ZOONOSES MONITORING

AUSTRIA

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

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

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

IN 2006

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Austria**

Reporting Year: **2006**

Institutions and laboratories involved in reporting and monitoring:

Laboratory name	Description	Contribution
Central Veterinary Services	Federal Ministry for Health, Family and Youth	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 for Health, Family and Youth	Revision of the draft of the Trend Report
DG Public Health	Federal Ministry for Health, Family and Youth	Revision of the draft of the Trend Report
Provincial Veterinary Services	9 Provences, 1 Veterinary Service per Provence	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	Federal Statistics is the Federal Government's non-personal information system, which provides data on the economy, demography, environment and social and cultural situation in Austria to federal bodies to assist them with planning, laying the groundwork for decisions and controlling measures implemented, and also to the scientific community, business and the public.	Demographic and livestock census data
Competence Centre Infectious Diseases Epidemiology (CC-INFE)	Austrian Agency for Health and Food Safety, AGES	Compilation, validation, data entry and submission of the Zoonoses Trend Report

National Reference Centre for Salmonella 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
Institute for Biostatistics	Austrian Agency for Health and Food Safety, AGES	Analysis of antimicrobial resistance of Campylobacter spp. and E. coli
National Reference Laboratory for Campylobacter, Institute of Hygiene	Medical University of Graz	Data concerning campylobacteriosis in humans
National Reference Laboratory 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) and Listeria, Department of Hygiene, Microbiology and Social Medicine, Division of Hygiene & Medical Microbiology	Innsbruck Medical University	Data concerning VTEC and listerisosis in humans

National Reference Laboratory for Yersinia Institute for Medical Microbiology and Hygiene (IMED), Linz	Austrian Agency for Health and Food Safety, 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
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
Carinthian Institute for Food Analysis and Quality Control	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

National Reference Laboratory for Rabies, Institute for Veterinary Disease Control, Moedling	Austrian Agency for Health and Food Safety, AGES	Data concerning rabies
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
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

Carinthian Institute for Veterinary Disease Control, Ehrental	Regional Veterinary Laboratory	Data concerning investigations in animals
Austrian Poultry Health Service	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[1]. The information has also been forwarded to the European Food Safety Authority (EFSA).

The report contains information on trends and sources of zoonoses and zoonotic agents in Austria during the year 2006. The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal bacteria as well as information on epidemiological investigations of foodborne outbreaks. Complementary data on susceptible animal populations in the country is also given.

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

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

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

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

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

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1. ANIMAL POPULATIONS

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

A. Information on susceptible animal population

Sources of information:

The Statistics Austria is the Federal Government's non-personal information system, which provides data on the economy, demography, environment and social and cultural situation in Austria to federal bodies to assist them with planning, laying the groundwork for decisions and controlling measures implemented, and also to the scientific community, business and the public.

It has to be mentioned that the number of holdings and animals is based on extrapolations of the latest livestock census from the year 1999 in combination with the data of the yearly random sample survey performed by Statistics Austria. Exception: The number of holdings is created from the official database for cattle and the Veterinary Information System (VIS).

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

All data relate to 2006.

Table Susceptible animal populations

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks	Year*	Number of holdings	Year*	Number of slaughtered animals	Year*	Livestock numbers (live animals)	Year*
Cattle (bovine animals)	in total			80161		682763		2002919	
Gallus gallus (fowl)	in total					59680606			
Goats	animals under 1 year							22872	
	animals over 1 year							46175	
	milk goats			3337				20581	
	in total			10548		41625		69047	
Pigs	breeding animals							313285	
	fattening pigs			37741		5263066		1103920	
	in total			52450		5361710		3160819	
Sheep	milk ewes			861				17683	
	animals under 1 year (lambs)							158033	
	animals over 1 year							218294	
	in total			15896		310092		376327	
Turkeys	in total					2037066			

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 still poses a major problem for human health. But in 2006, the number of notified cases of campylobacteriosis exceeded the number of notified salmonellosis cases.

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 poultry meat has declined from more than 33% to less than 10%. Consumption eggs are presently the major 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 = 5,379). According to the Federal Ministy of Health, Family and Youth the official number of notified cases is 4,985 (by 8th May 2007, vorlÃ¤ufiger Jahresausweis Ã¼ber angezeigte FÃ¤lle Ã¼bertragbarer Krankheiten 2006). Compared to the number of notified cases of campylobacteriosis (see chapter campylobacteriosis) salmonellosis is only the second most important cause for enteric diseases in Austria.

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

In feedingstuffs the prevalence of salmonella (<1%) is still decreasing. Salmonella is only of minor relevance in Austrian cattle and pigs. Poultry is considered the main source for human infection. Although only few eggs were positive for salmonella (approx. 0.1 - 1%), infected eggs pose the main source of human infections.

Recent actions taken to control the zoonoses

There were various programs implemented to improve the situation in poultry, concerning meat and egg production. The main effort is directed onto sanitation of breeding flocks.

Suggestions to the Community for the actions to be taken

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

Additional information

Nil

2.1.2. Salmonellosis in humans

A. Salmonellosis in humans

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

â ¢ Probable case: A laboratory confirmed isolate without clinical information or, a case with clinical symptoms that has an epidemiological link

â ¢ Confirmed case: A clinically compatible case that is laboratory confirmed

Diagnostic/analytical methods used

Bacteriology: Sample material is processed as described in Richtlinien fÃ¼r die Diagnostik von Salmonellen (Anonymus: Standardisierung und QualitÃ¤tssicherung in der mikrobiologischen Diagnostik. Richtlinien. Bundesministerium fÃ¼r Soziale Sicherheit und Generationen. ISBN 3-84123-126-0, Wien, 2001, pg. 11-12).

At the NRL Salmonella all strains 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.

Notification system in place

Specialists in Laboratory Diagnosis or Microbiology and Hygiene and the attended physicians are subjected to notification. Notification of salmonellosis according to the epidemic act has been mandatory since 1950 (BGBl. 1950/186 Epidemiegesetz, as amended). Since 2002 a note of the Federal Ministry for Social Security and Generations has been implemented (Meldepflicht infektiÃ¶ser Erkrankungen fÃ¼r 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.

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.

On July 24th 2006 the amendment of the epidemic act (114. Bundesgesetz: Ã nderung 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 1989 and 1990, human infections with S. Enteritidis 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 2003. Since that year the number of laboratory confirmed cases of human Salmonella infections decreased by approx. 30 % but from 2005 to 2006 only by 4 %.

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

The number of laboratory confirmed cases of human Salmonella infections decreased lower than the previous years.

The proportion of S. Enteritidis decreased slightly to 79 % (compared to 83 % in 2005). The distribution of the three most phage types PT4, PT8 and PT21 are very similar, 27 %, 23 % and 21

%. The number of S. Typhimurium isolates increased from 385 in 2005 to 627 (12 % of all Salmonella spp. isolates from humans). Amongst others this is due to three large foodborne outbreaks of S. Typhimurium DT46 (2 x) and DT41 (for more details see chapter food borne outbreaks).

The overall resistance rates against antibiotics remained stable over the past years. Table eggs are probably still the main source of human infections of S. Enteritidis and S. Typhimurium.

Relevance as zoonotic disease

In 2006, the number of notified human cases of campylobacteriosis exceeded the number of salmonellosis cases; due to EU wide control programs and targets for reduction of prevalences of salmonella in laying hen flocks and broilers the number of human salmonellosis cases is expected to be reduced.

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. High level resistances against Ciprofloxacin and third generation cephalosporins (Cefotaxime) were still extremely rare.

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

In 2006, there is no difference detectable in resistance-rates. The increase in the number of resistant isolates against ampicillin is due to more human cases affected by ampicillin resistant S. Enteritidis PT6a (2006: 185 cases, 2005: 18 cases).

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

Additional information

Nil

Table Salmonella in humans - Species/serotype distribution

Salmonella	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.	Unknown status
Salmonella	**5379**	**65.1**	**5264**	**63.7**	**115**	**2**	**0**
S. Agona	22	0.3	21	0.3	1	0.1	
S. Bovismorbificans	18	0.2	17	0.2	1	0.1	
S. Coeln	13	0.2	10	0.1	3	0.1	
S. Enteritidis	4238	51.3	4165	50.4	73	0.9	
S. Hadar	26	0.3	25	0.3	1	0.1	
S. Indiana	12	0.1	11	0.1	1	0.1	
S. Infantis	38	0.5	34	0.4	4	0.1	
S. Kentucky	18	0.2	17	0.2	1	0.1	
S. Newport	24	0.3	24	0.3	0	0	
S. Saintpaul	24	0.3	23	0.3	1	0.1	
S. Thompson	23	0.3	23	0.3	0	0	
S. Typhimurium	627	7.6	620	7.5	7	0.1	
S. Virchow	24	0.3	21	0.3	3	0.1	
S. Paratyphi B var. Java	17	0.2	16	0.2	1	0.1	
Other serotypes	255	3	237	2.8	18		

Table Salmonella in humans - Age distribution

Age Distribution	S. Enteritidis			S. Typhimurium			Salmonella spp.		
	All	M	F	All	M	F	All	M	F
<1 year	68	25	27	18	03	11	114	43	45
1 to 4 years	574	308	266	96	50	46	737	389	348
5 to 14 years	894	461	433	121	61	60	1082	567	515
15 to 24 years	580	264	316	67	32	35	732	344	388
25 to 44 years	892	413	479	127	48	79	1154	530	624
45 to 64 years	637	312	325	94	42	52	810	398	412
65 years and older	542	211	331	98	38	60	687	273	414
Age unknown	51	22	22	6	2	3	63	25	30
Total :	4238	2016	2199	627	276	346	5379	2569	2776

Table Salmonella in humans - Seasonal distribution

Month	S. Enteritidis	S. Typhimurium	Salmonella spp.
	Cases	Cases	Cases
January	180	29	237
February	95	14	134
March	96	12	128
April	94	17	134
May	195	36	265
June	373	66	473
July	457	154	652
August	733	129	942
September	764	87	925
October	651	32	751
November	423	26	496
December	177	25	242
not known	0	0	0
Total :	4238	627	5379

2.1.3. Salmonella in foodstuffs

A. Salmonella spp. in food

Monitoring system

Sampling strategy

No surveillance programmes are applied.

Foodstuff was sampled according to the Erlass der Bundesministerin fÃ¼r Gesundheit und Frauen: Revisions- und Probenplan fÃ¼r das Jahr 2006; Richtlinien Ã¼ber die Vollziehung der Ã berwachung des Verkehrs mit den durch das LMG 1975 erfassten Waren (GZ BMGF-75500/0164-IV/B/10/2005 of 26.01.2006). The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail etc. that have to be tested randomly per province according to the number of food enterprises per province. Each business has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP, control of manufacturing processes etc.

The sampling plan determines the number of samples of each class of goods, as raw meat, fresh or frozen; sausages; cheeses; milk; preserved food etc. that have to be investigated randomly.

Additionally to the routine monitoring plan there is an extra one for special food items.

In the year 2006, the following programs according to the Erlass der Bundesministerin fÃ¼r Gesundheit und Frauen: Schwerpunktprogramm 2006 (GZ BMGF-75500/0162-IV/B/10/2005) were conducted Austrian-wide:

Campaign A005: food item: Tiramisu, industrially produced, from retail

Investigation period: February â March

Pathogen: Salmonella: 95 samples were tested

Campaign A008: food item: meat preparation from bovine meat â intended to be eaten cooked, from retail

Investigation period: March - May

Pathogen: 112 samples were tested for Salmonella, Listeria, EHEC, Yersinia and for Campylobacter

Campaign A020: food item: meat products, raw from poultry (sausages), from retail

Investigation period: April â May

Pathogen: 104 samples were tested for Salmonella and Listeria

Campaign A029: food item: dried pasta with eggs, from retail

Investigation period: May - June

Pathogen: Salmonella: 99 samples were tested

Campaign A035: food item: salads from communal feeding, retail

Investigation period: Juli

Pathogen: Salmonella: 95 samples were tested

Campaign A045: food item: pig meat, raw, from retail

Investigation period: September â November

Pathogen: 96 samples were tested for Salmonella, Listeria, Yersinia and for Campylobacter

Campaign A051: food item: peeled shrimps, deep frozen, from retail trade

Investigation period: October â November

Pathogen: Listeria: 105 samples were tested

Samples from suspected foodstuffs are taken following outbreak investigation, complaint, confiscation, violation etc.

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 42Â°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. could be detected in fresh or raw meat samples, intended to be eaten raw or cooked in 6.2 % single broiler meat samples (49 out of 795), in 14.5 % single turkey meat samples (11/76), and in 12 out of 246 samples (4.9 %) of cooked broiler meat, ready-to-eat. In the monitoring program for raw meat products from poultry (A20) Salmonella spp. was found in 3 out of 104 samples (2.9 %). In pig meat fresh 4 out of 356 single samples including those of the monitoring program A45 (1.1 %) were detected positive. In fresh bovine meat none of the 217 tested single samples (including monitoring program A8) were found positive.

In 2006, the percentage of positive samples has been halved in broiler meat (11.7 % to 6.2 %), but has increased in turkey meat (11.3 % to 14.5 %). In comparision to 2005, there was no change in the numbers of positive samples in pig and bovine meat.

2,759 samples from milk, milk products and cheeses were tested for Salmonella spp. Only from two samples (1 ice cream and 1 cheese made from raw or low heat treated cow milk) Salmonella spp. could be isolated.

1,711 sample units containing 25 g of table eggs sampled at packing centre or at retail level were examined, in 48 samples (2.8 %) Salmonella spp. was detected, 47 times S. Enteritidis, and one time S. Duisburg.

The percentage of positive table eggs samples has increased from 1.6 % to 2.8 % in comparison to the year 2005.

Table Salmonella in poultry meat and products thereof (Part A)

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Heidelberg	S. Virchow	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Montevideo	S. Kentucky	S. Indiana	S. Infantis	S. Hadar	S. Mbandaka	S. Derby	S. Anatum	S. Blockley	S. Saintpaul
Meat from broilers (Gallus gallus)																				
fresh	I, II, III, V, VI, VIII	single	25g	717	41	0	1	8	4		1	1	4	9	3	1	1	1	1	2
(other than 25g)	VII	single	10g	59	1			1												
minced meat																				
intended to be eaten cooked	VII	single	25g	1	0															
meat preparation																				
intended to be eaten cooked	II, IV	single	25g	22	0															
(other than 25g)	V, VII	single	10g	128	7			2						5						
meat products																				
raw but intended to be eaten cooked	VI, VIII	single	25g	19	7									6						
cooked, ready-to-eat	I, III, V	single	25g	240	12			2	2	1				1	3	1			1	1

(other than 25g)	VII	single	25g	6	0														
Meat from turkey																			
fresh	II, III, IV, V, VI	single	25g	59	8	1					1		1		2				1	1
(other than 25g)	VII	single	10g	17	3										1			1	1	
meat preparation																				
intended to be eaten cooked	IV	single	25g	2	0															
(other than 25g)	V, VII	single	10g	18	2										2					
meat products																				
cooked, ready-to-eat	III, V	single	25g	4	0															
(other than 25g)	VII	single	10g	16	2			1							1					
Meat from duck	II, IV, V, VIII	single	25g	7	1			1												
Meat from geese	III, V	single	25g	4	2				2											
(other than 25g)	VII	single	10g	1	0															
Meat from guinea fowl	IV	single	25g	1	0															
Meat from other animal species or not specified																				
fresh	III	single	25g	1	0															
Other processed food products and prepared dishes	V	single	25g	5	0															
Meat from poultry, unspecified																				
meat products																				
raw and intended to be eaten raw																				

- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A20, see text Salmonella spp. in food)	I - VIII	single	25g	104	3			1							2					

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

Table Salmonella in poultry meat and products thereof (Part B)

	S. Senftenberg	S. Livingstone	S. Agona	S. Thompson	S. Bredeney
Meat from broilers (Gallus gallus)					
fresh	1	1	1	1	
(other than 25g)					
minced meat					
intended to be eaten cooked					
meat preparation					
intended to be eaten cooked					
(other than 25g)					
meat products					
raw but intended to be eaten cooked			1		
cooked, ready-to-eat					
(other than 25g)					
Meat from turkey					
fresh					1
(other than 25g)					
meat preparation					
intended to be eaten cooked					
(other than 25g)					

meat products					
cooked, ready-to-eat (other than 25g)					
Meat from duck					
Meat from geese					
(other than 25g)					
Meat from guinea fowl					
Meat from other animal species or not specified					
fresh					
Other processed food products and prepared dishes					
Meat from poultry, unspecified					
meat products					
raw and intended to be eaten raw					
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A20, see text Salmonella spp. in food)					

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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	S. Agona
Milk, cows'									
raw		---							
intended for direct human consumption	II	single	25g	13	0				
raw milk for manufacture									
intended for manufacture of raw or low heat-treated products	VIII	single	25g	18	0				
intended for manufacture of pasteurised/UHT products	V	single	25g	9	0				
pasteurised milk	II, IV, V, VI, VII	single	25g	99	0				
Milk, goats'									
pasteurised	II, VI	single	25g	2	0				
Milk, sheep's									
raw milk for manufacture									
intended for manufacture of pasteurised/UHT products	II	single	25g	1	0				
Cheeses made from cows' milk	III, V, VII	single	25g	191	0				
soft and semi-soft	III, VIII	single	25g	93	0				
made from raw or low heat-treated milk	IV, V, VIII	single	25g	101	1				1
made from pasteurised milk	IV, V, VIII	single	25g	387	0				
Cheeses made from goats' milk	III, VII	single	25g	7	0				
soft and semi-soft	III, VIII	single	25g	16	0				
made from raw or low heat-treated milk	III, VIII	single	25g	1	0				
made from pasteurised milk	II, V, VIII	single	25g	39	0				

Cheeses made from sheep's milk	III	single	25g	1	0				
soft and semi-soft	III, VIII	single	25g	6	0				
made from raw or low heat-treated milk	II, V	single	25g	3	0				
made from pasteurised milk	II, V	single	25g	31	0				
Dairy products (excluding cheeses)									
butter									
made from raw or low heat-treated milk	IV, V, VI, VII, VIII	single	25g	51	0				
made from pasteurised milk	II	single	25g	8	0				
cream									
made from raw or low heat-treated milk	V	single	25g	2	0				
made from pasteurised milk									
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A41, see text Salmonella spp. in food)	II	single	25g	13	0				
milk powder and whey powder	III, V	single	25g	21	0				
ice-cream	II, III, IV, V, VI, VIII	single	25g	1252	1	1			
(other than 25g)	VII	single	50g	177	0				
dairy products, not specified									
ready-to-eat									
made from pasteurised milk	II, III	single	25g	110	0				
made from pasteurised milk	VI, VII	single	25g	107	0				

Footnote

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VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Derby	S. Saintpaul	S. Choleraesuis	S. enterica subsp. enterica, rough
Meat from pig												
fresh	II, III, V, VI, VII, VIII	single	25g	33	1				1			
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A45, see text Salmonella spp. in food)	III, V, VI	single	25g	96	0							
minced meat												
intended to be eaten raw	II, III, IV, VI	single	25g	9	0							
intended to be eaten cooked	IV, VI, VII, VIII	single	25g	22	0							
meat preparation												
intended to be eaten raw	II, III, V, VIII	single	25g	97	1		1					
intended to be eaten cooked	I, III, VI, VII, VIII	single	25g	90	2	2						

meat products	V, VIII	single	25g	9	0							
raw but intended to be eaten cooked												
Meat from bovine animals												
fresh	II, III, V, VI, VII, VIII	single	25g	56	0							
minced meat												
intended to be eaten raw	II, III, VII	single	25g	34	0							
intended to be eaten cooked	VIII	single	25g	1	0							
meat preparation												
intended to be eaten raw	III, V	single	25g	5	0							
intended to be eaten cooked	VIII	single	25g	2	0							
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A8, see text Salmonella spp. in food)	II, III, V, VII	single	25g	112	0							
meat products												
raw but intended to be eaten cooked	V	single	25g	7	0							
Meat from sheep												
fresh	II, III, VII, VIII	single	25g	10	0							
Meat from bovine animals and pig												
minced meat												
intended to be eaten cooked (other than 25g)	III, V	single	25g	65	0							
	III	single	25g	93	0							
meat products	II	single	25g	33	0							

Meat from other animal species or not specified	II	single	25g	29	1					1		
Meat from deer (venison)												
fresh	II, VI, VIII	single	25g	62	2	1	1					
Meat from wild game - land mammals												
fresh	II	single	25g	19	2						1	1
Meat from wild boar												
fresh	II	single	25g	11	1		1					

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. group C2, monophasic strain	S. Hvittingfoss	S. Mbandaka	S. Bere	S. Duisburg	S. enterica subsp. enterica
Eggs														
table eggs	III, V, VIII	single	25g	1385	42	42								
- at packing centre	III, V, VI, VII	single	25g	299	6	5							1	
- at retail	II	single	50g	10	0									
- at packing centre (other than 25g)	II	single	50g	17	0									
- at retail (other than 25g)	VII	batch	25g	2	2	1	1							
shell	I, V	single	25g	42	6	6								
raw material (liquid egg) for egg products	II, III, V, VI, VII, VIII	single	25g	135	1	1								
Egg products	VI	single	25g	22	0									
Fishery products	---													
Crustaceans														
unspecified														

cooked	II, III, VIII	single	25g	12	1				1										
raw	III, V, VIII	single	25g	9	0														
Molluscan shellfish		---																	
raw	V, VIII	single	25g	20	0														
Sprouted seeds	V	single	25g	20	12										8	4			
Fruits and vegetables																			
precut	VIII	single	25g	42	0														
ready-to-eat	IV	single	25g	1	0														
Foodstuffs intended for special nutritional uses																			
dried dietary foods for special medical purposes intended for infants below 6 months	II, V	single	25g	11	0														
Ready-to-eat salads																			
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A35, seet text Salmonella spp. in food)	I - VIII	single	25g	95	0														
Vegetables	III, V	single	25g	95	0														
Cocoa and cocoa preparations, coffee and tea	VIII	single	25g	24	0														
Other processed food products and prepared dishes																			
noodles	IV, V, VI	single	25g	176	7	7													
unspecified																			
containing raw egg **chilled**	III, VII	single	25g	10	1	1													

- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A5, see text Salmonella spp. in food)	II, III, V, VI, VII, VIII	single	25g	95	0									
pasta														
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A29, see text Salmonella spp. in food)	II, III, IV, V, VI, VII, VIII	single	25g	99	0									
Bakery products														
pastry														
made with raw eggs	VIII	single	25g	11	1	1								
Chocolate	III)	single	25g	12	0									
Fish														
unspecified	III, V, VII	single	25g	34	0									
Spices and herbs	V, VIII	single	25g	71	1					1				
Other food	II, III, V, VI, VIII	single	25g	773	3	2					1			

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

2.1.4. Salmonella in animals

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

Monitoring system

Sampling strategy

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

There are only parent flocks existing in Austria. Permanent monitoring by a national program takes place at hatchery; each flock is tested regularly as well by the farmer as by the Veterinary Authority.

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. Inner organs as ovaries, liver and intestinal content are investigated.

If a parent flock is positive for other salmonellas Official Veterinarians take pooled feces samples from the incriminated flock. After a second positive result for Salmonella spp., within a period of two weeks organs from a minimum of 20 chickens were tested.

Laying hens flocks

Earliest 3 weeks prior to slaughter cloacal 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

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

Other: There were 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: There were no separate elite and grand parent flocks in Austria, only parent flocks! 1. Routinely: Every flocks is tested at the age of 4 and 12 weeks and 2 weeks before the laying period starts. 2. Confirmation: If Salmonella was isolates from day old chicks.

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

Other: There were 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 6 weeks by the Veterinary Authority; additional each flock is tested every 4 weeks by the farmer by boot swabs.

Laying hens: Day-old chicks

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

Laying hens: Rearing period

Other: no legal requirements, e.g. 2 times at week 12 and 2 weeks before the laying period start

Laying hens: Production period

Other: no legal requirements, according to the program of the cooperatives (e.g. every three month, every eight weeks)

Laying hens: Before slaughter at farm

Other: 3 weeks before slaughter at farm

Laying hens: At slaughter

Other: 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

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

Other: There were 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: There were 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: There were 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: Inner organs as ovaries, liver and intestinal content from a minimum of 20 chickens. Inner organs of 5 chickens or intestinal content of 5 chickens were pooled.

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: 9 cloacal 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)

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

There were 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

There were 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

There were 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

Laying hens: Day-old chicks

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

Laying hens: Rearing period

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

Laying hens: Production period

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

Laying hens: Before slaughter at farm

9 cloacal 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

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

There were 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

There were 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

There were 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

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 cloacal swabs

Laying hens: At slaughter

No sampling

Eggs at packing centre (flock based approach)

Salmonella spp. isolated from surface swabs

Diagnostic/analytical methods used

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

Bacteriological method: Other: There were 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+/-1Â°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

Bacteriological method: See day old chicks

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

Bacteriological method: See day old chicks

Laying hens: Day-old chicks

Bacteriological method: See day old chicks

Laying hens: Rearing period

Bacteriological method: See day old chicks

Laying hens: Production period

Bacteriological method: See day old chicks

Laying hens: Before slaughter at farm

Bacteriological method: See day old chicks

Laying hens: At slaughter

Bacteriological method: See day old chicks

Eggs at packing centre (flock based approach)

Bacteriological method: See day old chicks

Vaccination policy

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

There were 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

Laying hens flocks

The national program recommended vaccination against S. Enteritidis

Other preventive measures than vaccination in place

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

Nil

Laying hens flocks

Nil

Control program/mechanisms

The control program/strategies in place

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

There were 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 (BGBl 243/2000, Gefluegelhygieneverordnung 2000 of 28 July 2000). 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.

Laying hens flocks

The Austrian control program is conducted according to the National Poultry Hygiene Regulation (BGBl 243/2000, Gefluegelhygieneverordnung 2000 of 28 July 2000).

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)

There were no separate elite and grand parent flocks in Austria, only parent flocks!

Measures according to the National Poultry Hygiene Regulation:

â ¢ Banning of the incriminated sector of the holding

â ¢ Culling of the infected flock

â ¢ Disposal of the hatched eggs

â ¢ Abolishing of the restriction after cleaning and disinfection

â ¢ If necessary prescriptions of GMP to prevent re-infection

Laying hens flocks

Flocks were either treated with antimicrobials or competitive exclusion and a hygiene plan is performed. Slaughtering was only permitted for Salmonella negative flocks.

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 2005, Salmonella spp. was not detected in any parent flock.

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

Nil

Additional information

Nil

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

Monitoring system

Sampling strategy

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

There are only parent flocks existing in Austria. Permanent monitoring by a national program takes place at hatchery; each flock is tested regularly as well by the farmer as by the Veterinary Authority. 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. Inner organs as ovaries, liver and intestinal content are investigated.

If a parent flock is positive for other salmonellas Official Veterinarians take pooled faeces samples from the incriminated flock. After a second positive result for Salmonella spp., within a period of two weeks organs from a minimum of 20 chickens were tested.

Broiler flocks

Earliest 3 weeks prior to slaughter cloacal 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

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

Other: There were no separate elite and grand parent flocks in Austria, only parent flocks!

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

Other: There were no separate elite and grand parent flocks in Austria, only parent flocks!

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

Other: There were no separate elite and grand parent flocks in Austria, only parent flocks!

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

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

Other: There were no separate elite and grand parent flocks in Austria, only parent flocks!

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

Other: There were no separate elite and grand parent flocks in Austria, only parent flocks!

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

Other: There were no separate elite and grand parent flocks in Austria, only parent flocks!

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: 9 cloacal swabs per flock

Broiler 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

There were 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

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

There were 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

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 1gram per flock

Broiler flocks: Before slaughter at farm

9 cloacal swabs

Broiler flocks: At slaughter (flock based approach)

No sampling

Case definition

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

There were no separate elite and grand parent flocks in Austria, only parent flocks!

Routine testing: Salmonella spp. isolated from hatcher basket liners and dead chicks if available

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

There were 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

There were 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

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 cloacal swabs

Broiler flocks: At slaughter (flock based approach)

No sampling

Diagnostic/analytical methods used

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

Other: There were no separate elite and grand parent flocks in Austria, only parent flocks!

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

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

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

There were 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

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

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

There were 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 (BGBl 243/2000, GeflÃ¼gelhygieneverordnung 2000 of 28 July 2000). 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.

Broiler flocks

The Austrian control program is conducted according to the National Poultry Hygiene

Regulation (BGBl 243/2000, GeflÃ¼gelhygieneverordnung 2000 of 28 July)

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): Day-old chicks

There were no separate elite and grand parent flocks in Austria, only parent flocks!

Measures according to the National Poultry Hygiene Regulation:

â ¢ Banning of the incriminated sector of the holding

â ¢ Culling of the infected flock

â ¢ Disposal of the hatched eggs

â ¢ Abolishing of the restriction after cleaning and disinfection

â ¢ If necessary prescriptions of GMP to prevent re-infection

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

See day-old chicks.

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

See day-old chicks.

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 2005, Salmonella spp. was not detected in any parent flock.

