ZOONOSES MONITORING

GERMANY

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 2007

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Germany**
Reporting Year: **2007**

Institutions and laboratories involved in reporting and monitoring:

Laboratory name	Description	Contribution
Federal institute for Risk Assessment (BfR)	PO Box 33 0013 D 14191 Berlin Federal institution independent from political influences, place of national reporting officer	Data on zoonotic agents from food, animals and feed reported by the federal states authorities
National Veterinary Reference Laboratories in the BfR	Federal Institute for Risk Assessment	Salmonella, Campylobacter, E. coli VTEC, Trichinella: antimicrobial resistance, phage types and serotyping and species identification
Unit for Foodborne Outbreaks in the BfR	Federal Institute for Risk Assessment	Foodborne outbreak data - food related data
Robert Koch Institute	Robert Koch Institute, Nordufer 20, D 13353 Berlin (Federal Institution)	Foodborne outbreak data - human related data
Friedrich Loeffler - Institute	Institute for Epidemiology, Seestr. 55, D 16868 Wusterhausen	Rabies, brucellosis, tuberculosis and salmonellosis in animals

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/ 99/ EC[1]. The information has also been forwarded to the European Food Safety Authority (EFSA).
The report contains information on trends and sources of zoonoses and zoonotic agents in Germany during the year 2007. The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal bacteria as well as information on epidemiological investigations of foodborne outbreaks. Complementary data on susceptible animal populations in the country is also given.
The information given covers both zoonoses that are important for the public health in the whole European Community as well as zoonoses, which are relevant on the basis of the national epidemiological situation.
The report describes the monitoring systems in place and the prevention and control strategies applied in the country. For some zoonoses this monitoring is based on legal requirements laid down by the Community Legislation, while for the other zoonoses national approaches are applied.
The report presents the results of the examinations carried out in the reporting year. A national evaluation of the epidemiological situation, with special reference to trends and sources of zoonotic infections, is given. Whenever possible, the relevance of findings in foodstuffs and animals to zoonoses cases in humans is evaluated.
The information covered by this report is used in the annual Community Summary Report on zoonoses that is published each year by EFSA.

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

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1. ANIMAL POPULATIONS

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

A. Information on susceptible animal population

Sources of information:

Official animal count May and Nov 2007, Bundesministerium fuer Ernaehrung, Landwirtschaft und Verbraucherschutz

Definitions used for different types of animals, herds, flocks and holdings as well as the types covered by the information:

Dairy cows and heifers includes all female breeding stock >1 year of age.
Cattle meat production includes all animals >1 year of age not included in "dairy cows and heifers"

Table Susceptible animal populations

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks	Year*	Number of slaughtered animals	Year*	Livestock numbers (live animals)	Year*	Number of holdings	Year*
Cattle (bovine animals)	dairy cows and heifers					4087300	2007	99000	2007
	meat production animals					71700	2007		
	calves (under 1 year)					3976100	2007		
	in total					12707300	2007	165500	2007
Ducks	in total					2617858	2007	8184	2007
Gallus gallus (fowl)	laying hens					38463704	2007	72883	2007
	broilers					59221711	2007	8680	2007
	breeding flocks for egg production line - in total (1)					16940069	2007		
	in total					114625484	2007	75829	2007
Geese	in total					327197	2007	5852	2007
Pigs	breeding animals					2454200	2007	27200	2007
	fattening pigs					11256800	2007		
	in total					27113000	2007	79700	2007
Turkeys	in total					10892177	2007	2289	2007

(1): rearing animals

Footnote

Data on bovine animals and pigs have been counted at November 2007, the others have been counted in May 2007

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

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

2.1. SALMONELLOSIS

2.1.1. General evaluation of the national situation

A. General evaluation

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

The zoonoses data were reported by the authorities or institutes of the federal states ('federal laender'). Questionnairs for the laender institutions can be downloaded from www.bfr.bund.de/ cd/ 299. The filled forms were send to the reporting officer within the BfR. After controlling the forms were added to an database automatically. The evaluation is standardised by the database system and the results are used for the prevalences tables and for the serovar tables under 'monitoring' (cf. foodnotes).

2.1.2. Salmonellosis in humans

2.1.3. Salmonella in foodstuffs

A. Salmonella spp. in eggs and egg products

Monitoring system

Sampling strategy

cf. Salmonella sp. in food

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

The number of examinations of eggs for human consumption reported was higher as in the former year. In 2007, the Salmonella rate has not significantly increased to 0.72 % of samples collected under the sampling plan (2006: 0.59 %). As before, S. Enteritidis was at the top of Salmonella detection in samples of eggs. In 2007, the relative share of S. Enteritidis was 67 % of the serotyped Salmonella (2006: 88 %).
In the egg shell investigations 0.53 % of the samples were positive with Salmonella. From egg yolk, S. Enteritidis could be isolated in two cases.

B. Salmonella spp. in broiler meat and products thereof

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

Poultry meat: In 2007, the total rate of positive samples collected under the sampling plan within the official food control has significantly decreased to 8,35 % (2006: 11.54 %). The rate in broiler meat has slightly decreased to 8,79 % (2006: 9.70 %). S. Enteritidis was detected more frequently than in the previous year (in broilers: 11 % of the serotyped Salmonella, 2006: 9 %). The share of S. Typhimurium decreased to 6 % (2006: 19 %). S. Paratyphi B, mostly as var. Java, was isolated from broiler meat in 22 % of the serotyped Salmonella (2006: 11 %).
Regarding meat products containing poultry meat, the reports received from the federal states revealed an increase of the Salmonella rate to 2.86 % (2006: 2.13 %). In 2007, for the first time data on meat products containing poultry meat were collected separately by animal species. In meat products containing broiler meat, 1.20 % positive samples were reported. Poultry meat prepared for processing in the kitchen was reported from 12 states. For 2007, in 413 examinations of poultry meat preparations (all poultry species) 10.41 % (2006: 10.74 %) proved to be Salmonella positive. Among these, S. Enteritidis was detected in 3 cases (7% of the serotyped Salmolla), S. Typhimurium in 1 case and S. Paratyphi B var. Java in 21 % of the serotyped Salmonella. Meat prepared for processing in the kitchen from broilers have shown Salmonella in 12.87 % with S. Enteritidis in 14 % of the serotyped salmonella.

C. Salmonella spp. in pig meat and products thereof

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

In the reports for bacteriological meat examination (Bakteriologische Fleischuntersuchungen BU) in

2007 at slaughterhouses, all reasons for conducting these examinations have been summarized. The Salmonella rate detected in samples of carcasses of swine has increased to 3.78 % (2006: 0.86 %). Among isolates from slaughtered swine, S. Typhimurium was preponderant again (49 % of Salmonella). S. Enteritidis was isolated in 2 cases only, i.e. in 1 % of Salmonella detected. ELISA examinations of meat juice from swine at slaughter revealed a presence of Salmonella antibody titres in 13.95 % of slaughtered animals (2006: 9.28 %). For 2007, two federal states reported on this examination strategy for more than 20,000 pigs. The percentage of positive reactions has increased.
The results of Salmonella testing of food samples collected under the sampling plan within the official food control are presented. Pork was examined less frequently than in the previous year (2040 samples, 2006: 2101). Salmonella were detected in 3.73 % of the samples tested (2006: 2.86 %), which is a slight increase compared with those of the previous year. Again, S. Typhimurium was isolated most frequently from pork (60% of Salmonella). S. Enteritidis was not isolated from pork as in the preceding year. In comminuted raw meat (not with the Minced Meat Regulations: intended to be eaten cooked) of pork was found an increase of the Salmonella rate to 4.73 % (2006: 2.91 %). Comminuted raw meat according to the Minced Meat Regulations (intended to be eaten raw) showed a decrease to 2.54 % (2006: 3.98 %), and raw meat products according to the Minced Meat Regulations showed nearly the same result as in the previous year with 2.52 % (2006: 2.48 %). Only two Salmonella findings were made in heat stabilized meat products of pork, one S.Enteritidis and one S.Typhimurium ('cooked, ready-to-eat': 0,08 %; 2006: 0.44 %). Salmonella were isolated from 0,86 % (2006: 0.76 %) of stabilized meat products made from pork with S.Typhimurium dominating.

D. Salmonella spp. in bovine meat and products thereof

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

In the reports for bacteriological meat examination (Bakteriologische Fleischuntersuchungen BU) at slaughterhouses, all reasons for conducting these examinations have been summarized. Examination results in samples of carcasses of cattle have decreased to 0.73 % of samples in contrast to the previous years (2006: 0.97 %). Among isolates from slaughtered cattle, S. Anatum was again the most frequent found serovar (41 % of the serotyped Salmonella), S. Typhimurium was found in 10 samples (19.6 % of Salmonella). S. Enteritidis was isolated in 1 case only.
The detection rate of Salmonella in beef in samples according to the sampling plan within the official food control decreased 2007 to no findings (2006: 0.31 %). Comminuted raw meat according to the Minced Meat Regulations (intended to be eaten raw) showed a share of positives of 0.83 % (2006: 0.88 %) with S. Typimurium in four cases and one S. Derby finding. In raw meat products made from beef according to the Minced Meat Regulations no Salmonella could be isolated. In one case S. Typhimurium was isolated from beef in heat treated meat products ('cooked, ready-to-eat') and no findings were made in stabilized meat products.

E. Salmonella spp. in food

Monitoring system

Sampling strategy

Examinations at the slaughterhouse: Bacteriological meat examinations (BU) in accordance with Annex 1 to the Regulations on Meat Hygiene (FLHVO) are ordered when certain suspicions arise during slaughter, when parts that should undergo meat examination are missing

or when the examination is delayed or no longer possible. The procedure for the performance of bacteriological meat examinations is set out in the General administrative provisions on the performance of official examinations according to the Meat Hygiene Act (VwVFIHG), Federal Gazette No. 238a, 23 December 1986.
Foods: Samples of foods on the market are regularly collected and examined by official food control staff (5 samples per 1,000 inhabitants) for bacterial contamination in accordance with the Official Collection of Methods of Examination under Art. 64(1) of the Food and Feed Code (LFGB) (up to 2004: Art. 35 of the Foods and Other Commodities Act (LMBG)). Sampling is performed in accordance with Art. 10 and 11 of the General administrative provisions on the principles for carrying out the official monitoring of food and wine law provisions (AVV-RUEb) and is undertaken in a risk-oriented manner. The methods to be used according to Art. 64(1) of the Foods and Other Commodities Act, e.g. for Salmonella, largely correspond to those described in ISO 6579.

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

In the reports for bacteriological meat examination (Bakteriologische Fleischuntersuchungen BU) in 2007 at slaughterhouses, all reasons for conducting these examinations have been summarized. The results of bacteriological meat examinations in meat animals were positive in 1.95 % of all samples (2006: 0.94 %).

F. Salmonella spp. in food - Meat from other poultry species

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

The Salmonella rates in meat from other poultry than broilers were comparable or less than broilers: meat from ducks 9.46 % (2006: 14,75 %), meat from geese 10,34 % (2006: 12.50 %) and meat from turkeys 5.58 % (2006: 10.50 %). In the meat of all these other poultry species the prevalence has decreased. S. Enteritidis could not be isolated from the meat of these other poultry species, S. Typhimurium was isolated only from meat from ducks and geese. In meat from turkeys S. Saintpaul was the most frequent serovar with 1.75 % (2006: 1,64 %), S. Hadar was 2007 the second most frequent serovar with 1.05 % (2006: 3.82 %).

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	Other serotypes	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Meat from broilers (Gallus gallus) (3)	offical food control with sampling plan	single	25g	762	67	49	7	4	7
fresh									
- at processing plant	offical food control with sampling plan	single	25g	36	4	1			3
- at retail	offical food control with sampling plan	single	25g	714	61	51	6	4	
meat preparation (4)	offical food control with sampling plan	single	25g	171	22	19	3		
intended to be eaten cooked									
- at processing plant	offical food control with sampling plan	single	25g	34	4	3	1		
- at retail	offical food control with sampling plan	single	25g	128	18	16	2		
meat products									
cooked, ready-to-eat	offical food control with sampling plan	single	25g	250	3	3			
- at processing plant	offical food control with sampling plan	single	25g	30	2	2			

- at retail	offical food control with sampling plan	single	25g	198	1	1			
Meat from turkey									
fresh									
- at processing plant	offical food control with sampling plan	single	25g	34	1	1			
- at retail	offical food control with sampling plan	single	25g	513	31	31			
meat preparation									
intended to be eaten cooked									
- at processing plant	offical food control with sampling plan	single	25g	25	2	1		1	
- at retail	offical food control with sampling plan	single	25g	132	10	10			
meat products									
cooked, ready-to-eat									
- at processing plant	offical food control with sampling plan	single	25g	34	5	5			
- at retail	offical food control with sampling plan	single	25g	113	2	1			1
Meat from duck									
- at slaughterhouse (1)	offical food control with sampling plan	single	25g	11	1	1			
- at retail	offical food control with sampling plan	single	25g	126	11	6		5	
Meat from geese									
- at slaughterhouse (2)	offical food control with sampling plan	single	25g	2	0				

- at retail	offical food control with sampling plan	single	25g	25	3	1		2	

(1) : at processing plant
(2) : at processing plant
(3) : in total
(4) : raw, prepared for barbecue and roasting
(5) : total of all poultry meat

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
Milk, cows'								
raw (1)	official food control with sampling plan	single	25g	117	0			
intended for direct human consumption (2)	official food control with sampling plan	single	25g	208	0			
raw milk for manufacture								
intended for manufacture of pasteurised/ UHT products	official food control with sampling plan	single	25g	197	0			
pasteurised milk								
- at processing plant	official food control with sampling plan	single	25g	122	0			
- at retail	official food control with sampling plan	single	25g	861	0			
Cheeses made from cows' milk								
- at processing plant	official food control with sampling plan	single	25g	658	0			
- at retail	official food control with sampling plan	single	25g	2255	0			
soft and semi-soft								
- at processing plant	official food control with sampling plan	single	25g	98	0			
- at retail	official food control with sampling plan	single	25g	375	0			
made from raw or low heat-treated milk								
- at processing plant	official food control with sampling plan	single	25g	41	0			

- at retail	official food control with sampling plan	single	25g	80	0			
made from pasteurised milk								
- at processing plant	official food control with sampling plan	single	25g	57	0			
- at retail	official food control with sampling plan	single	25g	295	0			
Cheeses made from goats' milk								
- at processing plant	official food control with sampling plan	single	25g	51	0			
- at retail	official food control with sampling plan	single	25g	116	0			
Cheeses made from sheep's milk								
- at processing plant	official food control with sampling plan	single	25g	31	0			
- at retail	official food control with sampling plan	single	2g	80	0			
Dairy products (excluding cheeses)								
butter								
made from raw or low heat-treated milk								
- at processing plant	official food control with sampling plan	single	25g	249	0			
- at retail	official food control with sampling plan	single	25g	317	0			
milk powder and whey powder								
- at processing plant	official food control with sampling plan	single	25g	85	0			
- at retail	official food control with sampling plan	single	25g	40	0			
ice-cream								
- at processing plant	official food control with sampling plan	single	25g	1678	0			
- at retail	official food control with sampling plan	single	25g	6180	0			

(1) : Raw milk selled at farm with recommendation for a heating of 10 min.
(2) : certified raw milk

Table Salmonella in red 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	Other serotypes
Meat from pig (3)	offical food control with sampling plan	single	25g	2040	76		45	9	22
fresh									
- at slaughterhouse	official slaughter control	single	10g	5233	198	2	96	52	48
- at processing plant	offical food control with sampling plan	single	25g	304	27		17	1	9
- at retail	offical food control with sampling plan	single	25g	1664	47		27	16	4
minced meat									
intended to be eaten raw									
- at processing plant	offical food control with sampling plan	single	25g	249	8		3	2	3
- at retail	offical food control with sampling plan	single	25g	525	12		8	1	3
intended to be eaten cooked									
- at processing plant	offical food control with sampling plan	single	25g	17	6		4		2
- at retail	offical food control with sampling plan	single	25g	151	2		2		
meat preparation									

intended to be eaten cooked									
- at processing plant (1)	offical food control with sampling plan	single	25g	34	1				1
- at retail (2)	offical food control with sampling plan	single	25g	270	3		2		1
meat products									
raw but intended to be eaten cooked									
- at processing plant	offical food control with sampling plan	single	25g	355	11		6	1	4
- at retail	offical food control with sampling plan	single	25g	704	15	1	9	2	3
cooked, ready-to-eat									
- at processing plant	offical food control with sampling plan	single	25g	105	0				
- at retail	offical food control with sampling plan	single	25g	847	1	1			
Meat from bovine animals	offical food control with sampling plan	single	25g	606	0				
fresh									
- at slaughterhouse	official slaughter control	single	10g	8119	59	1	10	12	36
- at processing plant	offical food control with sampling plan	single	25g	97	0				
- at retail	offical food control with sampling plan	single	25g	489	0				
minced meat									
intended to be eaten raw									
- at processing plant	offical food control with sampling plan	single	25g	63	1				1

- at retail	offical food control with sampling plan	single	25g	539	4		4		
intended to be eaten cooked									
- at processing plant	offical food control with sampling plan	single	25g	6	0				
- at retail	offical food control with sampling plan	single	25g	72	0				
meat products									
raw but intended to be eaten cooked									
- at processing plant	offical food control with sampling plan	single	25g	23	0				
- at retail	offical food control with sampling plan	single	25g	46	0				
cooked, ready-to-eat									
- at processing plant	offical food control with sampling plan	single	25g	13	0				
- at retail	offical food control with sampling plan	single	25g	114	1		1		
Meat from sheep									
fresh									
- at slaughterhouse	official slaughter control	single	10g	24	1			1	
- at processing plant	offical food control with sampling plan	single	25g	6	0				
- at retail	offical food control with sampling plan	single	25g	90	0				
Meat from horse									
fresh									
- at slaughterhouse	official slaughter control	single	10g	7	0				

- at processing plant	offical food control with sampling plan	single	25g	2	0				
- at retail	offical food control with sampling plan	single	25g	7	0				
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos)	offical food control with sampling plan	single	25g	3417	98	5	52	10	31

(1) : may contain meat from beef
(2) : may contain meat from beef
(3) : without slaugter data

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	Other serotypes
Eggs									
table eggs	offical food control with sampling plan	single	25g	6382	46	30	1	2	13
- at packing centre	official food control with sampling plan	single	25g	795	5	5			
- at retail	official food control with sampling plan	single	25g	5521	41	25	1	2	13
Egg products									
- at processing plant	official food control with sampling plan	single	25g	135	0				
- at retail	official food control with sampling plan	single	25g	171	1	1			
Fishery products, unspecified									
- at processing plant	official food control with sampling plan	single	25g	474	0				
- at retail	official food control with sampling plan	single	25g	3633	7	1	1		5
Crustaceans									

- at processing plant	official food control with sampling plan	single	25g	60	0				
- at retail	official food control with sampling plan	single	25g	693	3		1		2
Seeds, sprouted									
ready-to-eat	official food control with sampling plan	single	135	135	3			1	2
Fruits and vegetables									
precut	official food control with sampling plan	single	25g	882	1	1			
Infant formula									
dried									
intended for infants below 6 months (1)	official food control with sampling plan	single	25g	664	0				
Foodstuffs intended for special nutritional uses									
dried dietary foods for special medical purposes intended for infants below 6 months (2)	official food control with sampling plan	single	25g	242	0				

(1) : all 'childrens food'
(2) : all 'dietary food'

2.1.4. Salmonella in animals

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

Monitoring system

Sampling strategy

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

According to the Regulations on Salmonella in Chicken, the competent authorities are to be informed of the detection of S. Enteritidis and S. Typhimurium in chicken breeding flocks and hatcheries. The results obtained under these Regulations have been included in the reports submitted by the federal states.
The reports received from the federal states on Salmonella isolates in hens are used for the zoonoses trend report.

