

AUSTRIA

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

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

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

IN 2008

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Austria**

Reporting Year:

Laboratory name	Description	Contribution
Central Veterinary Services	Federal Ministry of Health	Data concerning notifiable zoonoses in animals; Revision of the draft of the Trend Report; Approval of the Trend Report for Submission
Food Office	Federal Ministry of Health	Revision of the draft of the Trend Report
DG Public Health	Federal Ministry of Health	Revision of the draft of the Trend Report
Feed Office	Federal Ministry of Agriculture, Forestry, the Environment and Water Management	Revision of the draft of the Trend Report
Provincial Veterinary Services	9 provinces, one Veterinary Service per province	Data concerning notifiable zoonoses in animals
Regional Health Boards	One Regional Health Board per province	Collection of the data concerning food borne outbreaks
Statistics Austria	The independent and non-profit-making federal institution, Statistics Austria, provides data on the economy, demography, environment and social and cultural situation in Austria to federal bodies. Federal agencies can then implement controlling measures in the scientific community, business and public institutions.	Demographic and livestock census data
Competence Centre for Infectious Disease Epidemiology (CC-INFE)	Austrian Agency for Health and Food Safety, AGES	Compilation, validation, data entry and submission of the Zoonoses Trend Report

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Laboratory name	Description	Contribution
Data, Statistics and Risk Assessment	Austrian Agency for Health and Food Safety, AGES	Analysis of laboratory results for antimicrobial resistance of <i>Campylobacter</i> spp. <i>Enterococcus faecalis/faecium</i> and <i>E. coli</i>
Human Medicine	Austrian Agency for Health and Food Safety, AGES	Data entry into internal data base concerning all cases notified as foodborne disease
National Reference Centre for <i>Salmonella</i> Institute for Medical Microbiology and Hygiene, (IMED), Graz	Austrian Agency for Health and Food Safety, AGES	Data concerning salmonellosis in feedingstuff, animals, foodstuff and humans
National Reference Laboratory for <i>Campylobacter</i> , Institute for Medical Microbiology and Hygiene, (IMED), Graz	Medical University of Graz	Data concerning campylobacteriosis in humans
National Reference Centre for Tuberculosis, Institute for Medical Microbiology and Hygiene (IMED), Vienna	Austrian Agency for Health and Food Safety, AGES	Data concerning mycobacteriosis in humans
National Reference Center for EHEC (VTEC) Department of Hygiene, Microbiology and Social Medicine, Division of Hygiene & Medical Microbiology	Innsbruck Medical University	Data concerning VTEC and listeriosis in humans
National Reference Centre for Listeria Institute for Medical Microbiology and Hygiene (IMED), Vienna	Austrian Agency for Health and Food Safety, AGES	Data concerning listeriosis in humans

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Laboratory name	Description	Contribution
National Reference Laboratory for Yersinia, analyse BioLab limited company (GmbH)	Limited Liability Corporation of Elisabethinen Linz, MBB BioLab limited company (GmbH) and AGES	Data concerning yersiniosis in humans
National Reference Laboratory for Toxoplasmosis, Echinococcosis, Toxocarosis and other Parasitic Diseases, Clinical Institute for Hygiene and Medical Microbiology	Medical University of Vienna	Data concerning parasitic diseases in humans
National Reference Laboratory for Brucellosis, Institute for Veterinary Disease Control, (IVET), Moedling	Austrian Agency for Health and Food Safety, AGES	Data concerning brucellosis in animals and humans
National Reference Laboratory for Rabies, Institute for Veterinary Disease Control, Moedling	Austrian Agency for Health and Food Safety, AGES	Data concerning rabies
Official Food Control Laboratories (ILMU)	Austrian Agency for Health and Food Safety, AGES; Laboratories in Graz, Innsbruck, Linz, Salzburg and Vienna	Data concerning investigations in foodstuffs
Food Safety Department of the City of Vienna	Regional Food Laboratory	Data concerning investigations in foodstuffs
Institute for Environment and Food Safety of the State of Vorarlberg	Regional Food Laboratory	Data concerning investigations in foodstuffs
Carinthian Institute for Food Analysis and Quality Control	Regional Food Laboratory	Data concerning investigations in foodstuffs

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Laboratory name	Description	Contribution
National Reference Laboratory for Tuberculosis in Animals, Institute for Veterinary Disease Control, Moedling	Austrian Agency for Health and Food Safety, AGES	Data concerning tuberculosis in animals
National Reference Laboratory for Trichinellosis in Animals, Institute for Veterinary Disease Control, (IVET), Innsbruck	Austrian Agency for Health and Food Safety, AGES	Data concerning trichinellosis in animals
Institutes for Veterinary Disease Control (IVET)	Austrian Agency for Health and Food Safety, AGES; Laboratories in Graz, Innsbruck, Linz and Moedling	Data concerning investigations in animals; bacteriological investigation in slaughtered animals
Carinthian Institute for Veterinary Disease Control, Ehrental	Regional Veterinary Laboratory	Data concerning investigations in animals
Austrian Poultry Health Service (QGV)	Association installed by law, running different programs e.g. salmonella control and hygiene programs, Control of veterinarians and poultry farmers	Data concerning the Austrian poultry industry
Institute for Agricultural Analysis, Linz	Austrian Agency for Health and Food Safety, AGES	Data concerning feeding stuff

PREFACE

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

The report contains information on trends and sources of zoonoses and zoonotic agents in Austria during the year 2008 .

The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal bacteria as well as information on epidemiological investigations of foodborne outbreaks. Complementary data on susceptible animal populations in the country is also given. The information given covers both zoonoses that are important for the public health in the whole European Community as well as zoonoses, which are relevant on the basis of the national epidemiological situation.

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

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

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

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

List of Contents

1	ANIMAL POPULATIONS	1
2	INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS	7
2.1	SALMONELLOSIS	8
2.1.1	General evaluation of the national situation	8
2.1.2	Salmonellosis in humans	10
2.1.3	Salmonella in foodstuffs	14
2.1.4	Salmonella in animals	31
2.1.5	Salmonella in feedingstuffs	57
2.1.6	Salmonella serovars and phagetype distribution	73
2.1.7	Antimicrobial resistance in Salmonella isolates	92
2.2	CAMPYLOBACTERIOSIS	137
2.2.1	General evaluation of the national situation	137
2.2.2	Campylobacteriosis in humans	139
2.2.3	Campylobacter in foodstuffs	141
2.2.4	Campylobacter in animals	146
2.2.5	Antimicrobial resistance in Campylobacter isolates	153
2.3	LISTERIOSIS	183
2.3.1	General evaluation of the national situation	183
2.3.2	Listeriosis in humans	185
2.3.3	Listeria in foodstuffs	187
2.3.4	Listeria in animals	203
2.4	E. COLI INFECTIONS	205
2.4.1	General evaluation of the national situation	205
2.4.2	E. coli infections in humans	207
2.4.3	Escherichia coli, pathogenic in foodstuffs	209
2.4.4	Escherichia coli, pathogenic in animals	216
2.5	TUBERCULOSIS, MYCOBACTERIAL DISEASES	224
2.5.1	General evaluation of the national situation	224
2.5.2	Tuberculosis, mycobacterial diseases in humans	225
2.5.3	Mycobacterium in animals	227
2.6	BRUCELLOSIS	236
2.6.1	General evaluation of the national situation	236
2.6.2	Brucellosis in humans	237
2.6.3	Brucella in foodstuffs	239
2.6.4	Brucella in animals	240
2.7	YERSINIOSIS	250
2.7.1	General evaluation of the national situation	250
2.7.2	Yersiniosis in humans	251
2.7.3	Yersinia in foodstuffs	252
2.7.4	Yersinia in animals	255

2.8	TRICHINELLOSIS	256
2.8.1	General evaluation of the national situation	256
2.8.2	Trichinellosis in humans	257
2.8.3	Trichinella in animals	258
2.9	ECHINOCOCCOSIS	263
2.9.1	General evaluation of the national situation	263
2.9.2	Echinococcosis in humans	264
2.9.3	Echinococcus in animals	266
2.10	TOXOPLASMOSIS	269
2.10.1	General evaluation of the national situation	269
2.10.2	Toxoplasmosis in humans	270
2.10.3	Toxoplasma in animals	271
2.11	RABIES	273
2.11.1	General evaluation of the national situation	273
2.11.2	Rabies in humans	274
2.11.3	Lyssavirus (rabies) in animals	275
2.12	Q-FEVER	281
2.12.1	General evaluation of the national situation	281
2.12.2	Coxiella (Q-fever) in animals	281
3	INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL	283
3.1	ENTEROCOCCUS, NON-PATHOGENIC	284
3.1.1	General evaluation of the national situation	284
3.1.2	Antimicrobial resistance in Enterococcus, non-pathogenic isolates	284
3.2	ESCHERICHIA COLI, NON-PATHOGENIC	298
3.2.1	General evaluation of the national situation	298
3.2.2	Antimicrobial resistance in Escherichia coli, non-pathogenic isolates	299
4	INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS	311
4.1	HISTAMINE	312
4.1.1	General evaluation of the national situation	312
4.1.2	Histamine in foodstuffs	313
4.2	ENTEROBACTER SAKAZAKII	316
4.2.1	General evaluation of the national situation	316
4.2.2	Enterobacter sakazakii in foodstuffs	317
4.3	STAPHYLOCOCCAL ENTEROTOXINS	319
4.3.1	General evaluation of the national situation	319
4.3.2	Staphylococcal enterotoxins in foodstuffs	320
5	FOODBORNE OUTBREAKS	324

1. ANIMAL POPULATIONS

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

A. Information on susceptible animal population

Sources of information:

The independent and non-profit-making federal institution, Statistics Austria, provides data on the economy, demography, environment and social and cultural situation in Austria to federal bodies. Federal agencies can then implement controlling measures in the scientific community, business and public institutions. The data for this report are available from an online database established by Statistics Austria.

b) herds, flocks, holdings, stocks

Cattle: The number of holdings and animals is based on the official database for cattle.

Equids, Pigs, Sheep, Goats & Farmed Deer: The number of holdings and animals is based on the yearly full survey of the Veterinary Information System (VIS).

Poultry: The number of holdings and animals is based on a random sample survey performed by Statistics Austria (farm structure survey). The last random sample survey was performed 2007.

b) slaughterers

Cattle, Equids: The number of slaughterers is based on a monthly/yearly statistic of all examined slaughterers (reported by veterinarians), performed by Statistics Austria.

Pigs: The number of slaughterers is based on a monthly/yearly statistic of all examined slaughterers (reported by veterinarians), combined with not-examined slaughterers (out of pig-random-sample-surveys) performed by Statistics Austria.

Sheep & Goats: The number of slaughterers is based on an expert-model carried out by Statistics Austria.

Poultry: The number of slaughterers is based on a monthly/yearly full survey in poultry-slaughterhouses (only) performed by Statistics Austria.

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

All data are received from Statistics Austria.

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

Cattle: BGBI. II Nr. 391/2008 (Statistik über den Viehbestand im Jahr 2008)

Swine, Sheep and Goats: BGBI. II Nr. 166/2007 (Tierkennzeichnungs- und Registrierungsverordnung 2007)

Poultry: BGBI. II Nr. 310/2007 (Erstellung der Statistik über die Agrarstruktur und den Viehbestand im Jahr 2007)

Geographical distribution and size distribution of the herds, flocks and holdings

Pigs: 96.7% of all pigs are kept in 84.5% of the holdings that are located in the 4 provinces Carinthia, Lower Austria, Upper Austria and Styria;

Sheep: 72.7 % of the sheep holdings are located in the 4 provinces Lower Austria, Upper Austria, Styria and the Tyrol; 74.7% of the sheep are kept there.

Goats: 71.5 % of the goat holdings are located in the 4 provinces Lower Austria, Upper Austria, Styria and the Tyrol; 77.4% of the goats are kept there.

Additional information

Nil

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals		Year		Year		Year		Year
Cattle (bovine animals)	calves (under 1 year)			80670	2008	636469	2008		
	dairy cows and heifers			610304	2008	1098847	2008		
	in total			690974	2008	1997209	2008	75194	2008
	meat production animals					261893	2008		
Deer	farmed - in total					34443	2008	1794	2008
Ducks	elite breeding flocks			0		0		0	
	grandparent breeding flocks			0		0		0	
	in total					55765	2007	9864	2007
	parent breeding flocks			0		0		0	
Gallus gallus (fowl)	broilers					6845275	2007	1367	2007
	elite breeding flocks, unspecified - in total			0		0		0	
	grandparent breeding flocks, unspecified - in total			0		0		0	
	in total			65909719	2008	13570372	2007	58998	2007

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals		Year		Year		Year		Year
<i>Gallus gallus (fowl)</i>	laying hens					4994197	2007	56403	2007
Geese	elite breeding flocks			0		0		0	
	grandparent breeding flocks			0		0		0	
	in total			25379	2008	21877	2007	1971	2007
	parent breeding flocks			0		0		0	
Goats	animals over 1 year			9249	2008	51366	2008	8514	2008
	animals under 1 year			35787	2008	26330	2008	4816	2008
	in total			45036	2008	77655	2008	10278	2008
	milk goats					23671	2008	3204	2008
Pigs	breeding animals - unspecified - sows and gilts			111763	2008	300645	2008	9470	2008
	fattening pigs			5444745	2008	1129324	2008	30380	2008
	in total			5556508	2008	3172736	2008	39993	2008
Sheep	animals over 1 year			63515	2008	224341	2008	15274	2008
	animals under 1 year (lambs)			255406	2008	165371	2008	13486	2008

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals		Year		Year		Year		Year
Sheep	in total			318921	2008	389379	2008	15276	2008
	milk ewes					20816	2008	989	2008
Solipeds, domestic	horses - in total			903	2008	70008	2008	18845	2008
Turkeys	breeding flocks, unspecified - in total			0		0		0	
	elite breeding flocks			0		0		0	
	grandparent breeding flocks			0		0		0	
	in total			1899503	2008	568364	2007	1203	2007
	parent breeding flocks			0		0		0	

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

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

2.1 SALMONELLOSIS

2.1.1 General evaluation of the national situation

A. General evaluation

History of the disease and/or infection in the country

Human salmonellosis remains a major health problem in Austria. In 2008, the number of notified salmonellosis cases was the second highest reported pathogen after campylobacteriosis.

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

The incidence of human salmonellosis has significantly declined since the peak in 1998/1999. The salmonella-contamination of raw poultry meat has declined from 30% in 1999 to less than 7% in 2008. The consumption of eggs that are contaminated with Salmonella is presently the main source of human infection.

The number of salmonellosis cases presented in this report reflects the number of primary human isolates and respectively the number of laboratory confirmed cases sent to the National Reference Centre for Salmonella, n = 3,196. This number shows a reduction of 21% compared to the year 2007 and reflects the success of interventions aimed at combating salmonella. According to the Federal Ministry of Health, the official number of notified cases is 2,790 (aggregated cases, vorläufiger Jahresausweis über angezeigte Fälle übertragbarer Krankheiten 2008). 2,328 cases have been notified as single cases (see chapter 2. collection of human cases).

As compared to the number of notified cases of campylobacteriosis (see chapter campylobacteriosis), salmonella is the second most important cause for enteric diseases in Austria.

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

In 2008, data from feedingstuffs indicate that the prevalence of salmonella (<1%) is decreasing compared to previous years. The number of cases which test positive for Salmonella is highest in poultry. Therefore, poultry is considered the main source for human infection. Although only few eggs were positive for salmonella (1.2% of the total number of tested eggs), infected eggs pose the main source of human infections.

Recent actions taken to control the zoonoses

There were various programs implemented to control the contamination of Salmonella in poultry, most programs involved meat and egg production. The main effort of the intervention is directed toward improving the sanitation of breeding flocks and laying flocks according to EU legislation.

Suggestions to the Community for the actions to be taken

Continue the efforts already started, especially to improve harmonization of monitoring and control programs along the food chain.

2.1.2 Salmonellosis in humans

A. Salmonellosis in humans

Reporting system in place for the human cases

Human cases are reported to the Austrian Federal Ministry of Health from the Health Authorities. The system distinguishes between domestic and imported cases.

The number of salmonellosis cases presented in this report reflects the number of primary human isolates and respectively the number of laboratory confirmed cases sent to the National Reference Centre for *Salmonella*. Both numbers differ due to different sources.

Case definition

Clinical picture compatible with salmonellosis, e. g. diarrhoea, abdominal pain, nausea and sometimes vomiting. The organism may cause extraintestinal infections.

Laboratory criteria for diagnosis: Isolation of *Salmonella* spp. (non-typhi, non-paratyphi) from a clinical specimen.

Case classification

- Probable case: A laboratory confirmed isolate without clinical information or, a case with clinical symptoms that has an epidemiological link
- Confirmed case: A clinically compatible case that is laboratory confirmed

Diagnostic/analytical methods used

Bacteriology: Sample material is processed as described in Richtlinien für die Diagnostik von *Salmonellen* (Anonymus: Standardisierung und Qualitätssicherung in der mikrobiologischen Diagnostik. Richtlinien. Bundesministerium für Soziale Sicherheit und Generationen. ISBN 3-84123-126-0, Wien, 2001, pg. 11-12).

At the National Reference Centre for *Salmonella* (NRC *Salmonella*), all isolates are serotyped according to the Kauffmann-White-Scheme. And further all *S. Enteritidis* and *S. Typhimurium* isolates are phage typed according to the methods used by HPA, Colindale, UK. Additionally the antimicrobial resistance testing by disk diffusion method is performed with each isolate.

Notification system in place

Specialists in Laboratory Diagnosis or Microbiology and Hygiene and the attending physicians are required to report all *Salmonella* cases. Notification of salmonellosis according to the epidemic act has been mandatory since 1950 (BGBI. 1950/186 Epidemiegesetz, as amended). Since 2002, a note of the Federal Ministry for Social Security, Generations and Consumer Protection

(BMSK) has been implemented (Meldepflicht infektiöser Erkrankungen für Labors GZ: 21.700/5- VIII/D/5/02), in which medical doctors specialised in Laboratory Diagnosis or Microbiology and Hygiene are required to report all cases of Salmonella which are clinically verified.

The number of salmonellosis cases presented in this report reflects the number of primary human isolates and respectively the number of laboratory confirmed cases sent to the National Reference Centre for Salmonella.

History of the disease and/or infection in the country

In 1989 and 1990, human infections with salmonella increased markedly in Austria.

After a peak in 1992, the incidence of salmonella illness decreased, but the number of infections has remained at a high level until 2002. Since that year the number of laboratory confirmed cases of human Salmonella infections has decreased by 62% (2002: 8,405 primary isolates, 2008: 3,196 primary isolates).

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

In 2008, the number of laboratory confirmed cases of human Salmonella infections again decreased compared to the year before.

The proportion of S. Enteritidis, out of all Salmonella isolates, decreased in 2008 slightly to 68,5% (compared to 77% in 2007). The distribution and order of the three most common phage types (in 2007: PT8 (34%), PT4, (30%) and PT21 (15%)) are very similar, 2008, PT4 has been the most frequently (35%) identified, followed by PT8 (24%) and PT21 (19%). In 2007, the three most common phage types account for 78% of all S. Enteritidis strains, compared to 79% in 2007. The number of S. Typhimurium isolates reported remained more or less the same (n=374) compared to 2007 (n=354).

This represents 11.6% of all Salmonella spp. isolates from human stool samples.

In 2008, an increase of resistant isolates had been observed (see chapter 2.1.7.).

Table eggs are probably still the main source of human infections of S. Enteritidis.

Relevance as zoonotic disease

In 2008, the number of notified human cases of campylobacteriosis again exceeded the number of salmonellosis cases. It is believed that the reduction in the number of human salmonellosis cases is due to EU wide control programs and establishment of goals for the reduction of prevalences of salmonella in laying hen flocks and broilers.

Additional information

Annual report of the National Reference Center:

http://www.bmg.gv.at/cms/site/attachments/4/6/2/CH0954/CMS1237532383420/jb_salm_onellen_2008.pdf

Table Salmonella in humans - Species/serotype distribution

Salmonella	Cases	Cases Inc.	Autochth on cases	Autochth on Inc.	Imported cases	Imported Inc.	Unknown status
	3196	0	0	0	170	0	3026
S. Abony	17						17
S. Agona	24				3		21
S. Enteritidis	2200				131		2069
S. Hadar	26				1		25
S. Infantis	55				1		54
S. Kentucky	12				2		10
S. Montevideo	13						13
S. Muenchen	11						11
S. Napoli	16				1		15
S. Newport	23				2		21
S. Oranienburg	13				1		12
S. Rissen	11						11
S. Saintpaul	36						36
S. Senftenberg	10				2		8
S. Thompson	23						23
S. Typhimurium	374				6		368
S. Virchow	16				1		15
S. Paratyphi B var. Java	15				1		14
S. 1,4,5,12:i:-	95				4		91
Other serotypes	206				14		192

2.1.3 **Salmonella in foodstuffs**

A. *Salmonella* spp. in food

Monitoring system

Sampling strategy

Foodstuff was sampled according to the ordinance „Revisions- und Probenplan für das Jahr 2008 gemäß §31 LMSVG; Richtlinien über die Vollziehung der Überwachung des Verkehrs mit den durch das LMSVG erfassten Waren; Berichtsschema 2008“ (BMGFJ-75500/0247-IV/B/7/2007 von 08.01.2008) from the Federal Ministry of Health. This “Revisions- und Probenplan” is part of the multi-annual national control plan (2007-2010) according to Art. 41 ff of Regulation (EC) No 882/2004.

The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail outlets etc. that have to be sampled and tested randomly according to the number of food enterprises per province. Every business within Austria has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP concepts, control of manufacturing processes etc.

In 2008, approximately 40,000 samples were planned to be tested in Austria. About 60% (24,000) of these are planned samples (surveillance) and only these numbers are used in this report (data from suspect samples are not shown). These planned samples either consist of samples of the yearly sampling plan which determines the number of samples of each food category that have to be investigated randomly, e.g. raw meat (fresh or frozen); sausages; cheeses; milk; preserved food etc. There are different sampling stages where food samples are taken: e.g. from retail, processing plant, primary production.

In addition there is a monitoring plan for food items (40-45 campaigns per year). In the course of these programs food items of special interest for defined parameters – amongst others zoonotic agents – are investigated. The sampling takes place during a fixed period of time in order to gain in-depth information. In 2008, eight relevant food campaign programs were conducted throughout Austria (Schwerpunktprogramm 2008 BMGFJ-75500/0242-IV/B/7/2007). Details and results of these campaigns can be found in the respective chapters.

Diagnostic/analytical methods used

According to ISO 6579: 1999, with modifications: After preenrichment, selective enrichment in modified semisolid Rappaport-Vassiliadis or Diasalm, 18-24 hours at 42°C. Subsequently plating on XLD agar, Brilliant green-Phenolred-Lactose-Saccharose agar (BPLS), Salmonella Detection and Identification Medium (SMID) or Rambach agar.

25 g of raw material for egg products or 25 g of pooled content of 5 table eggs are either incubated directly or preenriched in peptone water. Further steps are performed as described above.

All isolates are sent to the NRL Salmonella and serotyped according to the Kauffmann-White-Scheme. All *S. Enteritidis* and *S. Typhimurium* isolates are phage-typed according to the methods used by HPA, Colindale, UK.

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

Salmonella spp. was detected in fresh single broiler meat samples in 6.4 % (23 out of 359), in 15% of fresh turkey meat samples (5/34), and in 1 out of 46 samples (2.2 %) of unspecified poultry meat fresh samples. In 2007, there was no *Salmonella* spp. sample found positive in 45 samples of cooked meat products of broilers, ready-to-eat. However, in 2008, 5.6% (10 out of 180) were found positive.

None of the tested bovine meat samples (0/127) tested positive. In all the pig meat samples (fresh and cooked), one of the 289 tested single samples (0.3 %) was found positive. In mixed meat samples (minced pig and bovine meat) 2 of the 130 samples tested were found positive (1.5%).

In 2008, 2,204 samples from milk, milk products and cheeses (all from cows', sheeps' or goats' milk) were tested for *Salmonella* spp. and no sample was found positive as in the year 2007. Out of the 89 sample units, each containing 25g of table eggs that were sampled and examined at packing centres or at retail level, no sample was tested positive for salmonella. 2 out of 49 (4%) samples from liquid egg products, were found positive (both *S. Enteritidis*).

B. *Salmonella* spp. in food - Other processed food products and prepared dishes - unspecified - ready-to-eat foods - chilled - at retail - Surveillance - official controls -

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.

Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

Investigation period: April - June

Type of specimen taken

Other processed food products and prepared dishes

Methods of sampling (description of sampling techniques)

Sample weight: 25g

Definition of positive finding

Detection of *Salmonella* spp. in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

105 samples tested, 0-times positive for *Salmonella* spp.

Additional information

Samples were also tested for *L. monocytogenes*

C. *Salmonella* spp. in food - Dairy products (excluding cheeses) - cream - made from pasteurised milk - at catering - Control and eradication programmes - official and

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.

Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

Investigation period: September – November

Type of specimen taken

Cream, made from pasteurised milk

Methods of sampling (description of sampling techniques)

Sample weight: 25g

Definition of positive finding

Detection of *Salmonella* spp. in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

96 samples tested, 0-times positive for *Salmonella* spp.

Additional information

Samples were also tested for *L. monocytogenes*

D. *Salmonella* spp. in food - Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - at retail - Surveillance - official controls - objective sampling

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.

Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

Investigation period: April - May

Type of specimen taken

Ice-cream, made from pasteurised milk

Methods of sampling (description of sampling techniques)

Sample weight: 25g

Definition of positive finding

Detection of *Salmonella* spp. in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

130 samples tested, 0-times positive for *Salmonella* spp.

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Agona	S. Derby	S. Enteritidis	S. Hadar	S. Indiana	S. Infantis
Meat from broilers (<i>Gallus gallus</i>) - carcass - chilled - - neck skin - Survey - EU baseline survey		animal	25g	408	10	0	0	2	0	0	1
Meat from broilers (<i>Gallus gallus</i>) - carcass - spent hens - at slaughterhouse - Surveillance - official controls - objective sampling		single	100cm ² skin	10	10	10					
Meat from broilers (<i>Gallus gallus</i>) - fresh - at cutting plant - Surveillance - official controls - objective sampling		single	25g	64	0						
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	295	23	2	1	3	2	1	3
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling		single	25g	180	10				6	2	
Meat from poultry, unspecified - fresh - at processing plant - Surveillance - official controls - objective sampling		single	25g	12	0						
Meat from poultry, unspecified - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	34	1						
Meat from poultry, unspecified - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls - objective sampling		single	10g	8	0						
Meat from poultry, unspecified - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling		single	10g	88	3				2	1	

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Agona</i>	<i>S. Derby</i>	<i>S. Enteritidis</i>	<i>S. Hadar</i>	<i>S. Indiana</i>	<i>S. Infantis</i>
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls - objective sampling		single	25g	7	0						
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling		single	25g	32	0						
Meat from turkey - fresh - at processing plant - Surveillance - official controls - objective sampling		single	25g	6	0						
Meat from turkey - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	28	5						

	<i>S. Kentucky</i>	<i>S. Kottbus</i>	<i>S. Montevideo</i>	<i>S. Newport</i>	<i>S. Ohio</i>	<i>S. Saintpaul</i>	<i>S. Senftenberg</i>	<i>S. Typhimurium</i>	<i>Salmonella</i> spp., unspecified
Meat from broilers (<i>Gallus gallus</i>) - carcass - chilled - neck skin - Survey - EU baseline survey	1	0	4	0	0	0	1	1	
Meat from broilers (<i>Gallus gallus</i>) - carcass - spent hens - at slaughterhouse - Surveillance - official controls - objective sampling									
Meat from broilers (<i>Gallus gallus</i>) - fresh - at cutting plant - Surveillance - official controls - objective sampling									
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail - Surveillance - official controls - objective sampling					1	4	2	4	
Meat from broilers (<i>Gallus gallus</i>) - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling									

Table Salmonella in poultry meat and products thereof

	S. Kentucky	S. Kottbus	S. Montevideo	S. Newport	S. Ohio	S. Saintpaul	S. Senftenberg	S. Typhimurium	Salmonella spp., unspecified
Meat from poultry, unspecified - fresh - at processing plant - Surveillance - official controls - objective sampling									
Meat from poultry, unspecified - fresh - at retail - Surveillance - official controls - objective sampling								1	
Meat from poultry, unspecified - meat preparation - intended to be eaten cooked - at processing plant - Surveillance - official controls - objective sampling									
Meat from poultry, unspecified - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling									
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls - objective sampling									
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling									
Meat from turkey - fresh - at processing plant - Surveillance - official controls - objective sampling									
Meat from turkey - fresh - at retail - Surveillance - official controls - objective sampling		1		1		1		2	

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Enteritidis</i>	<i>S. Typhimurium</i>	<i>Salmonella</i> spp., unspecified
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	165	0			
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at retail - Surveillance - official controls - objective sampling		single	25g	92	0			
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	230	0			
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance - official controls - objective sampling		single	25g	31	0			
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from pasteurised milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	36	0			
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	65	0			
Dairy products (excluding cheeses) - butter - at processing plant - Surveillance - official controls - objective sampling		single	25g	67	0			
Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - at retail - Surveillance - official controls - objective sampling		single	25g	88	0			

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Dairy products (excluding cheeses) - dairy products, not specified - at processing plant - Surveillance - official controls - objective sampling		single	25g	124	0			
Dairy products (excluding cheeses) - ice-cream - at catering - Surveillance - official controls - objective sampling		single	25g	207	0			
Dairy products (excluding cheeses) - ice-cream - at processing plant - Surveillance - official controls - objective sampling		single	25g	456	0			
Dairy products (excluding cheeses) - ice-cream - at retail - Surveillance - official controls - objective sampling		single	25g	348	0			
Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - at retail - Surveillance - official controls - objective sampling (Campaign A-010-08)		single	25g	130	0			
Milk, cows' - pasteurised milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	41	0			
Milk, cows' - pasteurised milk - at retail - Surveillance - official controls - objective sampling		single	25g	6	0			
Milk, cows' - raw - at farm - Surveillance - official controls - objective sampling		single	25g	14	0			
Milk, cows' - raw - intended for direct human consumption - at farm - Surveillance - official controls - objective sampling		single	25g	8	0			

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Dublin	S. Enteritidis	S. Infantis	S. Typhimurium	S. group B, monophasic strain	Salmonella spp., unspecified
Meat from bovine animals - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	15	0						
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling		single	10g	38	0						
Meat from bovine animals - meat products - raw but intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling		single	25g	24	0						
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling		single	10g	47	0						
Meat from deer (venison) - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	9	0						
Meat from other animal species or not specified - at retail - Surveillance - official controls - objective sampling		single	10g	34	2					2	
Meat from pig - fresh - at retail		single	25g	30	0						
Meat from pig - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling		single	10g	114	0						
Meat from pig - meat products - cooked, ready-to-eat - at processing plant - Surveillance - official controls - objective sampling		single	25g	35	0						
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling		single	25g	90	1					1	

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Dublin	S. Enteritidis	S. Infantis	S. Typhimurium	S. group B, monophasic strain	Salmonella spp., unspecified
Meat from pig - meat products - raw but intended to be eaten cooked - at processing plant - Surveillance - official controls - objective sampling		single	25g	13	0						
Meat from pig - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling		single	10g	7	0						
Meat from sheep - fresh - at retail		single	25g	10	0						
Meat, mixed meat - minced meat - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling		single	10g	130	2	1				1	
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at processing plant - Surveillance - official controls - objective sampling		single	25g	28	1			1			
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling		single	25g	34	0						

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Gustavia	S. Infantis	S. Typhimurium	Salmonella spp., unspecified
Bakery products - cakes - at retail - Surveillance - official controls - objective sampling		single	25g	103	0					
Bakery products - pastry - at retail - Surveillance - official controls - objective sampling		single	25g	160	0					
Chocolate - at retail - Surveillance - official controls - objective sampling		single	25g	44	0					
Cocoa and cocoa preparations, coffee and tea - at retail - Surveillance - official controls - objective sampling		single	25g	17	0					
Crustaceans - at retail - Surveillance - official controls - objective sampling		single	25g	22	0					
Egg products - at processing plant - Surveillance - official controls - objective sampling		single	25g	4	0					
Egg products - at retail - Surveillance - official controls - objective sampling		single	25g	18	0					
Egg products - dried - at retail - Surveillance - official controls - objective sampling		single	25g	2	0					
Egg products - liquid - at processing plant - Surveillance - official controls - objective sampling		single	25g	49	2	2				
Eggs - table eggs - at packing centre - Surveillance - official controls - objective sampling		single	25g	18	0					
Eggs - table eggs - at retail - Surveillance - official controls - objective sampling		single	25g	57	0					
Eggs - table eggs - at retail - Surveillance - official controls - objective sampling (whole eggs)		single	5 eggs	14	0					
Fish - raw - at retail - Surveillance - official controls - objective sampling		single	25g	17	0					

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Gustavia	S. Infantis	S. Typhimurium	Salmonella spp., unspecified
Fishery products, unspecified - at processing plant - Surveillance - official controls - objective sampling		single	25g	10	0					
Fishery products, unspecified - at retail - Surveillance - official controls - objective sampling		single	25g	14	0					
Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months - at retail - Surveillance - official controls - objective sampling		single	25g	2	0					
Fruits - products - at retail - Surveillance - official controls - objective sampling		single	25g	44	0					
Fruits and vegetables - precut - ready-to-eat - at retail - Surveillance - official controls - objective sampling		single	25g	3	0					
Infant formula - dried - intended for infants below 6 months - at retail - Surveillance - official controls - objective sampling		single	25g	12	0					
Juice - fruit juice - unpasteurised - at processing plant - Surveillance - official controls - objective sampling		single	25g	22	0					
Mushrooms - at retail - Surveillance - official controls - objective sampling		single	25g	3	0					
Nuts and nut products - at retail - Surveillance - official controls - objective sampling		single	25g	13	0					
Other food - at catering - Surveillance - official controls - objective sampling		single	25g	365	0					
Other food - at processing plant - Surveillance - official controls - objective sampling		single	25g	74	0					
Other food - at retail - Surveillance - official controls - objective sampling		single	25g	139	2			1	1	

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Gustavia	S. Infantis	S. Typhimurium	Salmonella spp., unspecified
Other food of non-animal origin - at retail - Surveillance - official controls - objective sampling		single	25g	40	0					
Other processed food products and prepared dishes - pasta - at processing plant - Surveillance - official controls - objective sampling		single	25g	140	0					
Other processed food products and prepared dishes - pasta - at retail - Surveillance - official controls - objective sampling		single	25g	106	0					
Other processed food products and prepared dishes - unspecified - ready-to-eat foods - chilled - at retail - Surveillance - official controls - objective sampling (Campaign A-804-08)		single	25g	105	0					
Ready-to-eat salads - at processing plant - Surveillance - official controls - objective sampling		single	25g	23	0					
Ready-to-eat salads - at retail - Surveillance - official controls - objective sampling		single	25g	33	0					
Sauce and dressings - at catering - Surveillance - official controls - objective sampling		single	25g	6	0					
Spices and herbs - at retail - Surveillance - official controls - objective sampling		single	25g	33	0					
Vegetables - at retail - Surveillance - official controls - objective sampling		single	25g	29	1			1		
Vegetables - products - at retail - Surveillance - official controls - objective sampling		single	25g	22	0					

2.1.4 **Salmonella in animals**

A. *Salmonella* spp. in turkey - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

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

There are no breeding flocks in Austria

Meat production flocks

Earliest 3 weeks prior to slaughter boot swabs have to be taken. Other programs are not foreseen, only voluntary sampling by the farmer or sampling according to private cooperatives is performed.

Frequency of the sampling

Meat production flocks: Day-old chicks

Other: no legal requirements, e.g. at day one each flock

Meat production flocks: Rearing period

Other: no legal requirements

Meat production flocks: Before slaughter at farm

Other: 3 weeks before slaughter at farm

Meat production flocks: At slaughter (flock based approach)

Other: No sampling

Type of specimen taken

Meat production flocks: Day-old chicks

Other: no legal requirements, e.g. visibly soiled hatcher basket liners

Meat production flocks: Rearing period

Other: no legal requirements, e.g. pooled feces

Meat production flocks: Before slaughter at farm

Other: two pairs of boot swabs per flock per flock

Meat production flocks: At slaughter (flock based approach)

Other: no sampling

Methods of sampling (description of sampling techniques)

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

No flocks in Austria

Meat production flocks: Day-old chicks

no legal requirements, e.g. visibly soiled hatcher basket liners

Meat production flocks: Rearing period

no legal requirements, e.g. pooled feces

Meat production flocks: Before slaughter at farm

two pairs of boot swabs per flock per flock

Meat production flocks: At slaughter (flock based approach)

no sampling

Case definition

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

No flocks in Austria

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

No flocks in Austria

Meat production flocks: Day-old chicks

No legal requirements

Meat production flocks: Rearing period

No legal requirements

Meat production flocks: Before slaughter at farm

Salmonella spp. isolated from boot swabs

Meat production flocks: At slaughter (flock based approach)

No sampling

Diagnostic/analytical methods used

Meat production flocks: Day-old chicks

Other: : Sample material is incubated in liquid medium. Modification of ISO 6579 (2002), where a semi solid medium (MSRV) is used as the single selective enrichment medium. The semi solid medium is incubated at 41.5 +/- 1 °C for 24 or 48 hours.

