ZOONOSES MONITORING

GERMANY

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

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

including information on foodborne outbreaks and antimicrobial resistance in zoonotic agents

IN 2004

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Germany**

Reporting Year: **2004**

Institutions and laboratories involved in monitoring:

Laboratory name	Description	Contribution
Federal Institute for Risk Assessment (BfR), Berlin	National Reference Laboratory for the Epidemiology of Zoonoses (BfR, 43.2)	German Reporting officer

PREFACE

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

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

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

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

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

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

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

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1. ANIMAL POPULATIONS

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

A. Information on susceptible animal population

Sources of information:

Statistisches Bundesamt and BMVEL (425)

Additional information

From 1998 on the countings of cattle and pigs were performed at the 3th Nov. of each year and at the 3th May, but only the last counting was used for this databank. Sheeps were counted at 3th of May. Horses and Poultry were counted only each second year at the 3th of May.

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

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks		Number of holdings	
			Year*		Year*
Gallus gallus	in total (1)		40436251		1339

(1): no. of animal sites in holdings

Table 14.2 Susceptible animal populations: number of animals

* Only if different than current reporting year

Animal species	Category of animals	Livestock numbers (live animals)	Year*	Number of slaughtered animals	Year*
Cattle (bovine animals)	calves (under 1 year)	4080000	2004		
	in total	13031000	2004		
Ducks	in total	2626000	2003		
Gallus gallus	broilers	54611000	2003		
	laying hens	38965000	2003		
	in total	109793000	2003		
Geese	in total	384000	2003		
Pigs	sows and gilts	2467000	2004		
	fattening pigs	16970000	2004		
	in total	26335000	2004		
Sheep	animals under 1 year (lambs)	984000	2004		
	animals over 1 year	1729000	2004		
	in total	2713000	2004		
Solipeds	horses - in total	525000	2003		
Turkeys	in total	10604000	2003		
Poultry	in total	123408000	2003		

Footnote

animal counting only from 3. Nov. 2004 or from 2003

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

Additional information

2.1.2. Salmonellosis in humans

A. Salmonellosis in humans

Reporting system in place for the human cases

mandatory (Communicable Diseases Law Reform Act)

Case definition

(in German) Salmonella spp., außer S. Typhi oder S. Paratyphi (Salmonellose)
ICD10: A02. Sonstige Salmonelleninfektionen, inkl.: Infektion oder Lebensmittelvergiftung durch Salmonellen
außer durch Salmonella Typhi und Salmonella Paratyphi,
A02.0 Salmonellenenteritis (Enteritis infectiosa durch Salmonellen),
A02.1 Salmonellensepsis,
A02.2 Lokalisierte Salmonelleninfektionen (Arthritis, Meningitis, Osteomyelitis, Pneumonie, tubulointerstitielle Nierenkrankheit durch Salmonellen),
A02.8 Sonstige näher bezeichnete Salmonelleninfektionen,
A02.9 Salmonelleninfektion, nicht näher bezeichnet
Klinisches Bild
Klinisches Bild einer akuten Salmonellose, definiert als mindestens eines der vier folgenden Symptome:
- Durchfall,
- krampfartige Bauchschmerzen,
- Erbrechen,
- Fieber.
Zusatzinformation
Salmonellen können auch generalisierte (Sepsis) und lokalisierte Infektionen außerhalb des Darmtraktes
(z.B. Arthritis, Endokarditis, Pyelonephritis) verursachen. Diese sollen - im Falle einer akuten Infektion - ebenfalls übermittelt werden. Eine ebenfalls mögliche reaktive Arthritis ist nicht melde- und
übermittlungspflichtig.
ICD10: A02.1 Salmonellensepsis,
A02.2 Lokalisierte Salmonelleninfektionen (Arthritis, Meningitis, Osteomyelitis, Pneumonie, tubulointerstitielle Nierenkrankheit durch Salmonellen),
A02.8 Sonstige näher bezeichnete Salmonelleninfektionen
Labordiagnostischer Nachweis
Positiver Befund mit der folgenden Methode:
[direkter Erregernachweis:]
- Erregerisolierung (kulturell).
Zusatzinformation
Das Ergebnis der Bestimmung des Serovars und ggf. des Lysotyps sollte übermittelt werden.
Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der drei folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:

Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim Menschen durch
- Mensch-zu-Mensch-Übertragung ODER
- gemeinsame Expositionsquelle (z.B. Tierkontakt, Lebensmittel).
Falldefinitionen des Robert Koch-Instituts, Ausgabe 2004 117
Verzehr eines Lebensmittels (inkl. Trinkwasser), in dessen Resten Salmonella spp. labordiagnostisch
nachgewiesen wurde.
Kontakt mit einem labordiagnostisch nachgewiesen infizierten Tier (z.B. Geflügel) oder seinen Ausscheidungen, oder Verzehr seiner Produkte (z.B. Eier).
Inkubationszeit ca. 6-72 Stunden.

Notification system in place

yes

History of the disease and/or infection in the country

Declining incidence

Relevance as zoonotic disease

Important: in 2004, the second most frequently reported of all reportable pathogens

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc	unknown status
Salmonella	56947	69	48962	59.3	3725	4.5	4260
S. Enteritidis(1)	36630	44.4	31641	38.3	2328	2.8	2661
S. Typhimurium(2)	11319	13.7	10007	12.1	326	0.4	986
Salmonella spp.(3)	8998	10.9	7314	8.9	1071	1.3	613

(1) : percent of salmonella cases
(2) : percent of salmonella cases
(3) : other salmonella cases

Footnote

S. Enteritids 67%, S. Typhimurium 21%, autochtone cases 93%, 7% imported, mostly from Spain, Turkey, Egypt, Greece (each about 1%)

Table 3.4.1.B Salmonellosis in man - age distribution

Age Distribution	S. Enteritidis			S. Typhimurium			Salmonella spp.		
	All	M	F	All	M	F	All	M	F
<1 year	754	394	358	334	172	162			
1 to 4 years	5974	3110	2859	3089	1563	1526			
5 to 14 years	7197	3751	3435	2749	1594	1154			
15 to 24 years	3903	1803	2098	1285	716	569			
25 to 44 years	7413	3371	4040	1374	743	631			
45 to 64 years	6475	2759	3716	1305	716	588			
65 years and older	4869	1858	3009	1181	544	637			
Age unknown	45	19	26	2	1	1			
Total :	36630	17065	19541	11319	6049	5268	0	0	0

Table 3.4.2 Salmonellosis in man - seasonal distribution

Month	S. Enteritidis	S. Typhimurium	Salmonella spp.
	Cases	Cases	Cases
January	1532	873	
February	1165	709	
March	1335	825	
April	1457	755	
May	2073	1011	
June	3190	1103	
July	4764	1119	
August	5820	1175	
September	6276	1054	
October	4494	981	
November	2838	967	
December	1686	747	
not known			
Total :	36630	11319	0

2.1.3. Salmonella in foodstuffs

A. Salmonella spp in eggs and egg products

Monitoring system

Sampling strategy

In this report only food samples taken under the official sampling plan are reported.

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

A little fewer examinations of eggs for human consumption than in the preceding year were reported. The Salmonella rate continued to reduce in 2004, to 0.43 % of samples collected under the sampling plan (2003: 0.57 %). As before, S. Enteritidis was at the top of Salmonella findings in samples of eggs for human consumption collected under the sampling plan. In 2004, the relative share of S. Enteritidis amounted to as much as 90 % of the salmonellas detected (2003: 78 %). Additional S. Typhimurium was detected in Table Eggs. Only two findings of Salmonella other than S.Enteritidis were possible in yolks. S. Enteritidis was isolated also in egg products. The resulting confidence interval for Salmonella rates in eggs for human consumption is 0.30 % - 0.56 % (95 % confidence level). Based on data comparable to those of the previous year (0.43 % - 0.71 %), there is a clear overlapping of ranges, i.e. no significant decrease has been recorded.

B. Salmonella spp. in broiler meat and products thereof

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

Poultry meat: In 2004, the total rate for samples collected under a sampling plan has decreased to 8.74 % (2003: 16.46 %). Also for broilers, this rate decreased to 11.04 % (2003: 18.95 %). In these examinations, S. Enteritidis was detected in fewer cases than in the previous year (in broilers: 0,71 %; 2003: 6.40 %). Also the share of S. Typhimurium decreased in broilers to 1.07 % (2003: 2.51 %). S. Paratyphi, mostly as form B and var. Java, was isolated in broilers in 15 cases in up to 1.33 % of samples (2003: 1.78 %). The resulting confidence interval for Salmonella rates in poultry meat is 7.69 % - 9.80 % (95 % confidence). Based on data comparable to those of the previous year (14.89 % - 18.04 %), there is no overlapping of ranges, i.e. a significant decrease has been recorded. Broiler meat were tested with a confidence interval of 9.21 % - 12.87 % (95 % confidence) showing also no overlapping with the range of the previous year (16.76 % - 21.13 %). Hence, a statistically significant decrease was seen in poultry meat.

C. Salmonella spp. in pig meat and products thereof

Control program/mechanisms

Recent actions taken to control the zoonoses

control programmes for Salmonella in pork are being discussed at the national level

D. Salmonella spp. in food

Monitoring system

Sampling strategy

On the basis of samples (5 samples per 1000 population), foods which are on the market are examined at regular intervals for bacterial contamination in compliance with the Official Collection of Methods of Examination under § 35 of the German Foods and Other Commodities Act (Lebensmittel- und Bedarfsgegenständegesetz - LMBG). Sampling is performed in accordance with EU Directive 89/397/EEC on official food control which has been converted into national law by Bundesrat Decision No. 150/92.

Frequency of the sampling

regulary

Methods of sampling (description of sampling techniques)

Samples collected under a sampling defined by the Laender

Diagnostic/analytical methods used

The methods to be used according to § 35 of the Foods and Other Commodities Act largely correspond to those described in ISO 6579.

Control program/mechanisms

Recent actions taken to control the zoonoses

Measures according to the German Foods and Other Commodities Act (Lebensmittel- und Bedarfsgegenständegesetz - LMBG)

Results of the investigation

s. detail descriptions

E. Salmonella spp. in food - red meat

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

Meat, except poultry, was examined less frequently than in the previous year (2816 samples, 2003: 4467). Salmonella were detected in relative more cases in 2.95 % of samples (2003: 2.15 %). The resulting confidence interval is 2.32 % - 3.57 % (95 % confidence level). Based on data comparable to those of the previous year (1.72 % - 2.57 %), this means a clear overlapping of these ranges, i.e. no significant increase.
The detection rate in pork increased further to 3.67 % (2003: 3.00 %). Similar to the previous year, only a few (3) Salmonella isolates were obtained from beef.
Again, S. Typhimurium was isolated most frequently from meat. S. Enteritidis was isolated only in 2 cases from game meat.

Table 3.3.1 Salmonella sp. in meat and meat products

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium
Bovine meat								
fresh								
- at slaughter	slaughter inspection		samples		4435	33		2
- at processing plant	samples collected under the official sampling plan		samples		50			
- at retail	samples collected under the official sampling plan		samples		363	3		
minced meat								
- at processing plant (1)	samples collected under the official sampling plan		samples		83	6		4
- at retail (2)	samples collected under the official sampling plan		samples		1763	47	1	22
meat products								
non-ready-to-eat								
- at processing plant (3)	samples collected under the official sampling plan	spiced and prepared meat	samples		5	0		
- at retail (4)	samples collected under the official sampling plan	spiced and prepared meat	samples		252	3		
ready-to-eat								
- at processing plant (5)	samples collected under the official sampling plan		samples		308	7		5

- at retail (6)	samples collected under the official sampling plan		samples		5455	90	2	39
Pig meat								
fresh								
- at slaughter	slaughter inspection		sample		4744	25		13
- at processing plant	samples collected under the official sampling plan		samples		201	6		3
- at retail	samples collected under the official sampling plan		sample		1217	47		21
Broiler meat	samples collected under the official sampling plan		samples	25g	1123	124	8	12
fresh								
- at processing plant	samples collected under the official sampling plan		samples		46	3		
- at retail	samples collected under the official sampling plan		samples		838	108	7	11
meat products								
non-ready-to-eat								
- at processing plant (7)	samples collected under the official sampling plan		samples		29	2		
- at retail (8)	samples collected under the official sampling plan		samples		221	11	2	
ready-to-eat								
- at processing plant (9)	samples collected under the official sampling plan		samples		96	3		
- at retail (10)	samples collected under the official sampling plan		samples		436	8	2	

Turkey meat	samples collected under the official sampling plan		samples	25g	901	57	2	11
fresh								
- at processing plant	samples collected under the official sampling plan		samples		66	8		1
- at retail	samples collected under the official sampling plan		samples		707	43	2	7
red meat	samples collected under the official sampling plan		samples	25g	2816	83	2	35
meat product								
heat treated	samples collected under the official sampling plan		samples	25g	2655	4		2
stabilized	samples collected under the official sampling plan		samples	25g	7414	61	2	33
Poultry meat	samples collected under the official sampling plan		samples	25g	2768	242	29	46

(1) : no information on animal source
(2) : no information on animal source
(3) : no information on animal source
(4) : no information on animal source
(5) : Raw meat product, no information on animal source
(6) : Raw meat product, no information on animal source
(7) : no information on animal source
(8) : no information on animal source
(9) : no information on animal source
(10) : no information on animal source

Footnote

all samplings with 25g samples, some institutions are using 10g for some food categories

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-08-10	red meat	Sample weight		25g
	Poultry meat	Sample weight		25g
	Broiler meat	Sample weight		25g
	Turkey meat	Source of information		samples collected under the official sampling plan
	Turkey meat	Epidemiological unit		samples
	Turkey meat	Sample weight		25g

	red meat - meat product - heat treated	Sample weight		25g
	red meat - meat product - stabilized	Sample weight		25g

Table 3.3.2 Salmonella sp. in other food

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium
cow milk								
raw (1)	samples collected under the official sampling plan		samples	25	669	0		
Dairy products								
ready-to-eat (2)	samples collected under the official sampling plan		samples	25	6694	1	1	
Table eggs								
- at retail	samples collected under the official sampling plan		samples	25	10179	44	39	1
shell	samples collected under the official sampling plan		samples	25	8968	38	35	1
white	samples collected under the official sampling plan		samples	25	1870	0		
yolk	samples collected under the official sampling plan		samples	25	9160	2		
Egg products	samples collected under the official sampling plan		samples	25	243	2		2
Raw material (liquid egg) for egg products	samples collected under the official sampling plan		samples	25				
Fishery products								

fish (3)	samples collected under the official sampling plan		samples	25	4359	4		1

(1) : collected milk before treatment
(2) : without raw milk products
(3) : incl. marine animals and products

Footnote

all samplings with 25g samples, some institutions are using 10g for some food categories

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-08-11	cow milk - raw	Sample weight		25
	Dairy products - ready-to-eat	Sample weight		25
	Table eggs - at retail	Sample weight		25
	Egg products	Sample weight		25
	Raw material (liquid egg) for egg products	Sample weight		25
	Fishery products - fish	Sample weight		25
	Table eggs - shell	Sample weight		25
	Table eggs - white	Sample weight		25
	Table eggs - yolk	Sample weight		25

2.1.4. Salmonella in animals

A. Salmonella spp. in bovine animals

Monitoring system

Sampling strategy

Reporting/ surveillance system: Mandatory reporting of outbreaks since 6 January 1972 and 14 November 1991 (BGBl. I S. 2118) according to the 'Regulation on protection against salmonellosis in cattle'. If salmonellosis or the suspicion of salmonellosis has been confirmed officially in a herd of cattle or another animal kept together with such cattle, the competent authority will direct the examination of all cattle of the herd or the batch affected and, if necessary for disease control, also the other animals kept together with those cattle.