Vaccination policy

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

Vaccination of breeding flocks and smaller laying hen flocks during rearing can be ordered by the competent authorities.

Laying hens flocks

Vaccination of laying hen flocks during rearing against Salmonella is mandatory for herds >250 hens (Salmonella-Poultry-Order: Verordnung zum Schutz gegen bestimmte Salmonelleninfektionen beim Haushuhn).

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

Salmonella were detected in 1.0 % (2006: 0.7 %) of the 4013 breeding flocks (all production lines) examined in their laying phase. For a substantial number of breeding flocks the purpose (egg or meat production) was not specified. Results of examinations on Salmonella were only reported for 23 breeding flocks for egg production in their production period. Salmonella were detected in 4 of these flocks. Of those 3 were S. Enteritidis and 1 was S. Typhimurium.
During their production period 1.76 % of the laying hen flocks examined were positive for Salmonella, which is more than the data of 2006 (1.4 %).

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

Monitoring system

Sampling strategy

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

necessary)

According to the Regulations on Salmonella in Chicken (Verordnung zum Schutz gegen bestimmte Salmonelleninfektionen des Haushuhns) the competent authorities are to be informed on the detection of S. Enteritidis and S. Typhimurium in chicken breeding flocks and hatcheries. The results obtained under these Regulations have been included in the reports submitted by the federal Länder.
The reports received from the federal Länder on Salmonella isolates in hens are used for the zoonoses trend report.

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

Data on broiler parent lines in the laying phase were reported from 2329 flocks in 2007. Salmonella were isolated in 0.82 % of the flocks as in the previous year. Only one isolation of S. Enteritidis was reported for breeding flocks for meat production.
7.7 % of the broiler flocks examined were Salmonella positive (2006: 4.86 %).

C. Salmonella spp. in turkey - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Meat production flocks

There is no official monitoring system on farm level. The data presented are derived from the reports of the federal states and include samples that were taken for various reasons.
Between Oct 2006 and Sept 2007 a baseline study on the prevalence of Salmonella in turkeys based on Commission decision 2006/ 662/ EG and technical specification SANCO/ 2083/ 2006 was carried out. Results were reported in the framework of the baseline study elsewhere.

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

For turkeys (all types of flocks), the number of flocks reported to be positive increased to 6.55 % of the flocks (2006: 3.41 %), while the number of reported examinations were reduced to the half. S. Enteritidis and S. Typhimurium were not isolated, S. Saintpaul was the most frequent serovar in turkey flocks.

D. Salmonella spp. in geese - breeding flocks and meat production flocks

Control program/ mechanisms

The control program/ strategies in place

Meat production flocks

There is no official monitoring system in place. Data are derived from examinations carried out for various reasons.

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

The number of investigated geese flocks reported by 7 federal states was about 60 as in the previous year. The proportion of positive flocks among the tested flocks was 2007 12.5 % (2006: 5.2 %). Five of the 7 isolates were S. Typhimurium. From one investigated goose S. Enteritidis was reported (not in the table for reported flocks).

E. Salmonella spp. in ducks - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Meat production flocks

There is no official monitoring system in place. Samples are mostly taken according to the farm policy.

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

Overall, the proportion of positive flocks among the tested flocks has decreased to 5 % (2006: 19 %) with 2 flocks positive for S. Typhimurium. In fattening flocks 1 of 25 flocks was positive with S. Typhimurium.

F. Salmonella spp. in pigs

Monitoring system

Sampling strategy

Fattening herds

There is no official monitoring system in place. Data are derived from samples taken for various reasons.
The data presented here are based solely on bacteriological examinations carried out for various reasons. Serological data are not included.
Starting with Oct 2006 a baseline survey on the prevalence of salmonella in fattening pigs based on Commission decision 2006/ 668/ EC was conducted. Results are reported within in the framework of the baseline study elsewhere.

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

There was a decrease in the proportion of positive herds with 7.14 % compared to 2006 (8.22 %). The majority of isolates were S. Typhimurium (61 % of the Salmonella). The proportion of positive herds was higher in fattening than in breeding pigs.

G. Salmonella spp. in bovine animals

Monitoring system

Sampling strategy

According to Regulation on Protection against Salmonellosis in Cattle from 6 January 1972 and 14 November 1991 (BGBl. I S. 2118)

Methods of sampling (description of sampling techniques)

Animals at farm

Faecal samples, organs from diseased or dead animals.

Animals at slaughter (herd based approach)

Organs from animals in case of suspicion of salmonellosis.

Case definition

Animals at farm

Bovine salmonellosis is present if i) faecal samples have been taken at an interval of eight to fifteen days and, irrespective of the order of results, the presence of Salmonella has been detected by bacteriological examination in at least three of these samples or ii) manifestations of the disease indicating salmonellosis have been detected by clinical or pathological-anatomical examinations and the presence of Salmonella as been detected by bacteriological methods of examination. A positve case is the first detection in an animal or in a farm in a year.

Vaccination policy

Prophylactic and metaphylactic vaccination using live or inactivated vaccines are optional.
There are several vaccines licensed for use in cattle. In cases of salmonellosis caused by serotypes that are not covered by the licensed vaccines herd specific vaccines produced by authorized companies are also in use.

Other preventive measures than vaccination in place

Good Farming Practices and Good Hygienic Practices

Control program/ mechanisms

The control program/ strategies in place

According to Regulation on Protection against Salmonellosis in Cattle from 6 January 1972 and 14 November 1991 (BGBl. I S. 2118)

Measures in case of the positive findings or single cases

According to Regulation on Protection against Salmonellosis in Cattle from 6 January 1972 and 14 November 1991 (BGBl. I S. 2118)

Notification system in place

Officially confirmed outbreaks of salmonellosis in cattle are notified in the National Animal Disease

Reporting System (TSN) since 1995.

Results of the investigation

Notification of 120 outbreaks of bovine salmonellosis in cattle in Germany.
see also: Methner, U. Bovine salmonellosis in Germany, Animal Health report 2007, Friedrich Loeffler Institute, Germany

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

The number of reports on examinations for Salmonella in cattle herds was 2007 less than 2006. The proportion of positive herds for adult cattle with 5.66 % is consistent with the result of the last year (2006: 5.88 %). S. Typhimurium predominated, followed by S. Dublin, while S. Enteritidis was identified in 9 herds (0.34 %).

H. Salmonella spp. in animal

Monitoring system

Sampling strategy

The investigations of farm animals are mostly in the responsibility of the farmers in respect of hygiene control of their facilities. Some animal breeding companies or agricultural aggregations have own monitoring systems.
Salmonella findings in cattle are reportable under the Regulations on Bovine Salmonellosis as part of the law on animal epidemics. The major part of the examinations of farm animals is conducted in cattle. Often, other (farm) animal species are included in the examinations of the cattle herds involved.
Additionally, the veterinary control of animals before slaughter is a source of official samplings.

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

According to the animal law on epidemics 100 herds have been reported to have salmonellosis in 2007. These official reporting system on animal epidemics (TSN) is based on internet and served by the Friedrich-Loeffler-Institute.

I. Salmonella spp. in animal - Turkeys - at farm - Monitoring - monitoring survey - objective sampling (Sampling in framework of baseline study)

Monitoring system

Sampling strategy

A one year survey, as described in Decision 2006/ 662/ EC, was started in October 2006 and continued until September 2007.
For breeding turkeys, all holdings with at least 250 breeding birds were selected. For fattening turkeys, objective sampling was applied using a multistage approach to get a representative sample of the population of holdings of turkeys with a capacity of at least 500 birds in the total territory of Germany. To achieve this, in a first step the number of holdings to be selected was

determined stratified for region and holding size on the level of the federal states. This was repeated in each state. There, the number of holdings to be sampled by the local authority was fixed. Finally, the holdings were randomly selected from the registry available there. Sampling was performed at the farm by an official veterinarian. Within the holdings selected, one flock of the holding was sampled for fattening turkeys and all flocks for breeding turkeys.
Flocks were sampled with the last three weeks before slaughter for fattening turkeys and within the last nine weeks before slaughter for breeding turkeys.

Frequency of the sampling

Animals at farm

Once a year

Type of specimen taken

Animals at farm

Faeces

Methods of sampling (description of sampling techniques)

Animals at farm

Faecal samples were collected by boot swabs (5 pairs).

Case definition

Animals at farm

A flock was considered positive if at least one out of the five samples tested was positive.

Diagnostic/ analytical methods used

Animals at farm

Bacteriological method: ISO 6579:2002

Vaccination policy

Usually, fattening turkey flocks are not vaccinated, but breeding flocks may be vaccinated.

Measures in case of the positive findings or single cases

No special measures were taken in the context of the survey.

Results of the investigation

Results of the survey have been published by EFSA.
In Germany, in none of the 98 flocks of breeding turkeys, Salmonella spp. was confirmed. As regards fattening turkeys, in 31 (10.3%) out of 300 flocks included in the survey, Salmonella spp. has been detected. In nine flocks (3.0%), S.Enteritidis or S.Typhimurium have been isolated.

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

The outcome of the survey will be used to fix a target for reduction and to assess the progress of the control strategy, which has to be implemented.

J. Salmonella spp. in animal - Pigs - at slaughterhouse - Monitoring - monitoring survey - objective sampling (Sampling in framework of baseline study)

Monitoring system

Sampling strategy

A one year survey, as described in Decision 2006/ 668/ EC, was started in October 2006 and continued until September 2007.
Slaughterhouses were selected to cover at least 80% of the national slaughter capacity. Further stratification was applied to cover all regions representatively. On the individual slaughterhouse, random sampling was applied to select the individual slaughter pigs.

Frequency of the sampling

Animals at slaughter (herd based approach)

Sampling distributed evenly throughout the year

Type of specimen taken

Animals at slaughter (herd based approach)

Organs:lymph nodes

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

From each selected pig at least five ileocaecal lymph node samples were taken weighting at least 25g.

Case definition

Animals at slaughter (herd based approach)

An animal was considered positive if the lymph node sample was bacteriologically positive for Salmonella spp.

Diagnostic/ analytical methods used

Animals at slaughter (herd based approach)

Bacteriological method: ISO 6579:2002

Measures in case of the positive findings or single cases

No special measures were taken in the context of the survey.

Results of the investigation

Results of the survey have been published by EFSA. From 326 (12.7%) out of 2,569 slaughter pigs tested Salmonella spp. was isolated in lymph node samples. S.Typhimurium was most frequently detected.

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

The outcome of the survey will be used to fix a target for reduction and to assess the progress of the control strategy, which has to be implemented.

Table Salmonella in breeding flocks of Gallus gallus

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Infantis	S. Hadar	S. Indiana	S. Virchow	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	Other serotypes
Gallus gallus (fowl)												
parent breeding flocks for egg production line												
day-old chicks	Official reports of the Laender	flock	7	0								
during rearing period	Official reports of the Laender	flock	3	0								
during production period	Official reports of the Laender	flock	23	4					3	1		
parent breeding flocks for meat production line												
day-old chicks	Official reports of the Laender	flock	63	3			1		1		1	
during rearing period	Official reports of the Laender	flock	16	0								
during production period	Official reports of the Laender	flock	2329	19					1			18
breeding flocks, unspecified												

- in total (1)	Official reports of the Laender	flock	5312	45			1		5	1	1		37
during production period (2)	Official reports of the Laender	flock	4013	40					4	1			35
day-old chicks (3)	Official reports of the Laender	flock	111	3			1		1		1		
during rearing period (4)	Official reports of the Laender	flock	1046	0									
before slaughter (5)	Official reports of the Laender	flock	142	2									2

(1) : total of all breeding flocks
(2) : total of all breeding flocks
(3) : total of all breeding flocks
(4) : total of all breeding flocks
(5) : total of all breeding flocks

Table Salmonella in other poultry

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	Other serotypes	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Gallus gallus (fowl)								
laying hens								
day-old chicks	Official reports of the Laender	flock	143	2		1	1	
during rearing period	Official reports of the Laender	flock	445	13		11	2	
during production period	Official reports of the Laender	flock	5105	90	3	69	12	6
broilers								
day-old chicks	Official reports of the Laender	flock	159	1	1			
during rearing period	Official reports of the Laender	flock	1393	107	2	1		104
Ducks	Official reports of the Laender	flock	66	3			2	1
meat production flocks	Official reports of the Laender	flock	25	1			1	
Geese	Official reports of the Laender	flock	56	7			5	2
meat production flocks	Official reports of the Laender	flock	29	6			5	1
Turkeys	Official reports of the Laender	flock	275	18	18			
breeding flocks	Official reports of the Laender	flock	1	0				
meat production flocks	Official reports of the Laender	flock	26	1	1			

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	Other serotypes
Pigeons (1)	Official reports of the Laender	single	2797	246	1	142	103	
Parrots	Official reports of the Laender	single	1066	4	1	2		1

(1) : incl. breeding pigeons

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	Other serotypes	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Cattle (bovine animals)	Official reports of the Laender	herd	2631	149	35	9	60	45
calves (under 1 year)	Official reports of the Laender	herd	650	24	10		12	2
adult cattle over 2 years (3)	Official reports of the Laender	herd	358	9			5	4
- in total	Official reports of the Laender	single	88135	3440	878	28	1165	1369
Sheep	Official reports of the Laender	herd	550	18	5	1	1	11
Goats	Official reports of the Laender	herd	136	4	3			1
Pigs (1)	Official reports of the Laender	herd	1737	124	24		77	23
breeding animals	Official reports of the Laender	herd	67	1			1	
fattening pigs	Official reports of the Laender	herd	500	40	2		9	29
Solipeds, domestic (2)	Official reports of the Laender	herd	258	7	2	1	4	

(1) : without immunological screening
(2) : horses
(3) : milk producing herds

2.1.5. Salmonella in feedingstuffs

A. Salmonella spp. in feed

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

a. Domestic and Common Market:
In carnivore feeds, more Salmonella were found with 11.09 % positive samples (2006: 1.89%). S. Typhimurium was identified in a quarter of positive samples of carnivore feed. The overall Salmonella rate in oil extraction grits increased to 16.8 % (2006: 3.9 %). Rapeseed showed 15 % positive cases (2006: 7 %). The contamination of soybeans with Salmonella increased to 22 % (2006: 2 %). The contamination in cereal, grit and flour remained at a low level with one of the samples positive (0.5 %; 2006: 0.1 %). Salmonella was detected in pelleted and not pelleted mixed feed. In pelleted mixed feed Salmonella were found in 0.7 % of the samples (2006: 5.6 %). In not pelleted mixed feed Salmonella were found in 3.5 % of samples with S. Typhimurium in the half of the positive samples followed by S. Senftenberg and Derby. S. Enteritidis could not be found in mixed feedstuffs in 2007.
b. Imports from third countries:
Imported feeds of animal origin were mainly imported as fish meal as in the previous years. Fish meal was imported as meal and in loose form to Bremen and Hamburg. 5.7% of the fish meal consignments tested positive for Salmonella (2006: 5.5%). 4.3 % of the 241,830 imported tonnes proved to be Salmonella positive, i.e. 10,256 tonnes. The main amounts of imports originated from Peru and Chile. About 4 % of the consignments from Chile and Peru were found to contain Salmonella, similar to the previous year. Salmonella could be detected also in imports from Panama. Carnivore feed has shown a lower Salmonella detection rate with 1.6 % (2006: 8.7 %). S. Typhimurium and S. Enteritidis could not be isolated from fish meal imports or any other imported feedstuffs of animal origin in 2007.

Additional information

Random samples of feeds of animal origin are regularly examined by the official laboratories of the federal Laender in accordance with the Regulations on Feed Production. Examinations for Salmonella are also frequently conducted in this context. Prior to import, feeds of animal origin and other products of animal origin are examined on a random sample basis according to the provisions and sampling as stipulated in the regulation (EC) 1774/ 2002. The sampling procedure is based on the former Annex 12 to the Regulations on the Protection of the Domestic Market against Epizootics. In the case of processed animal protein at least 25 individual samples are collected from batches of up to 250 tonnes and 5 extra samples for every additional 50 tonnes.

