptomycin	16	168	108									3	23	21	13	22	26	32	28						
Amphenicols	Chloramphenicol	16	168	39									1	59	58	11	11	17	11							
	Florfenicol	16	168	2									1	73	72	20	1		1							
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.25	168	1				116	50	1					1											
	Ceftazidim	1	168	1						143	24			1												
Fluoroquinolones	Ciprofloxacin	0.03	168	17	4	75	72	4	1	8	1					3										
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	8	168	97								1	31	37	2		2	95								
Quinolones	Nalidixic acid	16	168	19										143	4	2		5	14							
Sulfonamides	Sulfonamide	256	168	103											28	24	13				1	2	100			
Tetracyclines	Tetracyclin	8	168	142								20	5		1	3	8	57	74							
Trimethoprim	Trimethoprim	2	168	93							71	1	3					93								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Footnote:

Multiresistance is calculated using only the 10 antimicrobials mentioned in EFSA J (2008) 141: 1-44

Table Antimicrobial susceptibility testing of E. coli in food

E. coli		Meat from pig		Meat from bovine animals		Meat from broilers (Gallus gallus)		Meat from other poultry species		Meat, mixed meat	
Isolates out of a monitoring program (yes/no)											
Number of isolates available in the laboratory				10						19	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin			10	0					19	2
	Kanamycin			8	1					19	19
	Neomycin			2	0					19	19
	Streptomycin			10	1					19	19
Amphenicols	Chloramphenicol			10	0					18	7
	Florfenicol			10	0					19	0
Cephalosporins	3rd generation cephalosporins			10	0					19	6
Fluoroquinolones	Ciprofloxacin			10	0					19	5
	Enrofloxacin			10	0					19	6
Fully sensitive	Fully sensitive			10	3						
Penicillins	Ampicillin			10	5					19	9
Quinolones	Nalidixic acid			10	0					19	11
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial			10	1						
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials			10	4						
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials			10	1					19	1
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials			10	0					19	3
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials			10	0					19	15
Sulfonamides	Sulfonamide			10	3					19	12
Tetracyclines	Tetracyclin			10	4					19	12

Table Antimicrobial susceptibility testing of E. coli in food

Footnote:

HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

Table Breakpoints used for antimicrobial susceptibility testing

Test Method Used	
Disc diffusion	○
Agar dilution	○
Broth dilution	◉
E-test	○

Standards used for testing
EU

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**				2	0.25	32				
	Kanamycin				8	4	128				
	Streptomycin				16	2	128				
Amphenicols	**Chloramphenicol**				16	2	64				
	Florfenicol				16	2	64				
Cephalosporins	**Cefotaxim**				0.25	0.06	4				
	Ceftazidim				1	0.25	16				
Fluoroquinolones	**Ciprofloxacin**				0.03	0.008	8				
Penicillins	**Ampicillin**				8	0.5	32				
Quinolones	**Nalidixic acid**				16	4	64				
Sulfonamides	**Sulfonamide**				256	8	1024				
Tetracyclines	**Tetracyclin**				8	1	64				
Trimethoprim	**Trimethoprim**				2	0.5	32				

Table Breakpoints used for antimicrobial susceptibility testing

Test Method Used	
Disc diffusion	◉
Agar dilution	○
Broth dilution	○
E-test	○

Standards used for testing
NCCLS

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

Table Breakpoints used for antimicrobial susceptibility testing

Footnote:

HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1 HISTAMINE

4.1.1 General evaluation of the national situation

4.1.2 Histamine in foodstuffs

4.2 ENTEROBACTER SAKAZAKII

4.2.1 General evaluation of the national situation

4.2.2 Enterobacter sakazakii in foodstuffs

4.3 STAPHYLOCOCCAL ENTEROTOXINS

4.3.1 General evaluation of the national situation

4.3.2 Staphylococcal enterotoxins in foodstuffs

5. FOODBORNE

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

Royal Decree 2210/1995, december 25, by Epidemiological Surveillance National Net is created.

Notifiable Disease Surveillance System (NDSS)

In December of 1995 the National Network of Epidemiological Surveillance was created by law.
During 1997 the protocols of statutory notification of diseases were approved and implemented in Spain. In Spain the Autonomous Regions have wide powers with respect to epidemiological surveillance and national decisions are usually taken by consensus.
All practising doctors are obliged to notify, both those in the public health service and in private practice, and both those practising outside and within hospitals. On occasions the appearance of cases and outbreaks is detected by other means (from the mass media, from citizens complants, etc.) and in these cases the information is checked and if confirmed it is incorporated into the system at the corresponding level.
The notification may be carried out using a variety of systems: mail, fax, telephone, e-mail, etc. Presently all the regions (and in many cases levels below) transmit the data by e-mail. A network is being developed for the National Epidemiological Surveillance Network which will permit the flow of data from the local level.