Type of specimen taken

Animals at farm

Faeces

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 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 by bacteriological methods of examination.

Diagnostic/analytical methods used

Animals at farm

With following modifications: similar to ISO 6579, but no pre-enrichment

Vaccination policy

Prophylactic and metaphylactic vaccination using live or inactivated vaccines are optional

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.

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

Statistical data: In 2004, 153 outbreaks of salmonellosis in cattle were reported in Germany. Therefore, the decline in registered outbreaks of bovine salmonellosis observed since 2002 continued in considerable extent.
While the serovars Salmonella Typhimurium and Typhimurium variatio copenhagen caused ca. 50 % of the annual reported oubreaks of salmonellosis from 1995 to 2002 and therefore represented the most important serovars, their share decreased in 2003 and 2004 to ca. 38 % - 39 %.
At the same time the number of outbreaks caused by the host-adapted serovar Salmonella Dublin revealed an increase from 27 % in 2002 to 38 % in 2003. However, this rise did not continue, in 2004 the share of outbreaks produced by Salmonella Dublin amounted to only 30 %.
11 % of the reported outbreaks in 2004 were caused by Salmonella Abony (previous nomenclature Salmonella Abortus-bovis) and ca. 6 % by Salmonella Enteritidis. The summarised group of all other serovars (e.g. Anatum, Infantis, Derby, Kottbus, Ohio) were the reason for about 15 % of all outbreaks of salmonellosis in cattle in 2004 and therefore revealed a higher share of ca. 5 % compared with previous years. Currently, there are no signs for an increase of any single serovar from this group.
The distribution of the serovars in the reported outbreaks reveals considerable differences between the federal Länder in Germany. The finding that the host-adapted Salmonella serovar Dublin is not detected in some federal Länder but repeatedly the cause of the majority of salmonellosis outbreaks in some other federal Länder might be an indicator that this serovar is endemic in several areas. In regions where Salmonella Dublin and also Salmonella Typhiumurium show an endemic occurrence the prophylactic use of vaccines might be recommended.

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
214	194	262	219	227	191	194	258	232	153

Additional information

Diagnostic/analytical methods used: According to 'Regulation on Protection against Salmonellosis in Cattle' from 6 January 1972 and 14 November 1991 (BGBl. I S. 2118)

B. Salmonella spp. in animal

Monitoring system

Sampling strategy

Epizootics: According to the Regulations on reportable epizootics (those involving governmental control measures), the occurrence of Salmonellosis in Cattle is notified to the competent veterinary officer. The reports are included immediately in the data reporting system on epizootics (Tierseuchen-Nachrichtensystem - TSN, a computer network). The data are evaluated by the former Federal Research Centre for Virus Diseases of Animals (BFAV), now Friedrich Loeffler Institute (FLI) Wusterhausen. In parallel, specific measures are taken by the competent veterinary officer in the Laender. According to the Regulations on animal diseases reportable for statistical purposes, data on such diseases are regularly transmitted through the competent veterinary officer and the superior Laender authorities to the Federal Ministry of Consumer Protection, Food, and Agriculture. On the basis of these data, an annual overview is compiled. In parallel to this, Salmonella infections in breeder chickens must be reported to the superior Laender authorities as well as the Federal Ministry of Consumer Protection, Food and Agriculture through the competent veterinary officer according to §10 of the Regulations on Salmonella in Chickens (Hühner-Salmonellen-Verordnung). The measures to be taken are in compliance with Annex III of the Zoonoses Directive (92/117/EEC). Sera, vaccines and antigens for the prevention, diagnosis and curing of diseases in animals are subject to approval under § 17c of the Epizootics Act. The methods of examination required under the Regulations on Bovine Salmonellosis are performed according to the Annex to the Notes relating to the implementation of these regulations.

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

Examinations at the slaughterhouse: Bacteriological meat examinations according to Annex 1 of the German Regulations on Meat Hygiene (Fleischhygiene-Verordnung - FLHV) are ordered in certain cases of suspicion which may arise in the process of slaughtering, in cases where parts to be subject to meat examination are missing or where examination is delayed or no longer possible. The performance of these bacteriological meat examinations is governed by the General Administrative Regulations on the Performance of Official Examinations under the German Meat Hygiene Act (Allgemeine Verwaltungsvorschrift über die Durchführung der amtlichen Untersuchung nach dem Fleischhygienegesetz - VwVFlHG); Bundesanzeiger (Federal Gazette) No. 238a of 23 December 1986.

Case definition

Animals at farm

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

	Source of information	Remarks	Epidemiological unit	Flocks tested	Flocks positive	S. Enteritidis	S. Typhimurium
Gallus gallus							
parent breeding flocks for egg production line							
day-old chicks			herds	1	0		
- during production period		laying period	herds	86	0		
- during rearing period			herds	2	1		1
parent breeding flocks for meat production line							
- during rearing period			herds	1	0		
- during production period		laying period	herds	2270	9		

Table 3.2.2 Salmonella sp. in other commercial poultry

	Source of information	Remarks	Epidemiological unit	Flocks tested	Flocks positive	S. Typhimurium	S. Enteritidis
Gallus gallus							
laying hens							
day-old chicks			herds	148	9	1	8
- during rearing period			herds	25	3	2	1
- during production period			herds	4707	100	19	47
before slaughter			herds	36	0		
broilers							
day-old chicks			herds	329	2		2
- during rearing period		fattening	herds	1204	104	6	1
before slaughter			herds	13	4	3	
Ducks			herds	102	8	1	
breeding flocks, unspecified			herds	1	0		
- during production period		fattening	herds	20	5		
Geese			herds	77	6	2	
breeding flocks, unspecified			herds	3	0		
- during production period		fattening	herds	11	0		
Turkeys			herds	1541	70	10	5
breeding flocks, unspecified				1	1	1	1
- during production period		fattening	herds	86	3	1	

Table 3.2.3 Salmonella sp. in non-commercial poultry and birds

	Source of information	Remarks	Epidemiological unit	Flocks tested	Flocks positive	S. Enteritidis	S. Typhimurium
Pigeons (1)		'travel' and breedings pigeons	animals	4938	585		554

(1) : single animals, not flocks

Table 3.2.4 Salmonella sp. in animals (non poultry)

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	S. Enteritidis	S. Typhimurium
Cattle (bovine animals)			herds	3013	275	9	108
mixed herds		official notified outbreaks	herds		153		
Sheep			herds	205	7		1
Goats			herds	69	0		
Pigs			herds	2135	136	1	89
breeding animals			herds	47	3		2
fattening pigs			herds	278	28		23
Solipeds			herds	236	1		1

2.1.5. Salmonella in feedstuffs

Table 3.1.1 Salmonella sp. in feed material of animal origin

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Typhimurium	S. Enteritidis
Feed material of land animal origin								
Dairy products		national	samples		570	1	1	
Meat meal (1)		national	samples		585	16	1	
Meat and bone meal (2)		national	samples		188	0		
Bone meal (3)		national	samples		42	0		
Blood meal (4)		national	samples		1517	41	6	
Animal fat (5)		national	samples		44	0		
Feed material of marine animal origin								
Fish meal		national	samples		1628	21		
imported (6)		from Argentina, Chile, Ecuador, Island, Morocco, Peru, Uruguay and Poland	lots	25g	420	38		
Fish oil		national	samples		6	0		
Meat meal acc.to 90/667/EC		national	samples		159	1		

(1) : from rendering plant
(2) : from rendering plant
(3) : from rendering plant
(4) : incl. blood product
(5) : from rendering plant
(6) : 198208 tons imported, 23774 tons are positive, sampling up to 250 t per lot at least 25 samples and for each further 50 tons 5 samples additional

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-08-10	Feed material of marine animal origin - Fish meal - imported	Sample weight		25g

Table 3.1.2 Salmonella sp. in feed of vegetable origin

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Typhimurium	S. Enteritidis
Feed material of cereal grain origin			samples		892	5	1	
Barley derived			samples		103	2	1	
Wheat derived			samples		386	2		
Maize			samples		99	1		
Feed material of oil seed or fruit origin			samples		1529	107	2	
Groundnut derived			samples		10	1		
Rape seed derived			samples		591	94		
Palm kernel derived			samples		19	3		
Soya (bean) derived			samples		669	13		
Sunflower seed derived			samples		108	2		
Linseed derived			samples		26	1		

Table 3.1.3 Salmonella sp. in compound feedingstuff

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	S. Enteritidis	S. Typhimurium
Compound feedingstuffs for cattle								
Final product		not spec.	samples		261	0		
pellets			samples		281	1		
meal			samples		55	2		
Compound feedingstuffs for pigs								
Final product		not spec.	samples		569	1		
pellets			samples		576	1		
meal			samples		230	10		3
Compound feedingstuffs for poultry (non specified)			sample		2035	61		1
Final product		meal	samples		408	2		
pellets			samples		501	0		
Pet food								
Dog snacks (pig ears, chewing bones)			samples		1861	8		1
Compound feedingstuffs, not spec.		meal	samples		794	5		
pellets			samples		2209	2		1

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 3.3.3 Salmonella serovars in animals

Serovars		Cattle (bovine animals)		Pigs		Gallus gallus		Other poultry		Gallus gallus - laying hens		Gallus gallus - broilers	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory (1)	N=	275		136						100		104	
Number of isolates serotyped	N=	274		114						93		104	
Number of isolates per type													
S. Agama				1									
S. Agona		1											
S. Anatum		4										1	
S. Brandenburg				2									
S. Bredeney				1									
S. Derby		2		6									
S. Dublin		129											
S. Duesseldorf				1									
S. Enteritidis		9		1						47		1	
S. Hadar		2										1	
S. Heidelberg				1									
S. Infantis		3		4						6		28	
S. Isangi												2	
S. Kottbus		3										1	
S. Litchfield				1									

S. Livingstone									1		11	
S. London	1								1			
S. Mbandaka	1								13		2	
S. Montevideo	2								1			
S. Newlands			1									
S. Oranienburg											25	
S. Panama	1											
S. Tennessee											4	
S. Typhimurium	108		89						19		6	
S. Virchow									4		22	
S. Worthington			1									
S. Gallinarum									1			
Total of typed *Salmonella*isolates												

(1) : all cases

Footnote

(*) M : Monitor, C : Clinical
Data of herds

Table 3.3.4 Salmonella serovars in food

Serovars		Bovine meat		Pig meat		Broiler meat		Other poultry		Other products of animal origin		Table eggs	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=	3		58		124						44	
Number of isolates serotyped	N=	3		54		88						43	
Number of isolates per type													
S. Albany						1							
S. Anatum						3							
S. Blockley						3							
S. Bovismorbificans				1									
S. Brandenburg				1		1							
S. Bredeney				1									
S. Derby				9									
S. Enteritidis						8						39	
S. Give				2									
S. Goldcoast		1		2									
S. Hadar						2							
S. Indiana						2							
S. Infantis		1		2		21							
S. Kapemba				1									

S. Kottbus					1							
S. Livingstone	1				3							
S. London			1									
S. Mbandaka											1	
S. Ohio			1		1							
S. Rissen			2									
S. Saintpaul			1		1							
S. Stanleyville					1							
S. Thompson					1							
S. Typhimurium			26		12						1	
S. Virchow					8							
S. Paratyphi B var. Java (1)					15							
S. Gallinarum											1	
Total of typed *Salmonella* isolates												

(1) : maily as Java reported

Footnote

(*) M : Monitor, C : Clinical
Samples under the official sampling plan

Table 3.3.5 S.Enteridis phagetypes in animals

Phagetype		Cattle (bovine animals)		Pigs		Gallus gallus		Other poultry		Poultry - not specified	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory (1)	N=	13		1		54		10		19	
Number of isolates serotyped (2)	N=	13		1		54		10		19	
Number of isolates per type											
PT 1		0		0		4		0		0	
PT 4		4		0		39		1		17	
PT 6		0		0		2		0		0	
PT 8		5		1		2		1		0	
PT 21		0		0		5		1		2	
Not typable		1		0		0		0		0	
PT 1b		0		0		0		1		0	
PT 21c		1		0		0		0		0	
PT 13a		0		0		0		5		0	
PT RDNC		2		0		2		1		0	
Total of typed *Salmonella*isolates											

(1) : no differenciation possible, means all samples
(2) : no differenciation possible, means all samples

Footnote

(*) M : Monitor, C : Clinical
Data from the NRL-Salm, BfR

Table 3.3.6 S.Enteridis phagetypes in food

Phagetype		Bovine meat		Pig meat		Broiler meat		Other poultry		Other products of animal origin		red meat	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=					32		2				8	
Number of isolates serotyped	N=					32		2				8	
Number of isolates per type													
PT 4						18		0				6	
PT 8						1		0				1	
PT 14b						1		0				0	
PT 21						8		0				1	
PT 1b						1		0				0	
PT 4b						1		0				0	
PT 6a						0		1				0	
PT RDNC						2		1				0	
Total of typed *Salmonella*isolates													

Footnote

(*) M : Monitor, C : Clinical
Red meat means beef and pork, Broiler meat means Poultry meat (Gallus gallus)

Table 3.3.7 Salmonella Typhimurium phagetypes in animals

Phagetype		Cattle (bovine animals)		Pigs		Gallus gallus		Other poultry	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory (1)	N=	188		299		49		41	
Number of isolates serotyped (2)	N=	188		299		49		41	
Number of isolates per type									
DT 1		4		0		1		1	
DT 7		0		2		1		0	
DT 8		0		0		3		3	
DT 9		11		4		2		0	
DT 12		1		7		8		0	
DT 104		161		143		18		31	
DT 120		0		27		3		0	
DT 193		2		12		1		0	
DT 208		0		1		0		0	
U 302		0		1		0		0	
Not typable		2		14		0		0	
DT 40		0		1		0		2	
DT RDNC		6		74		10		0	
DT 22		0		1		0		0	
DT 193a		0		1		0		0	
DT 49		0		0		0		1	

DT 195	0		1		0		0	
DT 15a	0		3		0		0	
DT 17	0		2		0		0	
DT 10	0		3		0		0	
DT 110	0		1		0		0	
DT 2	0		0		2		2	
DT 12a	1		0		0		0	
DT 59	0		1		0		0	
DT 74	0		0		0		1	
Total of typed *Salmonella*isolates								

(1) : all samples
(2) : all samples

Footnote

(*) M : Monitor, C : Clinical
Data from the NRL-Salm, BfR

Table 3.3.8 Salmonella Typhimurium phagetypes in food

Phagetype		Bovine meat		Pig meat		Broiler meat		Other poultry		Other products of animal origin		red meat	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory (1)	N=					47		27				177	
Number of isolates serotyped (2)	N=					47		27				177	
Number of isolates per type													
DT 1						0		0				2	
DT 7						7		0				1	
DT 8						2		2				0	
DT 12						0		0				9	
DT 46						0		0				1	
DT 104						0		3				75	
DT 120						6		0				7	
DT 193						0		4				9	
DT 208						0		0				4	
U 302						0		1				7	
Not typable						0		4				7	
DT 41						1		0				0	
DT RDNC						31		2				39	

DT 193a					0		0				1	
DT 195					0		0				4	
DT 17					0		0				1	
DT 30					0		3				1	
DT 85					0		7				0	
DT 35					0		0				2	
U 310					0		0				1	
DT 151					0		0				2	
DT 86					0		1				0	
DT 59					0		0				2	
DT 96					0		0				1	
U 278					0		0				1	
Total of typed *Salmonella*isolates												

(1) : all samples
(2) : all samples

Footnote

(*) M : Monitor, C : Clinical
Broiler meat means Poultry meat (Gallus gallus), red meat incl. products

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.