Table Salmonella in feed material of animal origin

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	Other serotypes	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of land animal origin									
dairy products	official reports of the Laender	single	25g	37	0				
meat meal	official reports of the Laender	single	25g	297	0				
bone meal (1)	official reports of the Laender	single	25g	307	11				11
greaves	official reports of the Laender	single	25g	14	0				
blood meal	official reports of the Laender	single	25g	36	0				
animal fat	official reports of the Laender	single	25g	75	0				
Feed material of marine animal origin									
fish meal	official reports of the Laender	single	25g	296	7				7
(Border controls)	official reports of the Laender	batch	25g	824	47	25			22

(1) : low risk materials

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Typhimurium	Salmonella spp., unspecified	Other serotypes	S. Enteritidis
Feed material of cereal grain origin									
barley derived	official reports of the Laender	single	500g	21	0				
wheat derived	official reports of the Laender	single	500g	46	0				
maize	official reports of the Laender	single	500g	8	0				
Feed material of oil seed or fruit origin	official reports of the Laender	single	500g	303	51		25	26	
rape seed derived	official reports of the Laender	single	500g	200	30		11	19	
palm kernel derived	official reports of the Laender	single	500g	1	0				
soya (bean) derived	official reports of the Laender	single	500g	88	19		14	5	
sunflower seed derived	official reports of the Laender	single	500g	3	0				
linseed derived	official reports of the Laender	single	500g	2	0				

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified	S. Anatum	Other serotypes
Compound feedingstuffs for cattle										
final product	official reports of the Laender	single	500g	49	0					
Compound feedingstuffs for pigs										
final product	official reports of the Laender	single	500g	107	0					
Compound feedingstuffs for poultry (non specified)										
final product	official reports of the Laender	single	500g	51	0					
Pet food										
dog snacks (pig ears, chewing bones)	official reports of the Laender	single	25g	1055	117	30	7	14	1	65

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		Turkeys - Survey		Pigs - Survey		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Turkeys	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=	69		277		3440	309	584	501		175		108	109	14	4	20	30	80
Number of isolates serotyped	N=	59	0	244	0	2558	259	490	461	0	132	0	74	108	14	4	12	30	67
Number of isolates per type																			
S. Abony						1													
S. Agona						2		1											
S. Anatum						7	22	2					1			1	1		7
S. Anatum var. 15						313		3											
S. Bareilly														3					
S. Blockley																		1	
S. Bovismorbificans						50	9											1	
S. Brandenburg						52		4	1										
S. Bredeney								2								1			
S. Cerro														1					
S. Choleraesuis								3											
S. Derby		1		26		2		27	44		2							1	
S. Dublin						98	8	1											
S. Enteritidis				8		28	24	4	9		88		5	79	9	1	1		8

S. Give					157	20	1							1					
S. Goldcoast					290		1												
S. Hadar	11									1							5	10	
S. Havana					308		4												
S. Indiana					4							33						10	
S. Infantis			6		54	20	7	8					1	1					
S. Jerusalem													1						
S. Kottbus	8																		
S. Lagos							1												
S. Livingstone	1				1		3	7				6	2	1		3			
S. London							23	10											
S. Mbandaka										12			1						
S. Montevideo					15		1			6			2				1		
S. Muenchen																	9		
S. Newport	3																		
S. Ohio					2		2												
S. Rissen								5											
S. Saintpaul	12				1							1					11	25	
S. Senftenberg															1		1		
S. Thompson					8														
S. Typhimurium	13		153		1165	115	400	279		18		28	14	2		2		7	
S. 4,12:d:-	5									5									
S. 4,12:i:-	5		51			34		98											
S. 9,12:-:-						7													
S. Paratyphi B var. Java													1			5			
S. Gallinarum													3						

Footnote

(*) M : Monitoring, C : Clinical
Monitoring: Reports of the Laender, Turkeys and Pigs, Survey: Data from the baseline study; Clinical: Data available at the NRL Salmonella

Table Salmonella serovars in food

Serovars		Meat from duck		Meat from geese		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin		Meat from turkey		Meat from other poultry species		Eggs - table eggs	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=		39		4	1	13	75	132	67	241				70	32	127	49		46	94
Number of isolates serotyped	N=	0	29	0	3	1	2	65	113	60	206	0	0	0	59	31	107	45	0	44	84
Number of isolates per type																					
S. Agona																1					
S. Anatum var. 15										1											
S. Bardo											10										
S. Blockley										1						2					
S. Bovismorbificans									3							1	2				
S. Braenderup																		1			
S. Brandenburg								1													
S. Bredeney										2						2	15	1			
S. Derby							1	10	10						8	1	2				
S. Enteritidis			2						5	7	63				1		2	14		30	77
S. Gabon								1													
S. Goldcoast								1													
S. Hadar			2							1	5				1	6	30				
S. Heidelberg			6							1											

S. Indiana									3	11					4		4		1	
S. Infantis							1	6	10	13				4			2		10	3
S. Kiambu									1	16										
S. Kottbus																	1			
S. Lagos							1													
S. Livingstone									2								2			
S. London							3												1	
S. Manhattan									1						1					
S. Mbandaka															1				1	
S. Montevideo															1					
S. Newport				1						3					1	4	2			
S. Ohio									6	13							2			
S. Panama							2													
S. Saintpaul									2						10	31				
S. Schwarzengrund																	1			
S. Senftenberg																	2			
S. Stanley									1											
S. Thompson									1								1			
S. Typhimurium		18		2	1	1	45	58	4	17				38		20	8		1	4
S. Virchow		1							1	3										
S. Paratyphi B var. Java									15	52						1	4			
S. group B (1)								31						7						

(1) : S.4,5,12:1:-

Footnote

(*) M : Monitoring, C : Clinical
Monitoring: Reports of the Laender; Clinical: Data available at the NRL Salmonella

Table Salmonella serovars in feed

Serovars		Compound feedingstuffs for pigs		Feed material of cereal grain origin		Feed material of oil seed or fruit origin		Feed material of marine animal origin		Pet food		Compound feedingstuffs, not specified	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=			1		51	21	47	166	117	92	6	
Number of isolates serotyped	N=	0	0	1	0	51	15	25	133	103	60	6	0
Number of isolates per type													
S. Agona						9		2		9			
S. Alachua								2	10				
S. Anatum						6		3	14	1			
S. Bareilly										4			
S. Cerro								12	83				
S. Derby						4				6	1	1	
S. Enteritidis										7	1		
S. Gaminara										1			
S. Infantis										3	3		
S. Kentucky				1						2	1		
S. Kiambu								1					
S. Lexington						2							

S. Liverpool									1			
S. Livingstone									11	15		
S. Mbandaka						7	1		4			
S. Montevideo									1			
S. Newport						2			5	4		
S. Oranienburg								10	1			
S. Orion						6						
S. Othmarschen									1			
S. Ouakam							1					
S. Schwarzengrund									2			
S. Senftenberg					3		3	15	2		2	
S. Stanley									2			
S. Tennessee					2							
S. Typhimurium									30	19	3	
S. Virchow								1				
S. Weltevreden									1			
S. Worthington									9	9		
S. 4,12:d:-										7		
Salmonella spp., unspecified					25							

Footnote

(*) M : Monitoring, C : Clinical
Monitoring: Reports of the Laender; Clinical: Data available at the NRL Salmonella;
Isolates reported under 'Feed material of marine animal origin' are mostly fishmeal sampled at border control; compound feedingstuffs are not pelleted

Table Salmonella Enteritidis phagetypes in animals

Phagetype		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=										
Number of isolates phagetyped	N=	0	24	9	7	0	97	0	12	2	7
Number of isolates per type											
PT 1			9				8				
PT 4			5	4	2		53		4		7
PT 6							7				
PT 8			2	4	4		11		2		
PT 14b										2	
PT 21							13				
Not typable			1						5		
PT 35							1				
PT 11			2	1	1				1		
RDNC			5				3				
PT 32							1				

Footnote

(*) M : Monitoring, C : Clinical
Clinical: Data available at the NRL Salmonella

Table Salmonella Enteritidis phagetypes in food

Phagetype		Eggs - table eggs		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin		Meat from turkey	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=		77				5		63		2		10		2
Number of isolates phagetyped	N=	0	77	0	0	0	5	0	63	0	2	0	10	0	2
Number of isolates per type															
PT 1									3						
PT 4			40						30		1		3		
PT 6			2						4				1		
PT 8			26				2		14				5		1
PT 14b							2		2				1		
PT 21			3						5		1				1
PT 3									1						
PT 2									1						
PT 6a							1		1						
PT 12			1												
PT 23			1												
PT 7a			1												
RDNC			3						2						

Footnote

(*) M : Monitoring, C : Clinical
Clinical: Data available at the NRL Salmonella

Table Salmonella Typhimurium phagetypes in animals

Phagetype		Turkeys		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=										
Number of isolates phagetyped	N=	22	6	0	112	177	276	0	22	0	34
Number of isolates per type											
DT 7					2	1	3				
DT 8			1		6	1			3		20
DT 9			1		11				5		1
DT 12					11	7	3				
DT 66						1					
DT 104l		9	2		29	72	81		1		4
DT 120					3	8	11				
DT 193					1	6	39				1
DT 208						5	7				
U 302						1	6				
Not typable						1	7				
DT 40					1	1	3				
DT 41						2			2		2
U 310		1				3	2				
DT 15a							1				
DT 17					3	1	2				
DT 30							1				1

DT 99	1	1			1			1		
DT 1	1			4	1			3		
DT 2				5		1		5		
DT 4					1					
DT 86										1
DT 59						1				
RDNC	5			7	24	34		2		4
DT 104b low	5	1		29	39	74				
DT 126					1					

Footnote

(*) M : Monitoring, C : Clinical
Clinical: Data available at the NRL Salmonella

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		Meat from turkey		Eggs - table eggs	
Sources of isolates (*)		M	C	M	C	M	C	M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=		1		58		17		20		84		20		4
Number of isolates phagetyped	N=	0	1	0	58	0	17	0	20	0	84	0	20	0	4
Number of isolates per type															
DT 7					2								2		
DT 8									15						
DT 12											2				
DT 104l			1		12		2		1		14		8		
DT 120					2		1				8		6		
DT 193					6						8				
DT 208					2						2				
U 302					1						4				
Not typable							1				3				
DT 132															1
U 310											4		3		
DT 17											1				
DT 30									1						
DT 2													1		

DT 126a								1						
RDNC				5		12		2		13				
DT 104b low				28		1				25				3

Footnote

(*) M : Monitoring, C : Clinical
Clinical: Data available at the NRL Salmonella

2.1.7. Antimicrobial resistance in Salmonella isolates

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

A. Antimicrobial resistance in Salmonella in cattle

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

B. Antimicrobial resistance in Salmonella in poultry

Laboratory used for detection for resistance

Antimicrobials included in monitoring

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

C. Antimicrobial resistance in Salmonella in foodstuff derived from cattle

Laboratory used for detection for resistance

Antimicrobials included in monitoring

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

D. Antimicrobial resistance in Salmonella in foodstuff derived from pigs

Laboratory used for detection for resistance

Antimicrobials included in monitoring

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

E. Antimicrobial resistance in Salmonella in foodstuff derived from poultry

Laboratory used for detection for resistance

Antimicrobials included in monitoring

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

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

	S. Derby
	Pigs
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	44

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=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	16	44	0						43	0	0	1											
Kanamycin	64	44	1								43	0	0	0	0	1							
Neomycin	16	44	1							43	0	0	0	0	1								
Streptomycin	16	44	14								6	19	5	3	4	7							
Amphenicols																							
Chloramphenicol	16	44	5							1	4	28	6	2	0	3							
Florfenicol	16	44	3							1	7	29	4	2	0	1							
Cephalosporins																							
Ceftiofur	8	44	0					10	30	4													
Fluoroquinolones																							
Ciprofloxacin	2	44	0	40	4																		
Penicillins																							
Ampicillin	32	44	13						19	10	2	0	0	0	13								
Quinolones																							
Nalidixic acid	32	44	0								42	2											
Sulfonamides																							
Sulfamethoxazol	512	44	17											5	20	2	0	0	17				
Tetracyclines																							
Tetracyclin	16	44	14							29	1	0	0	0	14								
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of S. Dublin in Cattle (bovine animals) - quantitative data [Dilution method]

	S. Dublin
	Cattle (bovine animals)
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	8

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	16	8	0						8														
Kanamycin	64	8	0								8												
Neomycin	16	8	0							8													
Streptomycin	32	8	0								2	6											
Amphenicols																							
Chloramphenicol	32	8	0								7	1											
Florfenicol	32	8	0								7	1											
Cephalosporins																							
Ceftiofur	8	8	0					8															
Fluoroquinolones																							
Ciprofloxacin	2	8	0	7	0	1																	
Penicillins																							
Ampicillin	32	8	1						7	0	0	0	0	0	1								
Quinolones																							
Nalidixic acid	32	8	1								7	0	0	0	0	0	1						
Sulfonamides																							
Sulfamethoxazol	512	8	1											2	4	1	0	0	1				
Tetracyclines																							
Tetracyclin	16	8	1							7	0	0	0	0	1								
Trimethoprim	16	8	1								7	0	0	0	1								
Trimethoprim + sulfonamides	0																						

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

	S. Enteritidis
	Gallus gallus (fowl) - broilers
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	1

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	1	0						1														
Kanamycin	32	1	0								1												
Neomycin	8	1	0							1													
Streptomycin	16	1	0										1										
Amphenicols																							
Chloramphenicol	16	1	0									1											
Florfenicol	16	1	0								1												
Cephalosporins																							
Ceftiofur	4	1	0						1														
Fluoroquinolones																							
Ciprofloxacin	1	1	0	1																			
Penicillins																							
Ampicillin	16	1	0							1													
Quinolones																							
Nalidixic acid	16	1	0								1												
Sulfonamides																							
Sulfamethoxazol	256	1	0												1								
Tetracyclines																							
Tetracyclin	8	1	0							1													
Trimethoprim	8	1	0								1												
Trimethoprim + sulfonamides	0																						

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

	S. Enteritidis
	Turkeys
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	8

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	8	0						8														
Kanamycin	32	8	0								8												
Neomycin	8	8	0							8													
Streptomycin	16	8	0								8												
Amphenicols																							
Chloramphenicol	16	8	0								2	6											
Florfenicol	16	8	0								8												
Cephalosporins																							
Ceftiofur	4	8	0					2	6														
Fluoroquinolones																							
Ciprofloxacin	1	8	0	8																			
Penicillins																							
Ampicillin	16	8	0						2	6													
Quinolones																							
Nalidixic acid	16	8	0								8												
Sulfonamides																							
Sulfamethoxazol	256	8	0												7	1							
Tetracyclines																							
Tetracyclin	8	8	0							8													
Trimethoprim	8	8	0								8												
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of S.Enteritidis in animals

n = Number of resistant isolates

S. Enteritidis

	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers	
Isolates out of a monitoring programme	no		no		no		no		no		no	
Number of isolates available in the laboratory	24		9		87		8		9		1	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides												
Gentamicin	24	0	9	0	87	0	8	0	9	0	1	0
Kanamycin	24	0	9	0	87	0	8	0	9	0	1	0
Neomycin	24	0	9	0	76	0	8	0	9	0	1	0
Streptomycin	24	1	9	1	87	3	8	0	9	0	1	0
Amphenicols												
Chloramphenicol	24	0	9	1	87	0	8	0	9	0	1	0
Florfenicol	24	0	9	1	87	0	8	0	9	0	1	0
Cephalosporins												
Ceftiofur	24	0	9	0	87	0	8	0	9	0	1	0
Fluoroquinolones												
Ciprofloxacin	24	0	9	0	87	0	8	0	9	0	1	0
Fully sensitive	24	23	9	8	87	73	8	8	9	9	1	1
Number of multiresistant isolates	24	0	9	1	87	5	8	0	9	0	1	0
Penicillins												
Ampicillin	24	0	9	1	87	1	8	0	9	0	1	0
Quinolones												
Nalidixic acid	24	0	9	0	87	9	8	0	9	0	1	0
Resistant to 1 antimicrobial	24	1	9	0	87	9	8	0	9	0	1	0
Resistant to 2 antimicrobials	24	0	9	0	87	0	8	0	9	0	1	0
Resistant to 3 antimicrobials	24	0	9	0	87	0	8	0	9	0	1	0
Resistant to 4 antimicrobials	24	0	9	0	87	2	8	0	9	0	1	0
Resistant to >4 antimicrobials	24	0	9	1	87	3	8	0	9	0	1	0
Sulfonamides												
Sulfamethoxazol	24	0	9	1	87	5	8	0	9	0	1	0
Tetracyclines												
Tetracyclin	24	0	9	1	87	4	8	0	9	0	1	0
Trimethoprim	24	0	9	0	87	4	8	0	9	0	1	0
Trimethoprim + sulfonamides												

Footnote

multiresistant isolates are resistant to more than one antimicrobial

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

	S. Enteritidis
	Cattle (bovine animals)
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	24

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=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	16	24	0						24														
Kanamycin	64	24	0								23	1											
Neomycin	16	24	0							24													
Streptomycin	32	24	1								16	4	3		1								
Amphenicols																							
Chloramphenicol	32	24	0								8	16											
Florfenicol	32	24	0								15	9											
Cephalosporins																							
Ceftiofur	8	24	0					4	20														
Fluoroquinolones																							
Ciprofloxacin	2	24	0	22	2																		
Penicillins																							
Ampicillin	32	24	0						6	18													
Quinolones																							
Nalidixic acid	32	24	0								24												
Sulfonamides																							
Sulfamethoxazol	512	24	0											2	20	2							
Tetracyclines																							
Tetracyclin	16	24	0							23	1												
Trimethoprim	32	24	0								24												
Trimethoprim + sulfonamides	0	24	0																				

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

	S. Enteritidis
	Gallus gallus (fowl)
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	87

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	87	0				10	1	72	0	1	3											
Kanamycin	32	87	0								87												
Neomycin	8	76	0							76													
Streptomycin	16	87	3							9	73	2	0	2	0	0	1						
Amphenicols																							
Chloramphenicol	16	87	0								42	43	2										
Florfenicol	16	87	0							3	68	16											
Cephalosporins																							
Ceftiofur	4	76	0					23	51	2													
Fluoroquinolones																							
Ciprofloxacin	1	87	0	77	1	0	4	5															
Penicillins																							
Ampicillin	16	87	1						40	41	5	0	0	0	1								
Quinolones																							
Nalidixic acid	16	87	9								77	1	0	0	0	1	8						
Sulfonamides																							
Sulfamethoxazol	256	87	5											7	73	2	0	0	4	1			
Tetracyclines																							
Tetracyclin	8	87	4						2	75	6	0	0	0	3	1							
Trimethoprim	8	87	4					11	0	0	72	0	0	0	4								
Trimethoprim + sulfonamides	0																						

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

	S. Enteritidis
	Gallus gallus (fowl) - laying hens
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	9

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	9	0						9														
Kanamycin	32	9	0								9												
Neomycin	8	9	0							9													
Streptomycin	16	9	0								9												
Amphenicols																							
Chloramphenicol	16	9	0								5	4											
Florfenicol	16	9	0								8	1											
Cephalosporins																							
Ceftiofur	4	9	0					2	7														
Fluoroquinolones																							
Ciprofloxacin	1	9	0	9																			
Penicillins																							
Ampicillin	16	9	0						4	5													
Quinolones																							
Nalidixic acid	16	9	0								9												
Sulfonamides																							
Sulfamethoxazol	256	9	0												8	1							
Tetracyclines																							
Tetracyclin	8	9	0							7	2												
Trimethoprim	8	9	0								9												
Trimethoprim + sulfonamides	0																						

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

	S. Enteritidis
	Pigs
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	9

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=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	16	9	0				1	0	8														
Kanamycin	64	9	0								9												
Neomycin	16	8	0							8													
Streptomycin	16	9	1							1	6	1	0	1									
Amphenicols																							
Chloramphenicol	32	9	1								3	5	0	0	0	1							
Florfenicol	16	9	1								4	4	0	1									
Cephalosporins																							
Ceftiofur	8	8	0					6	2														
Fluoroquinolones																							
Ciprofloxacin	2	9	0	9																			
Penicillins																							
Ampicillin	32	9	1						5	2	1	0	0	0	1								
Quinolones																							
Nalidixic acid	32	9	0								8	1											
Sulfonamides																							
Sulfamethoxazol	512	9	1												8	0	0	0	1				
Tetracyclines																							
Tetracyclin	16	9	1							7	1	0	0	1									
Trimethoprim	16	9	0					1			8												
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of S. Saintpaul in Turkeys - quantitative data [Dilution method]