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

Nil

Additional information

Nil

C. 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 were no breeding flocks in Austria

Meat production flocks

Earliest 3 weeks prior to slaughter cloacal 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: 9 cloacal swabs 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 legal requirements, e.g. visibly soiled hatcher basket liners

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

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

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

9 cloacal swabs

Meat production flocks: Day-old chicks

No sampling

Meat production flocks: Rearing period

No legal requirements

Meat production flocks: Before slaughter at farm

9 cloacal swabs

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 cloacal 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+/- 1Â°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 (BGBl 243/2000, GeflÃ¼gelhygieneverordnung 2000 of 28 July 2000).

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

Flocks were treated with antimicrobials. Slaughtering was only permitted for Salmonella negative flocks.

Notification system in place

Notification not mandatory

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

Slaughtering was only permitted for Salmonella negative flocks.

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

Slaughtering was only permitted for Salmonella negative flocks.

D. Salmonella spp. in animal

Monitoring system

Sampling strategy

This information only concerns animals except poultry!

1. Feces from animals suffering from diarrhea that were sent to a veterinary laboratory are examined for salmonellosis

2. After findings of enteritis in course of pathological examinations of deceased animals intestinal content is tested for Salmonella.

3. After slaughtering in course of the ante- and post mortem inspection act, all animals that are objected to bacteriological examination are tested for salmonella.

Frequency of the sampling

Animals at farm

Other: Samples sent to a bacteriological laboratory are examined.

Animals at slaughter (herd based approach)

Other: NO HERD BASED APPROACH! After emergency slaughtering or targeted when a carcass seems not to be fit for consumption.

Type of specimen taken

Animals at farm

Other: Feces or intestinal content

Animals at slaughter (herd based approach)

Other: NO HERD BASED APPROACH! 2 parts from muscles, 2 lymph nodes, parts of lever, spleen and kidney and if present pathological alterations

Methods of sampling (description of sampling techniques)

Animals at farm

No special methods

Animals at slaughter (herd based approach)

Samples were wrapped in sterile plastic bags. After cooling down to 4Â°C the samples were sent in a polystyrene box after adding cooling units to the locally appropriate Institute of Veterinary Diseases Control.

Case definition

Animals at farm

Salmonella spp. isolated from the sample

Animals at slaughter (herd based approach)

NO HERD BASED APPROACH! Salmonella spp. isolated from the sample

Diagnostic/analytical methods used

Animals at farm

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+/- 1Â°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.

Animals at slaughter (herd based approach)

Other: see animals at farm.

Vaccination policy

No vaccination is performed in these animals.

Other preventive measures than vaccination in place

None

Control program/mechanisms

The control program/strategies in place

No control programs in place

Suggestions to the Community for the actions to be taken

Europe wide harmonized standards for monitoring programs would be highly welcome.

Measures in case of the positive findings or single cases

1. and 2. No measures

3. According to BGBl 1982/522, Fleischuntersuchungsverordnung, as amended and BGBl 1994/395, Fleischuntersuchungsverordnung, as amended: The carcass is unfit for human consumption and must be removed. In all slaughtered animals descending from the same holding a post-mortem bacteriological examination has to be initiated.

Notification system in place

1. and 2. Notification not mandatory

3. According to BGBl 1994/395, Â§10 (8), Fleischuntersuchungsverordnung, as amended: The competent authority has to notify to the finding to the local authority.

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

Meat from animals other than poultry plays a neglecting role as source of infection for human salmonella sases.

Table Salmonella in breeding flocks of Gallus gallus

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Gallus gallus (fowl)							
parent breeding flocks for egg production line		---					
during rearing period	QGV	flock	3	0	0	0	
during production period	QGV	flock	11	0	0	0	
parent breeding flocks for meat production line		---					
during rearing period	QGV	flock	26	0	0	0	
during production period	QGV	flock	50	0	0	0	

Footnote

QGV = Austrian Health Poultry Service

Table Salmonella in other poultry (Part A)

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Mbandaka	S. Anatum	S. Blockley	S. Give	S. Tennessee	S. Kottbus	S. Rissen	S. Montevideo	S. Bredeney	S. Hadar	S. Indiana	S. Infantis	S. Kentucky	S. Senftenberg	S. Virchow	S. Worthington
Gallus gallus (fowl)		---																		
laying hens	QGV	flock	1044	0																
day-old chicks	QGV	flock	896	10								5								
during rearing period	QGV	flock	2419	78				2	1			4			1	5	1	9		
during production period		---																		
broilers	QGV	flock	1183	0																
day-old chicks	QGV	flock	3363	61		2	1			2		13	2	4	6	5	3	10	5	1
during rearing period	QGV	flock	356	28					1			15				2		1	1	
sampling in the framework of the broiler baseline study																				
Ducks		---																		
meat production flocks	QGV	flock	26	3											1					
Geese		---																		
breeding flocks	QGV	flock	1	0																

meat production flocks	QGV	flock	93	8			4			1										
Turkeys		---																		
meat production flocks	QGV	flock	282	27	1		2			4	1	7		3				4		

Footnote

QGV = Austrian Health Poultry Service

Table Salmonella in other poultry (Part B)

	S. Agona	S. Saintpaul	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Gallus gallus (fowl)					
laying hens			0	0	
day-old chicks			1	1	3
during rearing period			47	8	
during production period					
broilers			0	0	
day-old chicks	2		4	1	
during rearing period			6	2	
sampling in the framework of the broiler baseline study					
Ducks					
meat production flocks			1	1	
Geese					
breeding flocks			0	0	
meat production flocks			0	3	
Turkeys					

Footnote

QGV = Austrian Health Poultry Service

Table Salmonella in other birds

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Blockley	S. Kottbus	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Pigeons	II)	animal	2	0			0	0	
Ostriches	II)	animal	19	0			0	0	
Geese	II)	animal	26	9	3	4	0	2	
Falcons	II)	animal	1	0			0	0	

Footnote

II) All 4 AGES Institutes for Veterinary Disease Control and Carinthian Institute for Veterinary Disease Control, Ehrental

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Derby	S. Ebrie	S. Havana	S. Panama	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Muenchen	S. Infantis	S. Kedougou	S. Mbandaka	S. Newport	S. IIb:k:1,5,7	S. IIIb61:k:1,5,7	S. IIIb
Cattle (bovine animals)	II)	animal	1344	1					0	1									
calves (under 1 year) (1)	II)	animal	208	0					0	0									
adult cattle over 2 years	II)	animal	85	1						1									
Sheep	II)	animal	81	5											1		1	3	
Goats	II)	animal	1	0					0	0									
Pigs		---																	
fattening pigs	II)	animal	32	1					0	0									1
unspecified	II)	animal	283	4					0	1			1	1	1				
Solipeds, domestic	II)	animal	29	0															
Hares	II)	animal	58	0					0	0									
Rabbits	II)	animal	8	0					0	0									
Cats	II)	animal	120	1					0	1									
Dogs	II)	animal	96	3	1				1	1									
Deer	II)	animal	37	0					0	0									
Snakes	II)	animal	3	3				1	0	0		1				1			

Guinea pigs	II)	animal	3	0					0	0								
Rats	II)	animal	1	0					0	0								
Reptiles (2)	II)	animal	1	1		1	1		0	0								

(1) : under 6 months of age
(2) : 2 serotypes detected in one sample!

Footnote

II) all 4 AGES Institutes for Veterinary Disease Control and Carinthian Institute for Veterinary Disease Control, Ehrental

2.1.5. Salmonella in feedingstuffs

A. Salmonella spp. in feed - All feedingstuffs - in total - Monitoring - official sampling

Monitoring system

Sampling strategy

Sampling is as well random as targeted without regional criteria. The sampling is performed by competent authorities; the samples were taken on farms, slaughterhouses, processing plants, retailers. The sampling is part of the permanent monitoring.

Frequency of the sampling

Domestic feed material of plant origin

Other: Sampling distributed evenly throughout the year, each farm, processing plant, and retailer is sampled at least two times per year. Control is conducted in the final product. Suspected batches are sampled.

Domestic feed material of animal origin

Other: as above

Imported feed material of plant origin

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

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

As above

Imported feed material of plant origin

As above

Imported feed material of animal origin

As above

Process control in feed mills

As above

Compound feedingstuffs

As 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

Bacteriological method: ISO 6579:2002

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: BGBl. Nr. 139/1999 (Futtermittelgesetz 1999, Â§ 3) and BGBl. Nr. 93/2000 (Futtermittelverordnung 2000, as amended) containing general requirements for feedingstuffs and BGBl. II Nr. 243/2000 (GeflÃ¼gelhygieneverordnung 2000).

EC: 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

Notification of the positive findings and the confiscation and prescription of following official measures as withdrawal from the market, 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

As above

Imported feed material of plant origin

As above

Imported feed material of animal origin

As above

Process control in feed mills

As above

Compound feedingstuffs

As above

Notification system in place

Notification to the local authority according the Rapid Alert System for Food and Feed (RASFF) that is 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 situation in 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, palletizing feed/contaminated feed.

Additional information

Nil

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified	S. Stockholm	S. Havana	S. Tennessee	S. Mbandaka	S. Montevideo	S. Ohio	S. Oranienburg	S. Senftenberg
Feed material of cereal grain origin																
barley derived	*	batch	25g	19	0											
wheat derived	*	batch	25g	6	0											
maize derived	*	batch	25g	3	0											
other cereal grain derived	*	batch	25g	12	0											
Feed material of oil seed or fruit origin	*	batch	25g	2	0											
groundnut derived	*	batch	25g	1	0											
rape seed derived	*	batch	25g	174	8					1		7				
(compulsory testing)	+	batch	50g	10	0											
palm kernel derived	*	batch	25g	3	0											
soya (bean) derived	*	batch	25g	39	1							1				
(compulsory testing)	+	batch	50g	37	2						1	1				

cotton seed derived (compulsory testing)	*	batch	25g	5	0											
	+	batch	50g	5	0											
sunflower seed derived (compulsory testing)	*	batch	25g	122	8								2	4	1	1
	+	batch	50g	3	0											
other oil seeds derived (compulsory testing)	*	batch	25g	3	2			1	1							
	+	batch	25g	9	1			1								
Other feed material																
legume seeds and similar products	*	batch	25g	2	0											
other seeds and fruits (compulsory testing)		---														
	+	batch	50g	1	0											

Footnote

*) quality assurance program of private companies AGES Institute for Agricultural Analysis Linz
sample weight 25g = non-compulsory testing
+) Compulsory monitoring program (Futtermittel-Gesetz 1999) AGES Institute for Agricultural Analysis Linz
sample weight 50g = compulsory testing

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified	S. Montevideo
Compound feedingstuffs for cattle									
final product	*	batch	25g	7	0				
(non-compulsory testing)	+	batch	50g	10	0				
Compound feedingstuffs for pigs									
final product	*	batch	25g	9	1				1
Compound feedingstuffs for poultry (non specified)									
final product	*	batch	25g	37	0				
(non-compulsory testing)	+	batch	50g	21	0				
Compound feedingstuffs for poultry -breeders									
final product	*	batch	25g	19	0				
(non-compulsory testing)	+	batch	50g	5	0				
Compound feedingstuffs for poultry - laying hens									
final product	*	batch	25g	31	0				
(non-compulsory testing)	+	batch	50g	150	1				1
Compund feedingstuffs for poultry - broilers									
final product	*	batch	25g	65	0				
(non-compulsory testing)	+	batch	50g	13	0				

Footnote

*) quality assurance program of private companies AGES Institute for Agricultural Analysis Linz
sample weight 25g = non-compulsory testing
+) Compulsory monitoring program (Futtermittel-Gesetz 1999) AGES Institute for Agricultural Analysis Linz
sample weight 50g = compulsory testing

2.1.6. Salmonella serovars and phagetype distribution

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

Table Salmonella serovars in animals

Serovars		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=	0	14	0	26	0	625	0	0	0	126
Number of isolates serotyped	N=	0	14	0	26	0	625	0	0	0	126
Number of isolates per type											
S. Agona		0	1	0	0	0	18	0	0	0	3
S. Anatum		0	0	0	0	0	2	0	0	0	2
S. Blockley		0	0	0	0	0	8	0	0	0	5
S. Bredeney		0	0	0	0	0	9	0	0	0	0
S. Choleraesuis		0	0	0	1	0	0	0	0	0	0
S. Derby		0	0	0	4	0	0	0	0	0	0
S. Dublin		0	5	0	0	0	0	0	0	0	0
S. Enteritidis		0	0	0	1	0	183	0	0	0	0
S. Give		0	1	0	0	0	2	0	0	0	0
S. Hadar		0	0	0	0	0	5	0	0	0	37
S. Heidelberg		0	0	0	0	0	1	0	0	0	0
S. Idikan		0	0	0	0	0	1	0	0	0	0
S. Indiana		0	0	0	0	0	14	0	0	0	0
S. Infantis		0	0	0	1	0	63	0	0	0	0
S. Kedougou		0	0	0	1	0	0	0	0	0	0
S. Kentucky		0	0	0	0	0	8	0	0	0	4

S. Kottbus	0	0	0	0	0	3	0	0	0	2
S. Livingstone	0	0	0	0	0	4	0	0	0	0
S. Mbandaka	0	0	0	1	0	5	0	0	0	0
S. Montevideo	0	0	0	13	0	131	0	0	0	20
S. Newport	0	1	0	0	0	1	0	0	0	1
S. Ohio	0	0	0	1	0	0	0	0	0	0
S. Regent	0	0	0	0	0	1	0	0	0	0
S. Rissen	0	0	0	0	0	0	0	0	0	1
S. Saintpaul	0	0	0	0	0	14	0	0	0	27
S. Senftenberg	0	0	0	0	0	43	0	0	0	17
S. Tennessee	0	0	0	0	0	3	0	0	0	0
S. Thompson	0	0	0	1	0	0	0	0	0	0
S. Typhimurium	0	4	0	0	0	67	0	0	0	4
S. Virchow	0	0	0	0	0	10	0	0	0	0
S. Worthington	0	0	0	0	0	14	0	0	0	2
S. IIIb61:k:1,5,7	0	0	0	2	0	1	0	0	0	0
S. Gallinarum	0	0	0	0	0	8	0	0	0	0
S. enterica subsp. enterica, rough	0	1	0	0	0	5	0	0	0	1
S. I 4,12,27:b:-	0	1	0	0	0	0	0	0	0	0
S. group B H-	0	0	0	0	0	1	0	0	0	0

Footnote

(*) M : Monitoring, C : Clinical

Table Salmonella serovars in food

Serovars		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=	0	2	0	6	0	100	0	0	0	0
Number of isolates serotyped	N=	0	2	0	6	0	100	0	0	0	0
Number of isolates per type											
S. Agona							4				
S. Blockley							3				
S. Derby					1		0				
S. Enteritidis			1		3		14				
S. Hadar							4				
S. Indiana							3				
S. Infantis							44				
S. Kentucky							3				
S. Kottbus			1		1		1				
S. Livingstone							1				
S. Mbandaka							3				
S. Montevideo							3				
S. Saintpaul							2				

S. Senftenberg								6					
S. Thompson								1					
S. Typhimurium				1				2					
S. Virchow								1					
S. Gallinarum								3					
S. enterica subsp. enterica, rough								2					

Footnote

(*) M : Monitoring, C : Clinical

Table Salmonella Enteritidis phagetypes in animals

Phagetype		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=	0	0	0	1	0	183	0	0
Number of isolates phagetyped	N=	0	0	0	1	0	183	0	0
Number of isolates per type									
PT 1							10		
PT 4					1		66		
PT 6							33		
PT 8							18		
PT 21							24		
PT 6a							1		
PT 23							1		
PT 7							22		
PT 5c							3		
RDNC							4		
PT 1d							1		

Footnote

(*) M : Monitoring, C : Clinical

Table Salmonella Enteritidis phagetypes in food

Phagetype	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory N=		1		3		14				
Number of isolates phagetyped N=	0	1	0	3	0	14	0	0	0	0
Number of isolates per type										
PT 1				1		2				
PT 4		1				4				
PT 6						3				
PT 8						3				
PT 21				1		1				
PT 3				1						
RDNC						1				

Footnote

(*) M : Monitoring, C : Clinical

Table Salmonella Enteritidis phagetypes in humans

Phagetype		humans	
Sources of isolates		M(*)	C(*)
Number of isolates in the laboratory	N=	0	4238
Number of isolates phagetyped	N=	0	4238
Number of isolates per type			
PT 1			212
PT 4			1125
PT 5			5
PT 6			371
PT 8			964
PT 14b			67
PT 21			884
PT 1b			3
PT 21c			5
PT 3			38
PT 13a			30
PT 2			11
PT 35			3
PT 4b			5
PT 6a			201
PT 12			9
PT 23			5
PT 7			33
PT U			32
PT 5a			10
PT 5c			7
PT 29			12
PT 34			3
PT 37			2
PT 7a			4
PT 15			1
PT 13			1
PT 11			3
PT 1c			56
RDNC			91
PT 32a			3
PT 19			27
PT 4a			2
PT 1d			7
PT 1a			6

Footnote

(*) M : Monitoring, C : Clinical

Table Salmonella Typhimurium phagetypes in animals

Phagetype		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=	0	4	0	0	0	67	0	0	0	4
Number of isolates phagetyped	N=	0	4	0	0	0	67	0	0	0	4
Number of isolates per type											
DT 46							19				4
DT 104l			3				3				
DT 120							5				
DT 193							26				
DT U291							2				
DT 41							3				
DT 46a							1				
DT 85							2				
DT 2			1								
DT 29							2				
DT 104H							2				
RDNC							2				

Footnote

(*) M : Monitoring, C : Clinical

Table Salmonella Typhimurium phagetypes in food

Phagetype		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=	0	0	0	1	0	2	0	0	0	0
Number of isolates phagetyped	N=	0	0	0	1	0	2	0	0	0	0
Number of isolates per type											
DT 104l					1		1				
DT 99							1				

Footnote

(*) M : Monitoring, C : Clinical

Table Salmonella Typhimurium phagetypes in humans

Phagetype		humans	
Sources of isolates		M(*)	C(*)
Number of isolates in the laboratory	N=	0	627
Number of isolates phagetyped	N=	0	627
Number of isolates per type			
DT 8			4
DT 12			1
DT 46			267
DT 66			1
DT 104l			79
DT 120			33
DT 193			14
DT 41			68
DT 22			1
DT 124			1
DT 15a			1
DT 17			2
DT 30			1
DT 85			1
DT 99			1
DT 10			4
DT U			18
DT 1			18
DT 104H			8
DT 141			2
DT 136			1
RDNC			92
DT U302			2
DT 36			1
DT 166			3
DT 191			1
DT 89			1
DT 126			1

Footnote

(*) M : Monitoring, C : Clinical

2.1.7. Antimicrobial resistance in Salmonella isolates

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

A. Antimicrobial resistance of Salmonella spp. in animal

Sampling strategy used in monitoring

Frequency of the sampling

see Antimicrobial resistance of Salmonella spp. in food!

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. High level resistances against Ciprofloxacin and third generation cephalosporins (Cefotaxime) were still extremely rare.

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

In 2006, there is no difference detectable in resistance-rates. The increase in the number of resistant isolates against ampicillin is due to more human cases affected by ampicillin resistant S. Enteritidis PT6a (2006: 185 cases, 2005: 18 cases).

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 is no monitoring program in Austria. All Salmonella spp. isolated in veterinary and food laboratories, as well as all primary isolates from humans were sent to the NRC-S and there the susceptibility testing has been performed using the disk diffusion method.

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 and there the susceptibility testing has been performed using the disk diffusion method.

Laboratory methodology used for identification of the microbial isolates

See chapter salmonellosis in humans

Laboratory used for detection for resistance

Antimicrobials included in monitoring

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

Control program/mechanisms

The control program/strategies in place

All Salmonella spp. isolates that were sent to the NRL-S have been tested.

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

D. Antimicrobial resistance of Salmonella spp. in animal - Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study - at farm

Sampling strategy used in monitoring

Frequency of the sampling

According to the technical specifications 365 flocks all over Austria have been sampled..

Type of specimen taken

In each flock 5 boot swabs were collected.

Procedures for the selection of isolates for antimicrobial testing

Each isolated Salmonella spp. was tested for the antimicrobial susceptibility by the disk diffusion test. In each flock positive for Salmonella spp., each strain was tested in the microdilution test for the minimal inhibition concentrations, e.g. if S. Enteritidis PT4 was isolated from 3 different samples within one flock, the microdilution test was performed only once with this strain.

Laboratory methodology used for identification of the microbial isolates

The method given in the technical specifications was used.

Control program/mechanisms

Recent actions taken to control the zoonoses

The baseline survey has been performed and the targets to reduce S. Enteritidis and S. Typhimurium set for the future.

Table Antimicrobial susceptibility testing of S.Enteritidis in animals

n = Number of resistant isolates

	S. Enteritidis							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus (fowl)**		**Turkeys**	
Isolates out of a monitoring programme	no		no		no		no	
Number of isolates available in the laboratory	0		1		183		0	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines								
Tetracyclin					183	1		
Amphenicols								
Chloramphenicol					183	0		
Cephalosporins								
Cefotaxim					183	0		
Fluoroquinolones								
Ciprofloxacin					183	0		
Quinolones								
Nalidixic acid					183	1		
Sulfonamides								
Sulfonamide					183	1		
Trimethoprim					183	0		
Aminoglycosides								
Streptomycin					183	4		
Gentamicin					183	0		
Penicillins								
Ampicillin					183	0		
Fully sensitive					183	179		
Resistant to 1 antimicrobial					183	3		
Resistant to 2 antimicrobials					183	0		
Resistant to 3 antimicrobials					183	0		
Resistant to 4 antimicrobials					183	1		
Resistant to >4 antimicrobials					183	0		

Footnote

Multiresistance, tested by disk diffusion test: For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of S. Enteritidis - qualitative data

n = Number of resistant isolates

	S. Enteritidis							
	Meat from broilers (Gallus gallus)		**All foodstuffs**		**Meat from bovine animals**		**Meat from pig**	
Isolates out of a monitoring programme	no				no		no	
Number of isolates available in the laboratory	14				1		3	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines								
Tetracyclin	14	0						
Amphenicols								
Chloramphenicol	14	0						
Cephalosporins								
Cefotaxim	14	0						
Fluoroquinolones								
Ciprofloxacin	14	0						
Quinolones								
Nalidixic acid	14	4						
Sulfonamides								
Sulfonamide	14	0						
Trimethoprim	14	0						
Aminoglycosides								
Streptomycin	14	0						
Gentamicin	14	0						
Penicillins								
Ampicillin	14	1						
Fully sensitive	14	9						
Resistant to 1 antimicrobial	14	5						
Resistant to 2 antimicrobials	14	0						
Resistant to 3 antimicrobials	14	0						
Resistant to 4 antimicrobials	14	0						
Resistant to >4 antimicrobials	14	0						

Footnote

Only one isolate from bovine meat and 3 samples from pig meat!
For broiler meat: Multiresistance, tested by disk diffusion test: For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of Salmonella in humans, Salmonella Enteritidis

n = Number of resistant isolates

	S. Enteritidis	
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	4238	
Antimicrobials:	**N**	**n**
Tetracyclines		
Tetracyclin	4238	17
Amphenicols		
Chloramphenicol	4238	0
Cephalosporins		
Cefotaxim	4238	0
Fluoroquinolones		
Ciprofloxacin	4238	0
Quinolones		
Nalidixic acid	4238	177
Sulfonamides		
Sulfonamide	4238	15
Trimethoprim	4238	8
Aminoglycosides		
Streptomycin	4238	8
Gentamicin	4238	2
Penicillins		
Ampicillin	4238	214
Fully sensitive	4238	3828
Resistant to 1 antimicrobial	4238	382
Resistant to 2 antimicrobials	4238	14
Resistant to 3 antimicrobials	4238	5
Resistant to 4 antimicrobials	4238	9
Resistant to >4 antimicrobials	4238	0

Footnote

Multiresistance, tested by disk diffusion test: For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

n = Number of resistant isolates

	S. Typhimurium							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus (fowl)**		**Turkeys**	
Isolates out of a monitoring programme	no		no		no		no	
Number of isolates available in the laboratory	4		0		67		4	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines								
Tetracyclin					67	5		
Amphenicols								
Chloramphenicol					67	0		
Cephalosporins								
Cefotaxim					67	0		
Fluoroquinolones								
Ciprofloxacin					67	0		
Quinolones								
Nalidixic acid					67	0		
Sulfonamides								
Sulfonamide					67	6		
Trimethoprim					67	0		
Aminoglycosides								
Streptomycin					67	6		
Gentamicin					67	0		
Penicillins								
Ampicillin					67	3		
Fully sensitive					67	57		
Resistant to 1 antimicrobial					67	2		
Resistant to 2 antimicrobials					67	7		
Resistant to 3 antimicrobials					67	0		
Resistant to 4 antimicrobials					67	1		
Resistant to >4 antimicrobials					67	0		
Number of multiresistant S. Typhimurium DT104								
with penta resistance					67	0		

Footnote

Multiresistance, tested by disk diffusion test: For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of S. Typhimurium - qualitative data

n = Number of resistant isolates

	S. Typhimurium	
	All foodstuffs	
Isolates out of a monitoring programme		
Number of isolates available in the laboratory		
Antimicrobials:	**N**	**n**

Footnote

Only one isolate from pig meat and 2 isolates from broiler meat!

Table Antimicrobial susceptibility testing of Salmonella in humans, Salmonella Typhimurium

n = Number of resistant isolates

	S. Typhimurium	
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	627	
Antimicrobials:	**N**	**n**
Tetracyclines		
Tetracyclin	627	146
Amphenicols		
Chloramphenicol	627	98
Cephalosporins		
Cefotaxim	627	0
Fluoroquinolones		
Ciprofloxacin	627	1
Quinolones		
Nalidixic acid	627	14
Sulfonamides		
Sulfonamide	627	154
Trimethoprim	627	19
Aminoglycosides		
Streptomycin	627	139
Gentamicin	627	5
Penicillins		
Ampicillin	627	151
Fully sensitive	627	446
Resistant to 1 antimicrobial	627	23
Resistant to 2 antimicrobials	627	12
Resistant to 3 antimicrobials	627	18
Resistant to 4 antimicrobials	627	33
Resistant to >4 antimicrobials	627	95
Number of multiresistant S. Typhimurium DT104		
with penta resistance (1)	627	70

(1) : ACSSuT

Footnote

Multiresistance, tested by disk diffusion test: For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of Salmonella in animals

n = Number of resistant isolates

	Salmonella spp.									
	Cattle (bovine animals)		**Pigs**		**Gallus gallus (fowl)**		**Turkeys**		**Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study**	
Isolates out of a monitoring programme	no		no		no		no		yes	
Number of isolates available in the laboratory	14		26		625		126		28	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines										
Tetracyclin	14	3	26	13	625	44	126	51	28	0
Amphenicols										
Chloramphenicol	14	3	26	3	625	1	126	0	28	0
Florfenicol									28	0
Cephalosporins										
Cephalothin									28	0
Cefotaxim	14	3	26	3	625	0	126	0		
Ceftiofur									28	0
Fluoroquinolones										
Ciprofloxacin	14	0	26	0	625	0	126	0	28	0
Quinolones										
Nalidixic acid	14	0	26	0	625	45	126	11	28	0
Sulfonamides										
Sulfonamide	14	3	26	14	625	42	126	10	28	2
Trimethoprim	14	0	26	6	625	7	126	8		
Aminoglycosides										
Streptomycin	14	6	26	14	625	41	126	48	28	1
Gentamicin	14	0	26	4	625	0	126	0	28	0
Neomycin									28	0
Apramycin									28	0
Spectinomycin									28	1
Penicillins										
Amoxicillin / Clavulanic acid									28	0
Ampicillin	14	3	26	8	625	28	126	21	28	4
Polymyxins										
Colistin									28	0
Fully sensitive	14	8	26	11	625	544	126	58	28	23
Resistant to 1 antimicrobial	14	3	26	1	625	22	126	14	28	3
Resistant to 2 antimicrobials	14	0	26	1	625	11	126	30	28	1
Resistant to 3 antimicrobials	14	0	26	0	625	28	126	16	28	1
Resistant to 4 antimicrobials	14	0	26	6	625	20	126	7	28	0
Resistant to >4 antimicrobials	14	3	26	7	625	0	126	1	28	0

Footnote

Multiresistance by disk diffusion test (except for Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study): For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole. For Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study, testing by dilution method; this includes resistance to ampicillin, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol and sulphamethoxazole, but not to cefotaxime, trimethoprim (that breakpoint was outside of the range tested).