Table 3.2.5.2 Antimicrobial susceptibility testing of S.Enteritidis in animals

	S. Enteritidis							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus**		**Turkeys**	
Isolates out of a monitoring program	no		no		no		no	
Number of isolates available in the laboratory	13		1		54		8	
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	0	0%	0	0%	0	0%	1	12.5%
Amphenicols								
Chloramphenicol	0	0%	0	0%	0	0%	0	0%
Florfenicol	0	0%	0	0%	0	0%	0	0%
Cephalosporin								
Ceftiofur	0	0%	0	0%	0	0%	0	0%
Fluoroquinolones								
Ciprofloxacin	0	0%	0	0%	0	0%	0	0%
Quinolones								
Nalidixic acid	0	0%	0	0%	17	31.5%	0	0%
Trimethoprim	0	0%	0	0%	0	0%	0	0%
Sulfonamides								
Sulfonamide	0	0%	0	0%	0	0%	0	0%
Aminoglycosides								
Streptomycin	0	0%	0	0%	1	1.9%	0	0%
Gentamicin	0	0%	0	0%	0	0%	0	0%
Neomycin	0	0%	0	0%	0	0%	0	0%
Kanamycin	0	0%	0	0%	0	0%	0	0%
Penicillins								
Ampicillin	0	0%	0	0%	1	1.9%	0	0%
Number of multiresistant isolates								
fully sensitives	13	100%	1	100%	36	66.7%	7	87.5%
resistant to 1 antimicrobial	0	0%	0	0%	17	31.5%	1	12.5%
resistant to 2 antimicrobials	0	0%	0	0%	1	1.8%	0	0%
resistant to 3 antimicrobials	0	0%	0	0%	0	0%	0	0%
resistant to 4 antimicrobials	0	0%	0	0%	0	0%	0	0%
resistant to >4 antimicrobials	0	0%	0	0%	0	0%	0	0%

Table 3.2.5.3 Antimicrobial susceptibility testing of S.Typhimurium in animals

	S. Typhimurium							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus**		**Turkeys**	
Isolates out of a monitoring program	no		no		no		no	
Number of isolates available in the laboratory	188		299		49		34	
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	167	88.8%	233	77.9%	29	59.2%	32	94.1%
Amphenicols								
Chloramphenicol	137	72.9%	138	46.2%	26	53.1%	31	91.2%
Florfenicol	136	72.3%	132	44.2%	26	53.1%	30	88.2%
Cephalosporin								
Ceftiofur	0	0%	0	0%	0	0%	0	0%
Fluoroquinolones								
Ciprofloxacin	1	0.5%	0	0%	0	0%	0	0%
Quinolones								
Nalidixic acid	1	0.5%	5	1.7%	1	2.0%	0	0%
Trimethoprim	30	16.0%	80	26.8%	1	2.0%	4	11.8%
Sulfonamides								
Sulfonamide	181	96.3%	269	90.0%	40	81.6%	34	100%
Aminoglycosides								
Streptomycin	169	89.9%	247	82.6%	31	63.3%	31	91.2%
Gentamicin	3	1.6%	18	6.0%	0	0%	0	0%
Neomycin	21	11.2%	42	14.1%	0	0%	0	0%
Kanamycin	22	11.7%	42	14.1%	0	0%	0	0%
Penicillins								
Ampicillin	166	88.3%	235	78.6%	31	63.3%	32	94.1%
Number of multiresistant isolates								
fully sensitives	7	3.7%	21	7.0%	7	14.3%	0	0%
resistant to 1 antimicrobial	12	6.4%	22	7.4%	9	18.4%	2	5.9%
resistant to 2 antimicrobials	0	0%	8	2.7%	4	8.2%	0	0%
resistant to 3 antimicrobials	2	1.1%	21	7.0%	0	0%	0	0%
resistant to 4 antimicrobials	2	1.1%	52	17.4%	3	6.1%	1	2.9%
resistant to >4 antimicrobials	165	87.8%	175	58.5%	26	53.1%	31	91.2%
Number of multiresistant DT104								
with penta resistance	0	0%	2	1.4%	0	0%	0	0%
resistant to other antimicrobials	161	100%	141	98.6%	18	100%	31	100%

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

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

	S. Typhimurium																					
	all animals																					
Isolates out of a monitoring program	no																					
Number of isolates available in the laboratory	188																					
Antimicrobials:	**N**	**%R**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracycline	167	88.8%							11.2	0	0	0	88.8									
Amphenicols																						
Chloramphenicol	137	72.9							0	14.9	11.7	0.5	0	72.9								
Florfenicol	136	72.3							0	25.5	1.6	0.5	16.5	55.9								
Cephalosporin																						
Ceftiofur	0	0					77.5	21.8	0.5	0	0											
Fluoroquinolones																						
Ciprofloxacin	1	0.5	98.4	0.5	0.5	0	0	0	0.5	0												
Quinolones																						
Nalidixic acid	1	0.5								96.3	2.7	0.5	0	0	0.5							
Trimethoprim	30	16.0%								84.0	0	0	16.0									
Sulfonamides																						
Sulfonamide	181	96.3											0.5	3.2	0	96.3						
Aminoglycosides																						
Streptomycin	169	89.9								3.7	5.9	0.5	0	89.9								
Gentamicin	3	1.6						96.8	1.6	0	0	0	1.6									
Neomycin	21	11.2							87.8	1.0	0	0	11.2									
Kanamycin	22	11.7								84.1	3.2	0.5	0.5	11.7								
Penicillins																						
Ampicillin	166	88.3						11.2	0.5	0	0	0	88.3									

Footnote

Data from Cattle only; N=Number of resistant isolates, %R = % of the resistant isolates to the total available isolates; Data from the NRL-Salm, BfR

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

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

	S. Typhimurium																					
	red meat																					
Isolates out of a monitoring program	no																					
Number of isolates available in the laboratory	174																					
Antimicrobials:	**N**	**%R**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracycline	112	64.4%							35.0	0.6	0	0.6	63.8									
Amphenicols																						
Chloramphenicol	59	33.9							1.2	28.1	33.9	2.9	0	33.9								
Florfenicol	56	32.2							2.9	56.9	6.3	1.7	13.2	19.0								
Cephalosporin																						
Ceftiofur	0	0					78.7	20.1	1.2	0	0											
Fluoroquinolones																						
Ciprofloxacin	1	0.6	91.4	5.7	0	1.2	1.2	0	0	0.6												
Quinolones																						
Nalidixic acid	5	2.9								90.8	5.7	0.6	0	0	2.9							
Trimethoprim	25	14.4%								85.6	0	0	14.4									
Sulfonamides																						
Sulfonamide	135	77.5											2.9	8.6	9.8	1.2	77.5					
Aminoglycosides																						
Streptomycin	111	63.8								10.4	21.8	4.0	4.0	59.8								
Gentamicin	5	2.9						96.5	0.6	0	0	0.6	2.3									
Neomycin	10	5.7							93.7	0	0.6	0.6	5.1									
Kanamycin	10	5.7								90.8	2.9	0.6	0	5.7								
Penicillins																						
Ampicillin	115	66.1						31.6	1.7	0.6	0	0	66.1									

Footnote

Beef and Pork; N=Number of resistant isolates, %R = % of the resistant isolates to the total available isolates

Table 3.2.5.1 Antimicrobial susceptibility testing of Salmonella spp. in animals

	Salmonella spp.							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus**		**Turkeys**	
Isolates out of a monitoring program	no		no		no		no	
Number of isolates available in the laboratory	18		40		86		11	
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	0	0%	14	35.0%	11	12.8%	6	54.6%
Amphenicols								
Chloramphenicol	0	0%	1	2.5%	0	0%	2	18.2%
Florfenicol	0	0%	0	0%	0	0%	0	0%
Cephalosporin								
Ceftiofur	0	0%	0	0%	0	0%	0	
Fluoroquinolones								
Ciprofloxacin	0	0%	0	0%	0	0%	0	0%
Quinolones								
Nalidixic acid	0	0%	0	0%	10	11.6%	9	81.8%
Trimethoprim	0	0%	4	10,0%	5	5.8%	2	18.2%
Sulfonamides								
Sulfonamide	0	0%	9	22.5%	15	17.4%	10	90.9%
Aminoglycosides								
Streptomycin	0	0%	9	22.5%	13	15.1%	10	90.9%
Gentamicin	0	0%	0	0%	0		6	54.6%
Neomycin	0	0%	0	0%	0		1	9.1%
Kanamycin	0	0%	0	0%	0		6	54.6%
Penicillins								
Ampicillin	0	0%	1	2.5%	10	11.6%	10	90.9%
Number of multiresistant isolates								
fully sensitives	18	100%	24	60.0%	63	73.3%	0	0%
resistant to 1 antimicrobial	0	0%	3	7.5%	9	10.5%	1	9.1%
resistant to 2 antimicrobials	0	0%	0	0%	0	0%	0	0%
resistant to 3 antimicrobials	0	0%	5	12.5%	0	0%	0	0%
resistant to 4 antimicrobials	0	0%	7	17.5%	2	2.3%	0	0%
resistant to >4 antimicrobials	0	0%	1	2.5%	12	13.9%	10	90.9%

Footnote

At cattle and Gallus gallus data from S.Infantis were given, at pigs data from S. Derby and at turkeys data from S. Saintpaul

Table 3.2.5.5 Antimicrobial susceptibility testing of Salmonella spp. in food

	Salmonella spp.							
	Broiler meat		**Other poultry meat**		**Pig meat**		**Bovine meat**	
Isolates out of a monitoring program	no		no				no	
Number of isolates available in the laboratory	202		449				303	
Antimicrobials:	**N**	**%R**	**N**	**%R**	**N**	**%R**	**N**	**%R**
Tetracycline	49	24.3%	23	46.9%			149	49.2%
Amphenicols								
Chloramphenicol	2	1%	16	32.7%			64	21.1%
Florfenicol	0	0%	5	10.2%			58	19.1%
Fluoroquinolones								
Ciprofloxacin	0	0%	1	2.0%			1	0.3%
Quinolones								
Nalidixic acid	33	16.3%	19	38.8%			8	2.6%
Trimethoprim	35	17.3%	6	12.2%			40	13.2%
Sulfonamides								
Sulfonamide	63	31.2%	30	61.2%			178	58.8%
Aminoglycosides								
Streptomycin	38	18.8%	22	44.9%			138	45.6%
Gentamicin	0	0%	9	18.4%			8	2.6%
Neomycin	5	2.5%	5	10.2%			14	4.6%
Kanamycin	5	2.5%	9	18.4%			14	4.6%
Penicillins								
Ampicillin	45	22.3%	26	53.1%			142	46.9%
Number of multiresistant isolates								
fully sensitives	114	56.4%	7	14.3%			98	32.3%
resistant to 1 antimicrobial	24	11.9%	4	8.2%			53	17.5%
resistant to 2 antimicrobials	8	4.0%	3	6.1%			5	1.7%
resistant to 3 antimicrobials	5	2.5%	6	12.2%			17	5.6%
resistant to 4 antimicrobials	10	5.0%	11	22.5%			36	11.9%
resistant to >4 antimicrobials	41	20.2%	18	36.7%			94	31.0%

Footnote

Other poultry meat represents turkey meat

Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Animals

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

NCCLS
CASFM

Subject to quality control

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracycline	NCCLS*	4	8	8	2	32				
Amphenicols										
Chloramphenicol	NCCLS	8	16	16	2	64				
Florfenicol	NCCLS	8	16	16	2	64				
Fluoroquinolones										
Ciprofloxacin(1)	NCCLS	0.25	0.5	1.0	0.03	4				
Enrofloxacin										
Quinolones										
Nalidixic acid	DANMAP2001	16		16	4	128				
Trimethoprim	DANMAP2001	8		8	4	32				
Sulfonamides										
Sulfonamide	NCCLS	256		256	32	512				
Aminoglycosides										
Streptomycin	DANMAP2001	8	16	16	4	64				
Gentamicin	NCCLS	4	8	8	1	32				
Neomycin	DANMAP201	4	8	8	2	32				
Kanamycin	NCCLS	16	32	32	4	64				
Trimethoprim + sulfonamides										
Trimethoprim + Sulfonamide (3)	DANMAP2003	2		2	1	8				
Cephalosporin										
Ceftiofur	NCCLS	2	4	4	0.5	8				
3rd generation cephalosporins										
Penicillins										
Ampicillin	NCCLS	8	16	16	1	32				

(1) : NCCLS taken from Enrofloxacin; intermediate value means 0.5-1.0
(2) : values for trimethoprim in combinations with sulfonamides
(3) : values for sulfonamides in combinations with Trimethoprim

Footnote

* NCCLS has changed the name to CLSI

Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Food

Test Method Used

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

Standards used for testing

- NCCLS
- CASFM

Subject to quality control

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracycline	NCCLS*	4	8	8	2	32				
Amphenicols										
Chloramphenicol	NCCLS	8	16	16	2	64				
Florfenicol	NCCLS	8	16	16	2	64				
Fluoroquinolones										
Ciprofloxacin	NCCLS	0.25	0.5	1.0	0.03	4				
Enrofloxacin										
Quinolones										
Nalidixic acid	DANMAP2001	16		16	4	128				
Trimethoprim	DANMAP2001	8		8	4	32				
Sulfonamides										
Sulfonamide	NCCLS	256		256	32	512				
Aminoglycosides										
Streptomycin	DANMAP2001	8	16	16	4	64				
Gentamicin	NCCLS	4	8	8	1	32				
Neomycin	DANMAP201	4	8	8	2	32				
Kanamycin	NCCLS	16	32	32	4	64				
Trimethoprim + sulfonamides										
Trimethoprim + Sulfonamide	DANMAP2003	2		2	1	8				
Cephalosporin										
Ceftiofur	NCCLS	2	4	4	0.5	8				
3rd generation cephalosporins										
Penicillins										
Ampicillin	NCCLS	8	16	16	1	32				

Table 3.2.6 Breakpoints for antibiotic resistance of Salmonella in Feedingstuff

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

NCCLS
CASFM

Subject to quality control

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracycline	NCCLS*	4	8	8	2	32				
Amphenicols										
Chloramphenicol	NCCLS	8	16	16	2	64				
Florfenicol	NCCLS	8	16	16	2	64				
Fluoroquinolones										
Ciprofloxacin	NCCLS	0.25	0.5	1.0	0.03	4				
Enrofloxacin										
Quinolones										
Nalidixic acid	DANMAP2001	16		16	4	128				
Trimethoprim	DANMAP2001	8		8	4	32				
Sulfonamides										
Sulfonamide	NCCLS	256		256	32	512				
Aminoglycosides										
Streptomycin	DANMAP2001	8	16	16	4	64				
Gentamicin	NCCLS	4	8	8	1	32				
Neomycin	DANMAP201	4	8	8	2	32				
Kanamycin	NCCLS	16	32	32	4	64				
Trimethoprim + sulfonamides										
Trimethoprim + Sulfonamide	DANMAP2003	2		2	1	8				
Cephalosporin										
Ceftiofur	NCCLS	2	4	4	0.5	8				
3rd generation cephalosporins										
Penicillins										
Ampicillin	NCCLS	8	16	16	1	32				

2.2. CAMPYLOBACTERIOSIS

2.2.1. General evaluation of the national situation

2.2.2. Campylobacteriosis in humans

A. Thermophilic Campylobacter in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act)

Case definition

(in German) Campylobacter spp., darmpathogen (Campylobacter-Enteritis)
ICD10: A04.5 Enteritis durch Campylobacter
Klinisches Bild
Klinisches Bild einer akuten Campylobacter-Enteritis, definiert als mindestens eines der drei folgenden
Symptome:
- Durchfall,
- krampfartige Bauchschmerzen,
- Fieber.

Labordiagnostischer Nachweis
Positiver Befund mit mindestens einer der beiden folgenden Methoden:
[direkter Erregernachweis:]
- Erregerisolierung (kulturell),
- Antigennachweis mittels ELISA.