	S. Saintpaul
	Turkeys
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	25

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	25	6						2	0	1	16	6										
Kanamycin	32	25	5								2	0	0	18	3	2							
Neomycin	8	24	2							22	0	0	0	0	2								
Streptomycin	16	25	22								2	0	1	13	7	2							
Amphenicols																							
Chloramphenicol	16	25	1								3	5	16	1									
Florfenicol	16	25	1								3	7	14	1									
Cephalosporins																							
Ceftiofur	4	24	0						4	18	2												
Fluoroquinolones																							
Ciprofloxacin	1	25	6	4	0	0	0	2	13	6													
Penicillins																							
Ampicillin	16	25	25												25								
Quinolones																							
Nalidixic acid	16	25	21								4	0	0	0	1	1	19						
Sulfonamides																							
Sulfamethoxazol	256	25	24													1	0	0	23	1			
Tetracyclines																							
Tetracyclin	8	25	3							2	20	0	0	0	3								
Trimethoprim	8	25	2							1	22	0	0	0	2								
Trimethoprim + sulfonamides	0																						

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

	S. Typhimurium
	Turkeys
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	6

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	6	0				1	0	5														
Kanamycin	32	6	1								5	0	0	0	0	1							
Neomycin	8	5	1							4	0	0	0	0	1								
Streptomycin	16	6	3									3	0	0	3								
Amphenicols																							
Chloramphenicol	16	6	3								1	2	0	0	0	3							
Florfenicol	16	6	3								3	0	0	1	2								
Cephalosporins																							
Ceftiofur	4	5	0					1	4														
Fluoroquinolones																							
Ciprofloxacin	1	6	0	6																			
Penicillins																							
Ampicillin	16	6	3						2	1	0	0	0	0	3								
Quinolones																							
Nalidixic acid	16	6	0								5	1											
Sulfonamides																							
Sulfamethoxazol	256	6	3											1	2	0	0	0	3				
Tetracyclines																							
Tetracyclin	8	6	3							3	0	0	0	1	2								
Trimethoprim	8	6	2					1	0	0	3	0	0	0	2								
Trimethoprim + sulfonamides	0																						

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

	S. Typhimurium
	Gallus gallus (fowl)
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	18

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	18	0						17	1													
Kanamycin	32	18	0								18												
Neomycin	8	18	0							18													
Streptomycin	16	18	5								4	4	5	4	1								
Amphenicols																							
Chloramphenicol	16	18	1								6	11	0	0	0	1							
Florfenicol	16	18	1							3	12	2	0	0	1								
Cephalosporins																							
Ceftiofur	4	18	0					8	10														
Fluoroquinolones																							
Ciprofloxacin	1	18	0	18																			
Penicillins																							
Ampicillin	16	18	2						9	7	0	0	0	0	2								
Quinolones																							
Nalidixic acid	16	18	0								16	2											
Sulfonamides																							
Sulfamethoxazol	256	18	3											6	0	5	4	0	3				
Tetracyclines																							
Tetracyclin	8	18	2							14	1	1	0	1	1								
Trimethoprim	8	18	1								17	0	0	0	1								
Trimethoprim + sulfonamides	0																						

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

	S. Typhimurium
	Gallus gallus (fowl) - laying hens
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	2

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	2	0						2														
Kanamycin	32	2	0								2												
Neomycin	8	2	0							2													
Streptomycin	16	2	0								1	1											
Amphenicols																							
Chloramphenicol	16	2	0									2											
Florfenicol	16	2	0								1	1											
Cephalosporins																							
Ceftiofur	4	2	0					1	1														
Fluoroquinolones																							
Ciprofloxacin	1	2	0	2																			
Penicillins																							
Ampicillin	16	2	0							2													
Quinolones																							
Nalidixic acid	16	2	0								2												
Sulfonamides																							
Sulfamethoxazol	256	2	0												1	1							
Tetracyclines																							
Tetracyclin	8	2	0							2													
Trimethoprim	8	2	0								2												
Trimethoprim + sulfonamides	0																						

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

	S. Typhimurium
	Gallus gallus (fowl) - broilers
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	2

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	2	0						2														
Kanamycin	32	2	0								2												
Neomycin	8	2	0							2													
Streptomycin	16	2	0									1	1										
Amphenicols																							
Chloramphenicol	16	2	0								1	1											
Florfenicol	16	2	0								1	1											
Cephalosporins																							
Ceftiofur	4	2	0					1	1														
Fluoroquinolones																							
Ciprofloxacin	1	2	0	2																			
Penicillins																							
Ampicillin	16	2	0							2													
Quinolones																							
Nalidixic acid	16	2	0								1	1											
Sulfonamides																							
Sulfamethoxazol	256	2	0												2								
Tetracyclines																							
Tetracyclin	8	2	0								2												
Trimethoprim	8	2	0								2												
Trimethoprim + sulfonamides	0																						

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

	S. Typhimurium
	Pigs
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	276

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	276	7				4	0	260	2	0	3	5	1	1								
Kanamycin	64	276	29								240	5	1	1	0	29							
Neomycin	8	272	29							239	3	1	0	8	21								
Streptomycin	16	276	231								6	31	8	12	85	133	1						
Amphenicols																							
Chloramphenicol	16	276	119								28	123	6			119							
Florfenicol	16	276	112							3	64	93	4	22	73	17							
Cephalosporins																							
Ceftiofur	8	272	0					82	174	16	0	0											
Fluoroquinolones																							
Ciprofloxacin	2	276	0	245	15	6	3	5	2														
Penicillins																							
Ampicillin	32	276	235						19	22	0	0	0	0	235								
Quinolones																							
Nalidixic acid	32	276	9								249	16	2	0	1	1	7						
Sulfonamides																							
Sulfamethoxazol	512	276	243											4	25	4	0	0	239	4			
Tetracyclines																							
Tetracyclin	16	276	230							40	4	0	2	66	163	1							
Trimethoprim	16	276	79					4	0	0	193	0	0	0	79								
Trimethoprim + sulfonamides	0																						

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

	S. Typhimurium
	Cattle (bovine animals)
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	112

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																		
				<=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	16	112	1						110	0	0	1	0	0	1								
Kanamycin	64	112	0								102	0	0	1	9								
Neomycin	16	107	9							98	0	0	0	4	5								
Streptomycin	32	112	55								14	33	5	5	31	24							
Amphenicols																							
Chloramphenicol	16	112	38							1	23	48	2	0	2	36							
Florfenicol	16	112	35								39	35	3	6	27	2							
Cephalosporins																							
Ceftiofur	8	107	0					29	75	3													
Fluoroquinolones																							
Ciprofloxacin	2	112	0	101	3	3	5																
Penicillins																							
Ampicillin	32	112	57						15	1	39				57								
Quinolones																							
Nalidixic acid	32	112	7								98	6	1	0	0	7							
Sulfonamides																							
Sulfamethoxazol	512	112	62											4	30	8	8	0	62				
Tetracyclines																							
Tetracyclin	16	112	52							51	8	1		30	22								
Trimethoprim	16	112	20					4	0	0	88	0	0	20									
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

n = Number of resistant isolates

S. Typhimurium

	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers	
Isolates out of a monitoring programme	no		no		no		no		no		no	
Number of isolates available in the laboratory	112		276		18		6		2		2	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides												
Gentamicin	112	1	276	7	18	0	6	0	2	0	2	0
Kanamycin	112	9	276	29	18	0	6	1	2	0	2	0
Neomycin	112	9	276	29	18	0	6	1	2	0	2	0
Streptomycin	112	60	276	231	18	5	6	4	2	0	2	0
Amphenicols												
Chloramphenicol	112	38	276	119	18	1	6	4	2	0	2	0
Florfenicol	112	35	276	112	18	1	6	4	2	0	2	0
Cephalosporins												
Ceftiofur	112	0	276	0	18	0	6	0	2	0	2	0
Fluoroquinolones												
Ciprofloxacin	112	0	276	0	18	0	6	0	2	0	2	0
Fully sensitive	112	46	276	20	18	12	6	3	2	2	2	2
Number of multiresistant isolates	112	60	276	243	18	2	6	3	2	0	2	0
Penicillins												
Ampicillin	112	57	276	235	18	2	6	4	2	0	2	0
Quinolones												
Nalidixic acid	112	7	276	9	18	0	6	0	2	0	2	0
Resistant to 1 antimicrobial	112	6	276	13	18	4	6	0	2	0	2	0
Resistant to 2 antimicrobials	112	0	276	0	18	0	6	0	2	0	2	0
Resistant to 3 antimicrobials	112	2	276	11	18	0	6	0	2	0	2	0
Resistant to 4 antimicrobials	112	11	276	42	18	0	6	0	2	0	2	0
Resistant to >4 antimicrobials	112	47	276	190	18	2	6	3	2	0	2	0
Sulfonamides												
Sulfamethoxazol	112	62	276	243	18	3	6	4	2	0	2	0
Tetracyclines												
Tetracyclin	112	53	276	232	18	2	6	4	2	0	2	0
Trimethoprim	112	20	276	79	18	1	6	2	2	0	2	0
Trimethoprim + sulfonamides												

Footnote

multiresistant isolates are resistant to more than one antimicrobial

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

	S. Paratyphi B var. Java
	Gallus gallus (fowl) - broilers
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	5

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	5	0						5														
Kanamycin	32	5	0								5												
Neomycin	8	5	0							5													
Streptomycin	16	5	1										4	1									
Amphenicols																							
Chloramphenicol	16	5	0								5												
Florfenicol	16	5	0								5												
Cephalosporins																							
Ceftiofur	4	5	0					5															
Fluoroquinolones																							
Ciprofloxacin	1	5	0				1	4															
Penicillins																							
Ampicillin	16	5	0						5														
Quinolones																							
Nalidixic acid	16	5	5														5						
Sulfonamides																							
Sulfamethoxazol	256	5	0											5									
Tetracyclines																							
Tetracyclin	8	5	0							5													
Trimethoprim	8	5	5												5								
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of Salmonella in animals

n = Number of resistant isolates	Salmonella spp.											
	Cattle (bovine animals)		**Pigs**		**Gallus gallus (fowl)**		**Turkeys**		**Gallus gallus (fowl) - laying hens**		**Gallus gallus (fowl) - broilers**	
Isolates out of a monitoring programme	no		no		no		no		no		no	
Number of isolates available in the laboratory	304		498		175		80		14		19	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides												
Gentamicin	304	1	498	12	175	0	80	7	14	0	19	0
Kanamycin	304	15	498	48	175	2	80	8	14	0	19	0
Neomycin	304	15	498	45	175	1	78	4	14	0	19	0
Streptomycin	304	104	498	347	175	15	80	44	14	0	19	1
Amphenicols												
Chloramphenicol	304	38	498	145	175	1	80	5	14	0	19	0
Florfenicol	304	35	498	123	175	1	80	5	14	0	19	0
Cephalosporins												
Ceftiofur	304	0	484	1	175	0	80	0	14	0	19	0
Fluoroquinolones												
Ciprofloxacin	304	0	498	0	175	0	80	0	14	0	19	0
Fully sensitive	304	190	498	89	175	143	80	26	14	14	19	13
Number of multiresistant isolates	304	99	498	375	175	16	80	45	14	0	19	5
Penicillins												
Ampicillin	304	95	498	349	175	10	80	36	14	0	19	1
Quinolones												
Nalidixic acid	304	8	498	11	175	14	80	27	14	0	19	5
Resistant to 1 antimicrobial	304	11	498	34	175	16	80	9	14	0	19	1
Resistant to 2 antimicrobials	304	2	498	8	175	2	80	8	14	0	19	0
Resistant to 3 antimicrobials	304	2	498	18	175	0	80	3	14	0	19	4
Resistant to 4 antimicrobials	304	40	498	111	175	5	80	2	14	0	19	1
Resistant to >4 antimicrobials	304	55	498	238	175	9	80	32	14	0	19	0
Sulfonamides												
Sulfamethoxazol	304	99	498	370	175	13	80	34	14	0	19	0
Tetracyclines												
Tetracyclin	304	92	498	362	175	15	80	24	14	0	19	0
Trimethoprim	304	28	498	121	175	7	80	8	14	0	19	5
Trimethoprim + sulfonamides												

Footnote

multiresistant isolates are resistant to more than one antimicrobial

Table Antimicrobial susceptibility testing of Salmonella spp. in food

n = Number of resistant isolates	Salmonella spp.													
	Meat from other animal species or not specified		**Eggs**		**Meat from bovine animals**		**Meat from pig**		**Meat from broilers (Gallus gallus)**		**Meat from other poultry species**		**Meat from turkey**	
Isolates out of a monitoring programme	no		no		no		no		no		no		no	
Number of isolates available in the laboratory	205		93		11		128		222		43		119	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides														
Gentamicin	205	1	93	1	11	0	128	1	221	2	43	0	119	4
Kanamycin	205	11	93	0	11	0	128	16	221	23	43	0	119	13
Neomycin	195	11	92	0	10	0	117	16	214	21	37	0	116	12
Streptomycin	205	110	93	7	11	3	128	76	221	58	43	7	119	74
Amphenicols														
Chloramphenicol	205	27	93	4	11	1	128	20	221	8	43	1	119	10
Florfenicol	205	23	93	4	11	1	128	18	221	3	43	1	119	5
Cephalosporins														
Ceftiofur	195	1	92	0	10	0	117	1	214	2	37	0	116	0
Fluoroquinolones														
Ciprofloxacin	205	1	93	0	11	0	128	0	221	0	43	0	119	3
Fully sensitive	205	63	93	85	11	7	128	34	221	118	43	32	119	10
Penicillins														
Ampicillin	205	100	93	6	11	1	128	81	221	52	43	4	119	56
Quinolones														
Nalidixic acid	205	25	93	1	11	3	128	3	221	71	43	4	119	57
Resistant to 1 antimicrobial	205	21	93	0	11	0	128	10	221	15	43	5	119	10
Resistant to 2 antimicrobials	205	4	93	0	11	0	128	5	221	2	43	3	119	15
Resistant to 3 antimicrobials	205	6	93	0	11	0	128	0	221	12	43	0	119	27
Resistant to 4 antimicrobials	205	55	93	2	11	2	128	32	221	19	43	0	119	11
Resistant to >4 antimicrobials	205	56	93	6	11	2	128	47	221	55	43	3	119	46
Sulfonamides														
Sulfamethoxazol	205	108	93	8	11	2	128	82	221	51	43	4	119	52
Tetracyclines														
Tetracyclin	205	103	93	7	11	1	128	86	221	47	43	4	119	91
Trimethoprim	205	34	93	2	11	3	128	27	221	56	43	2	119	11
Trimethoprim + sulfonamides														

Table Antimicrobial susceptibility testing of Salmonella spp. in Eggs - quantitative data [Dilution method]

	Salmonella spp.
	Eggs
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	93

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	93	1				1	0	89	1	1	0	1										
Kanamycin	32	93	0								92	1											
Neomycin	8	92	0							92													
Streptomycin	16	93	7							1	79	4	2	1	6								
Amphenicols																							
Chloramphenicol	16	93	4								30	57	2	0	0	4							
Florfenicol	16	93	4								61	28	0	0	4								
Cephalosporins																							
Ceftiofur	4	92	0					30	61	1													
Fluoroquinolones																							
Ciprofloxacin	1	93	0	90	2	0	0	1															
Penicillins																							
Ampicillin	16	93	6						35	48	4	0	0	0	6								
Quinolones																							
Nalidixic acid	16	93	1								90	2	0	0	0	0	1						
Sulfonamides																							
Sulfamethoxazol	256	93	8											4	76	4	1	0	8				
Tetracyclines																							
Tetracyclin	8	93	7							79	7	0	0	1	6								
Trimethoprim	8	93	2					1	0	0	90	0	0	0	2								
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of Salmonella spp. in Meat from bovine animals - quantitative data [Dilution method]

	Salmonella spp.
	Meat from bovine animals
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	11

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	11	0					1	10														
Kanamycin	32	11	0								11												
Neomycin	8	10	0							10													
Streptomycin	16	11	3								2	4	2	2	1								
Amphenicols																							
Chloramphenicol	16	11	1								3	5	2	0	0	1							
Florfenicol	16	11	1								3	6	1	1									
Cephalosporins																							
Ceftiofur	4	10	0					3	4	3													
Fluoroquinolones																							
Ciprofloxacin	1	11	0	8	0	0	0	1	2														
Penicillins																							
Ampicillin	16	11	1						6	2	1	1	0	0	1								
Quinolones																							
Nalidixic acid	16	11	3								8	0	0	0	0	0	3						
Sulfonamides																							
Sulfamethoxazol	256	11	2											1	7	1	0	0	2				
Tetracyclines																							
Tetracyclin	8	11	1							8	2	0	0	1									
Trimethoprim	8	11	3					1	0	0	7	0	0	0	3								
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of Salmonella spp. in Meat from pig - quantitative data [Dilution method]

	Salmonella spp.
	Meat from pig
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	128

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	128	1				9	2	115	1	0	0	0	0	1								
Kanamycin	32	128	16								108	4	0	0	0	16							
Neomycin	8	117	16							99	2	0	0	14	2								
Streptomycin	16	128	76								12	34	6	3	12	59	2						
Amphenicols																							
Chloramphenicol	16	128	20							1	8	92	7	0	2	18							
Florfenicol	16	128	18							1	31	74	4	4	7	7							
Cephalosporins																							
Ceftiofur	4	117	1					31	79	6	0	0	1										
Fluoroquinolones																							
Ciprofloxacin	1	128	0	119	5	1	1	1	1														
Penicillins																							
Ampicillin	16	128	81						31	15	1	0	0	0	81								
Quinolones																							
Nalidixic acid	16	128	3								116	9	0	0	0	1	2						
Sulfonamides																							
Sulfamethoxazol	256	128	82											3	33	6	4	0	75	7			
Tetracyclines																							
Tetracyclin	8	128	86						1	38	2	1	0	10	71	5							
Trimethoprim	8	128	27					10	0	0	91	0	0	0	27								
Trimethoprim + sulfonamides	0																						

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

	Salmonella spp.
	Meat from broilers (Gallus gallus)
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	222

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	221	2				6	1	210	2	0	0	2										
Kanamycin	32	221	23								198	0	0	0	1	22							
Neomycin	8	214	21							193	0	0	4	11	6								
Streptomycin	16	221	58							1	72	62	28	29	15	14							
Amphenicols																							
Chloramphenicol	16	221	8							7	62	129	15	0	1	7							
Florfenicol	16	221	3							10	117	83	8	1	2								
Cephalosporins																							
Ceftiofur	4	214	2					67	121	24	0	0	2										
Fluoroquinolones																							
Ciprofloxacin	1	221	0	147	3	1	30	29	11														
Penicillins																							
Ampicillin	16	221	52						92	68	9	0	0	2	50								
Quinolones																							
Nalidixic acid	16	221	71								142	8	0	0	1	8	62						
Sulfonamides																							
Sulfamethoxazol	256	221	51										1	22	125	21	1	0	49	2			
Tetracyclines																							
Tetracyclin	8	221	47						1	151	21	1	0	5	41	1							
Trimethoprim	8	221	56					5	0	0	160	0	0	0	56								
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of Salmonella spp. in Meat from turkey - quantitative data [Dilution method]

