



EUROPEAN COMMISSION
HEALTH & CONSUMER PROTECTION DIRECTORATE-GENERAL
Directorate D - Food Safety: production and distribution chain
D2 - Biological risks

SANCO/339/2005
Part 1

**Trends and sources of zoonotic agents
in animals, feedingstuffs, food and man
in the European Union and Norway
in 2003**

Part 1

An evaluation of the trend reports provided for the year 2003 by the Member States and Norway to the European Commission in accordance with Article 5 of the Directive 92/117/EEC

Prepared by the Community Reference Laboratory on the Epidemiology of Zoonoses, BfR, Berlin, Germany

Working document
Does not necessarily represent the views of the Commission Services

NOTE:

This report has to be carefully interpreted.

For most of the zoonotic agents covered by the report, comparable or uniform surveillance schemes are not applied in the European Union.

The data presented may not necessarily derive from national plans where sampling is specific and statistically planned. Therefore the results are often not directly comparable between different Member States.

This edition includes only Part 1 of the report.

Part 2, which contains all the original reports from the 15 Member States and Norway.

In addition, the reports provided on a voluntary basis by four New Member States are attached too.

Table of Contents	1
Executive summary	11
Summary	13
Introduction	29
 Information on the zoonotic agents listed in Annex I (1) of Directive 92/117/EEC	
1. Tuberculosis	31
1.1. Bovine tuberculosis	31
1.1.1. Bovine tuberculosis in cattle	31
1.1.2. Sheep and goats	36
1.1.3. Pigs	37
1.1.4. Deer (farmed and wildlife)	37
1.1.5. Other wildlife	37
1.1.6. Zoo animals	38
1.1.7. Pets	38
1.2. Tuberculosis in humans caused by <i>Mycobacterium bovis</i>	38
2. Brucellosis	41
2.1. Brucellosis in animals	41
2.1.1. Bovine brucellosis	41
2.1.2. Ovine and caprine brucellosis	45
2.1.3. Brucellosis in pigs	49
2.1.4. Brucellosis in other animals	49
2.2. <i>Brucella</i> in food	50
2.3. Human brucellosis	50
3. <i>Salmonella</i>	55
3.1. <i>Salmonella</i> in feed materials	55
3.2. <i>Salmonella</i> in animals and products thereof	70
3.2.1. <i>Salmonella</i> in <i>Gallus gallus</i> (chicken, hens)	70
3.2.1.1. Monitoring and control strategies in breeding flocks	70
3.2.1.2. Monitoring and control strategies in laying hens and eggs for human consumption	73
3.2.1.3. Monitoring and control strategies in broilers and broiler meat	74
3.2.1.4. Recent situation - All breeding flocks of <i>Gallus gallus</i>	79
3.2.1.5. Recent situation - Egg production line – breeding flocks	81
3.2.1.6. Recent situation - Egg production line – laying hens	83
3.2.1.7. Recent situation - Eggs and egg products	85
3.2.1.8. Recent situation - Poultry meat production line – breeders	87
3.2.1.9. Recent situation - Poultry meat production line – broilers	88
3.2.1.10. Recent situation - Poultry meat production line – poultry meat	90
3.2.1.11. Recent situation - Serovar pattern in <i>Gallus gallus</i>	95
3.2.2. <i>Salmonella</i> in other poultry (excluding <i>Gallus gallus</i>)	105
Monitoring and control strategies	105
Recent situation	112
Serovar pattern in poultry and poultry meat	115
3.2.3. <i>Salmonella</i> in pigs and pork	122
Monitoring and control strategies	122
Results	126
Pigs	126
Pork and pork products	127
Serovar pattern in pigs and pork	129
3.2.4. <i>Salmonella</i> in cattle and products thereof	132
Monitoring and control strategies	132
Results	132
Cattle	132
Beef and beef products	137
Milk and milk products	138
Serovar pattern in cattle and beef	139
3.2.5. <i>Salmonella</i> in other animals	143
Sheep and goats	143
Horses	143
Wildlife animals	143
Reptiles	143
Pets	143
3.2.6. <i>Salmonella</i> in other foodstuff	144
Meat studies	144
Fish and fish products	144

3.3. Salmonellosis in humans	145
3.3.1. Surveillance systems	145
3.3.2. Overall trend	145
3.3.3. Serovars of <i>Salmonella</i>	148
3.3.4. Age distribution	154
3.3.5. Seasonal distribution	158
3.4. Sero- and phagetypes of <i>Salmonella</i> – an overview	161
3.4.1. Serovars	161
3.4.2. Phagetypes of <i>S. Enteritidis</i> and <i>S. Typhimurium</i>	161
4. <i>Trichinella</i>	181
4.1. <i>Trichinella</i> in animals	181
4.2. Trichinellosis in humans	184

Information on the zoonotic agents listed in Annex I (2) of Directive 92/117/EEC

5. Rabies	187
5.1. Rabies in animals	187
5.2. Rabies in humans	187
6. <i>Campylobacter</i>	191
6.1. <i>Campylobacter</i> in animals and food	191
6.1.1. <i>Campylobacter</i> in poultry and poultry meat	191
6.1.2. <i>Campylobacter</i> in pigs and products thereof	195
6.1.3. <i>Campylobacter</i> in cattle and products thereof	196
6.1.4. <i>Campylobacter</i> in other foodstuffs	197
6.1.5. <i>Campylobacter</i> in the New Member States	197
6.2. <i>Campylobacteriosis</i> in humans	197
7. <i>Listeria</i>	205
7.1. <i>Listeria</i> in animals	205
7.2. <i>Listeria</i> in food	205
7.3. Listeriosis in humans	209
8. <i>Yersinia</i>	213
8.1. <i>Yersinia</i> in animals	213
8.2. <i>Yersinia</i> in food	213
8.3. Yersiniosis in humans	213
9. <i>Echinococcus</i>	221
9.1. <i>Echinococcus</i> in animals	221
9.2. <i>Echinococcosis</i> in humans	225
10. <i>Toxoplasma</i>	229
10.1. <i>Toxoplasma</i> in animals	229
10.2. Toxoplasmosis in humans	229

Information on the zoonotic agents not listed in Annex I of Directive 92/117/EEC

11. Verotoxigenic <i>Escherichia coli</i>	233
11.1. Verotoxigenic <i>Escherichia coli</i> in animals and products thereof	233
11.2. Verotoxigenic <i>E. coli</i> in humans	236

Other Information

12. Antimicrobial resistance	241
12.1. <i>Salmonella</i>	241
12.2. <i>Campylobacter</i>	248
12.3. <i>Escherichia coli</i>	249
13. Demographic Data	329
Abbreviations	339
Annex	341

Tables in the text

Table A	Month of first receipt of the National Trend Reports	30
Table MY 1.	Notification of bovine tuberculosis in Member States not officially tuberculosis free in 2003	33
Table MY 2.	Bovine tuberculosis: Tuberculin testing of herds in Member States not officially tuberculosis free	34
Table MY 3.	Bovine tuberculosis: Meat inspection of animals in Member States not officially tuberculosis free	36
Table MY 4.	Bovines destroyed or slaughtered in Member States not officially tuberculosis free due to bovine tuberculosis	36
Table MY 5.	Human tuberculosis caused by <i>Mycobacterium bovis</i>	39
Table BR 1.	Bovine brucellosis on the basis of notification, 2003	43
Table BR 2.	Results of routine testing of herds for bovine brucellosis in Member States not officially brucellosis free	43
Table BR 3.	Bovine animals destroyed or slaughtered due to bovine brucellosis	45
Table BR 4.	Ovine and caprine brucellosis (<i>B. melitensis</i>) on the basis of notification, 2003	47
Table BR 5.	Results of routine testing of holdings for ovine and caprine brucellosis in Member States not officially brucellosis (<i>B. melitensis</i>) free	47
Table BR 6.	Number of sheep and goats slaughtered or destroyed due to ovine and caprine brucellosis (<i>B. melitensis</i>)	49
Table BR 7.	Human brucellosis	52
Table SA 1.	Surveillance systems on <i>Salmonella</i> in feedingstuffs, 2003	56
Table SA 2.	<i>Salmonella</i> in feed materials, 2001 to 2003 – Sample and batch based data	57
Table SA 3.	<i>Salmonella</i> in animal derived feed materials, 2001 to 2003	58
Table SA 4.	<i>Salmonella</i> in vegetable derived feed materials, 2001 to 2003	59
Table SA 5.	<i>Salmonella</i> in vegetable derived feed materials: Oil seeds, their products and by-products, 2003	60
Table SA 6.	<i>Salmonella</i> in cereals, 2002 and 2003	61
Table SA 7.	<i>Salmonella</i> in compound feedingstuffs – process control samples, 2002 – 2003	61
Table SA 8.	<i>Salmonella</i> in compound feedingstuffs, 2003	62
Table SA 9.	<i>Salmonella</i> in compound feedingstuffs for poultry (final products), 2002 and 2003	63
Table SA 10.	<i>Salmonella</i> in feedingstuffs for other animals, 2002 and 2003	63
Table SA 11.	Most frequent <i>Salmonella</i> serovars in feed material and compound feedingstuff in the individual countries 2003 – domestic	65
Table SA 12.	Most frequent <i>Salmonella</i> serovars in feed material and compound feedingstuff in the individual countries 2003 – imports	66
Table SA 13.	<i>Salmonella</i> in animal derived proteins, separated by origin	69
Table SA 14.	<i>Salmonella</i> in vegetable derived proteins, separated by origin	69
Table SA 15.	<i>Salmonella</i> in compound feedingstuffs, separated by origin	69
Table SA 16.	<i>Salmonella</i> monitoring programmes in poultry breeders (<i>Gallus gallus</i>), 2003	71
Table SA 17.	<i>Salmonella</i> monitoring programmes in poultry breeders (<i>Gallus gallus</i>), 2003 – additional sampling	72
Table SA 18.	Control measures taken in poultry breeder flocks in case of <i>Salmonella</i> infection	73
Table SA 19.	Sampling strategies in laying hens producing table eggs, 2003	75
Table SA 20.	Measures taken in laying hens (<i>Gallus gallus</i>) producing table eggs in case of <i>Salmonella</i> infections, 2003	76
Table SA 21.	Sampling strategies in broilers, 2003	77
Table SA 22.	<i>Salmonella</i> monitoring programmes in broilers and poultry meat products (<i>Gallus gallus</i>), 2003	78
Table SA 23.	Measures taken in broilers <i>Gallus gallus</i> in case of <i>Salmonella</i> infections, 2003	79
Table SA 24.	<i>Salmonella</i> in poultry breeders in countries, which run an approved <i>Salmonella</i> control programme (flock based data)	80
Table SA 25.	<i>Salmonella</i> in poultry breeders (incl. grandparent breeders, all age groups) in countries, which run a <i>Salmonella</i> control programme in accordance with Council Directive 92/117/EEC (flock based data)	81
Table SA 26.	<i>Salmonella</i> in layer breeders and laying hens producing table eggs in countries which run a monitoring programme in both animals groups, 2003 (flock based data)	82
Table SA 27a	<i>Salmonella</i> in layer breeders (only parent breeders, all age groups) in countries which run a <i>Salmonella</i> control programme in accordance with Council Directive 92/117/EEC (flock based data)	82
Table SA 27b	<i>Salmonella</i> in layer breeders (only parent breeders, all age group) in countries which run a <i>Salmonella</i> control programme in accordance with Council Directive 92/117/EEC (animal or incident based data)	82
Table SA 28a	<i>Salmonella</i> in laying hens (all age groups) producing table eggs in countries which run a monitoring programme, 2001 – 2003 (flock based data)	85
Table SA 28b	<i>Salmonella</i> in laying hens (all age groups) producing table eggs in countries which run a monitoring programme, 2001 – 2003 (animal or incident based data)	85
Table SA 29.	<i>Salmonella</i> in eggs and egg products	86
Table SA 30.	<i>Salmonella</i> in the different parts of eggs	87
Table SA 31.	<i>Salmonella</i> in broiler breeders and broilers in countries which run a monitoring programme in both animals groups, 2003 (flock based data)	87
Table SA 32a	<i>Salmonella</i> in broiler breeders (only parent breeders, all age groups) in countries which run a <i>Salmonella</i> control programme in accordance with Council Directive 92/117/EEC, 2001 – 2003 (flock based data)	88
Table SA 32b	<i>Salmonella</i> in broiler breeders (only parent breeders, all age groups) in countries which run a <i>Salmonella</i> control programme in accordance with Council Directive 92/117/EEC, 2001 – 2003 (animals or incident based data)	88
Table Sa 33a	<i>Salmonella</i> in broilers (all age groups) in countries which run a monitoring programme, 2001 – 2003 (flock based data)	90
Table SA 33b	<i>Salmonella</i> in broilers (all age groups) in countries which run a monitoring programme, 2001 – 2003 (animal or incident based data)	90
Table SA 34.	<i>Salmonella</i> in poultry meat in countries which run a approved control programme	91
Table SA 35.	<i>Salmonella</i> in poultry meat in countries which run a monitoring programme, 2001 – 2003	92
Table SA 36.	Most frequent <i>Salmonella</i> serovars in poultry breeders (<i>Gallus gallus</i>) in the individual countries, 2003	95