Meat production flocks: Rearing period

Other: see day-old chicks

Meat production flocks: Before slaughter at farm

Other: see day-old chicks

Meat production flocks: At slaughter (flock based approach)

Other: _see day-old chicks

Vaccination policy

Meat production flocks

Neither legal requirements nor recommendations

Other preventive measures than vaccination in place

Meat production flocks

Nil

Control program/mechanisms

The control program/strategies in place

Meat production flocks

The Austrian control program is conducted according to the National Poultry Hygiene Regulation (BGBI. I Nr. 6/2007, Geflügelhygieneverordnung 2007 of April 30th, 2007).

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

Notification not mandatory

Notification system in place

Notification not mandatory

B. *Salmonella* spp. in *Gallus Gallus* - breeding flocks

Monitoring system

Sampling strategy

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

Only parent flocks exist in Austria. The permanent monitoring plan performed by a national program takes place at hatcheries; each flock is tested regularly as well by the farmer as by the Veterinary Authorities.

If *S. Enteritidis*, *S. Typhimurium*, *S. Pullorum Gallinarum* and *S. Arizonae* is isolated from breeding flocks at the hatchery the flock is banned and a sample of 20 birds at random from within the incriminated flock has to be taken. The inner organs, such as ovaries, liver and the intestinal content is investigated.

If a parent flock tests positive for other salmonellas, official veterinarians are required to take pooled feces samples from the flock being investigated. In the event of a second positive result for *Salmonella* spp. within a two week period, then organs from a minimum of 20 chickens must be tested.

Since April 30, 2007 the EU-Regulation 2005/1003 is in force. Additional *Salmonella* serotypes have been included in the national program: *S. Infantis*, *S. Hadar* and *S. Virchow*.

Frequency of the sampling

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! Every flock is tested at day one

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

Other: Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! 1. Routine testing: Every flock is tested at the age of 4 and 12 weeks and 2 weeks before the laying period starts. 2. Confirmation: If routine testing reveals positive *Salmonella* test results then follow-up test must be performed from the identical flock.

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

Other: Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! Monitoring by national program, takes place at hatchery, each flock is tested every two weeks at hatch by the farmer, and every 16 weeks by the Veterinary Authorities; additional each flock is tested every 4 weeks by the farmer by boot swabs.

Type of specimen taken

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! Visibly soiled hatcher basket liners, dead chicks if available

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

Other: Not applicable. There are no separate elite and grand parent flocks in

Austria, only parent flocks! Routine testing: drag swabs, pooled feces. For confirmation: organs as ovaries, liver and intestinal content from a minimum of 20 chickens.

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

Other: Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! Routine testing: Drag swabs, pooled feces and dust in the hatchery, meconium, broken eggshells and hatched eggs. For confirmation: 300 feces samples and up to inner organs of 5 chickens or intestinal content of 5 chickens were pooled.

Methods of sampling (description of sampling techniques)

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! Visibly soiled hatcher basket liners, dead chicks if available

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! Routine testing: 60 pooled droppings a 1gram per flock, collection of dust. For confirmation: Diagnostically killing of 20 random chickens from within the incriminated flock

Breeding flocks: Production period

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks!

Routine testing: 1 drag swab, pooled feces, collection of dust. For confirmation: Diagnostically killing of 20 random chickens from within the incriminated flock

Case definition

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks!

Routine testing: *Salmonella* spp. isolated from hatcher basket liners

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks!

Salmonella spp. isolated from inner organs or from content of intestines of chickens killed for diagnosis

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks!

Salmonella spp. isolated from inner organs or from content of intestines of chicken

Diagnostic/analytical methods used

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! Sample material is incubated in liquid medium. Modification of ISO 6579 (2002), where a semi solid medium (MSRV) is used as the single selective enrichment medium. The semi solid medium is incubated at 41.5+- 1°C for 24 or 48 hours. All isolates are sent to the NRL Salmonella and serotyped according to the Kauffmann-White-Scheme. All S. Enteritidis and S. Typhimurium isolates are phage-typed according to the methods used by HPA, Colindale, UK.

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

Other: See day old chicks

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

Other: See day old chicks

Vaccination policy

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! The national program for parent flocks made vaccination against Salmonella mandatory for all flocks

Other preventive measures than vaccination in place

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

Nil

Control program/mechanisms

The control program/strategies in place

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks! The Austrian control program is conducted according to the National Poultry Hygiene Regulation (BGBI. I Nr. 6/2007, Geflügelhygieneverordnung 2007 of April 30th, 2007). The Austrian program for monitoring and eradication of Salmonella in breeding flocks of poultry was again (already since 2000) approved for the year 2006 by Commission Decision 2005/887/EG of 12 December 2005.

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

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

Not applicable. There are no separate elite and grand parent flocks in Austria, only parent flocks!

Measures according to the National Poultry Hygiene Regulation:

- Banning of the incriminated sector of the holding
- Culling of the infected flock
- Disposal of the hatched eggs
- Abolishing of the restriction after cleaning and disinfection
- If necessary prescriptions of GMP to prevent re-infection

Notification system in place

All positive results from parent flocks must be reported to the local authorities and via the Austrian Poultry Health Service to the Federal Ministry of Health (BMG).

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

In 2008, *Salmonella* spp. was not detected in any parent flock.

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

Nil.

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

Monitoring system

Sampling strategy

Laying hens flocks

At the earliest 3 weeks prior to slaughter, two pairs of boot swabs must be taken from each flock. Since May 2007, every flock has been tested in accordance to regulation 1168/2006.

Frequency of the sampling

Laying hens: Day-old chicks

Other: No legal requirements, e.g. at day one of each flock

Laying hens: Rearing period

Other: 3 times at day one, week 8 to 12 and 2 weeks before the laying period start

Laying hens: Production period

Other: Each flock is tested every 15 weeks with two pairs of boot swabs ; an official veterinarian is testing every flock once a year according to regulation 1168/2006.

Laying hens: Before slaughter at farm

Other: 3 weeks before slaughter at farm with two pairs of boot swabs

Laying hens: At slaughter

Other: Not applicable. no sampling

Eggs at packing centre (flock based approach)

Other: according to the program of the cooperatives voluntary surface swabs (e.g. every eight weeks)

Type of specimen taken

Laying hens: Day-old chicks

Other: no legal requirements, e.g. visibly soiled hatcher basket liners

Laying hens: Rearing period

Other: no legal requirements, e.g. pooled feces

Laying hens: Production period

Other: no legal requirements, e.g. pooled feces or drag swabs

Laying hens: Before slaughter at farm

Other: two pairs of boot swabs per flock

Laying hens: At slaughter

Other: no sampling

Eggs at packing centre (flock based approach)

Other: Voluntary e.g. surface swabs

Methods of sampling (description of sampling techniques)

Laying hens: Day-old chicks

No legal requirements, e.g. visibly soiled hatcher basket liners

Laying hens: Rearing period

2 pair of boot swabs per flock

Laying hens: Production period

2 pair of boot swabs per flock

Laying hens: Before slaughter at farm

Two pairs of boot swabs per flock

Laying hens: At slaughter

No sampling

Eggs at packing centre (flock based approach)

No legal requirements, e.g. surface swabs

Case definition

Laying hens: Day-old chicks

No legal requirements, e.g. *Salmonella* spp. isolated from hatcher basket liners

Laying hens: Rearing period

No legal requirements

Laying hens: Production period

No legal requirements

Laying hens: Before slaughter at farm

Salmonella spp. isolated from boot swabs

Laying hens: At slaughter

No sampling

Eggs at packing centre (flock based approach)

Salmonella spp. isolated from surface swabs

Diagnostic/analytical methods used

Laying hens: Day-old chicks

Other: Sample material is incubated in liquid medium. Modification of ISO 6579 (2002), where a semi solid medium (MSRV) is used as the single selective enrichment medium. The semi solid medium is incubated at 41.5 +/- 1 °C for 24 or 48 hours. All isolates are sent to the NRL *Salmonella* and serotyped according to the Kauffmann-White-Scheme. All *S. Enteritidis* and *S. Typhimurium* isolates are phage-typed according to the methods used by HPA, Colindale, UK.

Laying hens: Rearing period

Other: See laying hens, day old chicks

Laying hens: Production period

Other: See laying hens, day old chicks

Laying hens: Before slaughter at farm

Other: See laying hens, day old chicks

Laying hens: At slaughter

Other: no testing

Eggs at packing centre (flock based approach)

Other: See laying hens, day old chicks.

Vaccination policy

Laying hens flocks

The national program made vaccination against *Salmonella enteritidis* mandatory for all flocks

Other preventive measures than vaccination in place

Laying hens flocks

Nil

Control program/mechanisms

The control program/strategies in place

Laying hens flocks

The Austrian control program is conducted according to the National Poultry Hygiene Regulation (BGBI. I Nr. 6/2007, Geflügelhygieneverordnung 2007 of April 30th, 2007).

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

Laying hens flocks

No class A eggs

Notification system in place

All positive results from parent flocks must be reported to the local authorities and via the Austrian Poultry Health Service to the Federal Ministry of Health (BMG).

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

In 2008, *Salmonella* spp. was not detected in any parent flock.

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

Nil

D. *Salmonella* spp. in *Gallus Gallus* - broiler flocks

Monitoring system

Sampling strategy

Broiler flocks

Earliest 3 weeks prior to slaughter boot swabs have to be taken. Other programs are not foreseen, only voluntary sampling by the farmer or sampling according to private cooperatives is performed.

Frequency of the sampling

Broiler flocks: Day-old chicks

Other: no legal requirements, e.g. at day one each flock

Broiler flocks: Rearing period

Other: no legal requirements

Broiler flocks: Before slaughter at farm

Other: 3 weeks before slaughter at farm

Broiler flocks: At slaughter (flock based approach)

Other: No sampling

Type of specimen taken

Broiler flocks: Day-old chicks

Other: no legal requirements, e.g. visibly soiled hatcher basket liners

Broiler flocks: Rearing period

Other: no legal requirements, e.g. pooled feces

Broiler flocks: Before slaughter at farm

Other: two pairs of boot swabs per flock per flock

Broiler flocks: At slaughter (flock based approach)

Other: No sampling

Methods of sampling (description of sampling techniques)

Broiler flocks: Day-old chicks

No legal requirements, e.g. visibly soiled hatcher basket liners

Broiler flocks: Rearing period

No legal requirements, e.g. 60 pooled droppings a 1 gram per flock

Broiler flocks: Before slaughter at farm

two pairs of boot swabs per flock

Broiler flocks: At slaughter (flock based approach)

No sampling

Case definition

Broiler flocks: Day-old chicks

No legal requirements

Broiler flocks: Rearing period

No legal requirements

Broiler flocks: Before slaughter at farm

Salmonella spp. isolated from boot swabs

Broiler flocks: At slaughter (flock based approach)

No sampling

Diagnostic/analytical methods used

Broiler flocks: Day-old chicks

Other: See day-old chicks

Broiler flocks: Rearing period

Other: See day-old chicks

Broiler flocks: Before slaughter at farm

Other: See day-old chicks

Broiler flocks: At slaughter (flock based approach)

Other: no testing

Vaccination policy

Broiler flocks

Neither legal requirements nor recommendations

Other preventive measures than vaccination in place

Broiler flocks

Nil

Control program/mechanisms

The control program/strategies in place

Broiler flocks

The Austrian control program is conducted according to the National Poultry Hygiene Regulation (BGBI. I Nr. 6/2007, Geflügelhygieneverordnung 2007 of April 30th, 2007)

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

Broiler flocks: Day-old chicks

Flocks were treated either with antimicrobials or competitive exclusion strategies

takes place.

Broiler flocks: Rearing period

Flocks were treated either with antimicrobials or competitive exclusion strategies takes place.

Broiler flocks: Before slaughter at farm

Flocks were treated either with antimicrobials or competitive exclusion strategies takes place. Slaughtering was only permitted for *Salmonella* spp. negative flocks.

Broiler flocks: At slaughter (flock based approach)

No testing

Notification system in place

All positive findings in parent flocks had to be notified to the local authority and via the Austrian Poultry Health Service to the Federal Ministry of Health and Women.

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

In 2008, *Salmonella* spp. was not detected in any parent flock.

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

Nil

E. *Salmonella* spp. in animal - Pigs - breeding animals - unspecified - at farm - animal sample - faeces - Survey - EU baseline survey

Monitoring system

Sampling strategy

Out of 2,866 breeding pig holdings 238 plus 10% were randomly chosen stratified by size according to the number of holdings in the different provinces.

Frequency of the sampling

Animals at farm

Other: The date of sampling was distributed equally over the year.

Type of specimen taken

Animals at farm

Other: Pooled feces samples per pen; 10 pens per holding.

Methods of sampling (description of sampling techniques)

Animals at farm

Feces was collected by the competent authority or under its supervision in accordance with the technical specifications

Case definition

Animals at farm

Salmonella spp. isolated from one or more samples per holding

Diagnostic/analytical methods used

Animals at farm

Other: in accordance with the technical specifications

Vaccination policy

Neither legal requirements nor recommendations

Other preventive measures than vaccination in place

Nil

Control program/mechanisms

The control program/strategies in place

Nil

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

No measures in course of this survey

Notification system in place

No measures in course of this survey

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

Very low prevalence of *Salmonella* spp. in Austrian breeding pigs holdings, only 15 out of 252 sampled holdings (6.0%)

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

Due to the low prevalence pork plays a minor role as vehicle for salmonella infections in humans.

Table Salmonella in breeding flocks of *Gallus gallus*

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Enteritidis</i>	<i>S. Hadar</i>	<i>S. Infantis</i>	<i>S. Montevideo</i>	<i>S. Typhimurium</i>	<i>S. Virchow</i>
<i>Gallus gallus</i> (fowl) - parent breeding flocks for egg production line - during production period - - faeces - Control and eradication programmes - official and industry sampling	17	QGV	flock	17	0	0	0	0	0	0	0
<i>Gallus gallus</i> (fowl) - parent breeding flocks for egg production line - during rearing period - - faeces - Control and eradication programmes - official and industry sampling	7	QGV	flock	7	0	0	0	0	0	0	0
<i>Gallus gallus</i> (fowl) - parent breeding flocks for meat production line - during production period - - faeces - Control and eradication programmes - official and industry sampling	35	QGV	flock	35	0	0	0	0	0	0	0
<i>Gallus gallus</i> (fowl) - parent breeding flocks for meat production line - during rearing period - - faeces - Control and eradication programmes - official and industry sampling	56	QGV	flock	56	2	0	0	0	2	0	0

	<i>Salmonella</i> spp., unspecified
<i>Gallus gallus</i> (fowl) - parent breeding flocks for egg production line - during production period - - faeces - Control and eradication programmes - official and industry sampling	0
<i>Gallus gallus</i> (fowl) - parent breeding flocks for egg production line - during rearing period - - faeces - Control and eradication programmes - official and industry sampling	0
<i>Gallus gallus</i> (fowl) - parent breeding flocks for meat production line - during production period - - faeces - Control and eradication programmes - official and industry sampling	0

Table Salmonella in breeding flocks of Gallus gallus

	Salmonella spp., unspecified
Gallus gallus (fowl) - parent breeding flocks for meat production line - during rearing period - faeces - Control and eradication programmes - official and industry sampling	0

Table Salmonella in other poultry

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for <i>Salmonella</i> spp.	S. Agona	S. Braenderup	S. Enteritidis	S. Hadar	S. Indiana	S. Infantis
Ducks - meat production flocks - - faeces - Surveillance - official controls (census sampling)	66	QGV	flock	66	15			1		4	
Gallus gallus (fowl) - broilers - day-old chicks - at hatchery - Surveillance - official controls (census sampling)	1291	QGV	batch	1291	3			2			
Gallus gallus (fowl) - broilers - during rearing period - - faeces - Surveillance - official controls (census sampling)	3099	QGV	flock	3099	178	3	2	32	2	2	4
Gallus gallus (fowl) - laying hens - day-old chicks - at hatchery - Control and eradication programmes - official and industry sampling - census sampling	811	QGV	batch	811	0						
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - industry sampling - census sampling	1966	QGV	flock	1966	49	2	1	23			8
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - official sampling - objective sampling	1966	QGV	flock	1088	33	1		16			5
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - official sampling - suspect sampling	1966	QGV	flock	4	0						
Gallus gallus (fowl) - laying hens - during rearing period - - faeces - Control and eradication programmes - official and industry sampling - census sampling	657	QGV	flock	470	12			5			
Geese - meat production flocks - - faeces - Surveillance - official controls (census sampling)	62	QGV	flock	62	4					2	
Turkeys - meat production flocks - - faeces - Surveillance - official controls (census sampling)	325	QGV	flock	325	30			2	2		

Table Salmonella in other poultry

	S. Jerusalem	S. Kentucky	S. Kottbus	S. Lexington	S. Livingstone	S. London	S. Meleagridis	S. Montevideo	S. Ohio	S. Regent	S. Rissen
Ducks - meat production flocks - - faeces - Surveillance - official controls (census sampling)			1				3		2	1	
Gallus gallus (fowl) - broilers - day-old chicks - at hatchery - Surveillance - official controls (census sampling)								1			
Gallus gallus (fowl) - broilers - during rearing period - - faeces - Surveillance - official controls (census sampling)	1	2	2				5	105			
Gallus gallus (fowl) - laying hens - day-old chicks - at hatchery - Control and eradication programmes - official and industry sampling - census sampling											
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - industry sampling - census sampling						1					1
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - official sampling - objective sampling						1	1				
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - official sampling - suspect sampling											
Gallus gallus (fowl) - laying hens - during rearing period - - faeces - Control and eradication programmes - official and industry sampling - census sampling			1	1				1			
Geese - meat production flocks - - faeces - Surveillance - official controls (census sampling)											
Turkeys - meat production flocks - - faeces - Surveillance - official controls (census sampling)			1						6		

Table Salmonella in other poultry

	S. Saintpaul	S. Schwarzengrund	S. Senftenberg	S. Thompson	S. Typhimurium	S. Worthington	S. Paratyphi B var. Java	Salmonella spp., unspecified
Ducks - meat production flocks - - faeces - Surveillance - official controls (census sampling)	1				2			
Gallus gallus (fowl) - broilers - day-old chicks - at hatchery - Surveillance - official controls (census sampling)								
Gallus gallus (fowl) - broilers - during rearing period - - faeces - Surveillance - official controls (census sampling)	3		1	4	7	1	1	1
Gallus gallus (fowl) - laying hens - day-old chicks - at hatchery - Control and eradication programmes - official and industry sampling - census sampling								
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - industry sampling - census sampling	1		1		4			2
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - official sampling - objective sampling			1		7			1
Gallus gallus (fowl) - laying hens - during production period - - faeces - Control and eradication programmes - official sampling - suspect sampling								
Gallus gallus (fowl) - laying hens - during rearing period - - faeces - Control and eradication programmes - official and industry sampling - census sampling	3				1			
Geese - meat production flocks - - faeces - Surveillance - official controls (census sampling)					2			
Turkeys - meat production flocks - - faeces - Surveillance - official controls (census sampling)	16		3					

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for <i>Salmonella</i> spp.	S. Bredeney	S. Derby	S. Dublin	S. Enteritidis	S. Ibadan	S. Indiana	S. Infantis
Alpine chamois - Clinical investigations		animal	6	0							
Badgers - Clinical investigations		animal	1	1							
Birds - Clinical investigations		animal	17	2							
Birds - wild - Clinical investigations		animal	2	0							
Capricorns - Clinical investigations		animal	1	0							
Cats - Clinical investigations		animal	51	1							
Cattle (bovine animals) - - faeces - Clinical investigations		animal	390	11			10	1			
Cattle (bovine animals) - - organ/tissue - Clinical investigations		animal	3455	25			16	2			
Deer - Clinical investigations		animal	34	1							
Dogs - Clinical investigations		animal	30	0							
Goats - - faeces - Clinical investigations		animal	2	0							
Goats - - organ/tissue - Clinical investigations		animal	17	1							1
Guinea pigs - Clinical investigations		animal	8	0							
Monkeys - Clinical investigations		animal	1	0							
Pigs - breeding animals - unspecified - - faeces - Clinical investigations		animal	143	18				1			1
Pigs - breeding animals - unspecified - - faeces - Survey - EU baseline survey		holding	252	15	1	2			1	1	
Pigs - unspecified - - organ/tissue - Clinical investigations		animal	381	6		2					
Rabbits - Clinical investigations		animal	45	0							
Reptiles - Clinical investigations		animal	4	2							

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Bredeney</i>	<i>S. Derby</i>	<i>S. Dublin</i>	<i>S. Enteritidis</i>	<i>S. Ibadan</i>	<i>S. Indiana</i>	<i>S. Infantis</i>
Sheep - - faeces - Clinical investigations		animal	3	0							
Sheep - - organ/tissue - Clinical investigations		animal	83	6				1			
Snakes - Clinical investigations		animal	3	0							
Solipeds, domestic - Clinical investigations		animal	22	0							
Squirrels - Clinical investigations		animal	1	0							
Turtles - at farm - animal sample - Clinical investigations		animal	3	1							1

	<i>S. Koketime</i>	<i>S. Livingstone</i>	<i>S. Mbandaka</i>	<i>S. Montevideo</i>	<i>S. Muenchen</i>	<i>S. Tennessee</i>	<i>S. Typhimurium</i>	<i>S. 1,13,23:-:-</i>	<i>S. 1,13,23:z29:z</i>	<i>S. 1,3,19:d:-27</i>	<i>S. group B, monophasic strain</i>
Alpine chamois - Clinical investigations											
Badgers - Clinical investigations								1			
Birds - Clinical investigations								2			
Birds - wild - Clinical investigations											
Capricorns - Clinical investigations											
Cats - Clinical investigations								1			
Cattle (bovine animals) - - faeces - Clinical investigations											
Cattle (bovine animals) - - organ/tissue - Clinical investigations								7			
Deer - Clinical investigations								1			
Dogs - Clinical investigations											
Goats - - faeces - Clinical investigations											

Table Salmonella in other animals

	S. Koketime	S. Livingstone	S. Mbandaka	S. Montevideo	S. Muenchen	S. Tennessee	S. Typhimurium	S. 1,13,23:-:-	S. 1,13,23:z29:z	S. 1,3,19:d:-27	S. 1,3,19:d:-	S. group B, monophasic strain
Goats - - organ/tissue - Clinical investigations												
Guinea pigs - Clinical investigations												
Monkeys - Clinical investigations												
Pigs - breeding animals - unspecified - - faeces - Clinical investigations								7				9
Pigs - breeding animals - unspecified - - faeces - Survey - EU baseline survey		2	1	2	1	1	3					
Pigs - unspecified - - organ/tissue - Clinical investigations							4					
Rabbits - Clinical investigations												
Reptiles - Clinical investigations	1						1					
Sheep - - faeces - Clinical investigations												
Sheep - - organ/tissue - Clinical investigations												
Snakes - Clinical investigations												
Solipeds, domestic - Clinical investigations												
Squirrels - Clinical investigations												
Turtles - at farm - animal sample - Clinical investigations												

Not typeable	Salmonella spp., unspecified	S. IIIb
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Alpine chamois - Clinical investigations		
Badgers - Clinical investigations		

Table Salmonella in other animals

	Not typeable	Salmonella spp., unspecified	S. IIIb
Birds - Clinical investigations			
Birds - wild - Clinical investigations			
Capricorns - Clinical investigations			
Cats - Clinical investigations			
Cattle (bovine animals) - - faeces - Clinical investigations			
Cattle (bovine animals) - - organ/tissue - Clinical investigations			
Deer - Clinical investigations			
Dogs - Clinical investigations			
Goats - - faeces - Clinical investigations			
Goats - - organ/tissue - Clinical investigations			
Guinea pigs - Clinical investigations			
Monkeys - Clinical investigations			
Pigs - breeding animals - unspecified - - faeces - Clinical investigations			
Pigs - breeding animals - unspecified - - faeces - Survey - EU baseline survey			
Pigs - unspecified - - organ/tissue - Clinical investigations			
Rabbits - Clinical investigations			
Reptiles - Clinical investigations			
Sheep - - faeces - Clinical investigations			
Sheep - - organ/tissue - Clinical investigations			5

Table Salmonella in other animals

	Not typeable	Salmonella spp., unspecified	S. IIIb
Snakes - Clinical investigations			
Solipeds, domestic - Clinical investigations			
Squirrels - Clinical investigations			
Turtles - at farm - animal sample - Clinical investigations			

2.1.5 **Salmonella in feedingstuffs**

A. *Salmonella* spp. in feed - All feedingstuffs - Surveillance - official controls - objective sampling

Monitoring system

Sampling strategy

Random sampling is performed without regional criteria. The sampling is carried out by competent authorities; the samples were taken on farms, slaughterhouses, processing plants, retailers. The sampling is part of the national permanent monitoring program.

Frequency of the sampling

Domestic feed material of plant origin

Other: The sampling plan is assigned and the tests are evenly distributed throughout the year. Every farm, processing plant, and retailer is sampled at least twice per year. The final product is then inspected. Discrepancies within reported batches lead to further testing.

Domestic feed material of animal origin

Other: See above

Imported feed material of plant origin

Other: See above

Imported feed material of animal origin

Other: See above

Process control in feed mills

Other: See above

Compound feedingstuffs

Other: See above

Type of specimen taken

Domestic feed material of plant origin

Oil seed meals and cakes

Domestic feed material of animal origin

Fish meal, dried animal by-products for pets

Imported feed material of plant origin

Oil seed meals and cakes

Imported feed material of animal origin

Fish meal, dried animal by-products for pets

Process control in feed mills

Not applicable (n. a.)

Compound feedingstuffs

Feed for poultry

Methods of sampling (description of sampling techniques)

Domestic feed material of plant origin

Sampling is performed according EC-Directive 76/371/EEC applying special hygiene requirements or sampling of original packaged products.

Domestic feed material of animal origin

See above

Imported feed material of plant origin

See above

Imported feed material of animal origin

See above

Process control in feed mills

See above

Compound feedingstuffs

See above

Definition of positive finding

Domestic feed material of plant origin

Salmonella spp. isolated from the sample

Domestic feed material of animal origin

Salmonella spp. isolated from the sample

Imported feed material of plant origin

Salmonella spp. isolated from the sample

Imported feed material of animal origin

Salmonella spp. isolated from the sample

Process control in feed mills

Salmonella spp. isolated from the sample

Compound feedingstuffs

Salmonella spp. isolated from the sample

Diagnostic/analytical methods used

Domestic feed material of plant origin

Other: Bacteriological method: ISO 6579:2002; sample weight: 50 g; all isolates are sent to the NRL Salmonella and serotyped according to the Kauffmann-White-Scheme. All S. Enteritidis and S. Typhimurium isolates are phage typed according to the methods used by HPA, Colindale, UK.

Domestic feed material of animal origin

Other: as above

Imported feed material of plant animal

Other: as above

Imported feed material of animal origin

Other: as above

Process control in feed mills

Other: as above

Compound feedingstuffs

Other: as above

Control program/mechanisms

The control program/strategies in place

National legislation: BGBI. Nr. 139/1999 (Futtermittelgesetz 1999, § 3) and BGBI. Nr. 93/2000 (Futtermittelverordnung 2000, as amended) containing general requirements for feedingstuffs and BGBI. II Nr. 243/2000 (Geflügelhygieneverordnung 2000).

EC: VO (EG) 183/2005 (Futtermittelhygieneverordnung) and VO (EG) 882/2004 (Kontrollverordnung) with regard to salmonella monitoring, general requirements for feed material and compound feed, coordinated annual control program

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings

Domestic feed material of plant origin

In the event of a positive result, the notification results in the confiscation of the infected feedingstuffs according to official measures. This includes the withdrawal of the feedingstuffs from the market, the recall of feed, decontamination of the feed, disposal or other use of the feed, exploration and elimination of the sources of contamination and operational measures to prevent future contaminations.

Domestic feed material of animal origin

See above

Imported feed material of plant origin

See above

Imported feed material of animal origin

See above

Process control in feed mills

See above

Compound feedingstuffs

See above

Notification system in place

The Rapid Alert System for Food and Feed (RASFF) notifies the local authorities and the system has been in place since 1979. The legal basis of the RASFF is Regulation EC/178/2002.

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

In the last 20 years, the quality of feed has improved due to the increase of numbers of farms, processing plants and retailer using HACCP concepts, traceability of contaminated feed/components of feed and palletizing feed/contaminated feed.

Additional information

Nil

Table Salmonella in feed material of animal origin

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Enteritidis</i>	<i>S. Montevideo</i>	<i>S. Typhimurium</i>	<i>Salmonella</i> spp., unspecified
Feed material of land animal origin - meat meal - at processing plant - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	1		1		
Feed material of marine animal origin - fish meal - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0				
Feed material of marine animal origin - fish meal - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	9	0				

Footnote:

Source of information: Compulsory monitoring program (Futtermittel-Gesetz 1999).

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Enteritidis</i>	<i>S. Lexington</i>	<i>S. Mbandaka</i>	<i>S. Montevideo</i>	<i>S. Putten</i>	<i>S. Typhimurium</i>
Feed material of cereal grain origin - wheat derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	3	0						
Feed material of oil seed or fruit origin - linseed derived - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						
Feed material of oil seed or fruit origin - linseed derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	9	0						
Feed material of oil seed or fruit origin - other oil seeds derived - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						
Feed material of oil seed or fruit origin - other oil seeds derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	7	0						
Feed material of oil seed or fruit origin - rape seed derived - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	2	0						
Feed material of oil seed or fruit origin - rape seed derived - at processing plant - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						
Feed material of oil seed or fruit origin - rape seed derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	19	0						

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Enteritidis</i>	<i>S. Lexington</i>	<i>S. Mbandaka</i>	<i>S. Montevideo</i>	<i>S. Putten</i>	<i>S. Typhimurium</i>
Feed material of oil seed or fruit origin - soya (bean) derived - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	7	0						
Feed material of oil seed or fruit origin - soya (bean) derived - at processing plant - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	4	0						
Feed material of oil seed or fruit origin - soya (bean) derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	68	4			1	1	1	1
Feed material of oil seed or fruit origin - sunflower seed derived - at processing plant - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						
Feed material of oil seed or fruit origin - sunflower seed derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						
Other feed material - forages and roughages - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	2	0						
Other feed material - other plants - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						
Other feed material - tubers, roots and similar products - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						

Table Salmonella in other feed matter

	Salmonella spp., unspecified
Feed material of cereal grain origin - wheat derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - linseed derived - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - linseed derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - other oil seeds derived - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - other oil seeds derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - rape seed derived - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - rape seed derived - at processing plant - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - rape seed derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	

Table Salmonella in other feed matter

	Salmonella spp., unspecified
Feed material of oil seed or fruit origin - soya (bean) derived - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - soya (bean) derived - at processing plant - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - soya (bean) derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - sunflower seed derived - at processing plant - Control and eradication programmes - official and industry sampling	
Feed material of oil seed or fruit origin - sunflower seed derived - at retail - domestic production - Control and eradication programmes - official and industry sampling	
Other feed material - forages and roughages - at retail - domestic production - Control and eradication programmes - official and industry sampling	
Other feed material - other plants - at retail - domestic production - Control and eradication programmes - official and industry sampling	
Other feed material - tubers, roots and similar products - at retail - domestic production - Control and eradication programmes - official and industry sampling	

Footnote:

Source of information: AGES Institute for Agricultural Analysis Linz.

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Bredeney</i>	<i>S. Cerro</i>	<i>S. Derby</i>	<i>S. Enteritidis</i>	<i>S. Jerusalem</i>	<i>S. Livingstone</i>
Compound feedingstuffs for cattle - final product - at farm - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	6	0						
Compound feedingstuffs for cattle - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	5	0						
Compound feedingstuffs for cattle - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	19	0						
Compound feedingstuffs for pigs - final product - at farm - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	6	1						
Compound feedingstuffs for pigs - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	10	0						
Compound feedingstuffs for pigs - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	47	0						
Compound feedingstuffs for poultry (non specified) - final product - at farm - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						
Compound feedingstuffs for poultry (non specified) - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	2	0						
Compound feedingstuffs for poultry (non specified) - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	10	0						

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Bredeney</i>	<i>S. Cerro</i>	<i>S. Derby</i>	<i>S. Enteritidis</i>	<i>S. Jerusalem</i>	<i>S. Livingstone</i>
Compound feedingstuffs for poultry - laying hens - final product - at farm - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	51	1					1	
Compound feedingstuffs for poultry - laying hens - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	5	0						
Compound feedingstuffs for poultry - laying hens - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	71	0						
Compound feedingstuffs for poultry -breeders - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	2	0						
Compound feedingstuffs for poultry -breeders - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	6	0						
Compound feedingstuffs for poultry - broilers - final product - at farm - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	16	0						
Compound feedingstuffs for poultry - broilers - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	7	0						
Compound feedingstuffs for poultry - broilers - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	33	0						
Feed material of marine animal origin - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	3	0						

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for <i>Salmonella</i> spp.	<i>S. Bredeney</i>	<i>S. Cerro</i>	<i>S. Derby</i>	<i>S. Enteritidis</i>	<i>S. Jerusalem</i>	<i>S. Livingstone</i>
Other feed material - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	19	0						
Pet food - dog snacks (pig ears, chewing bones) - at processing plant - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	4	1			1			
Pet food - dog snacks (pig ears, chewing bones) - at retail - domestic production - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	31	6	1	1				1
Pet food - dog snacks (pig ears, chewing bones) - at retail - imported - Control and eradication programmes - official and industry sampling	Compulsory	batch	50g	1	0						

	<i>S. Montevideo</i>	<i>S. Typhimurium</i>	<i>S. group B, monophasic strain</i>	<i>Salmonella</i> spp., unspecified	<i>S. enterica</i> subsp. <i>enterica</i> , rough
Compound feedingstuffs for cattle - final product - at farm - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for cattle - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for cattle - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for pigs - final product - at farm - Control and eradication programmes - official and industry sampling	1				

Table Salmonella in compound feedingstuffs

	S. Montevideo	S. Typhimuriu m	S. group B, monophasic strain	Salmonella spp., unspecified	S. enterica subsp. enterica, rough
Compound feedingstuffs for pigs - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for pigs - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for poultry (non specified) - final product - at farm - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for poultry (non specified) - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for poultry (non specified) - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for poultry - laying hens - final product - at farm - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for poultry - laying hens - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for poultry - laying hens - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling					

Table Salmonella in compound feedingstuffs

	S. Montevideo	S. Typhimuriu m	S. group B, monophasic strain	Salmonella spp., unspecified	S. enterica subsp. enterica, rough
Compound feedingstuffs for poultry -breeders - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling					
Compound feedingstuffs for poultry -breeders - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling					
Compund feedingstuffs for poultry - broilers - final product - at farm - Control and eradication programmes - official and industry sampling					
Compund feedingstuffs for poultry - broilers - final product - at feed mill - domestic production - Control and eradication programmes - official and industry sampling					
Compund feedingstuffs for poultry - broilers - final product - at retail - domestic production - Control and eradication programmes - official and industry sampling					
Feed material of marine animal origin - at retail - domestic production - Control and eradication programmes - official and industry sampling					
Other feed material - at retail - domestic production - Control and eradication programmes - official and industry sampling					
Pet food - dog snacks (pig ears, chewing bones) - at processing plant - Control and eradication programmes - official and industry sampling					
Pet food - dog snacks (pig ears, chewing bones) - at retail - domestic production - Control and eradication programmes - official and industry sampling		1	1		1

Table Salmonella in compound feedingstuffs

	S. Montevideo	S. Typhimuriu m	S. group B, monophasic strain	Salmonella spp., unspecified	S. enterica subsp. enterica, rough
Pet food - dog snacks (pig ears, chewing bones) - at retail - imported - Control and eradication programmes - official and industry sampling					

Footnote:

Source of information: Compulsory monitoring program (Futtermittel-Gesetz 1999), AGES Institute for Agricultural Analysis Linz.

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 phageotypes in human cases and in foodstuffs or animals may indicate that the food category or animal species in question serves as a source of human infections. However as information is not available from all potential sources of infections, conclusions have to be drawn with caution.

