ZOONOSES MONITORING

HUNGARY

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

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

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

IN 2008

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Hungary**

Reporting Year:

Laboratory name	Description	Contribution
Central Agricultural Office		Responsible authority for zoonoses data collection and reporting

PREFACE

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

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

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

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

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

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

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

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1. ANIMAL POPULATIONS

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

A. Information on susceptible animal population

Sources of information:

Data on susceptible animal populations were taken from official publications of the Hungarian Central Statistical Office unless it is noted that from the Central Agricultural Office who collected data from the registrations of the Directorate of Food Chain Safety and Animal Health of the Agricultural Offices of the 19 counties of Hungary.

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

Most of the population data refer to the actual population as of the 1st of December 2008.

National evaluation of the numbers of susceptible population and trends in these

According to the data of the Hungarian Central Statistical Office, the decreasing tendency in most of the animal populations continued.

Table Susceptible animal populations

Animal species	Category of animals	Number of herds or flocks	Year	Number of slaughtered animals	Year	Livestock numbers (live animals)	Year	Number of holdings	Year
Cattle (bovine animals)	in total	18869				790036			
Gallus gallus (fowl)	in total					38000000			
	laying hens					12000000			
Geese	in total					3100000			
Goats	animals over 1 year					14882			
	in total	472							
Pigs	in total	53323				3384582			
Sheep	animals over 1 year					1084944			
	animals under 1 year (lambs)					29737			
	in total	7046				1114681			
Turkeys	in total					4000000			

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

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

2.1 SALMONELLOSIS

2.1.1 General evaluation of the national situation

A. General evaluation

History of the disease and/or infection in the country

In 1992 the Veterinary Science Committee of the Hungarian Academy of Sciences has established its Salmonella Subcommittee with the main aim to support the work of the Hungarian Ministry of Agriculture and Rural Development in the control of Salmonella with regards to poultry flocks.
This subcommittee has formed a working group with EU experts to prepare the Integrated Quality Chain System for Salmonella Control in the Hungarian Poultry Sector (Edel-Wray-Nagy et al, 1995).
This has been issued by the Ministry for use in the poultry sector and distributed to the County Animal Health and Food Control Stations in 1995. In further years the Salmonella Subcommittee has arranged several courses and lectures to distribute the booklet for wider use. The Basic Document of this Guideline contained the adaptation of Council directive 92/117/EEC. The Guidelines contained general and specific instructions for hatcheries, breeding flocks, broilers, layers, egg packaging plants, slaughterhouses and feedmills. A special chapter was devoted to disinfection and cleaning.
Based on the above Guidelines several large Hungarian poultry farming systems (BÃ¡bolna, BÃ³ly, NÃ¡dudvar) have built up and started their Salmonella Reduction Programs between 1996 and 2002. Besides, the Salmonella subcommittee has agreed with the Ministry of Agriculture and Rural Development to review the situation and to propose a Hungarian Salmonella Reduction Plan for Hungary, which was published by Nagy et al. in 1997.
Directive 92/117/EEC and the basics of the above mentioned Guidelines served the basis for the first ministerial decree [49/2002. (V.24) FVM] on the control of salmonellosis in poultry flocks, which referred to Salmonella Enteritidis and S. Typhimurium in Gallus gallus. The amendment to this Directive [97/2003. (VIII.19) FVM] made the application of the Order compulsory for breeding flocks and hatcheries, and continued to define the above 2 Salmonella serovars to be regarded as Salmonella for the purposes of that decree. The amendment also made the vaccination of table egg producing laying flocks compulsory.

After the accession the EC regulations became directly applicable in Hungary as well. In 2005 Hungary joined the Community baseline study on the prevalence of salmonella in laying flocks of Gallus gallus and in 2006 the Community baseline survey on the prevalence of Salmonella spp. in broiler flocks of Gallus gallus.

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

Preparations for the introduction of risk assessment in the control of salmonellosis are being made in the framework of the MedVetNet, (EU-FP6 Network of Excellence), through the Hungarian partner institute (VMRI). The general understanding between public health-, veterinary- and food safety officials is that the main source of S. Enteritidis infections in humans could be the S. Enteritidis infection of table egg producing flocks (see Hungarian report on layers), which most likely has its vertical origin in the breeding flocks (see Hungarian report on breeders). Earlier comparative investigations detected essentially the same PT in human as in animal and food isolates (GadÃ³ et al, 1998). S. Typhimurium is much less frequently isolated from breeders than from layers. Phage type DT104 has been detected as an emerging type from 1991 in both human and animal (food) isolates (SzmollÃ©ny, et al., 2000, PÃ¡szti et al, 2001). Based on studies of the Hungarian National Research and Development Plan (NKFP 4/040/2001) it can be stated that the majority of isolates of S. Typhimurium in porcine, in poultry as well as in humans belong to the DT104 phage type and are essentially representing one main multiresistant clone with characteristic integron pattern (GadÃ³ et al. 2003, NÃ³grÃ¡dy et al, 2003).
With regard to other serovars, the increase of S. Infantis in several animal species, especially in broiler flocks (above 80 % of the isolated strains) has to be mentioned (KostyÃ¡k 2001). This is also reflected in an increase of S. Infantis in human strains (in 2003 the 2nd most frequent human serovar with 7,5%), (Anon 2004.) which is a matter of increasing concern.