Table SA 37. Most frequent Salmonella serovars in the egg production line in the individual countries, 2003	98
Table SA 38. Most frequent Salmonella serovars in the poultry meat production line in the individual countries, 2003	102
Table SA 39. Salmonella monitoring programmes in turkey breeders, 2003	106
Table SA 40. Salmonella monitoring programmes in geese breeders, 2003	107
Table SA 41. Salmonella monitoring programmes in duck breeders, 2003	108
Table SA 42. Sampling strategies in turkeys – production level, 2003	109
Table SA 43. Salmonella monitoring programmes in turkey meat and turkey meat products, 2003	110
Table SA 44. Sampling strategies in ducks and geese – production level, 2003	111
Table SA 45. Salmonella in turkey breeders and turkey flocks in countries which run a monitoring programme in both animals groups, 2003 (flock based data)	112
Table SA 46. Salmonella in geese breeders and commercial geese flocks in countries which run a monitoring programme in both animals groups, 2003 (flock based data)	113
Table SA 47. Salmonella in duck breeders and commercial duck flocks in countries which run a monitoring programme in both animals groups, 2003 (flock based data)	113
Table SA 48. Most frequent Salmonella serovars in the main poultry species in the individual countries, 2003	116
Table SA 49. Most frequent Salmonella serovars in meat of the main poultry species in the individual countries, 2003	119
Table SA 50. Sampling strategies in pigs, 2003	123
Table SA 51. Salmonella monitoring programmes in pigs and pork, 2003	124
Table SA 52. Measures taken in pigs herds in case of Salmonella infections, 2003	125
Table SA 53. Salmonella in pigs and pork in countries which run a monitoring / surveillance programme	128
Table SA 54. Salmonella in pork, minced meat and meat products made from pork at retail, 2003	128
Table SA 55. Most frequent Salmonella serovars in pigs in the individual countries, 2003	129
Table SA 56. Most frequent Salmonella serovars in pork in the individual countries, 2003	129
Table SA 57. Sampling strategies in cattle, 2003	134
Table SA 58. Salmonella monitoring programmes in beef, 2003	135
Table SA 59. Measures which may be taken in cattle herds in case of Salmonella infections, 2003	136
Table SA 60. Salmonella in cattle and products thereof in countries which run a monitoring / surveillance programme	137
Table SA 61. Salmonella in beef, minced meat and meat products at retail, 2003	138
Table SA 62. Most frequent Salmonella serovars in cattle in the individual countries, 2003	140
Table SA 63. Most frequent Salmonella serovars in beef in the individual countries, 2003	140
Table SA 64. Human salmonellosis / notified cases of Salmonella	146
Table SA 65. Human salmonellosis / notified cases of Salmonella by origin	147
Table SA 66. The first ten serovars in order to their declining frequencies in the individual regions, 2003	152
Table SA 67. Serovars and percentage of their occurrence referred to all cases in the country, 2003	153
Table SA 68. Countries, which provided data on serovars	161
Table SA 69. Phagetype distribution (%) of <i>S. Enteritidis</i> in 2003	166
Table SA 70. Phagetype distribution (%) of <i>S. Typhimurium</i> in 2003	167
Table SA 71. Phagetype distribution (%) of <i>S. Enteritidis</i> in humans in 2003	168
Table SA 72. Phagetype distribution (%) of <i>S. Typhimurium</i> in humans in 2003	168
Table SA 73. Phagetype distribution (% of all isolates) of <i>S. Typhimurium</i> in The Netherlands in 2003	168
Table SA 74. Main Salmonella serovars in Austria, 2003	169
Table SA 75. Main Salmonella serovars in Belgium, 2003	170
Table SA 76. Main Salmonella serovars in Denmark, 2003	171
Table SA 77. Main Salmonella serovars in France, 2003	172
Table SA 78. Main Salmonella serovars in Finland, 2003	172
Table SA 79. Main Salmonella serovars in Germany, 2003	173
Table SA 80. Main Salmonella serovars in Greece, 2003	174
Table SA 81. Main Salmonella serovars in Ireland, 2003	174
Table SA 82. Main Salmonella serovars in Italy, 2003	175
Table SA 83. Main Salmonella serovars in Luxembourg, 2003	175
Table SA 84. Main Salmonella serovars in Norway, 2003	176
Table SA 85. Main Salmonella serovars in Portugal, 2003	176
Table SA 86. Main Salmonella serovars in Spain, 2003	177
Table SA 87. Main Salmonella serovars in Sweden, 2003	177
Table SA 88. Main Salmonella serovars in The Netherlands, 2003	178
Table SA 89. Main Salmonella serovars in UK (Great Britain), 2003	179
Table SA 90. Main Salmonella serovars in UK (Northern Ireland), 2003	179
Table TR 1. Trichinella findings in animals, 1998 - 2003	181
Table TR 2. Examinations for Trichinella in animals in 2003	182
Table TR 3. Trichinellosis in humans, 1997 - 2003	184
Table RA 1. Rabies in animals, 1999 – 2003	188
Table RA 2. Rabies cases in animals, 2003	190
Table CA 1. Campylobacter (thermophilic <i>C. jejuni</i> / <i>C. coli</i>) monitoring programmes in poultry, 2003	192
Table CA 2. Campylobacter (thermophilic <i>C. jejuni</i> / <i>C. coli</i>) monitoring programmes in poultry meat, 2003	193
Table CA 3. Campylobacter in broilers and products thereof in countries which run a monitoring programme or studies	194
Table CA 4. Campylobacter findings in poultry meat along the food chain, 2003	195
Table CA 5. Campylobacter in pigs in countries which run a monitoring programme in pigs or pork in 2003	196
Table CA 6. Campylobacter in cattle and beef in countries which run a monitoring programme or a survey	197
Table CA 7. Human campylobacteriosis, 1998 - 2003	199
Table LI 1. Sample sizes and definitions applied for reporting of <i>L. monocytogenes</i> in food	206
Table LI 2. Prevalence of <i>L. monocytogenes</i> in food, 2001 and 2003 (based on detection of the bacterium)	206
Table LI 3. Results of the study run on the prevalence of <i>L. monocytogenes</i> in Belgium in 2002 and 2003	207
Table LI 4. Human listeriosis	210

Table YE 1. Human yersiniosis	216
Table EH 1. Countries where <i>E. granulosus</i> is prevalent (Mediterranean region of the European Union)	222
Table EH 2. Countries reporting on <i>E. multilocularis</i> findings in foxes	224
Table EH 3. Human echinococcosis	226
Table TO 1. Human toxoplasmosis	230
Table EC 1. Studies and monitoring activities on verotoxigenic <i>E. coli</i> in animals, 2003	234
Table EC 2. Verotoxigenic <i>E. coli</i> monitoring programmes in food, 2003	234
Table EC 3. Human cases of verotoxigenic <i>E. coli</i> 2003	238
Table AB 1. Test methods used for antibiotic resistance testing of <i>Salmonella</i> spp. 2003	253
Table AB 2. Breakpoints used for antibiotic resistance testing of <i>Salmonella</i> spp. for those antimicrobials where no NCCLS breakpoint is fixed 2003	255
Table AB 3. Breakpoints used for antibiotic resistance testing of <i>Salmonella</i> spp. - deviations from NCCLS-Standards 2003	256
Table AB 4. Breakpoints used for antibiotic resistance testing of <i>Salmonella</i> spp. with agar diffusion other than NCCLS 2003	257
Table AB 5. Antibiotic resistance testing of <i>Salmonella</i> spp. in animals and food – Percentage of resistant isolates 2003	258
Table AB 6. Antibiotic resistance testing of <i>Salmonella</i> spp. in cattle and beef – Percentage of resistant isolates 2003	263
Table AB 7. Antibiotic resistance testing of <i>Salmonella</i> spp. in pigs and pork – Percentage of resistant isolates 2003	265
Table AB 8. Antibiotic resistance testing of <i>Salmonella</i> spp. in poultry and poultry meat – Percentage of resistant isolates 2003	268
Table AB 9. Antibiotic resistance testing of <i>Salmonella</i> spp. in humans - Percentage of resistant isolates 2003	271
Table AB 10. Antibiotic resistance testing of <i>Salmonella</i> Enteritidis - Percentage of resistant isolates 2003	272
Table AB 11. Antibiotic resistance testing of <i>Salmonella</i> Typhimurium - Percentage of resistant isolates 2003	275
Table AB 12. Antibiotic resistance testing of <i>Salmonella</i> serovars - Percentage of resistant isolates 2003	279
Antimicrobial resistance in <i>Salmonella</i> spp. - Distribution (%) of MIC-values, 2003:	
Table AB 13. Tetracyclin	282
Table AB 14. Chloramphenicol	283
Table AB 15. Florfenicol	284
Table AB 16. Ampicillin and Amoxicillin/davulanate	285
Table AB 17. Nalidixic acid	287
Table AB 18. Fluoroquinolones	288
Table AB 19. Sulfonamides	290
Table AB 20. Trimethoprim and Sulfonamide/Trimethoprim	291
Table AB 21. Cephalosporins	293
Table AB 22. Streptomycin	295
Table AB 23. Gentamicin	296
Table AB 24. Neomycin	297
Table AB 25. Kanamycin and other Aminoglycosides	298
Table AB 26. Test methods used for antibiotic resistance testing of <i>Campylobacter</i> spp. 2003	299
Table AB 27. Breakpoints used for antibiotic resistance testing of <i>Campylobacter</i> spp. 2003	300
Table AB 28. Antibiotic resistance testing of <i>Campylobacter</i> spp. in animals – Percentage of resistant isolates 2003	302
Table AB 29. Antibiotic resistance testing of <i>Campylobacter</i> spp. in the individual animal species and humans – Percentage of resistant isolates 2003	303
Table AB 30. Antibiotic resistance testing of <i>Campylobacter</i> spp. – Percentage of resistant isolates 2003	304
Antimicrobial resistance in <i>Campylobacter</i> spp. - Distribution (%) of MIC-values, 2003:	
Table AB 31. Tetracyclin	306
Table AB 32. Ampicillin	307
Table AB 33. Nalidixic acid	308
Table AB 34. Ciprofloxacin	309
Table AB 35. Aminoglycosides	310
Table AB 36. Erythromycin	311
Table AB 37. Test methods used for antibiotic resistance testing of <i>Escherichia coli</i> 2003	312
Table AB 38. Breakpoints used for antibiotic resistance testing of <i>Escherichia coli</i> for those antimicrobials where no NCCLS breakpoint is fixed 2003	313
Table AB 39. Breakpoints used for antibiotic resistance testing of <i>Escherichia coli</i> – deviations from NCCLS-Standards 2003	314
Table AB 40. Breakpoints used for antibiotic resistance testing of <i>Escherichia coli</i> with agar diffusion other than NCCLS 2003	315
Table AB 41. Antibiotic resistance testing of <i>Escherichia coli</i> in animals – Percentage of resistant isolates 2003	316
Table AB 42. Antibiotic resistance testing of <i>Escherichia coli</i> – Percentage of resistant isolates 2003	317
Antimicrobial resistance in <i>E. coli</i> - Distribution (%) of MIC-values, 2003:	
Table AB 43. Tetracyclin	320
Table AB 44. Chloramphenicol and Florfenicol	321
Table AB 45. Ampicillin and Amoxicillin/davulanate	322
Table AB 46. Nalidixic acid	323
Table AB 47. Fluoroquinolones	324

Table AB 48.	Sulfonamide/Trimethoprim	325
Table AB 49.	Cephalosporins	326
Table AB 50.	Streptomycin and Gentamicin	327
Table AB 51.	Neomycin and other Aminoglycosides	328
Table DD 1	Source of the data provided by the countries	329
Table DD 2.	Human population (in thousand) in 2003	330
Table DD 3	Poultry population	332
Table DD 4	Population of poultry other than Gallus gallus	333
Table DD 5	Cattle population	334
Table DD 6	Pigs population	335
Table DD 7	Sheep and goats population	336
Table DD 8	Horses population	337
Table DD 9	Farmed deer and moose population	337