	Salmonella spp.
	Meat from turkey
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	119

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	119	4				1	1	99	4	0	10	4										
Kanamycin	32	119	13								94	3	0	9	1	12							
Neomycin	8	116	12							102	2	0	2	6	4								
Streptomycin	16	119	74								9	26	10	21	25	27	1						
Amphenicols																							
Chloramphenicol	16	119	10							1	25	59	24	0	0	10							
Florfenicol	16	119	5							2	49	43	20	1	0	4							
Cephalosporins																							
Ceftiofur	4	116	0					19	68	29													
Fluoroquinolones																							
Ciprofloxacin	1	119	3	53	5	0	12	29	17	3													
Penicillins																							
Ampicillin	16	119	56						31	21	10	1	0	0	56								
Quinolones																							
Nalidixic acid	16	119	57								53	5	4	3	1	4	49						
Sulfonamides																							
Sulfamethoxazol	256	119	52											22	32	11	2	1	48	3			
Tetracyclines																							
Tetracyclin	8	119	91							16	11	1	1	5	84	1							
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of Salmonella spp. in Meat from other poultry species - quantitative data [Dilution method]

	Salmonella spp.
	Meat from other poultry species
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	43

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	43	0				6	0	37														
Kanamycin	32	43	0								43												
Neomycin	8	37	0							37													
Streptomycin	16	43	7								5	27	4	2	1	4							
Amphenicols																							
Chloramphenicol	16	43	1								8	34	0	0	0	1							
Florfenicol	16	43	1								21	21	0	0	1								
Cephalosporins																							
Ceftiofur	4	37	0					12	24	1													
Fluoroquinolones																							
Ciprofloxacin	1	43	0	36	3	0	2	1	1														
Penicillins																							
Ampicillin	16	43	4					2	24	13	0	0	0	0	4								
Quinolones																							
Nalidixic acid	16	43	4								33	6	0	0	0	1	3						
Sulfonamides																							
Sulfamethoxazol	256	43	4											7	25	7	0	0	4				
Tetracyclines																							
Tetracyclin	8	43	4						2	28	9	0	0	0	4								
Trimethoprim	8	43	2					6	0	0	35	0	0	0	2								
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of Salmonella spp. in Meat from other animal species or not specified - quantitative data [Dilution method]

	Salmonella spp.
	Meat from other animal species or not specified
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	205

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	205	1				10	0	187	2	2	3	0	1									
Kanamycin	32	205	11								187	3	1	3	0	11							
Neomycin	8	195	11							182	2	0	0	5	6								
Streptomycin	16	205	110								28	50	17	19	24	66	1						
Amphenicols																							
Chloramphenicol	16	205	27							4	37	128	9	0	0	27							
Florfenicol	16	205	23							8	64	104	6	4	15	4							
Cephalosporins																							
Ceftiofur	4	195	1					61	126	7	0	0	1										
Fluoroquinolones																							
Ciprofloxacin	1	205	1	169	10	4	4	14	3	1													
Penicillins																							
Ampicillin	16	205	100					1	61	41	2	0	0	0	100								
Quinolones																							
Nalidixic acid	16	205	25								170	10	0	0	0	0	25						
Sulfonamides																							
Sulfamethoxazol	256	205	108											16	64	17	00	0	102	6			
Tetracyclines																							
Tetracyclin	8	205	103						1	87	14	0	1	12	88	2							
Trimethoprim	8	205	34					10	0	0	161	0	0	0	34								
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing in Salmonella spp.

n = Number of resistant isolates	Salmonella spp.			
	Pet food		**Feed material of marine animal origin**	
Isolates out of a monitoring programme	no		no	
Number of isolates available in the laboratory	56		39	
Antimicrobials:	**N**	**n**	**N**	**n**
Aminoglycosides				
Gentamicin	55	1	30	0
Kanamycin	55	1	30	0
Neomycin	55	1	30	0
Streptomycin	55	15	30	0
Amphenicols				
Chloramphenicol	55	4	30	0
Florfenicol	55	3	30	0
Cephalosporins				
Ceftiofur	55	0	30	0
Fluoroquinolones				
Ciprofloxacin	55	0	30	0
Penicillins				
Ampicillin	55	12	30	0
Quinolones				
Nalidixic acid	55	4	30	0
Sulfonamides				
Sulfamethoxazol	55	12	30	0
Tetracyclines				
Tetracyclin	55	15	30	0
Trimethoprim	55	2	30	0
Trimethoprim + sulfonamides				
Trimethoprim + Sulfamethoxazol	55	3	30	0

Table Antimicrobial susceptibility testing of Salmonella spp. in Feed material of marine animal origin - quantitative data [Dilution method]

	Salmonella spp.
	Feed material of marine animal origin
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	39

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	30	0						29	1													
Kanamycin	32	30	0								30												
Neomycin	8	30	0							30													
Streptomycin	16	30	0								16	12	2										
Amphenicols																							
Chloramphenicol	16	30	0								11	18	1										
Florfenicol	16	30	0								20	10											
Cephalosporins																							
Ceftiofur	4	30	0					14	15	1													
Fluoroquinolones																							
Ciprofloxacin	1	30	0	30																			
Penicillins																							
Ampicillin	16	30	0						22	8													
Quinolones																							
Nalidixic acid	16	30	0								30												
Sulfonamides																							
Sulfamethoxazol	256	30	0											15	7	8							
Tetracyclines																							
Tetracyclin	8	30	0							29	1												
Trimethoprim	8	30	0								30												
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing of Salmonella spp. in Pet food - quantitative data [Dilution method]

	Salmonella spp.
	Pet food
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	56

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	8	55	1						53	1	0	0	0	0	1								
Kanamycin	32	55	1								51	2	1	0	0	1							
Neomycin	8	55	1							54	0	0	0	0	1								
Streptomycin	16	55	15								10	25	5	2	5	8							
Amphenicols																							
Chloramphenicol	16	55	4							1	15	35	0	0	0	4							
Florfenicol	16	55	3							1	30	21	0	3									
Cephalosporins																							
Ceftiofur	4	55	0					25	30														
Fluoroquinolones																							
Ciprofloxacin	1	55	0	49	2	0	1	3															
Penicillins																							
Ampicillin	16	55	12						25	16	2	0	0	0	12								
Quinolones																							
Nalidixic acid	16	55	4								51	0	0	0	1	0	3						
Sulfonamides																							
Sulfamethoxazol	256	55	12											6	26	10	1	0	12				
Tetracyclines																							
Tetracyclin	8	55	15							36	4	0	0	4	11								
Trimethoprim	8	55	3								52	0	0	0	3								
Trimethoprim + sulfonamides	0																						

Table Antimicrobial susceptibility testing in Salmonella spp., unspecified

n = Number of resistant isolates	Salmonella spp., unspecified													
	Meat from broilers (Gallus gallus)		**Meat from turkey**		**Meat from other poultry species**		**Meat from pig**		**Meat from bovine animals**		**Meat from other animal species or not specified**		**Eggs**	
Isolates out of a monitoring programme														
Number of isolates available in the laboratory														
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**

Footnote

This table should be deleted (there are no data)

Table Breakpoints for antibiotic resistance testing in Animals

Test Method Used

Broth dilution

Standards used for testing

NCCLS

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol		8	16	16	2	64				
Florfenicol		8	16	16	2	64				
Tetracyclines										
Tetracyclin		4	8	8	2	32				
Fluoroquinolones										
Ciprofloxacin		0.25	0.5	1	0.03	4				
Enrofloxacin										
Quinolones										
Nalidixic acid		16		16	4	128				
Trimethoprim		8		8	4	32				
Sulfonamides										
Sulfonamide										
Sulfamethoxazol		256		256	32	512				
Aminoglycosides										
Streptomycin		8	16	16	4	64				
Gentamicin		4	8	8	1	32				
Neomycin		4	8	8	2	32				
Kanamycin		16	32	32	4	64				
Trimethoprim + sulfonamides										
Trimethoprim + Sulfamethoxazol		2		2	1	8				
Cephalosporins										
Ceftiofur		2	4	4	0.5	8				
3rd generation cephalosporins										
Penicillins										
Ampicillin		8	16	16	1	32				

Footnote

Ciprofloxacin: intermediate 0.5-1.0
Both concentrations of Trimethoprim/ Sulfamethoxazole should be given in the table(sens. <= 2/ 38 etc.

Table Breakpoints for antibiotic resistance testing in Food

Test Method Used

Broth dilution

Standards used for testing

NCCLS

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol		8	16	16	2	64				
Florfenicol		8	16	16	2	64				
Tetracyclines										
Tetracyclin		4	8	8	2	32				
Fluoroquinolones										
Ciprofloxacin		0.25	0.5	1	0.03	4				
Enrofloxacin										
Quinolones										
Nalidixic acid		16		16	4	128				
Trimethoprim		8		8	4	32				
Sulfonamides										
Sulfonamide										
Sulfamethoxazol		256		256	32	512				
Aminoglycosides										
Streptomycin		8	16	16	4	64				
Gentamicin		4	8	8	1	32				
Neomycin		4	8	8	2	32				
Kanamycin		16	32	32	4	64				
Trimethoprim + sulfonamides										
Trimethoprim + Sulfamethoxazol		2		2	1	8				
Cephalosporins										
Ceftiofur		2	4	4	0.5	8				
3rd generation cephalosporins										
Penicillins										
Ampicillin		8	16	16	1	32				

Footnote

Ciprofloxacin: intermediate 0.5-1.0
Both concentrations of Trimethoprim/ Sulfamethoxazole
should be given in the table(sens. <= 2/ 38 etc.

Table Breakpoints for antibiotic resistance testing in Feedingstuff

Test Method Used

Broth dilution

Standards used for testing

NCCLS

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol		8	16	16	2	64				
Florfenicol		8	16	16	2	64				
Tetracyclines										
Tetracyclin		4	8	8	2	32				
Fluoroquinolones										
Ciprofloxacin		0.25	0.5	1	0.03	4				
Enrofloxacin										
Quinolones										
Nalidixic acid		16		16	4	128				
Trimethoprim		8		8	4	32				
Sulfonamides										
Sulfonamide										
Sulfamethoxazol		256		256	32	512				
Aminoglycosides										
Streptomycin		8	16	16	4	64				
Gentamicin		4	8	8	1	32				
Neomycin		4	8	8	2	32				
Kanamycin		16	32	32	4	64				
Trimethoprim + sulfonamides										
Trimethoprim + Sulfamethoxazol		2		2	1	8				
Cephalosporins										
Ceftiofur		2	4	4	0.5	8				
3rd generation cephalosporins										
Penicillins										
Ampicillin		8	16	16	1	32				

Footnote

Ciprofloxacin: intermediate 0.5-1.0
Both concentrations of Trimethoprim/ Sulfamethoxazole
should be given in the table(sens. <= 2/ 38 etc.

2.2. CAMPYLOBACTERIOSIS

2.2.1. General evaluation of the national situation

2.2.2. Campylobacteriosis in humans

2.2.3. Campylobacter in foodstuffs

A. Campylobacter spp. in food

Monitoring system

Sampling strategy

For 2007, results of Campylobacter detection in the most important foods obtained in examinations of samples collected under the sampling plan within the official food control were reported from most of the federal states.

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

As in the former year, Campylobacter detection was mainly possible in poultry meat with 33.67 % of samples tested positive (2006: 31.89 %). The result of broiler meat investigations showed the highest Campylobacter rate, namely 41.22 % (2006: 38.98 %). In meat from turkeys, Campylobacter was detected in 17.6 % (2006: 17.9 %) of samples. Meat products containing poultry meat exhibited an increased Campylobacter rate to 9.35 % (2006: 6.08 %). In pork, Campylobacter was detected in 1.3 % of samples (2006: 0.7 %).
From Campylobacter positive foods, mainly C. jejuni and C. coli were isolated. From poultry meat, C. jejuni was isolated nearly in two thirds of cases again. In raw milk at farm (for retail), C. jejuni was identified in one case (0.5 %; 2006: 1.0 %). From fish, seafood and their products one C. coli could be isolated. In raw milk for producer of pasteurised milk C. jejuni was found. In cheese made from raw milk one Campylobacter detection was possible, all other milk food groups proved to be Campylobacter negative.

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. lari	C. upsaliensis	C. jejuni	Thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus)	offical food control with sampling plan	single	25	621	256	35		1	191	29
fresh										
- at processing plant	offical food control with sampling plan	single	25	35	14	2			11	1
- at retail	offical food control with sampling plan	single	25	574	235	29		1	178	27
meat preparation										
intended to be eaten cooked										
- at processing plant	offical food control with sampling plan	single	25	8	1				1	
- at retail	offical food control with sampling plan	single	25	91	20	4			12	4
meat products										
cooked, ready-to-eat										
- at retail	offical food control with sampling plan	single	25	21	1				1	
Meat from turkey										

fresh										
- at processing plant	offical food control with sampling plan	single	25	27	6	2			2	2
- at retail	offical food control with sampling plan	single	25	345	61	10			43	8
meat preparation intended to be eaten cooked										
- at processing plant	offical food control with sampling plan	single	25	6	0					
- at retail	offical food control with sampling plan	single	25	61	5				4	1
meat products cooked, ready-to-eat										
- at processing plant	offical food control with sampling plan	single	25	12	0					
- at retail	offical food control with sampling plan	single	25	9	0					
Meat from duck										
- at slaughterhouse (1)	offical food control with sampling plan	single	25	6	1				1	
- at retail	offical food control with sampling plan	single	25	52	19	3			13	3
Meat from geese										
- at slaughterhouse (2)	offical food control with sampling plan	single	25	2	0					
- at retail	offical food control with sampling plan	single	25	21	2				2	

(1) : at processing plant
(2) : at processing plant

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. jejuni	C. coli	C. upsaliensis	C. lari	Thermophilic Campylobacter spp., unspecified
Meat from pig	offical food control with sampling plan	single	25g	151	2	1				1
fresh										
- at processing plant	offical food control with sampling plan	single	25g	26	1					1
- at retail	offical food control with sampling plan	single	25g	123	1	1				
Meat from bovine animals	offical food control with sampling plan	single	25g	60	0					
fresh										
- at processing plant	offical food control with sampling plan	single	25g	25	0					
- at retail	offical food control with sampling plan	single	25g	35	0					
Meat from sheep	offical food control with sampling plan	single	25g	10	0					

fresh										
- at retail	offical food control with sampling plan	single	25g	10	0					
Milk, cows'										
raw (1)	offical food control with sampling plan	single	25g	193	1	1				
intended for direct human consumption (2)	offical food control with sampling plan	single	25g	145	0					
raw milk for manufacture										
intended for manufacture of raw or low heat-treated products (3)	offical food control with sampling plan	single	25g	243	4	3				1

(1) : raw milk selled at farm with recommendation to heat for 10 min.
(2) : certified milk
(3) : raw milk for all manufactures

2.2.4. Campylobacter in animals

A. Campylobacter spp. in animal

Monitoring system

Sampling strategy

The data of herds or flocks are based on thermophilic Campylobacter species. Samples have been sent to the laboratory for diagnostic examination.

Diagnostic/ analytical methods used

At slaughter: modified ISO 10272

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

Campylobacter testing in chicken was reported by 5 federal states. 67 % of the tested flocks were positive (2006: 20.5 %).
Of the reported herds of cattle from 6 federal states, 11.3 % were positive (2006: 9.7 %). Of 13044 individual cattle tested for Campylobacter for various reasons, 3.0 % were positive as in the year before. The proportion was substantially higher in calves (18%) than in dairy cows (no isolates).
In swine, 38.8 % of the examined herds were positive for Campylobacter, which is more than last year (2006: 16.5 %).

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic Campylobacter spp.	C. jejuni	C. coli	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Cattle (bovine animals)									
dairy cows	Official reports of the Laender	herd	57	0					
calves (under 1 year)	Official reports of the Laender	herd	70	16	6	10			
- in total	Official reports of the Laender	herd	503	54	32	19	3		
Sheep	Official reports of the Laender	herd	62	4	2	2			
Goats	Official reports of the Laender	herd	21	4	2	2			
Pigs	Official reports of the Laender	herd	224	66	7	58	1		
Solipeds, domestic	Official reports of the Laender	herd	370	211	129	82			
Gallus gallus (fowl)									
broilers	Official reports of the Laender	flock	482	314	135	90			89
Turkeys (1)	Official reports of the Laender	flock	4	4	3	2			
Dogs	Official reports of the Laender	single	677	37	14	12	1	4	6

Cats	Official reports of the Laender	single	227	16	13	2			1

(1) : In one sample C.jejuni and C.coli were present

2.2.5. Antimicrobial resistance in Campylobacter isolates

Table Antimicrobial susceptibility testing in C. coli

n = Number of resistant isolates	C. coli			
	Pigs		**Gallus gallus (fowl)**	
Isolates out of a monitoring programme	yes			
Number of isolates available in the laboratory	91			
Antimicrobials:	**N**	**n**	**N**	**n**
Aminoglycosides				
Gentamicin	91	8		
Streptomycin	91	90		
Fluoroquinolones				
Ciprofloxacin	91	41		
Macrolides				
Erythromycin	91	25		
Resistant to 1 antimicrobial		5		
Resistant to 2 antimicrobials		39		
Resistant to 3 antimicrobials		28		
Resistant to 4 antimicrobials		18		
Resistant to >4 antimicrobials		1		
Tetracyclines				
Tetracyclin	91	80		

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

	C. coli
	Pigs - fattening pigs - at slaughterhouse - Monitoring
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	91

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	91	8					2	18	63	8												
Streptomycin	4	91	90								1	4	4	1	18	63							
Fluoroquinolones																							
Ciprofloxacin	1						1	19	30	13	3	1	24										
Macrolides																							
Erythromycin	16	91	25						1	12	34	15	4	1	24								
Tetracyclines																							
Tetracyclin	2	91	80					8	1	2	0	1	6	13	35	25							

Table Antimicrobial susceptibility testing of C. jejuni in broilers - Gallus gallus (fowl) - before slaughter - quantitative data [Dilution method]

	C. jejuni
	Gallus gallus (fowl) - broilers - before slaughter
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	100

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	100	7					20	73	7													
Fluoroquinolones																							
Ciprofloxacin	1							10	16	8	2	1	63										
Macrolides																							
Erythromycin	4	100	13					1	13	48	25	7	1	0	5								
Tetracyclines																							
Tetracyclin	4	100	54					44	2	0	0	0	2	7	45								