Table Antimicrobial susceptibility testing of Salmonella spp. in broilers - Gallus gallus (fowl) - sampling in the framework of the broiler baseline study - quantitative data [Dilution method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	Salmonella spp.
	Gallus gallus (fowl) - broilers - sampling in the framework of the broiler baseline study
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	28

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	28	0							28													
Amphenicols																						
Chloramphenicol	28	0								6	22											
Florfenicol	28	0								27	1											
Cephalosporins																						
Cephalothin	28	0							19	4	5											
3rd generation cephalosporins	0	0																				
Cefotaxim	0	0																				
Ceftiofur	28	0					27	1														
Fluoroquinolones																						
Ciprofloxacin	28	0	28																			
Enrofloxacin	0	0																				
Quinolones																						
Nalidixic acid	28	0									28											
Sulfonamides																						
Sulfonamide	28	2												25	1			2				
Trimethoprim	0	0																				
Aminoglycosides																						
Streptomycin	28	1								14	12	1		1								
Gentamicin	28	0						28														
Neomycin	28	0							28													
Kanamycin	0	0																				
Apramycin	28	0								28												

Spectinomycin	28	1									25	2		1									
Penicillins																							
Amoxicillin / Clavulanic acid	28	0							24		4												
Ampicillin	28	4						20	4				4										
Polymyxins																							
Colistin	28	0								28													
Trimethoprim + sulfonamides	0	0																					

Table Antimicrobial susceptibility testing of Salmonella spp. in food

n = Number of resistant isolates

	Salmonella spp.							
	Meat from bovine animals		**Meat from pig**		**Meat from broilers (Gallus gallus)**		**Meat from other poultry species**	
Isolates out of a monitoring programme	no		no		no			
Number of isolates available in the laboratory	2		5		100			
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines								
Tetracyclin	2	0	5	1	100	52		
Amphenicols								
Chloramphenicol	2	0	5	1	100	1		
Cephalosporins								
Cefotaxim	2	0	5	0	100	0		
Fluoroquinolones								
Ciprofloxacin	2	0	5	0	100	0		
Quinolones								
Nalidixic acid	2	0	5	0	100	57		
Sulfonamides								
Sulfonamide	2	0	5	2	100	45		
Trimethoprim	2	0	5	0	100	57		
Aminoglycosides								
Streptomycin	2	0	5	2	100	31		
Gentamicin	2	0	5	0	100	0		
Penicillins								
Ampicillin	2	1	5	1	100	6		
Fully sensitive	2	1	5	3	100	36		
Resistant to 1 antimicrobial	2	1	5	1	100	9		
Resistant to 2 antimicrobials	2	0	5	0	100	3		
Resistant to 3 antimicrobials	2	0	5	0	100	30		
Resistant to 4 antimicrobials	2	0	5	0	100	21		
Resistant to >4 antimicrobials	2	0	5	1	100	1		

Footnote

Multiresistance, tested by disk diffusion test: For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of Salmonella in humans, Salmonella spp.

n = Number of resistant isolates

	Salmonella spp.	
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	5379	
Antimicrobials:	**N**	**n**
Tetracyclines		
Tetracyclin	5379	275
Amphenicols		
Chloramphenicol	5379	116
Cephalosporins		
Cefotaxim	5379	3
Fluoroquinolones		
Ciprofloxacin	5379	8
Quinolones		
Nalidixic acid	5379	277
Sulfonamides		
Sulfonamide	5379	242
Trimethoprim	5379	52
Aminoglycosides		
Streptomycin	5379	232
Gentamicin	5379	17
Penicillins		
Ampicillin	5379	428
Fully sensitive	5379	4632
Resistant to 1 antimicrobial	5379	432
Resistant to 2 antimicrobials	5379	63
Resistant to 3 antimicrobials	5379	60
Resistant to 4 antimicrobials	5379	72
Resistant to >4 antimicrobials	5379	120

Footnote

Multiresistance, tested by disk diffusion test: For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Antimicrobial susceptibility testing of Other serotypes - qualitative data

n = Number of resistant isolates

	Other serotypes	
	humans (other than S. Enteritidis and S. Typhimurium)	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	514	
Antimicrobials:	**N**	**n**
Tetracyclines		
Tetracyclin	514	112
Amphenicols		
Chloramphenicol	514	18
Cephalosporins		
Cefotaxim	514	3
Fluoroquinolones		
Ciprofloxacin	514	7
Quinolones		
Nalidixic acid	514	86
Sulfonamides		
Sulfonamide	514	73
Trimethoprim	514	25
Aminoglycosides		
Streptomycin	514	85
Gentamicin	514	10
Penicillins		
Ampicillin	514	63
Fully sensitive	514	358
Resistant to 1 antimicrobial	514	27
Resistant to 2 antimicrobials	514	37
Resistant to 3 antimicrobials	514	37
Resistant to 4 antimicrobials	514	30
Resistant to >4 antimicrobials	514	25

Footnote

Multiresistance, tested by disk diffusion test: For Salmonella this includes resistance to ampicillin, cefotaxime, nalidixic acid (or ciprofloxacin), streptomycin, gentamicin, tetracycline, chloramphenicol, trimethoprim and sulphamethoxazole.

Table Breakpoints for antibiotic resistance testing in Animals

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

CLSI
EFSA

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol				16	2	64	30	18		12
Florfenicol				16	2	64				
Tetracyclines										
Tetracyclin				8	2	32	30	19		14
Cephalosporins										
Cephalothin				16	2	64				
Cefotaxim							30	23		14
Ceftiofur				2	0.5	8				
3rd generation cephalosporins										
Fluoroquinolones										
Ciprofloxacin				0.06	0.03	4	5	21		15
Enrofloxacin										
Quinolones										
Nalidixic acid				16	8	128	30	19		13
Trimethoprim				2	4	32	5	16		10
Sulfonamides										
Sulfonamide				256	64	1024	300	17		12
Aminoglycosides										
Streptomycin				32	4	64	10	15		11
Gentamicin				2	1	32	10	15		12
Neomycin				4	2	32				
Kanamycin										
Apramycin				8	4	64				
Spectinomycin				64	4	128				
Trimethoprim + sulfonamides										
Penicillins										
Amoxicillin / Clavulanic acid				16	2	32				
Ampicillin				4	1	32	10	17		13
Polymyxins										
Colistin				8	4	64				

Table Breakpoints for antibiotic resistance testing in Food

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

CLSI
EFSA

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol				16	2	64	30	18		12
Florfenicol				16	2	64				
Tetracyclines										
Tetracyclin				8	2	32	30	19		14
Cephalosporins										
Cephalothin				16	2	64				
Cefotaxim							30	23		14
Ceftiofur				2	0.5	8				
3rd generation cephalosporins										
Fluoroquinolones										
Ciprofloxacin				0.06	0.03	4	5	21		15
Enrofloxacin										
Quinolones										
Nalidixic acid				16	8	128	30	19		13
Trimethoprim				2	4	32	5	16		10
Sulfonamides										
Sulfonamide				256	64	1024	300	17		12
Aminoglycosides										
Streptomycin				32	4	64	10	15		11
Gentamicin				2	1	32	10	15		12
Neomycin				4	2	32				
Kanamycin										
Apramycin				8	4	64				
Spectinomycin				64	4	128				
Trimethoprim + sulfonamides										
Penicillins										
Amoxicillin / Clavulanic acid				16	2	32				
Ampicillin				4	1	32	10	17		13
Polymyxins										
Colistin				8	4	64				

Table Breakpoints for antibiotic resistance testing in Feedingstuff

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

CLSI
EFSA

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol				16	2	64	30	18		12
Florfenicol				16	2	64				
Tetracyclines										
Tetracyclin				8	2	32	30	19		14
Cephalosporins										
Cephalothin				16	2	64				
Cefotaxim							30	23		14
Ceftiofur				2	0.5	8				
3rd generation cephalosporins										
Fluoroquinolones										
Ciprofloxacin				0.06	0.03	4	5	21		15
Enrofloxacin										
Quinolones										
Nalidixic acid				16	8	128	30	19		13
Trimethoprim				2	4	32	5	16		10
Sulfonamides										
Sulfonamide				256	64	1024	300	17		12
Aminoglycosides										
Streptomycin				32	4	64	10	15		11
Gentamicin				2	1	32	10	15		12
Neomycin				4	2	32				
Kanamycin										
Apramycin				8	4	64				
Spectinomycin				64	4	128				
Trimethoprim + sulfonamides										
Penicillins										
Amoxicillin / Clavulanic acid				16	2	32				
Ampicillin				4	1	32	10	17		13
Polymyxins										
Colistin				8	4	64				

Table Breakpoints for antibiotic resistance testing in Humans

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

CLSI
EFSA

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol				16	2	64	30	18		12
Florfenicol				16	2	64				
Tetracyclines										
Tetracyclin				8	2	32	30	19		14
Cephalosporins										
Cephalothin				16	2	64				
Cefotaxim							30	23		14
Ceftiofur				2	0.5	8				
3rd generation cephalosporins										
Fluoroquinolones										
Ciprofloxacin				0.06	0.03	4	5	21		15
Enrofloxacin										
Quinolones										
Nalidixic acid				16	8	128	30	19		13
Trimethoprim				2	4	32	5	16		10
Sulfonamides										
Sulfonamide				256	64	1024	300	17		12
Aminoglycosides										
Streptomycin				32	4	64	10	15		11
Gentamicin				2	1	32	10	15		12
Neomycin				4	2	32				
Kanamycin										
Apramycin				8	4	64				
Spectinomycin				64	4	128				
Trimethoprim + sulfonamides										
Penicillins										
Amoxicillin / Clavulanic acid				16	2	32				
Ampicillin				4	1	32	10	17		13
Polymyxins										
Colistin				8	4	64				

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, for the first time the number of notified human campylobacteriosis cases in Austria has exceeded the number of notified salmonellosis cases.

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

In the last years the number of notified cases of campylobacteriosis â with the exception of 2003 â steadily increased reaching a new peak of 5,110 cases in 2006.

The sources of infection are still unclear; the few published outbreaks in Austria were due to contaminated cowâ s milk or chicken meat. Pets are considered as another possible source.

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

Feedingsstuffs has no obvious relevance. Animals are heavily infected: broiler flocks up to 53 %.The actual source of infection is unknown in most cases, chicken meat may account for approx. 40% of human infections.

Recent actions taken to control the zoonoses

On 1st January 2006 the Federal Zoonoses Act (128. Bundesgesetz: Zoonosengesetz, published on 18th November 2005) has been 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

â ¢ Securing of effective and continuous teamwork of special fields concerned

â ¢ Cooperation based on free exchange of general information and where necessary, of specific data

â ¢ Determination of measures in case of Austrian-wide food borne outbreaks (concerning several provinces by one outbreak)

â ¢ Issues the annually report on trends and sources of zoonoses in Austria

â ¢ Preparation of risk based, integrated monitoring and surveillance programmes

The Austrian wide monitoring program on the trends of campylobacter prevalence and antimicrobial resistance of campylobacter in poultry and bovine animals was continued for the third year according to the directive 2003/99/EC of the European Parliament and the Council of 17 November 2003 and the Federal Zoonoses Act (128. Bundesgesetz: Zoonosengesetz, published on 18th November 2005). The sampling was carried out from January 16th to November 17th 2006 and follow up programs will be realized 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

Case definition

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 Â°C for a minimum of 36 hours (Anonymus: Standardisierung und QualitÃ¤tssicherung in der mikrobiologischen Diagnostik. Richtlinien. Bundesministerium fÃ¼r 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 (BGBl. 1950/186 Epidemiegesetz, as amended): Primarily the attending physicians have to notify. Since 2002 an order has been implemented (Meldepflicht infektiÃ¶ser Erkrankungen fÃ¼r 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.

The number of campylobacter cases presented in this report reflects the number of laboratory primary human isolates and respectively the number of laboratory confirmed cases.

On July 24th 2006 the amendments of the epidemic act (114. Bundesgesetz: Ã nderung 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 for the first time has exceeded the number of notified salmonellosis cases.

Results of the investigation

see table

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

Following the number of notifications per year, campylobacteriosis is the most frequently notified food borne enteric disease in 2006. It seems to be that there are two main reasons for this new situation: The improvement of the notification system and the higher awareness of possible Campylobacter infections by physicians and laboratories. Additionally the amendments of the epidemic act have been published on July 24th 2006 (114. Bundesgesetz: Ã nderung des Epidemiegesetzes 1950): Accordingly, all zoonotic agents that have been isolated from humans and that are notifiable have to be sent to the corresponding reference laboratory for speciation.

The main sources of infections seem to be chicken meat and raw milk (Feierl G. 2007. Jahresbericht 2006 der Nationalen Referenzzentrale fÃ¼r Campylobacter. Mitteilungen der SanitÃ¤tsverwaltung 4/2007).

Relevance as zoonotic disease

In 2006, campylobacteriosis has become the most frequently notified food borne disease in Austria.

Additional information

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

B. Antimicrobial resistance of thermophilic Campylobacter spp., unspecified in 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.

Stool specimens were plated on Campylobacter blood-free selective media at 37 Â°C or 42 Â°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, indoxyl acetate hydrolysis, katalase production, and species-specific real-time PCR.

Broth micro dilution susceptibility testing of Campylobacter spp. isolates was done using customised SensititreÂ® 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 Â°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 Â°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, ciprofloxacin, gentamicin, and streptomycin!

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

Due to the fact that this sentinel surveillance system has been established for the first time in 2006 and the human isolates have been tested using the micro dilution method a comparison of results is not possible.

Suggestions to the Community for the actions to be taken

Continue to work for harmonization of monitoring programs.

Additional information

The newly established sentinel surveillance system will be continued.

Table Campylobacter in humans - Species/serotype distribution

	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.	Unknown status
Campylobacter	**5110**	**61.8**	**2176**	**26.3**	**385**	**4.6**	**2549**
C. coli	99	1.2	36	0.4	12	0.1	51
C. jejuni	2807	34	1107	13.4	209	2.5	1491
C. upsaliensis							
thermophilic Campylobacter spp., unspecified	2161	26.1	1009	12.2	162	2	990
Campylobacter spp., unspecified (1)	43	0.5	24	0.3	2	0	17

(1) : C. jejuni and C. coli concurrently isolated

Table Campylobacter in humans - Age distribution

Age Distribution	C. coli			C. jejuni			Campylobacter spp., unspecified			thermophilic Campylobacter spp., unspecified		
	All	M	F	All	M	F	All	M	F	All	M	F
<1 year	1	1	0	61	35	26	0	0	0	46	29	17
1 to 4 years	2	0	2	235	140	93	3	1	2	211	128	81
5 to 14 years	7	5	2	350	199	149	4	3	1	269	153	115
15 to 24 years	23	11	11	550	299	249	11	9	2	412	214	198
25 to 44 years	37	19	18	818	459	353	9	6	3	570	294	276
45 to 64 years	17	10	7	461	263	196	6	3	3	359	188	170
65 years and older	12	3	9	328	164	162	10	6	4	290	139	151
Age unknown	0	0	0	4	4	0	0	0	0	4	2	2
Total :	99	49	49	2807	1563	1228	43	28	15	2161	1147	1010

Footnote

Campylobacter spp., unspecified = C. jejuni and C. coli concurrently isolated;
In 16 C. jejuni -, one C. coli - and 4 thermophilic Campylobacter spp., unspecified cases the sex is not known.

Table Campylobacter in humans - Seasonal distribution

Month	C. coli	C. jejuni	C. upsaliensis	Campylobacter spp., unspecified	thermophilic Campylobacter spp., unspecified
	Cases	Cases	Cases	Cases	Cases
January	14	242		5	172
February	5	103		11	87
March	5	106		2	79
April	5	98		1	92
May	6	209		9	174
June	8	279		10	218
July	8	275		2	214
August	5	340		1	258
September	14	331		1	231
October	9	286		0	240
November	15	297		1	217
December	5	241		0	179
not known					
Total :	99	2807	0	43	2161

Footnote

Campylobacter spp., unspecified = C. jejuni and C. coli concurrently isolated;

2.2.3. Campylobacter in foodstuffs

A. C.,thermophilic in food

Monitoring system

Sampling strategy

No surveillance programmes are applied.

Foodstuff was sampled according to the Erlass der Bundesministerin fÃ¼r Gesundheit und Frauen: Revisions- und Probenplan fÃ¼r das Jahr 2006; Richtlinien Ã¼ber die Vollziehung der Ã berwachung des Verkehrs mit den durch das LMG 1975 erfassten Waren (GZ BMGF-75500/0164-IV/B/10/2005 of 26.01.2006). The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail etc. that have to be tested randomly per province according to the number of food enterprises per province. Each business has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP, control of manufacturing processes etc.

The sampling plan determines the number of samples of each class of goods, as raw meat, fresh or frozen; sausages; cheeses; milk; preserved food etc. that have to be investigated randomly. Samples from suspected foodstuffs are taken following outbreak investigation, complaint, confiscation, violation etc.

Information about the special monitoring programs (Schwerpunktprogramm 2006) for Campylobacter can be found on page 14.

Diagnostic/analytical methods used

Samples are cultured either according to ISO 10272: 1995 or preenriched in Bolton bouillon at 42 Â°C for 48 hours and subsequent plated on CCDA- or modified CCDA agar at 42 Â°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.

Results of the investigation

see tables

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

366 single samples of poultry meat, fresh or raw were tested and in 18.3 % (=67 samples) thermophilic Campylobacter was found. In 2006, the percentage of positive samples has been doubled in broiler meat (9.3 % to 18.3 %).

In 1 out of 93 tested single pig meat samples of the special monitoring program A045 and in none of the 103 tested bovine meat samples (A008) thermophilic Campylobacter could be detected.

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. lari	C. jejuni	C. upsaliensis	thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus)	I, II, V, VII, VIII	single	25g	268	58					58
fresh	VI	single	25g	1	0					
meat preparation										
intended to be eaten cooked	II, V	single	25g	12	0					
meat products										
raw but intended to be eaten cooked	I, VII	single	25g	85	9					9
cooked, ready-to-eat	II, V	single	25g	13	0					
mechanically separated meat (MSM)	VII	single	25g	7	0					
Meat from turkey	II, V, VI, VII, VIII	single	25g	9	3					3
fresh		---								
(Sampling unit: swab)	IV	single		1	0					
minced meat										
intended to be eaten cooked	II	single	25g	1	0					
meat preparation										
intended to be eaten cooked	IV, V	single		2	1					1
meat products										
cooked, ready-to-eat	VIII	single	25g	1	0					
(Sampling unit: swab)	IV, V	single		4	0					
Meat from duck	V	single	25g	1	0					
Meat from guinea fowl		---								
(Sampling unit: swab)	IV	single		1	0					

Meat from other animal species or not specified	V	single	25g	3	0					

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. jejuni	C. coli	C. upsaliensis	C. lari	thermophilic Campylobacter spp., unspecified
Meat from pig	II, III, V, VI, VII, VIII	single	25g	25	0					
fresh		---								
(Sampling unit: swab)	IV	single		1	0					
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A45, see text Salmonella spp. in food)	V, VI	single	25g	93	1					1
Meat from bovine animals		---								
fresh	III, VII	single	25g	16	0					
(Sampling unit: swab)	IV	single	25g	2	0					
meat preparation										
intended to be eaten cooked										
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A8, see text Salmonella spp. in food)	II, V, VII	single	25g	103	0					
Meat from other animal species or not specified		---								
meat products										
fermented sausages	II	single	25g	2	0					
Milk, cows'										
raw		---								

intended for direct human consumption	II, V	single	25g	12	0					
raw milk for manufacture										
intended for manufacture of raw or low heat-treated products	V	single	25g	12	0					
Fish	III, V, VI, VII	single	25g	41	0					
Meat from bovine animals and pig										
minced meat										
(Sampling unit: swab)	IV	single	25g	3	0					
Other products of animal origin	V	single	25g	53	0					
Meat from deer (venison)										
fresh	VIII	single	25g	1	0					
Cheeses, made from unspecified milk or other animal milk	VI, VII	single	25g	10	0					
Ready-to-eat salads	VII	single	25g	4	0					
Dairy products (excluding cheeses)										
dairy products, not specified										
ready-to-eat	V, VII	single	25g	7	0					
made from pasteurised milk	III	single	25G	12	0					
Other food	II, V, VI, VII	single	25g	224	0					

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

2.2.4. Campylobacter in animals

A. Thermophilic Campylobacter in Gallus gallus

Monitoring system

Sampling strategy

Monitoring program on the occurrence and trend of antimicrobial resistance in thermophilic Campylobacter is based on the prevalence of campylobacter in slaughter batches: At an estimated percentage of resistance in antimicrobials of 40 to 60 % and a desired accuracy of 5 % for a confidence level of 95%, 382 isolates of Campylobacter jejuni/coli from poultry were required.

To obtain this number of isolates, as primary sample size, 597 slaughter batches of poultry had to be tested, calculated on approximately more than 10,000 slaughter batches of poultry in 2004 in Austria, with an estimated prevalence of Campylobacter jejuni/coli of 61.4 %, based on the results from the monitoring in 2005, and at a desired accuracy of 5% for a confidence level of 95%. As a secondary sample size caeca of 10 animals had to be collected. The secondary sample size gives the number of birds to be sampled per batch and had been computed on slaughter batches of more than 2000 broilers, an expected prevalence of 30% within the batch and a confidence level of 95%. The sampling had been stratified on the number of slaughter batches by slaughter plants all over Austria. The date of sampling was randomized over the period of the study.

Sampling was performed in the 8 poultry slaughter plants with slaughter batches consisting of >2000 animals in Austria in 2004. The 8 slaughter plants included in the monitoring program accounted for almost 100% of broilers and turkeys of the total production in Austria.

Frequency of the sampling

At slaughter

Other: Detection of annual prevalence in slaughter batches of 61.4 % at a 5% desired accuracy for a 95% level of confidence. The sampling was distributed by randomization over the period of the study from January 16th to November 17th 2006.

Type of specimen taken

At slaughter

Other: Intestines of 10 animals.

Methods of sampling (description of sampling techniques)

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. After cooling down to 4 Â°C the sample was sent in a hobbock or polystyrene box after adding cooling units to the locally appropriate Institute of Veterinary Diseases Control (IVET). 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.

Case definition

At slaughter

A slaughter batch is considered to be infected with thermophilic Campylobacter following isolation of Campylobacter jejuni or C. coli from its colon.

Diagnostic/analytical methods used

At slaughter

Bacteriological method: The pooled samples were examined by direct inoculation on modified CCD agar (mCCDA) that was incubated in microaerophilic atmosphere at 42 Â± 1 Â°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 Â°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 are not notifiable in poultry in Austria.

Results of the investigation

See table.

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

In 2006, 52.7 % (315 out of 598) of the tested poultry slaughter batches/flocks were positive for thermophilic Campylobacter. There was again a decrease in the prevalence compared to the previous years. The prevalence in broiler flocks was 52.2 % (287 out of 550) and 59.1 % (13 out of 22) in turkey flocks. 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 acquiring an infection with C. jejuni/coli.

Additional information

Nil

B. Campylobacter spp. in animal - Pigs - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling

Monitoring system

Sampling strategy

Contrarily to the previous years and due to the fact that 99 % of the isolated thermophilic campylobacters in pigs are C. coli, which are only rarely detected in humans (approx. 5 %, see tables), there was no monitoring program conducted in pigs in 2006.

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

Monitoring system

Sampling strategy

The monitoring program on the occurrence and trends of antimicrobial resistance in thermophilic Campylobacter is based on the prevalence of campylobacter in slaughtered animals: At an estimated percentage of resistance in antimicrobials of 40 to 60 % and a

desired accuracy of 6 % for a confidence level of 95%, 256 isolates of Campylobacter jejuni/coli from bovine animals were required.

To obtain this number of isolates, as sample size 1,347 slaughtered bovine animals had to be tested, calculated on approximately 650.000 slaughtered bovine animals in 2004 in Austria, with an estimated prevalence of Campylobacter jejuni/coli of 19 %, based on the results of the monitoring in 2005, and at a desired accuracy of 5% for a confidence level of 95%. The sampling had been stratified on the number of slaughtering by abattoirs all over Austria. The date of sampling was randomized over the period of the study.

In Austria, all 68 abattoirs in which more than 500 bovine animals were slaughtered in 2004 accounted for approximately 83% of the total annual bovine production. Sampling was planned in 51 of the 68 abattoirs excluding those in which only one sampling in the whole period of the study would have been carried out.

Frequency of the sampling

The sampling was distributed by randomization over the period of the study from January 16th to November 17th 2006.

Type of specimen taken

Other: Caecum containing a minimum of 50 to 100 grams of faeces.

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 4Â°C the sample was sent in a hobbock or polystyrene box after adding cooling units to the locally appropriate Institute of Veterinary Diseases Control (IVET). 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 thermophilic 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 Â°C. Subsequently the preenrichment was plated on modified CCD agar (mCCDA) and incubated in microaerophilic atmosphere at 42 Â± 1 Â°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 Â°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 are not notifiable in poultry in Austria.

Results of the investigation

See table

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

In 2006, 19.4 % (258 out of 1,329 samples) of slaughtered bovine animals were positive for thermophilic Campylobacter. In meat production animals thermophilic Campylobacter could be detected in 28.6 % compared to 24.1 % in calves and 14.2 % in dairy cows. There was no significant change in the prevalence compared to the previous years. Compared to 52.7 % of poultry slaughter batches positive for thermophilic Campylobacter, it seems that the risk for humans to get infected after consumption of beef or veal remains of less relevance.

Additional information

Nil

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic Campylobacter spp.	C. jejuni	C. coli	C. lari	C. upsaliensis	thermophilic Campylobacter spp., unspecified
Cattle (bovine animals)									
dairy cows	4	animal	823	117	102	15			
calves (under 1 year) (1)	4	animal	83	20	14	6			
meat production animals (2)	4	animal	423	121	102	19			
Gallus gallus (fowl)									
broilers									
- at slaughterhouse	4	slaughter batch	550	287	168	119			
Turkeys	4	slaughter batch	22	13	5	8			

(1) : Calves = under 6 months of age
(2) : From 6 to 18 months of age

Footnote

4 ... all 4 AGES Institutes for Veterinary Disease Control

2.2.5. Antimicrobial resistance in Campylobacter isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in cattle

Sampling strategy used in monitoring

Frequency of the sampling

Described in chapter: Thermophilic campylobacter in bovine animals

Type of specimen taken

Described in chapter: Thermophilic campylobacter in bovine animals

Methods of sampling (description of sampling techniques)

Described in chapter: Thermophilic campylobacter in bovine animals

Procedures for the selection of isolates for antimicrobial testing

All 218 isolates of Campylobacter jejuni and 40 isolates of C. coli obtained in the monitoring program were sent to the AGES Institute for Medical Microbiology and Hygiene in Graz where the antimicrobial susceptibility testing of all isolates of Campylobacter spp. was performed.

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 MicrosoftÂ® Excel tables.

Laboratory methodology used for identification of the microbial isolates

Described in chapter: Thermophilic campylobacter in bovine animals.

Broth micro dilution susceptibility testing of Campylobacter spp. isolates was done using customised SensititreÂ® 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 Â°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 Â°C in a microaerophilic atmosphere. Campylobacter jejuni ATCC 33560 was used as control.

MIC values have been entered in a MicrosoftÂ® 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, ciprofloxacin, gentamicin, and streptomycin!

Laboratory used for detection for resistance

Antimicrobials included in monitoring

See tables

Breakpoints used in testing

See tables

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/7/2006, RÃ¼ckstandsuntersuchung-DurchfÃ¼hrungserlass 2006).

Recent actions taken to control the zoonoses

None.

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

Findings of resistance are not notifiable.

Results of the investigation

See tables

Additional information

Nil

B. Antimicrobial resistance in Campylobacter jejuni and coli in pigs

Sampling strategy used in monitoring

Frequency of the sampling

Contrarily to the previous years and due to the fact that 99 % of the isolated thermophilic campylobacters in pigs are C. coli, which are only rarely detected in humans (approx. 5 %, see tables), there was no monitoring program conducted in pigs in 2006.

C. Antimicrobial resistance in Campylobacter jejuni and coli in poultry

Sampling strategy used in monitoring

Frequency of the sampling

Described in chapter: Thermophilic Campylobacter in poultry

Type of specimen taken

Described in chapter: Thermophilic Campylobacter in poultry

Methods of sampling (description of sampling techniques)

Described in chapter: Thermophilic Campylobacter in poultry

Procedures for the selection of isolates for antimicrobial testing

All 179 isolates of Campylobacter jejuni and 136 isolates of C. coli obtained in the monitoring program were sent to the IMED in Graz where the antimicrobial susceptibility testing of all isolates of Campylobacter spp. was performed.

Methods used for collecting data

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

Laboratory methodology used for identification of the microbial isolates

Described in chapter: Thermophilic Campylobacter in poultry.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Broth micro dilution susceptibility testing of Campylobacter spp. isolates was done using customised SensititreÂ® 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 Â°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 Â°C in a microaerophilic atmosphere. Campylobacter jejuni ATCC 33560 was used as control.MIC values have been entered in a MicrosoftÂ® Excel datasheet.

Antimicrobials included in monitoring, see tables.

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, ciprofloxacin, gentamicin, and streptomycin!

Breakpoints used in testing

See tables

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/7/2006, RÃ¼ckstandsuntersuchung-DurchfÃ¼hrungserlass 2006).

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

Nil

Notification system in place

Findings of resistance are not notifiable.

Additional information

Nil

D. Antimicrobial resistance of thermophilic Campylobacter spp., unspecified in 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.

Stool specimens were plated on Campylobacter blood-free selective media at 37 Â°C or 42 Â°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, indoxyl acetate hydrolysis, katalase production, and species-specific real-time PCR.