Figures in the text

Figure A	Month of first receipt of the National trend reports	30
Figure MY 1.	Bovine tuberculosis in the European Union and Norway, 2003	31
Figure MY 2.	Bovine tuberculosis: Herds positive in tuberculin testing in NON-OTF Member States, 1994 - 2003	35
Figure MY 3.	The age distribution of tuberculosis caused by <i>M. bovis</i> (incidence rate per 100 000 persons of the age group) in the European countries and Norway	39
Figure BR 1.	Bovine brucellosis in 2003 – status of the countries	41
Figure BR 2.	Bovine brucellosis: herds positive in routine testing in NON-OBF Member States 1994 – 2003	44
Figure BR 3.	Ovine and caprine brucellosis in the European Union and Norway 2003	46
Figure BR 4.	Ovine and caprine brucellosis (<i>B. melitensis</i>): Positive holdings in routine testing in NON-ObmF Member States, 1994 - 2003	48
Figure BR 5.	Human brucellosis and the situation in livestock, 2003	51
Figure BR 6.	Trend in human brucellosis	51
Figure BR 7.	Age distribution of brucellosis in human, 2003	53
Figure SA 1.	The five most frequent Salmonella serovars (in % of all isolates) in feed materials and compound feedingstuffs, 2003	67
Figure SA 2.	The five most frequent Salmonella serovars (in % of all isolates) in the European Union in feed materials and compound feedingstuffs by their occurrence in the individual countries, 2003	68
Figure SA 3.	Salmonella in poultry breeders - Countries running an approved control programme, 1996 - 2003	80
Figure SA 4.	Salmonella in laying hens producing table eggs in countries, which run an approved control programme in breeders and layers, 1996 - 2003 (flock based data)	83
Figure SA 5.	Salmonella in layer breeders and laying hens producing table eggs in the individual countries, 1996 - 2003 (flock based data)	84
Figure SA 6.	Salmonella in broilers in countries, which run an approved control, programme in breeders and broilers, 1996 - 2003	89
Figure SA 7.	Salmonella in the meat production line in the individual countries, 1996 - 2003	91
Figure SA 8.	Salmonella in poultry (<i>Gallus gallus</i>) in the individual countries, 1996 - 2003	94
Figure SA 9.	The five most frequent Salmonella serovars (in % of all isolates) in poultry breeders (<i>Gallus gallus</i>), 2003	96
Figure SA 10.	The five most frequent Salmonella serovars (in % of all isolates) in the European Union in poultry breeders (<i>Gallus gallus</i>) in the individual countries, 2003	96
Figure SA 11.	The five most frequent Salmonella serovars (in % of all isolates) in the egg production line, 2003	99
Figure SA 12.	The five most frequent Salmonella serovars (in % of all isolates) in the European Union from the egg production line by their occurrence in the individual countries, 2003	100
Figure SA 13.	The five most frequent Salmonella serovars (in % of all isolates) in the poultry meat production line, 2003	103
Figure SA 14.	The five most frequent Salmonella serovars (in % of all isolates) in the European Union from the poultry meat production line by their occurrence in the individual countries, 2003	104
Figure SA 15.	The five most frequent Salmonella serovars (in %) in the main poultry species, 2003	117
Figure SA 16.	The five most frequent Salmonella serovars (in %) in the European Union from the main poultry species by their occurrence in the individual countries, 2003	118
Figure SA 17.	The five most frequent Salmonella serovars (in %) in the European Union from meat of the main poultry species by their occurrence in the individual countries, 2003	120
Figure SA 18.	The five most frequent Salmonella serovars (in %) in the European Union meat of the main poultry species by their occurrence in the individual countries, 2003	121
Figure SA 19.	The five most frequent Salmonella serovars (in % of all isolates) in pigs, 2003	130
Figure SA 20	The five most frequent Salmonella serovars (in % of all isolates) in the European Union from pigs by their occurrence in the individual countries, 2003	130
Figure SA 21.	The five most frequent Salmonella serovars (in % of all isolates) in pork, 2003	131
Figure SA 22.	The five most frequent Salmonella serovars (in % of all isolates) in the European Union from pork by their occurrence in the individual countries, 2003	131
Figure SA 23.	The five most frequent Salmonella serovars (in % of all isolates) in cattle, 2003	141
Figure SA 24.	The five most frequent Salmonella serovars (in % of all isolates) in the European Union from cattle by their occurrence in the individual countries, 2003	141
Figure SA 25.	The five most frequent Salmonella serovars (in % of all isolates) in beef, 2003	142
Figure SA 26.	The five most frequent Salmonella serovars (in % of all isolates) in the European Union from beef by their occurrence in the individual countries, 2003	142
Figure SA 27	Trend in human salmonellosis, 1995 - 2003	147
Figure SA 28.	Trend in domestic and imported cases of human salmonellosis, 1995 - 2003	148

Figure SA 29. Serovar patterns in human salmonellosis, 2003	149
Figure SA 30. Serovar patterns in human salmonellosis differentiated to imported and domestic cases, 2003	150
A. Ranking by the origin of infection	150
B. Ranking by the country	150
Figure SA 31. Distribution of the top five serovars in human salmonellosis, 2003	151
Figure SA 32. The age distribution of salmonellosis (incidence rate per 100 000 persons of the age group) in the European countries and Norway	155
Figure SA 33. Distribution of the salmonellosis cases over the year	158
Figure SA 34. Trend of all <i>S. Enteritidis</i> and <i>S. Typhimurium</i> cases in humans in comparison to cases caused by single phagetypes	165
Figure TR 1. The age distribution of trichinellosis (incidence rate per 100 000 inhabitants of the age group) in the European countries	185
Figure RA 1. Rabies cases in animals in the European Union, 1994 — 2003	189
Figure RA 2. Rabies cases in Germany, 1995 - 2003	190
Figure CA 1. Trend in human campylobacteriosis	198
Figure CA 2. Trend in human campylobacteriosis by origin	198
Figure CA 3. Incidence rate (cases per 100 000 inhabitants) of campylobacteriosis by age	200
Figure CA 4. Campylobacteriosis cases in the years 1999 to 2003	202
Figure LI 1. Number of reported cases of listeriosis	210
Figure LI 2. Age distribution of listeriosis (Incidence per 100000 per age group) in 2003	211
Figure YE 1. Trend in human yersiniosis	215
Figure YE 2. Incidence rate per 100 000 inhabitants of yersiniosis in different age groups	216
Figure YE 3. Distribution of yersiniosis cases over the year	218
Figure EH 1. Echinococcus infections in sheep and goats in countries where <i>E. granulosus</i> is prevalent (Mediterranean region of the European Union) (1996 – 2003)	223
Figure EH 2. Trend in human echinococcosis	225
Figure EH 3. Incidence rate per 100 000 inhabitants of echinococcosis in different age groups	227
Figure TO 1. Trend in human toxoplasmosis	230
Figure TO 2. Incidence rate per 100 000 inhabitants of toxoplasmosis in different age groups	231
Figure EC 1. Incidence rate per 100 000 inhabitants of verotoxigenic <i>E. coli</i> infection in different age groups	239

Tables in the Annex

Table AN - 1.1.1.	Tuberculosis in cattle in OTF countries, 2003	341
Table AN - 1.1.2.	Tuberculosis in cattle in NON-OTF countries, 2003	342
Table AN - 1.1.3.	Tuberculosis in cattle in the New Member States, 2003	343
Table AN - 1.1.4.	Tuberculosis in farmed deer, 2003	344
Table AN - 1.1.5.	Tuberculosis in other livestock, 2003	345
Table AN - 1.1.6.	Tuberculosis in other animals, 2003	346
Table AN - 2.1.1.	Brucellosis in cattle in OBF countries, 2003	347
Table AN - 2.1.2.	Brucellosis in cattle in NON-OBF countries, 2003	348
Table AN - 2.1.3.	Brucellosis in cattle in the New Member States, 2003	349
Table AN - 2.1.4.	Brucellosis in sheep and goats in ObmF countries, 2003	350
Table AN - 2.1.5.	Brucellosis in sheep and goats in NON-ObmF countries, 2003	351
Table AN - 2.1.6.	Brucellosis in sheep and goats in the New Member States, 2003	352
Table AN - 2.1.7.	Brucellosis in other animals, 2003	353
Table AN - 2.1.8.	Brucellosis in food, 2003	354
Table AN - 3.1.1.	<i>Salmonella</i> in feed materials not further specified, 2003	355
Table AN - 3.1.2.	<i>Salmonella</i> in feed materials - meat and bone meal, 2003	356
Table AN - 3.1.3.	<i>Salmonella</i> in feed materials - other, 2003	357
Table AN - 3.1.4.	<i>Salmonella</i> in feed materials - fish and products, 2003	359
Table AN - 3.1.5.	<i>Salmonella</i> in feed materials - cereals, 2003	360
Table AN - 3.1.6.	<i>Salmonella</i> in feed materials - oil seeds, fruits, their products and by-products, 2003	362
Table AN - 3.1.7.	<i>Salmonella</i> in feed materials - other vegetable products, 2003	365
Table AN - 3.1.8.	<i>Salmonella</i> in compound feedingstuffs - all categories, 2003	366
Table AN - 3.1.9.	<i>Salmonella</i> in compound feedingstuffs - poultry, 2003	367
Table AN - 3.1.10.	<i>Salmonella</i> in compound feedingstuffs - cattle, 2003	369
Table AN - 3.1.11.	<i>Salmonella</i> in compound feedingstuffs - pigs, 2003	370
Table AN - 3.1.12.	<i>Salmonella</i> in compound feedingstuffs - pets, 2003	371
Table AN - 3.1.13.	<i>Salmonella</i> in compound feedingstuffs - carnivores, 2003	372
Table AN - 3.1.14.	<i>Salmonella</i> in compound feedingstuffs - fish, 2003	373
Table AN - 3.1.15.	<i>Salmonella</i> in compound feedingstuffs - other animals, 2003	374
Table AN - 3.2.1.	<i>Salmonella</i> in poultry - breeder not further specified, 2003	375
Table AN - 3.2.2.	<i>Salmonella</i> in poultry - breeder specified by production line, 2003	375
Table AN - 3.2.3.	<i>Salmonella</i> in poultry - grandparent flocks, 2003	376
Table AN - 3.2.4.	<i>Salmonella</i> in poultry - parent breeders not further specified, 2003	377
Table AN - 3.2.5.	<i>Salmonella</i> in poultry - parent breeders of egg production, 2003	378
Table AN - 3.2.6.	<i>Salmonella</i> in poultry - parent breeders of meat production line, 2003	379
Table AN - 3.2.7.	<i>Salmonella</i> in poultry - not specified, 2003	380
Table AN - 3.2.8.	<i>Salmonella</i> in poultry - layers, 2003	381
Table AN - 3.2.9.	<i>Salmonella</i> in poultry - broilers, 2003	382
Table AN - 3.2.10.	<i>Salmonella</i> in poultry - ducks, 2003	383
Table AN - 3.2.11.	<i>Salmonella</i> in poultry - geese, 2003	384
Table AN - 3.2.12.	<i>Salmonella</i> in poultry - turkeys, 2003	385
Table AN - 3.2.13.	<i>Salmonella</i> in poultry - other poultry species, 2003	386
Table AN - 3.2.14.	<i>Salmonella</i> in other birds, 2003	387
Table AN - 3.2.15.	<i>Salmonella</i> in pigs, 2003	388
Table AN - 3.2.16.	<i>Salmonella</i> in cattle, 2003	389
Table AN - 3.2.17.	<i>Salmonella</i> in sheep and goats, 2003	390
Table AN - 3.2.18.	<i>Salmonella</i> in solipeds, 2003	391
Table AN - 3.2.19.	<i>Salmonella</i> in other livestock, 2003	392
Table AN - 3.2.20.	<i>Salmonella</i> in wildlife, 2003	393
Table AN - 3.2.21.	<i>Salmonella</i> in dogs and cats, 2003	394
Table AN - 3.2.22.	<i>Salmonella</i> in other animals, 2003	395
Table AN - 3.3.1.	<i>Salmonella</i> in poultry meat, 2003	396