The notification of outbreaks is mandatory and standardised. All the outbreaks must be reported immediately at the regional level. At the national level it is obligatory to report immediately only those outbreaks which, by law, are defined as being supra-communitary (considered to be of national interest) in order to facilitate their rapid control, where as the rest of the outbreaks are reported quarterly. Some regions have set up early warning systems in order to support doctors in reporting and investigating outbreaks. A similar national system is entering into operation.
In 1997 a uniform outbreak reporting format (variables and codification) was developed in all of Spain in accordance with the one recommended by the WHO Programme. The report includes relevant information such as agent, food involved, place of consumption and contributing factors.
The results of the statistical and epidemiological analysis are disseminated in annual reports. In addition they are published in epidemiological bulletins (national, regional and other). The weekly national epidemiological bulletin can be found at: http://cne.isciii.es/bes/bes.htm.

In Spain the investigation of outbreaks of any diseases in humans is regulated

within the National Epidemiological Surveillance Network.
The responsibility and coordination falls on the epidemiologist charged with the investigation of each outbreak. In foodborne outbreaks this is also the case, but in close coordination with those who have to investigate

Description of the types of outbreaks covered by the reporting:

The Spanish System covers all type of outbreaks, family, general and international outbreak

National evaluation of the reported outbreaks in the country:

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

Salmonella is the agent more frequently implied in foodborne outbreak, emphasizing S. Enteritidis.

The food implied in its majority was eggs and eggs products
Eggs
Meat
Milk

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

The place of consumption of the implied food was, mainly, the familiar home, being the time of the year with more foodborne outbreaks the summer and contributor factor more frequent the inadequate temperature.

Control measures or other actions taken to improve the situation

Outbreak investigations as well as necessary control measures are carried out by the health authorities of the autonomous regions.

Foodborne Outbreaks: summarized data

	Total number of outbreaks	Outbreaks	Human cases	Hospitalized	Deaths	Number of verified outbreaks
Bacillus	6	0	unknown	unknown	unknown	6
Campylobacter	7	0	unknown	unknown	unknown	7
Clostridium	12	0	unknown	unknown	unknown	12
Escherichia coli, pathogenic	6	0	unknown	unknown	unknown	6
Foodborne viruses	29	0	unknown	unknown	unknown	29
Listeria	0	0	unknown	unknown	unknown	0
Other agents	37	0	unknown	unknown	unknown	37
Parasites	2	0	unknown	unknown	unknown	2
Salmonella	212	0	unknown	unknown	unknown	212
Staphylococcus	25	0	unknown	unknown	unknown	25
Unknown	188	0	unknown	unknown	unknown	188
Yersinia	0	0	unknown	unknown	unknown	0

Verified Foodborne Outbreaks: detailed data

S. Choleraesuis

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	1060
Hospitalized	80
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs and products(24), broiler (1), turquey (1), fish (1), crustacean (1) , soups (1), cake (2), pudding (2), water (1) unknow (11), several foods (5)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Cross-contamination, Inadequate chilling, Infected food handler, Other contributory factor, Storage time/temperature abuse, Unknown, Unprocessed contaminated ingredient, Water treatment failure
Outbreaks	50
Comment	restaurant/hotel (33), school (5), Hospital (1), geratrics (2), camp (2), unknow (7)

S. Enteritidis

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	224
Hospitalized	56
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs and produts (35), water (1), several foods(1), unknow(6)
Type of evidence	
Setting	Unknown
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Inadequate chilling, Cross-contamination, Inadequate heat treatment, Infected food handler, Other contributory factor, Storage time/temperature abuse, Unknown, Unprocessed contaminated ingredient, Water treatment failure
Outbreaks	43
Comment	

S. Typhi

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	1
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	1
Comment	waster water filtration

S. Typhimurium

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	24
Hospitalized	2
Deaths	0
Foodstuff implicated	Bovine meat and products thereof
More Foodstuff	bovina meat (1), pig (1), cake(1)
Type of evidence	
Setting	Canteen or workplace catering
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Other contributory factor
Outbreaks	3
Comment	store (1) unknow (1)

S. Typhimurium

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	27
Hospitalized	3
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs (49 cake(1)
Type of evidence	
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Unprocessed contaminated ingredient
Outbreaks	5
Comment	

Salmonella spp.