Broth micro dilution susceptibility testing of Campylobacter spp. isolates was done using customised SensititreÂ® 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 Â°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 Â°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, ciprofloxacin, gentamicin, and streptomycin!

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

Due to the fact that this sentinel surveillance system has been established for the first time in 2006 and the human isolates have been tested using the micro dilution method a comparison of results is not possible.

Suggestions to the Community for the actions to be taken

Continue to work for harmonization of monitoring programs.

Additional information

The newly established sentinel surveillance system will be continued.

Table Antimicrobial susceptibility testing of C. coli in Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling - quantitative data [Dilution method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. coli Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	30

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	30	15				14	1				1		1	1	9	3						
Amphenicols																						
Chloramphenicol	30	0							21	8	1											
Fluoroquinolones																						
Ciprofloxacin	30	12		10	7	1				1	7	3	1									
Quinolones																						
Nalidixic acid	30	12							5	9	4			5	4	3						
Trimethoprim	30	30												3	27							
Aminoglycosides																						
Streptomycin	30	9						18	3	1			1	6	1							
Gentamicin	30	0				12	16	2														
Neomycin	30	0						28	2													
Macrolides																						
Erythromycin	30	0				7	12	6	5													
Penicillins																						
Amoxicillin / Clavulanic acid	30	0						13	9	8												
Ampicillin	30	3						3	4	9	11		1	2								
Polymyxins																						
Colistin	30	0								25	4	1										

Footnote

The given breakpoints correpond to C. jejuni! Differences in breakpoints for C. coli for Gentamicin (breakpoint=2), Streptomycin (breakpoint=4), Erythromycin (breakpoint=16), Nalidixic acid (breakpoint=32) and Ampicillin (breakpoint=16), rest is the same.

Table Antimicrobial susceptibility testing of C. coli in Poultry, unspecified - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling - quantitative data [Dilution method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. coli Poultry, unspecified - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	124

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	124	74				48	2				2	1	5	14	38	14						
Amphenicols																						
Chloramphenicol	124	0							91	30	3											
Fluoroquinolones																						
Ciprofloxacin	124	78		32	10	4			2	28	35	11	2									
Quinolones																						
Nalidixic acid	124	78							11	26	7	2	9	43	25	1						
Trimethoprim	124	124										1	4	7	112							
Aminoglycosides																						
Streptomycin	124	53						59	12	2		2	16	20	13							
Gentamicin	124	0				45	70	9														
Neomycin	124	0						104	20													
Macrolides																						
Erythromycin	124	13				27	31	32	18	3			1	3	1	8						
Penicillins																						
Amoxicillin / Clavulanic acid	124	0						46	36	32	10											
Ampicillin	124	21						20	20	20	43	6	3	10	2							
Polymyxins																						
Colistin	124	0								106	15	1	2									

Footnote

Poultry = Gallus gallus and turkeys; slaughter batches, not single animals
The given breakpoints correpond to C. jejuni! Differences in breakpoints for C. coli for Gentamicin (breakpoint=2), Streptomycin (breakpoint=4), Erythromycin (breakpoint=16), Nalidixic acid (breakpoint=32) and Ampicillin (breakpoint=16), rest is the same.

Table Antimicrobial susceptibility testing of C. coli - qualitative data

n = Number of resistant isolates

	C. coli			
	Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling		**Poultry, unspecified - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling**	
Isolates out of a monitoring programme	yes		yes	
Number of isolates available in the laboratory	30		124	
Antimicrobials:	**N**	**n**	**N**	**n**
Tetracyclines				
Tetracyclin	30	15	124	74
Amphenicols				
Chloramphenicol	30	0	124	0
Fluoroquinolones				
Ciprofloxacin	30	12	124	78
Quinolones				
Nalidixic acid	30	12	124	69
Trimethoprim	30	30	124	124
Aminoglycosides				
Streptomycin	30	8	124	51
Gentamicin	30	0	124	0
Neomycin	30	0	124	0
Macrolides				
Erythromycin	30	0	124	13
Penicillins				
Amoxicillin / Clavulanic acid	30	0	124	0
Ampicillin	30	3	124	15
Polymyxins				
Colistin	30	0	124	0
Fully sensitive	30	9	124	22
Resistant to 1 antimicrobial	30	8	124	23
Resistant to 2 antimicrobials	30	12	124	46
Resistant to 3 antimicrobials	30	1	124	31
Resistant to 4 antimicrobials	30	0	124	2
Resistant to >4 antimicrobials	30	0	124	0

Footnote

Poultry = Gallus gallus and turkeys; slaughter batches, not single animals
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, ciprofloxacin, gentamicin, and streptomycin!

Table Antimicrobial susceptibility testing of C. coli in humans - quantitative data [Dilution method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. coli
	humans
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	9

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	9	6				3								1	4	1						
Amphenicols																						
Chloramphenicol	9	0							8	1												
Fluoroquinolones																						
Ciprofloxacin	9	3		5	1					1		1	1									
Quinolones																						
Nalidixic acid	9	3								5	1		1	2								
Trimethoprim	9	9											2	2	5							
Aminoglycosides																						
Streptomycin	9	2						7		1					1							
Gentamicin	9	0				3	6															
Neomycin	9	0						9														
Macrolides																						
Erythromycin	9	1				6		1	1				1									
Penicillins																						
Amoxicillin / Clavulanic acid	9	0						3	5	1												
Ampicillin	9	0						1	2	5	1											
Polymyxins																						
Colistin	9	0								6	2	1										

Footnote

The given breakpoints correpond to C. jejuni! Differences in breakpoints for C. coli for Gentamicin (breakpoint=2), Streptomycin (breakpoint=4), Erythromycin (breakpoint=16), Nalidixic acid (breakpoint=32) and Ampicillin (breakpoint=16), rest is the same.

Table Antimicrobial susceptibility testing of C. coli - qualitative data

n = Number of resistant isolates

	C. coli	
	humans	
Isolates out of a monitoring programme	yes	
Number of isolates available in the laboratory	9	
Antimicrobials:	**N**	**n**
Tetracyclines		
Tetracyclin	9	6
Amphenicols		
Chloramphenicol	9	0
Fluoroquinolones		
Ciprofloxacin	9	3
Quinolones		
Nalidixic acid	9	2
Trimethoprim	9	9
Aminoglycosides		
Streptomycin	9	1
Gentamicin	9	0
Neomycin	9	0
Macrolides		
Erythromycin	9	1
Penicillins		
Amoxicillin / Clavulanic acid	9	0
Ampicillin	9	0
Polymyxins		
Colistin	9	0
Fully sensitive	9	2
Resistant to 1 antimicrobial	9	3
Resistant to 2 antimicrobials	9	4
Resistant to 3 antimicrobials	9	0
Resistant to 4 antimicrobials	9	0
Resistant to >4 antimicrobials	9	0

Footnote

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, ciprofloxacin, gentamicin, and streptomycin!

Table Antimicrobial susceptibility testing of C. jejuni - qualitative data

n = Number of resistant isolates

	C. jejuni			
	Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling		**Poultry, unspecified - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling**	
Isolates out of a monitoring programme	yes		yes	
Number of isolates available in the laboratory	205		166	
Antimicrobials:	**N**	**n**	**N**	**n**
Tetracyclines				
Tetracyclin	205	66	166	48
Amphenicols				
Chloramphenicol	205	0	166	0
Fluoroquinolones				
Ciprofloxacin	205	63	166	86
Quinolones				
Nalidixic acid	205	68	166	82
Trimethoprim	205	204	166	166
Aminoglycosides				
Streptomycin	205	8	166	3
Gentamicin	205	0	166	0
Neomycin	205	0	166	2
Macrolides				
Erythromycin	205	1	166	2
Penicillins				
Amoxicillin / Clavulanic acid	205	0	166	0
Ampicillin	205	29	166	42
Polymyxins				
Colistin	205	0	166	1
Fully sensitive	205	114	166	72
Resistant to 1 antimicrobial	205	45	166	52
Resistant to 2 antimicrobials	205	45	166	40
Resistant to 3 antimicrobials	205	1	166	1
Resistant to 4 antimicrobials	205	0	166	1
Resistant to >4 antimicrobials	205	0	166	0

Footnote

Poultry = Gallus gallus and turkeys; slaughter batches, not single animals
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, ciprofloxacin, gentamicin, and streptomycin!

Table Antimicrobial susceptibility testing of C. jejuni in Poultry, unspecified - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling - quantitative data [Dilution method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. jejuni Poultry, unspecified - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	166

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	166	48				105	9	1	3			1	3	26	13	5						
Amphenicols																						
Chloramphenicol	166	0							147	16	3											
Fluoroquinolones																						
Ciprofloxacin	166	86		54	24	2			3	4	56	13	10									
Quinolones																						
Nalidixic acid	166	82							26	52	4	2	2	15	49	16						
Trimethoprim	166	166											4	7	155							
Aminoglycosides																						
Streptomycin	166	3						157	6				2	1								
Gentamicin	166	0				121	45															
Neomycin	166	2						163	1				2									
Macrolides																						
Erythromycin	166	2				88	50	23	3						1	1						
Penicillins																						
Amoxicillin / Clavulanic acid	166	0						102	59	5												
Ampicillin	166	42						34	32	47	11	8	19	11	2	2						
Polymyxins																						
Colistin	166	1								132	28	5		1								

Footnote

Poultry = Gallus gallus and turkeys; slaughter batches, not single animals

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

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. jejuni Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	205

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	205	66				137	2			1		4	5	31	22	3						
Amphenicols																						
Chloramphenicol	205	0							194	9	2											
Fluoroquinolones																						
Ciprofloxacin	205	63		83	43	10	4	2		3	42	13	5									
Quinolones																						
Nalidixic acid	205	68							38	78	19	2	3	14	43	8						
Trimethoprim	205	204								1		1	3	3	197							
Aminoglycosides																						
Streptomycin	205	8						191	6		1		6		1							
Gentamicin	205	0				129	76															
Neomycin	205	0						204	1													
Macrolides																						
Erythromycin	205	1				104	74	23	3					1								
Penicillins																						
Amoxicillin / Clavulanic acid	205	0						134	60	10	1											
Ampicillin	205	29						38	58	66	14	4	10	13	2							
Polymyxins																						
Colistin	205	0								167	32	6										

Table Antimicrobial susceptibility testing of C. jejuni - qualitative data

n = Number of resistant isolates

	C. jejuni	
	humans	
Isolates out of a monitoring programme	yes	
Number of isolates available in the laboratory	77	
Antimicrobials:	**N**	**n**
Tetracyclines		
Tetracyclin	77	30
Amphenicols		
Chloramphenicol	77	0
Fluoroquinolones		
Ciprofloxacin	77	44
Quinolones		
Nalidixic acid	77	44
Trimethoprim	77	77
Aminoglycosides		
Streptomycin	77	0
Gentamicin	77	0
Neomycin	77	0
Macrolides		
Erythromycin	77	0
Penicillins		
Amoxicillin / Clavulanic acid	77	1
Ampicillin	77	21
Polymyxins		
Colistin	77	0
Fully sensitive	77	23
Resistant to 1 antimicrobial	77	34
Resistant to 2 antimicrobials	77	20
Resistant to 3 antimicrobials	77	0
Resistant to 4 antimicrobials	77	0
Resistant to >4 antimicrobials	77	0

Footnote

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, ciprofloxacin, gentamicin, and streptomycin!

Table Antimicrobial susceptibility testing of C. jejuni in humans - quantitative data [Dilution method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	C. jejuni
	humans
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	77

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	77	30				47				2	4	1		12	10	1						
Amphenicols																						
Chloramphenicol	77	0							74	2		1										
Fluoroquinolones																						
Ciprofloxacin	77	44		27	6					7	33	3		1								
Quinolones																						
Nalidixic acid	77	44							5	24	4		5	9	28	2						
Trimethoprim	77	77										1	5	2	69							
Aminoglycosides																						
Streptomycin	77	0						77														
Gentamicin	77	0				63	14															
Neomycin	77	0						77														
Macrolides																						
Erythromycin	77	0				72	3	1	1													
Penicillins																						
Amoxicillin / Clavulanic acid	77	1						56	20							1						
Ampicillin	77	21						20	17	18	1		11	6		4						
Polymyxins																						
Colistin	77	0								76		1										

Table Breakpoints used for antimicrobial susceptibility testing in Animals

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

NCCLS
EFSA

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol	CLSI			16	2	32				
Tetracyclines										
Tetracyclin	EFSA			2	0.25	128				
Fluoroquinolones										
Ciprofloxacin	EFSA			1	0.06	32				
Quinolones										
Nalidixic acid	CLSI			16	2	128				
Trimethoprim	CLSI			8	0.5	64				
Aminoglycosides										
Streptomycin	EFSA			2	1	64				
Gentamicin	EFSA			1	0.25	64				
Neomycin	CLSI			8	1	64				
Macrolides										
Erythromycin	EFSA			4	0.25	128				
Penicillins										
Amoxicillin / Clavulanic acid	CLSI			16	1	128				
Ampicillin	CLSI			8	1	128				
Polymyxins										
Colistin	CLSI			32	4	64				

Footnote

The given breakpoints correspond to C. jejuni!
Differences are in C. coli for Gentamicin (breakpoint=2), Streptomycin (breakpoint=4), Erythromycin (breakpoint=16), Nalidixic acid (breakpoint=32) and Ampicillin (breakpoint=16), rest is the same.

Table Breakpoints used for antimicrobial susceptibility testing in Humans

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

NCCLS
EFSA

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol	CLSI			16	2	32				
Tetracyclines										
Tetracyclin	EFSA			2	0.25	128				
Fluoroquinolones										
Ciprofloxacin	EFSA			1	0.06	32				
Quinolones										
Nalidixic acid	CLSI			16	2	128				
Trimethoprim	CLSI			8	0.5	64				
Aminoglycosides										
Streptomycin	EFSA			2	1	64				
Gentamicin	EFSA			1	0.25	64				
Neomycin	CLSI			8	1	64				
Macrolides										
Erythromycin	EFSA			4	0.25	128				
Penicillins										
Amoxicillin / Clavulanic acid	CLSI			16	1	128				
Ampicillin	CLSI			8	1	128				
Polymyxins										
Colistin	CLSI			32	4	64				

Footnote

The given breakpoints correspond to C. jejuni!
Differences are in C. coli for Gentamicin (breakpoint=2), Streptomycin (breakpoint=4), Erythromycin (breakpoint=16), Nalidixic acid (breakpoint=32) and Ampicillin (breakpoint=16), rest is the same.

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 2005. In 2006 a total of 10 culturally verified human cases of listeriosis were recorded for Austria, one of them was associated with pregnancy. The incidences are similar to those of most other western European countries (0.2-0.7). Lethality was high with 20% (2 out of 10) in 2006. This (usually) high rate and the sometimes severe permanent disabilities demand every effort to ascertain potential food-associated outbreaks as early as possible. However, the geographical distribution and the molecular subtyping results argue against any epidemic in Austria in 2006 (WÃ¼rzner R, Heller I, Grif, K 2006. Taetigkeitsbericht fÃ¼r das Jahr 2006. Mitteilungen der Sanitaetsverwaltung 4/2007: in press)

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

See 2.3.1.A. History of the disease

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

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 â 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 at Innsbruck Medical University 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 Coryne test.

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 (BGBl. II, 254/2004, Anzeigepflichtige Ã¼bertragbare Krankheiten 2004).

History of the disease and/or infection in the country

See 2.3.1.A. History of the disease

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

See 2.3.1.A. History of the disease

Relevance as zoonotic disease

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.

Additional information

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

Table Listeria in humans - Species/serotype distribution

Listeria	Cases	Cases Inc.
	10	0.12
Listeria spp.		
L. monocytogenes - L. monocytogenes serovar 1/2a	3	0.04
L. monocytogenes - L. monocytogenes serovar 4b	6	0.07
L. monocytogenes - L. monocytogenes serovar 1/2b	1	0.01
Congenital cases	1	0.01
Deaths	2	0.02

Table Listeria in humans - Age distribution

Age Distribution	L. monocytogenes			Listeria spp.		
	All	M	F	All	M	F
<1 year	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0
5 to 14 years	0	0	0	0	0	0
15 to 24 years	0	0	0	0	0	0
25 to 44 years	2	0	2	2	0	2
45 to 64 years	3	1	2	3	1	2
65 years and older	5	4	1	5	4	1
Age unknown	0	0	0	0	0	0
Total :	10	5	5	10	5	5

2.3.3. Listeria in foodstuffs

A. Listeria spp., unspecified in food

Monitoring system

Sampling strategy

No surveillance programmes are applied.

Foodstuff was sampled according to the Erlass der Bundesministerin fÃ¼r Gesundheit und Frauen: Revisions- und Probenplan fÃ¼r das Jahr 2006; Richtlinien Ã¼ber die Vollziehung der Ã berwachung des Verkehrs mit den durch das LMG 1975 erfassten Waren (GZ BMGF-75500/0164-IV/B/10/2005 of 26.01.2006). The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail etc. that have to be tested randomly per province according to the number of food enterprises per province. Each business has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP, control of manufacturing processes etc.

The sampling plan determines the number of samples of each class of goods, as raw meat, fresh or frozen; sausages; cheeses; milk; fish; preserved food etc. that have to be investigated randomly. Samples from suspected foodstuffs are taken following outbreak investigation, complaint, confiscation, violation etc.

Information about the special monitoring programs (Schwerpunktprogramm 2006) for Listeriosis can be found on page 14.

Diagnostic/analytical methods used

At the production plant

Other: Qualitative detection of Listeria spp. is performed according to ISO

At retail

Other: Qualitative detection of Listeria spp. is performed according to ISO

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

Listeria monocytogenes was detected in samples of cheeses in 0.5 % from cow milk (5/926, 0% from goat milk (0/43) and 15.6 % from sheep milk (7/45). In one sample of soft cheeses from pasteurised cow milk the content of L. monocytogenes was >100 cfu/g.

In 8/359 fresh poultry meat samples (2.2%), 14/152 fresh pig meat samples (9.2%) and in 6/62 fresh bovine meat samples (9.6%) L. monocytogenes was found but always at a lower content than 100/g.

4.8% of samples from fishery products (20/413) revealed a contamination with L. monocytogenes; the quantification showed 1 sample with a higher cfu than 100 per gram and 6 samples contained L. innocua.

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Listeria monocytogenes presence in x g	> detection limit but =< 100 cfu/g	L. monocytogenes > 100 cfu/g
Milk, cows'	II, V	single	25g	19	0			
raw								
intended for direct human consumption	VIII	single	25g	10	0			
pasteurised milk	II, IV, V, VII, VIII	single	25g	168	0			
Milk, sheep's								
pasteurised	II	single	25g	1	0			
Milk, goats'								
raw								
intended for direct human consumption	VI	single	25g	3	0			
pasteurised	II	single	25g	1	0			
Cheeses made from cows' milk								
soft and semi-soft	III, VIII	single	25g	192	0			
made from raw or low heat-treated milk	IV, V, VII	single	25g	17	0			
made from pasteurised milk	II, IV, V, VII	single	25g	302	3		2	1
hard	III, VIII	single	25g	373	1		1	0
made from raw or low heat-treated milk		single	25g	1	1		1	0
made from pasteurised milk		single	25g	41	0			
Cheeses made from goats' milk								
soft and semi-soft	III, VI, VII	single	25g	14	0			
made from pasteurised milk	II, V	single	25g	23	0			
hard	VIII	single	25g	4	0			
unspecified	VIII	single	25g	2	0			

Cheeses made from sheep's milk								
soft and semi-soft	III	single	25g	1	0			
made from raw or low heat-treated milk	V	single	25g	10	7		7	0
made from pasteurised milk	II, V	single	25g	30	0			
hard	VIII	single	25g	1	0			
made from raw or low heat-treated milk	VII	single	25g	3	0			
Dairy products (excluding cheeses)								
butter	II, IV, V, VI, VIII	single	25g	72	0			
cream	V, VII	single	25g	20	0			
ice-cream	II, IV, V, VI	single	25g	472	0			
yoghurt	IV, V	single	25g	127	0			
dairy products, not specified								
ready-to-eat								
made from pasteurised milk	III	single	25g	12	0			
made from raw or low heat-treated milk	V	single	25g	124	0			
sour milk	IV	single	25g	3	0			
Chocolate	V	single	25g	124	0			
Other processed food products and prepared dishes								
unspecified	V, VI	single	25g	139	0			

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
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V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Listeria monocytogenes presence in x g	> detection limit but =< 100 cfu/g	L. monocytogenes > 100 cfu/g	L. innocua
Meat from broilers (Gallus gallus)									
fresh	I, III	single	25g	319	7		7	0	2
meat products									
cooked, ready-to-eat	II, III, VII, VIII	single	25g	21	1		1	0	
Meat from pig	III, VII	single	25g	54	5		5		
fresh	II, IV, VI, VII	single	25g	98	9		9		
meat preparation									
intended to be eaten cooked									
chilled									
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring plan A45, see text Salmonella spp. in food)	III, V, VI	single	25g	96	4		4		
Meat from bovine animals	III, VII	single	25g	57	6		6		
fresh	III, VIII	single	25g	5	0				
meat preparation									
intended to be eaten cooked									
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring plan A08, see text Salmonella spp. in food)	II, III, V, VII	single	25g	112	6		6		
Fish									
smoked	II, III, VII, VIII	single	25g	46	0				
unspecified	I, II, III, IV, V, VI, VII, VIII	single	25g	413	20		19	1	6
Crustaceans									

unspecified									
cooked	IV, VI, VII, VIII	single	25g	30	0				
shrimps									
shelled, shucked and cooked									
chilled									
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring plan A51, see text Salmonella spp. in food)	II, III, IV, VI, VII, VIII	single	25g	105	0				
Foodstuffs intended for special nutritional uses	II, VI	single	25g	28	0				
Meat from turkey									
meat products									
cooked, ready-to-eat	VIII	single	25g	19	0				
Meat from poultry, unspecified									
meat products									
cooked, ready-to-eat									
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring plan A20, see text Salmonella spp. in food)	I, II, III, IV, V, VI, VII, VIII	single	25g	104	3		3		
Other processed food products and prepared dishes	V	single	25g	2	0				
unspecified	V	single	25g	44	0				
ready-to-eat foods	II	single	25g	25	0				
Meat, red meat (meat from bovines, pigs, goats, sheep, horses, donkeys, bison and water buffalos)									
minced meat									
intended to be eaten cooked	III	single	25g	24	8		8		
Meat from bovine animals and pig									
meat products	III	single	25g	27	2		2		
Meat from sheep									
fresh	III	single	25g	3	0				

Footnote

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V) AGES ILMU Wien
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VIII) AGES ILMU Innsbruck

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

Listeriosis is not notifiable in animal species.

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

a source of infection)

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	L. ivanovii
Cattle (bovine animals)	II	animal	353	3	3		
Sheep	II	animal	171	12	11		1
Goats	II	animal	63	1	1		
Pigs	II	animal	211	0			
Deer	II	animal	28	2	1	1	
Hares	II	animal	58	0			

Footnote

II) All 4 AGES Institutes for Veterinary Disease Control and Carinthian Institute for Veterinary Disease Control, Ehrental

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 2006, 345 samples were investigated at the Austrian Reference Center for Enterohemorrhagic Escherichia coli (EHEC). Thereby, 83 isolates (from 54 human, 5 veterinarian und 24 food samples) were confirmed, including 35 human EHEC, 19 human LP-STEC (Shiga toxin producing E. coli without eae-gene) and 2 serologically identified EHEC cases were diagnosed (56 human cases in total). Compared to the year before the number of EHEC O157 (16 isolates and 2 serologic cases) decreased a little bit, whereas the number of EHEC non-O157 was similar to the year before. Among the 56 diagnosed human EHEC and STEC cases in 2006, 5 cases with hemolytic uremic syndrome (HUS) as post infectious complication were diagnosed (2 caused by O157, one by O71:H8, one by O174:H21 and one by a double infection of ONT:H18 and O148:H-). The incidence of HUS in children in Austria due to EHEC and STEC was 0.23 HUS-cases per 100.000 children of age between 0 and 14 years in the year 2006.

The number of EHEC/STEC cases varied drastically between the different provinces, led by the province Tyrol with 37 confirmed 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 2006, only 4 small family outbreaks.

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 (as a source of infection)

In 2005, 6.0% (CI 3.1 â 10.5; 12 out of 201 samples) of slaughtered bovine animals were positive in the VT ELISA. VTEC could be isolated from 3.0% (CI 1.1 â 6.4; 6 out of 201 samples). One isolate, an E. coli O157:H7, positive for stx1 and stx2, was the only that harboured the eae-gene for the virulence factor Intimin. In 2004, in 1 out 287 samples (0.3%) E. coli O163:H- harbouring stx1, eae and EHEC-hly could be detected.

4.3% (CI 1.2 â 10.8; 4 out of 92 samples) of slaughtered sheep were positive in the VT-ELISA and from all 4 samples VTEC could be isolated. None of these isolates harboured the intimin gene.

The data of two outbreaks in Austria in 2003 involving environmental transmission or animal contact have been published as full papers (Grif et al., 2005, Eur J Clin Microbiol Infect Dis 24: 268-271 & Orth et al., 2006, Epidemiol Infect, in press).

Recent actions taken to control the zoonoses

An Austrian wide monitoring program on the trends of VTEC prevalence in bovine animals and sheep/goats 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/8/05 (Ã berwachungsprogramme 2005 zu ausgewÃ¤hlten Zoonosen und Antibiotikaresistenzen). The sampling was carried out from 30 May to 2 December 2005 and follow up programs will be realized in the forthcoming years.

Suggestions to the Community for the actions to be taken

More widespread information for parents, paediatrics and general practioners.

Additional information

The National Reference Center at 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 patientâ s specimen the patient and his family are interviewed using a questionnaire. Thereby, information about the clinical illness of the patient and the exposure in the 6 days prior to the onset of the illness is collected. Thus, the Reference Center contributes to finding the source of infection. The Reference Center is also in close contact with the Local and Regional Health Authorities by reporting EHEC cases and discussing the necessary environmental investigations.

2.4.2. E. Coli Infections in humans

A. Verotoxigenic Escherichia coli infections 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

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 Â°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 further confirmed by conventional biochemical tests (API 20 E, bioMerieux, Marcy-lÂ´Etoile, France). Enrichments are plated on Sorbitol-MacConkey agar and incubated for 24 hours at 37 Â°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.

Notification system in place

Medical doctors specialised in Laboratory Diagnosis or Microbiology and Hygiene and the attended physicians are subjected to notification. Notification of bacteriological food-borne illness according to the epidemic act has been mandatory since 1950 (BGBl. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

See History of the disease, general evaluation.

Results of the investigation

See table.

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

See History of the disease, general evaluation.

Relevance as zoonotic disease

HUS is a rare disease, but EHECs themselves are not rare, which means that a systemic disease develops only under certain particular predispositions, most of which are currently unknown. Although uncooked meat and unpasteurised dairy products are likely candidates to contract the bacterium, the source of an infection often remains unclear.

Additional information

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

Table Escherichia coli, pathogenic in humans - Age distribution

Escherichia coli, pathogenic	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
HUS						
- clinical cases	5	0.06				
- lab. confirmed cases	5	0.06				
- caused by O157 (VT+)	2	0.02				
- caused by other VTEC	3	0.04			1	0.01
E.coli infect. (except HUS)						
- clinical cases	51	0.62				
- laboratory confirmed	51	0.62				
- caused by 0157 (VT+)	16	0.19				
- caused by other VTEC	35	0.42				

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

	Verotoxigenic E. coli (VTEC)			VTEC O157:H7			VTEC non-O157		
Age Distribution	**All**	**M**	**F**	**All**	**M**	**F**	**All**	**M**	**F**
<1 year	2	1	1	0	0	0	2	1	1
1 to 4 years	39	22	17	12	5	7	27	17	10
5 to 14 years	9	6	3	4	2	2	5	4	1
15 to 24 years	0	0	0	0	0	0	0	0	0
25 to 44 years	2	0	2	2	0	2	0	0	0
45 to 64 years	1	1	0	0	0	0	1	1	0
65 years and older	3	2	1	0	0	0	3	2	1
Age unknown	0	0	0	0	0	0	0	0	0
Total :	56	32	24	18	7	11	38	25	13

2.4.3. Escherichia coli, pathogenic in foodstuffs

A. Verotoxigenic E. coli (VTEC) in food

Monitoring system

Sampling strategy

No surveillance programmes are applied.

Foodstuff was sampled according to the Erlass der Bundesministerin fÃ¼r Gesundheit und Frauen: Revisions- und Probenplan fÃ¼r das Jahr 2005; Richtlinien Ã¼ber die Vollziehung der Ã berwachung des Verkehrs mit den durch das LMG 1975 erfassten Waren (GZ BMGF-75500/0087--IV/B/10/2004 of 23.12.2004). The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail etc. that have to be tested randomly per province according to the number of food enterprises per province. Each business has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP, control of manufacturing processes etc.

The sampling plan determines the number of samples of each class of goods, as raw meat, fresh or frozen; sausages; cheeses; milk; preserved food etc. that have to be investigated randomly.

Samples from suspected foodstuffs are taken following outbreak investigation, complaint, confiscation, violation etc.