Recent actions taken to control the zoonoses

In 2008 control of Salmonella (S. Enteritidis and S. Typhimurium) was compulsory in breeding flocks of Gallus gallus as well as in hatcheries.
Laying flocks are vaccinated on a compulsory basis.

2.1.2 Salmonellosis in humans

A. Salmonellosis in humans

Reporting system in place for the human cases

There are around 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer’s Service (NPHMOS). Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic system for registering and analysing data of communicable diseases in a combined national database, so the system provides online connection amid the three levels (municipal, county and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: a clinically compatible case when the salmonella infection is laboratory confirmed.
Probable case: a clinically compatible case that is not confirmed by laboratory investigation, but it has an epidemiological link to a confirmed salmonellosis outbreak.

Diagnostic/analytical methods used

Salmonella isolates are obtained by culturing the faeces samples of the patients on selective-differentiating media, followed by biochemical testing and serotyping. Since 2003 the Hungarian and the Colindale sets of phages have been parallel used for phage typing of the human S. Enteritidis isolates received by the Phage-typing and Molecular Epidemiology Department of the ‘Johan Bela’ National Centre for Epidemiology. For S.Typhimurium isolates the schemes of Felix and Callow as well as Anderson et al. are also in use.

Notification system in place

Human cases have been notifiable since 1959. The physician reports data of case on a “case report form” by mail to the municipal institute of NPHMOS. The specialist of the institute records data immediately in the electronic system of the NPHMOS. Hungary has also a laboratory based surveillance system, and the NPHMOS has representative dataset from most of the microbiological laboratories about the laboratory investigated cases (since 2003 antibiotic

resistances have also been reported from 5 regional laboratory of NPHMOS and from a number of laboratories from universities or hospitals).
The illness is reported first as enteritis infectiosa syndrome on the basis of the symptoms. Having the results of the laboratory tests this syndrome-based diagnose is modified to etiology-based diagnose. In some cases reporting follows only the available laboratory test results.

History of the disease and/or infection in the country

Human cases have been notifiable since 1959. The isolated strains have been phage-typed since the 1960s. The number of the recorded cases has continuously increased from 1959 to 1996 (with a maximum of 28 046 reported case/year, incidence: 274,6/100 000 inhabitant/year). The number of the recorded outbreaks has also increased in a similar way (outbreak = two epidemiologically linked cases of salmonellosis, maximum number of reported outbreaks: 3450 outbreaks in 1995). Since 1996 both the number of the recorded cases and the outbreaks has continuously decreased. The mortality has increased only in the period of 1972-1994 (10-20 death/year, case fatality rate: 0.1-0.4%). In the other years the mortality was 5-10 death cases per year (case fatality rate: 0.03-0.09%). The age-specific incidence was the highest for the infants in all periods, and it declined with the progressing of the age.
The investigation of the outbreaks mostly demonstrated a food-borne origin. The ratio of the person-to-person transmission is insignificant. In the history of human salmonellosis in Hungary there were less than 10 outbreaks caused by contaminated water.
Up to 1980 the serotype S. Typhimurium predominated, and pork was identified as the main source of infection. At that time the infection has spread by homemade foods and also by the products of food-industry. Since 1980 the serotype S. Enteritidis has become predominant and poultry has been identified as the main source of the infection. Since then the prevalence of this serotype has remained about 70-80%. Between 1975 and 1980 the S. Enteritidis phage type 7 (according to the Hungarian scheme) has predominated. In the period of 1980-1990 strains characterized with phage type 1, from 1990 to 1996 strains characterized with phage type 1, 6 and 6b (according to the Hungarian scheme) were most frequently identified. After 1997 the phage type 6 (acc. to the Hungarian scheme) has become the most frequently occurring phage type.

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

The epidemiological situation of the salmonellosis in Hungary has continuously improved till 2004. The number of cases has decreased from 11 507 to 7557 since 2000 (incidence ranged between 114,3 – 74,7/100 000 inhabitants/year), the case fatality ratio changed between 0,01 – 0,08%. The decrease in the number of salmonellosis cases was mainly due to the decrease in the number of cases caused by S. Enteritidis. Eighty percent of the cases were sporadic. There were 6 – 700 community/institutional and family acquired outbreaks recorded. The number of the outbreaks declined more significantly than that of the sporadic cases. The investigation of the outbreaks has showed that in most cases the source of the infection was poultry. Mainly poultry eggs, and foods that contained eggs used without adequate heat-treatment and that were prepared at privet home or at canteen/catering trade caused outbreaks. There were only very few outbreaks caused by foods of industrial origin in the past ten years and there were no outbreaks caused by contaminated water.