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory										
Number of isolates serotyped	51	0	69	0	570	0	0	0	128	0
Number of isolates per serovar										
<i>S. Agona</i>					9					
<i>S. Anatum</i>					1					
<i>S. Braenderup</i>					5					
<i>S. Bredeney</i>			1		11					
<i>S. Derby</i>			11							
<i>S. Dublin</i>	32									
<i>S. Enteritidis</i>	4		1		234				14	

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory										
Number of isolates serotyped	51	0	69	0	570	0	0	0	128	0
Number of isolates per serovar										
S. Hadar					8				19	
S. Indiana	1		2		4					
S. Infantis			3		38					
S. Jerusalem					1				1	
S. Kentucky					7					
S. Kottbus					5				4	
S. Liverpool					1					
S. Livingstone			9		1					
S. London					2					
S. Mbandaka			1		1					
S. Meleagridis					8					
S. Mikawasima	2									

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory										
Number of isolates serotyped	51	0	69	0	570	0	0	0	128	0
Number of isolates per serovar										
S. Montevideo	1		2		128				10	
S. Muenchen			2							
S. Newport									7	
S. Ohio					1					
S. Regent					2					
S. Rissen					1					
S. Saintpaul	2		3		16				68	
S. Schwarzengrund					1					
S. Senftenberg					22				5	
S. Tennessee			1		1					
S. Thompson					5					
S. Typhimurium	8		20		38					

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory										
Number of isolates serotyped	51	0	69	0	570	0	0	0	128	0
Number of isolates per serovar										
S. Virchow					1					
S. Worthington	1				1					
S. IIIb61:k:1,5,7			1		1					
S. Paratyphi B var. Java					2					
S. group B, monophasic strain			12							
S. enterica subsp. enterica, rough					8					
S. group B H-					2					
S. IIIb 38:r:z					4					

Table Salmonella serovars in food

Serovars	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin		Meat from turkey	
	Sources of isolates		Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
	Number of isolates in the laboratory		2		4		83					33
Number of isolates serotyped	2	0	4	0	83	0	0	0	0	0	33	0
Number of isolates per serovar												
S. Agona					2							
S. Banana											1	
S. Blockley					1							
S. Bredeney					2						2	
S. Derby											1	
S. Enteritidis					26						1	
S. Hadar					2						6	
S. Indiana					1							
S. Infantis					24						3	
S. Kottbus											1	
S. Livingstone					1							
S. Montevideo					9							

Table Salmonella serovars in food

Serovars	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin		Meat from turkey	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	2		4		83						33	
Number of isolates serotyped	2	0	4	0	83	0	0	0	0	0	33	0
Number of isolates per serovar												
S. Newport											1	
S. Ohio					1							
S. Panama											1	
S. Saintpaul					1						9	
S. Senftenberg					3							
S. Typhimurium			3		1						4	
S. 21:-:-					3							
S. Paratyphi B var. Java					1							
S. Gallinarum					4							
S. group B, monophasic strain	2		1								2	
S. group C1, monophasic strain					1						1	

Table Salmonella Enteritidis phageotypes in animals

Phageotype	Turkeys		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	14		4		1		234			
Number of isolates phagetyped	14	0	4	0	1	0	234	0	0	0
Number of isolates per type										
PT 1							15			
PT 4			1		1		97			
PT 5							2			
PT 6			2				6			
PT 8	10		1				46			
PT 14b	2						1			
PT 21							28			
PT 21c							1			
PT 6a							2			
PT 6b							2			
PT 12							1			
PT 23	2						3			

Table Salmonella Enteritidis phageotypes in animals

Phageotype	Turkeys		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	14		4		1		234			
Number of isolates phagetyped	14	0	4	0	1	0	234	0	0	0
Number of isolates per type										
PT 7							21			
U							2			
RDNC							7			

Table Salmonella Enteritidis phageotypes in food

Phagetype	Meat from turkey		Meat from bovine animals		Meat from pig		Meat from broilers (<i>Gallus gallus</i>)		Other poultry		Other products of animal origin	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	1											
Number of isolates phagetyped	1	0	0	0	0	0	26	0	0	0	0	0
Number of isolates per type												
PT 1							1					
PT 4							10					
PT 6							1					
PT 8							10					
PT 21	1											
PT 13a							1					
PT 23							3					

Table Salmonella Enteritidis phageotypes in humans

Phagetype	humans		
	Sources of isolates	Monitoring	Clinical
		Number of isolates in the laboratory	
Number of isolates phagetyped	0	2200	
Number of isolates per type			
PT 1		80	
PT 4		772	
PT 5		13	
PT 6		125	
PT 8		524	
PT 14b		45	
PT 21		412	
PT 1b		15	
PT 3		9	
PT 44		1	
PT 13a		46	
PT 2		44	

Table Salmonella Enteritidis phageotypes in humans

Phagetype	humans	
	Monitoring	Clinical
Number of isolates in the laboratory		2200
Number of isolates phagetyped	0	2200
Number of isolates per type		
PT 35		5
PT 4b		11
PT 6a		18
PT 6b		2
PT 12		14
PT 23		3
PT 7		9
6c		1
PT 5a		1
PT 29		2
PT 34		1
PT 7a		1

Table Salmonella Enteritidis phageotypes in humans

Phagetype	humans	
	Monitoring	Clinical
Number of isolates in the laboratory		2200
Number of isolates phagetyped	0	2200
Number of isolates per type		
PT 13		11
PT 11		4
PT 1c		4
U		4
RDNC		20
PT 1d		1
PT 11b		2

Table Salmonella Typhimurium phageotypes in animals

Phagetype	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	8		20		38			
Number of isolates phagetyped	8	0	20	0	38	0	0	0
Number of isolates per type								
DT 46	1							
DT 104I	3		15		15			
DT 193					1			
DT 41					8			
DT 85					3			
DT 1	3							
U			3					
RDNC	1		2		4			
DT 166					7			

Table Salmonella Typhimurium phageotypes in food

Phagetype	Meat from turkey		Meat from bovine animals		Meat from pig		Meat from broilers (<i>Gallus gallus</i>)		Other poultry		Other products of animal origin	
	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	4				3		1					
Number of isolates phagetyped	4	0	0	0	3	0	1	0	0	0	0	0
Number of isolates per type												
DT 104I	2				1							
DT 120					1							
U	1											
RDNC	1				1		1					

Table Salmonella Typhimurium phageotypes in humans

Phagetype	humans	
	Monitoring	Clinical
	374	0
Number of isolates phagetyped	374	0
Number of isolates per type		
DT 8	3	
DT 12	3	
DT 104I	70	
DT 120	71	
DT 193	21	
DT 208	2	
U 302	7	
DT 41	61	
DT 193a	1	
DT 85	22	
DT 99	1	
DT 3	7	

Table Salmonella Typhimurium phageotypes in humans

Phageotype	humans	
	Monitoring	Clinical
Number of isolates in the laboratory	374	
Number of isolates phagetyped	374	0
Number of isolates per type		
DT 135	1	
DT 1	9	
DT 104H	16	
DT 125	1	
DT 129	1	
DT 136	1	
U	8	
RDNC	64	
DT 166	3	
DT 43	1	

2.1.7 Antimicrobial resistance in *Salmonella* isolates

A. Antimicrobial resistance of *Salmonella* spp. in animal

Sampling strategy used in monitoring

Frequency of the sampling

There currently is no monitoring program in Austria but all *Salmonella* spp. isolated in veterinary and food laboratories, as well as all primary isolates from humans were sent to the NRC-S where the susceptibility testing was performed using the disk diffusion method.

Salmonella isolates from control programmes or baseline surveys although are subjected to MIC-testing; all strains isolated in the course of a survey and all unique strains (from one epidemiological unit) from control programmes.

Type of specimen taken

Clinical samples from humans; for animals and food see chapters *Salmonella* spp. in animal species and *Salmonella* spp. in food.

Methods of sampling (description of sampling techniques)

Clinical samples from humans; for animals and food see chapters *Salmonella* spp. in animal species and *Salmonella* spp. in food.

Procedures for the selection of isolates for antimicrobial testing

All *Salmonella* spp. isolated in veterinary and food laboratories, as well as all primary isolates from humans were sent to the NRC-S where the susceptibility testing was performed using the disk diffusion method.

All strains isolated in the course of a survey and all unique strains (from one epidemiological unit) of a control programm are used.

Laboratory methodology used for identification of the microbial isolates

See chapter salmonellosis in humans; for the MIC testing CLSI standards are used, applying EUCAST cut-off values.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

National Reference Centre for *Salmonella*, AGES Graz

Antimicrobials included in monitoring

All *Salmonella* isolates were susceptibility tested (disc diffusion) according to CLSI. See corresponding tables!

Control program/mechanisms

The control program/strategies in place

Nil

Suggestions to the Community for the actions to be taken

An EU standardized antimicrobial resistance monitoring system would be highly welcome.

Additional information

Nil

B. Antimicrobial resistance of *Salmonella* spp. in humans

History of the disease and/or infection in the country

The overall resistance-rates against antibiotics remained stable over the past years.

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

Although in 2008 an increase had been observed. This can be attributed on the one hand to a higher number of multiresistant *S. Typhimurium* strains on the other hand to an increase of *S. Enteritidis* resistant to nalidixic acid. High level resistances against Ciprofloxacin and third generation cephalosporins (Cefotaxime) were still extremely rare in comparison to rates reported within the EU.

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Additional information

Nil

C. Antimicrobial resistance of *Salmonella* spp. in food

Sampling strategy used in monitoring

Frequency of the sampling

There currently is no monitoring program in Austria but all *Salmonella* spp. isolated in veterinary and food laboratories, as well as all primary isolates from humans were sent to the NRC-S where the susceptibility testing was performed using the disk diffusion method.

Salmonella isolates from control programmes or baseline surveys although are subjected to MIC-testing; all strains isolated in the course of a survey and all unique strains (from one epidemiological unit) from control programmes.

Type of specimen taken

Clinical samples from humans; for animals and food see chapters *Salmonella* spp. in animal species and *Salmonella* spp. in food.

Methods of sampling (description of sampling techniques)

Clinical samples from humans; for animals and food see chapters *Salmonella* spp. in animal species and *Salmonella* spp. in food.

Procedures for the selection of isolates for antimicrobial testing

All *Salmonella* spp. isolated in veterinary and food laboratories, as well as all primary isolates from humans were sent to the NRC-S where the susceptibility testing was performed using the disk diffusion method.

All strains isolated in the course of a survey and all unique strains (from one epidemiological unit) of a control programm are used.

Laboratory methodology used for identification of the microbial isolates

See chapter salmonellosis in humans; for the MIC testing CLSI standards are used, applying EUCAST cut-off values.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

National Reference Centre for *Salmonella*, AGES Graz

Antimicrobials included in monitoring

All *Salmonella* isolates were susceptibility tested (disc diffusion) according to CLSI. See corresponding tables!

Control program/mechanisms

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

An EU standardarized antimicrobial resistance monitoring system would be

highly welcome.

Additional information

Nil

Table Antimicrobial susceptibility testing of *S. Enteritidis* in *Gallus gallus* (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling - quantitative data [Dilution method]

S. Enteritidis		Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling																								
		yes																								
		40																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	40	0						34	5	1														
	Kanamycin		0	0																						
	Neomycin		0	0																						
	Streptomycin	32	40	0										33	6	1										
Amphenicols	Chloramphenicol	16	40	0											3	31	6									
	Florfenicol	16	40	0											7	33										
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	40	0				33	7																	
	Ceftazidim	2	40	0						39	1															
Fluoroquinolones	Ciprofloxacin	0.06	40	2		24	14			1	1															
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	40	0									35	5												
Polymyxins	Colistin	8	40	0												40										
Quinolones	Nalidixic acid	16	40	2											38				2							
Sulfonamides	Sulfamethoxazol	256	40	0												4	10	25	1							
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	40	0									26	14												
Trimethoprim	Trimethoprim	2	40	0							38	1	1													
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of S.Enteritidis in animals

S. Enteritidis Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling ((Dilution method))	
		no		no		no		no		no				yes	
		4		1		56		14		109				40	
		N	n	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	4	0	1	0	56	0	14	0	109	0			40	0
	Kanamycin	4	0	1	0	56	6	14	0	109	0			40	0
	Streptomycin	4	0	1	0	56	0	14	0	109	0			40	0
Amphenicols	Chloramphenicol	4	0	1	0	56	0	14	0	109	0			40	0
	Florfenicol													40	0
Cephalosporins	Cefotaxim	4	0	1	0	56	0	14	0	109	0			40	0
	Ceftazidim													40	0
Fluoroquinolones	Ciprofloxacin	4	0	1	0	56	0	14	0	109	0			40	2
Fully sensitive	Fully sensitive	4	4	1	1	56	11	14	14	109	102			40	38
Penicillins	Ampicillin	4	0	1	0	56	10	14	0	109	0			40	0
Polymyxins	Colistin													40	0
Quinolones	Nalidixic acid	4	0	1	0	56	45	14	0	109	7			40	2
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	4	0	1	0	56	29	14	0	109	7			40	2
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	4	0	1	0	56	3	14	0	109	0			40	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	4	0	1	0	56	8	14	0	109	0			40	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	4	0	1	0	56	0	14	0	109	0			40	0

Table Antimicrobial susceptibility testing of S.Enteritidis in animals

S. Enteritidis		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling ((Dilution method))		
		no	no	no	no	no	no	no	no	no	no	no	no	yes		
Isolates out of a monitoring program (yes/no)		4	0	1	0	56	7	14	0	109	0			40	0	
Number of isolates available in the laboratory		N	n	N	n	N	n	N	n	N	n	N	n	N	n	
Antimicrobials:		Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	4	0	1	0	56	0	14	0	109	0		40	0
Sulfonamides	Sulfamethoxazol	4	0	1	0	56	7	14	0	109	0			40	0	
Tetracyclines	Tetracyclin	4	0	1	0	56	6	14	0	109	0			40	0	
Trimethoprim	Trimethoprim	4	0	1	0	56	0	14	0	109	0			40	0	

Footnote:

If not specified, results derived from diffusion method. Number of fully-susceptible and number of isolates resistant to 1, 2, 3, 4 or greater than 4 antimicrobials of different classes, excluding cross-resistance. For Salmonella this includes resistance to ampicillin, cefotaxime, Nalidixic acid, streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of *S. Enteritidis* - qualitative data

S. Enteritidis		Meat from broilers (<i>Gallus gallus</i>)		Meat from turkey	
		no	no	no	no
Isolates out of a monitoring program (yes/no)		26		1	
Number of isolates available in the laboratory		N	n	N	n
Antimicrobials:					
Aminoglycosides	Gentamicin	26	0	1	0
	Kanamycin	26	0	1	0
	Streptomycin	26	0	1	0
Amphenicols	Chloramphenicol	26	0	1	0
Cephalosporins	Cefotaxim	26	0	1	0
Fluoroquinolones	Ciprofloxacin	26	0	1	0
Fully sensitive	Fully sensitive	26	19	1	1
Penicillins	Ampicillin	26	0	1	0
Quinolones	Nalidixic acid	26	7	1	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	26	7	1	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	26	0	1	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	26	0	1	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	26	0	1	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	26	0	1	0
Sulfonamides	Sulfamethoxazol	26	0	1	0
Tetracyclines	Tetracyclin	26	0	1	0
Trimethoprim	Trimethoprim	26	0	1	0

Footnote:

If not specified, results derived from diffusion method.

Table Antimicrobial susceptibility testing of *Salmonella* in humans, *Salmonella Enteritidis*

S. Enteritidis		humans		
		no		
		2200		
Antimicrobials:		N	n	
	Gentamicin	2200	2	
	Kanamycin	2200	2	
Aminoglycosides	Streptomycin	2200	8	
	Amphenicols	Chloramphenicol	2200	6
	Cephalosporins	Cefotaxim	2200	2
Fluoroquinolones	Ciprofloxacin	2200	0	
	Fully sensitive	Fully sensitive	2200	1860
	Penicillins	Ampicillin	2200	37
Quinolones	Nalidixic acid	2200	304	
	Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	2200	308
	Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	2200	15
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	2200	11	
	Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	2200	2
	Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	2200	4
Sulfonamides	Sulfamethoxazol	2200	13	
	Tetracyclines	Tetracyclin	2200	17
	Trimethoprim	Trimethoprim	2200	10

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

S. Typhimurium		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling ((Dilution method))	
		no		no				no		no		no		yes	
Isolates out of a monitoring program (yes/no)		8		20				0		23		10		16	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	8	0	20	0					23	0	10	0	16	0
	Kanamycin	8	0	20	2					23	0	10	0	16	0
	Streptomycin	8	3	20	17					23	0	10	0	16	0
Amphenicols	Chloramphenicol	8	3	20	16					23	0	10	0	16	0
	Florfenicol													16	0
Cephalosporins	Cefotaxim	8	0	20	0					23	0	10	0	16	0
	Ceftazidim													16	0
Fluoroquinolones	Ciprofloxacin	8	0	20	0					23	0	10	0	16	0
Fully sensitive	Fully sensitive	8	5	20	2					23	23	10	8	16	16
Penicillins	Ampicillin	8	0	20	17					23	0	10	2	16	0
Polymyxins	Colistin													16	0
Quinolones	Nalidixic acid	8	0	20	7					23	0	10	0	16	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	8	0	20	1					23	0	10	2	16	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	8	0	20	0					23	0	10	0	16	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	8	0	20	0					23	0	10	0	16	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	8	0	20	0					23	0	10	0	16	0

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

S. Typhimurium		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling ((Dilution method))	
		no	no	no	no	no	no	no	no	no	no	no	no	yes	
Isolates out of a monitoring program (yes/no)		8	20			0		23		10		16			
Number of isolates available in the laboratory		N	n	N	n	N	n	N	n	N	n	N	n	N	n
Antimicrobials:		Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	8	3	20	17			23	0	10	0	16	0
Sulfonamides	Sulfamethoxazol	8	0	20	17					23	0	10	0	16	0
Tetracyclines	Tetracyclin	8	3	20	18					23	0	10	0	16	0
Trimethoprim	Trimethoprim	8	0	20	1					23	0	10	0	16	0

Footnote:

If not specified, results derived from diffusion method.

Table Antimicrobial susceptibility testing of *S. Typhimurium* in *Gallus gallus* (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling - quantitative data [Dilution method]

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

Table Antimicrobial susceptibility testing of *S. Typhimurium* - qualitative data

S. Typhimurium Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory Antimicrobials:		Meat from turkey		Meat from broilers (<i>Gallus gallus</i>)		Meat from bovine animals		Meat from pig	
		no		no		no		no	
		4		1		0		3	
		N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	4	0	1	0			3	0
	Kanamycin	4	0	1	0			3	1
	Streptomycin	4	3	1	0			3	3
Amphenicols	Chloramphenicol	4	2	1	0			3	3
Cephalosporins	Cefotaxim	4	0	1	0			3	0
Fluoroquinolones	Ciprofloxacin	4	0	1	0			3	0
Fully sensitive	Fully sensitive	4	1	1	0			3	0
Penicillins	Ampicillin	4	3	1	1			3	3
Quinolones	Nalidixic acid	4	3	1	0			3	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	4	0	1	0			3	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	4	0	1	0			3	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	4	0	1	1			3	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	4	0	1	0			3	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	4	3	1	0			3	3
Sulfonamides	Sulfamethoxazol	4	3	1	1			3	3
Tetracyclines	Tetracyclin	4	3	1	0			3	3
Trimethoprim	Trimethoprim	4	0	1	1			3	1

Table Antimicrobial susceptibility testing of *Salmonella* in humans, *Salmonella Typhimurium*

S. Typhimurium		humans	
		no	
		374	
Antimicrobials:		N	n
Aminoglycosides			
	Gentamicin	374	11
	Kanamycin	374	12
	Streptomycin	374	148
Amphenicols	Chloramphenicol	374	102
Cephalosporins	Cefotaxim	374	2
Fluoroquinolones	Ciprofloxacin	374	0
Fully sensitive	Fully sensitive	374	182
Penicillins	Ampicillin	374	175
Quinolones	Nalidixic acid	374	27
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	374	21
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	374	8
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	374	9
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	374	36
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	374	118
Sulfonamides	Sulfamethoxazol	374	164
Tetracyclines	Tetracyclin	374	168
Trimethoprim	Trimethoprim	374	23

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

Salmonella spp.		Pigs - breeding animals - unspecified - - faeces - Survey - EU baseline survey																								
		yes																								
		15																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	15	0						10	5															
	Kanamycin		0	0																						
	Neomycin		0	0																						
	Streptomycin	32	15	2										1	5	6		1	1		1					
Amphenicols	Chloramphenicol	16	15	2												7	6				2					
	Florfenicol	16	15	2											13			2								
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	15	0					14	1																
	Ceftazidim	2	15	0							12	3														
Fluoroquinolones	Ciprofloxacin	0.06	15	0		8	7																			
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	15	2								3	10							2						
Polymyxins	Colistin	8	15	0												15										
Quinolones	Nalidixic acid	16	15	0											15											
Sulfonamides	Sulfamethoxazol	256	15	3														3	5	2	2			3		
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	15	3									10	2			1	1		1						
Trimethoprim	Trimethoprim	2	15	0							15															
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of *Salmonella* in animals

Salmonella spp.		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling		Pigs - breeding animals - at farm - Survey - EU baseline survey	
Isolates out of a monitoring program (yes/no)															yes		yes
															96		15
Antimicrobials:		N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin													96	0	15	0
	Kanamycin													96	0	15	0
	Streptomycin													96	0	15	2
Amphenicols	Chloramphenicol													96	0	15	2
	Florfenicol													96	0	15	2
Cephalosporins	Cefotaxim													96	0	15	0
	Ceftazidim													96	0	15	0
Fluoroquinolones	Ciprofloxacin													96	3	15	0
Fully sensitive	Fully sensitive													96	93	15	12
Penicillins	Ampicillin													96	0	15	2
Polymyxins	Colistin													96	0	15	0
Quinolones	Nalidixic acid													96	3	15	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial													96	2	15	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials													96	0	15	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials													96	0	15	2
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials													96	1	15	1
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials													96	0	15	0

Table Antimicrobial susceptibility testing of *Salmonella* in animals

Salmonella spp.		Cattle (bovine animals)	Pigs	Gallus gallus (fowl)	Turkeys	Gallus gallus (fowl) - laying hens	Gallus gallus (fowl) - broilers	Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling	Pigs - breeding animals - at farm - Survey - EU baseline survey	
Isolates out of a monitoring program (yes/no)								yes	yes	
Number of isolates available in the laboratory								96	15	
Antimicrobials:		N	n	N	n	N	n	N	n	N
Sulfonamides	Sulfamethoxazol							96	1	15
Tetracyclines	Tetracyclin							96	1	15
Trimethoprim	Trimethoprim							96	1	15
									0	

Footnote:

Dilution method. Number of fully-susceptible and number of isolates resistant to 1, 2, 3, 4 or greater than 4 antimicrobials of different classes, excluding cross-resistance. For *Salmonella* this includes resistance to ampicillin, cefotaxime, Nalidixic acid, streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of *Salmonella* spp. in carcass - Meat from broilers (*Gallus gallus*) - chilled - at slaughterhouse - animal sample - neck skin - Survey - EU baseline survey - quantitative data [Dilution method]

Salmonella spp.		Meat from broilers (<i>Gallus gallus</i>) - carcass - chilled - - neck skin - Survey - EU baseline survey																										
		Isolates out of a monitoring program (yes/no)																										
		Number of isolates available in the laboratory																										
Antimicrobials:		yes																										
		11																										
		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest		
Aminoglycosides	Gentamicin	2	11	0						8	3																	
	Neomycin		0	0																								
	Streptomycin	32	11	0												2	3	5	1									
Amphenicols	Chloramphenicol	16	11	0														5	5	1								
	Florfenicol	16	11	0														9	2									
Cephalosporins	Cefotaxim	0.5	11	0					8	2		1																
	Ceftazidim	2	11	0						7	3	1																
Fluoroquinolones	Ciprofloxacin	0.06	11	2		6	2	1		2																		
Penicillins	Ampicillin	4	11	0												8	2	1										
Polymyxins	Colistin	8	11	0															11									
Quinolones	Nalidixic acid	16	11	2														6	3				2					
Sulfonamides	Sulfamethoxazol	256	11	0																2	8		1					
Tetracyclines	Tetracyclin	8	11	0													6	3	2									
Trimethoprim	Trimethoprim	2	11	0							11																	
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																								

Table Antimicrobial susceptibility testing of *Salmonella* spp. in food

Salmonella spp.		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Meat from other poultry species		Meat from broilers (Gallus gallus) - carcass - chilled - - neck skin - Survey - EU baseline survey ((Dilution method))		Meat from turkey	
		Isolates out of a monitoring program (yes/no)		Number of isolates available in the laboratory		no				yes		no	
Antimicrobials:		0		0		26				11		1	
Aminoglycosides	Gentamicin	N	n	N	n	N	n	N	n	N	n	N	n
	Kanamycin					26	0			11	0	1	0
	Streptomycin					26	0			11	0	1	0
Amphenicols	Chloramphenicol					26	0			11	0	1	0
	Florfenicol									11	0		
Cephalosporins	Cefotaxim					26	0			11	0	1	0
	Ceftazidim									11	0		
Fluoroquinolones	Ciprofloxacin					26	0			11	2	1	0
Fully sensitive	Fully sensitive					26	19			11	9	1	1
Penicillins	Ampicillin					26	0			11	0	1	0
Polymyxins	Colistin									11	0		
Quinolones	Nalidixic acid					26	7			11	2	1	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial					26	7			11	2	1	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials					26	0			11	0	1	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials					26	0			11	0	1	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials					26	0			11	0	1	0

Table Antimicrobial susceptibility testing of *Salmonella* spp. in food

Salmonella spp.		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Meat from other poultry species		Meat from broilers (Gallus gallus) - carcass - chilled - - neck skin - Survey - EU baseline survey ((Dilution method))		Meat from turkey	
Isolates out of a monitoring program (yes/no)													
Number of isolates available in the laboratory				no				yes		no			
Antimicrobials:		0		0		26				11		1	
N	n	N	n	N	n	N	n	N	n	N	n	N	n
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials			26	0			11	0	1	0		
Sulfonamides	Sulfamethoxazol			26	0			11	0	1	0		
Tetracyclines	Tetracyclin			26	0			11	0	1	0		
Trimethoprim	Trimethoprim			26	0			11	0	1	0		

Footnote:

If not specified, results derived from diffusion method. Number of fully-susceptible and number of isolates resistant to 1, 2, 3, 4 or greater than 4 antimicrobials of different classes, excluding cross-resistance. For *Salmonella* this includes resistance to ampicillin, cefotaxime, Nalidixic acid, streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of Other serotypes in *Gallus gallus* (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling ((other than *S. Enteritidis* or *S. Typhimurium*)) - quantitative data [Dilution method]

Other serotypes		Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling ((other than <i>S. Enteritidis</i> or <i>S. Typhimurium</i>))																								
Isolates out of a monitoring program (yes/no)		yes																								
Number of isolates available in the laboratory		40																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	40	0						25	14	1														
	Kanamycin		0	0																						
	Neomycin		0	0																						
	Streptomycin	32	40	0										1	13	21	4	1								
Amphenicols	Chloramphenicol	16	40	0											2	14	24									
	Florfenicol	16	40	0											4	36										
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.5	40	0					19	18	2	1														
	Ceftazidim	2	40	0							19	19		2												
Fluoroquinolones	Ciprofloxacin	0.06	40	1	1	20	18			1																
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	4	40	0							5	32	3													
Polymyxins	Colistin	8	40	0											40											
Quinolones	Nalidixic acid	16	40	1										39				1								
Sulfonamides	Sulfamethoxazol	256	40	1											2	5	24	8			1					
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	40	1							18	21					1									
Trimethoprim	Trimethoprim	2	40	1							39						1									
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Antimicrobial susceptibility testing of Other serotypes - qualitative data

Other serotypes		Gallus gallus (fowl) - broilers	Cattle (bovine animals)		Pigs	Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling ((Dilution method))	Gallus gallus (fowl) - laying hens	Turkeys					
Isolates out of a monitoring program (yes/no)		no	no	no	yes	no	no	no	no				
		99		39		48		40		50		114	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n		
Aminoglycosides	Gentamicin	99	5	39	0	48	0	40	0	50	0	114	10
	Kanamycin	99	9	39	0	48	6	40	0	50	0	114	4
	Streptomycin	99	17	39	31	48	20	40	0	50	1	114	34
Amphenicols	Chloramphenicol	99	0	39	0	48	6	40	0	50	0	114	0
	Florfenicol							40	0				
Cephalosporins	Cefotaxim	99	0	39	0	48	0	40	0	50	0	114	0
	Ceftazidim							40	0				
Fluoroquinolones	Ciprofloxacin	99	0	39	0	48	0	40	1	50	0	114	0
Fully sensitive	Fully sensitive	99	69	39	8	48	27	40	39	50	48	114	52
Penicillins	Ampicillin	99	22	39	0	48	15	40	0	50	0	114	19
Polymyxins	Colistin							40	0				
Quinolones	Nalidixic acid	99	22	39	2	48	1	40	1	50	1	114	35
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	99	6	39	29	48	1	40	0	50	1	114	21
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	99	4	39	2	48	2	40	0	50	0	114	25
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	99	6	39	0	48	5	40	0	50	0	114	2
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	99	4	39	0	48	6	40	1	50	1	114	8

Table Antimicrobial susceptibility testing of Other serotypes - qualitative data

Other serotypes		Gallus gallus (fowl) - broilers	Cattle (bovine animals)		Pigs		Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling - census sampling ((Dilution method))	Gallus gallus (fowl) - laying hens	Turkeys				
Isolates out of a monitoring program (yes/no)		no		no		no		yes		no			
		99		39		48		40		50			
		N	n	N	n	N	n	N	n	N	n		
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	99	10	39	0	48	7	40	0	50	0	114	6
Sulfonamides	Sulfamethoxazol	99	13	39	0	48	19	40	1	50	1	114	15
Tetracyclines	Tetracyclin	99	10	39	0	48	17	40	1	50	1	114	21
Trimethoprim	Trimethoprim	99	6	39	0	48	7	40	1	50	1	114	1

Footnote:

Other serotypes than S. Enteritidis and S. Typhimurium. Results derived from diffusion method.

Table Antimicrobial susceptibility testing of Other serotypes - qualitative data

Other serotypes		Meat from bovine animals		Meat from broilers (<i>Gallus gallus</i>)		Meat from turkey		Meat from pig	
		no		no		no		no	
Antimicrobials:		2		56		28		1	
		N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	2	0	56	0	28	0	1	0
	Kanamycin	2	0	56	1	28	2	1	0
	Streptomycin	2	1	56	27	28	11	1	1
Amphenicols	Chloramphenicol	2	0	56	1	28	0	1	0
Cephalosporins	Cefotaxim	2	0	56	0	28	0	1	0
Fluoroquinolones	Ciprofloxacin	2	0	56	0	28	0	1	0
Fully sensitive	Fully sensitive	2	1	56	19	28	5	1	0
Penicillins	Ampicillin	2	1	56	5	28	8	1	1
Quinolones	Nalidixic acid	2	0	56	31	28	13	1	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	2	0	56	1	28	5	1	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	2	0	56	7	28	5	1	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	2	0	56	8	28	8	1	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	2	1	56	16	28	2	1	1
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	2	0	56	5	28	3	1	0
Sulfonamides	Sulfamethoxazol	2	1	56	29	28	7	1	1
Tetracyclines	Tetracyclin	2	1	56	29	28	19	1	1
Trimethoprim	Trimethoprim	2	0	56	5	28	3	1	0

Footnote:

other serotypes than S. Enteritidis and S. Typhimurium

Table Antimicrobial susceptibility testing of Other serotypes - qualitative data

Other serotypes		humans	
		no	
Isolates out of a monitoring program (yes/no)		622	
Number of isolates available in the laboratory		N	n
Antimicrobials:			
Aminoglycosides	Gentamicin	622	7
	Kanamycin	622	19
	Streptomycin	622	181
Amphenicols	Chloramphenicol	622	18
Cephalosporins	Cefotaxim	622	2
Fluoroquinolones	Ciprofloxacin	622	8
Fully sensitive	Fully sensitive	622	356
Penicillins	Ampicillin	622	149
Quinolones	Nalidixic acid	622	124
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	622	63
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	622	10
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	622	34
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	622	122
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	622	37
Sulfonamides	Sulfamethoxazol	622	158
Tetracyclines	Tetracyclin	622	199
Trimethoprim	Trimethoprim	622	34

Footnote:

other serotypes than S. Enteritidis and S. Typhimurium

Table Breakpoints for antibiotic resistance testing

Test Method Used		Standards used for testing	
Disc diffusion	●		
Agar dilution	○		
Broth dilution	●		
E-test	○		

		Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
			Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	Gentamicin				2	0.25	32	10	15		12
	Kanamycin							30	18		13
	Streptomycin				32	2	128	10	15		11
Amphenicols	Chloramphenicol				16	2	64	30	15		11
	Florfenicol				16	2	64				
Cephalosporins	Cefotaxim				0.5	0.06	4	30	23		14
	Ceftazidim				2	0.25	16				
Fluoroquinolones	Ciprofloxacin				0.06	0.008	8	5	21		15
Penicillins	Ampicillin				4	0.5	32	10	17		13
Polymyxins	Colistin				8	8	16				
Quinolones	Nalidixic acid				16	4	64	30	19		13
Sulfonamides	Sulfamethoxazol				256	8	1024	300	17		12
Tetracyclines	Tetracyclin				8	1	64	30	15		11
Trimethoprim	Trimethoprim				2	0.5	32	5	16		10

Table Breakpoints for antibiotic resistance testing

Footnote:

Standard for breakpoints:

Dilution method: EUCAST

Diffusion method: CLSI

Table Breakpoints for antibiotic resistance testing

Test Method Used		Standards used for testing	
Disc diffusion	●		
Agar dilution	○		
Broth dilution	●		
E-test	○		

		Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
			Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	Gentamicin				2	0.25	32	10	15		12
	Kanamycin							30	18		13
	Streptomycin				32	2	128	10	15		11
Amphenicols	Chloramphenicol				16	2	64	30	15		11
	Florfenicol				16	2	64				
Cephalosporins	Cefotaxim				0.5	0.06	4	30	23		14
	Ceftazidim				2	0.25	16				
Fluoroquinolones	Ciprofloxacin				0.06	0.008	8	5	21		15
Penicillins	Ampicillin				4	0.5	32	10	17		13
Polymyxins	Colistin				8	8	16				
Quinolones	Nalidixic acid				16	4	64	30	19		13
Sulfonamides	Sulfamethoxazol				256	8	1024	300	17		12
Tetracyclines	Tetracyclin				8	1	64	30	15		11
Trimethoprim	Trimethoprim				2	0.5	32	5	16		10

Table Breakpoints for antibiotic resistance testing

Footnote:

Standard for breakpoints:

Dilution method: EUCAST

Diffusion method: CLSI

Table Breakpoints for antibiotic resistance testing

Test Method Used		Standards used for testing	
Disc diffusion	●		
Agar dilution	○		
Broth dilution	●		
E-test	○		

		Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
			Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	Gentamicin				2	0.25	32	10	15		12
	Kanamycin							30	18		13
	Streptomycin				32	2	128	10	15		11
Amphenicols	Chloramphenicol				16	2	64	30	15		11
	Florfenicol				16	2	64				
Cephalosporins	Cefotaxim				0.5	0.06	4	30	23		14
	Ceftazidim				2	0.25	16				
Fluoroquinolones	Ciprofloxacin				0.06	0.008	8	5	21		15
Penicillins	Ampicillin				4	0.5	32	10	17		13
Polymyxins	Colistin				8	8	16				
Quinolones	Nalidixic acid				16	4	64	30	19		13
Sulfonamides	Sulfamethoxazol				256	8	1024	300	17		12
Tetracyclines	Tetracyclin				8	1	64	30	15		11
Trimethoprim	Trimethoprim				2	0.5	32	5	16		10

Table Breakpoints for antibiotic resistance testing

Footnote:

Standard for breakpoints:

Dilution method: EUCAST

Diffusion method: CLSI

Table Breakpoints for antibiotic resistance testing

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

Standards used for testing
CLSI

		Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
			Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	Gentamicin				2	0.25	32	10	15		12
	Kanamycin							30	18		13
	Streptomycin				32	2	128	10	15		11
Amphenicols	Chloramphenicol				16	2	64	30	15		11
	Florfenicol				16	2	64				
Cephalosporins	Cefotaxim				0.5	0.06	4	30	23		14
	Ceftazidim				2	0.25	16				
Fluoroquinolones	Ciprofloxacin				0.06	0.008	8	5	21		15
Penicillins	Ampicillin				4	0.5	32	10	17		13
Polymyxins	Colistin				8	8	16				
Quinolones	Nalidixic acid				16	4	64	30	19		13
Sulfonamides	Sulfamethoxazol				256	8	1024	300	17		12
Tetracyclines	Tetracyclin				8	1	64	30	15		11
Trimethoprim	Trimethoprim				2	0.5	32	5	16		10

Table Breakpoints for antibiotic resistance testing

Footnote:

Standard for breakpoints:

Dilution method: EUCAST

Diffusion method: CLSI

2.2 CAMPYLOBACTERIOSIS

2.2.1 General evaluation of the national situation

A. Thermophilic Campylobacter general evaluation

History of the disease and/or infection in the country

In 2006, the number of notified human campylobacteriosis cases in Austria exceeded the number of notified salmonellosis cases for the first time. Since then, the gap between the number of human campylobacter cases and salmonella cases is widening.