Zusatzinformation
Das Ergebnis der Speziesbestimmung sollte übermittelt werden.
Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der vier folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:
Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim
Menschen durch
- Mensch-zu-Mensch-Übertragung ODER
- gemeinsame Expositionsquelle (z.B. Badegewässer, Tierkontakt, Lebensmittel).

Baden in einem labordiagnostisch nachgewiesen kontaminierten Gewässer.
Kontakt mit einem labordiagnostisch nachgewiesen infizierten Tier oder seinen Ausscheidungen,
oder Verzehr seiner Produkte (z.B. Rohmilch, Fleisch).
Verzehr eines Lebensmittels (inkl. Trinkwasser), in dessen Resten Campylobacter labordiagnostisch
nachgewiesen wurde.
Inkubationszeit ca. 1-10 Tage.

Notification system in place

yes

History of the disease and/or infection in the country

Fluctuating high incidences

Relevance as zoonotic disease

Important: in 2004, the second most frequently reported of all reportable pathogens associated with food-borne disease (after Salmonellosis)

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc	unknown status
Campylobacter	55745	0	46682	0	4426	0	4637
C. coli	3334		2848		220		266
C. jejuni	33014		27474		2589		2951
C. upsaliensis	31		28		2		1
Campylobacter spp.	11704		9841		1031		832
C.,thermophilic(1)	7662		6491		584		587

(1) : C. coli/jejuni

Footnote

Inc. all Campylobacteriosis 67.5 , autochtone 56.6 and imported 5.4

Table 6.3.B Campylobacteriosis in man - age distribution

Age Distribution	C. coli			C. jejuni			Campylobacter spp.		
	All	M	F	All	M	F	All	M	F
<1 year	34	18	16	328	182	146	567	307	260
1 to 4 years	253	149	104	2470	1377	1090	4239	2374	1859
5 to 14 years	324	194	130	3343	2007	1336	5704	3422	2279
15 to 24 years	529	275	254	5177	2627	2550	8719	4390	4329
25 to 44 years	1135	576	559	11948	6236	5711	19752	10219	9532
45 to 64 years	639	317	322	6539	3511	3028	10968	5869	5099
65 years and older	420	183	237	3206	1588	1617	5790	2771	3016
Age unknown				3	2	1	6	3	3
Total :	3334	1712	1622	33014	17530	15479	55745	29355	26377

Table 6.3.C Campylobacteriosis in man - seasonal distribution

Month	C. coli	C. jejuni	C. upsaliensis	Campylobacter spp.
	Cases	Cases	Cases	Cases
January	300	2070	2	3489
February	217	1563	3	2731
March	201	1645		2834
April	206	1690	1	2818
May	217	2294	2	3830
June	306	3129	1	5225
July	313	3944	4	6576
August	403	4424	5	7394
September	383	3922	3	6733
October	276	3084	5	5248
November	295	2774	2	4718
December	217	2475	3	4149
not known				
Total :	3334	33014	31	55745

2.2.3. Campylobacter in foodstuffs

A. Thermophilic Campylobacter in Broiler meat and products thereof

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

Poultry meat: In 2004, the total rate for samples collected under a sampling plan has increased to 19.56 % (2003: 8.74 %). In broilers, this rate shows higher percentages with 42.97 % (2003: not reported). Mostly C. jejuni and C. coli were isolated and in some cases C. lari.
The resulting confidence interval for Campylobacter rates in poultry meat is 30.79 % - 34.34 % (95 % confidence). Based on data comparable to those of the previous year (17.48 % - 21.64 %), there is no overlapping of ranges, i.e. a significant increase has been recorded. Broiler meat were tested with a confidence interval of 40.45 % - 45.50 % (95 % confidence), but there are no recordings from 2003.

B. Campylobacter spp. in food

Monitoring system

Sampling strategy

On the basis of samples (5 samples per 1000 population), foods which are on the market are examined at regular intervals for bacterial contamination in compliance with the Official Collection of Methods of Examination under § 35 of the German Foods and Other Commodities Act (Lebensmittel- und Bedarfsgegenständegesetz - LMBG). Sampling is performed in accordance with EU Directive 89/397/EEC on official food control which has been converted into national law by Bundesrat Decision No. 150/92.

Frequency of the sampling

regulary

Methods of sampling (description of sampling techniques)

Samples collected under a sampling defined by the Laender

Diagnostic/analytical methods used

Methods comparable to ISO 10272

Table 6.2 Thermophilic Campylobacter spp. in food

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	C.,thermophilic	C. lari	C. jejuni	C. coli	C. upsaliensis	Campylobacter spp.
Bovine meat											
fresh											
- at processing plant	food under the official sampling plan		samples		3			1			1
- at retail	food under the official sampling plan		samples		9						0
meat products											
- at processing plant (3)	food under the official sampling plan	heat treated	samples		2						0
- at retail (4)	food under the official sampling plan	heat treated	samples		113						0
Pig meat	food under the official sampling plan		samples	25	475	3			6		9
fresh											
- at processing plant	food under the official sampling plan		samples		15						0
- at retail	food under the official sampling plan		samples		454	3			6		9
Poultry meat	food under the official sampling plan		samples	25	2684	39	6	536	161		874
fresh											

- at processing plant (1)	food under the official sampling plan		samples		151	8		42	7		80
- at retail (2)	food under the official sampling plan		samples		2000	31	3	402	143		690
meat products											
- at retail (5)	food under the official sampling plan		samples		174			11			19
cow milk											
raw	food under the official sampling plan	offered at farm	samples	25	464			0			0
Dairy products											
ready-to-eat	food under the official sampling plan		samples	25	889						1
Fishery products											
fish	food under the official sampling plan		samples	25	111						0
red meat	food under the official sampling plan		samples	25	539	3		1	6		10
Broiler meat	food under the official sampling plan		samples	25	2684	41		536	161		874

(1) : no information on animal source
(2) : no information on animal source
(3) : no information on animal source
(4) : no information on animal source
(5) : no information on animal source

Footnote

Campylobacter sp. is used as total Campylobacter positive; C., thermophile means only these without further specification; some institutions are using 20g samples

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-08-11	cow milk - raw	Sample weight		25

	Dairy products - ready-to-eat	Sample weight		25
	Fishery products - fish	Sample weight		25
	red meat	Sample weight		25
	Broiler meat	Sample weight		25
	Pig meat	Sample weight		25
	Poultry meat	Sample weight		25

2.2.4. Campylobacter in animals

A. Campylobacter spp. in animal

Monitoring system

Sampling strategy

no defined regulation on monitoring. Only diseases at cattle are reportable regarding aborting cases

Table 6.1.1 Thermophilic Campylobacter spp. in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	C. coli	C. jejuni	C. lari	C. upsaliensis	C.,thermophilic
Cattle (bovine animals)			herds	394	55	3	44	1		
dairy cows			herds	127	2					
Sheep			herds	32	2		2			
Goats			herds	10	1					
Pigs			herds	375	93	75	14			3
Solipeds			herds	1	0					
Gallus gallus										
broilers			herds	273	107	3	8			91
Pet animals										
dogs			animals	917	25	2	20	1		1
cats			animals	246	6	1	5			
Wildlife		Deer	animals	3	0					
Ducks			animals	534	124					
Turkeys			amimals	308	69					

2.2.5. Antimicrobial resistance in *Campylobacter* isolates

2.3. LISTERIOSIS

2.3.1. General evaluation of the national situation

A. Listeriosis general evaluation

History of the disease and/or infection in the country

Federal Institute for Health Protection of Consumers and Veterinary Medicine:
Recommendations for the Detection and Evaluation
of Listeria monocytogenes in Foods
for the official Food Hygiene Authorities
July 2000
Introduction
In 1991, the then existing Federal Health Office had published recommendations on the detection and evaluation of Listeria monocytogenes (L. m.) in foods. These recommendations were primarily meant for use by official food control laboratories and included an experimental design for the detection of L.m. in foods at the production and sales levels as well as a catalogue of evaluation and measures to be taken in the event of positive findings. They were based on the assumption that an evaluation of a contamination of foods by Listeria could only be done on a quantitative basis, in view of the wide distribution of the agent in foods and the environment on the one hand and the low incidence of listeriosis cases in humans, on the other.
These recommendations were revised for the first time in 1994 after comprehensive recording and evaluation of findings collected routinely on a national level by the official food control laboratories and concluded in the same year with regard to the presence of Listeria in foods of animal and vegetal origin. Evaluation of this survey had revealed that a more stringent evaluation value regarding L.m. than that fixed in 1991 to rate foods as potentially damaging to health, i.e. of 10^3 cfu/g or ml as compared to 104 cfu/g or ml fixed in 1991 was reasonable in the sense of preventive health protection and economically justifiable.
Now, after several years of routine application of the amended evaluation scheme, the catalogue of measures and the detection methodology by the official food control laboratories, it was felt that another review was needed to examine whether the following aspects of the recommendations had to be revised.
1. proposed evaluation values and limits;
2. classification of foods by the existing four risk groups;
3. qualitative and quantitative demonstration of Listeria using the method described in the official collection of methods under § 35 of the German Food Act (Lebensmittel- und Bedarfsgegenständegesetz - LMBG);
4. expediency and practicability of follow-up examinations after positive first findings, to enable a better estimate of the true L.m. counts;
5. classification of findings in accordance with food legislation; and
6. catalogue of measures.
In addition, there have been some severe changes in food legislation in the past years and thus, also the basis for evaluation of positive findings of Listeria has

changed.

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

Evaluation and limit values
In recent months, the number of objections to Listeria-contaminated foods made in international trade has increased. These objections frequently resulted in warnings under the EU "Rapid Alert System for Food". In particular, fishery and milk products (cheese) were involved. In particular, such obstacles for trade which often are seen as unjustified underline the need for a clear and technically substantiated decision on the legal evaluation of the presence of L.m. in foods.
At present, an evaluation value for L.m. of 10^2 colony forming units (cfu) per g or ml of food for a classification of such products as "safe for health", at least what concerns their fitness for international trade, is being discussed world-wide. At the 32nd Meeting of the Codex Alimentarius Committee on Food Hygiene (CCFH) held in Washington in 1999, Germany and an international working group jointly prepared a paper for discussion in which this evaluation value has been of central importance. In its opinion on Listeria monocytogenes, the Scientific Committee on Veterinary Measures Relating to Public Health of the European Commission, while mentioning the absence of a basis for calculation of dose-effect relationships, has referred to this value as a tolerance value worth of discussion; it has refrained, however, from giving concrete comments on the need for fixing a limit value.
In the evaluation scheme proposed, the BgVV has taken an evaluation value of $1x10^2$ cfu (L.m.)/g or ml food as a basis. This was decided after in some recent outbreaks of listeriosis, foods of various types had been established or suspected as sources of infection, in which L.m. counts of 10^2 cfu/g or ml or only slightly higher counts had been found (Annex 1).

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

Annex 2
Listeria monocytogenes (L.m.): Recommendations on Examination, Measures to be Taken and Evaluation for Purposes of Official Food
Control (BgVV, July 2000)
Food category /Sampling /Qualitative or /(Evaluation (E) Measures (M)
/ / quantitative /positive /Qualitative />1x102 cfu/g or ml
/ / examination /in 25 g/ml, / positivity
/ / /or in 1 g/ml /but
/ / / /<=$1x10^2$cfu/g/ml
I
Ready-to-eat foods whose manufacture ensures a
killing of L.m. and whose re-contamination must
not be possible
/At the end of /Qualitative)/E:Not marketable /Not / Not
/manufacture /(25 g or ml)/M:If applicable,2,3 /applicable /applicable
/In trade /Qualitative /E:Not marketable /Not /Not
/ /(25 g or ml)/M:1,2,if applicable,3 /applicable /applicable

II
Ready-to-eat foods which may be contaminated
with L.m. and permit multiplication of L.m.
- ; Heat-treated but not otherwise stabilized foods
/At the end of /Qualitative /E:depending on /E:Examine for/B:Not marketable
/manufacture /(25 g or ml) and /quant. /marketability /M:If
/ / / /M:If /applicable,
/ /quantitative /result /applicable, /1,2,3
/1,2,3
- ; Non heat-treated, non-stabilized** foods
In trade Qualitative
(1 g or ml) and
quantitative
E: → depending on
quant. result
E: Examine for
marketability3)
M: 1, if applicable, 2, 3
E: Not marketable
M: 1, if applicable, 2, 3
At the end of
manufacture
Qualitative
(25 g or ml) and
quantitative
E: → depending on
quant. result
E: No objection
M: If applicable, 1
E: Not marketable
M: If applicable, 1, 2, 3
III
Ready-to-eat foods which may be contaminated
with L.m. and do not permit multiplication of L.m.
- ; Heat-treated, stabilized** foods
- ; Non-heat-treated but otherwise stabilized** foods
In trade
Qualitative
(1 g or ml) and
quantitative
E: → depending on
quant. result E: No objection
M: If applicable, 1
E: No objection
M: 1, if applicable, 2, 3
IV
Foods not ready to eat which in accordance with

their intended use will be heated prior to consumption
At the end of manufacture
Qualitative (25 g or mg) and quantitative2)
E: → depending on quant. result
E: No objection
M: If applicable, 1
E: As a rule, no objection
M: If applicable, 1, 2, 3
In trade Qualitative (1 g or mg) and quantitative2)
E: → depending on quant. result
E: No objection
M: If applicable, 1
E: As a rule, no objection
M: If applicable, 1, 2, 3

Recent actions taken to control the zoonoses

Food categories
In the revised evaluation scheme proposed (Annex 2), it is assumed that in commercial establishments, manufacture and treatment of foods take place in accordance with a good hygienic practice and in-house control systems of food establishments under § 4 of the German Food Hygiene Regulation (Lebensmittelhygiene-Verordnung - LMHV) or pertinent special regulations have been introduced and are adhered to. On the basis of such a "certified" food item, the new categories will enable the consideration of a possible primary contamination, of the effects of process steps reducing the count of or killing the bacteria, of subsequent re-contamination and multiplication of L.m. in the ready-to-eat food and the submission of proposals for evaluation and measures to be taken.
As before, there will be four product categories, however modified in part. Of these, three (I, II and III) refer to ready-to-eat foods, and an additional one (IV) refers to products which in accordance with their intended use are subjected to a heating process to kill Listeria immediately before consumption. Since for one category (I, dietetic foods), the requirement of zero tolerance for L.m. is kept in view of the target group which is subject to a particular risk (infants, pregnant women, sick persons, immunocompromized persons) and, in the other extreme case, category IV (foods not ready for consumption) is, as a rule, neither subject to examination nor objection, a quantitative approach has been chosen for foods listed under categories II and III. The difference between these two categories lies in the differences of the

multiplication potential for L.m. The necessity of a decision on the classification of a defined ready-to-eat food item under one of the two categories may, in the individual case, confront the supervising authority with problems difficult to solve. In such cases of doubt, the food should be objected for reasons of preventive health care, if it is feared that the L.m. count may rise to a level above the evaluation value of $1x10^2$cfu/g or ml within the stipulated marketability period of the product. To avoid unjustified objections, it should be above all in the interest of the food industry and commerce to prove by results of examinations performed on their own or otherwise available data that under legal conditions or conditions stipulated by the manufacturer, this level would not be surpassed in the food.
To facilitate matters for the supervising authorities, Annex 3 lists specific foods as examples and assigns them to the proper categories.
As far as for milk and milk-based products, the provisions of the German Milk Regulation (Milchverordnung) apply, the examination and evaluation scheme prescribed therein must be used.