Table Antimicrobial susceptibility testing in C. jejuni

n = Number of resistant isolates		
	C. jejuni	
	Gallus gallus (fowl)	
Isolates out of a monitoring programme		yes
Number of isolates available in the laboratory		100
Antimicrobials:	**N**	**n**
Aminoglycosides		
Gentamicin	100	7
Fluoroquinolones		
Ciprofloxacin	100	74
Macrolides		
Erythromycin	100	13
Resistant to 1 antimicrobial		32
Resistant to 2 antimicrobials		41
Resistant to 3 antimicrobials		10
Resistant to 4 antimicrobials		1
Tetracyclines		
Tetracyclin	100	54

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

	C. jejuni
	Meat from broilers (Gallus gallus) - Monitoring - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	99

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=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	99	6				3	24	66	6													
Fluoroquinolones																							
Ciprofloxacin	1						1	5	30	9	4	0	50										
Macrolides																							
Erythromycin	4	99	8						13	43	35	5	0	1	2								
Tetracyclines																							
Tetracyclin	2	99	53					42	4	0	3	4	5	12	29								

Table Antimicrobial susceptibility testing in C. jejuni

n = Number of resistant isolates	C. jejuni			
	Meat from broilers (Gallus gallus)		**Meat from pig**	
Isolates out of a monitoring programme	yes			
Number of isolates available in the laboratory	99			
Antimicrobials:	**N**	**n**	**N**	**n**
Aminoglycosides				
Gentamicin	99	6		
Fluoroquinolones				
Ciprofloxacin	99	63		
Macrolides				
Erythromycin	99	8		
Resistant to 1 antimicrobial		47		
Resistant to 2 antimicrobials		31		
Resistant to 3 antimicrobials		7		
Resistant to 4 antimicrobials		0		
Tetracyclines				
Tetracyclin	99	53		

Table Breakpoints used for antimicrobial susceptibility testing in Animals

Test Method Used

Broth dilution

Standards used for testing

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracyclines										
Tetracyclin					0.5	64				
Fluoroquinolones										
Ciprofloxacin					0.12	16				
Quinolones										
Nalidixic acid										
Aminoglycosides										
Streptomycin					1	128				
Gentamicin					0.25	32				
Macrolides										
Erythromycin					0.5	64				
Penicillins										
Ampicillin										

Footnote

Different breakpoints used for C.coli (pig samples) and C. jejuni (poultry samples)(EUCAST recommendations)

Table Breakpoints used for antimicrobial susceptibility testing in Food

Test Method Used

Broth dilution

Standards used for testing

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracyclines										
Tetracyclin				2	0.5	64				
Fluoroquinolones										
Ciprofloxacin				1	0.12	16				
Quinolones										
Nalidixic acid										
Aminoglycosides										
Gentamicin				1	0.25	32				
Macrolides										
Erythromycin				4	0.5	64				
Penicillins										
Ampicillin										

2.3. LISTERIOSIS

2.3.1. General evaluation of the national situation

2.3.2. Listeriosis in humans

2.3.3. Listeria in foodstuffs

A. L. monocytogenes in food

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

In 2007, Listeria monocytogenes was detected in numerous categories of food by means of samples collected under a sampling plan within the official food control. Compared with the previous year, red meat showed an increase in the share of positive samples (6.20 %; 2006: 3.73 %). L. monocytogenes was reported for meat of cattle, pork, sheep, and game.
Comminuted raw meat complying with the Minced Meat Regulations (intended to be eaten raw) showed an increased share of L. monocytogenes to 18.10 % (2006: 15.96 %). Meat preparations (raw) of all red meat species (not in table) were found positive in 22.95 % of samples (2006: 18.36 %), this means a further increase for raw meat products. Stabilized meat products of pork at retail showed an slightly decrease of L. monocytogenes contamination to 8.51 % of samples (2006: 9.61 %). In heat treated meat products of pork at retail ('cooked, ready-to-eat'), the share of 2.60 % of positive samples has slightly decreased compared to the previous year (2006: 2.99 %). According to these data, the frequency of detection of L. monocytogenes in stabilized meat products was higher than in heat treated meat products.
In poultry meat, L. monocytogenes was detected in 19.16 % of the samples (2006: 7.47 %). Detection rates in fish, seafood and products made from these were still high with an increase to 10.58 % (2006: 9.25 %). Stabilised fish products showed detection rates in nearly the same height as in the previous year with 13.91 % (2006: 13.45 %). L. monocytogenes was detected in heat treated (smoked) fish products at 10.95 % (2006: 8.95 %). L. monocytogenes was only found in 0.55 % (one case; 2006: 0.93 %) of samples of certified milk. From raw milk sold at farm, an increased share of L. monocytogenes was reported at 2.56 % (2006: 1.46 %). In soft cheese made from raw milk and also made from pasteurised milk one L. monocytogenes-finding was reported each.

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

It appears that in meat and meat products, contamination with L. monocytogenes takes place after the slaughtering process and during subsequent storage and/ or onward treatment. L. monocytogenes has continued to be widespread thus representing a risk to the consumers, in particular immunocompromized persons and pregnant women. It has been recommended for a long time already that these groups of persons should not consume raw meat products. Since 2000 quantitative results for Listeria have been reported. Quantitative examinations for L. monocytogenes have been performed since the early 1990ies (BGA recommendations, 1991; BgVV, 2000). Quantitative examinations have been stated as the positive share of the samples examined by the federal states under the sampling plan within the official food control. In 2007, bacterial counts exceeding 10^2 cfu/ g were mainly detected in meat products and fish and products. The percentages of samples were below 1 % for most food categories.

Higher rates were observed in meat preparations (raw), in stabilised meat products and also in fish and products.

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
Milk, cows'										
raw (3)	offical food control with sampling plan	single	1g			78	2	12	0	
intended for direct human consumption (1)	offical food control with sampling plan	single	1g			183	1	117	0	
raw milk for manufacture										
intended for manufacture of raw or low heat-treated products (2)	offical food control with sampling plan	single				217	19	49	0	
pasteurised milk										
- at processing plant	offical food control with sampling plan	single	25g			114	0	1	0	
- at retail	offical food control with sampling plan	single	25g			574	0	230	0	
Cheeses made from cows' milk										
soft and semi-soft										
made from raw or low heat-treated milk										
- at processing plant	offical food control with sampling plan	single	25g			40	0	12	0	
- at retail	offical food control with sampling plan	single	25g			31	1	49	1	

made from pasteurised milk										
- at processing plant	offical food control with sampling plan	single	25g			41	1	19	0	
- at retail	offical food control with sampling plan	single	25g			337	0	280	0	
hard										
made from raw or low heat-treated milk										
- at processing plant	offical food control with sampling plan	single	25g			48	0	31	0	
- at retail	offical food control with sampling plan	single	25g			161	9	67	1	
made from pasteurised milk										
- at processing plant	offical food control with sampling plan	single	25g			471	5	232	2	
- at retail	offical food control with sampling plan	single	25g			2227	29	1617	7	3
Cheeses made from goats' milk										
hard										
made from pasteurised milk										
- at processing plant	offical food control with sampling plan	single	25g			63	0	30	0	
- at retail	offical food control with sampling plan	single	25g			89	0	36	0	
Cheeses made from sheep's milk										
hard										
made from pasteurised milk										
- at processing plant	offical food control with sampling plan	single	25g			76	28	57	6	11

- at retail	offical food control with sampling plan	single	25g			98	1	63	0	
Dairy products (excluding cheeses)										
butter										
- at processing plant	offical food control with sampling plan	single	25g			178	0	99	0	
- at retail	offical food control with sampling plan	single	25g			140	0	3	0	

(1) : certified milk
(2) : for all manufactures
(3) : raw milk selled at farm with recommendation to heat for 10 min.

Footnote

Data from detection methods and from enumaration methods come partely from different institutes, some institutions have investigated only enumeration methods according to (EC) No. 1441/ 2007

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
Meat from broilers (Gallus gallus)										
fresh (1)	offical food control with sampling plan	single	1g			214	41	286	4	6
meat products										
cooked, ready-to-eat										
- at processing plant (2)	offical food control with sampling plan	single	25g			111	18	107	8	
- at retail (3)	offical food control with sampling plan	single	25g			152	14	185	3	1
Meat from pig										
fresh	offical food control with sampling plan	single	1g			202	24	290	0	2
meat products										
cooked, ready-to-eat										
- at processing plant	offical food control with sampling plan	single	25g			236	25	247	6	1
- at retail	offical food control with sampling plan	single	25g			731	19	822	4	2
fermented sausages										

- at retail	offical food control with sampling plan	single	1g			517	44	598	7	1
Meat from bovine animals										
fresh	offical food control with sampling plan	single	1g			98	13	144	3	2
meat products										
cooked, ready-to-eat										
- at processing plant	offical food control with sampling plan	single	25g			3	0	1	0	
- at retail	offical food control with sampling plan	single	25g			12	1	3	0	
Fish										
smoked										
- at processing plant	offical food control with sampling plan	single	25g			172	16	165	2	1
- at retail	offical food control with sampling plan	single	25g			447	51	622	10	10
Crustaceans										
unspecified										
cooked										
- at processing plant (4)	official food control with sampling plan	single	1g			17	2	18	0	
- at retail (5)	official food control with sampling plan	single	1g			210	5	241	1	1
Fishery products, unspecified										
- at retail (stabilized)	offical food control with sampling plan	single	1g			1008	148	779	11	10

(1) : including other poultry meat
(2) : including other poultry meat, incl. stabilized meat products
(3) : including other poultry meat, incl. stabilized meat products
(4) : all crustaceans
(5) : all crustaceans

Footnote

Data from detection methods and from enumaration methods come partely from different institutes, some institutions have investigated only enumeration methods according to (EC) No. 1441/ 2007

2.3.4. Listeria in animals

A. L. monocytogenes in animal

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

The detection rate in chicken was comparable to that of the previous year. In cattle 2.0 % of the animals were found positive (2006: 2.2 %). The proportion of positive samples remained low in swine (one animal). In goats and sheep, the number of samples that were examined was substantitially lower. The proportion of samples positive for L. monocytogenes increased to 8.9 % and 5.8 % vs. 2.4 % and 1.5 % in 2006, respectively.

Table Listeria in animals

	Source of information	Sampling unit	Units tested	Total units positive for Listeria spp.	L. monocytogenes	Listeria spp., unspecified	L. monocytogenes - L. monocytogenes serovar 1/ 2a
Cattle (bovine animals)	Official reports of the Laender	single	3651	74	74		
dairy cows	Official reports of the Laender	single	1037	22	22		
Sheep	Official reports of the Laender	single	695	40	40		
Goats	Official reports of the Laender	single	226	20	20		2
Pigs	Official reports of the Laender	single	5266	1	1		
Gallus gallus (fowl)	Official reports of the Laender	single	2244	2	2		

2.4. E. COLI INFECTIONS

2.4.1. General evaluation of the national situation

2.4.2. E. Coli Infections in humans

2.4.3. Escherichia coli, pathogenic in foodstuffs

A. Verotoxigenic E. coli (VTEC) in food

Monitoring system

Sampling strategy

The federal states were requested to report results on VTEC, where toxin production had been examined by means of SLT-PCR, ELISA or cyto-toxin testing. The results obtained for samples tested under a sampling plan are shown. In 2007 as in the previous years, VTEC testing was mainly performed by means of the BgVV-Dessau method.

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

Mainly red meat, comminuted raw meat according to the Minced Meat Regulations and stabilised meat products have been tested. In these categories, the number of tests was diminished compared with the previous year. In 2007, VTEC/ STEC was detected in red meat with 5.41 % of samples, which is comparable to the previous year (2006: 5.21 %). In beef only a few findings could be made with 2.82 % of samples (2006: 4.52 %). The highest VTEC/ STEC rates were found in meat of game exhibiting 10 % of samples that tested positive, the same as in the previous year (2006: 10 %). In game, the serovars VTEC O128, O8, O146, O22 and O113 were reported. VTEC was detected in 2.95 % of samples of comminuted raw meat according to the Minced Meat Regulations (intended to be eaten raw: 2006: 5.89 %). Less detections of VTEC/ STEC were reported in 2007 from stabilized meat products with 1.08 % (2006: 1.79 %). There was no case of VTEC detection in soft cheese made from raw milk (2006: neg.). VTEC/ STEC was detected in 2007 mainly in untreated foods.

Table VT E. coli in food

	Source of information	Sampling unit	Sample weight	Units tested	Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC, other serotypes	Verotoxigenic E. coli (VTEC) - VTEC O128	Verotoxigenic E. coli (VTEC) - VTEC O113	Verotoxigenic E. coli (VTEC) - VTEC O8	Verotoxigenic E. coli (VTEC) - VTEC O146	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC non-O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified
Meat from broilers (Gallus gallus)	official food control with sampling plan	single	25g	4	0								
Meat from turkey	official food control with sampling plan	single	25g	7	0								
Meat from pig	official food control with sampling plan	single	25g	38	0								

Meat from bovine animals	official food control with sampling plan	single	25g	142	4							4
fresh												
- at processing plant	official food control with sampling plan	single	25g	24	1							1
- at retail	official food control with sampling plan	single	25g	111	3							3
minced meat intended to be eaten raw												
- at processing plant	official food control with sampling plan	single	25g	14	0							
- at retail	official food control with sampling plan	single	25g	347	8	1		1				6
Meat from sheep	official food control with sampling plan	single	25g	41	3							3
fresh												
- at processing plant	official food control with sampling plan	single	25g	2	1							1

- at retail	official food control with sampling plan	single	25g	37	2								2
Milk, cows'													
raw (1)	official food control with sampling plan	single	25g	209	4								4
intended for direct human consumption (2)	official food control with sampling plan	single	25g	156	1	1							
raw milk for manufacture	official food control with sampling plan	single	25g	106	0								
Cheeses made from cows' milk													
soft and semi-soft	official food control with sampling plan	single	25g	215	2								2
Meat from wild game - land mammals	official food control with sampling plan	single	25g	130	13	3	1	1	1	1			6

(1) : raw milk selled at farm with recommendation to heat for 10 min.
(2) : certified raw milk

2.4.4. Escherichia coli, pathogenic in animals

A. Verotoxigenic Escherichia coli in cattle (bovine animals)

Results of the investigation

The proportion of positive cattle for VTEC was low with 0.10 % (2006: 0.13 %). No isolations were reported from calves and for dairy cattle in 2007.

B. Verotoxigenic E. coli (VTEC) in animal

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

VTEC could be found in pigs in 7.83 % of the animals (2006: 2.42 %). O157 was isolated from two pigs. Sporadic findings were made in sheep, goats, and dogs.

Table VT E. coli in animals

	Source of information	Sampling unit	Sample weight	Units tested	Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC non-O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified	Verotoxigenic E. coli (VTEC) - VTEC, other serotypes	Verotoxigenic E. coli (VTEC) - VTEC O91
Cattle (bovine animals)	Official reports of the Laender	single		1204	33			29		4
calves (under 1 year)	Official reports of the Laender	single		371	0					
dairy cows										
- at farm	Official reports of the Laender	single		728	0					
Sheep										
- at farm	Official reports of the Laender	single		215	3			3		
Goats										
- at farm	Official reports of the Laender	single		66	4			4		
Pigs	Official reports of the Laender	single		1904	149	2		146	1	
Solipeds, domestic	Official reports of the Laender	single		108	0					
Poultry, unspecified	Official reports of the Laender	single		2434	0					
Dogs	Official reports of the Laender	single		668	2			2		
Cats	Official reports of the Laender	single		436	0					

2.5. TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1. General evaluation of the national situation

2.5.2. Tuberculosis, Mycobacterial Diseases in humans

2.5.3. Mycobacterium in animals

A. Mycobacterium bovis in bovine animals

Notification system in place

Tuberculosis is a notifiable disease according to "Verordnung zum Schutz gegen die Tuberkulose des Rindes" of 20. March 1997.

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

Due to the long lasting control policy, tuberculosis in cattle remains a rare event in Germany.

B. Mycobacterium bovis in farmed deer

Monitoring system

Frequency of the sampling

Farmed deer are generally subject to meat inspection according to German legislation. Samples for laboratory analysis will only be collected in case of clinical suspicion.

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
Sheep	Official reports of the Laender	single	629	1			1
Goats	Official reports of the Laender	single	31	0			
Pigs	Official reports of the Laender	single	1229	58			58
Zoo animals, all	Official reports of the Laender	single	143	37			37

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/ 432/ EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests (*)	Number of animals tested			
DEUTSCHLAND	165500	12707300		0	12	0.007					
Total	165500	12707300	0	0	12	0.007		0	0	0	0

(*) Legend:

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

2.6. BRUCELLOSIS

2.6.1. General evaluation of the national situation

2.6.2. Brucellosis in humans

2.6.3. Brucella in foodstuffs

2.6.4. Brucella in animals

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. melitensis	B. abortus	B. suis	Brucella spp., unspecified
Pigs	Official reports of the Laender	single	25523	10		8		2
Solipeds, domestic								
horses	Official reports of the Laender	single	1667	1		1		
Wild boars	Official reports of the Laender	single	5297	989			223	766
Sheep	Official reports of the Laender	single	32313	0				
Goats	Official reports of the Laender	single	4831	0				

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance						Investigations of suspect cases								
							Serological tests			Examination of bulk milk samples			Information about abortions			Epidemiological investigation					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds tested	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Number of positive animals		Number of animals examined microbio logically	Number of animals positive microbio logically
																		Serologically	BST		
DEUTSCHLAND	165500	12707300		0		0															
Total	165500	12707300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2.7. YERSINIOSIS

2.7.1. General evaluation of the national situation

2.7.2. Yersiniosis in humans

2.7.3. Yersinia in foodstuffs

A. Y. enterocolitica in food

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

In food samples collected under the sampling plan, Yersinia enterocolitica was detected in 2007 mainly in pork. There was a decrease in the number of samples collected under the sampling plan of pork. In pork, Yersinia enterocolitica was found in 9 % of these samples (2006: 10 %). Only in one case a serovar was reported, Yersinia enterocolitica O:5 as biotype 1 A.

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:5	Y. enterocolitica - O:3	Y. enterocolitica - O:9	Y. enterocolitica - unspecified
Meat from pig											
fresh (1)	official food control with sampling plan	single	25g	43	4		3	1			
minced meat	official food control with sampling plan	single	25g	25	0						
meat products	official food control with sampling plan	single	25g	119	0						
Meat from bovine animals											
fresh	official food control with sampling plan	single	25g	9	0						
Meat from sheep											
fresh	official food control with sampling plan	single	25g	3	0						
Milk, cows'											
raw (2)	official food control with sampling plan	single	25g	10	0						
intended for direct human consumption (3)	official food control with sampling plan	single	25g	46	0						
raw milk for manufacture											

intended for manufacture of raw or low heat-treated products (4)	official food control with sampling plan	single	25g	14	1		1				

(1) : all isolated strains were biotype 1A
(2) : raw milk selled at farm with recommentation to heat for 10 min.
(3) : certified raw milk
(4) : intended for all manufacture

2.7.4. Yersinia in animals

A. Yersinia enterocolitica in pigs

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

The proportion of positive samples for Yersinia enterocolitica in pigs was smaller than in the previous year with 0.56 % (2006. 3.0 %). In cattle Y. enterocolitica was found in 0.5 % of the investigated animals (2006: 0.2 %).
In pigs the serovar 0:3 was isolated in one quarter of the typed strains. The other typed serovars in pigs and cattle were O:9.