Table AN - 3.3.2.	<i>Salmonella</i> in poultry meat products, 2003	399
Table AN - 3.3.3.	<i>Salmonella</i> in food and meat not further specified, 2003	400
Table AN - 3.3.4.	<i>Salmonella</i> in beef and veal, 2003	401
Table AN - 3.3.5.	<i>Salmonella</i> in pork, 2003	403
Table AN - 3.3.6.	<i>Salmonella</i> in mutton and other meat, 2003	405
Table AN - 3.3.7.	<i>Salmonella</i> in minced meat and meat preparations, 2003	406
Table AN - 3.3.8.	<i>Salmonella</i> in meat products, 2003	407
Table AN - 3.3.9.	<i>Salmonella</i> in milk, 2003	411
Table AN - 3.3.10.	<i>Salmonella</i> in milk products, 2003	412
Table AN - 3.3.11.	<i>Salmonella</i> in eggs, 2003	413
Table AN - 3.3.12.	<i>Salmonella</i> in egg products, 2003	414
Table AN - 3.3.13.	<i>Salmonella</i> in fish and products, 2003	415
Table AN - 3.3.14.	<i>Salmonella</i> in bakery products and vegetables, 2003	417
Table AN - 3.3.15.	<i>Salmonella</i> in other food, 2003	418
Table AN - 4.1.1.	<i>Trichinella</i> in livestock and wild boars, 2003	420
Table AN - 4.1.2.	<i>Trichinella</i> in other animals, 2003	421
Table AN - 5.1.1.	Rabies in livestock, 2003	422
Table AN - 5.1.2.	Rabies in wildlife, 2003	423
Table AN - 5.1.3.	Rabies in pets, 2003	424
Table AN - 5.1.4.	Rabies in other animals, 2003	425
Table AN - 6.1.1.	<i>Campylobacter</i> in poultry, 2003	426
Table AN - 6.1.2.	<i>Campylobacter</i> in cattle, 2003	427
Table AN - 6.1.3.	<i>Campylobacter</i> in pigs, 2003	428
Table AN - 6.1.4.	<i>Campylobacter</i> in sheep and goats, 2003	429
Table AN - 6.1.5.	<i>Campylobacter</i> in solipeds, 2003	430
Table AN - 6.1.6.	<i>Campylobacter</i> in pets, 2003	431
Table AN - 6.1.7.	<i>Campylobacter</i> in other animals, 2003	432
Table AN - 6.2.1.	<i>Campylobacter</i> in poultry meat, 2003	433
Table AN - 6.2.2.	<i>Campylobacter</i> in poultry meat products, 2003	434
Table AN - 6.2.3.	<i>Campylobacter</i> in beef, 2003	435
Table AN - 6.2.4.	<i>Campylobacter</i> in meat not specified, pork and other meat, 2003	436
Table AN - 6.2.5.	<i>Campylobacter</i> in minced meat and meat products, 2003	437
Table AN - 6.2.6.	<i>Campylobacter</i> in milk and products, 2003	438
Table AN - 6.2.7.	<i>Campylobacter</i> in other food, 2003	439
Table AN - 7.1.	<i>Listeria</i> in animals, 2003	440
Table AN - 7.2.1.	<i>Listeria</i> in meat, minced meat and meat preparationst, 2003	441
Table AN - 7.2.2.	<i>Listeria</i> in meat products, 2003	442
Table AN - 7.2.3.	<i>Listeria</i> in poultry meat and poultry meat products, 2003	444
Table AN - 7.2.4.	<i>Listeria</i> in milk, 2003	445
Table AN - 7.2.5.	<i>Listeria</i> in milk products, 2003	446
Table AN - 7.2.6.	<i>Listeria</i> in fish and fish products, 2003	448
Table AN - 7.2.7.	<i>Listeria</i> in egg and egg products, 2003	450
Table AN - 7.2.8.	<i>Listeria</i> in vegetables, 2003	451
Table AN - 7.2.9.	<i>Listeria</i> in other food, 2003	452
Table AN - 8.1.1.	<i>Yersinia</i> in livestock, 2003	453
Table AN - 8.1.2.	<i>Yersinia</i> in other animals, 2003	454

Table AN - 8.2.1.	<i>Yersinia</i> in meat, 2003	455
Table AN - 8.2.2.	<i>Yersinia</i> in meat products, 2003	456
Table AN - 8.2.3.	<i>Yersinia</i> in poultry meat and products, 2003	457
Table AN - 8.2.4.	<i>Yersinia</i> in other food, 2003	458
Table AN - 9.1.1.	<i>Echinococcus</i> in cattle and pigs, 2003	460
Table AN - 9.1.2.	<i>Echinococcus</i> in sheep, goats and other livestock, 2003	461
Table AN - 9.1.3.	<i>Echinococcus</i> in other animals, 2003	462
Table AN - 10.1.1.	<i>Toxoplasma</i> in livestock, 2003	463
Table AN - 10.1.2.	<i>Toxoplasma</i> in other animals, 2003	464
Table AN - 11.1.1.	Verotoxigenic <i>E. coli</i> in cattle, 2003	465
Table AN - 11.1.2.	Verotoxigenic <i>E. coli</i> in pigs, 2003	466
Table AN - 11.1.3.	Verotoxigenic <i>E. coli</i> in sheep, goats and solipeds, 2003	467
Table AN - 11.1.4.	Verotoxigenic <i>E. coli</i> in other animals, 2003	468
Table AN - 11.2.1.	Verotoxigenic <i>E. coli</i> in beef, 2003	469
Table AN - 11.2.2.	Verotoxigenic <i>E. coli</i> in pork, 2003	470
Table AN - 11.2.3.	Verotoxigenic <i>E. coli</i> in other meat, 2003	471
Table AN - 11.2.4.	Verotoxigenic <i>E. coli</i> in minced meat and meat products, 2003	472
Table AN - 11.2.5.	Verotoxigenic <i>E. coli</i> in poultry meat, 2003	474
Table AN - 11.2.6.	Verotoxigenic <i>E. coli</i> in milk and milk products, 2003	475
Table AN - 11.2.7.	Verotoxigenic <i>E. coli</i> in other food, 2003	476

Introduction

The main objectives of Council Directive 92/117/EEC on zoonoses were the collection of epidemiological data in order to follow epidemiological trends of zoonoses and to indicate the need for appropriate measures to control them. According to Article 5 of Directive (as amended by Directive 97/22/EC) each Member State had to provide a national report by May 31 of each year. This directive has been repealed in 2004.

Four of the countries, which entered the European Union in 2004, provided on a voluntary basis a report on the zoonoses situation in 2003. These reports have been taken into account to some extent, all data are included in the Annex to the summary report.

The main aim of the current surveillance system for zoonoses in the European Union is to compile available information on the occurrence, and the distribution of zoonotic agents in humans and the veterinary sector. Based on this information, trends within the individual countries are assessed. This will give support to the efforts of the authorities to evaluate the current situation, to determine the need for control activities and to develop strategies for the control of diseases. In the future the purpose of this report should be an analysis and synthesis of current evidence that could form the basis of a risk assessment of the zoonotic risks within the Community.

The optimal ways of reporting have been discussed with representatives of the National Reference Laboratories at ten workshops. It has proved to be very useful to meet each year to discuss the next steps of further harmonisation of surveillance systems. Details on the results are laid down in the protocols on these workshops.

As an aid for reporting, the Community Reference Laboratory for the Epidemiology of Zoonoses (CRL-E) has prepared separate data collection sheets and data reporting tables for animals, food, feedingstuffs and humans. As in previous years these sheets have been slightly modified in order to state more precisely the epidemiological approach. As a result, the available reports have improved continuously since the first report for 1994. Most Member States have included some details on their surveillance systems. Unfortunately not all Member States provided a national evaluation of the situation in their country.

The national reports concerning trends and sources of zoonotic agents for 2003 have been passed on to the CRL-E, whose task is to assist the technical analysis and the co-ordination of reporting on the EU level, while taking into consideration the rules of confidentiality.

Figure A depicts the date of first receipt of the report and Table A provides some more details.

This report presents information on all zoonoses and zoonotic agents, which are covered by the reporting system. The National reports, which are presented in part 2 of this report as submitted to the European Commission, can be used as a source of further information.

Data for the previous years are given where appropriate. Further data are included in the Annex and in the National reports. As was the case in previous years it becomes obvious that for most aspects covered in this report, data were not available from all Member States. Therefore, countries are invited to complete their information in the future years.

This report has to be carefully interpreted. At the moment, surveillance systems, diagnostic methods and ways of reporting are not fully harmonised. Community rules on the control and surveillance are in force only for co-financed eradication programmes of bovine tuberculosis, bovine, ovine and caprine brucellosis, Salmonella (S.) Enteritidis and S. Typhimurium in poultry breeding flocks, as well as for *Trichinella* and *Echinococcus* sp. in connection of meat inspection. These rules form a basis for comparable data.

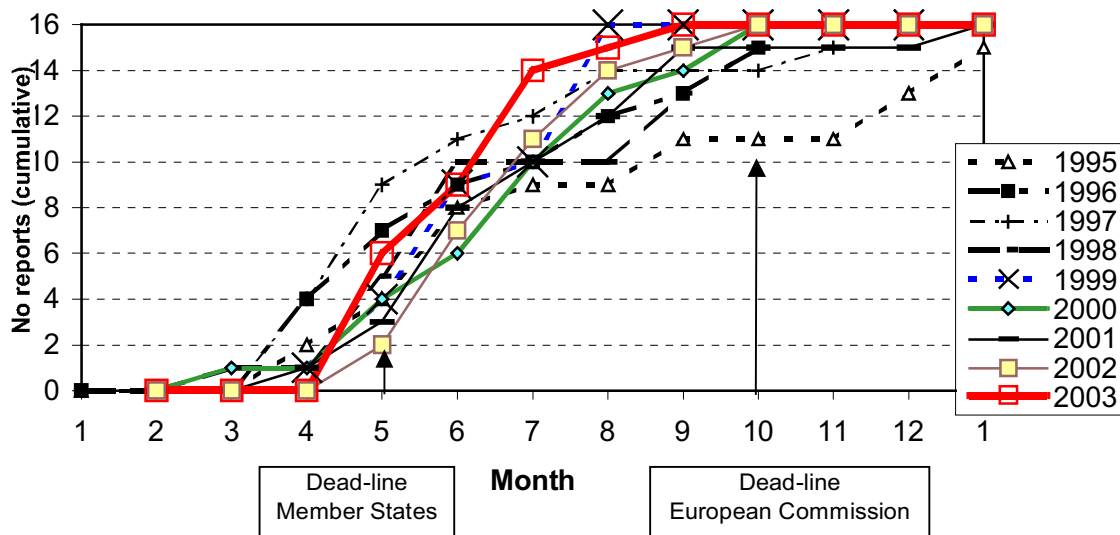
For other aspects (other animal species, food, other zoonoses and agents thereof), a valuable overview is available on the national approaches to tackle zoonoses and the results thereof.

Table A. Month of first receipt of the National trend reports

Country	Report 2000	Report 2001	Report 2002	Report 2003
A (Austria)	August	August; December	September	July
B (Belgium)	May	June	June	June
D (Germany)	August	January 2003	July	July
DK (Denmark)	May	May	June	June
E (Spain)	May / July	July; August	July	July
EL (Greece)	July	June	June	June
F (France)	October	September	August	September
FIN (Finland)	June	May	June	May
I (Italy)	August	September	August	August
IRL (Ireland)	July	July / August	July	July
L (Luxembourg)	March	April / November	August	May
N (Norway)	June	June	May	July
NL (The Netherlands)	July	June	May	May
P (Portugal)	October	August	October	May
S (Sweden)	July	June	June	May
UK (United Kingdom)	September	September	July	May

* Norway was not included into the reporting system as regards the reporting year 1999

Figure A. Month of first receipt of the National trend reports



Executive summary

Directive 92/117/EEC on zoonoses laid down rules on collection of information on zoonoses and zoonotic agents in humans, animals, food and feedingstuffs. In 2003 this data collection covered 11 zoonoses and antimicrobial resistance in two zoonotic agents and one indicator bacterium. The Member States and Norway sent their annual reports to the Commission, which together with the Community reference laboratory has prepared this yearly Community report. In addition, four new Member States provided a zoonoses report on a voluntary basis. These reports have been taken into account too.

In 2003, again salmonellosis and campylobacteriosis were by far the most frequently reported zoonoses in humans, with approximately 135 000 cases each. As regards the other zoonoses the numbers of reported human cases varied between 0 and 9 400.

For salmonellosis the decreasing tendency observed over several years continued and for campylobacteriosis, the downward trend observed since 2002 continued. In 2003, the overall reduction was 7 % for salmonellosis and 9 % for campylobacteriosis. In addition, a decrease in number of reported cases was observed for human brucellosis, yersiniosis, echinococcosis and verotoxigenic *E. coli* infections.

When compared with the previous years a slight increase in the number of cases was observed regarding listeriosis and toxoplasmosis. No major changes were detectable in the number of tuberculosis cases caused by *M. bovis* and trichinellosis cases. In 2003, no human rabies case was reported.