Additional information

Methodology of detection and evaluation of results
It is recommended to update and adapt the detection technique to the respective international standards passed as EN-ISO standards in 1996 and 1998:
Microbiology of food and animal feeding stuffs - Horizontal method for the detection and enumeration of Listeria monocytogenes
- Part 1: Detection method EN ISO 11 290-1 : 1996;
- Part 2: Enumeration method EN ISO 11 290-2 : 1998.
This recommendation also applies to the examination of milk and milk-based products.
Since a methodological variance of results has to be taken into account, the following is recommended to avoid unjustified objections. In official food control, calculation should be based on schematics from current legal provisions which have proved their practicability (Annex II Chapter II and Annex IV - Microbiological criteria - of the Council Directive 94/65/EC laying down the requirements for the production and placing on the market of minced meat and meat preparations). Accordingly, the evaluation value cannot be considered as surpassed unless the count determined has surpassed the evaluation value by three times.
Follow-up examinations after positive first findings
Experience by the supervising authorities has shown that follow-up examination of product batches recommended so far in each case to be performed after positive first findings has been causing practical difficulties. This can be attributed to
- ; high cost of precautionary sampling to the extent required for this purpose (6 samples per batch, one of which is destined for immediate examination and the other five for follow-up examinations which might become necessary). Beyond this, on the retail level, the high number of samples required may surpass the actual quantity offered for sale;
- ; difficulties in getting access to additional samples from the same product batch unless the additional samples have been drawn at the same time as the first sample;

- ; the time factor, which may affect the microbiological profile of a production batch in the course of storage (therefore being responsible for differences between followup examinations and first findings) and also result in a considerable delay until the final bacteriological findings become available.

4

For this reason the recommendation made in 1991, i.e. to perform follow-up examinations of the batch involved in the event of positive Listeria findings, has to be modified.

The modified recommendations are to evaluate in each case if follow-up examinations are necessary or possible at all. Follow-up examinations seem to be reasonable (number of samples n=5) especially in those cases where the first findings were positive with a number of L.m. <=1x102cfu/g or ml.

Rating of findings under current food legislation

In the present recommendations, only the marketability of the individual foods is commented taking into account their bacterial count (L.m.) and their classification under a defined category. Based on the respective literature, the BgVV has supported the opinion that occasionally, a consumption of foods exhibiting listerial counts slightly above $1x10^2$ cfu/g or ml may cause disease also in other than immunocompromized persons. Whether, however, there is a concrete eligibility to produce damage to health and, thus, an infringement of § 8 LMBG may be suspected, cannot be decided at this end, without knowing the concomitant circumstances. At any rate, it is not considered as justifiable to introduce into the market or to leave in the market ready-to-eat foods whose listerial count surpasses the recommended evaluation value of $1x10^2$ cfu/g or ml.

2.3.2. Listeriosis in humans

A. Listeriosis in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act)

Case definition

(in German) Listeria monocytogenes (Listeriose)
ICD10: A32.- Listeriose (inkl.: Nahrungsmittelbedingte Infektion durch Listerien),
A32.0 Kutane Listeriose,
A32.1 Meningitis und Meningoenzephalitis durch Listerien,
A32.7 Listeriensepsis,
A32.8 Sonstige Formen der Listeriose (Endokarditis durch Listerien, okuloglanduläre Listeriose, zerebrale
Arteriitis durch Listerien),
A32.9 Listeriose, nicht näher bezeichnet,
P37.2 Neugeborenenlisteriose (disseminiert)
Klinisches Bild
Klinisches Bild einer akuten Listeriose, definiert als eine der drei folgenden Formen:
Listeriose des Neugeborenen, definiert als Totgeburt ODER mindestens eines der fünf folgenden
Kriterien bei einem Kind im ersten Lebensmonat:
- Granulomatosis infantiseptica (Mikroabszesse in verschiedenen Organen),
- Meningitis/Meningoenzephalitis,
- septisches Krankheitsbild,
- Dyspnoe (Atemnot),
- Haut-, Bindehaut- oder Schleimhautläsionen (-veränderungen).
ICD10: P37.2 Neugeborenenlisteriose (disseminiert)
Listeriose der Schwangeren, definiert als mindestens eines der drei folgenden Kriterien:
- Fehl-, Früh- oder Totgeburt,
- grippeähnliche Beschwerden,
- Fieber.
Andere Form, definiert als mindestens eines der drei folgenden Kriterien:
- Fieber,
- Meningitis/Meningoenzephalitis,
- lokalisierte Infektionen (z.B. Abszesse, Gelenkentzündungen, Endokarditis).
Labordiagnostischer Nachweis
Positiver Befund mit der folgenden Methode:
[direkter Erregernachweis:]
- Erregerisolierung (kulturell) nur aus Blut, Liquor oder anderen normalerweise sterilen klinischen Materialien sowie Abstrichen vom Fetus, Tot- oder Neugeborenen.
Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der beiden folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:

Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim
Menschen durch
- Mutter-Kind-Beziehung (d.h. zwischen Tot- oder Neugeborenem und seiner Mutter) ODER
- gemeinsame Expositionsquelle (z.B. Lebensmittel).
Falldefinitionen des Robert Koch-Instituts, Ausgabe 2004 91
Verzehr eines Lebensmittels (inkl. Trinkwasser), in dessen Resten L. monocytogenes labordiagnostisch
nachgewiesen wurde.
Inkubationszeit ca. 3-70 Tage.

Notification system in place

yes

History of the disease and/or infection in the country

Increasing trend since 2001

Relevance as zoonotic disease

High case fatality ratio!

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

Listeria	Cases	Cases Inc
	295	0
Listeria spp.	295	
congenital cases	19	0.4
deaths	27	

Table 7.2.B Listeriosis in man - age distribution

Age Distribution	L. monocytogenes			Listeria spp.		
	All	M	F	All	M	F
<1 year	20	12	8			
1 to 4 years	3	2	1			
5 to 14 years						
15 to 24 years	2	0	2			
25 to 44 years	30	2	28			
45 to 64 years	77	41	36			
65 years and older	163	93	70			
Age unknown						
Total :	295	150	145	0	0	0

2.3.3. Listeria in foodstuffs

A. L. monocytogenes in food

Monitoring system

Sampling strategy

cf. Salmonella, see also general general evaluation with the recommendation to investigate Listeria monocytogenes in foodstuffs

Type of specimen taken

At retail

1g or 25g depending on the food category (cf. general evaluation)

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

Meat except poultry showed an increase of detection rate of Listeria monocytogenes after a continuing reduction in the share of positive samples collected under the sampling plan in the former years: 2004: 3.12 % (2003: 1.11 %, 2002: 3.32 %) with a confidence interval of 2.06 % - 4.18 % (2003: 0.60 %-1.62 %). The latter showed no overlapping with the previous year, a fact suggesting a significant increase.
Raw meat and raw meat products as defined by the Minced Meat Regulations exhibited an insignificant reduced share (10.97 %; 2003: 12.65 %), with a confidence interval of 10.01 % - 11.93 % (2003: 11.52 % - 13.78 %).
In heat-treated meat products, the share of 2.0 % of positive samples was the same as in the previous year.
Stabilized meat products showed a merely insignificant increase of L. monocytogenes contamination to 8.45 % of samples (2003: 7.52 %) with a confidence interval of 7.55 % - 9.35 % (2003: 6.64 % - 8.40 %). According to these data, the frequency of detection of L. monocytogenes in stabilized meat products was four times as high as that in heat-treated meat products.
The detection rates in fish, seafood and products made from these shows a significant decrease to 6.22 % (2003: 8.49 %) with a confidence interval of 5.45 % - 6.98 % (2003: 7.55 % - 9.42 %).
Milk products made from treated milk shows a minor and and an insignificant increase of L. monoctogenes rates to 0.54 % (2003: 0.29 %) with a confidence interval of 0.37 % - 0.72 % (2003: 0.16 % - 0.42 %).

Table 7.1 Listeria monocytogenes in food

	Source of information	Remarks	Epidemiological unit	Sample weight	Definition used	Units tested	<100 cfu/g	>100 cfu/g	L. monocytogenes
Bovine meat	food under the official sampling plan		samples	25		78			0
meat products ready-to-eat									
- at processing plant (1)	food under the official sampling plan		samples			711			42
- at processing plant - environmental sample (2)	food under the official sampling plan		samples			11776			82
- at retail (3)	food under the official sampling plan		samples			2825			375
Pig meat	food under the official sampling plan		samples	25		587			30
Poultry meat (4)	food under the official sampling plan		samples	25		742		3	97
meat products ready to eat									
- at processing plant	food under the official sampling plan		samples	25		58			3
- at retail	food under the official sampling plan		samples	25		225			11
Cheeses									

- at processing plant	food under the official sampling plan	soft cheese from raw milk	samples	25		36			0
- at retail	food under the official sampling plan	soft cheese from raw milk	samples	25		149			1
Dairy products									
other products									
ready-to-eat									
- at processing plant	food under the official sampling plan	made from treated milk	samples	25		945			1
- at retail	food under the official sampling plan	made from treated milk	samples	25		4400			24
cow milk									
raw									
for direct human consumption	food under the official sampling plan	milk at farm	samples	25		156			4
Fishery products (5)	food under the official sampling plan	marine animals and products	samples	25		3781		20	235
fish	shells, crabs and other	'fish and cuts'	samples	25		235			8
smoked									
- at processing plant	food under the official sampling plan	heat treated	samples	25		50			5
- at retail	food under the official sampling plan	heat treated	samples	25		418			32
other	food under the official sampling plan	shells, crabs and other	samples	25		236			14

- at retail	food under the official sampling plan	shells, crabs and other	samples	25		191			9
red meat	samples collected under the official sampling plan		samples	25		964			29
meat product									
heat treated (6)	samples collected under the official sampling plan		samples	25		2382		2	44
stabilized (7)	samples collected under the official sampling plan		samples	25		3161		6	224
raw meat and raw meat product	samples collected under the official sampling plan		samples	25		2825		16	375

(1) : no information on animal source
(2) : all food processing areas
(3) : no information on animal source
(4) : >100 Cfu/g from 513 investigations
(5) : >100 Cfu/g from 2060 investigations
(6) : >100 Cfu/g from 1282 investigations
(7) : >100 Cfu/g from 1351 investigations

Footnote

Due to problems in interpretation the results <100CFU/g were not included; some institutions are using 1g samples for some food categories (cf. text form)

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-08-11	Dairy products - other products - ready-to-eat - at processing plant	Sample weight		25
	Dairy products - other products - ready-to-eat - at retail	Sample weight		25
	Poultry meat - meat products - ready to eat - at processing plant	Sample weight		25
	Poultry meat - meat products - ready to eat - at retail	Sample weight		25
	Cheeses - at processing plant	Sample weight		25
	Cheeses - at retail	Sample weight		25
	cow milk - raw - for direct human consumption	Sample weight		25
	Fishery products - fish - smoked - at processing plant	Sample weight		25
	Fishery products - fish - smoked - at retail	Sample weight		25
	Fishery products - other	Sample weight		25
	Fishery products - other - at retail	Sample weight		25
	Bovine meat	Sample weight		25
	Pig meat	Sample weight		25
	Poultry meat	Sample weight		25

	Fishery products	Sample weight		25
	Fishery products - fish	Sample weight		25
	red meat	Sample weight		25
	red meat - meat product - heat treated	Sample weight		25
	red meat - meat product - stabilized	Sample weight		25
	red meat - raw meat and raw meat product	Sample weight		25

2.4. VEROCYTOTOXIC ESCHERICHIA COLI

2.4.1. General evaluation of the national situation

2.4.2. Verocytotoxic Escherichia coli in humans

A. Verotoxigenic Escherichia coli infections in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act)

Case definition

(in German) Escherichia coli, enterohämorrhagisch (EHEC-Erkrankung)
syn. STEC-Erkrankung
ICD10: A04.3 Darminfektion durch enterohämorrhagische Escherichia coli
Vorbemerkung
Diese Übermittlungskategorie hat sich durch Ausgliederung und Einrichtung einer separaten Übermittlungskategorie
'HUS, enteropathisch' früheren Versionen gegenüber geändert. Sie umfasst jetzt nur noch Fälle ohne das
klinische Bild eines hämolytisch-urämischen Syndroms (HUS). Die in der früheren EHEC-Falldefinition enthaltene
Differenzierung zwischen inkomplettem und komplettem HUS und thrombotisch-thrombozytopenischer Purpura
(TTP) entfällt.
Ausschlusskriterien
- Klinisches Bild eines HUS (siehe Falldefinition des enteropathischen HUS).
Klinisches Bild
Klinisches Bild einer akuten EHEC-Erkrankung, definiert als mindestens eines der drei folgenden
Symptome:
- Durchfall,
- krampfartige Bauchschmerzen,
- Erbrechen.
Labordiagnostischer Nachweis
Positiver Befund mit mindestens einer der beiden folgenden Methoden:
[Toxinnachweis:]
- Nachweis des Shiga-Toxins (Stx1 bzw. Stx2; syn. Verocytotoxin, VT) mittels ELISA im E.-coli-Isolat,
d.h. nach vorheriger Erregerisolierung (kulturell) aus Stuhl,
- Nachweis (z.B. PCR) des Shiga-Toxin-Gens (stx1, stx2) in Mischkultur, Stuhlanreicherung oder im
E.-coli-Isolat.
Zusatzinformationen
- Das Ergebnis der Serovarbestimmung sollte übermittelt werden.
- Der alleinige Stx-Nachweis mittels ELISA aus der Stuhlanreicherung gilt nicht als

labordiagnostischer
Nachweis.
Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der vier folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:
Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim
Menschen durch
- Mensch-zu-Mensch-Übertragung ODER
- gemeinsame Expositionsquelle (z.B. Badegewässer, Lebensmittel, Tierkontakt).
Falldefinitionen des Robert Koch-Instituts, Ausgabe 2004 49
Baden in einem labordiagnostisch nachgewiesen kontaminierten Gewässer.
Kontakt mit einem labordiagnostisch nachgewiesen infizierten Tier (z.B. Streichelzoo) oder seinen
Ausscheidungen, oder Verzehr seiner Produkte (z.B. Rohmilch).
Verzehr eines Lebensmittels (z.B. Rohmilch, Trinkwasser), in dessen Resten Shiga-Toxin bildende
E. coli labordiagnostisch nachgewiesen wurde.
Inkubationszeit ca. 2-8 Tage.