Table Yersinia in animals

	Source of information	Sampling unit	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica - O:9	Y. enterocolitica - O:3	Y. enterocolitica - unspecified
Cattle (bovine animals)	Official reports of the Laender	single	4568	23			17		6
Sheep	Official reports of the Laender	single	587	0					
Goats	Official reports of the Laender	single	167	0					
Pigs	Official reports of the Laender	single	6079	34			20	7	7
Solipeds, domestic	Official reports of the Laender	single	2263	1			1		
Poultry, unspecified	Official reports of the Laender	single	2197	0					
Dogs	Official reports of the Laender	single	1679	11					11
Cats	Official reports of the Laender	single	1015	0					

2.8. TRICHINELLOSIS

2.8.1. General evaluation of the national situation

2.8.2. Trichinellosis in humans

2.8.3. Trichinella in animals

A. Trichinella in pigs

Number of officially recognised Trichinella-free holdings

none

Categories of holdings officially recognised Trichinella-free

none

Officially recognised regions with negligible Trichinella risk

none

Monitoring system

Sampling strategy

General

meat inspection

Frequency of the sampling

General

Each animal has to be tested

Type of specimen taken

General

diaphragm

Methods of sampling (description of sampling techniques)

General

Artificial digestion (magnetic stirrer method, trichomatic 35); trichinoscopic examination in exceptional cases

Case definition

General

Meat which contains Trichinella muscle larva(e)

Diagnostic/ analytical methods used

General

Confirmation of isolate by Multiplex PCR

Preventive measures in place

yes

Control program/ mechanisms

The control program/ strategies in place

yes

Recent actions taken to control the zoonoses

routine meat inspection: reporting/ notification

Measures in case of the positive findings or single cases

Including the contingency plan in place: destroy positive carcass, trace back to the farm where positive animal came from

Notification system in place

yes (see above)

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

Fattening pigs raised under controlled housing conditions in integrated production system

negligible risk

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

low risk (risk is higher than indoor housing)

Breeding sows and boars

low to negligible risk

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

German pigs are considered free of Trichinella. No positive findings have been reported.

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

no relevance

Additional information

There were no trichinellosis outbreaks due to autochthonous infection in pig in 2007; the 2007 data are preliminary in the table

B. Trichinella in horses

Monitoring system

Sampling strategy

meat inspection

Frequency of the sampling

each animal has to be tested

Type of specimen taken

diaphragm, tongue or masseter

Methods of sampling (description of sampling techniques)

artificial digestion

Case definition

meat which contains Trichinella muscle larva(e)

Diagnostic/ analytical methods used

confirmation of isolate by Multiplex PCR

Results of the investigation including the origin of the positive animals

Trichinella positive horses have never been detected in Germany

Control program/ mechanisms

The control program/ strategies in place

yes

Recent actions taken to control the zoonoses

reporting/ notification

Measures in case of the positive findings or single cases

destroy positive carcass, trace back to the farm where positive animal came from

Notification system in place

yes

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

Horses are considered to be Trichinella-free

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

no relevance

Additional information

Recently, official statistical data from meat inspection in horses are available till 2006 (2006: no positive findings in 9608 examined horses). Preliminary data reported by the federal states are presented in the table.

C. Trichinella spp., unspecified in animal - Wild boars

Monitoring system

Sampling strategy

meat inspection

Frequency of the sampling

each animal

Type of specimen taken

diaphragm and fore leg muscle or tongue

Methods of sampling (description of sampling techniques)

artificial digestion or trichinoscopic examination

Case definition

meat which contains Trichinella muscle larva(e)

Diagnostic/ analytical methods used

confirmation of isolate by Multiplex PCR

Control program/ mechanisms

The control program/ strategies in place

yes

Recent actions taken to control the zoonoses

reporting/ notification

Measures in case of the positive findings or single cases

destroy positive carcass

Notification system in place

yes

Results of the investigation including the origin of the positive animals

Yes, there are Trichinella-positive findings in wild boars. Specification of isolates revealed T. spiralis and T. pseudospiralis.

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

Wild boars in Germany are a typical Trichinella reservoir (annual prevalence varies between 0.001 and 0.01%)

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

There is a risk of human trichinellosis due to consumption of wild boar meat

Additional information

Recently, official statistical data from meat inspection in wild boars became available till 2006 (2006: 8 positive findings in 272,258 examined wild boars corresponding with an average prevalence of 0.003%);
Besides wild boars, there is a monitoring in indicator animals. The estimated prevalence in red foxes (T. spiralis, T. pseudospiralis, T. britovi) and raccoon dogs (T. spiralis, T. pseudospiralis) is less than 0.1% and up to 1%, respectively. Preliminary data for 2007 presented in the table, based on reports by the federal states, indicate that again there were several Trichinella findings in wild boars in 2007.

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	Trichinella spp., unspecified	T. pseudospiralis
Pigs							
fattening pigs (1)	Federal Statistic	single	53310844	0			
Solipeds, domestic							
horses	Official reports of the Laender	single	1026	0			
Wild boars							
wild	Official reports of the Laender	single	134757	7	4	2	1
Foxes	Official reports of the Laender	single	3344	0			

(1) : preliminary data for 2007 from the federal office for statistic

2.9. ECHINOCOCCOSIS

2.9.1. General evaluation of the national situation

2.9.2. Echinococcosis in humans

2.9.3. Echinococcus in animals

Table Echinococcus in animals

	Source of information	Sampling unit	Units tested	Total units positive for Echinococcus spp.	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Cattle (bovine animals)	Official reports of the Laender	single	500	0			
Sheep	Official reports of the Laender	single	660	0			
Goats	Official reports of the Laender	single	1	0			
Pigs	Official reports of the Laender	single	543	0			
Solipeds, domestic	Official reports of the Laender	single	9	0			
Dogs	Official reports of the Laender	single	64	0			
Cats	Official reports of the Laender	single	51	0			
Foxes	Official reports of the Laender	single	4385	510		510	
Muskrats	Official reports of the Laender	single	763	27		27	
Raccoon dogs (1)	reporting system on animal epidemis	single		5			5
Monkeys (2)	reporting system on animal epidemis	single		1			1

(1) : Data from the reporting system for animal epidemics, where only detections are reportable
(2) : Data from the reporting system for animal epidemics, where only detections are reportable

2.10. TOXOPLASMOSIS

2.10.1. General evaluation of the national situation

2.10.2. Toxoplasmosis in humans

2.10.3. Toxoplasma in animals

Table Toxoplasma in animals

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma	T. gondii	Toxoplasma spp., unspecified
Cattle (bovine animals)	Official reports of the Laender	single	660	0		
Sheep	Official reports of the Laender	single	385	0		
Goats	Official reports of the Laender	single	95	0		
Solipeds, domestic	Official reports of the Laender	single	176	0		
Dogs	Official reports of the Laender	single	210	0		
Cats	Official reports of the Laender	single	649	5	1	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

Animal species: foxes, wildlife, domestic animals
Sampling strategy: 8 foxes per 100km² and year with special emphasis on indicator animals (animals being rabid, showing abnormal behaviour, road kills, animals found dead etc.)
Frequency of the sampling: permanent sampling (all year round)
Type of specimen taken: brain tissue (cortex, hippocampus, cerebellum, medulla oblongata)
Case definition: A case of Rabies in definitive hosts is defined as a detection of rabies virus antigen or the isolation of rabies virus in the brain of the respective animal.
Diagnostic/ analytical methods used: Fluorescent Antibody Test (FAT), Rabies Tissue Culture Infection Test (RTCIT), Reverse Transcriptase Polymerase Chain Reaction (RT_PCR), Real-time PCR
Notification system in place: Rabies is a notifiable disease

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

Results of the investigation: ?12 rabies cases in ?2006 (see table)
Investigations of the human contacts with the positive cases

Recent actions taken to control the zoonoses

Vaccination policy: oral rabies vaccination of foxes (ORV) in endemic areas
The control programmes/ strategies in place: ORV
Measures in case of the positive findings or single cases: ORV
Other preventative measures than vaccination in place: voluntary vaccination of pets and other domestic animals, complementary hunting

Suggestions to the Community for the actions to be taken

none

2.11.2. Rabies in humans

A. Rabies in humans

Reporting system in place for the human cases

notifiable

2.11.3. Lyssavirus (rabies) in animals

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	Unspecified Lyssavirus	European Bat Lyssavirus - unspecified	Classical rabies virus (genotype 1)
Cattle (bovine animals)	reporting system on animal epidemis	single	79				
Sheep	reporting system on animal epidemis	single	61				
Goats	reporting system on animal epidemis	single	12				
Pigs	reporting system on animal epidemis	single	5				
Solipeds, domestic	reporting system on animal epidemis	single	94				
Dogs	reporting system on animal epidemis	single	85				
Cats	reporting system on animal epidemis	single	329				
Bats							
wild (1)	reporting system on animal epidemis	single	90	6	6		
Foxes							
wild	reporting system on animal epidemis	single	14845				
Raccoon dogs							
wild	reporting system on animal epidemis	single	431				
Raccoons							

wild	reporting system on animal epidemis	single	319				
Badgers							
wild	reporting system on animal epidemis	single	123				
Marten							
wild	reporting system on animal epidemis	single	247				
Wild boars							
wild	reporting system on animal epidemis	single	106				
Deer							
wild							
roe deer	reporting system on animal epidemis	single	401				
red deer	reporting system on animal epidemis	single	11				
fallow deer	reporting system on animal epidemis	single	20				

(1) : Data from the reporting system for animal epidemics, where only detections are reportable

2.12. Q-FEVER

2.12.1. General evaluation of the national situation

2.12.2. Coxiella (Q-fever) in animals

Table Coxiella burnetii (Q fever) in animals

	Source of information	Sampling unit	Units tested	Total units positive for Coxiella (Q-fever)	C. burnetii
Cattle (bovine animals)	Official reports of the Laender	single	6936	742	742
Sheep	Official reports of the Laender	single	527	31	31
Goats	Official reports of the Laender	single	190	20	20

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

3.2. ESCHERICHIA COLI, NON-PATHOGENIC

3.2.1. General evaluation of the national situation

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

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

Table Enterobacter sakazakii in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Enterobacter sakazakii	E. sakazakii
Infant formula						
dried	official food control with sampling plan	single	25g	348	2	2
Foodstuffs intended for special nutritional uses						
dried dietary foods for special medical purposes intended for infants below 6 months	official food control with sampling plan	single	25g	36	1	1

4.3. STAPHYLOCOCCAL ENTEROTOXINS

4.3.1. General evaluation of the national situation

4.3.2. Staphylococcal enterotoxins in foodstuffs

Table Staphylococcal enterotoxins in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcal enterotoxins
Cheeses made from cows' milk					
hard	official food control with sampling plan	single	25g	1	0
Cheeses made from goats' milk					
hard	official food control with sampling plan	single	25g	1	0

5. FOODBORNE OUTBREAKS

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

A. Foodborne outbreaks

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

In Germany, two national systems collecting information on food-borne outbreaks exist.
Surveillance of Infectious Diseases in Humans is regulated in Germany by the Act on the Prevention and Control of Infectious Diseases in Man
(Protection against Infection Act), that came into force on 1 January 2001. It assigns the Robert Koch Institute (RKI) the task to compile the notifications of human infections at the national level and to evaluate and analyse the data under epidemiological aspects. Acute infections of statutorily notifiable pathogens are notified by laboratories and for some diseases also by physicians to the local public health office. Laboratory detection (acute infections) of all pathogens included in the EU Zoonoses Directive are notifiable by the diagnosing laboratory.
Outbreak reporting is integrated into this system by linking individual cases into groups with a common outbreak code.
On the local level, case-based data is entered by the local public health office in a standardised way describing the place and the suspected source or vehicle of the outbreak and the degree of evidence that a specific foodstuff is the vehicle in the outbreak (case-control study, cohort study, detection of pathogen in humans and foodstuff consumed, etc.). The information is then forwarded electronically via the state health authorities ("Bundesländer") to the RKI using a SQL database developed by the RKI. Multiple local outbreaks can be linked to meta-outbreaks on federal or national level, allowing multi-state outbreaks to be analysed. The system generates automated reports, based on case specific data. This system has increased by large the number of outbreaks that have been reported previously.
The investigation of local outbreaks lies in the responsibility of the local health departments. However, they can invite state health authorities or the RKI for assistance in the outbreak investigation.
Surveillance data and information on outbreaks are regularly published in the national epidemiological bulletin (see: www.rki.de>Infektionsschutz>Epidemiologisches Bulletin) and the annual report on the epidemiology of notifiable infectious diseases (see: www.rki.de>Infektionsschutz> Jahrbuch>2007).
In addition to the infectious disease reporting system of the Robert Koch-Institut, a voluntary reporting system collecting detailed information on the food implicated in outbreaks was established in 2005 at the Federal Institute for Risk Assessment (BfR). It is based on experiences gained from a former pilot project (ZEVALI). The system applies three reporting forms completed by the local food control authorities. The first form collects the necessary information on the human cases and other relevant information on the outbreak. The second form collects detailed data regarding the incriminated food vehicle. Data concerning the laboratory investigation of relevant food samples collected during the outbreak investigations are listed in the third form. Following the outbreak investigation, the three surveillance forms are sent to the BfR for data analysis. The BfR provides

feed-back on the results to all parties involved.

Description of the types of outbreaks covered by the reporting:

For infectious disease surveillance, outbreaks are defined as two or more epidemiologically linked cases of the same infection/ disease including at least one laboratory confirmed case. The reporting system is collecting information on the food implicated in outbreaks. As pick-list for foodstuffs Eurocode 2 is used. The electronic reporting system has a free text field for entering additional information on the outbreak, and further information on the implicated food is often mentioned there. All causative agents listed in the Zoonoses Directive (Directive 2003/ 99/ EC, Annex I, A, B) are monitored. Information on place of exposure is routinely collected allowing for categorisation of the type of outbreak. The information is often validated using additional information reported in a free text field to avoid confusion with EFSA's variable "setting".
Outbreaks are categorised as possibly food-borne if the local public health office who investigates the outbreak enters a foodstuff in the "foodstuff field" (pick list: Eurocode 2) of the electronic outbreak reporting system or classifies the information of the food stuff field as "meal is suspected, but food vehicle not determined". For the purpose of this report, a food-borne transmission route in outbreaks was considered to be confirmed ("verified food-borne outbreak) if the value "laboratory detection of the pathogen in food" or "food vehicle incriminated by evidence from a case-control study or cohort study" was chosen under the variable "type of evidence". It should be noted that this new categorisation makes comparisons with the previous report difficult because of the use of different categorisations for determining the degree of certainty of a food-borne transmission route.
The reporting system collecting detailed information on the food implicated in outbreaks of the BfR covers foodborne outbreaks caused by bacteria, viruses, parasites and toxins. The definition of foodborne outbreaks given in the Zoonoses Directive 2003/ 99/ EC is used by this system.

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

In 2007, 55 verified food-borne outbreaks were reported to Robert Koch Institute and 32 verified food-borne outbreaks were reported to BfR. Of these, 25 outbreaks were reported to both systems.
The 55 verified food-borne outbreaks reported to the Robert Koch Institute in 2007 affected 1,601 cases. One patient died (infected by S. Enteritidis). The 1,343 possible food-borne outbreaks reported to the Robert Koch Institute in 2007 affected a total of 7,727 human cases, of which one patient died (infected by norovirus). The number of possible food-borne outbreaks in 2007 was stable when compared to the year 2006 where 1.351 outbreaks were reported.
The reporting system for detailed information on the food implicated in outbreaks of the BfR has only recently been introduced and submission of outbreak reports to the system is voluntary. In 2007, a total of 104 foodborne outbreak investigations were reported to BfR. The outbreaks affected 1974 patients of whom 1 died. In 32 outbreaks investigated and reported to BfR in 2007 it was possible to confirm the implicated food vehicle by laboratory detection of the causative agent in a food sample.

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

Of the 55 verified food-borne outbreaks identified by human disease surveillance, 47 (85%)

were caused by Salmonella spp., of which 40 (85%) were serotyped as S. Enteritidis. Eggs or egg-products were the most frequently reported food-vehicles identified; however, the majority of food-borne S. Enteritidis outbreaks were not found to be associated with eggs or egg-products, including three of these outbreaks that affected more than 100 persons. The other eight verified food-borne outbreaks were associated with Campylobacter spp. and Trichinella spiralis infections, as well as intoxications caused by Bacillus cereus, Clostridium botulinum and Clostridium perfringens.

Most of the 1,343 possible food-borne outbreaks in Germany reported to the Robert Koch Institute were caused by Salmonella spp. (n=792, 59%) and Campylobacter spp. (n=258, 19%). A food was implicated in 693 (52%) outbreaks. Of these, eggs or egg products were thought to be responsible for 349 outbreaks (26%), meat or meat products for 230 outbreaks (17%), milk or dairy products for 47 outbreaks (3%) and fish or seafood was attributed as food vehicle in 38 outbreaks (3%). Most of the Salmonella outbreaks were attributed to eggs or egg products (n=338, 43%) and meat or meat products (n=111, 14%). For Campylobacter outbreaks, 105 (41%) were thought to be caused by meat or meat products and only 18 (7%) were attributed to milk and other dairy products. In 650 (48%) outbreaks, a meal was suspected as the cause of the outbreak but a specific food could not be incriminated.

The most frequently reported causative agent in the 104 outbreaks reported by food control authorities to BfR was Salmonella with 63 outbreaks (60%). Of these, 50 were caused by S. Enteritidis (61%). In 10 outbreaks PT 4 was detected and three outbreaks were caused by PT 8. The second most frequently reported agent was Campylobacter (11 outbreaks, 11%). Noroviruses were responsible for 10 outbreaks. Seven intoxications caused by Bacillus cereus (4), Clostridium botulinum (2) and Clostridium perfringens (1) were reported to BfR in 2007, involving 65 patients in total. One outbreak of Sarcosporidiosis involving 28 patients and caused by raw minced pork occurred.

The food vehicles incriminated in the 21 verified Salmonella outbreaks reported to BfR were often foods containing eggs such as fine bakery products (9 of the Salmonella outbreaks). One Salmonellosis outbreak was caused by packed, chopped, ready-to-eat lettuce. The two outbreaks caused by Clostridium botulinum were caused by home-canned green beans, fresh non-smoked liver pate from home-slaughtering and by smoked ham and bacon.