Relevance as zoonotic disease

In the outbreaks a person-to-person transmission has been detected only in very few cases (in specific communities). In most case the outbreaks were suspectedly or conformedly caused by strains originated from poultry, via contaminated food.

Additional information

At the Phage-typing and Molecular Epidemiology Department of the ‘Johan Bela’ National Center for Epidemiology, the phage typing reactions for S. Enteritidis and S. Typhimurium are prepared parallel both with a Hungarian and the international (Ward et al., Colindale) and the Felix-Callow as well as Anderson et al. sets of phages, respectively.

2.1.3 Salmonella in foodstuffs

A. Salmonella spp. in broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The sampling strategy in the slaughterhouses is based on the previous years' data on production volume. The monitoring plan prepared by the CAO Food and Feed Safety Directorate determines the number of samples/county/month. The monitoring samples are thrown by the regional veterinary authority and are examined in the official control laboratories belonging to the Central Agricultural Office (CAO). It is a permanent monitoring scheme, data are reported by the official laboratories to CAO and the Ministry of Agriculture and Rural Development in the frame of an annual laboratory report. All the Salmonella strains isolated are serotyped by the NRL Salmonella.

At meat processing plant

The sampling strategy in processing plants is randomised based on the previous years' data on production volume. The samles are thrown by the veterinary authority and are examined in the official food control laboratory.It is a permanent monitoring scheme, data are reported by the official laboratories to the Ministry of Agriculture and Rural Development in the frame of an annual laboratory report.

At retail

Retail is also sampled by the authority on a regular basis. The total number of samples is determenid in the annual monitoring plan. About 60 % of the official control samples in a product group are taken at retail.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Fresh meat

At meat processing plant

Other: minced meat, meat prep., meat products

At retail

Other: minced meat, meat prep., meat products

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

At least 500 grams of meat is sent to the laboratory. The test portion is 25 grams.

At meat processing plant

Batch sampling with 5 subsamples. Test portion is 5 x 10 or 25 grams according to Regulation 2073/2005/EC.

Definition of positive finding

At slaughterhouse and cutting plant

a sample or a batch is positive if salmonella was isolated

At meat processing plant

a sample or a batch is positive if salmonella was isolated

At retail

a sample or a batch is positive if salmonella was isolated

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: ISO 6579:2002

At retail

Bacteriological method: ISO 6579:2002

Preventive measures in place

According to 2073/2005/EC Reg.

Measures in case of the positive findings or single cases

According to Reg.2073/2005/EC.

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

Based on the monitoring results, salmonella prevalence is high in broiler meat in Hungary. The dominance of Salmonella Infantis strains is well-known in the past years. 90 % of the isolated strains are belonging to this serovar now.
From 1995, the rate of Salmonella Infantis/Enteritidis is showing a continuous increase for Infantis (1% to 90 %), and a decreasing trend for S. Enteritidis (from 60 % to 5%).

The marked increase of Salmonella Infantis serovar in broiler meat was not caused a significant increase in human Salmonella Infantis incidence. The dominating serovar in human infections is continuously S. Enteritidis wich has been responsible for 70-80 % of the human infections for many years.

B. Salmonella spp. in pig meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The sampling strategy in the slaughterhouses is based on the previous years' data on production volume. The monitoring plan prepared by the CAO Food and Feed Safety Directorate determines the number of samples/county/month. The monitoring samples are thrown by the regional veterinary authority and are examined in the official control laboratories belonging to the Central Agricultural Office (CAO). It is a permanent monitoring scheme, data are reported by the official laboratories to CAO and the Ministry of Agricilture and Regional Development in the frame of an annual laboratory report. All the Salmonella strains isolated are serotyped by the NRL Salmonella.

At meat processing plant

The sampling strategy in processing plants is randomised based on the previous years' data on production volume. The samles are thrown by the veterinary authority and are examined in the official food control laboratory.It is a permanent monitoring scheme, data are reported by the official laboratories to the Ministry of Agricilture and Regional Development in the frame of an annual laboratory report.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Fresh meat

At meat processing plant

Surface of carcass

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: NMKL No 71:1999

C. Salmonella spp. in bovine meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

Food business operators perform continuous sampling system determined in their HACCP plans, and nearby there is an official control system of the competent authorities with a randomised sampling as well. The data of self control processes are checked in the frame of official control of course, but are not collected to a database, therefore these are not involved in this report. The test results of samples examined by competent authorities in their own laboratories are reported, but the data collection system do not allow to report the data separately for te different stages of food chain (slaughterhouses, processing plants, retail). Based on the structure of the EU zoonosis report, the data collection system will be resturctured this year. This year all the data on fresh meat are reported in the table of slaughterhouses.