History of the disease and/or infection in the country

Reportable since 1998, stable incidence

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

Age distribution of HUS cases:

	ALL	M	F
<1 y	7	5	2
1 to 4 y	26	11	15
5 to 14 y	12	3	9
15 to 24 y	2	1	1
25 to 44 y	2	0	2
45 to 64 y	3	0	3
65 y and more	2	0	2
all age groups	54	20	34

Relevance as zoonotic disease

Low infective dose, potential for severe disease (Haemolytic Uraemic Syndrome), relatively high incidence

Additional information

Direct contact to ruminants is a risk factor for infections in addition to food vehicles

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

Pathogenic Escherichia coli	Cases	Cases Inc	Autochtone Inc	Autochtone cases	Imported cases	Imported Inc
HUS	54	0.1	0.1	47	4	0.09
- clinical cases	11	0.09	0.09	10		
- lab. confirmed cases	42	0.1	0.09	36	4	0.09
- caused by O157 (VT+)	28	0.09	0.09	24	3	0.09
- caused by other VTEC	4	0.09	0.09	3		
E.coli infect. (except HUS)	5586	6.8	5.9	4858	284	0.3
- laboratory confirmed	5493	6.7	5.8	4773	281	0.3
- caused by 0157 (VT+)	165	0.2	0.2	143	5	0.09
- caused by other VTEC	4469	5.4	4.8	3955	196	0.2

Footnote

0.09 means <0.1

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

Age Distribution	Verotoxigenic E. coli (VTEC)			VTEC O 157			VTEC O 157:H7			VTEC non-O 157		
	All	M	F	All	M	F	All	M	F	All	M	F
<1 year				36	20	16				932	454	476
1 to 4 years				91	51	40				2378	1311	1064
5 to 14 years				10	6	4				292	166	126
15 to 24 years				5	3	2				105	41	64
25 to 44 years				10	3	7				219	103	116
45 to 64 years				4	1	3				225	98	127
65 years and older				9	5	4				318	941	224
Age unknown												
Total :	0	0	0	165	89	76	0	0	0	4469	3114	2197

Footnote

E.coli infections without HUS, HUS as extra dates

2.4.3. Pathogenic Escherichia coli in foodstuffs

A. Verotoxigenic E. coli (VTEC) in food

Monitoring system

Sampling strategy

cf. Salmonella

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

Meat except poultry showed an increase of detection rate of E. coli VTEC/STEC in the share of positive samples collected under the sampling plan in the former years: 2004: 12.61 % (2003: 3.58 %) with a confidence interval of 9.12 % - 16.09 % (2003: 2.11 %-5.05 %). The latter showed no overlapping with the previous year, a fact suggesting a significant increase. The most isolates were found in game meat comparable to the former year.
Raw meat and raw meat products as defined by the Minced Meat Regulations exhibited an insignificant increase share to 3.16 % (2003: 2.24 %), with a confidence interval of 1.89 % - 4.42 % (2003: 1.46 % - 3.02 %).
Milk products made from raw milk show only two isolates similary to the former year (1 isolate). In contrast, in milk selled at farm 5 isolates could be found (2.44%; 2003: 0,12) with only 205 samples (2003: 818) with a confidence interval of 0.33 % - 4.55 % (2003: 0.00 % - 0.36 %), a fact suggesting an insignificant increase.

Table 11.2 Verocytotoxic Escherchia coli in food

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	VTEC O 157:H7	VTEC O 157
Bovine meat	samples collected under the official sampling plan		samples	25g	140	3		
fresh								
- at processing plant	samples collected under the official sampling plan		samples		28	0		
- at retail	samples collected under the official sampling plan		samples		102	3		
Pig meat	samples collected under the official sampling plan		samples	25g	29	1		
fresh								
- at processing plant	samples collected under the official sampling plan		samples		3	0		
- at retail	samples collected under the official sampling plan		samples		7	0		
Poultry meat	samples collected under the official sampling plan		samples	25g	85	0		
fresh								
- at retail	samples collected under the official sampling plan		samples		2	0		
Meat from sheep								
fresh								

- at processing plant	samples collected under the official sampling plan		samples		2	0		
- at retail	samples collected under the official sampling plan		samples		12	1		
cow milk								
raw	samples collected under the official sampling plan	at farm	samples	25g	205	5		
heat-treated	samples collected under the official sampling plan		samples	25g	3	0		
Dairy products	samples collected under the official sampling plan	made from raw milk	samples	25g	303	1		
Fishery products	samples collected under the official sampling plan		samples	25g	4	0		
red meat	samples collected under the official sampling plan		samples	25g	349	44		
meat product								
heat treated	samples collected under the official sampling plan		samples	25g	22	0		
stabilized	samples collected under the official sampling plan		samples	25g	182	0		
raw meat and raw meat product	samples collected under the official sampling plan		samples	25g	729	23		

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-08-10	cow milk - raw	Sample weight		25g
	Dairy products	Sample weight		25g
	Fishery products	Sample weight		25g
	cow milk - heat-treated	Sample weight		25g

	red meat	Sample weight		25g
	Bovine meat	Sample weight		25g
	Pig meat	Sample weight		25g
	Poultry meat	Sample weight		25g
	red meat - meat product - heat treated	Sample weight		25g
	red meat - meat product - stabilized	Sample weight		25g
	red meat - raw meat and raw meat product	Sample weight		25g

2.4.4. Pathogenic Escherichia coli in animals

A. Verotoxigenic E. coli (VTEC) in animal

Monitoring system

Sampling strategy

no defined regulation on monitoring.

Table 11.1 Verocytotoxic Escherchia coli in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	VTEC O 157	VTEC O 157:H7	VTEC O 177	VTEC O 145	VTEC O 153
Cattle (bovine animals)			animals	273	37			2		
calves (under 1 year)		calves	animals	97	0					
dairy cows			animals	29	7					
Sheep			animals	13	3					
Goats			animals	4	1				1	
Pigs			animals	209	18					
Solipeds			animals	4	0					
Pet animals										
dogs			animals	30	1					1

2.5. TUBERCULOSIS

2.5.1. General evaluation of the national situation

A. Tuberculosis General evaluation

History of the disease and/or infection in the country

Eradication of bovine tuberculosis in cattle since early 1960s (west) and late 1970s (east), officially free (EU) since 1997, other zoonotic mycobacteria sporadically in different animal species other than cattle

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

Cattle less than 10 cases per year, sources of infections mostly unknown

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

Findings in cattle still relevant

Recent actions taken to control the zoonoses

Nothing special

Additional information

2.5.2. Tuberculosis in humans

A. Tuberculosis due to Mycobacterium bovis in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act)

Case definition

(in German) M.-tuberculosis-Komplex außer BCG (Tuberkulose)
ICD10: A15. Tuberkulose der Atmungsorgane, bakteriologisch oder histologisch gesichert,
A16.- Tuberkulose der Atmungsorgane, weder bakteriologisch noch histologisch gesichert,
A17.- Tuberkulose des Nervensystems,
A18.- Tuberkulose sonstiger Organe,
A19.- Miliartuberkulose,
P37.0 Angeborene Tuberkulose
Vorbemerkung
Diese Übermittlungskategorie umfasst außer BCG alle zum M.-tuberculosis-Komplex gehörigen Spezies, d.h. z.Zt.
Mycobacterium tuberculosis, M. bovis, M. africanum, M. microti, M. canetti.
Klinisches Bild
Klinisches Bild einer Tuberkulose, definiert als eines der beiden folgenden Kriterien:
- der behandelnde Arzt stellt eine Indikation zur Durchführung einer vollständigen Antituberkulotika-
Therapie,
- nach dem Tod werden Befunde bekannt, die zu Lebzeiten eine ärztliche Indikation zur Durchführung
einer vollständigen Antituberkulotika-Therapie ergeben hätten.
Labordiagnostischer Nachweis
Positiver Befund mit mindestens einer der beiden folgenden Methoden:
[direkter Erregernachweis:]
- kulturelle Isolierung von M.-tuberculosis-Komplex,
- mikroskopischer, färberischer Nachweis säurefester Stäbchen, bestätigt durch
- Nukleinsäure-Nachweis (z.B. PCR) in Material des gleichen Organsystems.
Zusatzinformationen
- Magensaft gilt als verschlucktes respiratorisches Material.
- Die kulturelle Erregerisolierung und die Resistenzbestimmung sind in jedem Fall anzustreben.
- Der alleinige Nachweis säurefester Stäbchen oder der alleinige Nukleinsäure-Nachweis gelten nicht
als labordiagnostischer Nachweis.
Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der beiden folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:
Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim
Menschen durch

- Mensch-zu-Mensch-Übertragung ODER
- gemeinsame Expositionsquelle (z.B. Tierkontakt, Lebensmittel).

Kontakt mit einem labordiagnostisch nachgewiesen infizierten Tier oder seinen Ausscheidungen,
oder Verzehr seiner Produkte (z.B. Rohmilch).
Falldefinitionen des Robert Koch-Instituts, Ausgabe 2004 99
Inkubationszeit ca. 6 Wochen bis mehrere Jahrzehnte. Bei Fällen mit vermutlich mehrjährigen Inkubationszeiten ist die epidemiologische Bestätigung allerdings in der Regel unsicher und sollte nur
bei Vorliegen gewichtiger Hinweise (z.B. DNS-Fingerabdruck) postuliert werden.

Notification system in place

yes

History of the disease and/or infection in the country

In 2004 only 55 cases, no data

Relevance as zoonotic disease

Low, since 1997 domestic animals have been declared free of M. bovis, only sporadically, M .bovis has been detected in intestinal/mesenteric lymphnodes of animals

Additional information

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
Mycobacterium	6174	7.5	0	0	0	0
M. bovis	51	0.09				
M. tuberculosis	3454	4.2				
Mycobacterium spp.	2669	3.21				
reactivation of previous cases						
M.tuberculosis complex(1)	409	0.5				

(1) : 2004

Table 1.2.B Tuberculosis in man - age distribution

Age Distribution	M. bovis		
	All	M	F
<1 year			
1 to 4 years			
5 to 14 years			
15 to 24 years	4	4	
25 to 44 years	3	2	1
45 to 64 years	12	6	6
65 years and older	32	15	17
Age unknown			
Total :	51	27	24

2.5.3. Mycobacterium in animals

A. Mycobacterium bovis in Bovine Animals

Status as officially free of bovine tuberculosis during the reporting year

The entire country free

yes

Monitoring system

Sampling strategy

Examination of slaughtered cattle

Frequency of the sampling

Every individual

Type of specimen taken

Organs/ tissues: Tissue with lesions suspect for tuberculosis

Methods of sampling (description of sampling techniques)

Excision

Case definition

Positive by tuberculin testing and/or bacteriological investigation according to the 'Tuberkulose-Verordnung'

Vaccination policy

No

Measures in case of the positive findings or single cases

Repeated tuberculin testing of all contact animals, killing of the positive animals, restrictions to the farm according to the 'Tuberkulose-Verordnung'

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

Less than 10 cases per year for 10 years now, 'hot spots' in certain areas in the south and in the north-west of the country, sources of infection mostly unknown

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

Connections between actual animal and human cases are not seen

Additional information

B. Mycobacterium bovis in farmed deer

Monitoring system

Sampling strategy

NOT IN GERMANY

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

NOT IN GERMANY

Table 1.1.3 Tuberculosis in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	M. bovis	M. tuberculosis	M. avium complex
Goats			animals	7	0			
Pigs			animals	61	48			32
Zoo animals		incl. home animals	animals	298	23			1
Sheep			animals	24	0			
Cattle (bovine animals)			animals	3081	53	2		4

1.1.1 Bovine tuberculosis

MANDATORY	**CATTLE**		
Number of herds under official control:		Number of animals under official control:	
	OTF bovine herds	**OTF bovine herds with status suspended**	**Bovine herds infected with tuberculosis**
Status of herds at year end (a):			
New cases notified during the year (b):			
	Units tested	**Units suspected**	**Units positive**
Routine tuberculin test (c) - data concerning herds:			
Routine tuberculin test (c) - data concerning animals:			
	Animals slaughtered	**Animals suspected**	**Animals positive**
Routine post-mortem examination (d):		22	0
		Herds suspected	**Herds confirmed**
Follow up of suspected cases in post-mortem examination (e):		22	0
Follow-up investigation of suspected cases: trace, contacts (f):			
	Animals tested	**Animals suspected**	**Animals positive**
Other routine investigations: exports (g):(1)	1709	0	0
Other routine investigations: tests at AI stations (h):			
	All animals	**Positives**	**Contacts**
Animals destroyed (i):			
Animals slaughtered (j):			
VOLUNTARY	**CATTLE**		
	Animals tested	**Animals suspected**	**Animals positive**
Other investigations: imports (k):			
	Herds tested	**Herds suspected**	**Herds positive**
Other investigations: farms at risk (l):	38	6	5
	Samples tested	***M. bovis*isolated**	
Bacteriological examination (m):(2)	173	5	

(1) : 'exports' means here all trade controls
(2) : herds, incl. immunological methods

The following amendments were made :

Date of modification	Zoonose	Column	Old value	New value
2005-08-09	Routine post-mortem examination (d):	Animals suspected		22
	Routine post-mortem examination (d):	Animals positive		0
	Follow up of suspected cases in post-mortem examination (e):	Herds suspected		22
	Follow up of suspected cases in post-mortem examination (e):	Herds confirmed		0
	Other routine investigations: exports (g):	Animals tested		1709
	Other routine investigations: exports (g):	Animals suspected		0
	Other routine investigations: exports (g):	Animals positive		0
2005-08-09	Other investigations: farms at risk (l):	Herds tested		38
	Other investigations: farms at risk (l):	Herds suspected		6
	Other investigations: farms at risk (l):	Herds positive		5
	Bacteriological examination (m):	Samples tested		173
	Bacteriological examination (m):	M. bovis isolated		5

2.6. BRUCELLOSIS

2.6.1. General evaluation of the national situation

A. Brucellosis General evaluation

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

2.6.2. Brucellosis in humans

A. Brucellosis in humans

Reporting system in place for the human cases

yes

Case definition

(in German) Brucella spp. (Brucellose)
syn. Malta-Fieber, Mittelmeer-Fieber
ICD10: A23.- Brucellose, inkl.: Maltafieber, Mittelmeerfieber, Undulierendes Fieber,
A23.0 Brucellose durch Brucella melitensis (Maltafieber),
A23.1 Brucellose durch Brucella abortus (Bang-Krankheit, Morbus Bang),
A23.2 Brucellose durch Brucella suis (Schweinebrucellose),
A23.3 Brucellose durch Brucella canis,
A23.8 Sonstige Brucellose,
A23.9 Brucellose, nicht näher bezeichnet
Ausschlusskriterien
- Klinisches Bild bei Diagnosestellung bereits länger als 12 Monate andauernd.
Klinisches Bild
Klinisches Bild einer akuten Brucellose, definiert als
- Fieber ODER
- mindestens zwei der fünf folgenden Kriterien:
- Nachtschweiß,
- übermäßige Erschöpfung,
- Appetit- oder Gewichtsverlust,
- Kopfschmerzen,
- Gelenkschmerzen.
Labordiagnostischer Nachweis
Positiver Befund mit mindestens einer der beiden folgenden Methoden:
[direkter Erregernachweis:]
- Erregerisolierung (kulturell),
[indirekter (serologischer) Nachweis:]
- Antikörpernachweis (deutliche Änderung zwischen zwei Proben ODER einmaliger deutlich erhöhter Wert, z.B. SLA, KBR, ELISA).
Zusatzinformation
ELISA differenziert zwischen IgM- und IgG-Antikörpern. Beide Nachweise ergeben für sich allein den
geforderten labordiagnostischen Nachweis.
Falldefinitionen des Robert Koch-Instituts, Ausgabe 2004 25
Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der drei folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:
Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim

Menschen durch
- gemeinsame Expositionsquelle (z.B. Tierkontakt, Lebensmittel).
Kontakt mit einem labordiagnostisch nachgewiesen infizierten Tier oder seinen Ausscheidungen,
oder Verzehr seiner Produkte (z.B. Rohmilch, Fleisch).
Verzehr eines Lebensmittels, in dessen Resten Brucella labordiagnostisch nachgewiesen wurde.
Inkubationszeit ca. 5-60 Tage.