As regards *Salmonella*, there was no general trend in the prevalence in animals. In some countries, an increase of *S. Enteritidis* in the poultry population was observed. Among foodstuffs, poultry meat was most often reported to be contaminated with *Salmonella*.

Similarly, there is no common trend for *Campylobacter*. In some countries, *Campylobacter* was quite frequently detected in poultry and other livestock as well as in poultry meat.

Resistance to nalidixic acid and, to a lower extent, to fluoroquinolones and cephalosporins in *Salmonella* isolates of animal origin was demonstrated in several countries. In addition, high resistance rates to nalidixic acid and fluoroquinolones in *Campylobacter* isolates of animal and human origin were reported in several countries.

Yersiniosis (*Yersinia enterocolitica*) is ranked 3 by the number of reported human cases (9 399). Findings were reported mainly in pork.

Altogether, 1 094 human cases of brucellosis were notified in the European Union (13 MS) and Norway in 2003. In principle, for bovine, ovine and caprine brucellosis in those countries that are not officially free of that disease, the situation improved or remained on the level observed in previous years in those regions where control programmes are run.

1048 cases of listeriosis in humans were reported in the EU (13 countries) and Norway. *Listeria monocytogenes* was found in a broad range of different type of foods, including ready to eat foods, usually at low concentrations.

2 607 human cases of VTEC infections or HUS were reported in the EU (13 countries) and Norway. The presence of Verotoxigenic *E. coli*, especially serotype O157 but also of other types with public health relevance, in cattle herds and the link to human infections was demonstrated in several countries. The importance of non O157 serotypes to public health has also been confirmed. A total of 203 laboratory confirmed HUS syndromes were reported, 45 of them were attributed to non O157.

408 cases of human toxoplasmosis were notified in the EU and Norway. No specific studies on *Toxoplasma gondii* were conducted in animals during 2003.

374 cases of human echinococcosis were reported in the EU (14 countries) and Norway. Out of these, there were at least 30 cases of alveolar echinococcosis (*E. multilocularis*). *Echinococcus granulosus* was prevalent in animals in southern Member States, there no

major changes were observed. *E. multilocularis* findings in animals were reported by four European countries during 2003.

57 cases of human tuberculosis caused by *M. bovis* were reported in the EU (10 countries) and Norway. In countries that are not officially free of bovine tuberculosis, in all but one, situation continued to improve or remained unchanged.

56 cases of human trichinellosis were reported in the EU (13 countries) and Norway. *Trichinella* was reported in nine countries either in pigs or/and wildlife.

Five countries reported rabies cases in animals. The number of reported cases in animals has slightly decreased in Germany compared to 2002.

Summary

All Member States of the European Union and additionally Norway provided national reports on trends and sources of zoonotic agents in 2003 in accordance with Council Directive 92/117/EEC which has been repealed in 2004. This report contains a summary of the national information submitted and it covers 11 zoonotic agents, which are included in the reporting system. In addition, information on antimicrobial resistance in *Salmonella*, *Campylobacter* and for the first time in *E. coli* is covered.

For the first time, four new Member States provided a zoonoses report on a voluntary basis. These reports have been included in the summary report.

Community rules on monitoring or control are in force for bovine tuberculosis, bovine, ovine and caprine brucellosis, *Salmonella* (S.) Enteritidis and *S. Typhimurium* in poultry breeding flocks as well as for *Trichinella* and *Echinococcus sp.* in the framework of mandatory meat inspection. These rules form a basis for comparable data. For other zoonoses, a valuable overview is available on the national approaches to tackle zoonoses and the results thereof. However, the data concerning these zoonoses are usually not directly comparable between the Member States.

Tuberculosis

• Cattle

At the end of 2003, nine Member States (Austria, Belgium, Denmark, France, Finland, Germany, Luxembourg, Sweden, The Netherlands), six provinces in Italy and Norway were recognised being officially free of bovine tuberculosis (OTF). During 2003, Belgium and the provinces Bergamo, Lecco, Sondrio and Ascoli Piceno in Italy gained this status.

Within the non-OTF countries, at the end of 2003, between 89 % and 99 % of the herds were recognised OTF on national or regional level. Altogether, the percentage of infected herds at the year end ranged between 0,08% and 6,9%. There was no common trend in the non-OTF countries, but in principle situation continued to improve. In Ireland, Italy, Portugal and Spain, the number of newly identified positive herds and infected herds at the year end decreased slightly. In Great Britain it remained at the same level whereas in Northern-Ireland, the number of newly identified positive herds and infected herds at the year end increased.

In Italy and the mainland of Portugal, less than 1% of the tested herds showed positive reactors on national or regional level. In Greece, Ireland, Spain and the United Kingdom, these figures are above 1 %. In Northern Ireland, 12,4 % of the herds tested showed positive reactors.

• Humans

Only in a few countries, the notification system provides separate figures on cases caused by *M. tuberculosis* and *M. bovis*. In principle, the proportion for *M. bovis* is small compared to *M. tuberculosis*, which is man to man transmission. In total, 57 cases of human tuberculosis caused by *M. bovis* have been reported in 10 Member States of the European Union and Norway. This is comparable to the situation in the previous year.

Most cases in the domestic population are recurrent cases in the elderly population. Additionally, sporadic cases are identified in immigrants.

Brucellosis

• Cattle

In 2003, nine Member States (Austria, Belgium, Denmark, Finland, Germany, Luxembourg, Sweden, The Netherlands, and Great Britain), Norway, 21 provinces in Italy and four islands of the autonomous region of the Azores (Portugal) were recognised as officially brucellosis

free (OBF). During 2003, Belgium and 21 provinces in the regions Lombardia (6 provinces), Marche (1 province), Trentino-Alto Adige (1 province in addition to Bolzano), Emilia-Romagna (9 provinces) and Sardinia (4 provinces) in Italy gained this status.

In the **non-OBF countries**, at the end of 2003, between 81 % (Greece, Portugal) and 100 % (Ireland) of the herds were recognised OBF. The rate of herds with positive reactors ranged between 0,001 % (France) and 1,3 % (Portugal) in 2003. In Madeira, no positive reactors were identified. In France, reactors in three herds were confirmed. In another three countries, Ireland, Northern Ireland and the mainland of Portugal, less than 1% of the tested herds showed positive reactors. Highest rates of infection were reported on some of the Azores islands (4,9%).

There was no common trend in the countries but in most countries situation remained at the same level or improved. In Italy, situation has remained comparable over several years now. In Spain, after an increase observed in 2001, the infection rate remained at the level observed in 2002. In Ireland and Northern Ireland, a lower number of herds gave a positive result in routine testing. Similarly, on the Azores and the mainland of Portugal, the share of herds positive in routine testing decreased in 2003. In Greece, 4,1 % of the herds tested in those regions where an eradication campaign is run were found positive in 2003, which is an increase compared to the 3,6 % observed in 2002.

- **Sheep and goats**

Altogether, 10 Member States, regions in 4 Member States and Norway are recognised officially brucellosis free (ObmF) (*B. melitensis*): Austria, Belgium, Denmark, Finland, Germany, The Netherlands, Ireland, Luxembourg, Sweden, the United Kingdom, 64 départements in France, 2 regions in Spain, 18 provinces in Italy and the autonomous region of the Azores in Portugal by the end of 2003. During 2003, 17 provinces in the regions Lombardia (11 provinces), Trentino-Alto Adige (1 province in addition to Bolzano), Toscana (1 province) and Sardinia (4 provinces) in Italy and the autonomous region of the Azores (Portugal) were recognised ObmF.

In the non-ObmF Member States the share of ObmF holdings at year-end varied between 46 % (Spain) and 82 % (France). The rate of herds with positive reactors ranged between 0,02 % (France) and 5,6 % (Spain) in 2003. Again, on Madeira no positive reactors were identified. In France, 0,02 % of the tested herds under an eradication programme implemented only in few departments showed positive reactors on national level. Infection rates, clearly above 1 %, were reported in Greece, Italy, the mainland of Portugal and Spain as in previous years. In Italy, Spain and Portugal, a decreasing tendency has continued for several years now. Within the eradication programme implemented in Greek islands and covering only a limited number of flocks, the share of infected holdings increased to 4,7 % in 2003.

- **Humans**

Altogether, 1094 human cases were notified in the European Union (13 MS) and Norway in 2003. There was a clear reduction of the number of cases in 2003. This is especially true for Greece, Portugal and Spain where the situation continued to improve.

Salmonella

- **Feed materials**

Data available demonstrate a *Salmonella* (S.) risk in animal and vegetable derived proteins as well as in feedingstuffs. In most countries the contamination of vegetable derived proteins is higher compared to that in animal derived proteins. On average, 0,7 % of the animal derived proteins compared to 2,6 % vegetable derived proteins were contaminated with Salmonella.

0,6 % of the meat and bone meal and 0,4 % of the fish meal samples were *Salmonella* positive on average. The contamination rate ranged between 0% and 2 % for meat and bone meal and between 0 % and 7 % for fish meal.

As in the previous years, the *Salmonella* contamination of oil seeds, oil fruits, their products and by-products was considerably higher compared to cereals in almost all countries. On average, 0,7 % of the cereals and 3,5 % of the oil seeds were contaminated with *Salmonella*.

Some *Salmonella* findings were reported in compound feedingstuffs in 12 out of 14 countries. On average, 0,95 % of poultry feed, 0,8 % of cattle feed and 0,5 % of pig feed batches were *Salmonella* positive but this does not take into account differences in monitoring procedures. *Salmonella* were detected in compound feedingstuffs for poultry (in 7 of 12 countries), cattle (in 5 of 12 countries) and pigs (in 4 of 11 countries).

The most frequent serotypes in animal derived proteins were *S. Montevideo*, *S. Typhimurium*, *S. Derby*, *S. Livingstone* and *S. Give*, reflecting more than 80 % of all isolates typed. In vegetable derived proteins, in 2003, *S. Agona*, *S. Mbandaka*, *S. Tennessee* and *S. Senftenberg* were the four most frequent ones. In compound feedingstuff, again *S. Mbandaka* and *S. Senftenberg* were the most frequent serovars.

- **Poultry (*Gallus gallus*)**

Directive 92/117 laid down harmonised rules for control of *S. Enteritidis* and *S. Typhimurium* in breeding flocks of *Gallus gallus*, by means of repeated sampling of flocks/hatcheries. In addition, on the basis of this Directive, the Commission approved national programmes to control salmonella in poultry in 7 Member States (Austria, France, Denmark, Ireland, Finland, Sweden and The Netherlands) and Norway. Although these programmes have different scope, they all go further than the minimum provisions for breeders foreseen in the Directive.

Breeding flocks

In general, the very favourable situation has continued in 2003 as regards *S. Enteritidis* and *S. Typhimurium* in Denmark, Finland, Ireland, Sweden and Norway. The *Salmonella* control programmes run in Finland, Sweden and Norway have documented that the prevalence of all *Salmonella* serovars in poultry is low. During 2003, in Finland and Norway, no *Salmonella* were detected in poultry breeding flocks (*Gallus gallus*). In Sweden and Ireland, no *S. Enteritidis* and *S. Typhimurium* were isolated, but a few other *Salmonella* serovars were found. In Denmark, one *S. Enteritidis* and six *S. Typhimurium* infected breeding flocks were detected.

In the other countries, infection rates reported in 2003 ranged between 0% and 8,4% for *S. Enteritidis* and *S. Typhimurium* infections. In Austria, Belgium, Germany, France, Italy, Great Britain and Northern Ireland, less than 1% of the flocks were infected with *S. Enteritidis* or *S. Typhimurium* during 2003. For Italy this is an improvement compared to the previous year. In Spain and Greece, *S. Enteritidis* could be detected at a considerable level, which is even higher than in 2002. In Netherlands, an increase of *S. Enteritidis* infected flocks was registered.

As in previous years, *S. Enteritidis* is the dominating serovar, sharing 38% of all isolates reported compared to 42 % in 2002. *S. Typhimurium* was reported in 4,5 % of all isolates from breeding flocks, which is comparable to 2002. In addition, some country specific patterns were observed. In Great Britain, *S. Livingstone* was dominating, in addition *S. Virchow* and *S. Senftenberg* were more frequently detected. In contrast, in Germany *S. Anatum* was the most frequent serovar in animal related data of poultry breeders.

Breeding flocks – egg production line

In principle, in the five countries (Denmark, Finland, Ireland, Sweden, Norway) which are running an approved control programme for several years no *Salmonella* are prevalent in

layer breeders. One positive imported flock, infected with *S. Montevideo* was reported in Sweden in 2003.