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

In recent years, the number of notified cases of campylobacteriosis – with the exception of 2003 – steadily increased, reaching a new peak of 6,077 cases in 2007. In 2008 a reduction to 4,303 cases (Notification of single cases) could be observed. The reason for the reduction is not clear; attention must be paid to the future trends.

The sources of infection are still unclear. The few published outbreaks in Austria were due to contaminated cow's raw milk or chicken meat. Pets may be considered another possible source.

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

Feedings stuff has no obvious relevance. Animals are heavily infected: broiler flocks up to 50 %. The actual source of infection is unknown in most human cases, chicken meat may account for approx. 40% of human infections.

Recent actions taken to control the zoonoses

On January 1st, 2006, the Federal Zoonoses Act (128. Bundesgesetz: Zoonosengesetz, published on 18th November 2005) was implemented. The subject of this Act is to ensure that zoonoses, zoonotic agents and related antimicrobial resistance are properly monitored, that food-borne outbreaks receive proper epidemiological investigation, to enable the collection of the information necessary in the EU. According to this Zoonoses Act, to survey and combat the zoonoses in Austria, a Federal Commission for Zoonoses (Zoonoses Commission) has been founded to advise the Federal Minister. The first meeting took place on May 3rd, 2006. The tasks of this Zoonoses Commission are

- Securing of effective and continuous teamwork of special fields concerned
- Cooperation based on free exchange of general information and where necessary, of specific data
- Determination of measures in case of Austrian-wide food borne outbreaks (concerning several provinces by one outbreak)
- Issues the annually report on trends and sources of zoonoses in Austria

- Preparation of risk based, integrated monitoring and surveillance programmes

The Austria-wide monitoring program on the trends of campylobacter prevalence and antimicrobial resistance of campylobacter in broiler, pigs and bovine animals was continued for the fourth year according to the directive 2003/99/EC of the European Parliament and the Council of 17 November 2003 and the Federal Zoonoses Act. The sampling was carried out from January to December 2008, and follow up programs will be implemented in the forthcoming years.

Suggestions to the Community for the actions to be taken

Continue to work for harmonization of monitoring programs

Additional information

Nil

2.2.2 Campylobacteriosis in humans

A. Thermophilic Campylobacter in humans

Reporting system in place for the human cases

Clinical picture compatible with campylobacteriosis, e.g.: diarrheal illness of variable severity and isolation of *Campylobacter* spp. from stool.

Diagnostic/analytical methods used

Stool samples are plated on selective media and incubated in microaerobic atmosphere at 37 - 42 °C for a minimum of 36 hours (Anonymus: Standardisierung und Qualitätssicherung in der mikrobiologischen Diagnostik. Richtlinien. Bundesministerium für Soziale Sicherheit und Generationen. ISBN 3-84123-126-0, Wien, 2001, pg. 13). *Campylobacter* is confirmed by observing the typical colony morphology and characteristic motility and morphology under the microscope. For typing and differentiation of isolates to species level the production of catalase and oxidase, the reaction in hippurate and indoxylacetate-hydrolysis is performed. The differentiation to species-level is not performed in each laboratory.

Notification system in place

Notification of campylobacteriosis since 1996 according to the epidemic act (BGBI. 1950/186 Epidemiegesetz, as amended): Primarily the attending physicians have to notify. Since 2002, an order has been implemented (Meldepflicht infektiöser Erkrankungen für Labors GZ: 21.700/5- VIII/D/5/02), in which medical doctors specialised in Laboratory Diagnosis or Microbiology and Hygiene are subjected to notification.

As described in chapter 2, in 2008 additionally to the notification of aggregated data also single case data were collected in the AGES. These data presented in this report reflects the number of single human cases notified. Only for reasons of comparison with the last years, the number of cases notified as aggregated data used.

On July 24th 2006 the amendments of the epidemic act (114. Bundesgesetz: Änderung des Epidemiegesetzes 1950) has been published: Accordingly, all zoonotic agents that are isolated in a laboratory and that are notifiable have to be sent to the corresponding reference laboratory for speciation.

History of the disease and/or infection in the country

In 2006, the number of notified human campylobacteriosis cases in Austria exceeded the number of notified salmonellosis cases for the first time. Since that year campylobacteriosis has remained the most frequently reported bacterial enteritis in humans in Austria.

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

Following the number of collected single cases per year, in 2008 campylobacteriosis (N=4,303) is the most frequently notified foodborne enteric disease. In comparison to 2007, a decrease of 26% of the notified cases (N=5,821) could be observed in 2008. The reason for the reduction is not clear; anyhow attention must be paid to the future trends. It seems that the main source of infections is chicken meat and raw milk (Feierl G. 2007. Jahresbericht 2006 der Nationalen Referenzzentrale für Campylobacter. Mitteilungen der Sanitätsverwaltung 4/2007).

Relevance as zoonotic disease

In 2008, campylobacteriosis remained the most frequently notified food borne disease in Austria.

Additional information

On July 24, 2006, the amendment of the Epidemic Act (114. Bundesgesetz: Änderung des Epidemiegesetzes 1950) was published. According to the Act, all notifiable zoonotic agents that are isolated from humans in a laboratory have to be sent to the corresponding national reference laboratory/centre for speciation.

Additionally a sentinel surveillance program for Campylobacter isolates from human infections was installed in October 2006. On a monthly basis, the first 10 isolates collected at each of four diagnostic laboratories serving different provinces in Austria are sent to the National Reference Laboratory for Campylobacter for speciation analysis and antimicrobial resistance testing.

Annual report of the National Reference Centre

http://www.bmg.gv.at/cms/site/attachments/9/7/8/CH0954/CMS1237550818447/jb_campylobacter_revised.pdf

2.2.3 **Campylobacter in foodstuffs**

A. Campylobacter spp., unspecified in food - All foodstuffs - Surveillance - official controls - objective sampling

Monitoring system

Sampling strategy

Foodstuff was sampled according to the ordinance „Revisions- und Probenplan für das Jahr 2008 gemäß §31 LMSVG; Richtlinien über die Vollziehung der Überwachung des Verkehrs mit den durch das LMSVG erfassten Waren; Berichtsschema 2008“ (BMGFJ-75500/0247-IV/B/7/2007 von 08.01.2008) from the Federal Ministry of Health. This “Revisions- und Probenplan” is part of the multi-annual national control plan (2007-2010) according to Art. 41 ff of Regulation (EC) No 882/2004.

The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail outlets etc. that have to be sampled and tested randomly according to the number of food enterprises per province. Every business within Austria has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP concepts, control of manufacturing processes etc.

In 2008, approximately 40,000 samples were planned to be tested in Austria. About 60% (24,000) of these are planned samples (surveillance) and only these numbers are used in this report (data from suspect samples are not shown). These planned samples either consist of samples of the yearly sampling plan which determines the number of samples of each food category that have to be investigated randomly, e.g. raw meat (fresh or frozen); sausages; cheeses; milk; preserved food etc. There are different sampling stages where food samples are taken: e.g. from retail, processing plant, primary production.

In addition there is a monitoring plan for food items (40-45 campaigns per year). In the course of these programs food items of special interest for defined parameters – amongst others zoonotic agents – are investigated. The sampling takes place during a fixed period of time in order to gain in-depth information. In 2008, eight relevant food campaign programs were conducted throughout Austria (Schwerpunktprogramm 2008 BMGFJ-75500/0242-IV/B/7/2007). Details and results of these campaigns can be found in the respective chapters.

Diagnostic/analytical methods used

Samples are cultured either according to ISO 10272: 1995 or preenriched in Bolton bouillon at 42 °C for 48 hours and subsequent plated on CCDA- or modified CCDA agar at 42 °C for 48 hours microaerophilic. *Campylobacter*-like colonies were identified serologically, observing their characteristic motility and morphology under the microscope and the production of catalase and oxidase.

Not all isolates of *Campylobacter* spp. are differentiated.

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

138 single samples of fresh broiler meat were tested and in 8% (=11 samples) thermotolerant *Campylobacter* was found. In 35 samples of pasteurised cows' milk, no sample was found positive and in 25 samples of raw cows' milk one sample was found positive for *C. coli* (4%).

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic <i>Campylobacter</i> spp.	<i>C. coli</i>	<i>C. jejuni</i>	<i>C. lari</i>	<i>C. upsaliensis</i>	Thermophilic <i>Campylobacter</i> spp., unspecified
Meat from broilers (<i>Gallus gallus</i>) - carcass - chilled - neck skin - Survey - EU baseline survey		animal	1g	408	320	98	217	0	0	5
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	138	11					11
Meat from other poultry species - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling		single	25g	79	11					11

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic <i>Campylobacter</i> spp.	<i>C. coli</i>	<i>C. jejuni</i>	<i>C. lari</i>	<i>C. upsaliensis</i>	Thermophilic <i>Campylobacter</i> spp., unspecified
Crustaceans - at catering - Surveillance - official controls - objective sampling		single	25g	5	0	0				
Dairy products (excluding cheeses) - dairy products, not specified - at processing plant - Surveillance - official controls - objective sampling		single	25g	14	0	0				
Dairy products (excluding cheeses) - dairy products, not specified - at retail - Surveillance - official controls - objective sampling		single	25g	12	0	0				
Dairy products (excluding cheeses) - ice-cream - at retail - Surveillance - official controls - objective sampling		single	25g	4	0	0				
Fish - raw - at catering - Surveillance - official controls - selective sampling		single	25g	2	0	0				
Fishery products, unspecified - at catering - Surveillance - official controls - selective sampling		single	25g	3	0	0				
Meat from bovine animals - fresh - at processing plant - Surveillance - official controls - objective sampling		single	25g	2	0	0				
Meat from pig - fresh - at catering - Surveillance - official controls - objective sampling		single	25g	3	0	0				
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling		single	25g	7	0	0				
Milk, cows' - pasteurised milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	15	0	0				
Milk, cows' - pasteurised milk - at retail - Surveillance - official controls - objective sampling		single	25g	20	0	0				

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic <i>Campylobacter</i> spp.	<i>C. coli</i>	<i>C. jejuni</i>	<i>C. lari</i>	<i>C. upsaliensis</i>	Thermophilic <i>Campylobacter</i> spp., unspecified
Milk, cows' - raw - at retail - Surveillance - official controls - objective sampling		single	25g	25	1	1				
Other food - at processing plant - Surveillance - official controls - objective sampling		single	25g	17	0	0				
Other food - at retail - Surveillance - official controls - objective sampling		single	25g	12	0	0				
Vegetables - products - at retail - Surveillance - official controls - objective sampling		single	25g	4	0	0				

2.2.4 **Campylobacter in animals**

A. thermophilic Campylobacter spp., unspecified in animal - Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective

Monitoring system

Sampling strategy

Since 2004 monitoring plans on the prevalence of selected zoonotic agents and their antimicrobial resistance have been performed annually. Based on the prevalence of thermotolerant *Campylobacter* in cattle in 2007 the number of caecum samples was calculated (N=923) to obtain 170 thermotolerant *Campylobacter* for antimicrobial susceptibility testing. Caecal contents of slaughtered cattle of Austrian origin were sampled in slaughter houses where at least 80% of all cattle were slaughtered in 2007. The sampling had been stratified on the number of slaughtered animals by abattoirs all over Austria. The date of sampling was randomized over the period of the study.

Frequency of the sampling

The sampling was distributed by randomization over the whole year 2008.

Type of specimen taken

Other: Animals at slaughter: Caecum containing a minimum of 50 to 100 grams of content.

Methods of sampling (description of sampling techniques)

The sampling was performed by official veterinarians carrying out the post-mortem inspection. At time of evisceration a part of the colon was ligated and wrapped in a sterile plastic bag. After cooling down to 4 °C the sample was sent in a hobbock or polystyrene box after adding cooling units to the Institute of Veterinary Diseases Control (IVET) in Graz. In the laboratory some content of each colon was inoculated in selective bouillon suitable for *Campylobacter jejuni/coli*.

Case definition

A bovine animal is considered to be infected with thermotolerant *Campylobacter* following isolation of *Campylobacter jejuni* or *C. coli* from its caecum.

Diagnostic/analytical methods used

Approximately 1 gram of content of the colon was enriched in Preston bouillon in microaerophilic atmosphere for 24 hours at 42 °C. Subsequently the preenrichment was plated on modified CCD agar (mCCDA) and incubated in microaerophilic atmosphere at 42 ± 1 °C for 48 hours. *Campylobacter*-like colonies were identified by observing their characteristic motility and morphology under the microscope and the production of catalase and oxidase.

For typing and differentiating of *C. jejuni* and *C. coli* isolates, hippurate reaction and indoxylacetate-hydrolysis was performed. All *C. jejuni* and *C. coli* isolates were frozen in proteose pepton solution containing 10% glycerol or thioglycolate-

broth at -70 °C.

For quality control *Campylobacter jejuni* ATCC 33560, *Escherichia coli* ATCC 25922 and internal control isolates of *C. jejuni* and *C. coli*.

Statistical analysis was performed with EpiInfo version 3.3.2.

Vaccination policy

Vaccination is not performed in Austria

Other preventive measures than vaccination in place

None

Control program/mechanisms

The control program/strategies in place

None

Recent actions taken to control the zoonoses

None

Suggestions to the Community for the actions to be taken

Emphasis should be placed on education of the people for a better care in kitchen hygiene.

Measures in case of the positive findings or single cases

None

Notification system in place

Findings of *C. jejuni* and *C. coli* in animals must not be reported to authorities in Austria.

Results of the investigation

See respective tables

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

In 263 out of 923 (28.5%; CI 95% 25.6-31.5) caecum samples from slaughtered bovine animals thermotolerant *Campylobacter* were detected. There was no significant change in the prevalence compared to the previous years (25.4% in 2007). Due to the 47.8% prevalence of positive broiler slaughter batches for thermotolerant *Campylobacter*, there may be a higher risk for humans to get infected from poultry meat than from the consumption of beef or veal.

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

Nil

Additional information

Nil

B. Campylobacter spp., unspecified in animal - Gallus gallus (fowl) - broilers - at slaughterhouse - Survey - EU baseline survey

Monitoring system

Sampling strategy

In 2008 a baseline survey on the prevalence and antimicrobial resistance of *Campylobacter* spp. in broiler flocks and on the prevalence of *Campylobacter* spp. and *Salmonella* spp. in broiler carcasses was carried out. The date of sampling was randomized over the whole year. Sampling was performed in the 5 broiler slaughter facilities with slaughter batches consisting of >2000 animals in Austria in 2007.

Frequency of the sampling

Rearing period: no program
Before slaughter at farm: no program
At slaughter: according to the randomized sampling plan

Methods of sampling (description of sampling techniques)

Rearing period: no program
Before slaughter at farm: no program
At slaughter: The sampling was performed by official veterinarians carrying out the post-mortem inspection. At time of evisceration the whole intestines of 10 animals were taken and wrapped in a sterile plastic bag. Additionally a carcass from the same slaughter batch was sampled. After cooling down to 4 °C the sample was sent in a hobbock or polystyrene box after adding cooling units to the Institute of Veterinary Diseases Control (IVET) in Graz. In the laboratory a caecum of each intestinal convolute was identified, some content of each caecum pooled and plated on selective medium suitable for *Campylobacter* jejuni/coli. The carcass was immediately forwarded to the national Reference laboratory for *Campylobacter* and the national Reference laboratory for *Salmonella*.

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Case definition

At slaughter: A slaughter batch is considered to be infected with thermotolerant *Campylobacter* following isolation of *Campylobacter* jejuni or *C. coli* from its caecum.

Diagnostic/analytical methods used

At slaughter: The pooled samples were examined by direct inoculation on modified CCD agar (mCCDA) that was incubated in microaerophilic atmosphere at 42 ± 1 °C for 48 hours. *Campylobacter*-like colonies were identified by observing their characteristic motility and morphology under the microscope and the production of catalase and oxidase. For typing and differentiating of *C. jejuni* and *C. coli* isolates, hippurate reaction and indoxylacetate-hydrolysis was performed. All *C. jejuni* and *C. coli* isolates were frozen in proteose peptone solution containing 10 % glycerol or thioglycolat-broth at -70 °C. For quality

control *Campylobacter jejuni* ATCC 33560, *Escherichia coli* ATCC 25922 and internal control isolates *C. jejuni* and *C. coli* were used. Statistical analysis was performed with EpiInfo version 3.3.2.

Vaccination policy

Vaccination is not performed in Austria.

Other preventive measures than vaccination in place

None

Control program/mechanisms

The control program/strategies in place

None

Recent actions taken to control the zoonoses

None

Suggestions to the Community for the actions to be taken

Emphasis should be placed on education of the people for a better care in kitchen hygiene.

Measures in case of the positive findings or single cases

None.

Notification system in place

Findings of *C. jejuni* and *C. coli* in animals must not be reported to authorities in Austria.

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

In the course of the baseline survey thermotolerant *Campylobacter* was detected in 195 out of 408 (47.8%; 42.9-52.8) of the tested slaughter batches. On 78.4% carcasses originating from the same slaughter batches thermotolerant *Campylobacter* could be detected. Due to the fact that poultry is the animal species with the highest prevalence of *Campylobacter jejuni* and *coli*, poultry meat seem to be the most risky food combined with mistakes in kitchen hygiene for humans acquiring an infection with *C. jejuni/coli*.

C. Campylobacter spp., unspecified in animal - Pigs - at slaughterhouse - Monitoring - official sampling - objective sampling

Monitoring system

Sampling strategy

In 2008, after a three years break slaughtered pigs were again included in the monitoring for thermotolerant *Campylobacter*. Based on the prevalence of thermotolerant *Campylobacter* determined in 2005 and 2004 samples size was calculated with a Bayesian approach (Stüger HP, Fuchs K, Much P, 2007. Bayesian Methods for Sample Size Calculation. SVEPM Konferenz, 27.-30.03.2007). 286 caecum samples were sampled in slaughterhouses where at least 80% of all pigs were slaughtered in 2007. The sampling had been stratified on the number of slaughtered animals by abattoirs all over Austria. The date of sampling was randomized over the whole year.

Frequency of the sampling

The sampling was distributed by randomization over the whole year 2008.

Type of specimen taken

Other: Animals at slaughter: Caecum containing a minimum of 50 to 100 grams of content.

Methods of sampling (description of sampling techniques)

The sampling was performed by official veterinarians carrying out the post-mortem inspection. At time of evisceration a part of the colon was ligated and wrapped in a sterile plastic bag. After cooling down to 4 °C the sample was sent in a hobbock or polystyrene box after adding cooling units to the Institute of Veterinary Diseases Control (IVET) in Graz. In the laboratory some content of each caecum was plated on selective medium suitable for *Campylobacter jejuni/coli*.

Case definition

A pig is considered to be infected with thermotolerant *Campylobacter* following isolation of *Campylobacter jejuni* or *C. coli* from its caecum.

Diagnostic/analytical methods used

At slaughter: The pooled samples were examined by direct inoculation on modified CCD agar (mCCDA) that was incubated in microaerophilic atmosphere at 42 ± 1 °C for 48 hours. *Campylobacter*-like colonies were identified by observing their characteristic motility and morphology under the microscope and the production of catalase and oxidase. For typing and differentiating of *C. jejuni* and *C. coli* isolates, hippurate reaction and indoxylacetate-hydrolysis was performed. All *C. jejuni* and *C. coli* isolates were frozen in proteose peptone solution containing 10 % glycerol or thioglycolat-broth at -70 °C. For quality control *Campylobacter jejuni* ATCC 33560, *Escherichia coli* ATCC 25922 and internal control isolates *C. jejuni* and *C. coli* were used. Statistical analysis was performed with EpiInfo version 3.3.2.

Vaccination policy

Vaccination is not performed in Austria

Control program/mechanisms

The control program/strategies in place

None

Recent actions taken to control the zoonoses

None

Suggestions to the Community for the actions to be taken

Emphasis should be placed on education of the people for a better care in kitchen hygiene.

Measures in case of the positive findings or single cases

None

Notification system in place

Findings of *C. jejuni* and *C. coli* in animals must not be reported to authorities in Austria.

Results of the investigation

See respective tables

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

95 to 100% of thermotolerant *Campylobacter* in pigs are among *Campylobacter coli*. This *Campylobacter* species is of low importance as a human pathogen. In 143 out of 286 (50%; CI 95% 44.1-55.9) of tested samples thermotolerant *Campylobacter* were detected, all were typed as *C. coli*.

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

Low importance.

Additional information

Nil

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic <i>Campylobacter</i> spp.	<i>C. coli</i>	<i>C. jejuni</i>	<i>C. lari</i>	<i>C. upsaliensis</i>	Thermophilic <i>Campylobacter</i> spp., unspecified
Cattle (bovine animals) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling		animal	923	263	31	232	0	0	0
Gallus gallus (fowl) - broilers - at slaughterhouse - Survey - EU baseline survey		slaughter	408	195	65	127	0	0	3
Pigs - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling		animal	286	143	143	0	0	0	0

2.2.5 Antimicrobial resistance in *Campylobacter* isolates

A. Antimicrobial resistance of Thermophilic *Campylobacter* spp., unspecified in humans - humans

History of the disease and/or infection in the country

A sentinel surveillance program for *Campylobacter* isolates from human infections was installed in October 2006. On a monthly basis, the first 10 isolates collected at each of four diagnostic laboratories serving different provinces in Austria are sent to the National Reference Laboratory for *Campylobacter* for speciation analysis and antimicrobial resistance testing.

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

The resistance rates against ciprofloxacin, tetracycline and erythromycin remained stable compared to 2007.

Suggestions to the Community for the actions to be taken

Nil

Additional information

The newly established sentinel surveillance system will be continued.

Laboratory methodology used for identification of the microbial isolates

Stool specimens were plated on *Campylobacter* blood-free selective media at 37°C or 42°C for 48 hours under micro aerobic conditions, and organisms were identified as *Campylobacter* spp. by oxidase testing and cell morphology. Isolates were speciated by hippurate hydrolysis, indoxy1 acetate hydrolysis, katalase production, and species-specific real-time PCR.

Broth micro dilution susceptibility testing of *Campylobacter* spp. isolates was done using customised Sensititre® susceptibility micro titre plates (TREK Diagnostic Systems, Ltd., East Grinstead, West Sussex, and England). Briefly, *Campylobacter* spp. strains were subcultivated on Columbia blood agar and incubated for 48 hours at 37 °C in a microaerophilic atmosphere. Inocula from fresh cultures were prepared by suspension in physiological saline to obtain a turbidity equivalent to that of a McFarland standard 0.5. The suspension was added to Mueller Hinton bouillon for a final concentration of approximately 5x10⁵ cfu/ml and incubated for 48 hours at 37 °C in a microaerophilic atmosphere. *Campylobacter jejuni* ATCC 33560 was used as control.

The number of isolates that are fully sensitive and the number of isolates resistant to 1, 2, 3, 4 and > 4 antimicrobials for *Campylobacter* includes only resistance to tetracycline, erythromycin, nalidixic acid, gentamicin, and streptomycin!

B. Antimicrobial resistance of Thermophilic Campylobacter spp., unspecified in animal

Sampling strategy used in monitoring

Frequency of the sampling

Described in chapter: Thermotolerant campylobacter in bovine animals, broilers and pigs

Type of specimen taken

Described in chapter: Thermotolerant campylobacter in bovine animals, broilers and pigs

Methods of sampling (description of sampling techniques)

Described in chapter: Thermotolerant campylobacter in bovine animals, broilers and pigs

Procedures for the selection of isolates for antimicrobial testing

Testing of all isolates will be performed in the AGES Institute for Medical Microbiology and Hygiene in Graz. The randomized sampling plan was calculated to obtain approximately 170 Isolates per animal species. If less than 170 isolates were obtained, all isolates were tested. If more than 170 thermotolerant Campylobacter were isolated 170 were randomly chosen.

Methods used for collecting data

All informations concerning the tested animals, sampled slaughterhouses and results of the antimicrobial testing were entered and analysed in a Microsoft® Excel tables.

Laboratory methodology used for identification of the microbial isolates

Described in chapter: Thermotolerant campylobacter in bovine animals, broilers and pigs.

Broth micro dilution susceptibility testing of *Campylobacter* spp. isolates was done using customised Sensititre® susceptibility micro titre plates (TREK Diagnostic Systems, Ltd., East Grinstead, West Sussex, and England). Briefly, *Campylobacter* spp. strains were subcultivated on Columbia blood agar and incubated for 48 hours at 37 °C in a microaerophilic atmosphere. Inocula from fresh cultures were prepared by suspension in physiological saline to obtain a turbidity equivalent to that of a McFarland standard 0.5. The suspension was added to Mueller Hinton bouillon for a final concentration of approximately 5x10⁵ cfu/ml and incubated for 48 hours at 37 °C in a microaerophilic atmosphere. *Campylobacter jejuni* ATCC 33560 was used as control.

MIC values have been entered in a Microsoft® Excel datasheet.

The number of isolates that are fully sensitive and the number of isolates resistant to 1, 2, 3, 4 and > 4 antimicrobials for *Campylobacter* includes only resistance to tetracycline, erythromycin, nalidixic acid, gentamicin, and streptomycin!

Preventive measures in place

None

Control program/mechanisms

The control program/strategies in place

Samples from food animals were monitored for antimicrobial residues according to a randomized sampling scheme (BMGF-74320/0003-IV/B/7/2008, Rückstandsuntersuchung-Durchführungserlass 2007).

Recent actions taken to control the zoonoses

A project has been started to assess the appropriate method for collecting data on antimicrobial usage in animals. Results of this study are expected in 2010.

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

Nil

Notification system in place

No notification system in place at this time.

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

Not yet evaluated.

Additional information

Nil

Table Antimicrobial susceptibility testing of C. coli - qualitative data

C. coli		Cattle (bovine animals) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling	Pigs - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling	Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study - Survey - EU baseline survey	
Isolates out of a monitoring program (yes/no)		yes		yes	
Number of isolates available in the laboratory		17		137	
		N	n	N	n
Antimicrobials:					
Aminoglycosides	Gentamicin	17	0	137	0
	Neomycin	17	0	137	1
	Streptomycin	17	9	137	113
Amphenicols	Chloramphenicol	17	0	137	0
Fluoroquinolones	Ciprofloxacin	17	10	137	44
Fully sensitive	Fully sensitive	17	1	137	3
Macrolides	Erythromycin	17	2	137	18
Penicillins	Amoxicillin / Clavulanic acid	17	0	137	0
	Ampicillin	17	0	137	0
Polymyxins	Colistin	17	0	137	0
Quinolones	Nalidixic acid	17	10	137	44
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	17	3	137	25
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	17	9	137	76
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	17	3	137	27
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	17	1	137	6
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	17	0	137	0
Tetracyclines	Tetracyclin	17	13	137	107
				N	n
				53	23

Table Antimicrobial susceptibility testing of *C. coli* - qualitative data

Footnote:

Number of multiresistant isolates: For *Campylobacter* this includes resistance to tetracycline, erythromycin, Nalidixic acid, gentamicin, and streptomycin

Table Antimicrobial susceptibility testing of *C. coli* in Cattle (bovine animals) - at slaughterhouse - Monitoring (test plate NLVC73) - quantitative data [Dilution method]

C. coli		Cattle (bovine animals) - at slaughterhouse - Monitoring (test plate NLVC73)																									
		yes																									
		17																									
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest	
Aminoglycosides	Gentamicin	2	17	0					5	11	1																
	Neomycin	2	17	0					2	5	9	1															
	Streptomycin	2	17	9							3	5				1	5	1	2								
Amphenicols	Chloramphenicol	16	17	0										8	6	3											
Fluoroquinolones	Ciprofloxacin	1	17	10				4	2	1					4	6											
Macrolides	Erythromycin	16	17	2						1	4	4	4	2								2					
Penicillins	Amoxicillin / Clavulanic acid	16	17	0								6	7	4													
	Ampicillin	16	17	0								3	3	3	5	3											
Polymyxins	Colistin	32	17	0										16	1												
Quinolones	Nalidixic acid	32	17	10										3	3	1		3	6	1							
Tetracyclines	Tetracyclin	2	17	13					2	1		1					1	1	2	9							

Table Antimicrobial susceptibility testing of *C. coli* in Pigs - Monitoring (test plate NLVC73) - quantitative data [Dilution method]

C. coli		Pigs - Monitoring (test plate NLVC73)																										
		yes																										
		137																										
		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest		
Aminoglycosides	Gentamicin	2	137	0					54	76	7																	
	Neomycin	2	137	1					2	56	70	8		1														
	Streptomycin	4	137	113							8	11	5		19	58	26	10										
Amphenicols	Chloramphenicol	16	137	0										61	59	17												
Fluoroquinolones	Ciprofloxacin	1	137	44				66	27						12	25	7											
Macrolides	Erythromycin	16	137	18						2	19	52	28	14	4		1		2	15								
Penicillins	Amoxicillin / Clavulanic acid	16	137	0								34	66	26	11													
	Ampicillin	16	137	17							2	4	22	31	53	8	2	13	2									
Polymyxins	Colistin	32	137	0										133	4													
Quinolones	Nalidixic acid	32	137	44										1	37	50	5		6	16	20	2						
Tetracyclines	Tetracyclin	2	137	107					9	10	5	6		1	2	5	4	13	82									

Table Antimicrobial susceptibility testing of *C. coli* in broilers - *Gallus gallus* (fowl) - sampling in the framework of the broiler baseline study - at slaughterhouse - Survey - EU baseline survey (test plate NLVC73) - quantitative data [Dilution method]

C. coli		Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study - at slaughterhouse - Survey - EU baseline survey (test plate NLVC73)																								
		yes																								
		53																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	53	0					22	31																
	Neomycin	2	53	1					3	18	31				1											
	Streptomycin	4	53	15							25	12	1			7	4	4								
Amphenicols	Chloramphenicol	16	53	0										18	31	3	1									
Fluoroquinolones	Ciprofloxacin	1	53	27				17	9					2	11	10	4									
Macrolides	Erythromycin	16	53	4						7	17	14	5	5	1		1	1		2						
Penicillins	Amoxicillin / Clavulanic acid	16	53	0								11	20	16	5	1										
	Ampicillin	16	53	6								2	4	14	25	2		3	3							
Polymyxins	Colistin	32	53	0										53												
Quinolones	Nalidixic acid	32	53	27									2	18	6			3	20	4						
Tetracyclines	Tetracyclin	2	53	23					10	15	3	2					1	5	17							

Table Antimicrobial susceptibility testing of *C. coli* in humans - Clinical investigations (Sentinel, test plate NLVC73) - quantitative data [Dilution method]

C. coli		humans - Clinical investigations (Sentinel, test plate NLVC73)																											
		Isolates out of a monitoring program (yes/no)																											
		Number of isolates available in the laboratory																											
Antimicrobials:		yes																											
		32	break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest		
Aminoglycosides	Gentamicin	2	32	1						13	17	1						1											
	Neomycin	2	32	1						2	12	16	1					1											
	Streptomycin	4	32	2								22	8				1		1										
Amphenicols	Chloramphenicol	16	32	0											12	17	2	1											
Fluoroquinolones	Ciprofloxacin	1	32	20					9	2	1					8	9	2	1										
Macrolides	Erythromycin	16	32	6						6		15	2	2		1							6						
Penicillins	Amoxicillin / Clavulanic acid	16	32	0											15	16	1												
	Ampicillin	16	32	2											1	11	17	1	1	1									
Polymyxins	Colistin	32	32	0												31	1												
Quinolones	Nalidixic acid	32	32	20												10	1	1		3	14	3							
Tetracyclines	Tetracyclin	2	32	12						5	14	1								1	11								

Table Antimicrobial susceptibility testing of *C. coli* in humans - Clinical investigations (Sentinel, test plate NLV48) - quantitative data [Dilution method]

C. coli Isolates out of a monitoring program (yes/no) Number of isolates available in the laboratory		humans - Clinical investigations (Sentinel, test plate NLV48)																								
		yes																								
		13																								
		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	13	0						6	6	1													0.25	64
	Neomycin	2	13	0								13													1	64
	Streptomycin	4	13	2								6	5	0	0	1	0	0	1						1	64
Amphenicols	Chloramphenicol	16	13	0									9	2	2										2	32
Fluoroquinolones	Ciprofloxacin	1	13	10				2	1	0	0	0	0	4	4	1	1								0.06	32
Macrolides	Erythromycin	16	13	1						4	1	4	3	0	0	0	0	0	0	1					0.25	128
Penicillins	Amoxicillin / Clavulanic acid	16	13	0							2	6	3	2											1	128
	Ampicillin	16	13	2							2	1	7	1	0	1	0	1	0	1					1	128
Polymyxins	Colistin	32	13	0								13													4	128
Quinolones	Nalidixic acid	32	13	10									3	0	0	0	4	5	1						2	128
Tetracyclines	Tetracyclin	2	13	6						6	0	1	0	0	0	0	1	1	3	1				0.25	128	

Table Antimicrobial susceptibility testing of *C. coli* - qualitative data

C. coli		humans - Clinical investigations (sum of both test plates)	
Isolates out of a monitoring program (yes/no)		yes	
Number of isolates available in the laboratory		45	
Antimicrobials:		N	n
Aminoglycosides	Gentamicin	45	1
	Neomycin	45	1
	Streptomycin	45	4
Amphenicols	Chloramphenicol	45	0
Fluoroquinolones	Ciprofloxacin	45	30
Fully sensitive	Fully sensitive	45	15
Macrolides	Erythromycin	45	7
Penicillins	Amoxicillin / Clavulanic acid	45	0
	Ampicillin	45	4
Polymyxins	Colistin	45	0
Quinolones	Nalidixic acid	45	30
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	45	12
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	45	9
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	45	7
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	45	1
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	45	1
Tetracyclines	Tetracyclin	45	18

Footnote:

Number of multiresistant isolates: For *Campylobacter* this includes resistance to tetracycline, erythromycin, Nalidixic acid, gentamicin, and streptomycin

Table Antimicrobial susceptibility testing of *C. jejuni* in broilers - *Gallus gallus* (fowl) - sampling in the framework of the broiler baseline study (test plate NLVC73) - quantitative data [Dilution method]

C. jejuni		Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study (test plate NLVC73)																								
		yes																								
		115																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	115	0					108	6	1															
	Neomycin	1	115	1					34	64	16						1									
	Streptomycin	2	115	2							111	2					1		1							
Amphenicols	Chloramphenicol	16	115	0										88	21	5	1									
Fluoroquinolones	Ciprofloxacin	1	115	57				38	14	6			1	2	43	9	1	1								
Macrolides	Erythromycin	4	115	0						25	55	32	3													
Penicillins	Amoxicillin / Clavulanic acid	16	115	0							94	20	1													
	Ampicillin	8	115	18							2	18	31	37	9		9	6	3							
Polymyxins	Colistin	32	115	0										113	2											
Quinolones	Nalidixic acid	16	115	56									22	29	6	2	1		35	20						
Tetracyclines	Tetracyclin	2	115	30					33	42	5	3	2		2	2	2	10	14							

Table Antimicrobial susceptibility testing of *C. jejuni* - qualitative data

C. jejuni		Cattle (bovine animals) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling		Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study	
Isolates out of a monitoring program (yes/no)		yes		yes	
Number of isolates available in the laboratory		152		115	
Antimicrobials:		N	n	N	n
Aminoglycosides	Gentamicin	152	0	115	0
	Neomycin	152	0	115	1
	Streptomycin	152	4	115	2
Amphenicols	Chloramphenicol	152	0	115	0
Fluoroquinolones	Ciprofloxacin	152	52	115	57
Fully sensitive	Fully sensitive	152	84	115	46
Macrolides	Erythromycin	152	0	115	0
Penicillins	Amoxicillin / Clavulanic acid	152	0	115	0
	Ampicillin	152	12	115	18
Polymyxins	Colistin	152	0	115	0
Quinolones	Nalidixic acid	152	52	115	56
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	152	47	115	50
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	152	21	115	19
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	152	0	115	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	152	0	115	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	152	0	115	0
Tetracyclines	Tetracyclin	152	33	115	30

Table Antimicrobial susceptibility testing of *C. jejuni* - qualitative data

Footnote:

Number of multiresistant isolates: For *Campylobacter* this includes resistance to tetracycline, erythromycin, Nalidixic acid, gentamicin, and streptomycin

Table Antimicrobial susceptibility testing of *C. jejuni* in Cattle (bovine animals) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling (test plate NLVC73) - quantitative data [Dilution method]

C. jejuni		Cattle (bovine animals) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling (test plate NLVC73)																								
		yes																								
		152																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	152	0					143	9																
	Neomycin	1	152	0					41	91	19	1														
	Streptomycin	2	152	4							146	2					3		1							
Amphenicols	Chloramphenicol	16	152	0										131	15	6										
Fluoroquinolones	Ciprofloxacin	1	152	52				87	9	4				4	38	6	4									
Macrolides	Erythromycin	4	152	0						28	64	56	3	1												
Penicillins	Amoxicillin / Clavulanic acid	16	152	0								135	17													
	Ampicillin	8	152	12							12	8	48	60	12	1	7	3	1							
Polymyxins	Colistin	32	152	0										144	8											
Quinolones	Nalidixic acid	16	152	52									43	47	10					2	26	24				
Tetracyclines	Tetracyclin	2	152	33					47	58	9	5		1			4	10	18							