Diagnostic/analytical methods used

Serology / isolation

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

Annually ca. 30 notified cases (mostly imported), source of infection: raw cheese and milk, contact with infected animals

Relevance as zoonotic disease

high

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
Brucella	12	0.23	6	0	6	0
B. abortus	4	.09	2		2	
B. melitensis	8	.05	4		4	
B. suis	0	.09				
occupational cases	20		6		14	

Footnote

.09 means '<0.1'; occupational cases means cases without species specifications, has to be added to the top line: 32; .09; 12; -; 20; -

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-09-14	B. abortus	Cases		4
	B. abortus	Cases Inc		.09
	B. abortus	Autochtone cases		2
	B. abortus	Imported cases		2
	B. melitensis	Cases		8
	B. melitensis	Cases Inc		.05
	B. melitensis	Autochtone cases		4
	B. melitensis	Imported cases		4
	B. suis	Cases		0
	B. suis	Cases Inc		.09
	occupational cases	Cases		20
	occupational cases	Autochtone cases		6
	occupational cases	Imported cases		14

Table 2.3.B Brucellosis in man - age distribution

Age Distribution	B. abortus			B. melitensis			Brucella spp.		
	All	M	F	All	M	F	All	M	F
<1 year									
1 to 4 years									
5 to 14 years	1		1				1		1
15 to 24 years				3	2	1	4	2	2
25 to 44 years	1	1		1	1		6	5	1
45 to 64 years	1	1		2	1	1	12	9	3
65 years and older	1	1		2	2		9	9	
Age unknown									
Total :	4	3	1	8	6	2	32	25	7

The following amendments were made :

Date of modification	Zoonose	Line	Column	Old value	New value
2005-09-14	B. abortus	5 to 14 years	All	1	1
	B. abortus	5 to 14 years	F	1	1
	B. abortus	25 to 44 years	All	1	1
	B. abortus	25 to 44 years	M	1	1
	B. abortus	45 to 64 years	All	1	1
	B. abortus	45 to 64 years	M	1	1
	B. abortus	65 years and older	All	1	1
	B. abortus	65 years and older	M	1	1
	B. melitensis	15 to 24 years	All	3	3
	B. melitensis	15 to 24 years	M	2	2
	B. melitensis	15 to 24 years	F	1	1
	B. melitensis	25 to 44 years	All	1	1
	B. melitensis	25 to 44 years	M	1	1
	B. melitensis	45 to 64 years	All	2	2
	B. melitensis	45 to 64 years	M	1	1
	B. melitensis	45 to 64 years	F	1	1
	B. melitensis	65 years and older	All	2	2
	B. melitensis	65 years and older	M	2	2
	Brucella spp.	5 to 14 years	All	1	1
	Brucella spp.	5 to 14 years	F	1	1
	Brucella spp.	15 to 24 years	All	4	4
	Brucella spp.	15 to 24 years	M	2	2

Brucella spp.	15 to 24 years	F	2	2	
Brucella spp.	25 to 44 years	All	6	6	
Brucella spp.	25 to 44 years	M	5	5	
Brucella spp.	25 to 44 years	F	1	1	
Brucella spp.	45 to 64 years	All	12	12	
Brucella spp.	45 to 64 years	M	9	9	
Brucella spp.	45 to 64 years	F	3	3	
Brucella spp.	65 years and older	All	9	9	
Brucella spp.	65 years and older	M	9	9	

2.6.3. Brucella in foodstuffs

Table 2.2 Brucella sp. in food

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	B. melitensis	B. abortus	B. suis
cow milk								
raw (1)		certified milk	samples	24	0			

(1) : tested by ELISA (antibodies)

2.6.4. Brucella in animals

A. Brucella spp. in animal

Monitoring system

Sampling strategy

Reportability (epizootics involving governmental control measures)
Where suspicion of brucellosis has been officially established in swine, blood should be sampled from all animals older than 4 months of the respective herd and examined in accordance with Annex C to Council Directive 64/432/EEC. Exceptions may be permitted for swine kept exclusively for fattening, if not opposed by reasons of epizootic control. Where an outbreak has been officially established in swine, examinations according to Annex C to Council Directive 64/432/EEC may be ruled to determine the degree of infection in the herd. The same applies to horses, dogs and other animals susceptible to the disease if they are or were kept together with swine of the herd affected in the same stable or on the same site. In addition, submission of expelled or dead foetuses, of stillborn animals or parts of these and of placental parts for examination for brucellosis may be ruled.
Where a suspicion of brucellosis has been officially established in sheep or goats, blood should be sampled from all animals of the respective herd, with the exception of suckling lambs, and examined in accordance with Annex C to Directive 64/432/EEC. Where an outbreak of brucellosis has been officially established in sheep or goats, examinations according to Annex C to Council Directive 64/432/EEC may be ruled to determine the degree of infection in the herd of sheep or goats. The same applies to horses, dogs and other animals susceptible to the disease if they are or were kept together with sheep or goats of the herd affected in the same stable or on the same site. In addition, submission of expelled or dead foetuses, of stillborn lambs or parts of these and of placental parts for examination for brucellosis may be ruled.

Methods of sampling (description of sampling techniques)

Since 1 January 1960: Examination of the blood of all cattle aged more than 12 months, at 2-year intervals each or, in herds including a minimum of 30 per cent dairy cows regularly supplying milk, twice yearly at intervals of at least 3 months, examination of milk from single milkings, milk churns, or bulk milk.

Case definition

A case of brucellosis in cattle, swine, sheep and goats is defined as a case that has been established by bacteriological or serological methods of examination.

Diagnostic/analytical methods used

For bacteriological examination, methods common for this purpose should be used. With regard to the performance of serological an allergic tests, the methods referred to Annex C to Council Directive 64/432/EEC shall apply.

Other preventive measures than vaccination in place

Protective measures after official establishment of disease: Where an outbreak of brucellosis or suspected brucellosis has been officially established in cattle, blood should be sampled from all animals of the respective cattle herd being older than 12 months and examined in accordance with Annex C to Council Directive 64/432/EEC. Such examination may also be ruled for horses, dogs, and other animals susceptible to the disease if they are or were kept together with cattle of the herd affected in the same stable or on the same site, as well as for cattle below 12 months of age. Exceptions may be permitted for cattle kept exclusively for fattening, if not opposed by reasons of epizootics control. In addition, submission of expelled or dead foetuses, of stillborn animals or parts of these and of placental parts for examination for brucellosis may be ruled.

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

Where an outbreak of brucellosis or suspected brucellosis has been officially established in other domestic animals except cattle, swine, sheep and goats, the same protective measures may be ruled for infected and suspect animals as stipulated for protection against brucellosis in cattle, swine, sheep and goats.
Outbreaks officially established in 2004: cattle: 0, swine: 1, sheep or goats: 1
Evaluation of cases: According to Council Directive 64/432/EEC, Germany has been officially recognized as being free from brucellosis.

Table 2.1.3 Brucellosis in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive	B. suis	B. melitensis	B. abortus
Pigs			animals	6530	2			
Cattle (bovine animals)		mostly immunol. tested	animals	878753	6			

2.1.1 Bovine brucellosis

MANDATORY	CATTLE		
Number of herds under official control:		Number of animals under official control:	
	OBF bovine herds	**OBF bovine herds with status suspended**	**Bovine herds infected with brucellosis**
Status of herds at year end (a):			
New cases notified during the year (b):			
	Animals tested	**Animals suspected**	**Animals positive**
Notification of clinical cases, including abortions (c):	171713	0	0
	Units tested	**Units suspected**	**Units positive**
Routine testing (d1) - data concerning herds:	10546	0	0
Routine testing (d2) - number of animals tested:	456401	0	0
Routine testing (d3) - number of animals tested individually:			
		Herds suspected	**Herds confirmed**
Follow-up investigation of suspected cases: trace, contacts (e):			
	Animals tested	**Animals suspected**	**Animals positive**
Other routine investigations: exports (f):			
Other routine investigations: tests at AI stations (g):			
	All animals	**Positives**	**Contacts**
Animals destroyed (h):			
Animals slaughtered (i):			

VOLUNTARY	CATTLE		
	Animals tested	**Animals suspected**	**Animals positive**
Other investigations: imports (k):			
	Herds tested	**Herds suspected**	**Herds positive**
Other investigations: farms at risk (l):			
	Samples tested	**Brucella isolated**	
Bacteriological examination (m):(1)			

(1) : herds

The following amendments were made :

Date of modification	Zoonose	Column	Old value	New value
2005-08-09	Notification of clinical cases, including abortions (c)	Animals tested		171713
	Notification of clinical cases, including abortions (c)	Animals suspected		0
	Notification of clinical cases, including abortions (c)	Animals positive		0
	Routine testing (d1) - data concerning herds:	Units tested		10546
	Routine testing (d1) - data concerning herds:	Units suspected		0
	Routine testing (d1) - data concerning herds:	Units positive		0
	Routine testing (d2) - number of animals tested:	Units tested		456401
	Routine testing (d2) - number of animals tested:	Units suspected		0
	Routine testing (d2) - number of animals tested:	Units positive		0

2.7. YERSINIOSIS

2.7.1. General evaluation of the national situation

2.7.2. Yersiniosis in humans

A. Yersinosis in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act)

Case definition

(in German) Yersinia enterocolitica, darmpathogen (Yersiniose)
ICD10: A04.6 Enteritis durch Yersinia enterocolitica
Klinisches Bild
Klinisches Bild einer akuten Yersiniose, definiert als mindestens eines der fünf folgenden Symptome:
- Durchfall,
- krampfartige Bauchschmerzen (Pseudoappendizitis),
- Tenesmen (schmerzhafter Stuhldrang),
- Erbrechen,
- Fieber.

Zusatzinformation
In der Folge kommt es oft zu extraintestinalen Reaktionen (z.B. Erythema nodosum, Arthritis), die aber
keine Kriterien für eine akute Yersiniose sind. Diese sind nicht melde- und übermittlungspflichtig.
ICD10: A28.2 Extraintestinale Yersiniose
Labordiagnostischer Nachweis
Positiver Befund mit der folgenden Methode:
[direkter Erregernachweis:]
- Erregerisolierung (kulturell).

Zusatzinformationen
- Das Ergebnis der Bestimmung humanpathogener Serotypen und Pathogenitätsfaktoren sollte übermittelt werden.
- Neben Y. enterocolitica gibt es auch andere darmpathogene Arten der Gattung Yersinia wie z.B.
Y. pseudotuberculosis, die nach den gesetzlichen Bestimmungen nicht meldepflichtig sind.

Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der drei folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:
Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim
Menschen durch
- Mensch-zu-Mensch-Übertragung ODER

- gemeinsame Expositionsquelle (z.B. Tierkontakt, Lebensmittel).

Kontakt mit einem labordiagnostisch nachgewiesen infizierten Tier oder seinen Ausscheidungen.

Verzehr eines Lebensmittels (inkl. Trinkwasser), in dessen Resten Y. enterocolitica labordiagnostisch
nachgewiesen wurde.
Inkubationszeit ca. 3-10 Tage.

Notification system in place

yes

History of the disease and/or infection in the country

Incidence relatively stable over the recent years

Relevance as zoonotic disease

yes

Additional information

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

Yersinia	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
	11191	13.6	9851	11.9	262	0.39
Y. enterocolitica	6182	7.5	5429	6.6	152	0.2
Y. enterocolitica O:3	4683	5.7	4135	5.0	100	0.1
Y. enterocolitica O:9	326	0.4	287	0.3	10	0.09

Footnote

0.09 means <0.1

Table 8.3.B Yersiniosis in man - age distribution

Age Distribution	Y. enterocolitica			Yersinia spp.		
	All	M	F	All	M	F
<1 year	158	86	72			
1 to 4 years	2160	1159	1000			
5 to 14 years	1724	949	775			
15 to 24 years	593	371	222			
25 to 44 years	681	367	314			
45 to 64 years	569	277	292			
65 years and older	297	143	154			
Age unknown						
Total :	6182	3352	2829	0	0	0

Table 8.3.C Yersiniosis in man - seasonal distribution

Month	Y. enterocolitica	Yersinia spp.
	Cases	Cases
January	545	
February	460	
March	420	
April	380	
May	444	
June	524	
July	608	
August	574	
September	668	
October	541	
November	556	
December	462	
not known		
Total :	6182	0

2.7.3. Yersinia in foodstuffs

A. Yersinia spp. in food

Monitoring system

Sampling strategy

cf. Salmonella

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

Meat, except poultry, was examined minor frequently (226 samples) than in the previous year (2003: 478), except from pig meat where nearly the same number of samples has been investigated (2004: 177). Yersinia enterocolitica was detected in more cases in 38.9 % of samples (2003: 3.1 %). The resulting confidence interval in red meat is 32.58 % - 45.30 % (95 % confidence level). Based on data comparable to those of the previous year (1.58 % - 4.70 %), there is no overlapping of these ranges, i.e. a significant increase regarding that under 385 samples were reported in 2004. Also for pig meat high percentages has been recorded with 52.9 % (2003: 8.0 %).

Table 8.2 Yersinia enterocolitica in food

	Source of information	Remarks	Epidemiological unit	Sample weight	Units tested	Units positive	Y. enterocolitica	Y. enterocolitica O:3	Y. enterocolitica O:9
Bovine meat	food under the official sampling plan		samples		34	18			
fresh									
- at retail	food under the official sampling plan		samples		1	0			
meat products									
- at processing plant (1)	food under the official sampling plan		samples		26	0			
- at retail (2)	food under the official sampling plan		samples		104	0			
Pig meat	food under the official sampling plan		samples		54	1		1	
fresh									
- at processing plant	food under the official sampling plan		samples		16	1		1	
- at retail	food under the official sampling plan		samples		36	0			
Poultry meat	food under the official sampling plan		samples		10	0			
fresh									

- at retail	food under the official sampling plan		samples		10	0			
meat products									
- at processing plant	food under the official sampling plan		samples		58	3			
- at retail	food under the official sampling plan		samples		15	0			
cow milk									
raw	food under the official sampling plan	at farm	samples		3	0			
Dairy products	food under the official sampling plan	made from treated milk	samples		8	0			
Fishery products	food under the official sampling plan		samples		10	0			
red meat	food under the official sampling plan		samples		57	1		1	

(1) : no information on animal source
(2) : no information on animal source

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-09-14	red meat	Units tested	226	57
	red meat	Units positive	88	1
	Poultry meat	Units tested	12	10
	Poultry meat	Units positive	1	0
	Bovine meat - fresh - at retail	Units tested	34	1
	Bovine meat - fresh - at retail	Units positive	18	0
	Pig meat - fresh - at retail	Units tested	159	36
	Pig meat - fresh - at retail	Units positive	63	0
	Poultry meat - fresh - at retail	Units tested	12	10
	Poultry meat - fresh - at retail	Units positive	1	0
	cow milk - raw	Units tested	53	3
	cow milk - raw	Units positive	7	0
	Fishery products	Units tested	11	10
2005-09-14	Pig meat	Units tested	177	54
	Pig meat	Units positive	64	1
	Bovine meat - meat products - at processing plant	Source of information	food under the official sampling plan	food under the official sampling plan
	Bovine meat - meat products - at retail	Units tested	188	104
	Bovine meat - meat products - at retail	Units positive	58	0
	red meat	Y. enterocolitica O:3		1

2.7.4. Yersinia in animals

A. Y. enterocolitica in animal

Monitoring system

Sampling strategy

no defined regulation on monitoring.

Table 8.1 Yersinia enterocolitica in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Y. enterocolitica	Y. enterocolitica O:9	Y. enterocolitica O:3
Cattle (bovine animals)		animals		8483	77	13	
Sheep		animals		894	1		
Goats		animals		260	0		
Pigs		animals		6751	63		5
Solipeds		animals		1623	0		
Poultry		animals		1890	0		
Pet animals							
dogs		animals		1703	19		1
cats		animals		1063	1		1

2.8. TRICHINELLOSIS

2.8.1. General evaluation of the national situation

A. Trichinellosis General evaluation

History of the disease and/or infection in the country

Raw pork or game meat as source of infections

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

Single infections as imported cases, outbreaks are rare

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

Very low (regarding autochthonous cases)

Recent actions taken to control the zoonoses

Meat inspection

2.8.2. Trichinellosis in humans

A. Trichinellosis in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act) (cf. Salmonella)

Case definition

(in German) Trichinella spiralis (Trichinellose), syn. Trichinose
ICD10: B75 Trichinellose (Infektion durch Trichinella-Arten, Trichinose)
Klinisches Bild
Klinisches Bild einer akuten Trichinellose, definiert als mindestens zwei der fünf folgenden Kriterien:
- Eosinophilie,
- Durchfall,
- Fieber,
- Muskelschmerzen,
- periorbitales Ödem (Schwellung um die Augenhöhle).