In Belgium, Germany, Italy and Northern Ireland, no *S. Enteritidis* or *S. Typhimurium* were confirmed in layer breeder flocks in 2003. In contrast to this, in Austria, France and the United Kingdom, where all flocks were negative last year, flocks infected with *S. Enteritidis* or *S. Typhimurium* were reported during 2003. An increase of the number of infected flocks is obvious for Spain, France and The Netherlands. In these countries up to 7,3% flocks infected with *S. Enteritidis* and 1,5% flocks infected with *S. Typhimurium* were observed in 2003. Similar, the share positive samples has increased in Greece. In The Netherlands, *S. Paratyphi B* var. *Java* has been identified in layer breeder flocks.

There was a clear reduction of *S. Enteritidis* within the isolates typed. In layer breeders, on average 24,5 % of the isolates belonged to this serovar compared to 62,8 % in 2002. *S. Enteritidis* was the dominating serovar in Greece and Spain. *S. Typhimurium* represented 22,6 % of all isolates.

Egg production line – laying hens (Table egg production)

As in 2002, in Norway, all flocks of laying hens (table egg production) were *Salmonella* negative. In Finland, Sweden and Ireland one positive layer flock, infected with *S. Enteritidis* or *S. Typhimurium* respectively was detected. In addition, some flocks infected with other serovars occurred in Ireland and Sweden. In Denmark, altogether 18 flocks, four pullet rearing flock and 14 table egg flocks infected with *Salmonella* were detected in 2003 which is slightly less than in 2002. Again, the prevalence was higher among battery flocks (5,4 %) than in any other production type (0,6-2,8 %).

In the other countries, as far as a trend can be assessed, an increasing trend was observed in several countries. In 2003, the reported infection rates for *S. Enteritidis* and *S. Typhimurium* in laying hens ranged from 1,9 % to 11,2 %. The prevalence rate for all *Salmonella* serovars ranged up to 18%.

An increase of *Salmonella* infected layer flocks was observed in Germany, Spain and Great Britain. The marked increase of reported incidents in layer flocks, observed in 2003 in Great Britain may reflect enhanced monitoring of this sector of the industry during the year. In France, the proportion *S. Enteritidis* infected flocks increased slightly. In the Netherlands, the percentage of *S. Enteritidis* positive flocks has gradually decreased whereas the percentage of *S. Typhimurium* positive flocks remained low. In Italy, the share of positive herds decreased. In Austria and Greece, 5,3% and 1% of the samples tested were positive for *S. Enteritidis* or *S. Typhimurium*.

In layers, there was a slightly lower proportion of *S. Enteritidis* isolates, 53,7 % in 2003 compared with 57,7 % in 2002. *S. Enteritidis* is still dominating in Austria, Germany, Denmark, France, Italy, Portugal and Spain and on the second position in Great Britain. *S. Infantis*, which is on the second position with 10,5 % of all isolates in 2003, was the most frequent serovar in the Netherlands. In addition, several isolates were reported in Austria and Germany. 9 % of all isolates were *S. Typhimurium*.

Eggs and egg products

In 2002, a *Salmonella* prevalence above 1 % in table eggs was reported in five out of nine reporting countries. The highest contamination rate had been reported in Spain. In 2003, all countries reported lower rates compared to the previous year. In two out of eight countries, *Salmonella* have been isolated in more than 1% of the table eggs investigated. In Spain, 1,9 % and in Greece, 2,9 % of the eggs were positive for *Salmonella*. In contrast, in raw material for egg products, in two out of five countries, *Salmonella* were isolated in 2003, whereas no *Salmonella* findings were reported in 2002. In egg products, in three countries positive samples were reported.

In the United Kingdom, two studies were run on raw shell eggs. 0,2 % of the pooled samples of six eggs collected from United Kingdom catering premises and 0,3 % pools (mostly boxes) of six eggs from UK produced shell eggs on retail sale were contaminated with *Salmonella*. In Germany, the *Salmonella* contamination rate in eggs was 0,57 %, which is slightly lower than the results in 2001 and 2002.

In all countries, with the exception of Spain, *S. Enteritidis* was most frequently isolated. Spain reported that all 37 isolates were other serovars than *S. Enteritidis* and *S. Typhimurium*.

Breeding flocks – meat production line

In the meat production sector situation is not as favourable as reported in the egg production sector.

In Finland, Sweden and Norway, all broiler breeder flocks were *Salmonella* negative. In Ireland, again no *S. Enteritidis* and *S. Typhimurium* were detected, but about 2% of the broiler breeder flocks were infected with other serovars than *S. Enteritidis* and *S. Typhimurium*. In Denmark, *S. Typhimurium* was detected in seven broiler breeder flocks. Three central rearing flocks were infected with *S. Typhimurium* DT170, three broiler breeder flocks, reared on the same premises, were infected with *S. Typhimurium* DT41, and one flock was infected with *S. Enteritidis*.

During 2003, in Germany, Great Britain, and Northern Ireland no findings of *S. Enteritidis* and *S. Typhimurium* were reported whereas in the other countries the prevalence for these two serovars together ranged between 0,4 % and 10 % infected flocks. Additionally, other serovars were detected in varying quantities. The overall *Salmonella* prevalence in these countries ranged between 0,5% and 16%.

Compared to the previous year, a lower infection rate with *S. Enteritidis* or *S. Typhimurium* has been reported in Germany and Italy. In Austria, a few more findings were reported in 2003. In France and Greece, situation is similar to 2002. In Spain, 9,3% broiler breeders infected with *S. Enteritidis* have been observed in 2003, compared to 4,5% infected flocks in 2002. In the Netherlands the share positive flocks has increased from 0,7% in 2002 to 2,1% in 2003, mainly due to an increase of *S. Enteritidis*. In addition, a rise of *S. Paratyphi* B var. Java during the last years has been observed. In Belgium, three *S. Enteritidis* positive and 5 *S. Typhimurium* positive broiler breeder herds were identified.

In Great Britain, during 2003, 260 incidents were reported in the meat production breeder line, and *S. Livingstone* and *S. Senftenberg* accounted for the majority of these reports.

S. Enteritidis continued to be the dominating serovar in broiler breeding flocks. In 2003, 38% of all isolates belonged to this type. *S. Enteritidis* was the most frequent serovar in broiler breeders in Austria, France, Greece, Portugal and Spain and on the second position in Germany (animal related data). *S. Livingstone*, *S. Virchow*, *S. Senftenberg* and *S. Typhimurium* were the serovars, which were also more frequently detected in broiler breeders.

Poultry meat production line - broilers

Altogether, infection rates in broiler flocks are higher compared to the breeder level.

In Sweden and Norway, one broiler flock infected with *Salmonella* was detected. In Finland, the share of *Salmonella* positive flocks was 0,2 %. In Denmark, 1,8 % of the broiler flocks were *Salmonella* positive on the average, which is a slight increase compared to 2002.

The infection rates reported in broiler flocks in the other countries ranged from 4,0 % to 24,3 % which reflects an increase in the *Salmonella* infection rate observed in some countries. Compared to 2002, a lower infection rate was reported in Italy. Similarly, the number of incidents reported in Great Britain was considerably reduced. In contrast, a higher infection rate was reported in Austria, Spain and Greece. In Germany, the number of

investigated broiler flocks decreased considerably, within these a reduced share of infected flocks was observed. In contrast, the proportion infected broilers tested for *Salmonella* has increased from 1,6 % to 4,8 %.

In broilers, *S. Paratyphi B* var. Java was dominating in 2002. In 2003, *S. Enteritidis* was the predominant type in broilers and poultry meat, representing 40 % and 13% of all isolates respectively. Within the individual countries, *S. Enteritidis* was the most frequent serovar in broilers in Austria, Germany, Greece, Portugal and Spain. In broilers, *S. Paratyphi B* var. Java moved to the second position in 2003, representing 15 % of all isolates compared with 20 % in 2002. Again, all isolates were reported in the Netherlands. *S. Infantis*, *S. Livingstone* and *S. Virchow* are on the next places and this is in line with the situation in 2002.

Poultry meat production line – poultry meat

The situation in the broiler flocks is reflected in the *Salmonella* situation in poultry meat. In Finland, Sweden and Norway, no *Salmonella* or only low *Salmonella* rates were reported at slaughterhouse or at processing plants in domestic products. In Denmark and Ireland, *Salmonella* was more frequently detected in poultry meat than in Finland, Sweden and Norway.

In the other countries, there is no common trend. In Belgium, for chicken carcasses, the detection rates varied between 2,0 % for samples collected at retail level and 17,5 % for samples taken at slaughterhouses. Chicken breasts were contaminated with *Salmonella* in 14,2 % of 148 samples collected at processing plants. This is in the same range as in the previous year.

In the Netherlands, the data collected at retail level closely followed the trend found at slaughterhouses. In 2003, the monitoring programme for poultry meat showed that the contamination with *Salmonella* is still declining, reaching 11,3 % in 2003. As in the previous year, more than 50% of the isolates consisted of *S. Paratyphi B* var. Java.

In contrast, in Germany, the share of *Salmonella* positive poultry meat samples increased to 16,5 % compared with 13,3 % in 2002. In Spain, 6,7 % of the poultry meat sampled at slaughterhouses, 18,5 % of the poultry meat sampled at processing plants and where 12,7 % of the samples at retail level were *Salmonella* positive. These are higher levels than reported in 2002. In Italy, at processing plants and retail level, 2,3 % and 1,0 % of the samples were *Salmonella* positive, whereas 3,3 % of the samples taken at slaughterhouses were positive for *Salmonella*. In Greece, 8,4 % and 6,3 % of the poultry meat samples collected at slaughterhouses and at retail were positive for *Salmonella*.

Within a survey run to estimate the *Salmonella* contamination in whole chickens available to the consumers in Wales, 42 (5,7 %) out of 735 samples tested positive for *Salmonella*.

As seen in 2002, in the overall distribution the serovar pattern in poultry meat is more divers compared to the live birds. *S. Enteritidis* and *S. Typhimurium* are dominating in poultry meat, followed by serotypes *S. Saintpaul*, *S. Heidelberg* and *S. Blockley*.

• Turkey

The sampling scheme fixed in Directive 92/117/EEC for *Gallus gallus* is applied in turkey breeders too in several countries voluntarily. In turkey breeding flocks, no *S. Enteritidis* or *S. Typhimurium* were detected in Germany, Sweden, Norway and Ireland. In Sweden, one rearing flock originating from another EU country infected with *S. Anatum* was detected. In Finland, 3 flocks infected with *S. Typhimurium* were detected. In Austria, 9 % of the samples taken at hatchery level from imported hatching eggs were positive for *Salmonella*.

In turkey flocks at the production level, no *Salmonella* were detected in Norway. In Finland, Ireland and Sweden a few positive flocks were identified. In Finland and Sweden, *S. Typhimurium* was detected whereas in Ireland, as in previous years only other serovars

than *S. Enteritidis* and *S. Typhimurium* were isolated. For Finland, Sweden and Norway, situation is comparable to previous years, with no or a few findings per year. In Denmark, Germany and Ireland, the share positive flocks was lower than in 2002. The contamination rates varied between 1,7 % and 5,7 %.

In Great Britain, a decreasing trend in the number of reported incidents in turkeys was seen in 2001 and 2002. In 2003, the number of reported incidents increased to 295. This may reflect increased monitoring by the industry.

In the Netherlands, results of the monitoring programme in turkey did not show an improvement of the contamination level over the last years.

Only very limited data are available on the *Salmonella* prevalence in turkey meat. In Germany, about 9 % of the samples tested were *Salmonella* positive which is similar to the previous year.

In turkeys, *S. Montevideo* was the most frequent serovar, mainly due to the findings in Great Britain and Austria. In 2003, *S. Heidelberg* moved to the second position, in the previous year it was the most frequent one. It is still the most frequent one in Austria. On the next positions are *S. Typhimurium*, *S. Indiana* and *S. Kottbus*. In addition, *S. Newport* was among the more frequent ones in Great Britain.

• Pigs and pork

In Finland, Sweden and Norway, low contamination rates were detected in the carcass swabs and lymph node samples taken at the slaughterhouses and in the crushed meat samples taken at slaughterhouses or cutting plants. No or very few *Salmonella* infected herds were identified in these countries in 2003. In Sweden, a feed mill distributed feed contaminated with *S. Cubana* to several pig and cattle farms. In 30 pig herds at least one faecal sample was positive for *S. Cubana*, and in 18 herds only positive feed samples were found.

In the other countries, the situation as regards fattening pigs is different.

In Denmark, again 1,4% of the individual carcass swabs were *Salmonella* positive. In the serological control programme, by the end of 2003, 3,3 % of the herds fell in Level 2 or 3, which indicate *Salmonella* infection which is slightly higher than in 2002.