Table Antimicrobial susceptibility testing of *C. jejuni* in Meat from broilers (*Gallus gallus*) - at retail - Surveillance - official controls - objective sampling (test plate NLV48) - quantitative data [Dilution method]

C. jejuni		Meat from broilers (<i>Gallus gallus</i>) - at retail - Surveillance - official controls - objective sampling (test plate NLV48)																								
		yes																								
		33																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	33	0						22	11													0.25	64	
	Neomycin	1	33	0								33												1	64	
	Streptomycin	2	33	0								32	1											1	64	
Amphenicols	Chloramphenicol	16	33	0									32	1										2	32	
Fluoroquinolones	Ciprofloxacin	1	33	22				4	7	0		0	0	2	11	8	1							0.06	32	
Macrolides	Erythromycin	4	33	0						21	9	2	1											0.25	128	
Penicillins	Amoxicillin / Clavulanic acid	16	33	0								16	17											1	128	
	Ampicillin	8	33	11								6	8	7	1	0	10	0	0	1				1	128	
Polymyxins	Colistin	32	33	0										31	2									4	128	
Quinolones	Nalidixic acid	16	33	22									3	7	1	0	0	4	14	4				2	128	
Tetracyclines	Tetracyclin	2	33	4						27	2	0	0	0	0	0	0	2	2					0.25	128	

Table Antimicrobial susceptibility testing of *C. jejuni* in Meat from broilers (*Gallus gallus*) - at retail - Surveillance - official controls - objective sampling (test plate NLVC73) - quantitative data [Dilution method]

C. jejuni		Meat from broilers (<i>Gallus gallus</i>) - at retail - Surveillance - official controls - objective sampling (test plate NLVC73)																								
		yes																								
		4																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	4	0					3	1																
	Neomycin	1	4	0					1	3																
	Streptomycin	2	4	0							4															
Amphenicols	Chloramphenicol	16	4	0										4												
Fluoroquinolones	Ciprofloxacin	1	4	2				2								1	1									
Macrolides	Erythromycin	4	4	0							3	1														
Penicillins	Amoxicillin / Clavulanic acid	16	4	0							2	2														
	Ampicillin	8	4	2									2					1	1							
Polymyxins	Colistin	32	4	0										4												
Quinolones	Nalidixic acid	16	4	2									1	1							2					
Tetracyclines	Tetracyclin	2	4	3						1									1	2						

Table Antimicrobial susceptibility testing of *C. jejuni* - qualitative data

C. jejuni		Meat from broilers (<i>Gallus gallus</i>) - at retail - Surveillance - official controls - objective sampling (sum of both test plates)	
Isolates out of a monitoring program (yes/no)		yes	
Number of isolates available in the laboratory		37	
Antimicrobials:		N	n
Aminoglycosides	Gentamicin	37	0
	Neomycin	37	0
	Streptomycin	37	0
Amphenicols	Chloramphenicol	37	0
Fluoroquinolones	Ciprofloxacin	37	24
Fully sensitive	Fully sensitive	37	11
Macrolides	Erythromycin	37	0
Penicillins	Amoxicillin / Clavulanic acid	37	0
	Ampicillin	37	13
Polymyxins	Colistin	37	0
Quinolones	Nalidixic acid	37	24
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	37	21
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	37	5
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	37	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	37	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	37	0

Table Antimicrobial susceptibility testing of *C. jejuni* - qualitative data

C. jejuni		Meat from broilers (<i>Gallus gallus</i>) - at retail - Surveillance - official controls - objective sampling (sum of both test plates)	
Isolates out of a monitoring program (yes/no)		yes	
Number of isolates available in the laboratory		37	
Antimicrobials:		N	n
Tetracyclines	Tetracyclin	37	7

Footnote:

Number of multiresistant isolates: For *Campylobacter* this includes resistance to tetracycline, erythromycin, Nalidixic acid, gentamicin, and streptomycin

Table Antimicrobial susceptibility testing of *C. jejuni* in humans - Clinical investigations (Sentinel, test plate NLV48) - quantitative data [Dilution method]

C. jejuni		humans - Clinical investigations (Sentinel, test plate NLV48)																									
		Isolates out of a monitoring program (yes/no)																									
		Number of isolates available in the laboratory																									
Antimicrobials:		129																									
		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest	
Aminoglycosides	Gentamicin	1	129	0						106	23															0.25	64
	Neomycin	1	129	1								128	0	0		0	0	0	1							1	64
	Streptomycin	2	129	2								127	0	0	0	0	2									1	64
Amphenicols	Chloramphenicol	16	129	0									94	33	2											2	32
Fluoroquinolones	Ciprofloxacin	1	129	74				31	14	10		0	0	3	58	5	7	1								0.06	32
Macrolides	Erythromycin	4	129	0						54	29	28	17	1												0.25	128
Penicillins	Amoxicillin / Clavulanic acid	16	129	0								56	69	4												1	128
	Ampicillin	8	129	29								11	24	39	26	2	6	13	4	4						1	128
Polymyxins	Colistin	32	129	0										109	17	3										4	128
Quinolones	Nalidixic acid	16	129	71									19	32	7	0	1	9	43	18						2	128
Tetracyclines	Tetracyclin	2	129	37						83	9	0	0	0	1	1	4	10	13	8						025	128

Table Antimicrobial susceptibility testing of *C. jejuni* - qualitative data

<i>C. jejuni</i>		humans - Clinical investigations (sum of both test plates)	
Isolates out of a monitoring program (yes/no)		yes	
Number of isolates available in the laboratory		390	
Antimicrobials:		N	n
Aminoglycosides	Gentamicin	390	0
	Neomycin	390	2
	Streptomycin	390	6
Amphenicols	Chloramphenicol	390	0
Fluoroquinolones	Ciprofloxacin	390	205
Fully sensitive	Fully sensitive	390	160
Macrolides	Erythromycin	390	1
Penicillins	Amoxicillin / Clavulanic acid	390	0
	Ampicillin	390	71
Polymyxins	Colistin	390	0
Quinolones	Nalidixic acid	390	202
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	390	158
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	390	68
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	390	4
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	390	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	390	0
Tetracyclines	Tetracyclin	390	97

Footnote:

Number of multiresistant isolates: For *Campylobacter* this includes resistance to tetracycline, erythromycin, Nalidixic acid, gentamicin, and streptomycin

Table Antimicrobial susceptibility testing of *C. jejuni* in humans - Clinical investigations (Sentinel, test plate NLVC73) - quantitative data [Dilution method]

C. jejuni		humans - Clinical investigations (Sentinel, test plate NLVC73)																								
		yes																								
		261																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	1	261	0					218	43																
	Neomycin	1	261	1					31	146	79	4						1								
	Streptomycin	2	261	4							244	13				2	1	1								
Amphenicols	Chloramphenicol	16	261	0										186	61	10	4									
Fluoroquinolones	Ciprofloxacin	1	261	131				67	54	7	2		4	8	73	30	9	7								
Macrolides	Erythromycin	4	261	1					31	126	92	11									1					
Penicillins	Amoxicillin / Clavulanic acid	16	261	0							208	52	1													
	Ampicillin	8	261	42							2	8	65	109	35	6	14	17	5							
Polymyxins	Colistin	32	261	0										241	20											
Quinolones	Nalidixic acid	16	261	131									28	88	11	3	1	5	56	69						
Tetracyclines	Tetracyclin	2	261	60					69	90	33	7	2	3		1	10	18	28							

Table Breakpoints used for antimicrobial susceptibility testing

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

Standards used for testing
CLSI

		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
Aminoglycosides	Gentamicin	EUCAST			1	0.125	16				
	Neomycin	EUCAST			1	0.125	8				
	Streptomycin	EUCAST			2	0.5	32				
Amphenicols	Chloramphenicol	EUCAST			16	2	64				
Fluoroquinolones	Ciprofloxacin	EUCAST			1	0.06	32				
Macrolides	Erythromycin	EUCAST			4	0.25	128				
Penicillins	Amoxicillin / Clavulanic acid	EUCAST			16	1	64				
	Ampicillin	EUCAST			8	0.5	64				
Polymyxins	Colistin	EUCAST			32	4	128				
Quinolones	Nalidixic acid	EUCAST			16	2	256				
Tetracyclines	Tetracyclin	EUCAST			2	0.125	64				

Table Breakpoints used for antimicrobial susceptibility testing

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

Standards used for testing
CLSI

		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
Aminoglycosides	Gentamicin	EUCAST			1	0.125	16				
	Neomycin	EUCAST			1	0.125	8				
	Streptomycin	EUCAST			2	0.5	32				
Amphenicols	Chloramphenicol	EUCAST			16	2	64				
Fluoroquinolones	Ciprofloxacin	EUCAST			1	0.06	32				
Macrolides	Erythromycin	EUCAST			4	0.25	128				
Penicillins	Amoxicillin / Clavulanic acid	EUCAST			16	1	64				
	Ampicillin	EUCAST			8	0.5	64				
Polymyxins	Colistin	EUCAST			32	4	128				
Quinolones	Nalidixic acid	EUCAST			16	2	256				
Tetracyclines	Tetracyclin	EUCAST			2	0.125	64				

Table Breakpoints used for antimicrobial susceptibility testing

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

Standards used for testing
CLSI

		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
Aminoglycosides	Gentamicin	EUCAST			1	0.125	16				
	Neomycin	EUCAST			1	0.125	8				
	Streptomycin	EUCAST			2	0.5	32				
Amphenicols	Chloramphenicol	EUCAST			16	2	64				
Fluoroquinolones	Ciprofloxacin	EUCAST			1	0.06	32				
Macrolides	Erythromycin	EUCAST			4	0.25	128				
Penicillins	Amoxicillin / Clavulanic acid	EUCAST			16	1	64				
	Ampicillin	EUCAST			8	0.5	64				
Polymyxins	Colistin	EUCAST			32	4	128				
Quinolones	Nalidixic acid	EUCAST			16	2	256				
Tetracyclines	Tetracyclin	EUCAST			2	0.125	64				

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

Listeriosis can be regarded as a relatively rare infectious disease in Austria with an annual incidence between 0.1 and 0.25 cases per 100,000 inhabitants in the years 1996 to 2007. In 2008 a record total of 31 culturally verified human cases of listeriosis were recorded for Austria (incidence 0.38 per 100,000 inhabitants), four of them were associated with pregnancy –The incidences are similar to those of most other western European countries (0.2-0.9). Lethality was high with 19% (6 out of 31) in 2008. This (usually) high rate and the sometimes severe permanent disabilities demand every effort to ascertain potential food-associated outbreaks as early as possible. In Austria an outbreak of febrile gastroenteritis associated with jellied pork contaminated with *Listeria monocytogenes* was documented in 2008 (Pichler J, Much P, Kasper S, Fretz R, Auer B et al. 2009: An outbreak of febrile gastroenteritis associated with jellied pork contaminated with *Listeria monocytogenes*. Wien. Klin. Wochenschr. (2009)121: 149-156).

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

See History of the disease

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

Listeriosis is a rare disease, but not a rare bacterium, which means that a systemic disease develops only under certain particular predispositions, including pregnancy and immunosuppression.

Although dairy products and salmon are likely candidates, the source of an infection often remains unclear. Ready-to-eat meat and meat products harbour listeria in 0–7 % and ready-to-eat smoked fish in 9 %.

Recent actions taken to control the zoonoses

A monthly report is sent to the Ministry of Health by the National Reference Center, whereas outbreaks are reported immediately.

Restrictions tightened to sell unpasteurised milk in remote areas (Alps).

Suggestions to the Community for the actions to be taken

More widespread information for pregnant and immunocompromised persons should be provided.

Additional information

The National Reference Center from the AGES (Austrian Agency for Health and Food Safety) Vienna coordinates the confirmation, subtyping and comparison of isolates.

2.3.2 Listeriosis in humans

A. Listeriosis in humans

Reporting system in place for the human cases

A monthly report is sent to the Ministry of Health by the National Reference Center, whereas outbreaks are reported immediately.

Case definition

A clinically compatible case that is laboratory confirmed after isolation of *L. monocytogenes* from a normally sterile site or vaginal swabs.

Diagnostic/analytical methods used

Bacteriology: Smears of the samples are Gram stained. Specimen from normally sterile sites are inoculated in blood culture broth or thioglycollate broth and Columbia blood agar plates, vaginal swabs are plated only directly on Columbia blood and colistin-nalidixic acid (CNA) agar. *L. monocytogenes* is identified by catalase and Api Listeria test.

Stool samples were examined after cold enrichment in Fraser enrichment broth and streaked onto selective chromogenic agar plate and Columbia blood-agar. All isolates obtained in Austria are sent to the National Reference Center for confirmation, subtyping and comparison.

Notification system in place

Medical doctors specialised in Laboratory Diagnosis or Microbiology and Hygiene and the attended physicians are subjected to notification. Infections, fatal cases and suspected cases of listeriosis have to be notified according to the National Regulation 254/2004 (BGBI. II, 254/2004, Anzeigepflichtige übertragbare Krankheiten 2004).

History of the disease and/or infection in the country

See 2.3.1. History of the disease

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

See 2.3.1. History of the disease

Relevance as zoonotic disease

disease develops only under certain particular predispositions, including pregnancy and immunosuppression.

Although dairy products and salmon are likely candidates, the source of an infection often remains unclear.

Additional information

The National Reference Center at AGES, Vienna, coordinates the confirmation, subtyping and comparison of isolates.

Annual report of the National Reference Centre

http://www.bmg.gv.at/cms/site/attachments/4/4/2/CH0954/CMS1237532053435/jb_listerien_2008_02.02.09_b.pdf

2.3.3 Listeria in foodstuffs

A. Listeria spp., unspecified in food

Monitoring system

Sampling strategy

Foodstuff was sampled according to the ordinance „Revisions- und Probenplan für das Jahr 2008 gemäß §31 LMSVG; Richtlinien über die Vollziehung der Überwachung des Verkehrs mit den durch das LMSVG erfassten Waren; Berichtsschema 2008“ (BMGFJ-75500/0247-IV/B/7/2007 von 08.01.2008) from the Federal Ministry of Health. This “Revisions- und Probenplan” is part of the multi-annual national control plan (2007-2010) according to Art. 41 ff of Regulation (EC) No 882/2004.

The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail outlets etc. that have to be sampled and tested randomly according to the number of food enterprises per province. Every business within Austria has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP concepts, control of manufacturing processes etc.

In 2008, approximately 40,000 samples were planned to be tested in Austria. About 60% (24,000) of these are planned samples (surveillance) and only these numbers are used in this report (data from suspect samples are not shown). These planned samples either consist of samples of the yearly sampling plan which determines the number of samples of each food category that have to be investigated randomly, e.g. raw meat (fresh or frozen); sausages; cheeses; milk; preserved food etc. There are different sampling stages where food samples are taken: e.g. from retail, processing plant, primary production.

In addition there is a monitoring plan for food items (40-45 campaigns per year). In the course of these programs food items of special interest for defined parameters – amongst others zoonotic agents – are investigated. The sampling takes place during a fixed period of time in order to gain in-depth information. In 2008, eight relevant food campaign programs were conducted throughout Austria (Schwerpunktprogramm 2008 BMGFJ-75500/0242-IV/B/7/2007). Details and results of these campaigns can be found in the respective chapters.

Diagnostic/analytical methods used

At retail

Other: Qualitative detection of Listeria spp. is performed according to ISO 11290: Part 1 (1996). Quantification of Listeria spp. content in food is conducted either according to ISO 11290: Part 2 (1998) with following modifications: Listeria monocytogenes are confirmed on Ottaviani Agostini Agar, ALOA Agar,

RapidLmono agar, using Gram stain, motility testing and catalase production or by the Api Listeria test or Vidas LMO II.

Results of the investigation

See tables below.

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

Listeria monocytogenes was detected in samples of cheeses from pasteurised cows' milk – soft and semi-soft (Campaign A-803-08) in 1.8% (3/166) – one-time the content of *L. monocytogenes* was >100 cfu/g. In all the 292 tested samples of cheeses made from raw or low heat-treated cows' milk 6 samples were found positive for *L. monocytogenes*, 3-times the content was higher than 100 cfu/g. Additionally 3 samples were positive for *L. innocua*. In 15 out of 197 (7.6 %) single samples of cooked pig meat products, ready-to-eat, *Listeria monocytogenes* was detected and one-time the content was higher than 100 cfu/g. 6.3 % of samples from fishery products (6/96) revealed a contamination with *L. monocytogenes* lower than 100 cfu/g and also with *L. innocua* for 3-times.

B. L. monocytogenes in food - Other processed food products and prepared dishes - unspecified - ready-to-eat foods - chilled - at retail - Surveillance - official controls -

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.

Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

At retail

April - June

Type of specimen taken

At retail

Other processed food products and prepared dishes

Methods of sampling (description of sampling techniques)

At retail

Detection and enumeration method, sample weight: 25g

Definition of positive finding

At retail

Detection of L. monocytogenes in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

105 samples tested, 3-times positive for L. monocytogenes (all <10 cfu/g); 2-times positive for Listeria innocua

Additional information

Samples were also tested for Salmonella spp.

C. L. monocytogenes in food - Dairy products (excluding cheeses) - cream - made from pasteurised milk - at catering - Surveillance - official controls - objective sampling

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.

Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

At retail

Investigation period: September - November

Type of specimen taken

At retail

Cream, made from pasteurised milk

Methods of sampling (description of sampling techniques)

At retail

Detection and enumeration method, sample weight: 25g

Definition of positive finding

At retail

Detection of L. monocytogenes in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

96 samples tested, 0-times positive for L. monocytogenes.

Additional information

Samples were also tested for *Salmonella* spp.

D. L. monocytogenes in food - Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail - imported - Surveillance - official controls -

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.

Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

At retail

Investigation period: October - December

Type of specimen taken

At retail

cheeses made from pasteurised milk

Methods of sampling (description of sampling techniques)

At retail

Detection and enumeration method, sample weight: 25g

Definition of positive finding

At retail

Detection of L. monocytogenes in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

166 samples tested, 3-times positive(1-time quantitative not detectable, 1-time 100 KBE/g, 1-time 13.900 KBE/g)

E. L. monocytogenes in food - Cheeses, made from mixed milk from cows, sheep and/or goats - soft and semi-soft - made from raw or low heat-treated milk - at retail -

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.

Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

At retail

Investigation period: January - March

Type of specimen taken

At retail

cheeses made from raw or low heat-treated milk

Methods of sampling (description of sampling techniques)

At retail

Detection and enumeration method, sample weight: 25g

Definition of positive finding

At retail

Detection of L. monocytogenes in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

71 samples tested, Results: 1-time positive for L. monocytogenes (340 KBE/g); 1-time positive for Listeria ivanovii

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g	L. innocua
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - at retail - imported - Surveillance - official controls - objective sampling (Campaign A-803-08)		single	25g	166	3	166	3	166	0	1	
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at farm - Surveillance - official controls - objective sampling		single	25g	12	0	12	0	2	0	2	
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	297	0	268	0	169	0	0	
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at retail - Surveillance - official controls - objective sampling		single	25g	242	0	233	0	162	0	0	
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at farm - Surveillance - official controls - objective sampling		single	25g	22	0	22	0	7	0	0	
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	201	2	193	2	87	0	0	
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at retail - Surveillance - official controls - objective sampling		single	25g	69	4	67	4	60	0	3	3
Cheeses, made from mixed milk from cows, sheep and/or goats - soft and semi-soft - made from raw or low heat-treated milk - at retail - Surveillance - official controls - objective sampling (Campaign A-805-08)		single	25g	71	1	71	1	71	0	1	

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g	L. innocua
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from pasteurised milk - at farm - Surveillance - official controls - objective sampling		single	25g	3	0	2	0	3	0	0	
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from pasteurised milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	40	0	34	0	37	0	0	
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from pasteurised milk - at retail - Surveillance - official controls - objective sampling		single	25g	41	0	39	0	26	0	0	
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from raw or low heat-treated milk - at farm - Surveillance - official controls - objective sampling		single	25g	3	0	3	0	3	0	0	
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling		single	25g	38	0	38	0	31	0	0	
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from raw or low heat-treated milk - at retail - Surveillance - official controls - objective sampling		single	25g	26	0	25	0	26	0	0	
Dairy products (excluding cheeses) - butter - at processing plant - Surveillance - official controls - objective sampling		single	25g	44	0	44	0	10	0	0	
Dairy products (excluding cheeses) - butter - at retail - Surveillance - official controls - objective sampling		single	25g	42	2	41	2	21	0	0	

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g	L. innocua
Dairy products (excluding cheeses) - dairy desserts - at processing plant - Surveillance - official controls - objective sampling		single	25g	1	0	1	0	1	0	0	
Dairy products (excluding cheeses) - dairy desserts - at retail - Surveillance - official controls - objective sampling		single	25g	5	0	4	0	5	0	0	
Dairy products (excluding cheeses) - dairy products, not specified - at farm - Surveillance - official controls - objective sampling		single	25g	5	0	2	0	4	0	0	
Dairy products (excluding cheeses) - dairy products, not specified - at processing plant - Surveillance - official controls - objective sampling		single	25g	126	0	103	0	89	0	0	
Dairy products (excluding cheeses) - dairy products, not specified - at retail - Surveillance - official controls - objective sampling		single	25g	133	0	133	0	16	0	0	
Milk, cows' - pasteurised milk - at processing plant		single	25g	72	0	61	0	33	0	0	
Milk, cows' - pasteurised milk - at retail		single	25g	15	0	10	0	12	0	0	
Milk, cows' - raw - at retail - Surveillance - official controls - objective sampling		single	25g	19	0	19	0	18	0	0	
Milk, cows' - raw milk for manufacture - intended for manufacture of raw or low heat-treated products - at processing plant - Surveillance - official controls - objective sampling		single	25g	5	0	5	0	4	0	0	
Milk, cows' - raw milk for manufacture - intended for manufacture of raw or low heat-treated products - at retail - Surveillance - official controls - objective sampling		single	25g	3	1	3	1	3	0	0	

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g	L. innocua
Bakery products - at processing plant - Surveillance - official controls - objective sampling		single	25g	9	0	9	0	6	0	0	
Bakery products - cakes - at retail - Surveillance - official controls - objective sampling		single	25g	69	0	69	0	67	0	0	
Bakery products - pastry - at retail - Surveillance - official controls - objective sampling		single	25g	62	0	62	0	54	0	0	
Crustaceans - at retail - Surveillance - official controls - objective sampling		single	25g	11	2	11	2	7	0	1	
Fish - raw - at retail - Surveillance - official controls - objective sampling		single	25g	12	0	9	0	4	0	0	
Fish - smoked - at retail - Surveillance - official controls - objective sampling		single	25g	94	4	12	3	12	0	0	
Fishery products, unspecified - at processing plant - Surveillance - official controls - objective sampling		single	25g	28	2	28	2	26	0	0	
Fishery products, unspecified - at retail - Surveillance - official controls - objective sampling		single	25g	68	4	66	4	62	0	0	3
Fruits - at retail - Surveillance - official controls - objective sampling		single	25g	10	0	10	0	1	0	0	
Fruits - products - at retail - Surveillance - official controls - objective sampling		single	25g	24	0	24	0	1	0	0	
Meat from bovine animals - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	5	1	5	1	5	0	0	
Meat from broilers (Gallus gallus) - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	1	0	1	0	1	0	0	

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g	L. innocua
Meat from deer (venison) - fresh - at retail - Surveillance - official controls - objective sampling		single	25g	2	1	2	1	1	0	0	
Meat from pig - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling		single	25g	1	0	1	0	1	0	0	
Meat from pig - meat products - cooked, ready-to-eat - at processing plant		single	25g	57	2	56	2	54	0	0	
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling		single	25g	140	13	136	13	61	0	1	
Meat from pig - meat products - raw and intended to be eaten raw - at processing plant - Surveillance - official controls - objective sampling		single	25g	5	0	5	0	5	0	0	
Meat from pig - meat products - raw and intended to be eaten raw - at retail - Surveillance - official controls - objective sampling		single	25g	7	0	7	0	7	0	0	
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling		single	25g	13	0	13	0	13	0	0	
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at processing plant - Surveillance - official controls - objective sampling		single	25g	25	0	25	0	14	0	0	
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling		single	25g	22	1	22	1	21	0	0	
Mushrooms - at retail - Surveillance - official controls - objective sampling		single	25g	1	0	1	0	1	0	0	

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g	L. innocua
Nuts and nut products - at retail - Surveillance - official controls - objective sampling		single	25g	1	0	1	0	1	0	0	
Other food - at catering - Surveillance - official controls - objective sampling		single	25g	20	0	18	0	15	0	0	
Other food - at processing plant - Surveillance - official controls - objective sampling		single	25g	25	0	25	0	25	0	0	
Other food - at retail - Surveillance - official controls - objective sampling		single	25g	27	1	27	1	26	0	0	
Other processed food products and prepared dishes - pasta - at catering - Surveillance - official controls - objective sampling		single	25g	18	0	18	0	1	0	0	
Other processed food products and prepared dishes - unspecified - ready-to-eat foods - chilled - at retail - Surveillance - official controls - objective sampling (Campaign A-804-08)		single	25g	105	3	105	3	105	0	0	2
Ready-to-eat salads - at processing plant - Surveillance - official controls - objective sampling		single	25g	6	0	6	0	6	0	0	
Ready-to-eat salads - at retail - Surveillance - official controls - objective sampling		single	25g	16	0	14	0	9	0	0	
Spices and herbs - at retail - Surveillance - official controls - objective sampling		single	25g	1	0	1	0	1	0	0	
Vegetables - at retail - Surveillance - official controls - objective sampling		single	25g	2	0	2	0	2	0	0	

Table Listeria monocytogenes in other foods

	L. ivanovii	Listeria spp., unspecified	L. seeligeri
Bakery products - at processing plant - Surveillance - official controls - objective sampling			
Bakery products - cakes - at retail - Surveillance - official controls - objective sampling			
Bakery products - pastry - at retail - Surveillance - official controls - objective sampling			
Crustaceans - at retail - Surveillance - official controls - objective sampling			
Fish - raw - at retail - Surveillance - official controls - objective sampling			
Fish - smoked - at retail - Surveillance - official controls - objective sampling			
Fishery products, unspecified - at processing plant - Surveillance - official controls - objective sampling			
Fishery products, unspecified - at retail - Surveillance - official controls - objective sampling			
Fruits - at retail - Surveillance - official controls - objective sampling			
Fruits - products - at retail - Surveillance - official controls - objective sampling			
Meat from bovine animals - fresh - at retail - Surveillance - official controls - objective sampling			
Meat from broilers (<i>Gallus gallus</i>) - fresh - at retail - Surveillance - official controls - objective sampling			

Table Listeria monocytogenes in other foods

	L. ivanovii	Listeria spp., unspecified	L. seeligeri
Meat from deer (venison) - fresh - at retail - Surveillance - official controls - objective sampling			
Meat from pig - meat preparation - intended to be eaten cooked - at retail - Surveillance - official controls - objective sampling			
Meat from pig - meat products - cooked, ready-to-eat - at processing plant		2	
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling			
Meat from pig - meat products - raw and intended to be eaten raw - at processing plant - Surveillance - official controls - objective sampling			
Meat from pig - meat products - raw and intended to be eaten raw - at retail - Surveillance - official controls - objective sampling			
Meat from poultry, unspecified - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling			
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at processing plant - Surveillance - official controls - objective sampling			
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling	1		
Mushrooms - at retail - Surveillance - official controls - objective sampling			

Table Listeria monocytogenes in other foods

	L. ivanovii	Listeria spp., unspecified	L. seeligeri
Nuts and nut products - at retail - Surveillance - official controls - objective sampling			
Other food - at catering - Surveillance - official controls - objective sampling			
Other food - at processing plant - Surveillance - official controls - objective sampling			
Other food - at retail - Surveillance - official controls - objective sampling			1
Other processed food products and prepared dishes - pasta - at catering - Surveillance - official controls - objective sampling			
Other processed food products and prepared dishes - unspecified - ready-to-eat foods - chilled - at retail - Surveillance - official controls - objective sampling (Campaign A-804-08)			
Ready-to-eat salads - at processing plant - Surveillance - official controls - objective sampling			
Ready-to-eat salads - at retail - Surveillance - official controls - objective sampling			
Spices and herbs - at retail - Surveillance - official controls - objective sampling			
Vegetables - at retail - Surveillance - official controls - objective sampling			

Footnote:

Specification for the 2 samples positive for "Listeria spp., unspecified": the 2 samples were tested positive for L. spp. (non monocytogenes).

2.3.4 Listeria in animals

A. Listeria spp., unspecified in animal

Monitoring system

Sampling strategy

There is no active surveillance system and detection of cases is based on clinical observations.

Frequency of the sampling

When there is a suspected case.

Case definition

A case may be defined with positive histopathology and/or positive bacteriology. The animal is the epidemiological unit.

Diagnostic/analytical methods used

The diagnostic methods used include histopathology and bacteriology.

Measures in case of the positive findings or single cases

None

Notification system in place

No notification system of listeriosis in animal species available at this time.

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

As Listeria spp are present in the environment and also to a small degree in food-producing animals, a risk of contracting domestic listeriosis does exist.

Table Listeria in animals

	Source of information	Sampling unit	Units tested	Total units positive for Listeria spp.	L. monocytogenes	Listeria spp., unspecified
Alpine chamois - wild - from hunting - Clinical investigations		animal	1	0		
Cattle (bovine animals) - - organ/tissue - Clinical investigations		animal	24	14	13	1
Deer - wild - fallow deer - from hunting - Clinical investigations		animal	1	0		
Goats - - organ/tissue - Clinical investigations		animal	17	15	15	
Sheep - - milk - Clinical investigations		animal	30	0		
Sheep - - organ/tissue - Clinical investigations		animal	32	20	19	1
Solipeds, domestic - horses - - organ/tissue - Clinical investigations		animal	1	0		

2.4 E. COLI INFECTIONS

2.4.1 General evaluation of the national situation

A. Verotoxigenic Escherichia coli infections general evaluation

History of the disease and/or infection in the country

In the year 2008, 893 samples were investigated at the Austrian Reference Center for Enterohemorrhagic Escherichia coli (EHEC). Thereby, 251 isolates (from 97 human [three humans with two different isolates each], 114 veterinary and 37 food samples) were confirmed, comprising 72 human EHEC and 28 human LP-STEC (Shiga toxin producing E. coli without eae-gene) isolates. In addition, 6 serologically identified EHEC cases were diagnosed (103 human cases in total). As in the year before, the ratio of EHEC O157 (31 isolates and 6 serologic cases) to EHEC non-O157 (41) was similar. Among the 103 diagnosed human EHEC and STEC cases in 2008, 17 cases were diagnosed with hemolytic uremic syndrome (HUS) as post infectious complication (9 caused by O157, 2 by O26:H11, 2 by O111:H-, 1 by O111:H11, and, interestingly, another 3 cases by STEC (O183:H18, O119:H4, O2:H6)). The incidence of HUS in children in Austria due to EHEC and STEC was about one HUS-case per 100.000 children (13 children) of age between 0 and 14 years in the year 2008. The number of EHEC/STEC cases varied markedly between the different provinces, led by the province Tyrol with 39 confirmed human EHEC/STEC cases. The reason for that may lie in a new EHEC screening program initiated in 2004. There were no big outbreaks in Austria in 2008, only 10 small family outbreaks and one small outbreak involving a small village.

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

See History of the disease

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

The prevalence of isolated VTEC from calves but also from other cattle increased to more than 10%, but we hypothesize that this is due to a higher sensitivity of the new ELISA and the sampling material (rectum-anal swabs). Concerning the most important VTEC serotypes for humans (O157, O26, O103, O111 and O145) Serotype O157 could not be detected only one strain of VTEC O111 and one VTEC O145 could be found. The relevance of findings of VTEC in feaces seems to be low because VTEC are found only in a very low prevalence on meat samples from bovines and sheep.

Recent actions taken to control the zoonoses

An Austrian wide monitoring program on the trends of VTEC prevalence in bovine animals and sheep was implemented according to the directive 2003/99/EC of the European Parliament and the Council of 17 November 2003 in the National Orders. The sampling was carried out throughout 2008 and follow up programs will be implemented in the forthcoming years.

Suggestions to the Community for the actions to be taken

Increased awareness and information should be made available for parents, paediatricians and general practitioners in regard to food safety and the prevention of infection.

Additional information

The National Reference Center at the Innsbruck Medical University coordinates the confirmation, subtyping and comparison of isolates. In addition, the Reference Center is involved in outbreak investigations. When EHEC is diagnosed in a patient, the patient as well as their family are interviewed using a questionnaire. The questionnaire helps obtain the necessary information in regard to the characteristics of the illness and potential exposure 6 days prior to onset. Thus, the Reference Center contributes to finding the source of infection. The Reference Center also reports EHEC cases and coordinates environmental investigations with the Local and Regional Health Authorities.

2.4.2 **E. coli infections in humans**

A. Verotoxigenic Escherichia coli infections in humans

Reporting system in place for the human cases

The National Reference Center provides a monthly report discussing recent outbreaks to the Ministry of Health.

Case definition

Clinical description: Clinical picture compatible with EHEC infection, e.g. diarrhoea (often bloody) and abdominal cramps. Illness may be complicated by haemolytic uraemic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP).

Laboratory criteria for diagnosis: Detection of genes coding for Stx1/Stx2 production. For probable cases: Isolation of *E. coli* belonging to a serogroup known to cause enterohaemorrhagic disease.

Serological confirmation in patients with HUS or TTP (only in selected cases).

Diagnostic/analytical methods used

1. Detection of *E. coli* O157 (most prominent serotype in HUS cases):

- **Bacteriology:** Isolation of O157 colonies on Sorbitol-MacConkey agar after incubation for 24 hours at 37 °C. O157 is confirmed via the *E. coli* O157 Latex Test.

- **Serology:** This method is constantly used at the German HUS- "Konsiliarlabor"; anti-O157 antibodies of IgG and IgM types can be distinguished.

2. Detection of Verotoxin (VTEC) -producing strains (used at the National Reference Center for EHEC/VTEC/STEC in Innsbruck): Stools are enriched overnight in a medium containing mitomycin C (EHEC Direct Medium, Heipha, Heidelberg, Germany).

Enriched cultures are investigated for presence of Shiga toxins by commercial EIA (e.g. Premier, Novitec). Isolate identification is confirmed by conventional biochemical tests (API 20 E, bioMerieux, Marcy-l'Etoile, France). Enrichments are plated on Sorbitol-MacConkey agar and incubated for 24 hours at 37 °C. Detection of stx1 and stx2 genes and of the genes encoding EHEC hemolysin (hlyA) and intimin (eae) is done by PCR (Gerber et al. (2002) J Infect Dis 186:493-500).

All EHEC/STEC/VTEC isolates obtained in Austria are sent to the National Reference Center for confirmation, subtyping and comparison. All Shiga toxin producing *E. coli* are serotyped with *E. coli* antisera (*E. coli* antisera, Statens Serum Institut, Copenhagen, Denmark). Comparison of the isolates is done by Pulsed-Field-Gel-Electrophoresis and Ribotyping.

History of the disease and/or infection in the country

See History of the disease

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

See History of the disease

Relevance as zoonotic disease

HUS is a rare complication of E.coli infection, however EHECs themselves are not rare, which means that a systemic disease develops only under certain particular predispositions, most of which are currently unknown. Although raw or undercooked meat and unpasteurised dairy products are likely candidates to transfer the bacterium to humans, the actual source of infection often remains unclear.

Additional information

The National Reference Center at Innsbruck Medical University coordinates the confirmation, subtyping and comparison of isolates.

Annual Report of the National Reference Center:

http://www.bmkgfj.gv.at/cms/site/attachments/3/5/9/CH0951/CMS1214392137719/ehec_jb_2007.pdf

2.4.3 **Escherichia coli, pathogenic in foodstuffs**

A. Verotoxigenic E. coli (VTEC) in food

Monitoring system

Sampling strategy

Foodstuff was sampled according to the ordinance „Revisions- und Probenplan für das Jahr 2008 gemäß §31 LMSVG; Richtlinien über die Vollziehung der Überwachung des Verkehrs mit den durch das LMSVG erfassten Waren; Berichtsschema 2008“ (BMGFJ-75500/0247-IV/B/7/2007 von 08.01.2008) from the Federal Ministry of Health. This “Revisions- und Probenplan” is part of the multi-annual national control plan (2007-2010) according to Art. 41 ff of Regulation (EC) No 882/2004.

The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail outlets etc. that have to be sampled and tested randomly according to the number of food enterprises per province. Every business within Austria has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP concepts, control of manufacturing processes etc.

In 2008, approximately 40,000 samples were planned to be tested in Austria. About 60% (24,000) of these are planned samples (surveillance) and only these numbers are used in this report (data from suspect samples are not shown). These planned samples either consist of samples of the yearly sampling plan which determines the number of samples of each food category that have to be investigated randomly, e.g. raw meat (fresh or frozen); sausages; cheeses; milk; preserved food etc. There are different sampling stages where food samples are taken: e.g. from retail, processing plant, primary production.