At meat processing plant

The sampling strategy is randomised and continuous, performed by the competent authorities. Food producers operate their own continuous sampling system determined in their HACCP plans as well, with the same remarks as in the case of slaughterhouses.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Fresh meat

At meat processing plant

Surface of carcass

At retail

Other: fresh meat and all kinds of meat products

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

500 garms of sample is sent to the laboratory, the test portion is 25 grams

At meat processing plant

Batch sampling with 5 subsamples. Test portion is 10 or 25 grams determined by 2073/2005/EC Regulation.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: ISO 6579:2002

At retail

Bacteriological method: ISO 6579:2002

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Blockley	S. Bredeney	S. Enteritidis	S. Hadar	S. Indiana	S. Infantis
Meat from broilers (Gallus gallus) - fresh - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	188	142	0	1	2	0	1	136
Meat from broilers (Gallus gallus) - fresh - at slaughterhouse - Survey - EU baseline survey	CAO FFSD	batch	25 gramms	321	275	0	0	13	0	1	269
Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	67	32	0	0	1	0	0	28
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	225	0	0	0	0	0	0	0
Meat from broilers (Gallus gallus) - meat products - raw but intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	117	15	0	0	0	0	0	15
Meat from broilers (Gallus gallus) - minced meat - intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	7	4	0	0	0	0	0	4
Meat from duck - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	90	15	1	0	0	0	0	2
Meat from duck - Monitoring - official sampling - objective sampling (Meat preparation)	CAO FFSD	batch	10 gramms	15	4	0	0	0	0	0	2
Meat from geese - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	3	0	0	0	0	0	0	0
Meat from geese - fresh - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	86	2	0	0	0	0	0	0
Meat from turkey - fresh - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	253	34	1	9	0	0	0	10

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Blockley	S. Bredeney	S. Enteritidis	S. Hadar	S. Indiana	S. Infantis
Meat from turkey - meat preparation - intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	30	2	0	0	0	0	0	0
Meat from turkey - meat products - cooked, ready-to-eat - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	36	0	0	0	0	0	0	0
Meat from turkey - meat products - raw and intended to be eaten raw - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	12	0	0		0	0	0	0
Meat from turkey - meat products - raw but intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	44	4	0	0	0	0	0	2
Meat from turkey - minced meat - intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	37	13	0	3	0	1	0	2
Meat from wild game - birds - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	5	0	0	0	0	0	0	0

	S. Livingstone	S. Mbandaka	S. Saintpaul	S. Thompson	S. Typhimurium	S. Virchow	Salmonella spp., unspecified
Meat from broilers (Gallus gallus) - fresh - Monitoring - official sampling - objective sampling	0	0	1	0	1	0	0
Meat from broilers (Gallus gallus) - fresh - at slaughterhouse - Survey - EU baseline survey	0	0	0	1	1	0	0
Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - Monitoring - official sampling - objective sampling	0	2	0	1	0	0	0

Table Salmonella in poultry meat and products thereof

	S. Livingstone	S. Mbandaka	S. Saintpaul	S. Thompson	S. Typhimurium	S. Virchow	Salmonella spp., unspecified
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0
Meat from broilers (Gallus gallus) - meat products - raw but intended to be eaten cooked - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0
Meat from broilers (Gallus gallus) - minced meat - intended to be eaten cooked - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0
Meat from duck - Monitoring - official sampling - objective sampling	1	0	1	1	7	0	2
Meat from duck - Monitoring - official sampling - objective sampling (Meat preparation)	0	0	0	0	2	0	0
Meat from geese - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0
Meat from geese - fresh - Monitoring - official sampling - objective sampling	0	0	1	0	1	0	0
Meat from turkey - fresh - Monitoring - official sampling - objective sampling	0	0	11	0	0	2	1
Meat from turkey - meat preparation - intended to be eaten cooked - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	2
Meat from turkey - meat products - cooked, ready-to-eat - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0
Meat from turkey - meat products - raw and intended to be eaten raw - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0
Meat from turkey - meat products - raw but intended to be eaten cooked - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	2

Table Salmonella in poultry meat and products thereof

	S. Livingstone	S. Mbandaka	S. Saintpaul	S. Thompson	S. Typhimurium	S. Virchow	Salmonella spp., unspecified
Meat from turkey - minced meat - intended to be eaten cooked - Monitoring - official sampling - objective sampling	0	0	0	0	0	1	6
Meat from wild game - birds - Monitoring - official sampling - objective sampling	0	0	0	0	0	0	0