In Austria, 1 % of the faecal samples of fattening pigs were positive for *Salmonella*. Similarly, in diagnostic submissions, 0,7 % of the animals tested positive for *Salmonella*. In Belgium, 14,6 % of the carcass swabs were positive which compares to 15,4 % reported in 2002. In Germany, 6,6 % of the fattening pigs tested at slaughterhouse showed a positive immunological test result compared with 5,8 % in 2002. In bacteriological investigations, 5,5 % of the animals were *Salmonella* positive compared with 3,8 % in 2002. In Great Britain, the number of reported incidents increased from 207 in 2002 to 214 in 2003. The prevalence of *Salmonella* carriage in pigs at slaughter was 23,4 %.

In pork, contamination level at slaughterhouse ranged between 0,04 % and 6,10 %. At retail level, the contamination rate ranged between 0 % and 18,2 % for pork, 0 % and 9,4 % for minced meat and 0 % to 2,8 % in pork meat products.

In Belgium, 1,7 % positive samples of minced meat and 6,1 % positive cutted pork samples at processing plants have been reported. At retail level, 9,4 % of the minced meat samples were *Salmonella* positive. In the Netherlands, the prevalence of *Salmonella* in pork was more than halved in 2003, rating at 4,8 % in 2003 compared with 10,5 % in 2002. In Germany, 3,0 % of the pork samples taken at retail level were *Salmonella* positive, compared to 2,9 % in 2002.

Within the study on modified atmosphere packaged and vacuum packed cooked ready – to – eat meats at the end of shelf-life from retail premises, in Great Britain, none of the samples examined had *Salmonella* present.

The serovar pattern in pigs and pork remained unchanged. *S. Typhimurium* is clearly dominating in the overall figure, and this is true in most of the individual countries. The next frequent serovar is *S. Derby*. Interestingly, *S. Infantis* and *S. Enteritidis* isolates from pigs and pork were reported from several countries.

- **Cattle and products thereof**

Results of the surveillance programme at slaughterhouses and cutting plants run in Finland, Sweden and Norway showed that the *Salmonella* situation continued to be at a low level in cattle. In lymph node samples and carcass swabs *Salmonella* were rarely detected.

Within the abattoir survey, run in Finland, 0,07 % of the faecal samples were positive for *Salmonella*. In 2003, lymph nodes samples and carcass swabs were again very rarely contaminated, with levels of 0,06% each. In crushed meat samples, taken at processing plants, 0,08% of the samples were positive, compared with 0,4 % detected in the previous year.

In Denmark, the rate of *Salmonella* positive pooled carcass swabs increased from 0,32 % and 0,6 % in 2001 and 2002 respectively to 0,9 % in 2003. From 2,6 % of the faecal samples (one animal per farm) collected at slaughterhouse, *Salmonella* were isolated. During 2003, 74 outbreaks of clinical salmonellosis in Danish cattle herds were notified compared with 107 outbreaks in 2002. One cattle herd was found infected with multi-drug resistant *S. Typhimurium* DT 104.

In Styria (Austria), no *Salmonella* were isolated in faecal samples from cattle. Within clinical samples, 4 (0,2 %) out of 1804 animals were positive in Austria. In Germany, 15,4 % of the herds investigated and 4,3 % of the animals tested *Salmonella* were isolated in 2003. This is a further increase in the infection rate for cattle herds compared to 2001 and 2002. Additionally, the number of notified outbreaks of clinical salmonellosis in cattle herds was 232 compared with 258 in 2002 and 194 in 2001.

In Great Britain, the number of incidents reported in cattle increased to 1179 incidents compared with 1004 in 2002 and 626 in 2001. Within these reports, an isolation of *S. Paratyphi* B var. Java with a multiresistance pattern from a calf was reported. In Northern Ireland, 300 *Salmonella* isolates were received in 2003 compared with 280 in 2002.

In beef, contamination level was usually below 1 %. Within limited investigations in Austria and Spain, higher contamination rates were detected. In beef products, no *Salmonella* were detected in the study run in Wales. In contrast, in other countries *Salmonella* were isolated in up to 1,6 % of the samples tested.

In ready to eat milk products, *Salmonella* contamination rates up to 0,13% in cheese samples and up to 0,26 % in batches of milk products were detected.

In 2003, in cattle, again *S. Dublin* is dominating and *S. Typhimurium* is on the second place in the overall figure. In the individual Member States, either *S. Typhimurium* or *S. Dublin* is most frequently reported. Again, *S. Enteritidis* isolates from cattle were reported from several countries. The next frequent serovar was *S. Mbandaka*, compared with *S. Montevideo* in 2002 as well as *S. London* and *S. Panama* in 2001.

In beef, the overall pattern is more divers. Altogether, *S. Typhimurium* and *S. Derby* are the most frequently reported serovars. *S. Dublin* moved to the third position followed by *S. Enteritidis*. *S. Enteritidis* was isolated from beef in four Member States. *S. Dublin* was almost exclusively isolated from beef in Denmark.

- **Humans**

Altogether, 135 546 cases of human salmonellosis have been reported by the 15 Member States of the European Union and Norway in 2003. This means an overall decrease by 7% compared to 2002. In the individual countries, the situation is different. Compared to 2002,

the number of reported cases increased considerably in Belgium, Greece, Ireland, Portugal and Netherlands. In Belgium, an increase by 28% in the total number of human cases was recorded mainly due to *S. Enteritidis*, exceeding now 70% of all cases. Similarly, in the Netherlands, a considerable increase in human salmonellosis cases, fully caused by *S. Enteritidis* could be attributed to egg imports. A slight increase was observed in Spain, Norway and Scotland. A clear reduction in notified salmonellosis cases could be observed in Denmark, Germany, Italy and Luxembourg.

As in previous years, *S. Enteritidis* was dominating, causing 61,8 % (2002: 67,1 %) of all notified cases in the European Union and Norway. Rates in the individual countries ranged between 87,9 % in Austria and 33,3 % in France. *S. Typhimurium* was on the second place, causing 16,5 % of all cases. Rates in the individual countries ranged between 5,8 % in Austria and 28,7 % in Ireland. As in previous years, next to *S. Enteritidis* and *S. Typhimurium*, most cases were caused by *S. Virchow*, *S. Infantis*, and *S. Hadar*. Each of these serovars is involved in less than 1 % of all notified cases.

In Finland, Ireland, Norway and Sweden, there is a considerable difference in the serovar patterns of domestic and imported cases. There, *S. Enteritidis* is more frequently reported in imported cases. This is less pronounced in Northern Ireland and Scotland. In contrast to this, in Austria, Belgium and the Netherlands, the same proportion of *S. Enteritidis* cases was observed in domestic and imported cases or *S. Enteritidis* was more frequently involved in domestic cases.

Trichinellosis

• Animals

Pigs and horses are regularly tested for trichinellosis during meat inspection in the European Union and Norway. In 7 countries, no single *Trichinella* case was detected in 2003. As in previous years, *Trichinella* was found in domestic pigs in Finland and Spain. In addition, one positive finding was reported in Germany. No *Trichinella* larvae were detected in pigs in the Netherlands during 2003, there one positive sample had been detected in 2002. In horses, *Trichinella* is rarely detected. In 2003, no *Trichinella* was detected in the EU in horses. In wild boars, *Trichinella* was detected in 7 countries in 2003. In these countries, findings had been reported in previous years too. Positive findings in other wildlife animals were reported by six countries. Altogether, in 9 countries *Trichinella* larvae were reported in wildlife animals.

• Humans

Trichinellosis was very rare in humans in 2003. Altogether, 56 human cases were registered in the European Union (13 MS), against 48 (13 MS) in 2002, 53 (12 MS) in 2001 and 67 (11 MS) in 2000.

Rabies

• Animals

Rabies cases were reported in the same 5 Member States (Austria, Denmark, The Netherlands, Germany and Spain) of the European Union as in the previous years.

In Finland, Ireland, Italy, Sweden and Norway (mainland) no domestic cases of rabies were recorded since reporting commenced in 1994. For the fourth year in row no cases of rabies were detected in Belgium. In Austria, cases of rabies were detected in the domestic and wildlife population in previous years, during 2003 only one infected horse was detected. In Germany, rabies was detected in wildlife only. During 2003, there was a slight decrease in the total number of reported cases in Germany. As each year, so far, Spain reported cases of rabies in dogs from Melilla (North Africa).

In Denmark, Germany and The Netherlands rabies was detected in bats during 2003. No bat cases were reported on the mainland of Spain and in Great Britain during 2003.

- **Humans**

In 2003, no case of rabies in humans was reported in the European Union and Norway.

Campylobacteriosis

- **Poultry and poultry meat**

In the monitoring activities and studies performed in 2003, the *Campylobacter* contamination rate in broiler flocks ranged between 4,9 % and 71,4 %. This is in principle in line with results seen in previous years. These data reflect the high infection rate in broiler flocks in most countries.

In contrast, in Finland, 6,5 % of the flocks tested were *Campylobacter* positive in 2003. In 2000 and 2001, an infection rate below 10% had been observed in a survey at slaughterhouse level. In Norway, the infection rate determined within the surveillance programme was below 10%. In 2003, 4,9 % of the flocks were positive compared with 6,3 % in 2002 and 7,7 % in 2001. In Sweden, where the sampling scheme had been changed during 2001, since then each year an infection rate close to 20% was detected. In 2003, from 17,6 % of the flocks *Campylobacter* was isolated.

In the other countries, higher infection rates were detected. In Denmark, the prevalence in broiler flocks was 35 % in 2003 compared to 42,6 % in 2002. The total prevalence in raw chicken of domestic origin was 33 %. For chicken products, this represents a decrease compared to 2002 when the prevalence was 42 %. In Ireland, within the enhanced surveillance programme using a carcass wash method 58 % of the poultry meat samples, taken at processing plants, were positive for thermophilic *Campylobacter*. This is in the same range as in previous years. In Belgium, within the national random sampling at slaughterhouses, cutting plants and retail *Campylobacter* contamination rates in broiler and culled layer's carcasses and breast meat varied between 12,3 % and 45 %. In Germany, *Campylobacter* could be detected in about 20 % of the poultry meat samples collected within official food control. In the Wales chicken survey, 536 (73 %) out of 734 samples tested positive for *Campylobacter*.

- **Other animal species and products thereof**

As in previous years, quite high infection rates were reported in pigs. In Denmark, the prevalence rate was 93,4 % compared with 80 % in 2002. In Austria, Italy and Great Britain, the infection rates were slightly lower, ranging between 52 % in Italy and 69 % in Great Britain. Investigations run on *Campylobacter* in pork showed low contamination rates in some countries. In Italy, thermophilic *Campylobacter* were detected in 4 (9,8 %) out of 41 pork samples collected at retail shops. In Spain, 72 (55 %) out of 132 pork samples were *Campylobacter* positive. In Germany, 2,7 % of the pork samples were positive.

In Austria and Italy, about 35 % of the cattle herds were positive. In Denmark, the prevalence was 64 %. In the British survey, in 55 % of the cattle tested at slaughter thermophilic *Campylobacter* species were present. In the Finish survey, 31,3 % of the bovines were positive. Investigations run on *Campylobacter* in beef showed low contamination rates. In the beef samples tested, only a few positive findings were reported. In Finland, thermophilic *Campylobacter* was detected in 4,1 % of the carcass swabs taken from the surfaces of randomly chosen carcasses.

In 2003, *Campylobacter* was not reported in raw milk. One sample of a dairy products was *Campylobacter* positive.

No *Campylobacter* were detected in fish and fish products during 2002. In 2003, *Campylobacter* was isolated from 6 out of 57 samples of oysters tested in The Netherlands.

- **Humans**

Altogether, 135 974 cases of human campylobacteriosis have been reported in the European Union (13 Member States) and Norway. After an increasing trend over several years, in 2002 for the first time a decrease by 5% was reported. This trend continued in 2003, with an overall reduction by 9%.

There is no common trend among the countries. A pronounced increase in the number of notified human campylobacteriosis cases was observed in France, Ireland and Spain. In Sweden and Norway the overall number was slightly above the previous year. In contrast to this, the decreasing tendency continued in Denmark, Finland, the Netherlands and United Kingdom. A first decrease is reported in Austria, Belgium and Germany.

Listeriosis

- **Food**

High contamination with *L. monocytogenes* was reported in all type of meat and meat products. Most results reported are restricted to presence or absence of *L. monocytogenes*.

Contamination rates up to 11% in ready-to-eat beef, 6% in pork products, 21,5% in other meat products and 32,5% in poultry meat products were reported.

In Sweden, a total of 2,1% of cold cuts and sliced samples from domestic production facilities were positive for *L. monocytogenes*.