Information about the special monitoring programs (Schwerpunktprogramm 2006) for VT E.coli can be found on page 14.

Diagnostic/analytical methods used

Suspected food was preenriched in modified tryptic soy bouillon containing novobiocin at 37

Â°C for 24 hours. The enrichment is plated on FluorocultÂ® ECD Agar or Chromocult Coliformen Agar at 37 Â°C for 24 hours. The enrichment or E. coli colonies are tested in PCRs for harbouring Shiga Toxin 1 and/or 2 genes (Brian MJ et al., 1992: Polymerase chain reaction for diagnosis of enterohemorrhagic Escherichia coli infection and haemolytic-uremic syndrome. J. Clin. Microbiol. 30, pp. 1801-1806). Each Shiga-Toxin producing E. coli is serotyped in the National Reference Laboratory for EHEC and virulence factors are determined.

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

In 5 out of 112 bovine meat preparation samples (4.5%) from the special food programme A08, VT E.coli was detected. Also in 2 of the 164 samples (1.2%) of minced meat â intended to be eaten cooked, the pathogen was found.

Table VT E. coli in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Escherichia coli, pathogenic	E.coli, pathogenic, unspecified	Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O2:H6	Verotoxigenic E. coli (VTEC) - VTEC O128abc:H2	Verotoxigenic E. coli (VTEC) - VTEC O157:H19	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified	Verotoxigenic E. coli (VTEC) - VTEC O100:H-	Verotoxigenic E. coli (VTEC) - VTEC O113:H4	Verotoxigenic E. coli (VTEC) - VTEC O1:H10
Meat from broilers (Gallus gallus)		---													
fresh	V, VIII	single	25g	1	0										
Meat from pig		---													
fresh	VII	single	25g	10	0										
Meat from bovine animals		---													
fresh	II, V, VII, VIII	single	25g	31	0										
minced meat															
intended to be eaten cooked	V, VIII	single	25g	6	0										
meat preparation															

intended to be eaten cooked															
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring plan A08, see text Salmonella spp. in food)	II, III, V, VII	single	25g	112	5		5	1	1				1	1	1
Milk, cows'															
raw		---													
intended for direct human consumption	V, VIII	single	25g	3	0										
raw milk for manufacture															
intended for manufacture of raw or low heat-treated products	V, VIII	single	25g	20	0										
Milk, goats'															
raw		---													
intended for direct human consumption	II	single	25g	8	0										
raw milk for manufacture															
intended for manufacture of raw or low heat-treated products	V, VIII	single	25g	2	0										
Vegetables	V, VIII	single	25g	3	0										
Milk, sheep's															
pasteurised	V, VIII	single	25g	6	0										
Meat from bovine animals and pig															
minced meat															
intended to be eaten cooked	V, VIII	single	25g	164	2		2			1			1		
Juice	V, VIII	single	25g	118	0										

Other processed food products and prepared dishes	V, VII, VIII	single	25g	23	0										

Footnote

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VIII) AGES ILMU Innsbruck

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: At an estimated prevalence for VTEC of 5.9 %, based on the weighted results from the monitoring in 2004 and 2005, and a desired accuracy of 5 % for a confidence level of 95%, a VTEC ELISA test sensitivity of 95 % and specificity of 98 %, 288 slaughtered bovine animals had to be tested, calculated on approximately 650,000 slaughtered bovine animals in Austria in 2004.

The sampling had been stratified on the number of slaughtering by abattoirs all over Austria. The date of sampling was randomized over the period of the study.

In Austria, all 68 abattoirs in which more than 500 bovine animals were slaughtered in 2004 accounted for approximately 83% of the total annual bovine production. Sampling was planned in 51 of the 68 abattoirs excluding those in which only one sampling in the whole period of the study would have been carried out.

Frequency of the sampling

Animals at slaughter (herd based approach)

Other: The sampling was distributed by randomization over the period of the study from January 16th to November 17th 2006.

Type of specimen taken

Animals at slaughter (herd based approach)

Other: Colon containing a minimum of 50 to 100 grams of faeces.

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

The sampling was performed by official veterinarians carrying out the post â 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 Â°C the sample was sent within the same day in a hobbock or polystyrene box after adding cooling units to the locally appropriate AGES Institute of Veterinary Diseases Control (IVET). All samples were forwarded to the IVET in Linz, where the VTEC â examinations were carried out. In the laboratory some content of each colon was inoculated into bouillon.

Case definition

Animals at slaughter (herd based approach)

An animal is considered to be infected with VTEC following the isolation of VTEC from its intestine.

Diagnostic/analytical methods used

Animals at slaughter (herd based approach)

Other: At first approximately 1 g of content of the colon was preenriched in modified tryptic soy bouillon containing novobiocin (mTSB + n) for 5 hours at 37 Â°C on a shaker. Then 1 ml was inoculated into mTSB + n containing mitomycin C for 18-20 hours at 37Â°C on a shaker too. The process was followed by testing the enrichment for the occurrence of verotoxin in an enzyme immune assay (RidascreenÂ®, Premier (TM) EHEC). Positive enrichments were plated on MacConkey (MAC) - and on cefixime tellurite sorbitol MAC (CTSMAC) agar and incubated for 24 hours at 37Â°C. 2-4 colonies from each of the plates were subcultered on MAC as well as on CTSMAC. Afterwards the genomes of subcultered 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).

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

Findings of VTEC in animals are not notifiable.

Results of the investigation

See tables

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

The prevalence of isolated VTEC for cattle and small ruminants is stable below 5 %.

Additional information

Nil

B. Verotoxigenic E. coli (VTEC) in animal - Sheep and goats - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling

Monitoring system

Sampling strategy

Monitoring program on the prevalence of VTEC in slaughtered animals: At an estimated prevalence for VTEC of 3.7 %, based on the weighted results from the monitoring in 2004 and 2005, and a desired accuracy of 5% for a confidence level of 95%, a VTEC ELISA test sensitivity of 95 % and specificity of 98 %, 101 slaughtered sheep and goats had to be tested, calculated on approximately 340,000 slaughtered sheep and goats in Austria in 2004.

The sampling had been stratified on the number of slaughtering by abattoirs all over Austria. The date of sampling was randomized over the period of the study.

In Austria, all 11 abattoirs in which more than 200 sheep and goats were slaughtered in 2004 accounted for more than 90% of the total annual sheep and goat production. Sampling was performed in the 11 abattoirs.

Frequency of the sampling

Animals at slaughter (herd based approach)

Other: The sampling was distributed by randomization over the period of the study from January 16th to November 17th 2006.

Type of specimen taken

Animals at slaughter (herd based approach)

Other: Colon containing a minimum of 50 to 100 grams of faeces.

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

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 4Â°C the sample was sent in a hobbock or polystyrene box after adding cooling units to the locally appropriate AGES Institute of Veterinary Diseases Control (IVET). All samples were forwarded to the IVET in Linz, where the VTEC examinations were carried out. In the laboratory some content of each colon was inoculated into bouillon.

Case definition

Animals at slaughter (herd based approach)

A sheep or goat is considered to be infected with VTEC following the isolation of VTEC from its intestine.

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

Findings of VTEC in animals are not notifiable.

Results of the investigation

See table.

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

The prevalence of isolated VTEC for cattle and small ruminants is stable below 5 %.

Additional information

Nil

Table VT E. coli in animals

	Source of information	Sampling unit	Units tested	Total units positive for Escherichia coli, pathogenic	E.coli, pathogenic, unspecified	Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O174:H28	Verotoxigenic E. coli (VTEC) - VTEC O179:H8	Verotoxigenic E. coli (VTEC) - VTEC O76:H-	Verotoxigenic E. coli (VTEC) - VTEC O103:H2	Verotoxigenic E. coli (VTEC) - VTEC O116:H-	Verotoxigenic E. coli (VTEC) - VTEC O84:H-	Verotoxigenic E. coli (VTEC) - VTEC O174:H2	Verotoxigenic E. coli (VTEC) - VTEC O128abc:H2	Verotoxigenic E. coli (VTEC) - VTEC O124abc:H10	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified
Cattle (bovine animals)		---															
calves (under 1 year) (1)	I	animal	10	0		0											2
meat production animals (2)	I	animal	93	1		1					1						3
dairy cows	I	animal	194	6		6	1	1			2	1	1				9
Sheep	I	animal	127	3		3			1	1				1			4
Goats	I	animal	2	1		1									1		1

(1) : under 6 months of age
(2) : 6 to 18 months of age

Footnote

I = AGES Institute for Veterinary Disease Control in Linz and NRL VTEC.
For some EIA positive samples (Verotoxigenic E. coli - VTEC, unspecified) no VTEC isolation was possible. EIA = Enzyme immune assay.

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. In 2006, Mycobacterium bovis accounted for 3 and M. caprae for 2 of all human cases (definite cases). Incidence of definitive human tuberculosis was 6.24/100,000 (521 cases) and an overall incidence of 10.04/100,000 (830 cases definite and other than definite cases combined) in 2006.

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

Bovine tuberculosis poses no major public health problem. Cattle, sheep, goats and pigs are free of bovine tuberculosis: no single case was detected in 2006

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

Absence of positive findings in 2006

Recent actions taken to control the zoonoses

No new measures implemented

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

Case definition

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.

Diagnostic/analytical methods used

- 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 Â°C 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 BGBl. 127/1968: Tuberkulose-gesetz, as amended; National Regulation BGBl. Nr. 254/2004: Anzeigepflichtige Ã¼bertragbare Krankheiten 2004). M. bovis is notifiable since 2004 (National Regulation BGBl. Nr. 254/2004: Anzeigepflichtige Ã¼bertragbare 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

The 5 human cases (3 M. bovis, 2 M. caprae cases) are under investigation.

Relevance as zoonotic disease

The relevance is inconsiderable; in average only five of 830 human tuberculosis cases are caused by M. bovis/M caprae.

Table Mycobacterium in humans - Species/serotype distribution

Mycobacterium	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
Mycobacterium	**521**	**6.3**	**294**	**3.64**	**168**	**2.03**
M. bovis	3	0.04	1	0.1	2	0.02
M. tuberculosis	516	6.24	291	3.52	166	2.01
M. caprae	2	0.02	2	0.02	0	0
Reactivation of previous cases						
M. tuberculosis other than definitive according to WHO	309	3.74	158	1.91	112	1.35

Table Mycobacterium in humans - Age distribution

Age Distribution	M. bovis			M. tuberculosis			M. caprae		
	All	M	F	All	M	F	All	M	F
<1 year	0	0	0	9	3	6	0	0	0
1 to 4 years	0	0	0	11	6	5	0	0	0
5 to 14 years	0	0	0	8	2	6	0	0	0
15 to 24 years	0	0	0	48	31	17	0	0	0
25 to 44 years	0	0	0	163	115	48	0	0	0
45 to 64 years	2	1	1	154	128	26	0	0	0
65 years and older	1	1	0	123	70	53	2	1	1
Age unknown	0	0	0	0	0	0	0	0	0
Total :	3	2	1	516	355	161	2	1	1

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

The entire country free: Yes

Additional information

According to Council Directive 64/432/EWG from June 26th 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.

Monitoring system

Sampling strategy

Specimen from carcasses with macroscopically alterations suspicious for tuberculosis of are sampled in slaughterhouses and sent to an Institute for Veterinary Diagnosis.

Frequency of the sampling

Permanent post-mortem inspections of each slaughtered bovine and caprine animal.

Type of specimen taken

Organs/ tissues: Macroscopically tuberculous alterations and lymph nodes

Methods of sampling (description of sampling techniques)

The alterations and lymph nodes are excised and sent to the laboratory.

Case definition

According to Order Richtlinien fÃ¼r die veterinÃ¤rbehÃ¶rdliche Ã berwachung zur Erhaltung der Freiheit der Ã¶sterreichischen RinderbestÃ¤nde von Rindertuberkulose und zur DurchfÃ¼hrung und Beurteilung der intrakutanen Tuberkulinprobe (GZ 39.624/9-IX/A/8/00): 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 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 37Â°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

Compulsory ante-mortem and post-mortem inspection of all slaughtered bovine and caprine carcasses originating from official tuberculosis free holding.

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.

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.

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 mountain pastures or market places etc.

Regaining the status OTF:

There are 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 suspicion of tuberculosis has to be notified by the veterinarian/animal keeper/the person who takes care of the animals/other persons to the mayor, by the veterinarian additionally to the local authority and the diagnostic finding by the institute for Veterinary diagnosis as well to the local authority as to the office of the provincial government responsible for the holding, from which the tuberculosis-positive animal was originated. (BGBl. 1994/395, Fleischuntersuchungsverordnung, Â§ 10 (8), as amended or BGBl. 1909/177, Tierseuchengesetz, as amended).

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

In the area of Northern Tyrol and Southern Bavaria there is an endemic area for deer infected with M. caprae (Prodinger, W. M., A. Eigentler, F. Allerberger, M. Schonbauer, and W. Glawischnig.

2002. Infection of red deer, cattle, and humans with Mycobacterium bovis subsp. caprae in Western Austria. J. Clin. Microbiol. 40:2270-2272). Following the excretion of mycobacteria by the deer on mountain pastures the cows could be infected pasturing on the contaminated feedlots. (Last cases in cows notified in 2002).

In Austria, in the Tyrolean northern pre-Alps tuberculosis due to Mycobacterium caprae has been detected in 13 wildlife red deer since 1998. Animal contacts between farmed and wildlife deer shall be deemed to be theoretically because all deer farms are fenced in.

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

Nil

Additional information

M. caprae is differentiated in Austria.

B. Mycobacterium bovis in farmed deer

Monitoring system

Sampling strategy

Nil

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 laboratory

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 Â°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

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 according to BGBl. 1994/395, Fleischuntersuchungsverordnung, as amended) and RGBl. 1909/177, Tierseuchengesetz, as amended.

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

No cases in 2006 in Austria.

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

No cases in 2006 in Austria.

Additional information

Nil

C. Mycobacterium spp., unspecified in animal

Monitoring system

Sampling strategy

Samples from macroscopically suspected swine are taken in slaughterhouses

Frequency of the sampling

Permanent post-mortem inspections of each slaughtered animal

Type of specimen taken

Other: Macroscopically tuberculous alterations and lymphnodes

Methods of sampling (description of sampling techniques)

The alterations 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 37Â°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 according to Tierseuchengesetz RGBl. 1909/177 as amended.

Notification system in place

The suspicion and finding of tuberculosis is notifiable according to BGBl. 1994/395, Fleischuntersuchungsverordnung, as amended) and RGBl. 1909/177, Tierseuchengesetz, as amended.

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

No cases in 2006 in Austria.

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

No cases in 2006 in Austria.

Additional information

Nil

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium spp.	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified
Sheep	CVS	animal	310092	0			
Goats	CVS	animal	41625	0			
Pigs	CVS	animal	5361710	0			

Footnote

CVS = Central Veterinary Services, Federal Ministry of Health, Family and Youth

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	80257	1992716	80257	100	0	0	0	0	548	6	0
Total	80257	1992716	80257	100	0	0		0	548	6	0

Footnote

Source of information: Central Veterinary Services

(*) Legend:

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

2.6. BRUCELLOSIS

2.6.1. General evaluation of the national situation

A. Brucellosis general evaluation

History of the disease and/or infection in the country

Since decades, in Austria human brucellosis is 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

All human cases occurring in Austria in 2006 (n = 1) concerned immigrant workers who returned from their holiday at home and were most likely acquired abroad.

Recent actions taken to control the zoonoses

No new measures implemented

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

Nil

Case definition

Clinical description: Clinical picture compatible with brucellosis, e.g. acute or insidious onset of fever, night sweats, undue 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: Several blood samples are inoculated in blood culture broth in 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 QualitÃ¤tssicherung in der mikrobiologischen Diagnostik. Richtlinien. Bundesministerium fÃ¼r 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 subjected to notification. Notification of brucellosis according to the epidemic act has been mandatory since 1950 (BGBl. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

Austria is OBF and OBmF. All cases are epidemiologically linked to holidays in endemic countries or 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

Table Brucella in humans - Species/serotype distribution

Brucella	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
	1	0.01	0	0	1	0.01
B. abortus						
B. melitensis	1	0.01			1	0.01
B. suis						
Occupational cases						

Table Brucella in humans - Age distribution

Age Distribution	B. abortus			B. melitensis			Brucella spp.		
	All	M	F	All	M	F	All	M	F
<1 year									
1 to 4 years									
5 to 14 years									
15 to 24 years									
25 to 44 years									
45 to 64 years	0	0	0	1	1	0	1	1	0
65 years and older									
Age unknown									
Total :	0	0	0	1	1	0	1	1	0

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

According to the Council Directive 64/432/EEC of 26 June 1964, Austria revealed upon request in Commission Decision of July 15th 1999, CD 1999/466/EC, as amended, the status officially brucellosis-free for bovine herds.

Monitoring system

Sampling strategy

- Periodical monitoring scheme: Blood samples from cattle older than 2 years are monitored by means of serological tests. Samples are taken in the holdings; the sampling is part of a periodical monitoring scheme.

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

Frequency of the sampling

- Periodical monitoring scheme: Annually in 20% of the holdings in each province all cattle >= 2 years had to be examined. All holdings in each province were tested at least once in five years. Principally the sampling was performed during the cold season, between January and May and in November and December when the animals were kept in the stables.

- Abortion or premature birth: Abortion material and blood from the cow that had an abort was sampled immediately post abortion. If the result of the first serological examination was negative, a second blood sample was taken 2 weeks post abortion and tested again serologically. If this result was negative again, sampling and testing was repeated after two weeks.

Type of specimen taken

Other: - Periodical monitoring scheme: Blood samples

Methods of sampling (description of sampling techniques)

- Periodical monitoring scheme: Individual blood samples are taken in the holdings and sent to the laboratories.

- Abortion or premature birth: Abortive material and blood samples of the cow that had an abort had been sent to a veterinary laboratory.

Case definition

An animal is considered to be positive for Brucella abortus, in case of positive 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, Â§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

Periodical monitoring scheme: 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: Abortive material was tested bacteriologically and the cow that had an abort serologically as described above.

Bacteriology: Smears of the samples are stained by StableforthÂ´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 Â°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 (BGBl. 1957/147, Bangseuchengesetz, Â§ 13 Impfung)

Other preventive measures than vaccination in place

Periodical examinations, culling of reactors

Control program/mechanisms

The control program/strategies in place

Periodical monitoring scheme according the National Regulation BGBl 2003/526 (Bangseuchen-Untersuchungsverordnung 2004). Abortion or premature birth: Compulsory notification according BGBl 1957/147, Bangseuchengesetz, as amended, Â§11 Anzeigepflicht;

BGBl 1957/280, Bangseuchen-Verordnung, as amended, Â§9 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 BGBl 1957/147, Bangseuchengesetz, as amended, and BGBl 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 (BezirksverwaltungsbehÃ¶rde) (BGBl. 1957/147, Bangseuchengesetz, Â§ 11 Anzeigepflicht). If the cow is under treatment of a veterinarian or the veterinarian has been informed about the abortion, the veterinarian has to notify to the official authority

(BezirksverwaltungsbehÃ¶rde).

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 (as a source of infection)

Nil

Additional information

Nil

B. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

The entire country free

Yes.

Additional information

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

Monitoring system

Sampling strategy

To maintain the status officially brucellosis (B. melitensis) free, according to BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, of 14 May 2002) representative samples had been 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;

Abortion material and blood samples from the animal that had an abort were also investigated.

Frequency of the sampling

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

Methods of sampling (description of sampling techniques)

Individual blood samples and abortion material are taken in 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 StableforthÂ´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 Â°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 BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, of 14 May 2002, Â§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 BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, of 14 May 2002) representative 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 competent 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 BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, of 14 May 2002, Â§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 BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, 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 (as a source of infection)

Nil

Additional information

Nil

C. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

The entire country free

Yes.

Additional information

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

Monitoring system

Sampling strategy

To maintain the status officially brucellosis (B. melitensis) free, according to BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, of 14 May 2002) representative samples had been 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;

Abortion material and blood samples from the animal that had an abort were also investigated.

Frequency of the sampling

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

Type of specimen taken

Other: Monitoring: Blood samples; Clinical cases: Abortion material and blood samples from the animal that had an abort.

Methods of sampling (description of sampling techniques)

Individual blood samples and abortion material are taken in 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 StablefothÂ´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 Â°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 BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, of 14 May 2002, Â§4, Impfverbot) vaccination is not allowed.

Other preventive measures than vaccination in place

Monitoring program and investigation of abortions.

Control program/mechanisms

The control program/strategies in place

To maintain the status officially brucellosis (B. melitensis) free, according to BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, of 14 May 2002) representative 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 competent 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 BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, of 14 May 2002, Â§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 BGBl. 2002/184 (Brucella melitensis-Ã berwachungsverordnung, 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 (as a source of infection)

Nil

Additional information

Nil

D. B. suis in animal - Pigs - breeding animals - at farm - animal sample - blood - Clinical investigations - suspect sampling

Monitoring system

Sampling strategy

Abortion material and blood samples from pigs that had an abort are examined in veterinary laboratories.

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 animal that had an abort.

Methods of sampling (description of sampling techniques)

Monitoring: Blood samples; Clinical cases: Abortion material and blood samples from the animal that had an abort.

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) or infected with B. suis in case of bacteriological isolation.

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 StableforthÂ´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 37Â°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.

Notification system in place

B. suis is notifiable since 1993 according to BGBl 1993/756, Tierseuchen-Anzeigepflichtverordnung, as amended.

Results of the investigation

See table.

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 (as a source of infection)

Nil.

Additional information

Nil.

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. melitensis	B. abortus	B. suis	Brucella spp., unspecified
Pigs (1)	NRL B	animal	1088	0				
(tested by complement fixation test (additionally to RBT))	NRL B	animal	602	0				
(tested bacteriologically (additionally to RBT))	NRL B	animal	157	0				

(1) : tested by rose bengal test, RBT

Footnote

NRL B = National Reference Laboratory for Brucellosis

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance						Investigations of suspect cases								
							Serological tests			Examination of bulk milk samples			Information about abortions			Epidemiological investigation					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds tested	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Number of positive animals		Number of animals examined microbio logically	Number of animals positive microbio logically
																		Serologically	BST		
ÖSTERREICH	80257	1992716	80257	100	0	0	17050	202316	0	0	0	0	1262	0	0	412	13	0	0	0	0
Total	80257	1992716	80257	100	0	0	17050	202316	0	0	0	0	1262	0	0	412	13	0	0	0	0

Footnote

Source of information: Central Veterinary Services

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

Region	Total number of existing ovine / caprine		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases				
	Herds	Animals	Number of herds	%	Number of animals	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbio logically	Number of animals positive microbio logically	Number of suspended herds
ÖSTERREICH	27780	360397	27779	99.996	1	0.004	1551	11372	1	4	1	0	0	4
Total	27780	360397	27779	99.996	1	0.004	1551	11372	1	4	1	0	0	4

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.

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

In 2006, a total of 154 human infections were notified. 111 isolates from patients were sent to the National Reference Laboratory for Yersinia. The sources of infections are unclear. Neither studies on sporadic cases nor scientific outbreak investigations were performed in Austria so far.

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

No valid data are available for animals and feedingstuffs.

In 2006, a total of 96 single pig meat - raw samples (special food program A045) were tested for Yersinia spp. with 25 samples positive for Yersinia spp.

During the special food program A008 in 112 tested samples of bovine meat preparation (intended to be eaten cooked), 11 samples were found positive for Yersinia spp.

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. Yersinosis in humans

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 O3, O9 or O5 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 Â°C. Suspicious colonies are identified in an Api 20 E reaction and API 50 CHE reaction. Y. enterocolitica is agglutinated with sera against serogroups O3, O5, O9 and O8. Biovar and pathogenicy are defined.

Notification system in place

Medical doctors specialised in Laboratory Diagnosis or Microbiology and Hygiene and the attended physicians are subjected to notification. Notification of salmonellosis according to the epidemic act has been mandatory since 1950 (BGBl. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

Nil

Results of the investigation

See tables.

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

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

Relevance as zoonotic disease

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

Additional information

Nil.

Table Yersinia in humans - Species/serotype distribution

Yersinia	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
	111	1.34	0	0	0	0
Y. enterocolitica						
Y. pseudotuberculosis	1	0.01				
Yersinia spp., unspecified	1	0.01				
Y. enterocolitica - O:3	99	1.20				
Y. enterocolitica - O:9	10	0.12				

Table Yersinia in humans - Age distribution

Age Distribution	Y. enterocolitica			Yersinia spp.			O:3			O:9		
	All	M	F	All	M	F	All	M	F	All	M	F
<1 year	1	0	1				0	0	0	1	0	1
1 to 4 years	25	7	16				23	6	15	2	1	1
5 to 14 years	27	13	11				26	12	11	1	1	0
15 to 24 years	18	12	6				17	12	5	1	0	1
25 to 44 years	20	13	7				19	12	7	1	1	0
45 to 64 years	17	7	10				13	5	8	4	2	2
65 years and older	1	0	1				1	0	1	0	0	0
Age unknown	0	0	0				0	0	0	0	0	0
Total :	109	52	52	0	0	0	99	47	47	10	5	5

Table Yersinia in humans - Seasonal distribution

Month	Y. enterocolitica	Yersinia spp.	O:3	O:9
	Cases	Cases	Cases	Cases
January	6		6	0
February	6		6	0
March	17		15	2
April	7		7	0
May	14		13	1
June	6		5	1
July	8		6	2
August	11		8	3
September	7		6	1
October	12		12	0
November	8		8	0
December	7		7	0
not known	0		0	0
Total :	109	0	99	10

2.7.3. Yersinia in foodstuffs

A. Yersinia spp., unspecified in food

Monitoring system

Sampling strategy

No surveillance programmes are applied.

Foodstuff was sampled according to the Erlass der Bundesministerin fÃ¼r Gesundheit und Frauen: Revisions- und Probenplan fÃ¼r das Jahr 2006; Richtlinien Ã¼ber die Vollziehung der Ã berwachung des Verkehrs mit den durch das LMG 1975 erfassten Waren (GZ BMGF-75500/0164-IV/B/10/2005 of 26.01.2006). The Revision-Plan determines the number of food enterprises e.g. restaurants, dairies, retail etc. that have to be tested randomly per province according to the number of food enterprises per province. Each business has to be sampled at least once per year. The inspection can comprise sampling, hygienic investigations of the employees, checking of HACCP, control of manufacturing processes etc.

The sampling plan determines the number of samples of each class of goods, as raw meat, fresh or frozen; sausages; cheeses; milk; preserved food etc. that have to be investigated randomly.

Samples from suspected foodstuffs are taken following outbreak investigation, complaint, confiscation, violation etc.

Information about the special monitoring programs (Schwerpunktprogramm 2006) for Yersinia can be found on page 14.

Diagnostic/analytical methods used

Detection of Yersinia enterocolitica is performed according to ISO 10273:1994.

Table Yersinia in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica - O:3	Y. enterocolitica - O:9	Y. enterocolitica - unspecified
Meat from pig										
fresh	I	single	25g	3	0					
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring program A45, see text Salmonella spp. in food)	III, V, VI	single	25g	96	25		25			
Meat from bovine animals										
fresh	I	single	25g	10	3		3			
meat preparation										
intended to be eaten cooked										
- at retail - Monitoring - official sampling - objective sampling (Additional monitoring programm A8, see Salmonella spp. in food)	II, III, V, VII	single	25g	112	11		11			

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

2.7.4. Yersinia in animals

A. Yersinia spp., unspecified in animal

Monitoring system

Sampling strategy

Relevant only for Carinthian Institute for Veterinary Disease Control, Ehrental:

Animals with different clinical symptoms that have been dissected and fecal samples are tested for pathogenic bacteria. Organs and fecal samples are bacteriological cultured.

Frequency of the sampling

Clinical cases suspisious for different infectious diseases.

Type of specimen taken

Other: Different organs, feces and intestinal content

Case definition

Yersinia spp. isolated from clinical samples.

Diagnostic/analytical methods used

Specimen are plated on McConkey â and Blood agar plates. Plates are incubated at 37 Â°C in aerobic condition. Suspicious colonies are identified by API 20E.

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

Suggestions to the Community for the actions to be taken

EU wide harmonized monitoring program.

Measures in case of the positive findings or single cases

No measures foreseen.

Notification system in place

Findings of Yersinia are not notifiable in animals.

Results of the investigation

See tables.

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 (as a source of infection)

The relevance has not been investigated.

Additional information

Nil.

Table Yersinia in animals

	Source of information	Sampling unit	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. pseudotuberculosis	Y. enterocolitica - O:9	Y. enterocolitica - O:3	Y. enterocolitica - unspecified
Cattle (bovine animals)	*	animal	231	0						
Sheep	*	animal	49	0						
Goats	*	animal	1	0						
Pigs	*	animal	104	0						
Solipeds, domestic	*	animal	28	0						
Poultry, unspecified	*	animal	74	0						
Dogs	*	animal	96	0						
Cats	*	animal	57	0						
Pigeons	*	animal	1	0						
Deer	*	animal	9	0						
Hares	*	animal	58	2			2			
Rabbits	*	animal	8	0						
Guinea pigs	*	animal	3	0						
Snakes	*	animal	3	0						
Rats	*	animal	1	0						

Footnote

*) Carinthian Institute for Veterinary Disease Control, Ehrenthal

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 2006.