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	853
Hospitalized	89
Deaths	1
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs(29) bovine meat (3), pig meat(1), sausagges (2) , crustaceans (1), fish and products(3), UNKNOW (9), several foods (7), other (1), cake (5), cereals (1)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler, Inadequate heat treatment, Other contributory factor, Storage time/temperature abuse, Unknown, Unprocessed contaminated ingredient, Water treatment failure
Outbreaks	62
Comment	restaurant, hotel (50), take away (1), shool (2), geriatrics(4), OTHER SETTING (3), CAMP (1), catering (1)

Salmonella spp.

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	301
Hospitalized	60
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs and eggs products (30), broiler(1), crustacean (3), cakes (3), pudding (1), milk and products (3), unknow (6)
Type of evidence	
Setting	Unknown
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Inadequate heat treatment, Unknown, Unprocessed contaminated ingredient, Other contributory factor, Cross-contamination, Inadequate chilling, Storage time/temperature abuse, Infected food handler
Outbreaks	47
Comment	

Verified Foodborne Outbreaks: detailed data

C. jejuni

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	160
Hospitalized	0
Deaths	0
Foodstuff implicated	Broiler meat (Gallus gallus) and products thereof
More Foodstuff	unknow (1)
Type of evidence	
Setting	School, kindergarten
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse, Other contributory factor
Outbreaks	3
Comment	

C. jejuni

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	1
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

Campylobacter spp., unspecified

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	93
Hospitalized	0
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	cake, unknow
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor, Cross-contamination, Inadequate chilling, Unknown, Inadequate heat treatment
Outbreaks	3
Comment	

Verified Foodborne Outbreaks: detailed data

E.coli, pathogenic, unspecified

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	282
Hospitalized	0
Deaths	0
Foodstuff implicated	Broiler meat (Gallus gallus) and products thereof
More Foodstuff	cake, water, meat products, others, unknow
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure, Storage time/temperature abuse, Inadequate heat treatment
Outbreaks	6
Comment	school, geriatric

Verified Foodborne Outbreaks: detailed data

B. cereus

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	53
Hospitalized	0
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	cereals, several foo, unknow(2)
Type of evidence	Analytical epidemiological evidence, Laboratory characterization of food and human isolates, Laboratory detection in human cases, Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown, Cross-contamination, Inadequate heat treatment, Storage time/temperature abuse
Outbreaks	5
Comment	

B. cereus

	Value
Code	
Subagent Choice	Bacillus; B. cereus
Outbreak type	Household
Human cases	3
Hospitalized	0
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	
Type of evidence	Analytical epidemiological evidence
Setting	Unknown
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

C. botulinum

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Domestic
Contributory factors	Unknown
Outbreaks	1
Comment	

C. perfringens

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	550
Hospitalized	3
Deaths	0
Foodstuff implicated	Bovine meat and products thereof
More Foodstuff	pigs, broiler, other animal, several foods
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown, Storage time/temperature abuse, Infected food handler
Outbreaks	10
Comment	school, prison, geriatric, camp

Clostridium spp., unspecified

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	mushroom
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

S. aureus

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	174
Hospitalized	0
Deaths	0
Foodstuff implicated	Dairy products (other than cheeses)
More Foodstuff	dairy products (1), cheese (3), eggs (3), saussages(1), shellfish (1), soups(1), ice cream (1), sheeps (1), fast food (2), unknow (2)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Storage time/temperature abuse, Infected food handler, Inadequate heat treatment, Inadequate chilling, Cross-contamination
Outbreaks	16
Comment	restaurant (9), mobile retailer (1), others (3), camp (1), unknow(2)

Staphylococcus spp., unspecified

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	17
Hospitalized	2
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	cheese(1), salad(1), unkown (2)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown, Storage time/temperature abuse
Outbreaks	4
Comment	restaurant (1), store (2), other (1)

Staphylococcus spp., unspecified

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	35
Hospitalized	3
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	chesee (2), patatoes salad(1) unknow(2)
Type of evidence	
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Unknown, Infected food handler
Outbreaks	5
Comment	

Verified Foodborne Outbreaks: detailed data

Hepatitis A virus

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	64
Hospitalized	20
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	crustaceans (4) other (1), unknow(2)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown, Infected food handler, Unprocessed contaminated ingredient
Outbreaks	7
Comment	restaurant (4) unknow (3)