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

The place of exposure was available for 1,253 (93%) possible food borne outbreaks and 51 (93%) verified food-borne outbreaks reported to the Robert Koch Institute in 2007. Among possible food-borne outbreaks, outbreaks in households were most common (n=765, 61%) followed by outbreaks in restaurant settings (n=160, 13%) and in hotels (n=82, 7%). Of the 55 verified outbreaks reported in 2007, only 17 (31%) occurred in private homes involving human cases living in one household, whereas the remaining 38 (69%) were general outbreaks. The three largest outbreaks, all caused by S. Enteritidis, occurred in institutions (hospitals, or kindergarten supplied by one caterer).

Of the 32 verified foodborne outbreaks reported in 2007 to the reporting system for detailed information on the food implicated in outbreaks of the BfR, 10 (31%) occurred in households, while in 6 outbreaks (19%) involving 420 human cases the implicated food was consumed in hospitals/ medical care facilities. Four verified outbreaks (13%) were linked to schools or kindergartens.

Evaluation of the severity and clinical picture of the human cases

Death:
In 2007, two cases died in outbreaks characterised as food-borne according to EFSA-definitions. One case was part of verified food borne Salmonella-outbreak and the other belonged to a possibly food-borne norovirus outbreak.
Hospitalisation:
The proportion of hospitalised patients was 26% and 13% in verified and possible food-borne outbreaks, respectively.

Descriptions of single outbreaks of special interest

In the spring of 2007, three large S. Enteritidis outbreaks were noted in Germany with up to 303 cases in one incidence; two outbreaks occurred in hospitals and one in several kindergartens supplied by one caterer. Analytical epidemiological studies conducted in the respective outbreak investigations incriminated yoghurt and several desserts – none of which contained eggs. In one of the hospital outbreaks, the outbreak strain was isolated from a retain sample of a salad dressing as well as from the herd of layers whose eggs had been used in the production of cakes and other foods in the hospital kitchen. Furthermore, symptomatic and asymptomatic food workers were identified who likely have contributed to the extent of the prolonged outbreaks. It was concluded that the kitchen most likely had been contaminated through the use of shell eggs with consecutive infection of food handlers and cross-contamination of the foods consumed by the human cases. Both symptomatic and asymptomatic food handlers were also involved in the other large hospital outbreaks investigated in 2007.
Subtyping of the outbreak strains by a combination of phage typing and ribotyping revealed that each outbreak was caused by a different strain, which was taken as evidence of the absence of an epidemiological link between these outbreaks.
In July and August of 2007 an increase in incidence of S. Panama infections was detected among more than 30 young children. A case-control study implicated consumption of short-fermented mini-salami sticks as the likely vehicle of infection. Simultaneously to the beginning of the outbreak, a male food handler was identified with asymptomatic S. Panama infection who was employed in a factory producing short-fermented mini-salami sticks marketed under various brand names. At least some of these brands were also associated with an increased risk of infection in the case-control study. S. Panama could not be isolated from mini-salami samples drawn from stores and from retain samples drawn at producer level during the investigation. A microbiologically similar strain of S. Panama was found in pork sampled in another state, rendering it likely that the pork ingredient, not the food handler, contaminated the implicated food vehicle.
After a visit to relatives in Romania during the Christmas holidays three family members living in Bavaria came down with trichinellosis. The investigation revealed that raw smoked bacon and raw pork sausage of a home slaughtered pig, which contained larvae of Trichinella spiralis, were the cause of this outbreak.

Control measures or other actions taken to improve the situation

Several large outbreaks in 2007 were attributed to food prepared in hospital kitchens. Beyond measures instigated to control these outbreaks (eg. temporarily closure of kitchens), BfR convened a national expert meeting on hygiene management in hospital kitchens in November

2007. The experts concluded that no further legislation or regulations are needed, but that current regulations need to be consistently implemented by the food business operators and controlled by the competent authorities. This outcome was communicated to the relevant authorities of the Lander.

Foodborne Outbreaks: summarized data

	Total number of outbreaks	Number of possible outbreaks	Number of verified outbreaks
Bacillus	5	0	5
Campylobacter	259	258	1
Clostridium	3	0	3
Escherichia coli, pathogenic	17	17	0
Foodborne viruses	244	243	1
Listeria	0	0	0
Other agents	9	9	0
Parasites	14	12	2
Salmonella	843	793	50
Staphylococcus	0	0	0
Unknown	0	0	0
Yersinia	11	11	0

Verified Foodborne Outbreaks: detailed data

B. cereus

	Value
Code	3629051
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Cereals products including rice and seeds/pulses (nuts, almonds)
More Foodstuff	rice, boiled and fried
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Inadequate chilling, Storage time/temperature abuse
Outbreaks	1
Comment	positive test for diarrhoea-toxin

B. cereus

	Value
Code	18
Subagent Choice	
Outbreak type	General
Human cases	3
Hospitalized	0
Deaths	0
Foodstuff implicated	Other or mixed red meat and products thereof
More Foodstuff	Doner meat
Type of evidence	Laboratory detection in implicated food
Setting	Take-away or fast-food outlet
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse, Inadequate heat treatment
Outbreaks	1
Comment	Cereulide (emetic toxin) was found in the food

B. cereus

	Value
Code	3962417
Subagent Choice	
Outbreak type	General
Human cases	51
Hospitalized	0
Deaths	0
Foodstuff implicated	Cereals products including rice and seeds/pulses (nuts, almonds)
More Foodstuff	rice
Type of evidence	Laboratory detection in implicated food
Setting	Residential institution (nursing home, prison, boarding school)
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

B. cereus

	Value
Code	11
Subagent Choice	
Outbreak type	General
Human cases	8
Hospitalized	0
Deaths	0
Foodstuff implicated	Milk
More Foodstuff	pasteurised chocolate milk
Type of evidence	Laboratory detection in implicated food
Setting	Camp, picnic
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse, Inadequate heat treatment
Outbreaks	1
Comment	toxin-producing Bac. cereus

B. cereus

	Value
Code	3804737
Subagent Choice	
Outbreak type	General
Human cases	10
Hospitalized	0
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	hamburgers made from minced meat and cheese
Type of evidence	Laboratory detection in implicated food
Setting	School, kindergarten
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	small quantities (1,98 mg/g) of Cereulide were found in a sample of cheese of the same batch that was used to prepare the hamburgers

C. jejuni

	Value
Code	3999032
Subagent Choice	
Outbreak type	General
Human cases	14
Hospitalized	0
Deaths	0
Foodstuff implicated	Milk
More Foodstuff	raw milk
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	the raw milk was consumed by school children at the farm

C. botulinum

	Value
Code	3402369
Subagent Choice	
Outbreak type	Household
Human cases	3
Hospitalized	1
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	smoked ham, bacon
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	detection of Botulinum Toxin-gene Type B-specific DNA in the food

C. botulinum

	Value
Code	4117551
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	2
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	home-canned green beans, fresh non-smoked liver pate from home-slaughtering
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	toxin was found in the food

C. perfringens

	Value
Code	4041187
Subagent Choice	
Outbreak type	General
Human cases	37
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	chili con carne
Type of evidence	Laboratory detection in implicated food
Setting	School, kindergarten
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

norovirus (Norwalk-like virus)

	Value
Code	4038782
Subagent Choice	
Outbreak type	General
Human cases	18
Hospitalized	1
Deaths	0
Foodstuff implicated	Other or mixed red meat and products thereof
More Foodstuff	boiled tongue, escalope
Type of evidence	Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

Sarcocystis

	Value
Code	14
Subagent Choice	
Outbreak type	General
Human cases	28
Hospitalized	0
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	raw minced pork (Th¿ringer Mett)
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

T. spiralis

	Value
Code	3511498
Subagent Choice	
Outbreak type	Household
Human cases	3
Hospitalized	3
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	raw smoked bacon, raw pork sausage
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

DT 120

	Value
Code	3777914
Subagent Choice	
Outbreak type	Household
Human cases	5
Hospitalized	0
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	minced raw pork
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 1

	Value
Code	3740446
Subagent Choice	
Outbreak type	General
Human cases	9
Hospitalized	3
Deaths	0
Foodstuff implicated	Dairy products (other than cheeses)
More Foodstuff	Ice cream containing raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 21

	Value
Code	3877439
Subagent Choice	
Outbreak type	Household
Human cases	12
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	mayonnaise, salad dressing containing raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 21

	Value
Code	4392216
Subagent Choice	
Outbreak type	General
Human cases	43
Hospitalized	0
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	fine bakery product containing pasteurised dairy products and raw eggs, tiramisu
Type of evidence	Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

PT 25

	Value
Code	3996529
Subagent Choice	
Outbreak type	General
Human cases	32
Hospitalized	9
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	milk, dairy products (excluding cheeses), cheese
Type of evidence	Laboratory detection in implicated food
Setting	Residential institution (nursing home, prison, boarding school)
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	it was not specified whether the incriminated food was milk, a dairy product (excluding cheeses) or cheese

PT 4

	Value
Code	3615061
Subagent Choice	
Outbreak type	Household
Human cases	5
Hospitalized	0
Deaths	0
Foodstuff implicated	Dairy products (other than cheeses)
More Foodstuff	Dessert containing eggs
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 4

	Value
Code	3734208
Subagent Choice	
Outbreak type	General
Human cases	303
Hospitalized	37
Deaths	0
Foodstuff implicated	Dairy products (other than cheeses)
More Foodstuff	Custard made from milk and eggs
Type of evidence	Analytical epidemiological evidence
Setting	School, kindergarten
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 4

	Value
Code	4030002
Subagent Choice	
Outbreak type	General
Human cases	6
Hospitalized	4
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	dessert made from berries with custard
Type of evidence	Laboratory detection in implicated food
Setting	Hospital or medical care facility
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler, Inadequate chilling
Outbreaks	1
Comment	

PT 4

	Value
Code	3946477
Subagent Choice	
Outbreak type	General
Human cases	8
Hospitalized	1
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	fine bakery product with glazing containing raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	

PT 4

	Value
Code	3855151
Subagent Choice	
Outbreak type	General
Human cases	63
Hospitalized	26
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	bread-on-a-stick made from dough containing raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	School, kindergarten
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	

PT 4

	Value
Code	3998836
Subagent Choice	
Outbreak type	General
Human cases	9
Hospitalized	8
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	retain samples of various meals from hospital kitchen
Type of evidence	Laboratory detection in implicated food
Setting	Hospital or medical care facility
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 4

	Value
Code	4394434
Subagent Choice	
Outbreak type	General
Human cases	15
Hospitalized	11
Deaths	0
Foodstuff implicated	Vegetables and juices and other products thereof
More Foodstuff	lettuce, chopped, bagged, ready-to-eat
Type of evidence	Laboratory detection in implicated food
Setting	Hospital or medical care facility
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate chilling
Outbreaks	1
Comment	

PT 4

	Value
Code	3777491
Subagent Choice	
Outbreak type	General
Human cases	86
Hospitalized	56
Deaths	0
Foodstuff implicated	Dairy products (other than cheeses)
More Foodstuff	joghurt with fruitmix
Type of evidence	Laboratory detection in implicated food
Setting	Hospital or medical care facility
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler, Inadequate chilling, Cross-contamination
Outbreaks	1
Comment	

PT 4

	Value
Code	3818585
Subagent Choice	
Outbreak type	General
Human cases	248
Hospitalized	141
Deaths	1
Foodstuff implicated	Other foods
More Foodstuff	various desserts made fom milk or cream, retain sample of salad dressing
Type of evidence	Laboratory detection in implicated food, Analytical epidemiological evidence
Setting	Hospital or medical care facility
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler, Cross-contamination
Outbreaks	1
Comment	the source of contamination were shell eggs, the outbreak strain was isolated from the laying herd; apart from patients and staff of the hospital, this outbreak also affected residents of a nursing home supplied with food from the hospital kitchen

PT 4

	Value
Code	3720492
Subagent Choice	
Outbreak type	General
Human cases	11
Hospitalized	0
Deaths	0
Foodstuff implicated	Sweets and chocolate
More Foodstuff	dessert containing raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Inadequate chilling
Outbreaks	1
Comment	

PT 4

	Value
Code	3807693
Subagent Choice	
Outbreak type	General
Human cases	136
Hospitalized	43
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	spinach-pasta, potatoe salad, bockwurst (large frankfurter)
Type of evidence	Laboratory detection in implicated food
Setting	Residential institution (nursing home, prison, boarding school)
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler
Outbreaks	1
Comment	

PT 4

	Value
Code	4584923
Subagent Choice	
Outbreak type	General
Human cases	24
Hospitalized	4
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	cake baked with raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	School, kindergarten
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 4

	Value
Code	3906092
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	fried pork sausage
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 7a

	Value
Code	3749494
Subagent Choice	
Outbreak type	General
Human cases	11
Hospitalized	4
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	containing raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	S. Enteritidis PT 7a/n.c.

PT 8

	Value
Code	3496254
Subagent Choice	
Outbreak type	General
Human cases	56
Hospitalized	23
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	retain samples of various meals from hospital kitchen
Type of evidence	Laboratory detection in implicated food, Analytical epidemiological evidence
Setting	Hospital or medical care facility
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler
Outbreaks	1
Comment	apart from patients in a hospital, this outbreak also affected children in a kindergarten supplied with food from the hospital kitchen

PT 8

	Value
Code	3987558
Subagent Choice	
Outbreak type	Household
Human cases	3
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	minced beef with raw egg
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

PT 8

	Value
Code	3983453
Subagent Choice	
Outbreak type	General
Human cases	70
Hospitalized	6
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	pork roast
Type of evidence	Laboratory detection in implicated food
Setting	School, kindergarten
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler
Outbreaks	1
Comment	

PT 8

	Value
Code	4394346
Subagent Choice	
Outbreak type	General
Human cases	23
Hospitalized	3
Deaths	0
Foodstuff implicated	Sweets and chocolate
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	Residential institution (nursing home, prison, boarding school)
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 8

	Value
Code	4035064
Subagent Choice	
Outbreak type	General
Human cases	7
Hospitalized	1
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	fine bakery product containing pasteurised dairy products and raw eggs, tiramisu
Type of evidence	Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Bovismorbificans

	Value
Code	3615069
Subagent Choice	
Outbreak type	General
Human cases	15
Hospitalized	0
Deaths	0
Foodstuff implicated	Turkey meat and products thereof
More Foodstuff	ham made from turkey breast, raw, smoked, cured
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Cross-contamination
Outbreaks	1
Comment	

S. Bredeney

	Value
Code	3918520
Subagent Choice	
Outbreak type	General
Human cases	6
Hospitalized	2
Deaths	0
Foodstuff implicated	Turkey meat and products thereof
More Foodstuff	turkey sausage
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3494864
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3799561
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	2
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3830340
Subagent Choice	
Outbreak type	General
Human cases	12
Hospitalized	2
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3840571
Subagent Choice	
Outbreak type	General
Human cases	38
Hospitalized	1
Deaths	0
Foodstuff implicated	Vegetables and juices and other products thereof
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	School, kindergarten
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3870636
Subagent Choice	
Outbreak type	General
Human cases	3
Hospitalized	0
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	minced raw pork
Type of evidence	Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3895879
Subagent Choice	
Outbreak type	General
Human cases	17
Hospitalized	1
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	cake baked with raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3885289
Subagent Choice	
Outbreak type	General
Human cases	4
Hospitalized	1
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	cake with pudding-filling containing eggs
Type of evidence	Laboratory detection in implicated food
Setting	Unknown
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate chilling, Infected food handler
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	4094779
Subagent Choice	
Outbreak type	General
Human cases	54
Hospitalized	4
Deaths	0
Foodstuff implicated	Dairy products (other than cheeses)
More Foodstuff	curd cheese dessert containing banana and cocoa
Type of evidence	Laboratory detection in implicated food
Setting	Residential institution (nursing home, prison, boarding school)
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Inadequate chilling, Cross-contamination
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	4108219
Subagent Choice	
Outbreak type	General
Human cases	14
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	Potatoe salad
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Cross-contamination
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3998855
Subagent Choice	
Outbreak type	General
Human cases	38
Hospitalized	3
Deaths	0
Foodstuff implicated	Dairy products (other than cheeses)
More Foodstuff	chocolate pudding prepared with raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Inadequate chilling
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	4394363
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	2
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	4392229
Subagent Choice	
Outbreak type	Household
Human cases	7
Hospitalized	0
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	4383445
Subagent Choice	
Outbreak type	General
Human cases	14
Hospitalized	0
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	fine bakery product containing pasteurised dairy products and raw eggs, tiramisu
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	4022680
Subagent Choice	
Outbreak type	General
Human cases	6
Hospitalized	2
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	cake baked with raw eggs
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3946482
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Other or mixed red meat and products thereof
More Foodstuff	sausages, meat balls
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3924739
Subagent Choice	
Outbreak type	Household
Human cases	6
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	cold cuts, minced raw pork, egg
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	3919097
Subagent Choice	
Outbreak type	General
Human cases	3
Hospitalized	0
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	Laboratory detection in food was reported but food vehicle was not specified

S. Infantis

	Value
Code	3851281
Subagent Choice	
Outbreak type	General
Human cases	36
Hospitalized	0
Deaths	0
Foodstuff implicated	Unknown
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	Infected food handler
Outbreaks	1
Comment	Laboratory detection in food was reported but food vehicle was not specified

S. Panama

	Value
Code	4340119
Subagent Choice	
Outbreak type	General
Human cases	31
Hospitalized	4
Deaths	0
Foodstuff implicated	Other or mixed red meat and products thereof
More Foodstuff	fermented raw sausage (salami)
Type of evidence	Analytical epidemiological evidence
Setting	Unknown
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Typhimurium

	Value
Code	3995439
Subagent Choice	
Outbreak type	General
Human cases	21
Hospitalized	0
Deaths	0
Foodstuff implicated	Other or mixed red meat and products thereof
More Foodstuff	knackwurst
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. Typhimurium

	Value
Code	3968078
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	1
Deaths	0
Foodstuff implicated	Other or mixed red meat and products thereof
More Foodstuff	fermented raw sausage (salami)
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

Salmonella spp.

	Value
Code	3975549
Subagent Choice	
Outbreak type	General
Human cases	5
Hospitalized	0
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	fine bakery product (cake filled with butter creme; butter creme was prepared using raw eggs)
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Salmonella spp.

	Value
Code	3894112
Subagent Choice	
Outbreak type	General
Human cases	4
Hospitalized	4
Deaths	0
Foodstuff implicated	Cereals products including rice and seeds/pulses (nuts, almonds)
More Foodstuff	home-made pasta prepared with raw eggs (spaetzle)
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Inadequate chilling
Outbreaks	1
Comment	

Salmonella spp.

	Value
Code	3952009
Subagent Choice	
Outbreak type	General
Human cases	4
Hospitalized	3
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	pasta casserole containing eggs
Type of evidence	Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	