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

No documented human infections in 2006.

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

No documented infections in food-animals in 2006.

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 among symptomatic persons 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 trichionellosis according to the epidemic act since 1950 (BGBl. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

The last autochthonous cases have been reported in 1970.

Results of the investigation

No cases in 2006.

Description of the positive cases detected during the reporting year

No cases identified during 2006.

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

Nil

Relevance as zoonotic disease

No relevance in Austria

Additional information

Nil.

Table Trichinella in humans - Species/serotype distribution

Trichinella	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
	0	0	0	0	0	0
Trichinella spp.	0	0				

2.8.3. Trichinella in animals

A. Trichinella in pigs

Monitoring system

Sampling strategy

General

Targeted sampling of all slaughtered except pigs slaughtered by the farmer for his own consumption (=hause-slaughtering); the sampling is performed by competent authorities and not stratified by geographical regions; the samples are taken at slaughterhouses; the sampling is part of a permanent monitoring scheme.

Frequency of the sampling

General

Permanent post-mortem sampling of each slaughtered pig.

Type of specimen taken

General

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

Diagnostic/analytical methods used

General

According to the Manual of OIE-standards trichinelosis chapter 2.2.9; no modification);

â ¢ Compression method: Two muscles in a size of a haselnut where taken from the diaphragma of a slaughtered pig from both muscles 7 small parts in the size of a oatcorn will be investigated in the compressorium (=14 parts from the diaphragma of one pig);

â ¢ Digestion method: maximum 100 samples (=100 pigs) - 1g muscle per each sample, digestion with pepsin, water and hydrochloric acid, incubation about 30-60 min, sedimentation and investigation with a stereo- or trichinoscope.

Preventive measures in place

Nil.

Control program/mechanisms

The control program/strategies in place

Austrian post mortem meat inspection law for trichinosis (BGBl. 522/1982), RL 92/117/EWG, RL 77/96/EWG

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 BGBl 1982/522, Fleischuntersuchungsverordnung, as amended and BGBl 1994/395, Fleischuntersuchungsverordnung, as amended: The carcass is unfit for human consumption and must be removed. If trichinosis was detected using the digestion method and the carcass infected with trichinella cannot be identified, after cold treatment applied to all carcasses pooled in the sample their meat is fit for human consumption.

Notification system in place

According to BGBl 1994/395, Â§10 (8), Fleischuntersuchungsverordnung, as amended: The competent authority has to notify the finding to the local authority and to the office of the provincial government responsible for the holding, from which the trichnellosis-positive animal was originated.

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

No findings in slaughtered pigs

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

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 and not stratified by geographical regions; 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 the Manual of OIE-standards trichinelosis chapter 2.2.9; no modification).

â ¢ Compression method: Two muscles in a size of a haselnut where taken from the diaphragma of a slaughtered horse from both muscles 7 small parts in the size of a oatcorn will be investigated in the compressorium (=14 parts from the diaphragma of one horse);

â ¢ Digestion method: maximum 100 samples (=100 horses)- 1g muscle per each sample, digestion with pepsin, water and hydrochloric acid, incubation about 30-60 min, sedimentation and investigation with a stereo- or trichinoscope.

Results of the investigation including the origin of the positive animals

See table.

Control program/mechanisms

The control program/strategies in place

Austrian post mortem meat inspection law for trichinosis (BGBl. 522/1982), RL 92/117/EWG, RL 77/96/EWG.

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 BGBl 1982/522, Fleischuntersuchungsverordnung, as amended and BGBl 1994/395, Fleischuntersuchungsverordnung, as amended: The carcass is unfit for human consumption and must be removed. If trichinosis was detected using the digestion method and the carcass infected with trichinella cannot be identified, after cold treatment applied to all carcasses pooled in the sample their meat is fit for human consumption.

Notification system in place

According to BGBl 1994/395, Â§10 (8), Fleischuntersuchungsverordnung, as amended: The competent authority has to notify the finding to the local authority and to the office of the provincial government responsible for the holding, from which the trichinellosis-positive animal was originated.

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 (as a source of infection)

Nil.

Additional information

Nil.

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

Monitoring system

Sampling strategy

Sampling of all hunted or harvested wild boars; the sampling is performed by hunters with special knowledge about trichnella investigation or by competent authorities; the sampling is stratified by geographical regions depending to the habitats of wild boar in Austria; samples are taken after shouting 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; only about 50% of all free-living Austrian wild boars (1998-2000) were investigated for trichinella parasites.

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 the Manual of OIE-standards trichinelosis chapter 2.2.9; no modification)

â ¢ Compression method: Farmed and free-living wild boars: pieces from muscles in a size of a haselnut where taken from the tongue, diaphragma, masseter, forearm and intercostals part from all muscles 28 small parts in summary in the size of a oatcorn should be investigated in the compressorium.

â ¢ Digestion method: Farmed and free-living wild boars-maximum 100 samples (=100 wild boars)- 1g muscle per each sample, digestion with pepsin, water and hydrochloric acid, incubation about 30-60 min, sedimentation and investigation with a stereo- or trichinoscope.

Control program/mechanisms

The control program/strategies in place

Austrian post mortem meat inspection law for trichinosis (BGBl. 522/1982), RL 92/117/EWG, RL 77/96/EWG.

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 BGBl 1982/522, Fleischuntersuchungsverordnung, as amended and BGBl

1994/395, Fleischuntersuchungsverordnung, as amended: The carcass is unfit for human consumption and must be removed.

Notification system in place

According to BGBl 1994/395, Â§10 (8), Fleischuntersuchungsverordnung, as amended: The competent authority has to notify the finding to the local authority and to the office of the provincial government responsible for the holding, from which the trichinellosis-positive animal was originated.

Results of the investigation including the origin of the positive animals

See table.

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 (as a source of infection)

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		---				
fattening pigs						
raised under controlled housing conditions in integrated production system	CVS	animal	5361710	0		

Footnote

CVS) Central Verinary Services, Federal Ministry for Health, Family and Youth

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 prevalence to be low also in future. We see approx. 1-2 human cases of Echinococcus multilocularis infestation in Austria per year; in 2006 there were even 24 patients with the large majority of cases who acquired the cystic infection during childhood in countries like former Jugoslawia or Turkey (in 2005: 31 imported cases). 2 cases of alveolar echinococcosis were probable autochtone cases.

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

Alveolar echinococcosis: Due to the infection rates of red foxes in Austria (0-40 %) there is a relatively elevated risk for hunters, cat owners and farmers. Austrian sheep are no relevant source for cystic echinococcosis in Austrian patients.

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 (BGBl. II, 254/2004 of 18 June in 2004, Anzeigepflichtige Ã¼bertragbare Krankheiten 2004)

History of the disease and/or infection in the country

â ¢ 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 are known from each province; outbreaks are not known.

â ¢ 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

â ¢ Alveolar echinococcosis: We expect the prevalence to be low in future; sources of infection: fox faeces (contaminated hands and fingers, vegetables, water).

â ¢ Cystic echinococcosis: We expect the prevalence to be low in future; 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

Table Echinococcus in humans - Species/serotype distribution

	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
Echinococcus	**26**	**0.31**	**5**	**0.06**	**21**	**0.25**
E. granulosus	24	0.29	3	0.04	21	0.25
E. multilocularis	2	0.02	2	0.02	0	0
Echinococcus spp.						

Table Echinococcus in humans - Age distribution

Age Distribution	E. granulosus			E. multilocularis			Echinococcus spp.		
	All	M	F	All	M	F	All	M	F
<1 year	0	0	0	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0	0	0	0
5 to 14 years	1	1	0	0	0	0	1	1	0
15 to 24 years	6	4	2	0	0	0	6	4	2
25 to 44 years	11	7	4	1	1		12	8	4
45 to 64 years	5	3	2	1	0	1	6	3	3
65 years and older	1	0	1	0	0	0	1	0	1
Age unknown	0	0	0	0	0	0	0	0	0
Total :	24	15	9	2	1	1	26	16	10

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

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 BGBl. 1982/522, Fleischuntersuchungsgesetz, 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 BGBl 1982/522, Fleischuntersuchungsverordnung, as amended and BGBl 1994/395, Fleischuntersuchungsverordnung, as amended: The carcass is unfit for human consumption and must be removed.

Notification system in place

According to BGBl 1994/395, Â§10 (8), Fleischuntersuchungsverordnung, as amended: The competent authority has to notify the finding to the local authority.

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

In 2006 no case was detected in the post-mortem inspection.

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

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 Echinococcus spp.	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Cattle (bovine animals)	CVS	animal	682763	0			
Sheep	CVS	animal	310092	0			
Goats	CVS	animal	41625	0			
Pigs	CVS	animal	5361710	0			

Footnote

CVS) Central Veterinary Services, Federal Ministry for Health, Family and Youth

2.10. TOXOPLASMOSIS

2.10.1. General evaluation of the national situation

A. Toxoplasmosis general evaluation

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

Nil

Recent actions taken to control the zoonoses

Nil

Suggestions to the Community for the actions to be taken

Nil

2.10.2. Toxoplasmosis in humans

A. Toxoplasmosis in humans

Reporting system in place for the human cases

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 in case of clinical suspicion of toxoplasmosis and after abortion. Other species of animals are also occasionally sampled.

Frequency of the sampling

In case of clinical suspicion and abortion.

Case definition

A case is defined as an animal being tested positive. 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

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

Notification system in place

Toxoplasmosis is not notifiable in animals.

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

Nil

Table Toxoplasma in animals

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma gondii
Cattle (bovine animals)	MOE	animal	15	1
Sheep	MOE	animal	98	32
Goats	MOE	animal	64	11
Pigs	MOE	animal	48	8
Solipeds, domestic	MOE	animal	0	0
Dogs	MOE	animal	0	0
Cats	MOE	animal	0	0

Footnote

MOE) AGES Institute for Veterinary Disease Control Moedling

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 2006, there was (no) one case of a positive fox in Austria, but the differentiation revealed that the virus was vaccination strain.

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

Nil

Recent actions taken to control the zoonoses

In 2006 there was still vaccination programs carried out.

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 conjuntivae 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 (BGBl. 1950/186 Epidemiegesetz, as amended).

History of the disease and/or infection in the country

Nil

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

Nil

Relevance as zoonotic disease

Nil

2.11.3. Lyssavirus (rabies) in animals

A. unspecified Lyssavirus in animal - Foxes

Monitoring system

Sampling strategy

According to (GZ:39.642/14-VII/B/03): 8 foxes per 100kmÂ² in rabies infested and rabies endangered areas, 4 foxes per 100kmÂ² in not endangered and free areas (definition of areas: GZ 30.517/35-IV/12/03).

Frequency of the sampling

8 foxes per 100 kmÂ² in rabies infested and rabies endangered areas, 4 foxes per 100kmÂ² in not endangered and free areas.

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 cmÂ²) 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.

(The MIT (mouse inoculation test) was used to confirm positive findings) MIT is 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

Other preventive measures than vaccination in place

No measures

Control program/mechanisms

The control program/strategies in place

Fuchs-TollwutbekÃ¤mpfungsverordnung BGBl II 2001/75, Tierseuchengesetz TSG RGBl 1909/177 as amended, BGBl I 2002/65 IV. Abschnitt, Â§41, Â§42, Tierseuchengesetz-DurchfÃ¼hrungsverordnung 1909/178 as amended: BGBl 1955/76 TSG-DVO zum IV. Abschnitt Wutkrankheiten

â ¢ Control of vaccination: Detection of tetracycline in jaw bones of randomly chosen fox from the vaccination area; additionally an ELISA is performed to proof seroconversion.

Recent actions taken to control the zoonoses

In 2006, there were still vaccination programmes carried out (due to rabies in fox in 2003).

Suggestions to the Community for the actions to be taken

Nil

Measures in case of the positive findings or single cases

Tierseuchengesetz TSG RGBl 1909/177 as amended, BGBl I 2002/65 IV. Abschnitt, Â§41, Â§42, and vaccination of the Fox Population

Notification system in place

According to Tierseuchengesetz TSG RGBl 1909/177 as amended, BGBl I 2002/65 IV. Abschnitt, Â§41, Â§42

Results of the investigation

Nil

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

The virus isolated from a dead fox was not a wild rabies strain, but a vaccination strain. It is well known that vaccination of fox populations can cause lethality in very young animals.

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

Nil

B. unspecified Lyssavirus in animal

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 carcasses or heads sent to the laboratory.

Frequency of the sampling

In case of suspicion

Methods of sampling (description of sampling techniques)

Routinely there will be taken one site from the brain either a part from the amonÂ´s horn, brain stem or cerebellum. If an animal has bitten a person then 2 sites from the brain will be taken: ammonÂ´s horn and brain stem.

Case definition

An animal is considered positive if the fluorescent antibody test (FAT) or the rabies tissue culture infection test or the mouse inoculation test reveal 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.

(The MIT (mouse inoculation test) was used to confirm positive findings); MIT is 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

Tierseuchengesetz TSG RGBl 1909/177 as amended, BGBl I 2002/65 IV. Abschnitt, Â§41, Â§42; Tierseuchengesetz-DurchfÃ¼hrungsverordnung 1909/178 as amended: BGBl 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 RGBl 1909/177 as amended, BGBl I 2002/65 IV. Abschnitt, Â§41, Â§42. If a rabies suspicious pet bites a person, the person is treated.

Notification system in place

According to Tierseuchengesetz TSG RGBl 1909/177 as amended, BGBl I 2002/65 IV. Abschnitt,

Â§41, Â§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 (as a source of infection)

Nil

Additional information

Nil

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	unspecified Lyssavirus	European Bat Lyssavirus - unspecified	classical rabies virus (genotype 1)
Cattle (bovine animals)	*	animal	16	0			
Solipeds, domestic	*	animal	3	0			
Dogs	*	animal	68	0			
Cats	*	animal	77	0			
Bats							
wild	*	animal	2	0			
Foxes							
wild (1)	*	animal	7215	1			
Badgers							
wild	*	animal	83	0			
Marten							
wild	*	animal	713	0			
Wild boars							
wild	*	animal	2	0			
Deer		---					
wild							
roe deer	*	animal	14	0			
fallow deer	*	animal	2	0			
Other mustelides	*	animal	21	0			

(1) : The virus isolated from a dead fox was not a wild rabies strain, but a vaccination strain.

Footnote

*) National Reference Laboratory for Rabies, AGES

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.

Case definition

A case is defined as an animal being tested positive. The animal is the epidemiological unit.

Diagnostic/analytical methods used

The diagnostiv method is the compement fixation reaction detecting phase 1 and phase 2 antigen.

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 is not notifiable in animals

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

Human cases of Q-fever are not notifiable.

Table Coxiella burnetii (Q fever) in animals

	Source of information	Sampling unit	Units tested	Total units positive for Coxiella burnetii
Cattle (bovine animals)	MOE	animal	863	72
Sheep	MOE	animal	78	18
Goats	MOE	animal	20	6

Footnote

MOE) AGES Institute for Veterinary Disease Control Moedling

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1. ESCHERICHIA COLI, NON-PATHOGENIC

3.1.1. General evaluation of the national situation

A. Escherichia coli general evaluation

History of the disease and/or infection in the country

Resistance monitoring was started in Austria in 2004 and continued in 2005 and 2006.

Recent actions taken to control the zoonoses

The Austrian wide monitoring program on the trends of antimicrobial resistance of E. coli in poultry, 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 (Ã berwachungsprogramme 2005 zu ausgewÃ¤hlten Zoonosen und Antibiotikaresistenzen). The sampling was carried out from January 16th to November 17th 2006.

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

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

A. Antimicrobial resistance of E. coli in animal - Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling

Sampling strategy used in monitoring

Frequency of the sampling

Monitoring program on the occurrence and trend of antimicrobial resistance in E. coli is based on the prevalence of E. coli in slaughtered animals: At an estimated percentage of resistance in antimicrobials of 5.2 % in cattle and a desired accuracy of 6 % for a confidence level of 95%, 210 isolates of E. coli from bovine animals were required.

To obtain this number of isolates, as sample size 229 slaughtered bovine animals had to be tested, calculated on approximately 664.000 slaughtered bovine animals in 2004 in Austria, with an estimated prevalence of E. coli of 95 % based on the results from the monitoring in 2005, and at a desired accuracy of 5% for a confidence level of 95%. The sampling had been stratified on the number of slaughtering by abattoirs all over Austria. The date of sampling was randomized over the period of the study.

In Austria, all 68 abattoirs in which more than 500 bovine animals were slaughtered in 2004 accounted for approximately 83% of the total annual bovine production. Sampling was performed in 51 of the 68 abattoirs excluding those in which only one sampling in the whole period of the study would have been carried out.

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 Â°C the sample was sent in a hobbock or polystyrene box after adding cooling units to the locally appropriate Institute of Veterinary Diseases Control (IVET). In the laboratory some content of each colon was plated on selective medium suitable for E. coli.

Procedures for the selection of isolates for antimicrobial testing

All 206 E. coli isolated from bovine animals were sent from the involved laboratories to the AGES Institute for Veterinary Disease Control in Graz where the antimicrobial susceptibility testing of all isolates of E. coli were performed.

Laboratory methodology used for identification of the microbial isolates

E. coli colonies were identified after isolation on MacConkey plates and subculture on Columbia sheep blood agar plates by oxidase and spot indole test. All E. coli isolates were frozen in proteose pepton solution containing 10% glycerol at -70 Â°C. The susceptibility testing was done with SensititreÂ® Microbiology Systems (MCS Diagnostics). The frozen E. coli were subcultivated on Columbia agar (Oxoid) and incubated 24 hours at 37 Â°C. 3-5 colonies were suspended in physiological NaCl solution and adjusted to a McFarland of 0.5. 10 Î¼l of the suspension was inoculated in 10 ml Mueller Hinton bouillon and incubated 24 hours at 37 Â°C. MIC values have been entered in a MicrosoftÂ® Excel datasheet.

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/7/2006, RÃ¼ckstandsuntersuchung-DurchfÃ¼hrungserlass 2006)

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

B. Antimicrobial resistance of E. coli in animal - Pigs - at slaughterhouse -

animal sample - faeces - Monitoring - official sampling - objective sampling

Sampling strategy used in monitoring

Frequency of the sampling

Monitoring program on the occurrence and trend of antimicrobial resistance in E. coli based on the prevalence of E. coli in slaughtered animals: At an estimated percentage of resistance in antimicrobials between 40 and 60 % and a desired accuracy of 6 % for a confidence level of 95%, 381 isolates of E. coli from pigs were required.

To obtain this number of isolates, as sample size, 410 slaughtered pigs had to be tested, calculated on approximately 5,400,000 slaughtered pigs in 2004 in Austria, with an estimated prevalence of E. coli of 95 %, based on the results from the monitoring in 2005, and at a desired accuracy of 5% for a confidence level of 95%. The sampling had been stratified on the number of slaughtering by abattoirs all over Austria. The date of sampling was randomized over the period of the study.

In Austria, 73 abattoirs in which more than 3,500 pigs were slaughtered in 2004 accounted for approximately 90% of the total annual pig production. Sampling was performed in 48 of the 73 abattoirs excluding those in which only one sampling in the whole period of the study would have been carried out. The remaining 25 samples were distributed over the 48 abattoirs.

Type of specimen taken

Caecum containing 50 to 100 grams of faeces.

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 Â°C the sample was sent in a hobbock or polystyrene box after adding cooling units to the locally appropriate Institute of Veterinary Diseases Control (IVET). In the laboratory some content of each colon was plated on selective medium suitable

for E. coli.

Procedures for the selection of isolates for antimicrobial testing

Al 372 E. coli isolated from pigs were sent from the involved laboratories to the AGES Institute for Veterinary Disease Control in Graz where the antimicrobial susceptibility testing of all isolates of E. coli were performed.

Laboratory methodology used for identification of the microbial isolates

E. coli colonies were identified after isolation on MacConkey plates and subculture on Columbia sheep blood agar plates by oxidase and spot indole test.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

All E. coli isolates were frozen in proteose pepton solution containing 10% glycerol at -70Â°C.

The susceptibility testing was done with SensititreÂ® Microbiology Systems (MCS Diagnostics). The frozen E. coli were subcultivated on Columbia agar (Oxoid) and incubated 24 hours at 37Â°C. 3-5 colonies were suspended in physiological NaCl solution and adjusted to a McFarland of 0.5. 10 Î¼l of the suspension was inoculated in 10 ml Mueller Hinton bouillon and incubated 24 hours at 37 Â°C.

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

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/7/2006, RÃ¼ckstandsuntersuchung-DurchfÃ¼hrungserlass 2006).

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

C. Antimicrobial resistance of E. coli in animal - Gallus gallus (fowl) and turkeys - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling

Sampling strategy used in monitoring

Frequency of the sampling

Monitoring program on the occurrence and trend of antimicrobial resistance in E. coli based on the prevalence of E. coli in slaughter batches: At an estimated percentage of resistance in antimicrobials between 40 to 60 % and a desired accuracy of 6 % for a confidence level of 95%, 372 isolates of E. coli from poultry were required.

To obtain this number of isolates, as sample size, 396 slaughter batches of poultry had to be tested, calculated on approximately more than 10,000 slaughter batches of poultry in 2004 in Austria, with an estimated prevalence of E. coli of 95 %, based on the results from the monitoring in 2005, and at a desired accuracy of 5% for a confidence level of 95%. As the secondary sample size caeca of 10 animals had to be collected. The secondary sample size gives the number of birds per batch to be sampled and had been computed on slaughter batches of more than 2000 broilers, an expected prevalence of 30% within the batch and a confidence level of 95%. The sampling had been stratified on the number of slaughter batches by slaughter plants all over Austria. The date of sampling was randomized over the period of the study.

Sampling was performed in the 8 poultry slaughter plants with slaughter batches consisting of >2000 animals in Austria in 2003. The 8 slaughter plants included in the monitoring program accounted for almost 100% of broilers and turkeys of the total production in Austria.

Type of specimen taken

The whole intestines of 10 animals

Methods of sampling (description of sampling techniques)

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. After cooling down to 4Â°C the sample was sent in a hobbock or polystyrene box after adding cooling units to the locally appropriate Institute of Veterinary Diseases Control (IVET). In the laboratory a caecum of each intestinal convolute was identified, some content of each caecum pooled and plated on selective medium suitable for E. coli.

Procedures for the selection of isolates for antimicrobial testing

All 381 E. coli isolated from poultry flocks were sent from the involved laboratories to the AGES Institute for Veterinary Disease Control in Graz where the antimicrobial susceptibility testing of all isolates of E. coli were performed.

Laboratory methodology used for identification of the microbial isolates

E. coli colonies were identified after isolation on MacConkey plates and subculture on Columbia sheep blood agar plates by oxidase and spot indole test.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

All E. coli isolates were frozen in proteose pepton solution containing 10% glycerol at -70 Â°C.

The susceptibility testing was done with SensititreÂ® Microbiology Systems (MCS Diagnostics). The frozen E. coli were subcultivated on Columbia agar (Oxoid) and incubated 24 hours at 37 Â°C. 3-5 colonies were suspended in physiological NaCl solution and adjusted to a McFarland of 0.5. 10 Î¼l of the suspension was inoculated in 10 ml Mueller Hinton bouillon and incubated 24 hours at 37 Â°C.

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

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/7/2006, RÃ¼ckstandsuntersuchung-DurchfÃ¼hrungserlass 2006).

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

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling (Caecal samples of 10 animals per slaughter batch pooled) - quantitative data [Dilution method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	E. coli Gallus gallus (fowl) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling (Caecal samples of 10 animals per slaughter batch pooled)
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	266

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	266	73							174	16	3	2	5	66								
Amphenicols																						
Chloramphenicol	266	12							5	58	166	25	1	5	6							
Florfenicol	266	4							9	68	165	20	4									
Cephalosporins																						
Cephalothin	266	3							11	57	156	39			3							
3rd generation cephalosporins	0	0																				
Ceftiofur	266	1					261	1	1	2	1											
Fluoroquinolones																						
Ciprofloxacin	266	127	134	5	18	54	23	14	5	2	11											
Enrofloxacin	0	0																				
Quinolones																						
Nalidixic acid	266	130									136		7	27	47	49						
Sulfonamides																						
Sulfonamide	0	0																				
Sulfamethoxazol	266	81												185					81			
Trimethoprim	266	46								219	1	1	1	44								
Aminoglycosides																						
Streptomycin	266	83								142	28	13	40	13	30							
Gentamicin	266	3						255	8		1	1	1									
Neomycin	266	16							246	3	1		9	7								

Kanamycin	0	0																					
Apramycin	266	1							245	19	1			1									
Spectinomycin	266	25								8	191	38	4	6	19								
Penicillins																							
Amoxicillin / Clavulanic acid	266	3						75	129	57	2	2	1										
Ampicillin	266	66					9	87	96	7	1		66										
Polymyxins																							
Colistin	266	0							263	3													
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]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	E. coli
	Pigs - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	301

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	301	169							126	4	2	1	12	156								
Amphenicols																						
Chloramphenicol	301	11							3	79	198	10	2	3	6							
Florfenicol	301	1							7	115	170	8			1							
Cephalosporins																						
Cephalothin	301	0							19	116	140	26										
3rd generation cephalosporins	0	0																				
Ceftiofur	301	0					299	2														
Fluoroquinolones																						
Ciprofloxacin	301	9	290	2	3	4					2											
Enrofloxacin	0	0																				
Quinolones																						
Nalidixic acid	301	9									289	3		3	3	3						
Sulfonamides																						
Sulfonamide	0	0																				
Sulfamethoxazol	301	109												192			1	1	107			
Trimethoprim	301	58								241	2			58								
Aminoglycosides																						
Streptomycin	301	156								103	23	19	42	54	60							
Gentamicin	301	5						289	6	1	2		1	2								
Neomycin	301	12							279	9	1	1	5	6								
Kanamycin	0	0																				
Apramycin	301	1								265	31	4	1									

Spectinomycin	301	106								3	150	36	6	36	70								
Penicillins																							
Amoxicillin / Clavulanic acid	301	0							124	145	32												
Ampicillin	301	36						21	143	100	1		1	35									
Polymyxins																							
Colistin	301	0								300	1												
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]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	E. coli Cattle (bovine animals) - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	168

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	168	14							146	8			1	13								
Amphenicols																						
Chloramphenicol	168	3							4	43	114	4	1	1	1							
Florfenicol	168	1							3	71	91	2		1								
Cephalosporins																						
Cephalothin	168	1							6	42	110	9	1									
3rd generation cephalosporins	0	0																				
Ceftiofur	168	0					165	2	1													
Fluoroquinolones																						
Ciprofloxacin	168	1	166	1	1																	
Enrofloxacin	0	0																				
Quinolones																						
Nalidixic acid	168	0									166	2										
Sulfonamides																						
Sulfonamide	0	0																				
Sulfamethoxazol	168	13												154	1				13			
Trimethoprim	168	3								165				3								
Aminoglycosides																						
Streptomycin	168	13								141	13	1	4	4	5							
Gentamicin	168	1						164	3				1									
Neomycin	168	4							162	2			4									
Kanamycin	0	0																				

Apramycin	168	0								156	11	1											
Spectinomycin	168	4									11	136	16	1		4							
Penicillins																							
Amoxicillin / Clavulanic acid	168	1							47	110	9	1	1										
Ampicillin	168	4						9	65	86	4			4									
Polymyxins																							
Colistin	168	0								167	1												
Trimethoprim + sulfonamides	0	0																					

Table Antimicrobial susceptibility testing of E. coli in Turkeys - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling (Caecal samples of 10 animals per slaughter batch pooled) - quantitative data [Dilution method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	E. coli Turkeys - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling (Caecal samples of 10 animals per slaughter batch pooled)
Isolates out of a monitoring programme	no
Number of isolates available in the laboratory	11

Antimicrobials:	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Tetracyclines																						
Tetracyclin	11	7							4					7								
Amphenicols																						
Chloramphenicol	11	2								6	3			2								
Florfenicol	11	0								8	3											
Cephalosporins																						
Cephalothin	11	0								1	6	4										
3rd generation cephalosporins	0	0																				
Ceftiofur	11	0					11															
Fluoroquinolones																						
Ciprofloxacin	11	1	10					1														
Enrofloxacin	0	0																				
Quinolones																						
Nalidixic acid	11	1									10					1						
Sulfonamides																						
Sulfonamide	0	0																				
Sulfamethoxazol	11	3												8					3			
Trimethoprim	11	2								9			1	1								
Aminoglycosides																						
Streptomycin	11	3								7	1		1		2							
Gentamicin	11	0						11														
Neomycin	11	1							10				1									

Kanamycin	0	0																				
Apramycin	11	0								9	2											
Spectinomycin	11	2										8	1			2						
Penicillins																						
Amoxicillin / Clavulanic acid	11	0								9	2											
Ampicillin	11	2						1	3	5				2								
Polymyxins																						
Colistin	11	0								11												
Trimethoprim + sulfonamides	0	0																				