In the study of modified atmosphere packaged and vacuum packed ready-to-eat meats at end of shelf-life from retail premises, run in United Kingdom, 27 (1%) samples contained *L. monocytogenes* above 100 cfu/g. This was more frequently true for beef products (1,6%) and poultry meat products (1,1%) compared to porcine products (0,7%).

In Denmark, during 2003, 3 (0,3%) of 876 meat product samples contained more than 100 cfu/g. In Spain, in 9,5% of 885 minced meat, 2,6% of 807 pork products and 5,5% of 127 poultry meat samples, more than 100 cfu/g were present. In The Netherlands, one out of 19 samples of poultry meat products contained more than 100 cfu/g.

In milk and milk products *L. monocytogenes* was detected in varying proportions. Overall, the contamination rate in raw milk was low. In milk products, in up to 4,8% of samples *L. monocytogenes* was detected. The highest rates were reported in soft cheeses and cheeses containing raw milk. In Spain, 71 out of 1471 samples of ready-to-eat milk products contained more than 100 cfu/g. 65 of the 71 isolates were detected during one occasion in one company. In the Netherlands, in one out of 148 cheese samples, a contamination rate above 100 cfu/g was detected.

- **Human**

In total, 1048 listeriosis cases have been reported in the European Union (figures from 13 Member States) and Norway, in the previous year 860 cases in 12 Member States and Norway were notified. This is a clear increase in the number of reported cases compared to the previous year. The increase in number of cases from 2002 to 2003 is attributable predominantly to England and Wales, where 226 cases in 2003 compared with 129 cases in

2002 have been notified. In addition, more cases than in 2002 have been registered in Belgium, Finland, Germany, and The Netherlands.

Some countries were able to provide further details on the severity of the cases. Altogether, at least 63 fatalities (7 countries) and 148 pregnancy associated cases (9 countries) were registered.

Yersiniosis

- **Animals and products thereof**

The disease is not notifiable in animals in any of the reporting countries. *Y. enterocolitica* was isolated from several animal species.

In 2003, a total of 63 (13 %) of 493 examined pigs were found positive for *Y. enterocolitica* in Denmark. All of the obtained isolates were serotype O:3. Within the abattoir survey in Great Britain, 13,4% of 2112 pigs, 4,5% of 672 cattle and 8,0% of 715 sheep were positive for *Y. enterocolitica*. In Italy, within a survey run in 2003, no *Y. enterocolitica* were detected in poultry but 10 (13,3%) of 75 cattle, 2 (39%) of 51 pigs, 146 (65%) of 225 sheep were positive for *Y. enterocolitica*.

In contrast to these results, a considerable number of animals has been tested in Portugal but no or very few *Y. enterocolitica* were isolated from poultry, cattle, pigs, sheep, goats and other animals.

Most *Y. enterocolitica* isolates were reported in pork and pork products at retail. In other types of food, only single positive findings were reported in 2003.

- **Humans**

Altogether, 9399 human cases of yersiniosis were reported in the European Union (figures from 10 countries) and Norway. This is a clear decrease compared to the previous year, if figures are compared from those countries, where data are available for both years. In Sweden, again an increase in number of cases was observed, whereas in the other countries a stable situation or slightly lower numbers were reported. The increase observed in Sweden was almost exclusively observed during the summer months June to August. As in the previous years, in Denmark, Germany, France, Spain and Norway, the majority of isolates were serotype O:3.

Echinococcosis

- **Animals and products thereof**

Surveillance and control of *Echinococcus* (*E. granulosus*) through meat inspection in all known potential intermediate host species is compulsory in the EU. Data available from Greece, Italy, Portugal and Spain confirm that *E. granulosus* is prevalent in sheep, goat, cattle, pigs and wildlife.

In Greece, situation remained at the level observed in the previous year or has decreased slightly.

In Italy, the infection rate increased in sheep to the level observed in 2000 and 2001. In goats the prevalence observed in 2003 was similar to the level before the major increase in 2001. In cattle, pigs and solipeds situation remained comparable to the previous year. In wild boars, no *Echinococcus* findings were reported in 2003, where as in 2002 1,7 % of the animals were positive.

In Spain, the share positive pigs increased to 1,8 % compared to 0,6 % in 2002 and 0,4 % in 2001. This is due to an increase observed in domestic pigs slaughtered at home. During 2002, 13,5% of the wild boars were infected with *Echinococcus spp.*, which was considerably higher compared to the reports from previous years. In 2003, the rate infected wild boars was comparable to the situation before 2002.

No *E. multilocularis* has been found in 2003, or earlier, in Finland, Sweden and the mainland of Norway. During 2003, again, *E. multilocularis* was detected in foxes in Austria, Luxembourg, The Netherlands and in sibling voles in the archipelago of Svalbard. In several other countries, the presence of *E. multilocularis* has been reported in previous years but no specific studies were conducted during 2003.

- **Humans**

In total, 374 human cases of echinococcosis were registered in the European Union and Norway in 2003 (figures from 14 countries). Compared to the previous year, there was an overall decrease in the number of reported cases.

Cases of alveolar echinococcosis had been reported in Austria, France, Germany, and Scotland in previous years. Altogether, 30 cases of alveolar echinococcosis were reported in Austria, France and Germany in 2003.

Altogether, 307 cases of cystic echinococcosis were notified in 2003. In Austria, Finland, Germany, and The Netherlands, all or most of these cases were imported.

Toxoplasmosis

- **Animals**

In most Member States, toxoplasmosis is not reportable. No specific studies were reported in 2003. As in the years before *Toxoplasma (T.)* isolates were detected in several animal species, i.e. cattle, pigs, sheep, goat, cats, dogs, and wildlife in diagnostic investigations.

- **Humans**

Altogether, 408 cases have been notified in the European Union (figures from 11 Member States). There is a slight increase compared to the previous year in those countries which provided data over the last five years.

Verocytotoxic E. coli infections and HUS

- **Cattle and beef**

In Denmark, faecal samples from slaughtered calves were monitored for VT *E. coli* O157 and 7,1 % of the samples were found positive in 2003. In addition, in a study of the occurrence of five serogroups of *E. coli*, a total of 58 isolates were verified as belonging to serogroups O26 (14), O103 (4), O111 (0), O145 (5) and O157 (35). Three (0,4 %) O26 isolates and 23 (3,1 %) O157 isolates were identified as verocytotoxin producers.

In a survey, run in Finland, 0,4 % of the 1490 faecal samples were positive for VT *E. coli* O157. In addition, VTEC O157 was isolated from one cattle carcass.

In the British abattoir survey, the prevalence of VTEC O157 carriage in animals at slaughter was 4,7 % for cattle.

In The Netherlands, the prevalence of *E. coli* O157 in cattle was gradually increasing up to 2002. In investigations within the first quarter of 2003 the prevalence was already high for the time of the year, rating at 15,4 % positive calves. For the first time since 1989, VTEC O157 was isolated from beef at retail within the surveillance programme.

In a survey in Norway for the presence of VTEC O26, O103, O139, O145 and O157 in dairy farms, the overall animal prevalence of VTEC O157 was 0,2 %. In 126 (92 %) herds VTEC O103 was detected, while VTEC O157 was detected in one herd only (0,7 %).

In Germany, in 17,3 % of the cattle VTEC was reported in 2003 compared to 12,2 % in 2002. In 2002, some isolates of VT *E. coli* O157 were reported but not in 2003. In beef, VT *E. coli* was isolated from 6 out of 197 samples tested, but none of the isolates were VTEC O157.

In Belgium, within the national random survey, VTEC O157 was isolated from 0,7 % of beef carcasses at slaughterhouse and cutting meat at processing plants. At retail, 2,4 % of the minced beef samples were positive for VT *E. coli* O157.

- **Humans**

Altogether, 2607 laboratory confirmed cases of verotoxigenic *E. coli* infections or HUS were reported in 2003 compared with 2664 cases in 2002. A total of 203 laboratory confirmed HUS cases were reported in 13 countries compared with 238 cases in 2002. Out of these, 156 cases were caused by VT *E. coli* O157, and 45 cases by other serotypes.

Compared to the previous years, the number of reported cases has slightly decreased for the first time.

Antimicrobial resistance in Salmonella

Information on antimicrobial resistance in *Salmonella* was provided by all countries. In general, resistance to tetracycline seems to be common among the *Salmonella* isolates. In addition, resistance to ampicillin, streptomycin and sulfonamides were often detected.

Some resistance to ciprofloxacin or enrofloxacin was reported by 9 Member States. No resistance to these antimicrobials was identified in Austria, Belgium, Finland, The Netherlands and Norway. Resistance to nalidixic acid, which is an indicator of developing resistance to fluoroquinolones, was reported by most Member States. Most of the resistant isolates were *S. Enteritidis* from poultry, but this type of resistance was also detected in other serovars and animal species. No resistance to fluoroquinolones was detected in Finland and Norway. Resistance to cephalosporins was detected in animal or food isolates in Belgium, France, Italy, The Netherlands, Spain, Portugal and England and Wales.

The resistance patterns observed in the isolates from the individual animal species is closely linked to the dominating serovars. In cattle, as in previous years, the highest resistance rates are reported for tetracycline, chloramphenicol, ampicillin, sulfonamide, and streptomycin. In contrast, for the aminoglycosides gentamicin, kanamycin and neomycin, low rates were prevalent. Resistance to cephalosporins was detected in England and Wales. Isolates with resistance to fluoroquinolones were detected in Italy, Luxembourg and Sweden.

Resistance to tetracycline, ampicillin, nalidixic acid, sulfonamide and streptomycin are dominating in poultry isolates. Nalidixic acid resistance was found in most Member States and resistance to fluoroquinolones was detected in isolates from poultry or poultry products in 7 Member States.

In *S. Enteritidis*, in principle, very low resistance rates were reported in pig and cattle isolates. In poultry isolates, higher resistance rates were observed. Resistance to nalidixic acid was mainly linked to this serovar. In four countries, resistance to fluoroquinolones in *S. Enteritidis* from poultry was detected.

In *S. Typhimurium*, as in the previous year, high resistance rates were obvious for those antimicrobials where resistance occurs. Resistance to cephalosporins in *S. Typhimurium* from cattle and pigs was reported in England and Wales, but not in the other countries which investigated this group of antimicrobials.

High resistance rates were observed in some other serovars. Resistance to nalidixic acid was mainly observed in *S. Kottbus*, *S. Saintpaul*, *S. Paratyphi B* var. *Java*, *S. Hadar* and *S. Blockley* isolated from poultry. Additional resistance to fluoroquinolones was seen in the serovars *S. Hadar* and *S. Saintpaul*. The vast majority of *S. Virchow* isolates were resistant to nalidixic acid, few isolates acquired the additional resistance to fluoroquinolones.

It is also apparent that the resistance situation is different in the Member States.

Antimicrobial resistance in *Campylobacter*

In *Campylobacter* resistance rates between the northern countries, Denmark, Sweden and Norway, and the other reporting countries, Styria (Austria), Spain and The Netherlands were different. The resistance pattern were similar, but the share of resistant isolates differed. In the northern countries, low resistance rates were reported in isolates from domestic animals or animal products and all were susceptible to gentamicin and erythromycin. Isolates from pigs showed a higher resistance rate, in Denmark 24% were resistant to erythromycin, in Sweden 18% were resistant to nalidixic acid and 16% to fluoroquinolones. An opposite picture was seen in Spain, there isolates from pigs and poultry showed resistance rates above 90% for tetracycline, nalidixic acid and fluoroquinolones. In addition, they were resistant to erythromycin and gentamicin. In the other countries resistance to tetracycline, nalidixic acid and fluoroquinolones was high.

Antimicrobial resistance in *Escherichia coli*

For the first time, information on antimicrobial resistance in isolates of *Escherichia coli* investigated as indicator bacteria was collected. Isolates of *E. coli* were resistant to tetracycline, ampicillin, sulfonamides and streptomycin. A few or no isolates were resistant to chloramphenicol, nalidixic acid, cephalosporins, gentamicin, neomycin and kanamycin.

Isolates from cattle and beef, collected within a monitoring programme, were mainly sensitive to the antimicrobials tested. As regards pigs, more isolates showed resistance to tetracycline, trimethoprim, sulfonamides and streptomycin. Compared to bovine isolates, less isolates were resistant to ampicillin and chloramphenicol and 0 to 2% resistance to nalidixic acid and fluoroquinolones was observed. In Spain a higher percentage, 14% of the isolates, were resistant to nalidixic acid.

The resistance pattern in isolates from poultry is similar to the other food animals. Resistance rates to nalidixic acid were higher, fluoroquinolone resistance was present and also resistance to aminoglycosides other than streptomycin was higher than in pigs and poultry.