In addition there is a monitoring plan for food items (40-45 campaigns per year). In the course of these programs food items of special interest for defined parameters – amongst others zoonotic agents – are investigated. The sampling takes place during a fixed period of time in order to gain in-depth information. In 2008, eight relevant food campaign programs were conducted throughout Austria (Schwerpunktprogramm 2008 BMGFJ-75500/0242-IV/B/7/2007). Details and results of these campaigns can be found in the respective chapters.

B. Verotoxigenic E. coli (VTEC) in food - Fruits - non-precut - at retail - Surveillance - official controls - objective sampling (Campaign A-014-08)

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.

Samples are taken at restaurants by competent authorities.

Frequency of the sampling

Investigation period: May - June

Type of specimen taken

Fruits, non-precut (strawberries)

Methods of sampling (description of sampling techniques)

Sample weight: 25g

Definition of positive finding

Detection of VTEC in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

96 samples tested, 0-times positive for VTEC

C. Verotoxigenic E. coli (VTEC) in food - Meat from sheep - fresh - chilled - at retail -
Monitoring - official sampling - objective sampling (Campaign A-802-08)

Monitoring system

Sampling strategy

Sampling is done according to the monitoring plan from the Ministry of Health for food items of special interest for defined parameters. Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

Investigation period: February - April

Type of specimen taken

Meat from sheep, fresh

Methods of sampling (description of sampling techniques)

Sample weight: 25g

Definition of positive finding

Detection of VTEC in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

59 samples tested, 4-times positive for VTEC (O6:H-; ONT:H2; O166:H28; 3 serotypes in one sample O75:H-, O128:H-, ONT:H14)

Table VT E. coli in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC)-VTEC O157	Verotoxigenic E. coli (VTEC)-VTEC non-O157	Verotoxigenic E. coli (VTEC)-VTEC NT (Not Typeable)	Verotoxigenic E. coli (VTEC)-VTEC, unspecified	Verotoxigenic E. coli (VTEC)-VTEC O174:H2	Verotoxigenic E. coli (VTEC)-VTEC ONT:H14
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling		single		4	0						
Fruits and vegetables - non-precut - at retail - Surveillance - official controls - objective sampling (Campaign A-014-08)		single	25g	96	0						
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling		single		7	0						
Meat from sheep - fresh - chilled - at retail - Monitoring - official sampling - objective sampling (Campaign A-802-08)	¹⁾	single	25g	59	4						1
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling		single		7	0						
Milk, cows' - raw - at retail - Surveillance - official controls - objective sampling		single		2	0						

	Verotoxigenic E. coli (VTEC)-VTEC ONT:H2	Verotoxigenic E. coli (VTEC)-VTEC O6:H-	Verotoxigenic E. coli (VTEC)-VTEC O128:H-	Verotoxigenic E. coli (VTEC)-VTEC O166:H28	Verotoxigenic E. coli (VTEC)-VTEC O75:H-	Verotoxigenic E. coli (VTEC)-VTEC Orough:H29	Verotoxigenic E. coli (VTEC)-VTEC Orough:H-	Verotoxigenic E. coli (VTEC)-VTEC Orough:H12	Verotoxigenic E. coli (VTEC)-VTEC ONT:H8	Verotoxigenic E. coli (VTEC)-VTEC ONT:H49	Verotoxigenic E. coli (VTEC)-VTEC ONT:H21
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling											
Fruits and vegetables - non-precut - at retail - Surveillance - official controls - objective sampling (Campaign A-014-08)											

Table VT E. coli in food

	Verotoxigenic E. coli (VTEC)-VTEC ONT:H2	Verotoxigenic E. coli (VTEC)-VTEC O6:H-	Verotoxigenic E. coli (VTEC)-VTEC O128:H-	Verotoxigenic E. coli (VTEC)-VTEC O166:H28	Verotoxigenic E. coli (VTEC)-VTEC O75:H-	Verotoxigenic E. coli (VTEC)-VTEC Orough:H29	Verotoxigenic E. coli (VTEC)-VTEC Orough:H-	Verotoxigenic E. coli (VTEC)-VTEC Orough:H12	Verotoxigenic E. coli (VTEC)-VTEC ONT:H8	Verotoxigenic E. coli (VTEC)-VTEC ONT:H49	Verotoxigenic E. coli (VTEC)-VTEC ONT:H21
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling											
Meat from sheep - fresh - chilled - at retail - Monitoring - official sampling - objective sampling (Campaign A-802-08) ¹⁾	1	1	1	1	1						
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling											
Milk, cows' - raw - at retail - Surveillance - official controls - objective sampling											
	Verotoxigenic E. coli (VTEC)-VTEC ONT:H19	Verotoxigenic E. coli (VTEC)-VTEC ONT:H16	Verotoxigenic E. coli (VTEC)-VTEC ONT:H-	Verotoxigenic E. coli (VTEC)-VTEC O84:H2	Verotoxigenic E. coli (VTEC)-VTEC O8:H21	Verotoxigenic E. coli (VTEC)-VTEC O8:H2	Verotoxigenic E. coli (VTEC)-VTEC O78:H-	Verotoxigenic E. coli (VTEC)-VTEC O55:H2	Verotoxigenic E. coli (VTEC)-VTEC O5:H8	Verotoxigenic E. coli (VTEC)-VTEC O5:H-	Verotoxigenic E. coli (VTEC)-VTEC O177:H-
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling											
Fruits and vegetables - non-precut - at retail - Surveillance - official controls - objective sampling (Campaign A-014-08)											
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling											
Meat from sheep - fresh - chilled - at retail - Monitoring - official sampling - objective sampling (Campaign A-802-08) ¹⁾											

Table VT *E. coli* in food

	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H19	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H16	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O84:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O8:H21	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O8:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O78:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O55:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O5:H8	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O5:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O177:H-
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling											
Milk, cows' - raw - at retail - Surveillance - official controls - objective sampling											
	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O146:H28	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O145:H-									
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling											
Fruits and vegetables - non-precut - at retail - Surveillance - official controls - objective sampling (Campaign A-014-08)											
Meat from pig - meat products - cooked, ready-to-eat - at retail - Surveillance - official controls - objective sampling											
Meat from sheep - fresh - chilled - at retail - Monitoring - official sampling - objective sampling (Campaign A-802-08)	1)										
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling											
Milk, cows' - raw - at retail - Surveillance - official controls - objective sampling											

Table VT E. coli in food

Comments:

¹⁾ 3 serotypes in 1 sample

2.4.4 **Escherichia coli, pathogenic in animals**

A. Verotoxigenic Escherichia coli in cattle (bovine animals)

Monitoring system

Sampling strategy

The monitoring program on the prevalence of VTEC in slaughtered animals: In the previous years, a higher prevalence of VTEC in calves could be observed compared to cattle of other age groups. In 2008, two monitoring programs were implemented, one on calves and one on cattle older than 6 months. Therefore, 50 slaughtered calves and 50 slaughtered cattle older than 6 months had to be tested in 2008; this was based on the approx. 86,000 calves and 590,000 cattle (except calves) slaughtered in 2007.

The sampling was stratified based on the number of processed animals per abattoir in Austria. The date of sampling was randomized over the 2008. Sampling was performed in the 22 abattoirs which processed more than 80 % of Austria's cattle in 2007.

Frequency of the sampling

Animals at slaughter (herd based approach)

Other: The sampling was distributed randomly over the period of the study from January to December 2008.

Type of specimen taken

Animals at slaughter (herd based approach)

Other: A portion of the caecum containing a minimum of 50 to 100 grams and rectum-anal tissue from the same animal.

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

The sampling is performed by qualified veterinarians who carry out the post – mortem inspection. At time of evisceration, a portion of the caecum was ligated and wrapped in a sterile plastic bag; additionally a part of rectum and anus in a separate bag. After cooling down to 4 °C, the samples have been sent to the AGES Institute of Veterinary Diseases Control (IVET) in Graz the same day, in a hobbock or polystyrene box along with cooling packs. In the laboratory, a portion content of each caecum was inoculated into broth as well as a swab from a rectum-anal mucosal swab in a second broth.

Case definition

Animals at slaughter (herd based approach)

An animal is considered to be infected with VTEC following the isolation of VTEC (verotoxin producing *E. coli* irrespective of intimin) from its intestine/ rectum-anal mucosa.

Diagnostic/analytical methods used

Animals at slaughter (herd based approach)

Other: In a first step the samples are screened for verotoxins by ELISA, secondly the positive samples are investigated for VTEC isolates. At first approximately 1 g of content of the caecum and one swab was preenriched in two test tubes using modified tryptic soy broth containing novobiocin (mTSB + n) for 5 hours at 37 °C on a shaker. Then 1 ml of each preenrichment was inoculated into mTSB + n containing mitomycin C for 18-20 hours at 37 °C on a shaker too. The process was followed by testing the enrichment for the occurrence of verotoxin in an enzyme linked immuno sorbent assay (ELISA, Premier (TM) EHEC). Positive enrichments were plated on MacConkey (MAC) - and on cefixime tellurite sorbitol MAC (CTSMAC) agar and incubated for 24 hours at 37 °C. 2-4 colonies from each of the plates were subcultured on MAC as well as on CTSMAC. Afterwards the genomes of subcultured *E. coli* were investigated in a real time PCR for harboring the genes for Verotoxin 1, Verotoxin 2, Intimin and Enterohemolysin (Reischl U. et al. (2002): Real-Time Fluorescence PCR Assays for Detection and Characterization of Shiga Toxin, Intim and Enterohemolysin Genes from Shiga Toxin-Producing *Escherichia coli*. Journ. of Clin. Microb., 40, p. 2555-2565). The serotyping was carried out by the National Reference Centre for EHEC in Innsbruck. Statistical analysis was performed with EpiInfo version 3.3.2.

Vaccination policy

No vaccination

Other preventive measures than vaccination in place

No measures

Control program/mechanisms

Suggestions to the Community for the actions to be taken

Harmonization of methods, although not only a method for the five most important important serotypes.

Measures in case of the positive findings or single cases

No measures foreseen

Notification system in place

No notification system in place at this time.

Results of the investigation

Calves: 50 caeca and 36 rectum-anal tissue from 50 slaughtered calves were sampled; in 15 caeca (30%) and 18 rectum-anal swabs (50%) Verotoxin was detected by the ELISA. Although VTEC could be isolated only from 7 caeca

(14.0%; CI 95% 5.8-26.7) and 7 swabs (19.4%; CI 95% 8.2-36.0). In several samples more than one VTEC serotype were identified.

Cattle (other than calves): 46 caeca and 34 rectum-anal tissue from 46 slaughtered cattle were sampled; in 8 caeca (17.4%) and 22 rectum-anal swabs (64.7%) Verotoxin was detected by the ELISA. Although VTEC could be isolated only from 7 caeca (15.2%; CI 95% 6.3-28.9) and 4 swabs (11.8%; CI 95% 3.3-27.5). In several samples more than one VTEC serotype were identified.

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

The prevalence of isolated VTEC from calves but also from other cattle increased to more than 10%, but we hypothesize that this is due to a higher sensitivity of the new ELISA and the sampling material (rectum-anal swabs).

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

The relevance of findings of VTEC in feaces seems to be low because VTEC are found only in a very low prevalence on meat samples from bovines.

Additional information

Nil

B. Verotoxigenic *E. coli* (VTEC) in animal - Sheep

Monitoring system

Sampling strategy

Monitoring program on the prevalence of VTEC in sheep at farm:

The monitoring in 2007 was directed towards sheep at farms. 50 sheep had to be tested, calculated on a population of sheep of 350,000 in Austria in 2007. The sampling had been stratified on the number and size of sheep holdings in Austrian provinces.

Frequency of the sampling

Animals at farm

Other: The sampling of feces was done after blood sampling in course of the *Brucella melitensis* control program.

Type of specimen taken

Animals at farm

Methods of sampling (description of sampling techniques)

Animals at farm

Feces samples were wrapped in a sterile plastic bag. After cooling the sample down to 4 °C, it was sent in a hobbock or polystyrene box after adding cooling units to the AGES Institute of Veterinary Diseases Control (IVET) in Graz. In the laboratory, a portion of the feces (ca. 1 g) was inoculated into broth.

Case definition

Animals at farm

An animal is considered to be infected with VTEC following the isolation of VTEC (verotoxin producing *E. coli* irrespective of intimin) from its feces.

Diagnostic/analytical methods used

Animals at farm

Other: In a first step the samples are screened for verotoxins by ELISA, secondly the positive samples are investigated for VTEC isolates. At first approximately 1 g of feces was preenriched in two test tubes using modified tryptic soy broth containing novobiocin (mTSB + n) for 5 hours at 37 °C on a shaker. Then 1 ml of the preenrichment was inoculated into mTSB + n containing mitomycin C for 18-20 hours at 37 °C on a shaker too. More details see in chapter: Verotoxigenic *Escherichia coli* in cattle (bovine animals). Statistical analysis was performed with EpiInfo version 3.3.2.

Vaccination policy

No vaccination

Other preventive measures than vaccination in place

No measures

Control program/mechanisms

Suggestions to the Community for the actions to be taken

Harmonization of methods

Measures in case of the positive findings or single cases

No measures foreseen

Notification system in place

No notification

Results of the investigation

38 feces samples from sheep were sampled. In 13 samples (34.2%) Verotoxin was detected by the ELISA. VTEC could be isolated from 10 (26.3%; CI 95% 13.4-43.1) samples. In one sample more than one VTEC serotype was identified.

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

The prevalence of isolated VTEC from sheep increased to more than 20%, but we hypothesize that this is due to a higher sensitivity of the new ELISA.

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

The relevance of findings of VTEC in feaces of sheep seems to be low because sheep meat is consumed well-done.

Additional information

Nil

Table VT *E. coli* in animals

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic <i>E. coli</i> (VTEC)	VTEC O116:H12	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O157	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC non-O157	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC NT (Not Typeable)	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC, unspecified	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O174:H2
Cattle (bovine animals) - adult cattle over 2 years - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling		animal		46	3	0	0		2		1
Cattle (bovine animals) - adult cattle over 2 years - at slaughterhouse - animal sample - mucosal swab (rectum-anal) - Monitoring - official sampling - objective sampling		animal		34	10	0	0		3		0
Cattle (bovine animals) - calves (under 1 year) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling		animal		50	6	1	0		1		0
Cattle (bovine animals) - calves (under 1 year) - at slaughterhouse - animal sample - mucosal swab (rectum-anal) - Monitoring - official sampling - objective sampling		animal		36	11	0	0		1		0
Sheep - faeces - Monitoring - official sampling - objective sampling		animal		38	10	0	0		2		0

	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O116:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O103:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O118:H16	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC Orough:H29	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC Orough:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC Orough:H12	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H8	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H49	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H21	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H19
Cattle (bovine animals) - adult cattle over 2 years - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0	0	0	0	1
Cattle (bovine animals) - adult cattle over 2 years - at slaughterhouse - animal sample - mucosal swab (rectum-anal) - Monitoring - official sampling - objective sampling	0	1	0	1	1	0	0	1	1	0	1

Table VT *E. coli* in animals

	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O116:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O103:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O118:H16	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC Orough:H29	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC Orough:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC Orough:H12	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H8	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H49	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H21	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H19
Cattle (bovine animals) - calves (under 1 year) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling	2	0	0	0	0	0	0	0	0	0	0
Cattle (bovine animals) - calves (under 1 year) - at slaughterhouse - animal sample - mucosal swab (rectum-anal) - Monitoring - official sampling - objective sampling	0	0	1	0	0	1	2	1	0	0	0
Sheep - faeces - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0	0	0	2	0
	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H16	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC ONT:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O84:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O8:H21	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O8:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O78:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O55:H2	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O5:H8	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O5:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O177:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O146:H28
Cattle (bovine animals) - adult cattle over 2 years - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling	0	0	1	0	0	0	0	0	0	2	0
Cattle (bovine animals) - adult cattle over 2 years - at slaughterhouse - animal sample - mucosal swab (rectum-anal) - Monitoring - official sampling - objective sampling	0	1	0	0	0	0	0	1	0	1	0
Cattle (bovine animals) - calves (under 1 year) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling	0	0	0	0	1	0	0	0	0	0	0
Cattle (bovine animals) - calves (under 1 year) - at slaughterhouse - animal sample - mucosal swab (rectum-anal) - Monitoring - official sampling - objective sampling	0	1	0	0	0	0	0	0	0	0	0
Sheep - faeces - Monitoring - official sampling - objective sampling	1	0	0	1	0	1	1	0	1	0	1

Table VT *E. coli* in animals

	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O145:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O125:H51	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O119:HNT	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O119:H4	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O119:H-	Verotoxigenic <i>E. coli</i> (VTEC) 0111:H-	Verotoxigenic <i>E. coli</i> (VTEC)-VTEC O128abc
Cattle (bovine animals) - adult cattle over 2 years - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0
Cattle (bovine animals) - adult cattle over 2 years - at slaughterhouse - animal sample - mucosal swab (rectum-anal) - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0
Cattle (bovine animals) - calves (under 1 year) - at slaughterhouse - animal sample - caecum - Monitoring - official sampling - objective sampling	1	0	0	1	0	1	0
Cattle (bovine animals) - calves (under 1 year) - at slaughterhouse - animal sample - mucosal swab (rectum-anal) - Monitoring - official sampling - objective sampling	2	0	1	0	1	0	1
Sheep - faeces - Monitoring - official sampling - objective sampling	0	1	0	0	0	0	0

Footnote:

In some samples more than one VTEC serotype detected.

All cattle older 1 year are included in the EFSA category "adult cattle over 2 years".

2.5 TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1 General evaluation of the national situation

A. Tuberculosis general evaluation

History of the disease and/or infection in the country

Human tuberculosis has steadily declined during the last decades. Commission Decision 1999/467/EC of 15 July 1999 established the officially tuberculosis-free status of bovine herds of Austria.

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

Bovine tuberculosis poses no public health problem in Austria., sheep, goats and pigs are free of bovine tuberculosis. Although in spring 2008 in one slaughtered cattle infective lung tuberculosis was diagnosed caused by *M. caprae*. All cattle of that holding were culled following an intra cutan testing showing several positive reactors. Two more cattle holdings with several reagents were culled and some single reactors in contact holdings. In 21 cattle out of 14 holdings *M. caprae* was isolated. Since several years a reservoir of *M. caprae* in red deer in one Austrian region has been confirmed and cattle are exposed to the bacteria in the summertime grazing on contaminated pastures in the alps.

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

No findings of *M. bovis* in animals, although *M. caprae* was detected.

Recent actions taken to control the zoonoses

A new national regulation has been implemented due to the finding of *M. caprae* in cattle from a certain region (Rindertuberkuloseverordnung, BGBl II 2008/322). This regulation obliges the intracutan testings (using simultaneously bovine and avium tuberculin) off all cattle and goats that are kept together with cattle in given districts due to the epidemiological situation.

Suggestions to the Community for the actions to be taken

Continuation of the existing control programs

Additional information

Nil

2.5.2 Tuberculosis, mycobacterial diseases in humans

A. Tuberculosis due to *Mycobacterium bovis* in humans

Reporting system in place for the human cases

Definite: A case with isolation of *M. tuberculosis* complex (except *M. bovis* BCG) from any clinical specimen.

Other than definite: A case that meets the clinical criteria above but does not meet the laboratory criteria of a definite case.

Case definition

- Definite: Staining: Ziehl-Neelsen, Auramin-Rhodamin stains are performed on histological preparation and smears of the sample material
- Culture: After decontamination of the homogenised sample material in NALC-NaOH and centrifugation, the sample material is transferred in parallel on Loewenstein-Jensen agar containing glycerol and PACT and Stonebrink agar containing PACT and MGITmedium.
The media are incubated at 37 °C for up to 8 weeks.
Confirmation of the species by Amplicor (Roche)
- Other than definite: A skin test and an X-Ray of the thorax are performed.

Notification system in place

The person who diagnoses (laboratory/hospital/general practitioner) has to notify definite (*M. tuberculosis* and *M. bovis*) and other than definite cases (this excludes radiologists) to the local health authority (Federal Law BGBI. 127/1968: Tuberkulosegesetz, as amended; Epidemiegesetz 1950, as amended). *M. bovis* is notifiable since 2004 (National Regulation BGBI. Nr. 254/2004: Anzeigepflichtige übertragbare Krankheiten 2004).

History of the disease and/or infection in the country

The National Reference Laboratory for Tuberculosis (NRL-T) has been nominated since 1995. Since 1998 all data are compiled in a national database.

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

Preliminary *M. bovis* was isolated from three cases and *M. caprae* from two human cases.

Relevance as zoonotic disease

The relevance is inconsiderable; in 2008 only five out of preliminary 498 human tuberculosis cases were caused by *M. bovis* or *M. caprae*.

Additional information

Annual report of the National Reference Center:
<http://www.bmgfj.gv>.

at/cms/site/attachments/3/5/9/CH0951/CMS1214392137719/tb_jb_2007.pdf

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

Additional information

According to Council Directive 64/432/EWG from June 26, 1964, Austria has the status Officially Tuberculosis Free Member State declared in the Commission Decision 1999/467/EC from July 15th, 1999, replaced by Commission Decision 2003/467/EC from June 23rd, 2003. The national surveillance programme is regulated by the Directive GZ 39.624/9-IX/A/8/00. The monitoring programme is based on the compulsory ante-mortem and post-mortem inspection in which all cattle and goats originating from an official tuberculosis free holding have to be tested for tuberculous alterations.

A new national regulation has been implemented due to the finding of *M. caprae* in cattle from a certain region (Rindertuberkuloseverordnung, BGBl II 2008/322). This regulation obliges the intracutan testings (using simultaneously bovine and avium tuberculin) off all cattle and goats that are kept together with cattle in given districts due to the epidemiological situation.

Monitoring system

Sampling strategy

Specimen are taken from carcasses with macroscopically observable alterations, characteristic for tuberculosis. They are sampled in slaughterhouses and sent to the national reference laboratory for tuberculosis in animals.

All cattle in holdings of designated regions given in annex 2 of the Rindertuberkuloseverordnung (BGBl II 2008/322) were subjected to simultaneous intracutan testing.

Frequency of the sampling

Continuous post-mortem inspections of each slaughtered bovine and caprine animal. Intracutan testing: All cattle in holdings of designated regions given in annex 2 of the Rindertuberkuloseverordnung (BGBl II 2008/322).

Type of specimen taken

Organs/tissues: Tissues that are macroscopically altered due to tuberculous, including lymph nodes.

Methods of sampling (description of sampling techniques)

The alterations and lymph nodes are excised and sent to the national reference laboratory for tuberculosis in animals.

Case definition

According to Order Richtlinien für die veterinärbehördliche Überwachung zur Erhaltung der Freiheit der österreichischen Rinderbestände von Rindertuberkulose und zur Durchführung und Beurteilung der intrakutanen Tuberkulinprobe (GZ 39.624/9-IX/A/8/00): Tuberclues pathogenomically for tuberculosis detected in course of the post-mortem inspection or *Mycobacterium bovis* or *Mycobacterium tuberculosis* isolated from suspected material.

Results of the intracutan test: Doubtful and positive reactions are defined (see Rindertuberkuloseverordnung, BGBl II 2008/322).

Diagnostic/analytical methods used

Intracutan testing (simultaneous testing using bovine and avium tuberculin): The test is performed according to Council Directive 64/432/EEC of 26 June 1964, as amended and the national Rindertuberkuloseverordnung (BGBl II 2008/322).

Staining: Ziehl-Neelsen stains are performed on histological preparation and smears of the sample material.

Culture: After decontamination of the homogenised sample material in NALC and centrifugation, the sample material is transferred in parallel on Loewenstein-Jensen agar containing glycerol and PACT and Stonebrink agar containing PACT and Middlebrook medium. The media are incubated at 37 °C for up to 8 weeks.

Confirmation of the *Mycobacterium* species by PCR (De los Monteros et al. 1998: Journal of Clinical Microbiology 36: 239-242) in the National Reference Laboratory for Tuberculosis in Animals.

Vaccination policy

Vaccination is prohibited.

Other preventive measures than vaccination in place

Compulsory ante-mortem and post-mortem inspection of all slaughtered bovine and caprine carcasses originating from official tuberculosis free holding and intracutan tests in animals of given regions according to Rindertuberkuloseverordnung.

Control program/mechanisms

The control program/strategies in place

The control programs are based on the compulsory ante-mortem and post-mortem inspection of all slaughtered bovine and caprine carcasses originating from an official tuberculosis free holding.

Intracutan tests are performed in animals in holdings of given regions according to the epidemiological situation, defined in the Rindertuberkuloseverordnung.

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

The carcass is condemned.

Loss of the status OTF for the holding from which the animal was originated and for contact holdings.

Slaughtering of cows and goats from NON-OTF-holdings is forbidden

Prohibition of keeping these animals together with animals from OTF-holdings on pastures or market places etc.

Regaining the status OTF:

There must be no animals in the holding showing signs of clinical tuberculosis

All animals are recruited from an OTF-holding

M. bovis reactors after performing the skin test and contact animals have been eliminated

as well as the compulsory follow-up examination and disinfection have been carried out

No reactors identified after two intradermal testings of all animals in the holding older than 6 months examined earliest 60 days (first tuberculin test) and earliest 4 months (second tuberculin test) but latest 12 months after elimination of the last reactor.

Notification system in place

A suspected case of tuberculosis must be notified

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

No findings of M. bovis in cattle. Due to the fact that M. caprae is endemic in wildlife deer in Western parts of Austria (and South-Western parts of Germany), cattle in this areas should be observed with higher sensitivity. The National Regulation concerning Bovine Tuberculosis has been revised and set into force on 1. September 2008 (Rindertuberkuloseverordnung, BGBl II 2008/322).

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

Nil

Additional information

M. caprae is differentiated in Austria.

B. Mycobacterium bovis in farmed deer

Monitoring system

Sampling strategy

Due to the identification of *M. caprae* in several cattle holdings new control programmes have been developed to be implemented in 2009.

Frequency of the sampling

Every shot farmed deer that is foreseen to be used as a food is subjected to pre and post mortem inspection. Pre mortem inspection can be performed by the livestock owner if the owner is trained in this special inspection and if the Veterinarian has assured himself of the physical health of the animal within the last month prior to slaughtering.

Type of specimen taken

Other: Macroscopically tuberculous alterations and lymph nodes

Methods of sampling (description of sampling techniques)

The alterations and lymph nodes are excised and sent to the national reference laboratory for tuberculosis in animals.

Case definition

Tubercles pathognomically for tuberculosis detected in course of the post-mortem inspection or *Mycobacterium bovis* or *Mycobacterium tuberculosis* isolated from suspected material

Diagnostic/analytical methods used

Staining: Ziehl-Neelsen stain is performed on histological preparation and smears of the sample material

Culture: After decontamination of the homogenised sample material in NALC and centrifugation, the sample material is transferred in parallel on Loewenstein-Jensen agar containing glycerol and PACT and Stonebrink agar containing PACT and Middlebrook medium. The media are incubated at 37 °C up to 8 weeks.

Confirmation of the *Mycobacterium* species by PCR (De los Monteros et al. 1998:

Journal of Clinical Microbiology 36: 239-242) in the National Reference Laboratory for Tuberculosis in Animals

Vaccination policy

Vaccination is prohibited.

Other preventive measures than vaccination in place

Nil

Control program/mechanisms

The control program/strategies in place

The control programs are based on the compulsory ante-mortem and post-mortem inspection of all slaughtered carcasses originating from an official

tuberculosis free holding

Recent actions taken to control the zoonoses

In 2009, new programmes will be implemented.

Measures in case of the positive findings or single cases

The carcass is condemned. Further measures according to Tierseuchengesetz RGBl. 1909/177 as amended.

Notification system in place

The suspicion and finding of tuberculosis is notifiable.

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

No cases of M. bovis in 2008.

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

No cases of M. bovis in 2008.

Additional information

Nil

C. *Mycobacterium* spp., unspecified in animal - All animals - at slaughterhouse - Control and eradication programmes - official sampling

Monitoring system

Sampling strategy

Samples from suspected swine are taken in slaughterhouses. Sampling is performed when tissue of slaughtered animals is visibly altered, seen by the unaided eye.

Goats in defined regions that are kept together with cattle are subjected to intracutan testing (see chapter *Mycobacterium bovis* bovine animals; Rindertuberkuloseverordnung, BGBl II 2008/322).

Frequency of the sampling

Continuous post-mortem inspections of each slaughtered animal

Type of specimen taken

Other: Macroscopic tuberculous alterations and lymphnodes

Methods of sampling (description of sampling techniques)

The altered tissue and lymph nodes are excised and sent to the laboratory

Case definition

Tubercles pathognomically for tuberculosis detected in course of the post-mortem inspection or *Mycobacterium bovis* or *Mycobacterium tuberculosis* or *Mycobacterium avium* isolated from suspected material

Diagnostic/analytical methods used

Staining: Ziehl-Neelsen stains are performed on histological preparation and smears of the sample material

Culture: After decontamination of the homogenised sample material in NALC and centrifugation, the sample material is transferred in parallel on Loewenstein-Jensen agar containing glycerol and PACT and Stonebrink agar containing PACT and Middlebrook medium. The media are incubated at 37°C up to 8 weeks.

Confirmation of the *Mycobacterium* species by PCR (De los Monteros et al. 1998:

Journal of Clinical Microbiology 36: 239-242) in the National Reference Laboratory for Tuberculosis in Animals

Vaccination policy

Vaccination is prohibited.

Other preventive measures than vaccination in place

Nil

Control program/mechanisms

The control program/strategies in place

The control programs are based on the compulsory ante-mortem and post-mortem inspection of all slaughtered carcasses originating from an official

tuberculosis free holding

Recent actions taken to control the zoonoses

No need at the moment

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

The carcass is condemned. Further measures are performed according to Tierseuchengesetz RGBl. 1909/177, as amended.

Notification system in place

The detection of tuberculosis is notifiable.

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

No cases in Austria in 2008.

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

No cases in Austria in 2008.

Additional information

Nil

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for <i>Mycobacterium</i> spp.	<i>M. bovis</i>	<i>M. tuberculosis</i>	<i>Mycobacterium</i> spp., unspecified
Goats - at slaughterhouse - animal sample - Control and eradication programmes - official and industry sampling - census sampling	CVS	animal	45036	0			
Pigs - at slaughterhouse - animal sample - Control and eradication programmes - official and industry sampling - census sampling	CVS	animal	5556508	0			
Sheep - at slaughterhouse - animal sample - Control and eradication programmes - official sampling - census sampling	CVS	animal	318921	0			

Footnote:

CVS: Central Veterinary Service

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/432/EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests	Number of animals tested			
ÖSTERREICH	76845	1999866	76831	99.98	14	.02	0	20222	5	119	21
Total	76845	1999866	76831	99.98	14	0.02	0	20222	5	119	21
Total - 1											

Footnote:

All positive results are *M. caprae*: Same measures for control and eradication as for *M. bovis*.

Source of information: Central Veterinary Services.

2.6 BRUCELLOSIS

2.6.1 General evaluation of the national situation

A. Brucellosis general evaluation

History of the disease and/or infection in the country

In Austria, human brucellosis cases are considered to be an imported infectious disease. Austria has the status Officially Brucellosis Free (OBF).

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

Five human cases were identified in 2008; all cases were imported.

Recent actions taken to control the zoonoses

A new national regulation has been implemented concerning the examination of milk- and bloodsamples in cattle (Bangseuchen-Untersuchungsverordnung 2008, BGBL II 2007/305).

Suggestions to the Community for the actions to be taken

Continuation of the existing control programs

Additional information

Nil

2.6.2 Brucellosis in humans

A. Brucellosis in humans

Reporting system in place for the human cases

Notification of cases according to EU case definitions.

Case definition

Clinical description: Clinical picture compatible with brucellosis, e.g. acute or insidious onset of fever, night sweats, fatigue, anorexia, weight loss, headache and arthralgia.

Diagnostic/analytical methods used

- Serological examination: Serum samples are tested in the Complement Fixation Test (CFT) with reference standard antisera from CVL-Weybridge. Participation in international ring trials: Brucellosis European Ring Trial 2000 and 2002 (VLA Weybridge) with ELISA, CFT, RBT and SAT.
- Bacteriological: Multiple blood samples are inoculated in blood culture broth over several consecutive days. The incubation lasted 4 to 6 weeks, once per week medium is transferred on brucella agar and incubated 5 -10 % CO₂ atmosphere (Anonymus: Standardisierung und Qualitätssicherung in der mikrobiologischen Diagnostik. Richtlinien. Bundesministerium für Soziale Sicherheit und Generationen. ISBN 3-84123-126-0, Wien, 2001, pg. 56).
- The genus is identified by microscopic examination, catalase-, oxidase- and the slide agglutination test using brucella serum. The species is identified by CO₂ requirement, H₂S formation, urease activity, growth on media containing standard concentrations of basic fuchsin or thionin and agglutination with monospecific sera and by PCR (Real-time detection of *Brucella abortus*, *Brucella melitensis* and *Brucella suis*. 2001: Redkar et al., Mol Cell Probes. 2001 Feb;15(1):43-52.)

Notification system in place

Medical doctors specialised in Laboratory Diagnosis or Microbiology and Hygiene and the attended physicians are required to report all new cases. Notification of brucellosis according to the epidemic act has been mandatory since 1950 (BGBI. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

Austria is OBF and OBmF. All cases reported in Austria are epidemiologically linked to travel in endemic countries or to foreign workers from endemic countries.

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

This zoonosis has no relevance in Austria.

Relevance as zoonotic disease

Nil

2.6.3 Brucella in foodstuffs

A. Brucella spp., unspecified in food

Monitoring system

Sampling strategy

Due to the fact that Austria is OBF and OBmF, food is not investigated for Brucella spp.

2.6.4 Brucella in animals

A. Brucella abortus in bovine animals

Status as officially free of bovine brucellosis during the reporting year

The entire country free

Yes

Additional information

Upon the request of the Commission Decision of July 15th 1999, CD 1999/466/EC, as amended, by the Council Directive 64/432/EEC of 26 June 1964, Austria achieved the status: officially brucellosis-free for bovine herds.

A new national regulation has been implemented concerning the examination of milk- and bloodsamples in cattle (Bangseuchen-Untersuchungsverordnung 2008, BGBl II 2007/305). This means that in the case of dairy herds, the examination of milk samples in accordance with Annex C of Council Directive 64/432/EEC of 26 June 1964 can be performed.

Monitoring system

Sampling strategy

Nationwide all bovine milk producing holdings were subjected to bulk milk testing.

In non-milk producing holdings a risk based sampling plan was performed.

Abortion or premature birth: Abortive material and blood of the cow is sampled

Frequency of the sampling

Bulk milk sampling: All milk producing holdings had been sampled minimum once per year according to the new regulation (§6 Bangseuchen-Untersuchungsverordnung 2008, BGBl II 2007/305). In case of not-negative bulk milk samples, blood samples in the affected holding were investigated.

Holdings without milk production: A risk based sampling plan has been calculated stratified according to the different provinces (§6 Bangseuchen-Untersuchungsverordnung 2008, BGBl II 2007/305). If blood serology does not show a definitive negative result diagnostic slaughtering of the affected animal has to be carried out.

- Abortion or premature birth: Tissue and blood from the cow is sampled immediately post abortion. If the result of the first serological examination was negative, a second blood sample was taken 2 weeks post abortion for serological testing. If this result was negative again, sampling and testing was repeated after two weeks.

Type of specimen taken

Other: Bulk milk Blood samples Diagnostic slaughtering: organs and lymph nodes of the genital tract; udder and accessory lymph nodes; fetus (stomach, lungs); retropharyngeal lymph node. Abortion or premature birth: Tissue and blood samples from the animal that had an abortion.

Methods of sampling (description of sampling techniques)

Bulk milk sampling: §6 Bangseuchen-Untersuchungsverordnung 2008, BGBl II 2007/305.

Holdings without milk production: Individual blood samples are taken in the holdings and sent to the laboratories (§6 Bangseuchen-Untersuchungsverordnung 2008, BGBl II 2007/305).

Diagnostic slaughtering: §6 Bangseuchen-Untersuchungsverordnung 2008, BGBl II 2007/305.

Abortion or premature birth: Aborted tissue and blood samples sent to a veterinary laboratory.

Case definition

An animal is considered to be positive for *Brucella abortus*, in case of positive blood-serological test result and the epidemiological situation of the herd indicates the possibility that a brucella infection has been introduced to the herd (BGl 1957/280, Bangseuchen-Verordnung, §2 Untersuchungsergebnisse) or in case of bacteriological isolation. Although detection can be done on a single animal, the epidemiological unit in tracing back and tracing on is the herd.

Diagnostic/analytical methods used

Bulk milk: Testings according to Council Directive 64/432/EEC and the manual of Diagnostic Tests and Vaccines for Terrestrial Animals of the OIE.