Labordiagnostischer Nachweis
Positiver Befund mit mindestens einer der beiden folgenden Methoden:
[direkter Erregernachweis:]
- Mikroskopischer Nachweis von Trichinella-Larven in einer Muskelbiopsie,

[indirekter (serologischer) Nachweis:]
- IgM- ODER IgG-Antikörpernachweis (deutliche Änderung zwischen zwei Proben ODER einmaliger
deutlich erhöhter Wert, z.B. ELISA, IFT).

Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der beiden folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:
Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim
Menschen durch
- gemeinsame Expositionsquelle (z.B. Verzehr potentiell kontaminierter Lebensmittel).

Verzehr eines Lebensmittels, in dessen Resten Trichinella spiralis labordiagnostisch nachgewiesen
wurde.
Inkubationszeit ca. 5-45 Tage.

Diagnostic/analytical methods used

Diagnostic/analytical methods used: serology, muscle biopsy (rare)

Notification system in place

yes

History of the disease and/or infection in the country

Very few cases, most of them imported

Results of the investigation

1-10 cases annually

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

Role of risk areas where the domestic cycle still exists in pigs

Relevance as zoonotic disease

Very few cases, most of them imported

Additional information

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
Trichinella	5	0.09	0	0	4	0
Trichinella spp.	5	0.09		0	4	0

Footnote

no data on autochtone cases/inc

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-09-14	Trichinella spp.	Imported cases		4
	Trichinella spp.	Imported Inc	1	0
2005-09-14	Trichinella spp.	Autochtone Inc	4	0

Table 4.2.B Trichinellosis in man - age distribution

Age Distribution	Trichinella spp.		
	All	M	F
<1 year			
1 to 4 years			
5 to 14 years			
15 to 24 years	1		1
25 to 44 years	3	1	2
45 to 64 years	1	1	
65 years and older			
Age unknown			
Total :	5	2	3

2.8.3. Trichinella in animals

A. Trichinella in pigs

Monitoring system

Sampling strategy

Routine meat inspection

Frequency of the sampling

Other: Each pig has to be examined

Type of specimen taken

Other: diaphragm pillar

Methods of sampling (description of sampling techniques)

Artificial digestion, trichinoscopy

Case definition

Detection of Trichinella muscle larvae

Diagnostic/analytical methods used

Specification of isolate by PCR (reference laboratory)

Vaccination policy

no

Other preventive measures than vaccination in place

no

Control program/mechanisms

The control program/strategies in place

yes

Recent actions taken to control the zoonoses

Not relevant

Suggestions to the Community for the actions to be taken

Not relevant

Measures in case of the positive findings or single cases

Animal carcass subjected to destroy

Notification system in place

yes

Results of the investigation

Positive findings very rare (in 2003 1 pos. pig out of 42 Mio. slaughtered)

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

German pigs are considered to be free, problems may occur under outdoor conditions

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

no

B. Trichinella in horses

Monitoring system

Sampling strategy

Routine meat inspection

Frequency of the sampling

Every slaughtered animal is sampled

Type of specimen taken

Other: diphragm pillar, tongue or masseter

Methods of sampling (description of sampling techniques)

Artificial digestion

Case definition

Detection of Trichinella muscle larvae

Diagnostic/analytical methods used

Specification of isolate by PCR (reference laboratory)

Vaccination policy

no

Other preventive measures than vaccination in place

no

Control program/mechanisms

The control program/strategies in place

yes

Recent actions taken to control the zoonoses

Not relevant

Suggestions to the Community for the actions to be taken

Not relevant

Measures in case of the positive findings or single cases

Destroy caecass

Notification system in place

yes

Results of the investigation

No findings

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

Horses are considered to be free

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

no

C. Trichinella spp. in animal

Monitoring system

Sampling strategy

Animal species: wild animals: wild boar and other game
Sampling strategy: routine meat inspection

Frequency of the sampling

Each animal has to be examined

Type of specimen taken

Other: Diaphragm, foreleg

Methods of sampling (description of sampling techniques)

Artificial digestion or trichinoscopy

Case definition

Detection of Trichinella muscle larvae

Diagnostic/analytical methods used

Specification of isolate by PCR (reference laboratory)

Vaccination policy

no

Other preventive measures than vaccination in place

no

Control program/mechanisms

The control program/strategies in place

yes

Recent actions taken to control the zoonoses

Education of hunters

Suggestions to the Community for the actions to be taken

Need to enforce meat inspection in game

Measures in case of the positive findings or single cases

Destroy carcass

Notification system in place

yes

Results of the investigation

Prevalence in wild boars ca. 0.002% in 2003

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

Game (wild boar meat) can be a source for human infection

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

yes

Table 4.1 Trichinella in animals

	Source of information	Remarks	Epidemiological unit	Animals tested	Animals positive
Wildlife					
wild boars		spiralis	animals	102726	1
foxes			animals	5653	0

2.9. ECHINOCOCCOSIS

2.9.1. General evaluation of the national situation

2.9.2. Echinococcosis in humans

A. Echinococcus spp in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act)

Case definition

no

History of the disease and/or infection in the country

Has only been notifiable since 2001 most cases of E. granulosus are probably imported

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

	Cases	Cases Inc	Autochtone cases	Autochtone Inc	Imported cases	Imported Inc
Echinococcus	97	0.28	0	0	0	0
E. granulosus	66	0.1				
E. multilocularis	16	0.09				
Echinococcus spp.	15	0.09				

Footnote

0.09 means <0.1

Table 9.2.B Echinococcosis in man - age distribution

Age Distribution	E. granulosus			E. multilocularis			Echinococcus spp.		
	All	M	F	All	M	F	All	M	F
<1 year									
1 to 4 years									
5 to 14 years	2	1	1				2	1	1
15 to 24 years	11	2	8	2	1	1	14	4	9
25 to 44 years	27	12	13	4	0	4	34	14	18
45 to 64 years	14	7	7	5	4	1	23	12	11
65 years and older	11	4	7	5	1	4	23	7	16
Age unknown	1	1					1	1	
Total :	66	27	36	16	6	10	97	39	55

Footnote

Echinococcus sp. means all Echinococcus

2.9.3. Echinococcus in animals

A. Echinococcus spp. in animal

Monitoring system

Sampling strategy

no defined regulation on monitoring.

Table 9.1 Echinococcus sp. in animals

	Source of information	Remarks	Epidemiological unit	Units tested	E. granulosus	Echinococcus spp.	E. multilocularis
Pet animals							
dogs		animals		175		0	
cats		animals		88		2	2
Wildlife							
foxes		animals		5398		1324	1091

2.10. TOXOPLASMOSIS

2.10.1. General evaluation of the national situation

2.10.2. Toxoplasmosis in humans

A. Toxoplasmosis in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act) only for congenital cases

Case definition

no

History of the disease and/or infection in the country

Seroepidemiological surveys show high prevalence among adults, numbers of congenital cases are low

Additional information

Table 10.2.A Toxoplasmosis in man - species/serotype distribution

Toxoplasma	Cases	Cases Inc
	0	0
Toxoplasma spp.		
congenital cases	16	0.09

Footnote

0.09 means <0.1; only congenital cases are notifiable

2.10.3. Toxoplasma in animals

A. Toxoplasma spp. in animal

Monitoring system

Sampling strategy

no defined regulation on monitoring, notifiable without official measures

Table 10.1 Toxoplasma gondii in animals

	Source of information	Remarks	Epidemiological unit	Units tested	Units positive
Cattle (bovine animals)			animals	424	5
Sheep			animals	347	9
Goats			animals	51	2
Pigs			animals	614	0
Solipeds			animals	52	0
Pet animals					
dogs			animals	301	1
cats			animals	661	10

2.11. RABIES

2.11.1. General evaluation of the national situation

A. Rabies General evaluation

Recent actions taken to control the zoonoses

Oral vaccination were performed with foxes in 2004 in 5 Laender: NW, RP, HE, BW, BY

2.11.2. Rabies in humans

A. Rabies in humans

Reporting system in place for the human cases

Mandatory (Communicable Diseases Law Reform Act)

Case definition

(in German) Rabiesvirus, Lyssa-Virus (Tollwut)
ICD10: A82.- Tollwut [Rabies],
A82.0 Wildtier-Tollwut,
A82.1 Haustier-Tollwut,
A82.9 Tollwut, nicht näher bezeichnet
Klinisches Bild
Klinisches Bild der Tollwut, definiert als mindestens zwei der sieben folgenden Kriterien:
- Schmerzen oder Parästhesien (Empfindungsstörungen) im Körperteil der Bissstelle,
- Erregtheit mit Spasmen der Schluckmuskulatur,
- Lähmungen,
- Delirien,
- Krämpfe,
- Angstzustände,
- Hydrophobie (Wasserscheu).

Labordiagnostischer Nachweis:
Positiver Befund mit mindestens einer der drei folgenden Methoden:
[direkter Erregernachweis:]
- Virusisolierung,
- Nukleinsäure-Nachweis (z.B. PCR),
- Antigennachweis (z.B. direkte Immunfluoreszenz).

Zusatzinformation
Der direkte Erregernachweis zu Lebzeiten gelingt nur in etwa der Hälfte der Fälle. Ein negativer Befund
schließt eine Tollwut-Infektion keineswegs aus.
Epidemiologische Bestätigung
Epidemiologische Bestätigung, definiert als mindestens einer der beiden folgenden Nachweise unter
Berücksichtigung der Inkubationszeit:
Kontakt mit einem labordiagnostisch nachgewiesen infizierten Tier oder seinen Ausscheidungen.
Epidemiologischer Zusammenhang mit einer labordiagnostisch nachgewiesenen Infektion beim
Menschen durch
- gemeinsame Expositionsquelle (z.B. Tierkontakt).

Inkubationszeit wenige Tage bis 8 Wochen, selten bis zu 7 Jahren.

Notification system in place

yes

History of the disease and/or infection in the country

1 imported case in 2004,
1 imported case in 1996, no cases 1997-2003

2.11.3. Lyssavirus (rabies) in animals

A. Rabies virus in animal

Monitoring system

Diagnostic/analytical methods used

Specific method(s) of detection: Cell culture, immunofluorescence

Other preventive measures than vaccination in place

Protective measures after official establishment of disease: The responsible authority may order immediate killing and safe disposal of animals suspected of having contracted the disease. In the case of dogs and cats, the authority should order killing and safe disposal of such animals. Alternatively, the responsible authority may order, in the case of dogs and cats suspected of being affected by the disease, instead of their killing and safe disposal, official observation until confirmation or removal of such suspicion, if such animals have bitten a person or prove to be effectively protected by vaccination.
Persons holding a hunting licence should take care that wildlife animals suspected of being affected by the disease are immediately hunted, killed and safely disposed of without delay. Specimens needed for examinations to establish rabies are exempt from the obligation of safe disposal. If an outbreak of rabies has been officially established in a fox, or if it has been confirmed otherwise that rabies is propagated by foxes, the responsible authority will order intensified hunting and oral immunization of foxes where an areas has been declared to be at risk, or where there is a threat of an importation of rabies into a rabies-free area. Taking into account local conditions, the responsible authority will declare an area to be a risk area having a minimum extension of 5000 km², or a radius of at least 40 km around the site where a rabid animal was kept, hunted, killed, or found. Such declaration will be officially announced.

Results of the investigation

Outbreaks officially established in 2004: 48; out of these: 1 domestic animal; out of these: 1 dog; 47 wild animals; out of these: 3 deers, 27 foxes, 1 marten, 2 badgers and 14 bats.

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

Evaluation of cases: Compared to the years 2002 and 2003, the number of rabies cases increased in 2004 (2003: 37 cases, 2002: 43 cases). Out of the 48 cases established in 2004, 14 had been caused by infections with EBL 1 and 2 (bat rabies) that occurred in 4 Federal States. In 2004, sylvatic rabies affected the Federal States Hesse and Baden- Wuerttemberg. In Lower Saxony one imported dog had been officially confirmed rabies positive. The Federal States of Berlin, Brandenburg, Bremen, Hamburg, Mecklenburg-Western Pomerania, Lower Saxony, Rhineland-Palatinate, Saxony, Saxony-Anhalt, Schleswig-Holstein, Thuringia and Saarland have been officially recognized as free from terrestrial rabies. Terrestrial rabies has no longer been detected in Bavaria in 2003 and in North Rhine- Westphalia since 2001.

Table 5.1 Rabies in animals

	Source of information	Remarks	Animals tested	Animals positive
Wildlife				
bats	offical notification			14
foxes	offical notification			27
all	offical notification			47
badgers	offical notification			2
marten	offical notification			1
deer	offical notification			3
Pet animals				
dogs	offical notification			1
all animals	offical notification		26550	

The following amendments were made :

Date of modification	Species	Column	Old value	New value
2005-09-20	all animals	Source of information		offical notification
	all animals	Animals tested		26550

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1. E. COLI INDICATORS

3.1.1. General evaluation of the national situation

3.1.2. Antimicrobial resistance in *Escherichia coli* isolates

4. FOODBORNE OUTBREAKS

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

A. Foodborne outbreaks

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

Since the year 2001, in the German surveillance system case-based data are entered in the local public health units and forwarded electronically via the state health authorities ('Bundesländer') to the Robert Koch institute (RKI) using a SQL database developed by the RKI. Outbreak reporting is integrated into this system by linking individual cases into groups with a common outbreak code. On the local level, data is entered in a standardised way describing the place and the suspected source of the outbreak and the degree of evidence. Multiple local outbreaks can be linked to meta-outbreaks, allowing multi-states 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. The investigation of local outbreaks is the responsibility of the local health department,. However, they can ask the state health authorities or RKI for assistance

Description of the types of outbreaks covered by the reporting:

Outbreaks are defined as two or more linked cases including at least one laboratory confirmed case. All outbreaks due to pathogens that are usually transmitted by food are listed (without the evidence that they were really foodborne). Germany does not distinguish between Family and General Outbreaks

National evaluation of the reported outbreaks in the country:

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

most important pathogen is Salmonella, the involved vehicle is only rarely identified. The numbers of outbreaks due to Norovirus, Campylobacter and Hepatitis A have increased.

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

very few data; information from outbreak investigations

Evaluation of the severity and clinical picture of the human cases

few data available

Descriptions of single outbreaks of special interest

o Outbreak of hepatitis A due to bakery products
o Outbreak of hepatitis A in tourists returning from Egypt
o Disperse outbreak of S. Give attributed to minced pork
o Disperse outbreak of S. Goldcoast attributed to various raw pork products
o Local outbreak of S. Paratyphi acquired in Germany attributed to an infected food-handler
o Local outbreak of S. Typhi acquired in Germany
For details see the Annual Report on the Epidemiology of Notifiable Infectious Diseases (in Germany) for the Year 2004: www.rki.de >Infektionsschutz >Jahrbuch >2004

Control measures or other actions taken to improve the situation

improved collaboration of the authorities involved in outbreak investigation

Table 12. Foodborne outbreaks in humans

Causative agent	General outbreak	Family outbreak	Total Number in persons			Source			Type of evidence	Location of exposure	Contributing factors
			ill	died	in hospital		Suspected	Confirmed			
1	2	3	4	5	6	7			8	9	10
Salmonella	1991		8430								
Campylobacter	557		1391								
Salmonella - S. Enteritidis	1		124							Community event in Southern Germany	
Salmonella - S. Enteritidis(1)	24		720			bakery products				Kindergarten, restaurant, marriage, shiptravel to Scotland	
Salmonella - S. Infantis	1									hospital kindergarten	
Salmonella - S. Brandenburg	1					meat products				Holiday hotel	
Pathogenic Escherichia coli - Verotoxigenic E. coli (VTEC)(2)	36		92								
Yersinia - Y. enterocolitica	36		94								

(1) : at least 720 diseases
(2) : EHEC-diseases