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - Monitoring	CAO FFSD	single	25 gramms	202	0	0	0	0
Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - at retail - Monitoring	CAO FFSD	single	25 gramms	3	0	0	0	0
Cheeses made from goats' milk - at retail - Monitoring	CAO FFSD	single	25 gramms	11	0	0	0	0
Cheeses made from goats' milk - unspecified - made from raw or low heat-treated milk - Monitoring	CAO FFSD	single	25 gramms	1	0	0	0	0
Cheeses made from sheep's milk - at retail - Monitoring	CAO FFSD	single	25 gramms	6	0	0	0	0
Cheeses made from sheep's milk - soft and semi -soft - at retail - Monitoring	CAO FFSD	single	25 gramms	40	0	0	0	0
Dairy products (excluding cheeses) - butter - made from pasteurised milk - Monitoring	CAO FFSD	single	25 gramms	21	0	0	0	0
Dairy products (excluding cheeses) - dairy desserts - Monitoring	CAO FFSD	single	25 gramms	51	0	0	0	0
Dairy products (excluding cheeses) - fermented dairy products - Monitoring	CAO FFSD	single	25 gramms	19	0	0	0	0
Dairy products (excluding cheeses) - ice-cream - at retail	CAO FFSD	batch	25 gramms	619	0	0	0	0
Dairy products (excluding cheeses) - milk powder and whey powder - Monitoring - official sampling - objective sampling	CAO FFSD	single	5x25 gramms	59	0	0	0	0
Milk, cows' - pasteurised milk - at retail	CAO FFSD	single	25 millilitres	54	0	0	0	0
Milk, cows' - raw - Monitoring	CAO FFSD	single	25 millilitres	150	0	0	0	0
Milk, cows' - raw - intended for direct human consumption - Monitoring	CAO FFSD	single	25 millilitres	40	0	0	0	0

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Milk, goats' - raw - at retail - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 millilitres	1	0	0	0	0
Milk, sheep's - raw	CAO FFSD	single	25 millilitres	2	0	0	0	0

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Anatum	S. Derby	S. Enteritidis	S. Infantis	S. London	S. Ohio
Meat from bovine animals - fresh - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	213	5	0	0	0	2	0	0
Meat from bovine animals - meat products - cooked, ready-to-eat - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	16	0	0	0	0	0	0	0
Meat from bovine animals - meat products - raw and intended to be eaten raw - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	5	0	0	0	0	0	0	0
Meat from bovine animals - meat products - raw but intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	9	0	0	0	0	0	0	0
Meat from bovine animals - minced meat - intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	14	0	0	0	0	0	0	0
Meat from horse - meat products - cooked, ready -to-eat - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	2	0	0	0	0	0	0	0
Meat from horse - meat products - fermented sausages - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	37	0	0	0	0	0	0	0
Meat from pig - fresh - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	360	6	0	2	0	1	0	0
Meat from pig - meat preparation - intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gamms	244	12	0	2	0	2	0	1
Meat from pig - meat products - cooked ham - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	69	0	0	0	0	0	0	0
Meat from pig - meat products - cooked, ready-to -eat - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	433	0	0	0	0	0	0	0

Table Salmonella in red meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Anatum	S. Derby	S. Enteritidis	S. Infantis	S. London	S. Ohio	S. Typhimurium	Salmonella spp., unspecified
Meat from pig - meat products - fermented sausages - Monitoring - official sampling - objective sampling 1)	CAO FFSD	batch	5x25 gramms	956	27	1	3	0	6	1	0		
Meat from pig - meat products - raw and intended to be eaten raw - Monitoring 2)	CAO FFSD	batch	25 gramms	223	1	0	0	0	0	0	0		
Meat from pig - meat products - raw ham - Monitoring	CAO FFSD	batch	25 gramms	239	0	0	0	0	0	0	0		
Meat from pig - mechanically separated meat (MSM) - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 gramms	2	0	0	0	0	0	0	0		
Meat from pig - minced meat - intended to be eaten cooked - Monitoring - official sampling - objective sampling	CAO FFSD	batch	10 graams	175	4	0	1	0	1	0	0		
Meat from rabbit - fresh - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	4	0	0	0	0	0	0	0		
Meat from sheep - fresh - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	12	0	0	0	0	0	0	0		
Other products of animal origin - gelatin and collagen - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	49	1	0	0	0	1	0	0		
Meat from bovine animals - fresh - Monitoring - official sampling - objective sampling												1	2
Meat from bovine animals - meat products - cooked, ready-to-eat - Monitoring - official sampling - objective sampling												0	0

Table Salmonella in red meat and products thereof

	S. Typhimurium	Salmonella spp., unspecified
Meat from bovine animals - meat products - raw and intended to be eaten raw - Monitoring - official sampling - objective sampling	0	0
Meat from bovine animals - meat products - raw but intended to be eaten cooked - Monitoring - official sampling - objective sampling	0	0
Meat from bovine animals - minced meat - intended to be eaten cooked - Monitoring - official sampling - objective sampling	0	0
Meat from horse - meat products - cooked, ready-to-eat - Monitoring - official sampling - objective sampling	0	0
Meat from horse - meat products - fermented sausages - Monitoring - official sampling - objective sampling	0	0
Meat from pig - fresh - Monitoring - official sampling - objective sampling	3	0
Meat from pig - meat preparation - intended to be eaten cooked - Monitoring - official sampling - objective sampling	4	3
Meat from pig - meat products - cooked ham - Monitoring - official sampling - objective sampling	0	0
Meat from pig - meat products - cooked, ready-to-eat - Monitoring - official sampling - objective sampling	0	0
Meat from pig - meat products - fermented sausages - Monitoring - official sampling - objective sampling [1)]	9	7
Meat from pig - meat products - raw and intended to be eaten raw - Monitoring [2)]	1	0