Blood samples: Testings according to Council Directive 64/432/EEC and the manual of Diagnostic Tests and Vaccines for Terrestrial Animals of the OIE: Routinely single serum samples or serum pools (5 sera in one pool) were tested in the Indirect-ELISA (I-ELISA) using the three OIE ELISA *Brucella* Standard Sera (OIE ELISAwpSS, OIE ELISAspSS, OIE ELISAnSS) and the OIE *Brucella abortus* Positive International Standard Antiserum (OIEISS) to calibrate the method (Commission Regulation 535/2002/EC of 21 March 2002 amending Annex C to Council Directive 64/432/EEC and amending Decision 2000/330/EC). Following a positive or suspected test result in the IELISA single serum samples were also tested in the Complement Fixation Test (CFT), Rose Bengal test (RBT) and Competitive ELISA (C-ELISA). Participation in international ring trials:

Brucellosis European Ring Trial 2000 and 2002 (VLA Weybridge) with ELISA, CFT, RBT and Serum Agglutination Test (SAT). The National Reference Laboratory for Brucellosis, Institute for Veterinary Disease Control in Moedling organized the national Brucellosis Ring Trials for all Veterinary Institutes.

Abortion or premature birth: Aborted material was tested bacteriologically and serologically as described above. Bacteriology: Smears of the samples are stained by Stableforth's method. Brucella agar and Columbia agar (Merck) containing selective additives were used (Oxoid). After inoculation the media were incubated for 4-10 days at 37 °C in an atmosphere containing 10 % CO₂. The genus was identified by microscopic examination, catalase-, oxidase- and the slide agglutination test using brucella serum. The species was differentiated by CO₂ requirement, H₂S formation, urease activity, growth on media containing standard concentrations of basic fuchsin or thionin and agglutination with monospecific sera and by PCR (Real-time detection of Brucella abortus, Brucella melitensis and Brucella suis. 2001: Redkar et al., Mol Cell Probes. 2001 Feb;15(1):43-52.).

Vaccination policy

Vaccination is not allowed (BGBI. 1957/147, Bangseuchengesetz, § 13 Impfung)

Control program/mechanisms

The control program/strategies in place

Control programme according to the National Regulation (Bangseuchen-Untersuchungsverordnung 2008, BGBI II 2007/305). Abortion or premature birth: Compulsory notification according BGBI 1957/147, Bangseuchengesetz, as amended, § 11 Anzeigepflicht;

Recent actions taken to control the zoonoses

No actions, because OBF

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

According to BGBI 1957/147, Bangseuchengesetz, as amended, and BGBI 1909/177, Tierseuchengesetz, as amended

Notification system in place

Abortion or premature birth: Notification of abortions: The livestock owner has to notify each abortion within 24 hours to the mayor (Gemeinde). The mayor has to forward the notification to the local authority (Bezirksverwaltungsbehörde) (BGBI. 1957/147, Bangseuchengesetz, § 11 Anzeigepflicht). If the cow is being treated by a veterinarian or the veterinarian has been informed about the abortion, then the veterinarian has to notify to the official authority (Bezirksverwaltungsbehörde).

Results of the investigation

See tables

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

OBF

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

Nil

Additional information

Nil

B. B. suis in animal - Pigs

Monitoring system

Sampling strategy

According to Commission Decision Nr. 93/52/EWG, as amended, Austria has the status officially brucellosis (B. melitensis) free (ObmF).

Frequency of the sampling

Targeted, following abortion and in positive cases contact holdings.

Type of specimen taken

Other: - Monitoring: Blood samples; - Clinical cases: Abortion material and blood samples from the affected animal

Methods of sampling (description of sampling techniques)

Individual blood samples and abortion material are taken from animal holdings and sent to the laboratories.

Case definition

An animal is considered to be serologically positive for brucellosis following one/more positive CFT Complement Fixation Test (CFT) and RBT Rose Bengal test (RBT) results (B. abortus used antigen). A bacteriological isolation may also be possible as in the case of B. suis.

Diagnostic/analytical methods used

- Due to the fact that a *Brucella suis* antigen is not available, the *B. abortus* antigen is used for the Complement Fixation Test (CFT) and the Rose Bengal test (RBT) because *B. abortus* shows cross reactions with *B. suis* antibodies.
- ELISA and CFT is not available, the *B. abortus* ELISA and CFT are used because these tests show cross reactions with *B. suis* antibodies.
- Participation in international ring trials: Brucellosis European Ring Trial 2000 and 2002 (VLA Weybridge) with ELISA, CFT, RBT and Serum Agglutination Test (SAT). The National Reference Laboratory for Brucellosis, Institute for Veterinary Disease Control in Moedling organized the national Brucellosis Ring Trials for all Veterinary Institutes.

Bacteriology: Quality control: Laboratory strains

- Smears of the samples are stained by Stableforth's method
- *Brucella* agar and Columbia agar (Merck) containing selective additives (Oxoid) were used. After inoculation the media are incubated for 4-10 days at 37 °C in an atmosphere containing 10 % CO₂. The genus was identified by microscopic examination, catalase-, oxidase- and the slide agglutination test using *brucella* serum. The species were differentiated by CO₂ requirement, H₂S formation, urease activity, growth on media containing standard concentrations of basic fuchsin or thionin and agglutination with monospecific sera and by PCR (Real-time detection of *Brucella abortus*, *Brucella melitensis* and *Brucella suis*. 2001: Redkar et al., Mol Cell Probes. 2001 Feb;15(1):43-52.).

Vaccination policy

Nil

Other preventive measures than vaccination in place

Nil

Control program/mechanisms

The control program/strategies in place

Nil

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

No mandatory measures but notification is required.

Notification system in place

B. suis has been a notifiable disease since 1993 according to BGBI 1993/756, Tierseuchen- Anzeigepflichtverordnung, as amended.

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

Due to the results of the passive monitoring in pigs (no cases of B. suis) we conclude that there is no need for an active monitoring program.

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

Nil

Additional information

Nil

C. B. melitensis in animal - Sheep and goats

Monitoring system

Sampling strategy

To maintain the status officially brucellosis (B. melitensis) free, according to BGBl. 2002/184 (Brucella melitensis-Überwachungsverordnung, of 14 May 2002) a representative number of samples were examined with a confidence level of 95 % to detect infected holdings at a target prevalence of 0.2 %. Sampling was performed by the competent authority or under its supervision, by bodies to which it had delegated this responsibility. Samples were taken in the holdings.

Aborted material and blood samples from the animal were also investigated.

Frequency of the sampling

Principally the sampling was performed during the cold season, between November and May when the animals were kept in the stables.

Type of specimen taken

Other: • Monitoring: Blood samples. • Clinical cases: Aborted material and blood samples from the affected animal.

Methods of sampling (description of sampling techniques)

Individual blood samples and aborted material are taken within the holdings and sent to the laboratories.

Case definition

An animal is considered to be infected with B. melitensis in case of bacteriological isolation or positive serological test result.

Diagnostic/analytical methods used

- Routinely single serum samples were tested in the Indirect ELISA. Confirmation of suspected or positive results was performed by the Complement Fixation Test (CFT) with reference standard antisera from CVL-Weybridge. Participation in international ring trials: Brucellosis European Ring Trial 2000 and 2002 (VLA Weybridge) with ELISA, CFT, RBT and SAT. The National Reference Laboratory for Brucellosis, Institute for Veterinary Disease Control in Moedling organized the national Brucellosis Ring Trials for all national Veterinary Institutes.

Bacteriology: Smears of the samples were stained by Stableforth's method. Brucella agar and Columbia agar (Merck) containing selective additives (Oxoid) were used. After inoculation the media are incubated for 4 - 10 days at 37 °C in an atmosphere containing 10 % CO₂. The genus was identified by microscopic examination, catalase-, oxidase- and the slide agglutination test using brucella serum. The species were differentiated by CO₂ requirement, H₂S formation, urease activity, growth on media containing standard concentrations of basic fuchsin or thionin and agglutination with monospecific sera and by PCR (Real-time detection of Brucella abortus, Brucella melitensis and Brucella suis. 2001:

Redkar et al., Mol Cell Probes. 2001 Feb;15(1):43-52.).

Vaccination policy

According to BGBI. 2002/184 (Brucella melitensis-Überwachungsverordnung, of 14 May 2002, §4, Impfverbot) vaccination is not allowed.

Other preventive measures than vaccination in place

Monitoring program and investigation of aborts

Control program/mechanisms

The control program/strategies in place

To maintain the status officially brucellosis (B. melitensis) free, according to BGBI. 2002/184 (Brucella melitensis-Überwachungsverordnung, of 14 May 2002) a representative number of samples have to be examined with a confidence level of 95 % to detect infected holdings at a prevalence of 0.2 %. Sampling is performed by the appropriate authority or under its supervision, by bodies to which it has delegated this responsibility. Samples are taken in the holdings.

Notification and clarification of each clinical case by bacteriology and serology.

Recent actions taken to control the zoonoses

ObmF

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

According to BGBI. 2002/184 (Brucella melitensis-Überwachungsverordnung, of 14 May 2002, §3, Ausmerzung von Reagenten) reactors have to be culled, the carcasses have to be incinerated in an incineration plant.

Notification system in place

Notification of brucellosis or a suspicion of brucellosis according to BGBI. 2002/184 (Brucella melitensis-Überwachungsverordnung, of 14 May 2002).

Results of the investigation

See tables

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

ObmF

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

Nil

Additional information

According to Commission Decision Nr. 93/52/EWG, as amended, Austria has the status officially brucellosis (B. melitensis) free (ObmF).

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance						Investigations of suspect cases								
	Herds	Animals	Number of herds	%	Number of herds	%	Serological tests			Examination of bulk milk			Information about			Epidemiological investigation					
							Number of bovine herds tested	Number of animals tested	Number of infected herds	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Number of positive animals	Sero logically	BST	Number of animals examined microbiologically
ÖSTERREICH	76845	1999866	76844	100	1	0	4254	36772	1	37858	37996	0	897	0	0	1045	163	0	0	4	0
Total	76845	1999866	76844	100.0	1	0.0	4254	36772	1	37858	37996	0	897	0	0	1045	163	0	0	4	0
Total - 1																					

Footnote:

Source of information: Central Veterinary Services.

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

	Total number of existing		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases				
	Herds	Animals	Number of herds	%	Number of herds	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbiologically	Number of animals positive microbiologically	Number of suspended herds
Region														
ÖSTERREICH	51095	444685	51094	100	1	0	1580	13560	1	16	2	2	0	1
Total	51095	444685	51094	100.0	1	0.0	1580	13560	1	16	2	2	0	1
Total - 1														

Footnote:

Source of information: Central Veterinary Services.

2.7 YERSINIOSIS

2.7.1 General evaluation of the national situation

A. Yersinia enterocolitica general evaluation

History of the disease and/or infection in the country

Yersiniosis is not considered a major food borne illness in Austria. The incidence of human disease is low when compared to salmonellosis or campylobacteriosis.

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

Nil

Recent actions taken to control the zoonoses

None

Suggestions to the Community for the actions to be taken

Nil

Additional information

Nil

2.7.2 Yersiniosis in humans

A. Yersiniosis in humans

Reporting system in place for the human cases

Notification of cases according to EU case definitions. The numbers presented in this report reflect the number of primary isolates sent to the national reference lab for confirmation and typing.

Case definition

Clinical description: An illness of variable severity characterised by diarrhoea, fever, nausea, cramps and tenesmus.

Laboratory criteria for diagnosis: Isolation of *Yersinia enterocolitica* Serogroup O:3, O:9 or O:5 or *Y. pseudotuberculosis* from a clinical specimen.

Diagnostic/analytical methods used

Faecal (*Yersinia enterocolitica*) or resection (*Y. pseudotuberculosis*) sample material is plated directly on cefsulodin-irgasan-novobiocin (CIN) agar and incubated for 18 hours at 30 °C. Suspicious colonies are identified in an Api 20 E reaction and API 50 CHE reaction. *Y. enterocolitica* is agglutinated with sera against serogroups O:3, O:5, O:9 and O:8. Biovar and pathogenicity are defined.

Notification system in place

Medical doctors specialised in Laboratory Diagnosis or Microbiology and Hygiene and the attended physicians are required to report the disease. Notification of yersiniosis according to the epidemic act has been mandatory since 1950 (BGBI. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

Nil

Results of the investigation

The number of human cases has been similar in the last years.

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

Compared to salmonellosis and campylobacteriosis, yersiniosis is not an important food borne pathogen.

Additional information

Annual report of the National Reference Center:

http://www.bmwfj.gv.at/cms/site/attachments/3/5/9/CH0951/CMS1214392137719/yersinien_jb_2007.pdf

2.7.3 **Yersinia in foodstuffs**

A. Y. enterocolitica in food

Monitoring system

Sampling strategy

Foodstuff was sampled according to the ordinance „Revisions- und Probenplan für das Jahr 2008 gemäß §31 LMSVG; Richtlinien über die Vollziehung der Überwachung des Verkehrs mit den durch das LMSVG erfassten Waren; Berichtsschema 2008“ (BMGFJ-75500/0247-IV/B/7/2007 von 08.01.2008) from the Federal Ministry of Health. This “Revisions- und Probenplan” is part of the multi-annual national control plan (2007-2010) according to Art. 41 ff of Regulation (EC) No 882/2004.

The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail outlets etc. that have to be sampled and tested randomly according to the number of food enterprises per province. Every business within Austria has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP concepts, control of manufacturing processes etc.

In 2008, approximately 40,000 samples were planned to be tested in Austria. About 60% (24,000) of these are planned samples (surveillance) and only these numbers are used in this report (data from suspect samples are not shown). These planned samples either consist of samples of the yearly sampling plan which determines the number of samples of each food category that have to be investigated randomly, e.g. raw meat (fresh or frozen); sausages; cheeses; milk; preserved food etc. There are different sampling stages where food samples are taken: e.g. from retail, processing plant, primary production.

In addition there is a monitoring plan for food items (40-45 campaigns per year). In the course of these programs food items of special interest for defined parameters – amongst others zoonotic agents – are investigated. The sampling takes place during a fixed period of time in order to gain in-depth information. In 2008, eight relevant food campaign programs were conducted throughout Austria (Schwerpunktprogramm 2008 BMGFJ-75500/0242-IV/B/7/2007). Details and results of these campaigns can be found in the respective chapters.

B. Y. enterocolitica in food - Meat from pig - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling (Campaign A-801-08)

Monitoring system

Sampling strategy

Random sampling is done according to the sampling plan of the Ministry of Health.
Samples are taken at retail outlets by competent authorities.

Frequency of the sampling

Investigation period: March - April

Type of specimen taken

Other: fermented sausages and pate

Methods of sampling (description of sampling techniques)

Sample weight: 25g

Definition of positive finding

Detection of Y. enterocolitica in 25g

Control program/mechanisms

Recent actions taken to control the zoonoses

Follow-up surveillance programs

Results of the investigation

Out of 62 samples tested, 1 positive non-pathogenic strain was found (Biotype 1A, Serotype O:5)

Table Yersinia in food

Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitic a-O:3	Y. enterocolitic a-O:9	Y. enterocolitic a-unspecified	Y. enterocolitic a-biotype 1A
Meat from pig - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling (Campaign A-801-08)		single	25g	62	1					1

2.7.4 **Yersinia in animals**

A. Yersinia spp., unspecified in animal

Monitoring system

Sampling strategy

Not relevant in Austria therefore no testing.

Vaccination policy

No vaccination.

Other preventive measures than vaccination in place

Nil

Control program/mechanisms

Suggestions to the Community for the actions to be taken

EU wide harmonized monitoring program.

Notification system in place

Findings of Yersinia are not notifiable in animals.

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

No changes in recent years.

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

The relevance has not been investigated.

Additional information

Nil

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

No documented human infections in 2008.

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

No documented human infections in 2008.

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

No documented infections in food-animals in 2008.

Recent actions taken to control the zoonoses

No new measures implemented

Suggestions to the Community for the actions to be taken

Reconsider the necessity of routine trichinella meat inspection in pig carcasses

Additional information

Nil

2.8.2 Trichinellosis in humans

A. Trichinellosis in humans

Case definition

Clinical description: A disease caused by ingestion of *Trichinella* larvae. The disease has variable clinical manifestations. Common signs and symptoms include eosinophilia, fever, myalgia, and periorbital edema. Laboratory criteria for diagnosis: Demonstration of *Trichinella* larvae in tissue obtained by muscle biopsy, or positive serologic test for *Trichinella*

Diagnostic/analytical methods used

ELISA and Westernblot

Notification system in place

Notification of trichinellosis according to the epidemic act since 1950 (BGBI. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

The last autochthonous cases have been reported in 1970

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

Nil

Relevance as zoonotic disease

No relevance in Austria

2.8.3 **Trichinella in animals**

A. Trichinella in pigs

Monitoring system

Sampling strategy

General

Targeted sampling of all slaughtered pigs except pigs slaughtered by the farmer for his own consumption; the sampling is performed by competent authorities; the samples are taken at slaughterhouses; the sampling is part of a permanent monitoring scheme.

Frequency of the sampling

General

Other: Permanent post-mortem sampling of each slaughtered pig

Type of specimen taken

General

Muscles: Diaphragm (crus), tongue, masseter and abdominal muscles.

Methods of sampling (description of sampling techniques)

General

Appropriate muscle is excised out of the carcass.

Case definition

General

When trichinosis is detected with one of the given methods

Diagnostic/analytical methods used

General

According to Regulation (EC) Nr. 2075/2005

Control program/mechanisms

The control program/strategies in place

Lebensmittelsicherheits- und Verbraucherschutzgesetz (LMSVG, BGBI. I 2006/13, as amended), Fleischuntersuchungsverordnung (BGBI II 2006/109 as amended)

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

According to Regulation (EC) Nr. 854/2004, as amended.

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

Nil

Additional information

Nil

B. *Trichinella* in horses

Monitoring system

Sampling strategy

Targeted sampling of all slaughtered horses; the sampling is performed by competent authorities; the samples are taken at slaughterhouses; the sampling is part of a permanent monitoring scheme

Frequency of the sampling

Permanent post-mortem sampling of each slaughtered horse

Type of specimen taken

Muscles from tongue, masseter, diaphragm and neck.

Methods of sampling (description of sampling techniques)

Appropriate muscle is excised out of the carcass.

Case definition

When trichinosis is detected with one of the given methods.

Diagnostic/analytical methods used

According to Regulation (EC) Nr. 2075/2005

Control program/mechanisms

The control program/strategies in place

Lebensmittelsicherheits- und Verbraucherschutzgesetz (LMSVG, BGBI. I 2006/13, as amended), Fleischuntersuchungsverordnung (BGBI II 2006/109 as amended)

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

According to Regulation (EC) Nr. 854/2004 as amended.

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

Nil

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

Nil

Additional information

Nil

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

Monitoring system

Sampling strategy

Sampling of all hunted or harvested wild boars; the sampling is performed by hunters with special knowledge about trichinella investigation or by competent authorities; the sampling is stratified by geographical regions depending to the habitats of wild boar in Austria; samples are taken either immediately after shooting the animal or at the cold storage depots; the sampling is part of a monitoring scheme.

Frequency of the sampling

All farmed wild boars are controlled for trichinella.

Type of specimen taken

Diaphragm muscles (crus), tongue, masseter and abdominal muscles.

Methods of sampling (description of sampling techniques)

Appropriate muscle is excised out of the carcass.

Case definition

When trichinosis is detected with one of the given methods.

Diagnostic/analytical methods used

According to Regulation (EC) Nr. 2075/2005

Control program/mechanisms

The control program/strategies in place

Lebensmittelsicherheits- und Verbraucherschutzgesetz (LMSVG, BGBI. I 2006/13, as amended), Fleischuntersuchungsverordnung (BGBI II 2006/109 as amended)

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

According to Regulation (EC) Nr. 854/2004 as amended.

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

Nil

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

Nil

Additional information

Nil

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	Trichinella spp., unspecified
Pigs - at slaughterhouse - animal sample - Control and eradication programmes - official and industry sampling - census sampling		animal	5491872	0		
Solipeds, domestic - horses - at slaughterhouse - animal sample - Control and eradication programmes - official and industry sampling - census sampling		animal	903	0		
Wild boars - farmed - at slaughterhouse - animal sample - Control and eradication programmes - official and industry sampling - census sampling		animal	546	0		
Wild boars - wild		animal	11555	0		

2.9 ECHINOCOCCOSIS

2.9.1 General evaluation of the national situation

A. Echinococcus spp. general evaluation

History of the disease and/or infection in the country

Austria is a low risk country for both forms of echinococcosis

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

We expect the future prevalence to be low. In 2008, 2 cases of Echinococcus multilocularis infestation were diagnosed in Austria, one autochthonous case confirmed; in 2008 there were 7 patients with cystic echinococcosis.

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

We expect the future prevalence to be low. In 2008, 2 cases of Echinococcus multilocularis infestation were diagnosed in Austria, one autochthonous case confirmed; in 2008 there were 7 patients with cystic echinococcosis.

Recent actions taken to control the zoonoses

Tools for preventive serological screening of hunters (and also other persons) have been established to detect Echinococcus multilocularis infections in an early stage. The early detection of the infection is the prerequisite for a successful curative treatment.

Suggestions to the Community for the actions to be taken

Nil

Additional information

Nil

2.9.2 Echinococcosis in humans

A. Echinococcus spp. in humans

Case definition

Clinical apparent case (differentiation between alveolar and cystic echinococcosis necessary) with laboratory diagnostic confirmation: = histopathology or combination of imaging (ultrasound, X-ray, computed tomography or others) and positive serology or combination of specific DNA (by PCR) and positive serology).

Diagnostic/analytical methods used

ELISA and Westernblot technique, participant of the UK National External Quality Assessment Service for Microbiology, National Reference Laboratory for Echinococcosis.

Notification system in place

Echinococcosis is a notifiable disease since June 2004 according to the National Regulation 254/2004 (BGBI. II, 254/2004 of 18 June in 2004, Anzeigepflichtige übertragbare Krankheiten 2004)

History of the disease and/or infection in the country

- Alveolar echinococcosis has been known in Austria since 1897; annual incidence (1897 - 2004): 0-6 cases, mean incidence: 2.4 cases/year (only autochthonous cases); geographic distribution in Austria: mainly in the western provinces (Vorarlberg, Tyrol, Salzburg), but cases have been reported in every province; outbreaks are not known.
- Cystic echinococcosis has been known in Austria at least since 1819; Cases of cystic echinococcosis have been registered in the Clinical Institute of Hygiene and Medical Microbiology (Medical University Vienna) regularly since the beginning of the 1980ies. Annual incidence (1984 - 2006): 20 - 60 cases; mean incidence: 31 cases per year, one third of patients are of Austrian origin; two thirds are from abroad. Geographic distribution in Austria is unknown; a few autochthonous infections could be observed mainly in the eastern and southern provinces (Lower Austria, Burgenland, Styria); outbreaks are not known.

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

- Alveolar echinococcosis: We expect the future prevalence to be low; sources of infection: fox faeces (contaminated hands and fingers, vegetables, water).
- Cystic echinococcosis: We expect the future prevalence to be low; sources of infection: dog faeces, presumably in a very few foci (in or around farmers houses)

Relevance as zoonotic disease

Low prevalence of both forms of echinococcosis

2.9.3 Echinococcus in animals

A. Echinococcus spp., unspecified in animal

Monitoring system

Sampling strategy

Targeted sampling of all in abattoirs slaughtered animals; the sampling is performed by competent authorities in course of the post-mortem meat inspection; the sampling is part of a permanent monitoring scheme

Frequency of the sampling

Permanent post-mortem sampling of each slaughtered animal

Methods of sampling (description of sampling techniques)

All organs and muscles that were used for human consumption

Case definition

Each carcass in which cystic or alveolar hydatids are detected in muscles or organs

Diagnostic/analytical methods used

Other: All organs and muscles that were used for human consumption were visually inspected, palpated and cuttings were performed

Vaccination policy

No vaccination

Other preventive measures than vaccination in place

No measures

Control program/mechanisms

The control program/strategies in place

Post mortem meat inspection act according to BGBI. 1982/522, Fleischuntersuchungsgesetz, as amended

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

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

Cystic or alveolar echinococcosis in animals that are used for food production do not play a role for the infection of humans; it is primarily a hygienic problem. Only when infected waste from animals is used as feed for carnivores the risk of infection for humans increases.

Additional information

Nil

Table Echinococcus in animals

	Source of information	Sampling unit	Units tested	Total units positive for <i>Echinococcus</i> spp.	<i>E. granulosus</i>	<i>E. multilocularis</i>	<i>Echinococcus</i> spp., unspecified
Cattle (bovine animals) - at slaughterhouse - animal sample - Control and eradication programmes - official sampling - census sampling	CVS, PVS	animal	610304	297			297
Goats - at slaughterhouse - animal sample - Control and eradication programmes - official sampling - census sampling	CVS, PVS	animal	3527	0			0
Pigs - at slaughterhouse - animal sample - Control and eradication programmes - official sampling - census sampling	CVS, PVS	animal	5491872	30			30
Sheep - at slaughterhouse - animal sample - Control and eradication programmes - official sampling - census sampling	CVS, PVS	animal	116753	177			177

Footnote:

CVS: Central Veterinary Services, PVS: Provincial Veterinary Services

2.10 TOXOPLASMOSIS

2.10.1 General evaluation of the national situation

A. Toxoplasmosis general evaluation

History of the disease and/or infection in the country

No data available

2.10.2 Toxoplasmosis in humans

A. Toxoplasmosis in humans

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

Not notifiable in Austria, therefore no data available

2.10.3 Toxoplasma in animals

A. Toxoplasma spp., unspecified in animal

Monitoring system

Sampling strategy

There is no official surveillance for Toxoplasma spp. in animals. Sampling of cattle, sheep, goats or pigs is performed depending on clinical suspicion of toxoplasmosis and in cases after abortion. Other species of animals are also occasionally sampled.

Frequency of the sampling

In case of clinical suspicion and abortion.

Type of specimen taken

Blood

Case definition

A case is defined as an animal that tests positive ($\geq 1:40$). The animal is the epidemiological unit.

Diagnostic/analytical methods used

The diagnostic methods used for serology is the microagglutination test.

Vaccination policy

No vaccination

Control program/mechanisms

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Notification system in place

Toxoplasmosis is not notifiable in animals.

Results of the investigation

No valid data available

Table Toxoplasma in animals

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma	T. gondii
Cattle (bovine animals) - - blood - Clinical investigations		animal	13	0	
Goats - - blood - Clinical investigations		animal	19	8	8
Pigs - - blood - Clinical investigations		animal	25	1	1
Sheep - - blood - Clinical investigations		animal	20	4	4

2.11 RABIES

2.11.1 General evaluation of the national situation

A. Rabies general evaluation

History of the disease and/or infection in the country

Rabies in humans was a major public health issue in the 1960s.

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

In 2008, there was no case of rabies detected in animals in Austria.

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

Nil

Recent actions taken to control the zoonoses

In 2008, there were vaccination programs carried out in fox populations in areas of higher risk.

Suggestions to the Community for the actions to be taken

Nil

Additional information

Nil

2.11.2 Rabies in humans

A. Rabies in humans

Case definition

- Laboratory criteria for diagnosis
- Detection by direct fluorescent antibody of viral antigens in a clinical specimen (preferably the brain or the nerves surrounding hair follicles in the nape of the neck)
- Detection of rabies nucleic acid in clinical specimen
- Isolation (in cell culture or in a laboratory animal) of rabies virus from saliva, cerebrospinal fluid (CSF), or central nervous system tissue
- Identification of a rabies-neutralising antibody titre (complete neutralization) in the serum or CSF of an unvaccinated person.

Diagnostic/analytical methods used

Liquor, smears from pharynx, swab from conjunctivae biopsy at the nape of the neck and serum were examined in the fluorescent antibody test (FAT), immunohistochemistry and RT-PCR (Ito M., Itou T., Sakai T., et al. (2001). Detection of Rabies Virus RNA isolated from several species of animals in Brazil by RT-PCR. Journal of Veterinary medicine Science 63(12): 1309-1313.).

Notification system in place

Rabies and bite of an infected animal or an animal suspected to be infected according to the epidemic act (BGBI. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

Nil

Results of the investigation

Nil

Relevance as zoonotic disease

Nil

2.11.3 Lyssavirus (rabies) in animals

A. unspecified Lyssavirus in animal - Foxes - wild

Monitoring system

Sampling strategy

According to (GZ:39.642/14-VII/B/03): 8 foxes per 100km² in rabies infested and rabies endangered areas, 4 foxes per 100km² in not endangered and free areas (definition of areas: GZ 30.517/35-IV/12/03).

Frequency of the sampling

8 foxes per 100 km² in rabies infested and rabies endangered areas, 4 foxes per 100km² in not endangered and free areas.

Type of specimen taken

Other: Brain (brain stem or hippocampus)

Methods of sampling (description of sampling techniques)

Whole animals or heads of the dead animals are sent to the laboratories; sometimes brain tissue (derived from other laboratories). Brain tissue (e.g. 1 cm²) is examined.

Case definition

An animal is considered positive if the fluorescent antibody test (FAT) shows a positive signal.

Diagnostic/analytical methods used

The routine test was the fluorescent antibody test (FAT).

RTCIT (rabies tissue culture infection test) was performed on mouse neuroblastoma cells.

MIT (mouse inoculation test) will be only performed on demand, not for routine confirmation

Vaccination policy

Oral vaccination of foxes twice a year according to GZ: 30.517/52-IV/12/03 2008; additionally emergency vaccination in Carinthia according GZ. 74.10070105-IV/B572008.

Other preventive measures than vaccination in place

No measures

Control program/mechanisms

The control program/strategies in place

Fuchs-Tollwutbekämpfungsverordnung BGBI II 2001/75, Tierseuchengesetz TSG RGBI 1909/177 as amended, BGBI I 2002/65 IV. Abschnitt, §41, §42,

Tierseuchengesetz-Durchführungsverordnung 1909/178 as amended: BGBI 1955/76
TSG-DVO zum IV. Abschnitt Wutkrankheiten

Control of vaccination: Detection of tetracycline in jaw bones of randomly chosen foxes from the vaccination area; additionally an ELISA is performed to proof seroconversion.

Recent actions taken to control the zoonoses

In 2008, vaccination programmes were carried out (due to rabies in a fox in 2006).

Suggestions to the Community for the actions to be taken

Probably the reduction of the number of the animals (foxes) for investigation

Measures in case of the positive findings or single cases

Tierseuchengesetz TSG RGBI 1909/177 as amended, BGBI I 2002/65 IV. Abschnitt, §41, §42, and vaccination of the Fox Population

Notification system in place

According to Tierseuchengesetz TSG RGBI 1909/177 as amended, BGBI I 2002/65 IV. Abschnitt, §41, §42

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

Austria is declared as rabies free since 28.9.08. Note the additional emergency vaccination in Carinthia according GZ. 74.10070105-IV/B572008

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

Nil

B. unspecified Lyssavirus in animal - All animals (except foxes)

Monitoring system

Sampling strategy

Sampling is targeted when animals are observed with central nervous symptoms or after biting a person. The suspicious animal is killed or euthanized and the carcass or head is sent to the laboratory.

Frequency of the sampling

If a case is suspected

Type of specimen taken

Other: Other: Brain (hippocampus and brain stem) Methods of sampling (description of sampling techniques) Routinely a sample will be taken from one site of the brain: a part from the hippocampus, brain stem or cerebellum. If an animal has bitten a person then 2 parts from the brain will be taken: hippocampus and brain stem.

Case definition

An animal is considered positive if the fluorescent antibody tests (FAT) or the rabies tissue culture infection test or the mouse inoculation test show a positive result.

Diagnostic/analytical methods used

The routine test was the fluorescent antibody test (FAT).

RTCIT (rabies tissue culture infection test) was performed on mouse neuroblastoma cells.

MIT(mouse inoculation test) will be only performed on demand, not for routine confirmation

Vaccination policy

Voluntary vaccination of pets.

Other preventive measures than vaccination in place

No measures

Control program/mechanisms

The control program/strategies in place

The control program/strategies in place

Tierseuchengesetz TSG RGBI 1909/177 as amended, BGBI I 2002/65 IV. Abschnitt, §41, §42; Tierseuchengesetz-Durchführungsverordnung 1909/178 as amended: BGBI 1955/76

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

Tierseuchengesetz TSG RGBI 1909/177 as amended, BGBI I 2002/65 IV. Abschnitt, §41, §42. If a rabies suspicious pet bites a person, the person is treated.

Notification system in place

According to Tierseuchengesetz TSG RGBI 1909/177 as amended, BGBI I 2002/65 IV. Abschnitt, §41, §42

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

Nil

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

Nil

Additional information

On 28th of September 2008, Austria has been declared free of rabies.

Vaccination areas, rabies endangered and rabies free areas were redefined.

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	Unspecified Lyssavirus	Classical rabies virus (genotype 1)	European Bat Lyssavirus - unspecified
Badgers - wild - from hunting - Control and eradication programmes - official sampling - selective sampling		animal	81	0			
Bats - wild - Monitoring - official sampling - selective sampling (found dead)		animal	68	0			
Cats - stray cats - - organ/tissue - Clinical investigations		animal	80	0			
Cattle (bovine animals) - - organ/tissue - Clinical investigations		animal	6	0			
Deer - wild - roe deer - from hunting - Clinical investigations		animal	18	0			
Dogs - - organ/tissue - Clinical investigations		animal	57	0			
Foxes - wild - from hunting - Control and eradication programmes - official sampling - selective sampling		animal	8244	0			
Goats - - organ/tissue - Clinical investigations		animal	57	0			
Marten - wild - from hunting - Control and eradication programmes - official sampling - selective sampling		animal	866	0			
Other animals - - organ/tissue - Clinical investigations		animal	4	0			
Other animals - from hunting - Control and eradication programmes - official sampling - selective sampling		animal	29	0			
Other mustelides - from hunting - Control and eradication programmes - official sampling - selective sampling		animal	19	0			
Sheep - - organ/tissue - Clinical investigations		animal	2	0			

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	Unspecified Lyssavirus	Classical rabies virus (genotype 1)	European Bat Lyssavirus - unspecified
Solipeds, domestic - - organ/tissue - Clinical investigations		animal	2	0			
Wild boars - wild - from hunting - Clinical investigations		animal	1	0			

2.12 Q-FEVER

2.12.1 General evaluation of the national situation

2.12.2 Coxiella (Q-fever) in animals

A. Coxiella spp., unspecified in animal

Monitoring system

Sampling strategy

There is no official surveillance for Coxiella burnetii in animals. Sampling of cattle, sheep or goats is performed in case of clinical suspicion of Q-fever and after abortion.

Frequency of the sampling

In case of clinical suspicion and abortion.

Type of specimen taken

Blood

Case definition

A case is defined as an animal showing a titre $\geq 1:20$ or a positive PCR reaction. The animal is the epidemiological unit.

Diagnostic/analytical methods used

The diagnostic method is the complement fixation reaction, detecting phase 1 and phase 2 antigen. Organs and swabs are tested by real time PCR.

Vaccination policy

No vaccination.

Other preventive measures than vaccination in place

Nil

Control program/mechanisms

The control program/strategies in place

Nil

Recent actions taken to control the zoonoses

Nil

Notification system in place

Q-fever in animals is not a notifiable disease

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

Q-fever in humans is not a notifiable disease.

Table Coxiella burnetii (Q fever) in animals

	Source of information	Sampling unit	Units tested	Total units positive for Coxiella (Q-fever)	C. burnetii
Cattle (bovine animals) - - blood - Clinical investigations (Coxiella burnetii Ak)		animal	1142	11	11
Cattle (bovine animals) - - organ/tissue - Clinical investigations (Coxiella burnetii)		animal	5	2	2
Goats - - blood - Clinical investigations (Coxiella burnetii Ak)		animal	106	11	11
Goats - - organ/tissue - Clinical investigations (Coxiella burnetii)		animal	3	0	
Sheep - - blood - Clinical investigations (Coxiella burnetii Ak)		animal	25	0	
Sheep - - organ/tissue - Clinical investigations (Coxiella burnetii)		animal	2	0	

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1 ENTEROCOCCUS, NON-PATHOGENIC

3.1.1 General evaluation of the national situation

3.1.2 Antimicrobial resistance in Enterococcus, non-pathogenic isolates

A. Antimicrobial resistance of Enterococcus spp., unspecified in animal - All animals - farmed - at slaughterhouse - animal sample - caecum - Monitoring - official sampling -

Sampling strategy used in monitoring

Frequency of the sampling

A sampling plan was created according to the federal surveillance program „Überwachung ausgewählter Zoonosen und Antibiotikaresistenzen 2008 (GZ BMGFJ GZ 74600/0355-IV/B/5/2007)“ and the baseline survey on the prevalence and antimicrobial resistance of *Campylobacter* spp. in broiler flocks and on the prevalence of *Campylobacter* spp. and *Salmonella* spp. in broiler carcasses (CD 2007/516/EC). The sampling plan for enterococci includes cattle, pigs and broiler slaughter batches.

Type of specimen taken

Enterococci are isolated from the caecum of slaughtered cattle, pigs and broiler. 170 *E. faecalis* or *E. faecium* strains are tested for their antimicrobial susceptibility. The caecum from one cow or pig or the whole intestines from ten slaughtered broilers within a single slaughter batch at each slaughterhouse are collected.