Rotavirus

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

norovirus (Norwalk-like virus)

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	163
Hospitalized	0
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	crustaceans (1) whipped cream (1) several foods (2) , unknown (8)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Cross-contamination, Storage time/temperature abuse, Other contributory factor, Infected food handler, Inadequate heat treatment
Outbreaks	12
Comment	RESTAURANT (9), GERIATRIC (1), prison (1), other (1)

norovirus (Norwalk-like virus)

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	5
Hospitalized	0
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	crustaceans (1) saussagges (1)
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown, Storage time/temperature abuse
Outbreaks	2
Comment	

unspecified

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	74
Hospitalized	0
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	crustaceans... (3), unknown (2)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor, Cross-contamination, Unprocessed contaminated ingredient, Unknown
Outbreaks	5
Comment	other setting (2)

unspecified

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	13
Hospitalized	0
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	2
Comment	

Verified Foodborne Outbreaks: detailed data

Giardia spp., unspecified

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	32
Hospitalized	0
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	
Type of evidence	
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure
Outbreaks	1
Comment	

Trichinella

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	wild board meat
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

Brucella

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	3
Hospitalized	1
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	milk
Type of evidence	
Setting	Unknown
Place of origin of problem	Farm (primary production)
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Brucella

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	
Type of evidence	Laboratory detection in human cases
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Domestic
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Histamine

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	76
Hospitalized	0
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	fish and products (15), crustacean (1)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate chilling, Unprocessed contaminated ingredient, Unknown, Storage time/temperature abuse
Outbreaks	16
Comment	Restaurant (12), store (1), canteen (1), other setting (1), unknown (1)

Histamine

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	12
Hospitalized	1
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Unknown, Inadequate heat treatment
Outbreaks	5
Comment	

Mushroom toxins

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	12
Hospitalized	6
Deaths	1
Foodstuff implicated	Other foods
More Foodstuff	mushrooms
Type of evidence	Analytical epidemiological evidence
Setting	Household
Place of origin of problem	Other place of origin
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	4
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	6
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	
Type of evidence	
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	6
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	cannabis cake
Type of evidence	Analytical epidemiological evidence
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	3
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	meat contaminate with toxic products
Type of evidence	Analytical epidemiological evidence
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	16
Hospitalized	1
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure
Outbreaks	1
Comment	

S. boydii

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	83
Hospitalized	3
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	water source
Type of evidence	
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	1
Comment	source of water without thrataiment

S. flexneri

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	158
Hospitalized	38
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	
Type of evidence	
Setting	Camp, picnic
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	2
Comment	

S. sonnei

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	165
Hospitalized	3
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	
Type of evidence	
Setting	Other setting
Place of origin of problem	Water source
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

S. sonnei

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	5
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	several foods
Type of evidence	
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

ciguatoxin

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	25
Hospitalized	0
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	
Type of evidence	
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	suppliers

Verified Foodborne Outbreaks: detailed data

Unknown

	Value
Code	
Outbreak type	General
Human cases	1947
Hospitalized	11
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	broiler (6), pig meat (1), fish and fish products (9), crustacean..(5), cake (5), eggs (4), fruit (1), fast food (5), dairy product (1). cheese (2), water (8), turquey (1), other foods (12), unknow (79)
Type of evidence	Analytical epidemiological evidence
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure, Unprocessed contaminated ingredient, Unknown, Storage time/temperature abuse, Other contributory factor, Infected food handler, Inadequate heat treatment, Inadequate chilling, Cross-contamination
Outbreaks	139
Comment	restaurant (95), store (3), school(12), hospital (1), geriatric (2), other setting (7), camp (7), canteen (1), unknow (6)

Unknown

	Value
Code	
Outbreak type	Household
Human cases	222
Hospitalized	10
Deaths	0
Foodstuff implicated	Milk
More Foodstuff	Milk(1), Cheese (1), meat (2), meat rabbit (1), saussagges (1), broiler (3), fish (1), crustacean (3), cake (3), eggs (2), water (3), others (4), unknow (19), mushrooms (5)
Type of evidence	Analytical epidemiological evidence
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Unknown, Water treatment failure, Storage time/temperature abuse, Other contributory factor, Infected food handler, Inadequate heat treatment, Inadequate chilling, Cross-contamination
Outbreaks	49
Comment	