Table Salmonella in red meat and products thereof

	S. Typhimurium	Salmonella spp., unspecified
Meat from pig - meat products - raw ham - Monitoring	0	0
Meat from pig - mechanically separated meat (MSM) - Monitoring - official sampling - objective sampling	0	0
Meat from pig - minced meat - intended to be eaten cooked - Monitoring - official sampling - objective sampling	1	1
Meat from rabbit - fresh - Monitoring - official sampling - objective sampling	0	0
Meat from sheep - fresh - Monitoring - official sampling - objective sampling	0	0
Other products of animal origin - gelatin and collagen - Monitoring - official sampling - objective sampling	0	0

Comments:

[1] this category contains all kinds of sausages
[2] salami

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Infantis	S. Isangi	S. Litchfield	S. Livingstone	S. Mbandaka
Bakery products - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	248	0						
Cereals and meals - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	256	0						
Chocolate - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	145	1		1				
Cocoa and cocoa preparations, coffee and tea - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	74	0						
Confectionery products and pastes - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	209	1	1					
Crustaceans - at retail - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	32	0						
Egg products - dried - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 or 5*25	69	4	1		1			1
Egg products - liquid - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 or 5*25 ml	161	4	4					
Eggs - table eggs - at retail - Monitoring - official sampling - objective sampling 1)	CAO FFSD	batch	10 pcs	846	3	2				1	
Fish - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	60	1				1		
Fishery products, unspecified - raw - chilled - at retail - Monitoring	CAO FFSD	single	25 gramms	43	0						
Fishery products, unspecified - ready-to-eat - at retail - Monitoring	CAO FFSD	single	25 gramms	66	0						
Infant formula - dried - Monitoring - official sampling - objective sampling	CAO FFSD	batch	30x25	46	0						
Infant formula - ready-to-eat - at retail - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	7	0						

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Infantis	S. Isangi	S. Litchfield	S. Livingstone	S. Mbandaka
Molluscan shellfish - cooked - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	36	0						
Molluscan shellfish - raw - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	7	0						
Mushrooms - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	5	0						
Other processed food products and prepared dishes - Monitoring - official sampling	CAO FFSD	single	25 gramms	463	0						
Other processed food products and prepared dishes - noodles - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	292	5	4					
Other processed food products and prepared dishes - sandwiches - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	207	2						
Ready-to-eat salads - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	337	0						
Ready-to-eat salads - containing mayonnaise - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	396	1		1				
Seeds, dried - Monitoring - official sampling	CAO FFSD	single	25 gramms	22	0						
Seeds, sprouted - ready-to-eat - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	44	0						
Spices and herbs - dried - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	198	2						
Vegetables - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	29	0						
Vegetables - pre-cut - ready-to-eat - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	49	0						

Table Salmonella in other food

	S. Typhimurium	Salmonella spp., unspecified
Bakery products - Monitoring - official sampling - objective sampling		
Cereals and meals - Monitoring - official sampling - objective sampling		
Chocolate - Monitoring - official sampling - objective sampling		
Cocoa and cocoa preparations, coffee and tea - Monitoring - official sampling - objective sampling		
Confectionery products and pastes - Monitoring - official sampling - objective sampling		
Crustaceans - at retail - Monitoring - official sampling - objective sampling		
Egg products - dried - Monitoring - official sampling - objective sampling	1	
Egg products - liquid - Monitoring - official sampling - objective sampling		
Eggs - table eggs - at retail - Monitoring - official sampling - objective sampling [1)]		
Fish - at retail - Monitoring - official sampling		
Fishery products, unspecified - raw - chilled - at retail - Monitoring		
Fishery products, unspecified - ready-to-eat - at retail - Monitoring		
Infant formula - dried - Monitoring - official sampling - objective sampling		
Infant formula - ready-to-eat - at retail - Monitoring - official sampling - objective sampling		