Methods of sampling (description of sampling techniques)

The intestines were refrigerated to 4 °C and samples were sent to the Institute of Veterinary Disease Control (IVET) in Graz, where each pathogen was isolated and further characterized. The Institute of Medical Microbiology and Hygiene (IMED) in Graz performed the antimicrobial susceptibility testing for all strains.

Procedures for the selection of isolates for antimicrobial testing

The number of samples was calculated by experts of the Division for Data, Statistics and Risk Assessment of the AGES based on the expected prevalence of *Enterococcus faecalis* and *E. faecium* in the different animal species (cattle, pigs, broiler flocks). From each sample up to five enterococci were differentiated. Only *E. faecalis* and *E. faecium* strains were sent to the IMED Graz for antimicrobial susceptibility testing.

Methods used for collecting data

All information concerning the tested animals and the sampled slaughterhouses were recorded in a questionnaire. In the laboratory, the data were entered into a database and later analysed in Microsoft® Excel tables.

Laboratory methodology used for identification of the microbial isolates

The samples are injected into the Citrate Azide Tween Carbonate Agar (CATC-AGAR, Merck Art.Nr. 1.10279) and incubated at $37^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for 24 h. Then, the medium is left at room temperature for another 24 hrs. Potential colonies are subcultivated on blood agar (Oxoid Nr. CM0055, 5% Sheep blood) for 24 h at $37 \pm 1^{\circ}\text{C}$ which results in the differentiation of *E. faecalis* and *E. faecium* through Gram's method, Catalase Test, Arabinose- and Pyruvate-breakdown.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Enterococcus spp. samples isolated from cattle, pigs and broiler slaughter batches are tested for antimicrobial resistance against gentamicin, streptomycin, vancomycin, ciprofloxacin, erythromycin, nitrofurantoin, avilamycin, ampicillin, chloramphenicol, bacitracin, synergid and tetracycline.

Breakpoints used in testing

See respective tables

Preventive measures in place

None

Control program/mechanisms

The control program/strategies in place

None

Recent actions taken to control the zoonoses

None

Suggestions to the Community for the actions to be taken

None

Measures in case of the positive findings or single cases

None

Notification system in place

None

Results of the investigation

See respective tables. National evaluation of the recent situation, the trends and sources of infection is not available yet; a census on the use of antimicrobials in veterinary medicine is planned.

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

Not yet available

Additional information

None

Table Antimicrobial susceptibility testing of *E. faecium* - qualitative data

<i>E. faecium</i>		Cattle (bovine animals)		Gallus gallus (fowl)		Pigs	
		yes		yes		yes	
		113		80		131	
Antimicrobials:		N	n	N	n	N	n
Aminoglycosides	Gentamicin	113	0	80	1	131	0
	Streptomycin	113	0	80	14	131	8
Amphenicols	Chloramphenicol	113	0	80	0	131	1
Fluoroquinolones	Ciprofloxacin	113	1	80	1	131	2
Fully sensitive	Fully sensitive	113	22	80	3	131	7
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	113	75	80	44	131	90
	Vancomycin	113	6	80	4	131	2
Macrolides	Erythromycin	113	6	80	57	131	54
Nitroimidazoles and Nitrofurans	Nitrofurantoin	113	2	80	1	131	0
Orthosomycins	Avilamycin	113	0	80	5	131	0
Penicillins	Ampicillin	113	0	80	4	131	0
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	113	74	80	13	131	57
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	113	16	80	22	131	60
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	113	1	80	27	131	3
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	113	0	80	15	131	2
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	113	0	80	0	131	2
Streptogramins	Quinupristin/Dalfopristin	113	86	80	62	131	118
Tetracyclines	Tetracyclin	113	11	80	56	131	21

Footnote:

Number of fully-susceptible and number of isolates resistant to 1, 2, 3, 4 or greater than 4 antimicrobials of different classes, excluding cross-resistance. For enterococci this includes resistance to streptomycin, gentamicin, chloramphenicol, ampicillin, vancomycin, erythromycin, synercid, tetracycline.

Table Antimicrobial susceptibility testing of *E. faecium* in broilers - *Gallus gallus* (fowl) - sampling in the framework of the broiler baseline study - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey - quantitative data [Dilution method]

E. faecium		Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey																								
		yes																								
		80																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	80	1											43	33	3				1					
	Streptomycin	128	80	14													5	21	29	11	5	1	3	3	2	
Amphenicols	Chloramphenicol	32	80	0											29	45	3	3								
Fluoroquinolones	Ciprofloxacin	4	80	1						3	4	22	30	20	1											
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	80	44												7	2	9	18	16	3	25				
	Vancomycin	4	80	4											55	17	4									
Macrolides	Erythromycin	4	80	57							8	5	7	3	3	1	1	1	51							
Nitroimidazoles and Nitrofurans	Nitrofurantoin	256	80	1												7	15	18	27	12		1				
Orthosomycins	Avilamycin	16	80	5											23	40	9	2	1	3			2			
Penicillins	Ampicillin	4	80	4						11	24	13	12	16	4											
Streptogramins	Quinupristin/Dalfopristin	1	80	62							9	9	20	32	9	1										
Tetracyclines	Tetracyclin	2	80	56							19	4	1	2	2	3	6	33	10							
	Tetracyclines		0	0																						

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

E. faecium		Cattle (bovine animals) - - faeces - Monitoring - official sampling - objective sampling																								
		yes																								
		113																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	113	0											50	58	4	1								
	Streptomycin	128	113	0												31	32	49	1							
Amphenicols	Chloramphenicol	32	113	0											42	69	2									
Fluoroquinolones	Ciprofloxacin	4	113	1						7	27	50	10	18	1											
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	113	75												6	2	6	24	57	13	5				
	Vancomycin	4	113	6											73	9	25	4				2				
Macrolides	Erythromycin	4	113	6							40	9	29	29	4	2										
Nitroimidazoles and Nitrofurans	Nitrofurantoin	256	113	2												32	21	17	39	2			2			
Orthosomycins	Avilamycin	16	113	0											6	71	34	2								
Penicillins	Ampicillin	4	113	0						12	48	39	14													
Streptogramins	Quinupristin/Dalfopristin	1	113	86							18	9	23	62	1											
Tetracyclines	Tetracyclin	2	113	11							70	29	3	3		1	3	4								
	Tetracyclines		0	0																						

Table Antimicrobial susceptibility testing of *E. faecium* in Pigs - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling - quantitative data [Dilution method]

E. faecium		Pigs - - faeces - Monitoring - official sampling - objective sampling																								
		yes																								
		131																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	131	0											47	76	8									
	Streptomycin	128	131	8													5	34	83	1		3	1	4		
Amphenicols	Chloramphenicol	32	131	1											63	67			1							
Fluoroquinolones	Ciprofloxacin	4	131	2						11	26	76	8	8	2											
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	131	90												9	2	3	27	73	12	5				
	Vancomycin	4	131	2										122	3	4	2									
Macrolides	Erythromycin	4	131	54							16		15	46	44	4				6						
Nitroimidazoles and Nitrofurans	Nitrofurantoin	256	131	0												9	10	13	95	4						
Orthosomycins	Avilamycin	16	131	0										7	98	23	2	1								
Penicillins	Ampicillin	4	131	0						7	23	83	16	2												
Streptogramins	Quinupristin/Dalfopristin	1	131	118							7	6	41	73	4											
Tetracyclines	Tetracyclin	2	131	21							103	7		1				2	11	7						
	Tetracyclines			0	0																					

Table Antimicrobial susceptibility testing of *E. faecalis* - qualitative data

<i>E. faecalis</i>		Gallus gallus (fowl)		Pigs		Cattle (bovine animals)	
		yes		yes		yes	
		90		39		49	
		N	n	N	n	N	n
Antimicrobials:	Gentamicin	90	1	39	0	49	0
	Streptomycin	90	19	39	4	49	0
Amphenicols	Chloramphenicol	90	2	39	1	49	0
Fluoroquinolones	Ciprofloxacin	90	2	39	1	49	0
Fully sensitive	Fully sensitive	90	13	39	12	49	43
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	90	41	39	9	49	5
	Vancomycin	90	0	39	0	49	0
Macrolides	Erythromycin	90	52	39	5	49	2
Nitroimidazoles and Nitrofurans	Nitrofurantoin	90	0	39	0	49	1
Orthosomycins	Avilamycin	90	3	39	1	49	0
Penicillins	Ampicillin	90	0	39	0	49	1
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	90	35	39	22	49	3
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	90	23	39	3	49	3
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	90	17	39	1	49	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	90	2	39	1	49	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	90	0	39	0	49	0
Streptogramins	Quinupristin/Dalfopristin	90	0	39	0	49	0
Tetracyclines	Tetracyclin	90	66	39	25	49	6

Footnote:

Number of fully-susceptible and number of isolates resistant to 1, 2, 3, 4 or greater than 4 antimicrobials of different classes, excluding cross-resistance. For enterococci this includes resistance to streptomycin, gentamicin, chloramphenicol, ampicillin, vancomycin, erythromycin, synercid, tetracycline.

Table Antimicrobial susceptibility testing of *E. faecalis* in Pigs - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling - quantitative data [Dilution method]

E. faecalis		Pigs - - faeces - Monitoring - official sampling - objective sampling																								
		yes																								
		39																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	39	0											11	18	8	2								
	Streptomycin	512	39	4													1	8	20	6			2	2		
Amphenicols	Chloramphenicol	32	39	1											24	13		1	1							
Fluoroquinolones	Ciprofloxacin	4	39	1						6	15	17						1								
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	39	9												6	3	9	12	6	1	2				
	Vancomycin	4	39	0										35	4											
Macrolides	Erythromycin	4	39	5							18	10	4	2	2					3						
Nitroimidazoles and Nitrofurans	Nitrofurantoin	64	39	0												17	5	9	8							
Orthosomycins	Avilamycin	8	39	1										13	21	4							1			
Penicillins	Ampicillin	4	39	0						4	7	26	2													
Streptogramins	Quinupristin/Dalfopristin	32	39	0											5	14	19	1								
Tetracyclines	Tetracyclin	2	39	25							14						1	3	14	7						
	Tetracyclines		0	0																						

Table Antimicrobial susceptibility testing of *E. faecalis* in Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling - quantitative data [Dilution method]

E. faecalis		Cattle (bovine animals) - - faeces - Monitoring - official sampling - objective sampling																								
		yes																								
		49																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	49	0											11	25	13									
	Streptomycin	512	49	0													5	11	29	4						
Amphenicols	Chloramphenicol	32	49	0											38	11										
Fluoroquinolones	Ciprofloxacin	4	49	0						14	15	19	1													
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	49	5												16	8	6	14	4	1					
	Vancomycin	4	49	0										41	8											
Macrolides	Erythromycin	4	49	2							30	9	8				2									
Nitroimidazoles and Nitrofurans	Nitrofurantoin	64	49	1												22	7	14	5	1						
Orthosomycins	Avilamycin	8	49	0										19	28	2										
Penicillins	Ampicillin	4	49	1						9	9	24	5	1			1									
Streptogramins	Quinupristin/Dalfopristin	32	49	0							3	1	14	10	21											
Tetracyclines	Tetracyclin	2	49	6							41	2		1				4	1							
	Tetracyclines		0	0																						

Table Antimicrobial susceptibility testing of *E. faecalis* in broilers - *Gallus gallus* (fowl) - sampling in the framework of the broiler baseline study - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey - quantitative data [Dilution method]

E. faecalis		Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey																								
		Isolates out of a monitoring program (yes/no)																								
		Number of isolates available in the laboratory																								
Antimicrobials:		yes																								
		90																								
		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	32	90	1												29	50	10						1		
	Streptomycin	512	90	19														2	3	58	8			10	9	
Amphenicols	Chloramphenicol	32	90	2												55	33			2						
Fluoroquinolones	Ciprofloxacin	4	90	2						2	29	52	4	1		2										
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	64	90	41													2	1	6	40	8	2	31			
	Vancomycin	4	90	0											71	18	1									
Macrolides	Erythromycin	4	90	52							20	6	7	5	5	4	4	3	36							
Nitroimidazoles and Nitrofurans	Nitrofurantoin	64	90	0													65	14	7	4						
Orthosomycins	Avilamycin	8	90	3											41	44	2		2					1		
Penicillins	Ampicillin	4	90	0							9	77	3	1												
Streptogramins	Quinupristin/Dalfopristin	32	90	0												3	13	55	18	1						
Tetracyclines	Tetracyclin	2	90	66							24							1	29	21	15					
	Tetracyclines		0	0																						

Table Breakpoints for antibiotic resistance of Enterococcus, non-pathogenic

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

Standards used for testing
NCCLS EUCAST

		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
Aminoglycosides	Gentamicin	EUCAST			32	4	2048				
	Streptomycin	EUCAST			512	16	2048				
Amphenicols	Chloramphenicol	EUCAST			32	4	256				
Fluoroquinolones	Ciprofloxacin	EUCAST			4	0.25	32				
Glycopeptides (Cyclic peptides, Polypeptides)	Bacitracin	EUCAST			64	8	256				
	Vancomycin	EUCAST			4	1	64				
Macrolides	Erythromycin	EUCAST			4	0.5	64				
Nitroimidazoles and Nitrofurans	Nitrofurantoin	EUCAST			64	8	512				
Orthosomycins	Avilamycin	EUCAST			8	1	128				
Penicillins	Ampicillin	EUCAST			4	0.25	32				
Streptogramins	Quinupristin/Dalfopristin	EUCAST			32	0.5	128				
Tetracyclines	Tetracyclin	EUCAST			2	0.5	64				

3.2 ESCHERICHIA COLI, NON-PATHOGENIC

3.2.1 General evaluation of the national situation

A. Escherichia coli general evaluation

History of the disease and/or infection in the country

Resistance monitoring of faeces isolates from slaughtered animals was started in Austria in 2004 and continued in 2008.

Recent actions taken to control the zoonoses

The Austrian wide monitoring program on the trends of antimicrobial resistance of *E. coli* in broiler slaughter batches, bovine animals and pigs was implemented according to the directive 2003/99/EC of the European Parliament and the Council of 17 November 2003 in the National Order GZ: BMGF-74600/0092-IV/B/8/2005 (Überwachungsprogramme 2005 zu ausgewählten Zoonosen und Antibiotikaresistenzen). The sampling was carried out from January to December 2008 in slaughterhouses.

Suggestions to the Community for the actions to be taken

Europe wide harmonized standards for antimicrobial resistance monitoring would be highly welcome.

Additional information

Nil

3.2.2 Antimicrobial resistance in *Escherichia coli*, non-pathogenic

A. Antimicrobial resistance of *E. coli* in animal - All animals - farmed - at slaughterhouse - Monitoring - official sampling - objective sampling

Sampling strategy used in monitoring

Frequency of the sampling

A sampling plan was created according to the federal surveillance program „Überwachung ausgewählter Zoonosen und Antibiotikaresistenzen 2008 (GZ BMGFJ GZ 74600/0355-IV/B/5/2007)“ and the baseline survey on the prevalence and antimicrobial resistance of *Campylobacter* spp. in broiler flocks and on the prevalence of *Campylobacter* spp. and *Salmonella* spp. in broiler carcasses (CD 2007/516/EC). The sampling plan for *E. coli* includes cattle, pigs and broiler slaughter batches.

Type of specimen taken

E. coli is isolated from the caecum of slaughtered cattle, pigs and broiler. 170 *E. coli* strains are tested for their antimicrobial susceptibility. The caecum from one cow or pig or the whole intestines from ten slaughtered broilers within a single slaughter batch at each slaughterhouse are collected.

Methods of sampling (description of sampling techniques)

The intestines were refrigerated to 4 °C and samples were sent to the Institute of Veterinary Disease Control (IVET) in Graz, where each pathogen was isolated and further characterized. The Institute of Medical Microbiology and Hygiene (IMED) in Graz performed the antimicrobial susceptibility testing for all strains.

Procedures for the selection of isolates for antimicrobial testing

The number of samples was calculated by experts of the Division for Data, Statistics and Risk Assessment of the AGES based on the expected prevalence of *E. coli* among the different animal species (cattle, pigs, broiler flocks). All isolated strains of *E. coli* were sent to the IMED Graz for antimicrobial susceptibility testing.

Methods used for collecting data

All information concerning the tested animals and the sampled slaughterhouses were recorded in a questionnaire. In the laboratory, the data were entered into a database and later analysed in Microsoft® Excel tables.

Laboratory methodology used for identification of the microbial isolates

The intestinal contents are streaked onto the MacConkey- Agar plates (Merck Nr. 1.05465) and incubated for 24 hrs at 37±1 °C. The process is repeated for colonies which are suspected for *E. coli*. These colonies are streaked onto a blood-agar (Oxoid Nr. CM0055, 5% Sheep blood) and incubated for 24 hrs at 37±1 °C. The confirmation of the identification of *E. coli* is done with an oxidase- (Merck Nr. 1.13300.0001) and spot indol test (Firma Biomedica, Nr. 1069).

Laboratory used for detection for resistance

Antimicrobials included in monitoring

E. coli samples isolated from cattle, pigs and broiler slaughter batches are tested for antimicrobial susceptibility against gentamicin, kanamycin, streptomycin, ceftotaxim, sulfamethoxazol, trimethoprim, ciprofloxacin, nalidixin acid, ampicillin, chloramphenicol and tetracycline.

Breakpoints used in testing

See respective tables

Preventive measures in place

None

Control program/mechanisms

The control program/strategies in place

None

Recent actions taken to control the zoonoses

None

Suggestions to the Community for the actions to be taken

None

Measures in case of the positive findings or single cases

None

Notification system in place

None

Results of the investigation

See respective tables. National evaluation of the recent situation, the trends and sources of infection is not available yet; a census on the use of antimicrobials in veterinary medicine is planed.

Additional information

None

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

<i>E. coli</i>		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys	
		Isolates out of a monitoring program (yes/no)		yes		yes		yes	
		Number of isolates available in the laboratory		170		170		170	
Antimicrobials:									
Aminoglycosides	Gentamicin	170	0	170	1	170	5		
	Kanamycin	170	0	170	6	170	9		
	Streptomycin	170	7	170	94	170	53		
Amphenicols	Chloramphenicol	170	0	170	10	170	9		
Cephalosporins	Cefotaxim	170	0	170	1	170	5		
Fluoroquinolones	Ciprofloxacin	170	5	170	1	170	117		
Fully sensitive	Fully sensitive	170	152	170	41	170	29		
Penicillins	Ampicillin	170	4	170	24	170	41		
Quinolones	Nalidixic acid	170	2	170	1	170	116		
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	170	9	170	37	170	49		
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	170	4	170	45	170	44		
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	170	5	170	15	170	18		
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	170	0	170	16	170	12		
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	170	0	170	16	170	18		
Sulfonamides	Sulfamethoxazol	170	7	170	51	170	47		
Tetracyclines	Tetracyclin	170	11	170	109	170	45		
Trimethoprim	Trimethoprim	170	1	170	26	170	25		

Footnote:

Number of fully-susceptible and number of isolates resistant to 1, 2, 3, 4 or greater than 4 antimicrobials of different classes, excluding cross-resistance. For *E. coli* this includes resistance to ampicillin, cefotaxime, nalidixic acid, streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of *E. coli* in broilers - *Gallus gallus* (fowl) - sampling in the framework of the broiler baseline study - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey (Slaughter batch) - quantitative data [Dilution method]

E. coli		Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey (Slaughter batch)																								
		Isolates out of a monitoring program (yes/no)																								
		Number of isolates available in the laboratory																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	170	5						62	94	9			1	1	2	1								
	Kanamycin	8	170	9								3	100	55	3			9								
	Neomycin		0	0																						
	Streptomycin	16	170	53								23	62	16	16	24	12	8	7	2						
Amphenicols	Chloramphenicol	16	170	9								1	54	92	14			3	5	1						
	Florfenicol		0	0																						
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.25	170	5				145	19	1		1	2		2											
Fluoroquinolones	Ciprofloxacin	0.03	170	117	13	38	2	2	12	61	14	12	1	2	10	3										
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	8	170	41							7	70	46	6				41								
Quinolones	Nalidixic acid	16	170	116								45	8		1	2	28	37	13	36						
Sulfonamides	Sulfamethoxazol	256	170	47											40	62	19	2					47			
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	170	45							4	30	86	5				13	32							
Trimethoprim	Trimethoprim	2	170	25						62	68	15				25										
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

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

E. coli		Cattle (bovine animals) - - faeces - Monitoring - official sampling - objective sampling																									
		yes																									
		170																									
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest	
Aminoglycosides	Gentamicin	2	170	0						69	88	13															
	Kanamycin	8	170	0								9	100	58	3												
	Streptomycin	16	170	7								41	103	18	1	4	2	1									
Amphenicols	Chloramphenicol	16	170	0								4	70	89	7												
	Florfenicol		0	0																							
Cephalosporins	3rd generation cephalosporins		0	0																							
	Cefotaxim	0.25	170	0				159	10	1																	
Fluoroquinolones	Ciprofloxacin	0.03	170	5	40	117	8	3	1	1																	
	Enrofloxacin		0	0																							
Penicillins	Ampicillin	8	170	4								9	77	77	3							4					
Quinolones	Nalidixic acid	16	170	2								143	23	2								1	1				
Sulfonamides	Sulfamethoxazol	256	170	7														48	70	39	5	1				7	
	Sulfonamide		0	0																							
Tetracyclines	Tetracyclin	8	170	11								50	101	7	1				1	2	8						
Trimethoprim	Trimethoprim	2	170	1						76	72	20	1						1								
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

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

E. coli		Pigs - faeces - Monitoring - official sampling - objective sampling																								
		yes																								
		170																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin	2	170	1						57	100	10	2				1									
	Kanamycin	8	170	6								7	79	73	5			6								
	Neomycin		0	0																						
	Streptomycin	16	170	94									13	46	10	7	21	43	14	13	3					
Amphenicols	Chloramphenicol	16	170	10									7	60	90	3	5		2	3						
	Florfenicol		0	0																						
Cephalosporins	3rd generation cephalosporins		0	0																						
	Cefotaxim	0.25	170	1				165	4									1								
Fluoroquinolones	Ciprofloxacin	0.03	170	1	39	126	4			1																
	Enrofloxacin		0	0																						
Penicillins	Ampicillin	8	170	24							1	8	70	66	1				24							
Quinolones	Nalidixic acid	16	170	1									143	24	2					1						
Sulfonamides	Sulfamethoxazol	256	170	51													40	54	21	2	2		51			
	Sulfonamide		0	0																						
Tetracyclines	Tetracyclin	8	170	109								20	40	1				2	40	67						
Trimethoprim	Trimethoprim	2	170	26						66	66	12					26									
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																						

Table Breakpoints used for antimicrobial susceptibility testing

Test Method Used		Standards used for testing	
Disc diffusion	○		
Agar dilution	○		
Broth dilution	●		
E-test	○		

		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
Aminoglycosides	Gentamicin	EUCAST			2	0.25	32				
	Kanamycin	EUCAST			8	0.25	32				
	Streptomycin	EUCAST			16	2	256				
Amphenicols	Chloramphenicol	EUCAST			16	2	256				
Cephalosporins	Cefotaxim	EUCAST			0.25	0.06	128				
Fluoroquinolones	Ciprofloxacin	EUCAST			0.03	0.008	8				
Penicillins	Ampicillin	EUCAST			8	0.5	64				
Quinolones	Nalidixic acid	EUCAST			16	2	256				
Sulfonamides	Sulfamethoxazol	EUCAST			256	8	1024				
Tetracyclines	Tetracyclin	EUCAST			8	0.5	64				
Trimethoprim	Trimethoprim	EUCAST			2	0.25	16				

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1 HISTAMINE

4.1.1 General evaluation of the national situation

A. Histamine General evaluation

History of the disease and/or infection in the country

Not available

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

Not available

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

Not available

Recent actions taken to control the hazard

Not available

Suggestions to the Community for the actions to be taken

Not available

Additional information

Not available

4.1.2 Histamine in foodstuffs

A. Histamine in foodstuffs

Monitoring system

Sampling strategy

Not available

Frequency of the sampling

Not available

Methods of sampling (description of sampling techniques)

Not available

Definition of positive finding

Not available

Diagnostic/analytical methods used

Not available

Preventive measures in place

Not available

Control program/mechanisms

The control program/strategies in place

Not available

Recent actions taken

to control the hazard

Not available

Suggestions to the Community for the actions to be taken

Not available

Measures in case of the positive findings or single cases

Not available

Notification system in place

Not available

Results of the investigation

See table below

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

Not available

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

Not available

Additional information

Not available

Table Histamine in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units in non-conformity	≤ 100 mg/kg	>100 - ≤ 200 mg/kg	>200 - ≤ 400 mg/kg	> 400 mg/kg
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at retail - Surveillance - official controls - objective sampling		single		3	1	2		1	
Fish - raw - at catering - Surveillance - official controls - objective sampling		single		6	1	5		1	
Fishery products, unspecified - at retail - Surveillance - official controls - objective sampling		single		72	3	69		2	1
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos) - meat products - fermented sausages - at retail - Surveillance - official controls - objective sampling		single		2	1	1		1	

4.2 ENTEROBACTER SAKAZAKII

4.2.1 General evaluation of the national situation

A. Enterobacter sakazakii general evaluation

History of the disease and/or infection in the country

Not available

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

Not available

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

Not available

Recent actions taken to control the hazard

Not available

Suggestions to the Community for the actions to be taken

Not available

Additional information

Not available

4.2.2 **Enterobacter sakazakii in foodstuffs**

A. Enterobacter sakazakii in foodstuffs

Monitoring system

Sampling strategy

Not available

Frequency of the sampling

Not available

Methods of sampling (description of sampling techniques)

Not available

Definition of positive finding

Not available

Diagnostic/analytical methods used

Not available

Preventive measures in place

Not available

Control program/mechanisms

The control program/strategies in place

Not available

Recent actions taken

to control the hazard

Not available

Suggestions to the Community for the actions to be taken

Not available

Measures in case of the positive findings or single cases

Not available

Notification system in place

Not available

Results of the investigation

Not available

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

Not available

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

Not available

Additional information

Not available

4.3 STAPHYLOCOCCAL ENTEROTOXINS

4.3.1 General evaluation of the national situation

A. Staphylococcal enterotoxins general evaluation

History of the disease and/or infection in the country

Not available

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

Not available

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

Not available

Recent actions taken to control the hazard

Not available

Suggestions to the Community for the actions to be taken

Not available

Additional information

Not available

4.3.2 Staphylococcal enterotoxins in foodstuffs

A. Staphylococcal enterotoxins in foodstuffs

Monitoring system

Sampling strategy

Not available

Frequency of the sampling

Not available

Type of specimen taken

Other: Not available

Methods of sampling (description of sampling techniques)

Not available

Definition of positive finding

Not available

Diagnostic/analytical methods used

Not available

Preventive measures in place

Not available

Control program/mechanisms

The control program/strategies in place

Not available

Recent actions taken

to control the hazard

Not available

Suggestions to the Community for the actions to be taken

Not available

Measures in case of the positive findings or single cases

Not available

Notification system in place

Not available

Results of the investigation

See table below

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

Not available

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

Not available

Additional information

Not available

Table Staphylococcal enterotoxins in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcal enterotoxins
Cheeses made from cows' milk - unspecified - made from pasteurised milk - at processing plant - Surveillance - official controls - objective sampling		single		8	0
Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling		single		9	0
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from raw or low heat-treated milk - at processing plant - Surveillance - official controls - objective sampling		single		40	0
Cheeses, made from mixed milk from cows, sheep and/or goats - unspecified - made from raw or low heat-treated milk - at retail - Surveillance - official controls - objective sampling		single		10	0
Crustaceans - at catering - Surveillance - official controls - objective sampling		single		2	0
Meat from bovine animals - meat preparation - intended to be eaten cooked - at catering - Surveillance - official controls - objective sampling		single		5	0
Meat from pig - meat products - cooked, ready-to-eat - at catering - Surveillance - official controls - objective sampling		single		2	0
Other food - at retail - Surveillance - official controls - objective sampling		single		27	0

5. FOODBORNE

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

A. Foodborne outbreaks

System in place for identification, epidemiological investigations and reporting of

Presently, every district (Austria = 98 + Vienna) is responsible for outbreak investigation. However, food borne outbreaks affecting more than one district or even more than one province (Austria = 9 provinces) are regulated by the Federal Zoonoses Act (Zoonosengesetz, BGBI. I, 128/2005 entered into force on 1. January 2006). The Federal Zoonoses Commission was founded to advise the Federal Minister to survey and combat the zoonoses in Austria. One target of the Zoonoses Act is to ensure that food-borne outbreaks receive proper epidemiological investigation. It regulates, in case of food borne outbreaks affecting more than one province, that the governors of the affected provinces provide operative units to investigate possible or confirmed food borne outbreaks. Data concerning epidemiological criteria, potential implicated food items and the source of an outbreak must be collected and adequate epidemiological and microbiological examinations must be conducted. Short reports summarize each outbreak and must be communicated to the Federal Commission for Zoonoses and to AGES.

Description of the types of outbreaks covered by the reporting:

Since there has not been a coordinated approach for outbreak investigation in most provinces, the large majority (305 of 368) of food borne outbreaks are classified as household outbreaks. Coordinated investigation of outbreaks affecting more than one province - unhampered by district limits - will drastically decrease the total number of outbreaks.

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

In 2008, 368 food borne outbreaks (14 verified and 354 possible) affecting 1,376 persons were reported. 352 persons were hospitalized and no person died. The total number of food borne outbreaks decreased by 16% compared to 2007. The number of cases affected by an outbreak was 3.7 persons/outbreak. 18% (11% in 2007) of the reported outbreaks were acquired abroad. 32% of all food borne outbreaks acquired in Austria were caused by *Campylobacter* spp. (n=118), 60% by *Salmonella* spp. (n=223) and 78% thereof by serotype Enteritidis (n=174).

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

Salmonella and *Campylobacter* pose the most important agents causing 92% of all food borne outbreaks. The data quality does presently not allow conclusions on the relevance of different food categories.

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

The data quality does presently not allow conclusions on the relevance of different food categories.

Evaluation of the severity and clinical picture of the human cases

Hospitalized cases or cases that result in death are presently not ascertained in a valid way: Nevertheless, 25.6% of patients affected by these food borne outbreaks are reported as hospitalized (16.3% in 2007); there were no deaths (in 2007: 1 lethal case).

Descriptions of single outbreaks of special interest

Much P, Pichler J, Kasper S, Lassnig H, Kornschober C, Buchner A, König C, Allerberger F. 2008: A foodborne outbreak of *Salmonella Enteritidis* phage type 6 in Austria, 2008. *Wien. Klin. Wochenschr.* (2009)121: 132-136.

Pichler J, Much P, Kasper S, Fretz R, Auer B et al. 2009: An outbreak of febrile gastroenteritis associated with jellied pork contaminated with *Listeria monocytogenes*. *Wien. Klin. Wochenschr.* (2009)121: 149-156.

Kuo Hung-Wei, Kasper S, Jelovcan S, Höger G, Lederer I et al. 2009: A food-borne outbreak of *Shigella sonnei* gastroenteritis, Austria, 2008. *Wien. Klin. Wochenschr.* (2009) 121: 157-163.

Kasper S, Fretz R, Kornschober C, Allerberger F, Schmid D. 2009: Imported *Salmonella Enteritidis* cases: a multiphage outbreak among Austrian vacationers in Turkey, 2008 *Wien. Klin. Wochenschr.* (2009) 121: 144-148.

Wassermann-Neuhold M. 2009: Ausgewählte Erkrankungen und Ausbrüche im Jahr 2008 in der Steiermark, Jahresbericht zum Steirischen Seuchenplan 2008 http://www.verwaltung.steiermark.at/cms/dokumente/10039771_21212/f99f35af/Jahresbericht2008.pdf

Control measures or other actions taken to improve the situation

Improvement due to the implementation of the Federal Zoonoses Act e.g. the chain of command in terms of investigation of food borne outbreaks affecting more than one province was implemented.

Foodborne Outbreaks: summarized data

	Total number of outbreaks	Outbreaks	Human cases	Hospitalized	Deaths	Number of verified outbreaks
Bacillus	0	0	0	0	0	0
Campylobacter	118	117	252	42	0	1
Clostridium	0	0	0	0	0	0
Escherichia coli, pathogenic	11	11	31	9	0	0
Foodborne viruses	9	7	38	11	0	2
Listeria	1	0	0	0	0	1
Other agents	2	1	2	2	0	1
Parasites	0	0	0	0	0	0
Salmonella	223	214	823	213	0	9
Staphylococcus	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Yersinia	4	4	11	3	0	0

Verified Foodborne Outbreaks: detailed data**PT 21**

Value

Code	7
Subagent Choice	Salmonella; S. Enteritidis; PT 21
Outbreak type	Household
Human cases	4
Hospitalized	1
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in human cases, Laboratory characterization of food and human isolates, Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

PT 4**Value**

Code	6
Subagent Choice	Salmonella; S. Enteritidis; PT 4
Outbreak type	General
Human cases	23
Hospitalized	6
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	raw eggs
Type of evidence	Laboratory detection in implicated food, Laboratory characterization of food and human isolates, Laboratory detection in human cases
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

PT 4**Value**

Code	9
Subagent Choice	Salmonella; S. Enteritidis; PT 9
Outbreak type	Household
Human cases	4
Hospitalized	3
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in human cases, Laboratory characterization of food and human isolates, Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

PT 4**Value**

Code	4
Subagent Choice	Salmonella; S. Enteritidis; PT 4
Outbreak type	General
Human cases	3
Hospitalized	0
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	raw eggs
Type of evidence	Laboratory detection in implicated food, Laboratory characterization of food and human isolates, Laboratory detection in human cases
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

PT 4

Value

Code	5
Subagent Choice	Salmonella; S. Enteritidis; PT 4
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Broiler meat (Gallus gallus) and products thereof
More Foodstuff	
Type of evidence	Laboratory detection in human cases, Laboratory detection in implicated food, Laboratory characterization of food and human isolates
Setting	Household
Place of origin of problem	Farm (primary production)
Origin of foodstuff	Domestic
Contributory factors	
Outbreaks	1
Comment	

PT 6

Value

Code	2
Subagent Choice	Salmonella; S. Enteritidis; PT 6
Outbreak type	General
Human cases	9
Hospitalized	0
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	home-made dumplings
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases, Laboratory characterization of food and human isolates
Setting	Household
Place of origin of problem	Farm (primary production)
Origin of foodstuff	Domestic
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	

PT 8

Value

Code	8
Subagent Choice	Salmonella; S. Enteritidis; PT 8
Outbreak type	Household
Human cases	8
Hospitalized	3
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory characterization of food and human isolates, Laboratory detection in human cases, Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

PT 8

Value

Code	12
Subagent Choice	Salmonella; S. Enteritidis; PT 8
Outbreak type	Household
Human cases	2
Hospitalized	1
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases, <u>Laboratory characterization of food and human isolates</u>
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	

S. Saintpaul

Value

Code	10
Subagent Choice	Salmonella; S. Saintpaul
Outbreak type	General
Human cases	10
Hospitalized	5
Deaths	0
Foodstuff implicated	Broiler meat (Gallus gallus) and products thereof
More Foodstuff	Kebab
Type of evidence	Laboratory detection in human cases, Laboratory characterization of food and human isolates, Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data**C. jejuni**

Value

Code	11
Subagent Choice	Campylobacter; C. jejuni
Outbreak type	Household
Human cases	2
Hospitalized	1
Deaths	0
Foodstuff implicated	Milk
More Foodstuff	raw milk
Type of evidence	Laboratory detection in human cases, Laboratory characterization of food and human isolates, Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

L. monocytogenes serovar 4b

Value

Code	1
Subagent Choice	Listeria; L. monocytogenes; L. monocytogenes serovar 4b
Outbreak type	General
Human cases	14
Hospitalized	7
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	sliced jellied pork
Type of evidence	Laboratory characterization of food and human isolates, Analytical epidemiological evidence, Laboratory detection in human cases, Laboratory detection in implicated food
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Domestic
Contributory factors	Cross-contamination
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data**Flavivirus**

Value

Code	13
Subagent Choice	Foodborne viruses; flavivirus, Tick borne encephalitis virus (TBE)
Outbreak type	General
Human cases	6
Hospitalized	4
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	raw goats milk
Type of evidence	Laboratory detection in human cases, Laboratory detection in implicated food, Laboratory characterization of food and human isolates
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

norovirus (Norwalk-like virus)

Value

Code	14
Subagent Choice	Foodborne viruses; Calicivirus (including norovirus); norovirus (Norwalk-like virus)
Outbreak type	General
Human cases	77
Hospitalized	40
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	
Type of evidence	Analytical epidemiological evidence, Laboratory detection in human cases
Setting	Canteen or workplace catering
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Domestic
Contributory factors	Cross-contamination
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data**S. sonnei**

Value

Code	3
Subagent Choice	Other agents; Shigella; S. sonnei
Outbreak type	General
Human cases	53
Hospitalized	1
Deaths	0
Foodstuff implicated	Vegetables and juices and other products thereof
More Foodstuff	Salad
Type of evidence	Analytical epidemiological evidence
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Cross-contamination
Outbreaks	1
Comment	