Table Antimicrobial susceptibility testing of E. coli in animals

n = Number of resistant isolates

	E. coli									
	Cattle (bovine animals)		**Pigs**		**Gallus gallus (fowl)**		**Turkeys**		**Gallus gallus (fowl) and turkeys - at slaughterhouse - animal sample - faeces - Monitoring - official sampling - objective sampling (Caecal samples of 10 animals per slaughter batch)**	
Isolates out of a monitoring programme	yes		yes		yes		yes		yes	
Number of isolates available in the laboratory	168		301		266		11		277	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines										
Tetracyclin	168	14	301	169	266	73	11	7	277	80
Amphenicols										
Chloramphenicol	168	3	301	11	266	12	11	2	277	14
Florfenicol	168	1	301	1	266	4	11	0	277	4
Cephalosporins										
Cephalothin	168	1	301	0	266	3	11	0	277	3
Ceftiofur	168	0	301	0	266	1	11	0	277	1
Fluoroquinolones										
Ciprofloxacin	168	1	301	9	266	127	11	1	277	128
Quinolones										
Nalidixic acid	168	0	301	9	266	130	11	1	277	131
Sulfonamides										
Sulfamethoxazol	168	13	301	109	266	81	11	3	277	84
Trimethoprim	168	3	301	58	266	46	11	2	277	48
Aminoglycosides										
Streptomycin	168	13	301	156	266	83	11	3	277	86
Gentamicin	168	1	301	5	266	3	11	0	277	3
Neomycin	168	4	301	12	266	16	11	1	277	17
Apramycin	168	0	301	1	266	1	11	0	277	1
Spectinomycin	168	4	301	106	266	25	11	2	277	27
Penicillins										
Amoxicillin / Clavulanic acid	168	1	301	0	266	3	11	0	277	3
Ampicillin	168	4	301	36	266	66	11	2	277	68
Polymyxins										
Colistin	168	0	301	0	266	0	11	0	277	0

Table Breakpoints used for antimicrobial susceptibility testing in Animals

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

NCCLS

Escherichia coli, non-pathogenic	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol				16	2	64				
Florfenicol				16	2	64				
Tetracyclines										
Tetracyclin				8	2	32				
Cephalosporins										
Cephalothin				16	2	64				
Ceftiofur				4	0.5	8				
3rd generation cephalosporins										
Fluoroquinolones										
Ciprofloxacin				0.06	0.03	4				
Enrofloxacin										
Quinolones										
Nalidixic acid				16	8	128				
Trimethoprim				8	4	32				
Sulfonamides										
Sulfonamide										
Sulfamethoxazol				256	64	1024				
Aminoglycosides										
Streptomycin				16	4	64				
Gentamicin				4	1	32				
Neomycin				8	2	32				
Kanamycin										
Apramycin				16	4	64				
Spectinomycin				64	4	128				
Trimethoprim + sulfonamides										
Penicillins										
Amoxicillin / Clavulanic acid				16	2	32				
Ampicillin				16	1	32				
Polymyxins										
Colistin				8	4	64				

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1. HISTAMINE

4.1.1. General evaluation of the national situation

4.1.2. Histamine in foodstuffs

Table Histamine in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units in non- conformity	<= 100 mg/kg	>100 - <= 200 mg/kg	>200 - <= 400 mg/kg	> 400 mg/kg
Fish									
Fishery products from fish species associated with a high amount of histidine - not enzyme maturated		---							
(25 g)	I)	single	25 g	72	13	4	2	2	5
(10 g)	IV)	single	10 g	16	0	16	0	0	0
(5 g)	III)	single	5 g	69	3	0	2	1	0
Fishery products which have undergone enzyme maturation treatment in brine		---							
(5 g)	II)	single	5 g	5	0	0	0	0	0
(10 g)	IV	single	10 g	1	0	1	0	0	0

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

4.2. ENTEROBACTER SAKAZAKII

4.2.1. General evaluation of the national situation

4.2.2. Enterobacter sakazakii in foodstuffs

Table Enterobacter sakazakii in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Enterobacter sakazakii
Infant formula					
dried **intended for infants below 6 months** (333g)	I)	single	100g	3	1
	V)	single	333g	1	0
Foodstuffs intended for special nutritional uses					
dried dietary foods for special medical purposes intended for infants below 6 months	I)	single	100g	2	0

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

4.3. STAPHYLOCOCCAL ENTEROTOXINS

4.3.1. General evaluation of the national situation

4.3.2. Staphylococcal enterotoxins in foodstuffs

Table Staphylococcal enterotoxins in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcal enterotoxins
Cheeses made from cows' milk		---			
hard		---			
made from raw or low heat-treated milk	III)	single	25g	1	0
Dairy products (excluding cheeses)		---			
milk powder and whey powder	II)	single	10g	2	0
Other processed food products and prepared dishes					
noodles	I)	single	10g	8	0

Footnote

I) MA 38
II) AGES ILMU Linz
III) UI Vorarlberg
IV) AGES ILMU Salzburg
V) AGES ILMU Wien
VI) LUA Kärnten
VII) AGES ILMU Graz
VIII) AGES ILMU Innsbruck

5. FOODBORNE OUTBREAKS

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

A. Foodborne outbreaks

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

Presently, the individual district (Austria = 98 + Vienna) is responsible for outbreak investigation. Food borne outbreaks affecting more than one district or even more than one province (Austria = 9 provinces) is regulated by the Federal Zoonoses Act (Zoonosengesetz, BGBl. I, 128/2005 entered into force on 1. January 2006, see chapter salmonellosis). According to this Zoonoses Act, to survey and combat the zoonoses in Austria, a Federal Commission for Zoonoses (Zoonoses Commission) had been founded to advise the Federal Minister. One main subject of the law is that food-borne outbreaks receive proper epidemiological investigation. It determines measures in case of Austrian-wide food borne outbreaks (concerning several provinces affected by one outbreak) and forces the Heads of the affected Provincial Governments to provide operative units to investigate suspicious or confirmed food borne outbreaks. Data concerning epidemiological criteria, potential implicated food items and the source of the outbreak must be collected and adequate epidemiological and microbiological examinations must be conducted. Short reports according to the data necessary for this Report summarising each outbreak have to be communicated to the Federal Commission for Zoonoses and to the AGES.

Description of the types of outbreaks covered by the reporting:

Since there is no coordinated approach for outbreak investigation in most provinces, the large majority (515 of 609) of food borne outbreaks are called family outbreaks. A coordinated Austrian wide outbreak investigation - not hampered 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 2006, 609 food borne outbreaks have been reported affecting 2530 people. 493 persons of the diseased were hospitalized and 3 persons deceased following the infection. This reveals nearly the same number of outbreaks compared to 2005 (n = 606). 12 % (7.6 % in 2005) of

the reported outbreaks were acquired abroad. 22.5 % of all food borne outbreaks acquired in Austria were caused by Campylobacter spp. (n =137), 74.2 % by Salmonella spp. (n = 390) and 89.7 % of these by the serotype Enteritidis (n = 350).

In contrary to the similar number of food borne outbreaks the number of diseased person affected by an outbreak revealed an increase of 32.5 %. We conclude that this is due to successful investigation of outbreaks that lead to a merging of the cases of several family outbreaks and apparently unrelated sporadic cases into single general outbreaks.

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

Salmonella and Campylobacter pose the most important agents causing 97 % 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

Neither hospitalization nor lethality is presently ascertained in a valid way: Nevertheless, 19.5 % of patients affected by the reported food borne outbreaks are reported as hospitalized (19.3 % in 2005) and 3 cases as lethal (1 case lethal in 2005).

Descriptions of single outbreaks of special interest

Meusburger S, Reichert S, Heibl S, Nagl M, Karner F, Schachinger I, Allerberger F. Outbreak of foodborne botulism linked to barbecue, Austria, 2006. Euro Surveill 2006;11(12):E061214.4. Available from: http://www.eurosurveillance.org/ew/2006/061214.asp#4.

Schmid D, Gschiel E, Mann M, Huhulescu S, Ruppitsch W, Bohm G, and al. Outbreak of acute gastroenteritis in an Austrian boarding school, September 2006. Euro Surveill 2007;12(3). Available online: http://www.eurosurveillance.org/em/v12n03/1203-224.asp.

Fretz R, Schmid D, Brueller W, Girsch L, Pichler AM, Riediger K, Safer M, Allerberger F. Food poisoning due to Jimson weed mimicking Bacillus cereus food intoxication in Austria, 2006. Int J Infect Dis. 2007 May 17.

Control measures or other actions taken to improve the situation

Improvement due to the implementation of the Federal Zoonoses Act.

Suggestions to the community for the actions to be taken

Nil

Additional information

Nil

Table Foodborne outbreaks in humans

Causative agent	General outbreak	Household outbreak	Total Number of persons			Food implicated			Type of evidence for implication of the food	Place where food was consumed	Contributing factors
			ill (in total)	died	in hospital	Food (sub)category	Suspected as a source	Confirmed as a source			
1	2	3	4	5	6	7			8	9	10
Wax esters (from fish)	1		3	0	0	butterfish		x	epidemiologic coherence	school	lack in preparation
Toxins - C. botulinum toxin	1		5	0	5	pork meat from home farming	x			household, barbecue	house slaughtering
Campylobacter - C. coli		1	4	0		unknown					
Campylobacter - C. jejuni		1	2	0	1	unknown				household	
Campylobacter - C. jejuni		1	2	0	1	unknown				household	
Campylobacter - C. jejuni		1	2	0	0	unknown				household	
Campylobacter - C. jejuni		1	2	0		ice cream	x			household	
Campylobacter - C. jejuni		1	2	0		unknown				household	
Campylobacter - C. jejuni		1	2	0	1	unknown				household	
Campylobacter - C. jejuni		1	2	0		unknown				household	
Campylobacter - C. jejuni		1	3	0		unknown	x			restaurant	
Campylobacter - C. jejuni		1	2	0	1	unknown					
Campylobacter - C. jejuni		1	2	0		unknown				household	
Campylobacter - C. jejuni		1	3	0	1	unknown					
Campylobacter - C. jejuni		1	2	0	0	unknown				household	
Campylobacter - Campylobacter spp., unspecified		1	2	0	0	fish	x			restaurant	
Campylobacter - Campylobacter spp., unspecified		1	2	0	2	salad with roasted chicken	x			restaurant	
Campylobacter - Campylobacter spp., unspecified		1	2	0	0	unknown				household	
Campylobacter - Campylobacter spp., unspecified		1	2	0	1	unknown					
Campylobacter - Campylobacter spp., unspecified		1	2	0		unknown					

Escherichia coli, pathogenic - Enterotoxigenic E. coli (ETEC)													
Salmonella - S. Give		1	2	0		unknown							
Salmonella - S. Hadar		1	2	0	0	unknown					household		
Salmonella - S. Infantis	0	1	2	0	0	unknown							
Salmonella - S. Kentucky		1	2	0	0	unknown	x		epidemiologic coherence		holiday		
Salmonella - S. Kentucky	0	1	2	0	0	unknown							
Salmonella - S. Kentucky		1	2	0	2	tuna pizza							
Salmonella - S. Kentucky	1		2	0		unknown							
Salmonella - S. Livingstone		1	2	0	1	unknown							
Salmonella - S. Muenchen	0	1	2	0	0	unknown					household		
Salmonella - S. Oslo		1	2	0	1	unknown							
Salmonella - S. Panama	0	1	2	0	1	unknown					household		
Salmonella - S. Paratyphi B var. Java		1	5	0	1	unknown					household		
Salmonella - S. Saintpaul		1	4	0	1	unknown	x				household		
Salmonella - S. Thompson	1	0	3	0	0	unknown							
Salmonella - S. Typhimurium		1	2	0	2	egg dumplings	x				household		
Salmonella - S. Typhimurium		1	2	0	1	unknown							
Salmonella - S. Typhimurium		1	2	0	0	unknown	x		epidemiologic coherence		unknown		
Salmonella - S. Typhimurium													
Campylobacter - Campylobacter spp., unspecified		3	6	0	2	roasted chicken	x				household		
Campylobacter - Campylobacter spp., unspecified		1	2	0	0	unknown					household		
Campylobacter - Campylobacter spp., unspecified		1	2	0	0	unknown					household		
Toxins - Staphylococcal enterotoxins	1	0	128	0	0	unknown				German soldiers during field exercise in Austria			
Campylobacter - C. jejuni		1	2	0	1	raw cow milk	x				household		home farming
Campylobacter - C. jejuni		1	2	0		unknown					household		
Campylobacter - C. jejuni		1	2	0		duck	x				household		
Campylobacter - C. jejuni		1	2	0		unknown							
Campylobacter - C. jejuni		1	2	0	1								possible contact infection in hospital
Campylobacter - C. jejuni		1	2	0	1	unknown					household		
Campylobacter - C. jejuni	0	1	2	0	0	ice cream, roasted meat	x				household		

Anisakis - A. simplex		1	2		2	salmon smoked		x	microbiological proof	household	salmon self catched and smoed in Canada, consumed in Austria without considering warning notices
Campylobacter - Campylobacter spp., unspecified	1		4	0	0	chicken	x			restaurant	lack of preparation
Campylobacter - Campylobacter spp., unspecified		1	2	0	0	unknown				household	
Campylobacter - Campylobacter spp., unspecified		1	3	0	0	roasted chicken	x			household	
Campylobacter - Campylobacter spp., unspecified		1	2	0		unknown				festival	
Campylobacter - Campylobacter spp., unspecified		1	2	0		unknown	x				
Campylobacter - C. jejuni		1	2	0	0	turkey meat			epidemiologic coherence	household	
Campylobacter - C. jejuni		1	2	0	0	unknown	x		epidemiologic coherence	household	
Campylobacter - C. jejuni		1	2	0	1	unknown			epidemiologic coherence	household	
Campylobacter - C. jejuni	1	0	2	0	0	unknown					
Salmonella - S. Bovismorbificans		1	2	0	1	tiramisu	x			household	lack of preparation
Salmonella - S. Agona		1	2	0	0	unknown				household	
Salmonella - S. Bovismorbificans		1	2	0		chocolate mousse	x			tavern	
Salmonella - S. Enteritidis		1	2	0	2	unknown					
Campylobacter - Campylobacter spp., unspecified		1	2	0	0	unknown				household	
Campylobacter - Campylobacter spp., unspecified		1	2	0		unknown					
Campylobacter - Campylobacter spp., unspecified		1	3	0		omelette or salad	x			restaurant	
Campylobacter - C. jejuni	1		2	0	0	raw milk	x		epidemiologic coherence	tavern	
Campylobacter - C. jejuni		1	2	0		chicken	x			household	
Campylobacter - C. jejuni		1	2	0			x			unknown	
Campylobacter - C. jejuni		1	2	0	1						children with diarrhea at relatives
Campylobacter - C. jejuni		1	2	0	1	unknown				household	
Campylobacter - C. jejuni		1	2	0	1	roasted chicken	x			household	
Campylobacter - C. jejuni		1	2	0	0	turkey meat	x			household	
Salmonella - S. Abony		1	4	0	1	unknown				household	
Salmonella - S. Abony	0	1	2	0	1	unknown	x				

Salmonella - S. Virchow		1	3	0	0	scrambled eggs	x		telephone contact		
Salmonella - S. group D		1	2	0	1	fish	x		epidemiologic coherence	household	
Campylobacter - C. jejuni		1	3	0	0	unknown	x		epidemiologic coherence	household	
Campylobacter - C. jejuni		1	2	0	0	unknown				household	
Campylobacter - C. jejuni		1	2	0	0	unknown				household	
Campylobacter - C. jejuni		1	2	0	0	unknown				household	
Campylobacter - C. jejuni		1	2	0	2	unknown					
Campylobacter - C. jejuni		1	2	0		unknown					
Salmonella - S. group B	0	1	2	0	0	unknown	x				
Salmonella - S. group D		1	2	0	0	cheese	x		epidemiologic coherence	household	
Salmonella - S. group D		1	3	0	3	unknown	x		epidemiologic coherence	holiday	
Campylobacter - C. jejuni		1	2	0	0	unknown				household	
Campylobacter - C. jejuni		1	2	0	0	unknown				household	
Campylobacter - C. jejuni		1	2	0	0	chicken	x			household	
Campylobacter - C. jejuni		1	2	0	0	squid	x		epidemiologic coherence	restaurant	
Campylobacter - C. jejuni		1	3	0	0	unknown			epidemiologic coherence	household	farming
Campylobacter - C. jejuni	0	1	2	0	0	unknown					
Shigella - S. flexneri	1		2	0		unknown					
Shigella - S. sonnei		1	2	0	1	ice cream	x			unknown	
Yersinia - Y. enterocolitica		1	2	0	0	pork meat				unknown	
Yersinia - Y. enterocolitica		1	3	0		unknown					
Shigella - S. boydii		1	2	0		unknown				unknown	
Campylobacter - C. jejuni	0	1	2	0	0	unknown					
Toxins - Staphylococcal enterotoxins	1		113	0	101	chicken nuggets, rice		x	laboratory AGES	childrens home	
Toxins - Staphylococcal enterotoxins											
Campylobacter - C. jejuni		1	2	0	0	raw milk	x		epidemiologic coherence	household	farming
Campylobacter - C. jejuni	0	1	2	0	0	unknown	x			household	
Campylobacter - C. jejuni	0	1	2	0	0	unknown					
Campylobacter - C. jejuni	1	0	2	0	0	unknown					
Campylobacter - Campylobacter spp., unspecified	0	1	2	0	0	pork	x			restaurant	
Campylobacter - Campylobacter spp., unspecified	0	1	2	0	0	pork				unknown	
Campylobacter - Campylobacter spp., unspecified	0	1	2	0	0	pork				unknown	

Campylobacter - Campylobacter spp., unspecified	0	1	2	0	0	pork				unknown	
Campylobacter - Campylobacter spp., unspecified	0	1	2	0	2	pork				household	
Campylobacter - Campylobacter spp., unspecified	0	15	27	0	2	unknown					
Campylobacter - Campylobacter spp., unspecified	0	1	2	0	0	roasted chicken, hamburger					
Campylobacter - Campylobacter spp., unspecified	0	1	2	0	0	industrially produced icecream					
Campylobacter - Campylobacter spp., unspecified	0	2	4	0	0	grilled chicken liver					
Campylobacter - Campylobacter spp., unspecified	0	1	2	0	0	grilled meat					
Campylobacter - Campylobacter spp., unspecified											
Campylobacter - Campylobacter spp., unspecified											
Campylobacter - Campylobacter spp., unspecified											
Campylobacter - C. coli	0	1	2	0	0	unknowns		epidemiologic coherence	household		lack of hygienic measures
Campylobacter - C. coli											
Campylobacter - C. coli											
Campylobacter - C. jejuni	1	0	4	0	2	Hot dog with salad	x	epidemiologic coherence	food stall		lack of hygienic and structural measures
Campylobacter - C. jejuni	1	0	6	0	0	chicken, salad	x	epidemiologic coherence	restaurant		lack of hygienic measures
Campylobacter - C. jejuni	1	0	2	0	0	chicken, salad	x	epidemiologic coherence	restaurant		lack of hygienic and structural measures
Campylobacter - C. jejuni	1	0	2	0	0	chicken, salad	x	epidemiologic coherence	restaurant		lack of hygienic and structural measures
Campylobacter - C. jejuni	1	0	2	0	0			epidemiologic coherence	unknown		
Campylobacter - C. jejuni	1	0	2	0	0	roasted chicken	x	epidemiologic coherence	tavern		
Campylobacter - C. jejuni	0	1	3	0	0	chicken nuggets, roasted chicken	x	epidemiologic coherence	tavern		
Campylobacter - C. jejuni	0	17	36	0	6	unknown					
Campylobacter - C. jejuni	0	10	32	0	3	home prepared chicken					
Campylobacter - C. jejuni	0	2	4	0	0	roasted chicken, hamburger					
Campylobacter - C. jejuni	0	1	2	0	0	home prepared salad with roasted chicken					

Campylobacter - C. jejuni	0	1	2	0	0	Salami Pizza							
Campylobacter - C. jejuni													
Campylobacter - C. jejuni	0	2	4	0	0	fish							
Campylobacter - C. jejuni	0	1	2	0	1	baked cheese							
Campylobacter - C. jejuni	0	1	2	0	0	Lasagne							
Campylobacter - C. jejuni	0	2	4	0	1	eggs, chicken							
Campylobacter - C. jejuni													
Toxins - Jimson weed	1	0	8	0	1	balls of millet-carrots	x	seeds detected in food leftover	factory canteen				
Toxins - Jimson weed													
Salmonella - S. Enteritidis - PT 4		1	4	0	2	raw pastry dough	x		household				
Salmonella - S. Enteritidis - PT 1		1	3	0	1	raw egg, chicken	x		household				
Salmonella - S. Enteritidis - PT 1		1	2	0	0	tiramisu	x		household				
Salmonella - S. Enteritidis - PT 1		1	2	0		unknown			household				
Salmonella - S. Enteritidis - PT 1	1		4	0		pudding	x		unknown				
Salmonella - S. Enteritidis - PT 1		1	3	0	1	dumpling dough	x	epidemiologic coherence	household				
Salmonella - S. Enteritidis - PT 1	1		2	0	1	ham sandwich, cheese, tuna							
Salmonella - S. Enteritidis - PT 4		1	2	0	1	unknown			household				
Salmonella - S. Enteritidis - PT 1		1	4	0	1	home prepared paste with ham							
Salmonella - S. Enteritidis - PT 4		1	2	0	0	unknown			household				
Salmonella - S. Enteritidis - PT 1		1	3	0	2	chicken pie							
Salmonella - S. Enteritidis - PT 4		1	2	0	0	eggs	x		shop				
Salmonella - S. Enteritidis - PT 1	0	1	2	0	0								
Salmonella - S. Enteritidis - PT 1 (1)	1		24	0	2	raw or undercooked eggs	x	outbreak strain was detected in laying hen flock	excursion to a bakery or at home				
Salmonella - S. Enteritidis - PT 4		1	2	0	0	unknown			household				
Salmonella - S. Enteritidis - PT 4		1	2	0	0	unknown			household				
Salmonella - S. Enteritidis - PT 4		1	2	0	1	raw dough	x		household				
Salmonella - S. Enteritidis - PT 4		1	2	0	2	pancakes with marmelade	x		household				
Salmonella - S. Enteritidis - PT 13a		1	2	0	0	unknown			household				
Salmonella - S. Enteritidis - PT 14b		1	2	0	0	unknown		epidemiologic coherence	household				
Salmonella - S. Enteritidis - PT 4		1	2	0	0	unknown			household				
Salmonella - S. Enteritidis - PT 19 (2)	1	0	12	0	3	tiramisu	x		hotel				
Salmonella - S. Enteritidis - PT 1c	1		36	0	11	pastry	x		nursery				

Salmonella - S. Enteritidis - PT 1c	1		6	0	3	unknown	x		school canteen	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown	x		hotel	
Salmonella - S. Enteritidis - PT 21		1	3	0	0	unknown			household	
Salmonella - S. Enteritidis - PT 4	0	1	2	0	0	unknown				
Salmonella - S. Enteritidis - PT 21		1	3	0	1	unknown			household	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown			household	
Salmonella - S. Enteritidis - PT 21		1	2	0		unknown				
Salmonella - S. Enteritidis - PT 21	1		3	0	0	unknown			seminary	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown			household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown			household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown			household	
Salmonella - S. Enteritidis - PT 21	1		3	0	0	unknown			school	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown		epidemiologic coherence	household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown		epidemiologic coherence	household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown	x	epidemiologic coherence	holiday	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown		epidemiologic coherence	household	
Salmonella - S. Enteritidis - PT 21	1		65	0	0		x	epidemiologic coherence	school	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown		epidemiologic coherence	household	
Salmonella - S. Enteritidis - PT 21	1		6	0	0	unknown		epidemiologic coherence	tavern	
Salmonella - S. Enteritidis - PT 21	1		7	0	1	chicken	x	epidemiologic coherence	tourism school	
Salmonella - S. Enteritidis - PT 21	1		3	0	0	unknown		epidemiologic coherence	household	
Salmonella - S. Enteritidis - PT 21		1	4	0	0	unknown		epidemiologic coherence	household	
Salmonella - S. Enteritidis - PT 4	0	1	2	0	0	ice cream	x		household	

Salmonella - S. Enteritidis - PT 21	0	1	5	0	3	homemade cream cake	x			household
Salmonella - S. Enteritidis - PT 21	0	1	3	0		spaghetti carbonara	x			household
Salmonella - S. Enteritidis - PT 4		1	2	0	0	minced meat	x		telephone contact	household
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	eggs	x			household
Salmonella - S. Enteritidis - PT 21	0	1	2	0	1	unknown				
Salmonella - S. Enteritidis - PT 21	0	1	2	0	1	unknown				
Salmonella - S. Enteritidis - PT 21	0	1	3	0	0	raw dough	x			household
Salmonella - S. Enteritidis - PT 4	1		2	0		chicken				
Salmonella - S. Enteritidis - PT 4	1		2	0		hamburger, tomato salad				
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 5		1	2	0	0	pork meat				unknown
Salmonella - S. Enteritidis - PT 29		1	4	0	0	minced meat	x		epidemiologic coherence	holiday
Salmonella - S. Enteritidis - PT 3		1	2	0		unknown				unknown
Salmonella - S. Enteritidis - PT 6		1	2	0	1	machine-made ice cream	x			household
Salmonella - S. Enteritidis - PT 6		1	2	0	0	unknown				household

Salmonella - S. Enteritidis - PT 6		1	2	0	0	unknown				household	
Salmonella - S. Enteritidis - PT 6		1	2	0	1	unknown					
Salmonella - S. Enteritidis - PT 6		1	2	0	1	unknown				spa resort	
Salmonella - S. Enteritidis - PT 6		1	6	0	5	cake	x			hoousehold	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	1		22	0	0	unknown		epidemiologic coherence		medical institution	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	1		16	0	2	ice cream	x	cohort study		restaurant	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	1	0	13	0	0	unknown	x			residential accomodation	
Salmonella - S. Enteritidis - PT 4		1	2	0		tuna salad	x			restaurant	
Salmonella - S. Enteritidis - PT 4		1	2	0		iced coffee with whipped cream	x			restaurant	
Salmonella - S. Enteritidis - PT 4		1	2	0	1	unknown				household	
Salmonella - S. Enteritidis - PT 6		1	3	0		unknown					
Salmonella - S. Enteritidis - PT 4		1	4	0		unknown				household	
Salmonella - S. Enteritidis - PT 6		1	3	0	0	unknown				household	
Salmonella - S. Enteritidis - PT 6		1	4	0	1	chicken with potato salad	x			household	
Salmonella - S. Enteritidis - PT 4	0	1	2	0	1	unknown					
Salmonella - S. Enteritidis - PT 4	1	0	2	0	1	chocolate mousse	x				
Salmonella - S. Enteritidis - PT 4	0	1	2	0	0	unknown					
Salmonella - S. Enteritidis - PT 4	0	1	3	0	0	unknown				household	
Salmonella - S. Enteritidis - PT 4	0	1	4	0	0	banana cake	x			household	
Salmonella - S. Enteritidis - PT 4	1	0	9	0	1	cake	x			coffee house	
Salmonella - S. Enteritidis - PT 4	0	1	3	0	0		x			household	
Salmonella - S. Enteritidis - PT 4		1	4	0	3	chicken	x	epidemiologic coherence		household	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown				household	
Salmonella - S. Enteritidis - PT 21		1	3	0	0	unknown				household	
Salmonella - S. Enteritidis - PT 21		1	2	0		unknown				household	
Salmonella - S. Enteritidis - PT 21		1	2	0		unknown				household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	chicken, parfait	x	epidemiologic coherence		household	
Salmonella - S. Enteritidis - PT 21	1		5	0	0	unknown		epidemiologic coherence		hotel	

Salmonella - S. Enteritidis - PT 21																			
Salmonella - S. Enteritidis - PT 21																			
Salmonella - S. Enteritidis - PT 21																			
Salmonella - S. Enteritidis - PT 21																			
Salmonella - S. Enteritidis - PT 6		1	2	0	0	unknown	x									restaurant			
Salmonella - S. Enteritidis - PT 4		1	2	0		turkey meat	x									household			
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown										household			
Salmonella - S. Enteritidis - PT 6		1	2	0		unknown										household			
Salmonella - S. Enteritidis - PT 4		1	8	0	1	mayonnaise salad	x									family celebration, household			
Salmonella - S. Enteritidis - PT 6		1	7	0	3	cake, raw eggs										household, barbecue			
Salmonella - S. Enteritidis - PT 6		1	2	0		unknown										household			
Salmonella - S. Enteritidis - PT 4		1	2	0	1	unknown													
Salmonella - S. Enteritidis - PT 6		1	3	0	0	unknown					epidemiologic coherence					household			
Salmonella - S. Enteritidis - PT 4	1	0	3	0	0	chocolate mousse	x									restaurant			
Salmonella - S. Enteritidis - PT 6	0	1	2	0	0	unknown													
Salmonella - S. Enteritidis - PT 4	0	1	3	0	1	eggs	x									household			
Salmonella - S. Enteritidis - PT 4	0	1	4	0	1	eggs from own laying hen flock		x	microbiologic proof							farming			
Salmonella - S. Enteritidis - PT 4		1	3	0	1	unknown					epidemiologic coherence					household			
Salmonella - S. Enteritidis - PT 4		1	3	0	0	unknown										household			
Salmonella - S. Enteritidis - PT 4		1	3	0	2	unknown										household			
Salmonella - S. Enteritidis - PT 4		1	2	0	1	egg	x									household			
Salmonella - S. Enteritidis - PT 4		1	2	0		escalope	x									resaturant			
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown													
Salmonella - S. Enteritidis - PT 4		1	3	0		unknown													
Salmonella - S. Enteritidis - PT 4		1	5	0		raw cake dough	x									household			
Salmonella - S. Enteritidis - PT 4		1	3	0		unknown													
Salmonella - S. Enteritidis - PT 4		1	2	0		raw cake dough	x									household			
Salmonella - S. Enteritidis - PT 6	1		2	0	1	geese milk													
Salmonella - S. Enteritidis - PT 4		1	2	0	1	raw cake dough	x									household			
Salmonella - S. Enteritidis - PT 6 (3)	1	0	19	0	0	eggs		x	microbiologic proof										
Salmonella - S. Enteritidis - PT 4	0	1	2	0	0	unknown													
Salmonella - S. Enteritidis - PT 4		1	4	0		escalope from turkey	x									household			
Salmonella - S. Enteritidis - PT 6a		2	5	0	3	unknown										household			