Table Salmonella in other food

	S. Typhimurium	Salmonella spp., unspecified
Molluscan shellfish - cooked - at retail - Monitoring - official sampling		
Molluscan shellfish - raw - at retail - Monitoring - official sampling		
Mushrooms - at retail - Monitoring - official sampling		
Other processed food products and prepared dishes - Monitoring - official sampling		
Other processed food products and prepared dishes - noodles - Monitoring - official sampling - objective sampling	1	
Other processed food products and prepared dishes - sandwiches - Monitoring - official sampling - objective sampling		2
Ready-to-eat salads - Monitoring - official sampling - objective sampling		
Ready-to-eat salads - containing mayonnaise - at retail - Monitoring - official sampling		
Seeds, dried - Monitoring - official sampling		
Seeds, sprouted - ready-to-eat - at retail - Monitoring - official sampling		
Spices and herbs - dried - at retail - Monitoring - official sampling		2
Vegetables - at retail - Monitoring - official sampling		
Vegetables - pre-cut - ready-to-eat - at retail - Monitoring - official sampling		

Comments:

[1)] laboratory samples are surface of 5 eggs +yolk of 5 eggs

2.1.4 Salmonella in animals

Table Salmonella in breeding flocks of Gallus gallus

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Hadar	S. Infantis	S. Typhimurium	S. Virchow	Salmonella spp., unspecified
Gallus gallus (fowl) - parent breeding flocks, unspecified - day-old chicks - at farm - Control and eradication programmes - industry sampling (meconium)	832	county	flock	104	32	7			2		23
Gallus gallus (fowl) - parent breeding flocks, unspecified - during production period - at farm - Control and eradication programmes - official and industry sampling (swabs/dust)	832	county	flock	2204	56	9			3		44

Footnote:

The salmonella programme of the breeding flocks of Gallus gallus started at 01.01.2007. The baseline study showed a nearly 6% infection before the first year. At the end of the first year, the prevalence of the two important serotypes (Salmonella Enteritidis and Salmonella Typhimurium hereinafter: S.E., S.T.) was approximately 3%.
In 2008 there were 832 flocks included in the programme and until the end of the year, all of them were checked. In the first part of 2008 there were 6 flocks infected S.E., 3 ones with S.T and 20 ones infected with other serotypes. In the second part of the year there were 3 flocks infected with S.E., but there was not any S.T. infection. There were 24 flocks infected with other seotypes. In the second part of the year were only two reinfection: in county Veszprém in 7 flocks of a farm (after Salm. Mbandaka infection, reinfection with Salm. Infantis) and similary in county Somogy in 1 flock of a farm Salmonella Infantis infection, after a Salm. Mbandaka infection.
In 2008 the prevalence of Salmonella Enteritidis és Salmonella Typhimurium was 1,44% the prevalence of all Salmonella serotype was 6,73%.

Table Salmonella in other poultry

	Number of existing flocks	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Ducks - at farm - animal sample - Clinical investigations		CAO VDD	animal	322	52	0	21	31
Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - industry sampling - objective sampling	866		flock	2052	34	26	2	6
Gallus gallus (fowl) - laying hens - at farm - Control and eradication programmes - official and industry sampling [1)]	866	county	flock	2552	101	58	17	26
Gallus gallus (fowl) - laying hens - day-old chicks - at farm - Control and eradication programmes - industry sampling (meconium)	866	county	flock	496				
Gallus gallus (fowl) - laying hens - during production period - at farm - Control and eradication programmes - official and industry sampling (boot swabs/faeces/dust)	866	county	flock	1542				
Gallus gallus (fowl) - laying hens - during rearing period - at farm - Control and eradication programmes - official and industry sampling (faeces/boot swabs)	866	county	flock	514				
Gallus gallus (fowl) - unspecified - at farm - animal sample - Control and eradication programmes - industry sampling - objective sampling		CAO VDD	animal	227	74	4	0	70
Geese		CAO VDD	animal	289	67	6	54	7
Turkeys		CAO VDD	animal	239	47	2	21	24

Comments:

[1)] all

Footnote:

The salmonella programme of the laying flocks of Gallus gallus started at 01.01.2008. The baseline study showed a nearly 34% infection before the first year of the programme. At the end of the first year, the prevalence of the two important serotypes (Salmonella Enteritidis and Salmonella Typhimurium hereinafter: S.E., S.T.) was approximately 8,66%.
In 2008 there were 866 flocks included in the programme and until the end of the year, all of them were checked. In the first part of 2008 there were 14 flocks infected S.E., 9 ones with S.T and 4 ones infected with other serotypes. In the second part of the year there were 44 flocks infected with S.E., and 8 ones with S.T. infection. There were 22 flocks infected with other seotypes. In the second part of the year there was only one reinfection: in county Borsod Abaúj in 1 flocks of a farm (after S.E. infection, reinfection with S.E..
In 2008 the prevalence of Salmonella Enteritidis és Salmonella Typhimurium was 8,66%, that of all Salmonella serotypes was 11,66%. There was one case when both official and industrial samples - which were taken at the same time – had positive results.