Salmonella - S. Enteritidis - PT 6a	1	2	0	2	unknown			household		
Salmonella - S. Enteritidis - PT 6a	1	2	0	1	tiramisu	x		household		
Salmonella - S. Enteritidis - PT 6a	1	2	0		unknown					
Salmonella - S. Enteritidis - PT 6a	1	2	0	2	Kebab	x				
Salmonella - S. Enteritidis - PT 6a	1	3	0	1	unknown			household		
Salmonella - S. Enteritidis - PT 6a	1	2	0	0	fish finger with potato salad	x		restaurant		
Salmonella - S. Enteritidis - PT 6a 0	1	3	0	0	eggs	x				
Salmonella - S. Enteritidis - PT 6a 0	1	3	0	0	unknown	x		household		
Salmonella - S. Enteritidis - PT 7	1	2	0	1	unknown			unknown		
Salmonella - S. Enteritidis - PT 7	1	2	0		unknown					
Salmonella - S. Enteritidis - PT 8	1	5	0	2	dumplings with egg (insufficiently heated)	x		household		
Salmonella - S. Enteritidis - PT 8	1	2	0	0	tiramisu	x		household		
Salmonella - S. Enteritidis - PT 8	1	4	0	0	unknown			household		
Salmonella - S. Enteritidis - PT 8	1	2	0	1	unknown			household		
Salmonella - S. Enteritidis - PT 8	1	2	0	0	unknown			household		
Salmonella - S. Enteritidis - PT 8	1	2	0	1	unknown			household		
Salmonella - S. Enteritidis - PT 8	1	4	0	1	unknown			unknown		
Salmonella - S. Enteritidis - PT 8	1	3	0	0	pancakes with curd	x		household		
Salmonella - S. Enteritidis - PT 8	1	3	0	0	unknown			household		
Salmonella - S. Enteritidis - PT 8	1	2	0	1	unknown					
Salmonella - S. Enteritidis - PT 8	1	2	0	1	kebab	x		food stall		
Salmonella - S. Enteritidis - PT 8	1	2	0	1	unknown			unknown		
Salmonella - S. Enteritidis - PT 8	1	2	0	2	unknown			household		
Salmonella - S. Enteritidis - PT 8	1	2	0	1	unknown			household		
Salmonella - S. Enteritidis - PT 8	1	2	0		unknown					
Salmonella - S. Enteritidis - PT 8	1	3	0	1	unknown			household		
Salmonella - S. Enteritidis - PT 8	1	3	0	1	unknown			unknown		
Salmonella - S. Enteritidis - PT 8	1	3	0	1	unknown			household		
Salmonella - S. Enteritidis - RDNC	1	2	0	0	sausage	x		shop		
Salmonella - S. Enteritidis - RDNC	1	5	0	1	unknown		epidemiologic coherence	unknown		
Salmonella - S. Enteritidis - RDNC	1	4	0	0	unknown		epidemiologic coherence	household		

Salmonella - S. Enteritidis - RDNC	0	1	3	0	0	unknown	x					
Salmonella - S. Enteritidis - RDNC	1		2	0	1	kebab					tavern	
Salmonella - S. Enteritidis - U		1	2	0	0	unknown					holiday	
Salmonella - S. Typhimurium - DT 41 (4)	1		82	0	15	eggs (spinach dumplings, self-made cream cake)	x	x	epidemiologic coherence/microbiolo proof		coffee house, household, farming, restaurant	
Salmonella - S. Typhimurium - DT 46 (5)	2	0	225	3	31	eggs (cake, Tiramisu, ice cream)	x	x	epidemiologic coherence/microbiolo proof		household, meals on wheels, bakery, residential care home, ice cream parlour, tavern	
Yersinia - Y. enterocolitica - O:3		1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	pizza or eggs	x				household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	tiramisu	x				household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown					household	
Salmonella - S. Enteritidis - PT 21		1	2	0		unknown						
Salmonella - S. Enteritidis - PT 21		1	3	0		raw egg	x				restaurant	
Salmonella - S. Enteritidis - PT 21		1	4	0	2	unknown					household	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown			epidemiologic coherence		holiday	
Salmonella - S. Enteritidis - PT 21	1		7	0	0	tiramisu	x				restaurant	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown					household	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 4	0	1	2	0	0	unknown						
Salmonella - S. Enteritidis - PT 4	1	0	5	0	0	unknown						
Salmonella - S. Enteritidis - PT 21		1	6	0	2	banana cake	x				household	
Salmonella - S. Enteritidis - PT 21	1		7	0	3	tiramisu	x		epidemiologic cohorence			
Salmonella - S. Enteritidis - PT 21		1	3	0	0	eggs in dessert	x		epidemiologic coherence		household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown			epidemiologic coherence		household	

Salmonella - S. Enteritidis - PT 21																			
Salmonella - S. Enteritidis - PT 21																			
Salmonella - S. Enteritidis - PT 21																			
Salmonella - S. Enteritidis - PT 21																			
Salmonella - S. Enteritidis - PT 6	1		3	0	2	unknown						unknown							
Salmonella - S. Enteritidis - PT 6		1	2	0	1	spoilt foods	x					household							
Salmonella - S. Enteritidis - PT 4		1	5	0	1	unknown						household							
Salmonella - S. Enteritidis - PT 6		1	2	0	1	unknown						household							
Salmonella - S. Enteritidis - PT 4		1	2	0	1	unknown													
Salmonella - S. Enteritidis - PT 4		1	2	0		water	x					unknown							
Salmonella - S. Enteritidis - PT 6		1	2	0	1	unknown						household							
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown						household							
Salmonella - S. Enteritidis - PT 4	1		21	0	4	homemade tiramisu with raw eggs		x	salmonella detected in own laying hen flocks										
Salmonella - S. Enteritidis - PT 4		1	2	0	0	unknown			epidemiologic coherence			household							
Salmonella - S. Enteritidis - PT 6a		1	4	0		unknown						household							
Salmonella - S. Enteritidis - PT 8		1	3	0	1	eggs	x					household							
Salmonella - S. Enteritidis - PT 8		1	2	0	1	eggs	x					household							
Salmonella - S. Enteritidis - PT 8		1	2	0		unknown													
Salmonella - S. Enteritidis - PT 8		1	2	0	1	mayonnaise						unknown							
Salmonella - S. Enteritidis - PT 8		1	2	0		unknown						household							
Salmonella - S. Enteritidis - PT 8		1	4	0	1	unknown						household							
Salmonella - S. Enteritidis - PT 8 (6)		1	2	0		unknown						unknown							
Escherichia coli, pathogenic - Verotoxigenic E. coli (VTEC) - VTEC O103:H2	0	1	3	0	0	unknown			epidemiologic coherence			holiday on farm							
Salmonella - S. Enteritidis - PT 8	1		9	0		unknown						hotel							
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	unknown													
Salmonella - S. Enteritidis - PT 8	0	1	2	0	1	unknown													
Salmonella - S. Enteritidis - PT 8	1	0	4	0	4	unknown						restaurant							
Salmonella - S. Enteritidis - PT 8	0	1	4	0	0	eggs						household							
Salmonella - S. Enteritidis - PT 8	0	1	5	0	2	tiramisu		x	microbiologic proof			household							
Salmonella - S. Enteritidis - PT 2		1	2	0	0	szlomoer dumplings	x					pastry shop							
Salmonella - S. Enteritidis - PT 2		1	2	0	0	egg sauce	x					restaurant							

Salmonella - S. Enteritidis - PT 21	1		2	0	1	chicken, turkey meat, fried eggs	x		restaurant
Salmonella - S. Enteritidis - PT 8	1	0	2	0	0	ice cream	x		household
Salmonella - S. Enteritidis - PT 8	0	1	3	0	0	tiramisu	x		farming
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	fried eggs	x		
Salmonella - S. Enteritidis - PT 8	0	1	4	0	0	eggs	x		household
Salmonella - S. Enteritidis - PT 8	1	0	3	0	0	dumplings	x		farming
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	eggs	x		household
Salmonella - S. Enteritidis - PT 8	1	0	4	0	0	eggs	x		household
Salmonella - S. Enteritidis - PT 8	0	1	3	0	0	eggs	x		household
Salmonella - S. Enteritidis - PT 8	0	1	3	0	0	unknown			household
Salmonella - S. Enteritidis - PT 8	0	1	2	0	1	minced meat	x		household
Salmonella - S. Enteritidis - PT 8	0	1	2	0	1	poultry meat	x		household
Salmonella - S. Enteritidis - PT 8	0	1	3	0	0	eggs	x		household
Salmonella - S. Enteritidis - PT 8	0	1	4	0	1	unknown			household
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	unknown			
Salmonella - S. Enteritidis - PT 8	0	1	5	0	1	unknown			
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	unknown	x		
Salmonella - S. Enteritidis - PT 8	0	1	3	0	0	eggs	x		
Salmonella - S. Enteritidis - PT 8		1	2	0	0	chicken nuggets	x	telephone contact	unknown
Salmonella - S. Enteritidis - PT 8		1	2	0	0				holiday
Salmonella - S. Enteritidis - PT 8		1	2	0	0	raw cake dough			
Salmonella - S. Enteritidis - PT 8		1	2	0	1	homemade spread with egg			household
Salmonella - S. Enteritidis - PT 8		3	8	0	3	unknown			
Salmonella - S. Enteritidis - PT 8	1		2	0	2	meat with fried eggs			restaurant
Salmonella - S. Enteritidis - PT 8	1		2	0	1				restaurant
Salmonella - S. Enteritidis - PT 8		1	3	0		homemade dumplings			household
Salmonella - S. Enteritidis - PT 8	0	1	3	0	0	unknown			
Salmonella - S. Enteritidis - PT 21		1	2	0		soft-boiled egg	x		restaurant
Salmonella - S. Enteritidis - PT 21		1	2	0		unknown			hotel
Salmonella - S. Enteritidis - PT 21		1	2	0		salad dressing	x		restaurant
Salmonella - S. Enteritidis - PT 21		1	4	0	1	baked cauliflower	x		household
Salmonella - S. Enteritidis - PT 6		1	2	0	2	fish soup			household
Salmonella - S. Enteritidis - PT 4	0	1	2	0	0	unknown			
Salmonella - S. Enteritidis - PT 4	0	1	2	0	1	fried eggs	x		household
Salmonella - S. Enteritidis - PT 6a		1	4	0	0	unknown		epidemiologic coherence	household
Salmonella - S. Enteritidis - PT 8	0	1	4	0	1	unknown	x		

Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown	x					
Salmonella - S. Enteritidis - PT 21	0	1	3	0	0	unknown						
Salmonella - S. Enteritidis - PT 21	1	0	3	0	0	eggs		x	microbiologic proof			
Salmonella - S. Enteritidis - PT 6	1		4	0	2	unknown				casern		
Salmonella - S. Enteritidis - PT 4	1	0	2	0	0	fish/meat	x					
Salmonella - S. Enteritidis - PT 6	1		6	0	1	egg dumplings with curd	x		epidemiologic coherence	resaturant		
Salmonella - S. Enteritidis - PT 4		1	3	0	0	unknown				household		
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown						
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown						
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown						
Salmonella - S. Enteritidis - PT 6a		1	2	0	0	pork meat				household		
Salmonella - S. Enteritidis - PT 8		1	2	0		unknown				household		
Salmonella - S. Typhimurium - DT 104l	0	1	2	0	1	unknown						
Salmonella - S. Typhimurium - DT 104l		1	2	0	1	kebab, eggs						
Salmonella - S. Typhimurium - DT 104l		1	2	0	2	chicken				household		
Salmonella - S. Typhimurium - DT 104l		2	4	0		unknown						
Salmonella - S. Typhimurium - DT 120		1	2	0	2	unknown				household		
Salmonella - S. Typhimurium - DT 120		1	2	0	0	unknown				household		
Salmonella - S. Typhimurium - DT 120	1		3	0		sausages, sauerkraut, apple, juice	x			restaurant		
Salmonella - S. Typhimurium - DT 120		1	3	0	0	unknown				household		
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	1	0	7	0	7	unknown				hospital		
Salmonella - S. Enteritidis - PT 1		1	2	0	1	tiramisu	x			household		
Salmonella - S. Enteritidis - PT 4		1	4	0	0	raw dough	x			household		
Salmonella - S. Enteritidis - PT 4		1	2	0	2	unknown				household		
Salmonella - S. Enteritidis - PT 13a	0	1	2	0	0	unknown						
Salmonella - S. Enteritidis - PT 13a		1	2	0	0	unknown				unknown		

Salmonella - S. Enteritidis - PT 4		1		2	0	0	unknown				household
Salmonella - S. Enteritidis - PT 14b		1		3	0	0	pastry	x			bakery
Salmonella - S. Enteritidis - PT 14b		1		2	0	2	unknown				unknown
Salmonella - S. Enteritidis - PT 14b		1		4	0	0	unknown				unknown
Salmonella - S. Enteritidis - PT 6		1		2	0	1	unknown				household
Salmonella - S. Enteritidis - PT 6		1		2	0	0	turkey meat	x			holiday
Salmonella - S. Enteritidis - PT 4		1		3	0		unknown				unknown
Salmonella - S. Enteritidis - PT 4	1			2	0		unknown				
Salmonella - S. Enteritidis - PT 4	0	1		2	0	0	unknown				
Salmonella - S. Enteritidis - PT 4	0	1		2	0	0	unknown				
Salmonella - S. Enteritidis - PT 6		1		2	0	2	unknown		epidemiologic coherence		unknown
Salmonella - S. Enteritidis - PT 4	0	1		3	0	0	unknown	x			
Salmonella - S. Enteritidis - PT 4	0	1		4	0	0	unknown				
Salmonella - S. Enteritidis - PT 4	0	1		2	0	1	unknown				
Salmonella - S. Enteritidis - PT 4	0	1		2	0	1	unknown				
Salmonella - S. Enteritidis - PT 4	1	0		4	0	0	unknown				
Salmonella - S. Enteritidis - PT 6	1			2	0	1	fish soup				
Salmonella - S. Enteritidis - PT 4		1		3	0	0	chicken, parfait	x	epidemiologic coherence		household
Salmonella - S. Enteritidis - PT 6a		1		3	0		chicken	x			household
Salmonella - S. Enteritidis - PT 6a		1		2	0	1	unknown				household
Salmonella - S. Enteritidis - PT 8		1		2	0	0	pork meat				household
Salmonella - S. Enteritidis - PT 8		1		5	0	0	turkey meat	x			household
Salmonella - S. Enteritidis - PT 8		1		4	0	0	unknown				household
Salmonella - S. Enteritidis - PT 8		1		2	0	1	baked chicken	x			unknown
Salmonella - S. Enteritidis - PT 8		1		5	0	1	tiramisu	x			household
Salmonella - S. Enteritidis - PT 8	1			22	0	1	chicken nuggets with potato salad	x			restaurant
Salmonella - S. Enteritidis - PT 8	1			2	0	0	roasted chicken with potato salad	x			canteen kitchen
Salmonella - S. Enteritidis - PT 8		1		2	0	0	unknown				household
Salmonella - S. Enteritidis - PT 8		1		2	0	0	unknown				household
Salmonella - S. Enteritidis - PT 8		1		2	0	0	ice cream	x	epidemiologic coherence		holiday
Salmonella - S. Enteritidis - PT 8	1			8	0	0	unknown		epidemiologic coherence		hotel
Salmonella - S. Enteritidis - PT 8	1			2	0	0	unknown		epidemiologic coherence		hotel

Salmonella - S. Enteritidis - PT 8		1	6	0	1	egg dumplings	x		epidemiologic coherence	household	lack of hygienic measures
Salmonella - S. Enteritidis - PT 8	1		11	0	3	chicken		x	microbiologic proof	restaurant	
Salmonella - S. Enteritidis - PT 8	1		15	0	2	chicken, salad, chocolate mousse, egg dumplings	x		epidemiologic coherence	tavern	
Salmonella - S. Enteritidis - PT 8		1	8	0	3	homemade chicken		x	outbreak strain detected in frozen left over meal	household	
Salmonella - S. Enteritidis - PT 8		1	4	0	0	unknown			epidemiologic coherence	household	
Salmonella - S. Enteritidis - PT 8		1	3	0	1	unknown			epidemiologic coherence	household	
Salmonella - S. Enteritidis - PT 8	1		2	0	1	kebab	x		epidemiologic coherenece	kebab food stall	
Salmonella - S. Enteritidis - PT 8	1		3	0	0	unknown			epidemiologic coherence	unknown	
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	unknown					
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	eggs				household	
Salmonella - S. Enteritidis - PT 8	0	1	4	0	0	eggs				household	
Salmonella - S. Enteritidis - PT 4	0	1	2	0	0	unknown					
Salmonella - S. Enteritidis - PT 4		1	3	0	2	unknown				household	
Salmonella - S. Enteritidis - PT 8		1	2	0	1	unknown				household	
Salmonella - S. Enteritidis - PT 8		1	2	0	0	unknown				household	
Salmonella - S. Enteritidis - PT 8		1	3	0		unknown					
Salmonella - S. Enteritidis - PT 8		1	2	0	2	unknown				unknown	
Salmonella - S. Enteritidis - PT 8	1		6	0	3	raw egg	x			household	
Salmonella - S. Enteritidis - PT 8		1	2	0		unknown				household	
Salmonella - S. Enteritidis - PT 21	0	1	2	0	1	unknown					
Salmonella - S. Enteritidis - PT 21	1	0	3	0	0	fondue	x				
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown	x				
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown	x				
Salmonella - S. Enteritidis - PT 21	0	1	2	0	1	unknown					
Salmonella - S. Enteritidis - PT 21											
Salmonella - S. Enteritidis - PT 21											
Salmonella - S. Enteritidis - PT 21											

Salmonella - S. Enteritidis - PT 4	1	0	5	0	0	unknown					household	
Salmonella - S. Enteritidis - PT 8		1	2	0		unknown					household	
Salmonella - S. Typhimurium - DT 193		1	2	0		unknown					household	
Salmonella - S. Typhimurium - DT 193		1	2	0	0	sauce hollandaise	x	telephone contact			household	
Salmonella - S. Enteritidis - PT 7a	0	1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 8		1	4	0	0	unknown					household	
Salmonella - S. Enteritidis - PT 4	0	1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 14b		1	4	0	2	unknown						
Salmonella - S. Enteritidis - PT 14b		1	2	0	0	unknown					holiday	
Salmonella - S. Enteritidis - PT 14b	0	1	2	0	0	unknown						
Salmonella - S. Enteritidis - PT 4		1	2	0	1	unknown					holiday	
Salmonella - S. Enteritidis - PT 8		1	2	0	0	tiramisu	x				household	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 21		1	3	0	1	unknown						
Salmonella - S. Enteritidis - PT 21		1	2	0		unknown						
Salmonella - S. Enteritidis - PT 21		1	3	0	1	unknown						
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown		epidemiologic coherence			household	
Salmonella - S. Enteritidis - PT 21		1	2	0	1	unknown	x				household	
Salmonella - S. Enteritidis - PT 21		1	3	0	0	unknown					household	
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown						
Salmonella - S. Enteritidis - PT 21		0	37	0	3	mousse	x				household	
Salmonella - S. Enteritidis - PT 21		1	2	0		roasted pork and homemade tomato salad					household	
Salmonella - S. Enteritidis - PT 21			3	0	1	fried eggs						
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	1		45	0		unknown					airbase	
Salmonella - S. Enteritidis - PT 8												

Salmonella - S. Enteritidis - PT 8	0	1	4	0	0	eggs	x				household	
Salmonella - S. Enteritidis - PT 4		1	2	0		pizza	x				household	
Salmonella - S. Enteritidis - PT 6a		1	3	0	1	unknown	x				household	
Salmonella - S. Enteritidis - PT 6a	0	1	3	0	0	eggs	x				household	
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown						
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown					household	
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown					household	
Salmonella - S. Enteritidis - PT 4		1	3	0	1	unknown						
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown						
Salmonella - S. Enteritidis - PT 4		1	3	0	2	unknown						
Salmonella - S. Enteritidis - PT 1	1		2	0	0	tiramisu	x				family celebration	
Salmonella - S. Enteritidis - PT 1		1	3	0	2	roasted chicken	x				chicken food stall	
Salmonella - S. Enteritidis - PT 6		1	2	0	0	unknown					household	
Salmonella - S. Enteritidis - PT 6		1	3	0	0	unknown					household	
Salmonella - S. Enteritidis - PT 6a		1	2	0	0	unknown	x				household	contaminated raw food
Salmonella - S. Enteritidis - PT 6a	0	1	2	0	0	unknown						
Salmonella - S. Enteritidis - PT 8		1	3	0	3	unknown					household	
Salmonella - S. Enteritidis - PT 8		1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 7		1	2	0	0	unknown					household	
Food borne viruses - calicivirus (including norovirus) - norovirus (Norwalk-like virus)	1		26	0	1	unknown					old people home	
Salmonella - S. Enteritidis - PT 8		1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 8		1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 8		1	3	0		salmon	x				hotel	
Salmonella - S. Enteritidis - PT 4		1	2	0	1	unknown					household	
Salmonella - S. Enteritidis - PT 4		1	3	0	0	unknown					household	
Salmonella - S. Enteritidis - PT 19 (8)	1		10	0	5	eggs	x				household	
Salmonella - S. Enteritidis - PT 21		1	2	0	0	eggs		x	salmonella detected in own laying hen flocks		household	farming
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown						
Salmonella - S. Enteritidis - PT 21	0	1	4	0	0	unknown						
Salmonella - S. Enteritidis - PT 4	0	1	2	0	0	unknown	x				household	
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0		x					

Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown	x		household	
Salmonella - S. Enteritidis - PT 21	1	0	2	0	1	unknown			hotel	
Salmonella - S. Enteritidis - PT 4		1	4	0	3	homemade curd cake with raw egg yolk	x	survey, no proof of previdence	household	
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown				
Salmonella - S. Enteritidis - PT 21		1	2	0	0	rolls with marmalade		telephone contact	household	
Salmonella - S. Enteritidis - PT 21		1	3	0	3	meat/sausages	x	telephone contact	holiday	
Salmonella - S. Enteritidis - PT 21	1		2	0	2	escalope from turkey				
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 21										
Salmonella - S. Enteritidis - PT 6a	1		2	0	2	beef, vegetables			chinarestaurant	
Yersinia - Y. enterocolitica - O:3		1	2	0		chicken	x		spa resort	
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown				
Salmonella - S. Enteritidis - PT 4	1		2	0		unknown				
Salmonella - S. Enteritidis - PT 21	1		2	0	1	buffet, eggs, tiramisu				
Salmonella - S. Typhimurium - RDNC		1	3	0	0	unknown			holiday	
Salmonella - S. Typhimurium - DT U	0	1	2	0	0	unknown	x			
Salmonella - S. Typhimurium - RDNC		1	2	0	0	fried sausage	x		festival	
Salmonella - S. Typhimurium - RDNC	0	1		0	2	unknown	x			
Salmonella - S. Typhimurium - U		1	2	0	1	unknown			embassy	
Escherichia coli, pathogenic - Verotoxigenic E. coli (VTEC) - VTEC O103:H2										

Salmonella - S. Enteritidis - PT 4		1	5	0	3	scrambled eggs	x			household		
Salmonella - S. Enteritidis - PT 4		1	2	0	1	unknown				household		
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown				household		
Salmonella - S. Enteritidis - PT 4	0	1	2	0	1	unknown						
Salmonella - S. Enteritidis - PT 4		1	3	0	2	unknown						
Salmonella - S. Enteritidis - PT 4		1	2	0		unknown						
Salmonella - S. Enteritidis - PT 4		1	2	0	1	unknown				household		
Salmonella - S. Enteritidis - PT 4		1	2	0	2	unknown				household		
Salmonella - S. Enteritidis - PT 4		1	2	0	0	roasted chicken	x			restaurant		
Salmonella - S. Enteritidis - PT 4		1	2	0	0	unknown				household		
Salmonella - S. Enteritidis - PT 4		1	2	0	2	unknown				household		
Salmonella - S. Enteritidis - PT 21		1	2	0	0	chicken, parfait	x	epidemiologic coherence		household		
Salmonella - S. Enteritidis - PT 4	1	0	15	0	1	unknown	x			household		
Salmonella - S. Enteritidis - PT 21		1	3	0	0	unknown		epidemiologic coherence		household		
Salmonella - S. Enteritidis - PT 6a	1	0	6	0	0	eggs from own laying hen flock	x			unknown		
Salmonella - S. Enteritidis - PT 4		4	8	0	2	unknown						
Salmonella - S. Enteritidis - PT 21	0	1	2	0	0	unknown						
Salmonella - S. Enteritidis - PT 4	1		4	0	2	ice cream parlour						
Salmonella - S. Enteritidis - PT 8		1	2	0							contact infection with an infected veal	
Salmonella - S. Enteritidis - PT 21												
Salmonella - S. Enteritidis - PT 6		2	5	0	2	unknown						
Salmonella - S. Enteritidis - PT 4	0	1	3	0	0	unknown						
Salmonella - S. Typhimurium - DT 14b		1	2	0	1	unknown				household		
Salmonella - S. Enteritidis - PT 4 (9)	1		65	0	1	homemade mayonnaise salad		x	Salmonella detected in own laying hen flocks, in eggs and homemade mayonnaise	canteen		
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	unknown	x					
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	unknown	x			household		
Salmonella - S. Enteritidis - PT 21		1	2	0	2	unknown				household		
Salmonella - S. Enteritidis - PT 21		1	2	0	0	unknown			epidemiologic coherence	household		
Salmonella - S. Enteritidis - PT 4		1	2	0		homemade tiramisu				household		
Salmonella - S. Enteritidis - PT 6a	0	1	2	0	1	unknown				unknown		

Salmonella - S. Typhimurium - DT 104l		1	5	0	1	unknown				household	
Salmonella - S. Typhimurium - DT 104l	0	1	3	0	1	unknown				household	
Salmonella - S. Enteritidis - PT 21		1	3	0	0	unknown				household	
Salmonella - S. Enteritidis - PT 4	0	1	2	0	1		x			household	
Salmonella - S. Enteritidis - PT 8	0	1	2	0	0	eggs	x			household	
Salmonella - S. Enteritidis - PT 8	0	1	3	0	3	chicken	x			household	
Salmonella - S. Enteritidis - PT 1	0	2	4	0	1	unknown					
Salmonella - S. Enteritidis - PT 1											
Salmonella - S. Enteritidis - PT 1											
Salmonella - S. Enteritidis - PT 1											
Salmonella - S. Enteritidis - PT 8 (10)	1	0	2	0	0	eggs, buffet	x			restaurant	

(1) : 9 children only of one group of a kindergarten who participated in an excursion to a bakery and presumptively tasted a raw dough containing raw eggs. The origin of the eggs could be traced back to two holdings of laying hens. In one holding the outbreak strain was detected in fecal samples; further sporadic cases could be linked to the use of eggs from the same holding of laying hens.
(2) : A hotel associated outbreak. Eggs from Germany were the most probable vehicle (the outbreak strain could not be detected in the incriminated eggs but a nother strain)
(3) : One outbreak affecting one province; one holding of laying hens epidemiologically and bacteriologically identified. Other PT6 outbreaks were not thoroughly enough investigated and were not traced back to the incriminated holding.
(4) : One Austrian wide outbreak, one holding of laying hens epidemiologically and bacteriologically identified; assumed sporadic cases are included.
(5) : Two Austrian wide outbreaks, two holdings of laying hens bacteriologically identified; it was not possible to link all of the cases with one of the holdings; assumed sporadic cases are included.
(6) : S. Enteritidis PT 8 + S. Enteritidis RDNC
(7) : S. Enteritidis PT 8 + S. Hadar
(8) : One outbreak affecting one province; one holding of laying hens epidemiologically and bacteriologically identified.
(9) : S. Enteritidis PT 4 + PT 7
(10) : S. Enteritidis PT8 + S. Anatum