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Cattle (bovine animals) - at farm - Clinical investigations	CAO VDD	animal	29	21	0	1	20
Pigs - at farm - animal sample - Clinical investigations	CAO VDD	animal	68	34	0	1	33
Pigs - unspecified - at farm - animal sample - Monitoring	CAO VDD	animal	32	27	0	12	15

2.1.5 Salmonella in feedingstuffs

Table Salmonella in feed material of animal origin

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of land animal origin - meat meal - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	12	0	0	0	0
Feed material of marine animal origin - fish meal - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	6	0	0	0	0
Pet food - at slaughterhouse - Monitoring - official sampling - objective sampling (raw)		batch	25 gramms	5	2	1	1	0

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of cereal grain origin - barley derived - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	2	0	0	0	0
Feed material of cereal grain origin - maize - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	2	0	0	0	0
Feed material of cereal grain origin - maize - derived - at processing plant - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	6	0	0	0	0
Feed material of cereal grain origin - wheat derived - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	6	0	0	0	0
Feed material of oil seed or fruit origin - rape seed derived - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	5	0	0	0	0
Feed material of oil seed or fruit origin - soya (bean) derived - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	3	0	0	0	0
Feed material of oil seed or fruit origin - sunflower seed derived - at feed mill - domestic production - Monitoring - industry sampling - objective sampling	CAO FFSD	batch	25 gramms	7	0	0	0	0
Other feed material - other seeds and fruits - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	3	0	0	0	0

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Schleissheim	S. Typhimurium	Salmonella spp., unspecified
Compound feedingstuffs for cattle - final product - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	16	0	0	0	0	0
Compound feedingstuffs for pigs - final product - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	159	0	0	0	0	0
Compound feedingstuffs for poultry (non specified) - final product - at feed mill - domestic production - Monitoring - industry sampling - objective sampling	CAO FFSD	batch	25 gramms	7	0	0	0	0	0
Compound feedingstuffs for poultry - laying hens - final product - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	45	1	0	1	0	0
Compound feedingstuffs for poultry -breeders - final product - at feed mill - domestic production - Monitoring - industry sampling - objective sampling	CAO FFSD	batch	25 gramms	5	0	0	0	0	0
Compund feedingstuffs for poultry - broilers - final product - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	143	0	0	0	0	0
Pet food - dog snacks (pig ears, chewing bones) - at feed mill - domestic production - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 gramms	80	0	0	0	0	0

2.1.6 Salmonella serovars and phagetype distribution

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

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	15	29	32	68	227	53		850
Number of isolates serotyped	14	21	27	34	74	53	0	156
Number of isolates per serovar								
S. Agona	1	0	5	5	1	1	0	2
S. Anatum	4	8	0	0	0	0	0	15
S. Blockley	0	0	0	0	0	5	0	0
S. Bovismorbificans	3	6	1	2	0	2	0	10
S. Bredeney	1	0	1	0	0	0	0	17
S. Choleraesuis	0	0	0	10	0	0	0	0
S. Derby	0	0	3	6	0	1	0	0

Table Salmonella serovars in animals

Serovars	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory	**15**	**29**	**32**	**68**	**227**	**53**		**850**
Number of isolates serotyped	**14**	**21**	**27**	**34**	**74**	**53**	**0**	**156**
Number of isolates per serovar								
S. Enteritidis	0	0	0	0	4	11	0	8
S. Hadar	0	0	0	0	0	0	0	1
S. Indiana	0	0	0	0	1	0	0	5
S. Infantis	4	4	4	8	62	25	0	12
S. Kottbus	0	0	0	0	0	0	0	3
S. Livingstone	0	0	1	2	0	3	0	0
S. Mbandaka	0	0	0	0	4	0	0	0
S. Saintpaul	0	0	0	0	0	0	0	6
S. Senftenberg	0	0	0	0	0	1	0	0
S. Thompson	1	2	0	0	2	0	0	2
S. Typhimurium	0	1	12	1	0	4	0	75

Table Salmonella serovars in food

Serovars	Bakery products		Other food		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**
Number of isolates in the laboratory													
Number of isolates serotyped	**0**	**0**	**0**	**0**	**15**	**0**	**128**	**0**	**967**	**0**	**0**	**0**	**48**
Number of isolates per serovar													
S. Agona	0	0	0	0	0	0	1	0	1	0	0	0	0
S. Anatum	0	0	0	0	1	0	1	0	0	0	0	0	0
S. Blockley	0	0	0	0	0	0	0	0	1	0	0	0	0
S. Bovismorbificans	0	0	0	0	1	0	2	0	2	0	0	0	0
S. Brandenburg	0	0	0	0	0	0	0	0	0	0	0	0	2
S. Bredeney	0	0	0	0	4	0	5	0	0	0	0	0	5
S. Derby	0	0	0	0	0	0	30	0	0	0	0	0	23
S. Enteritidis	0	0	0	0	4	0	1	0	26	0	0	0	14
S. Hadar	0	0	0	0	0	0	0	0	0	0	0	0	0
S. Infantis	0	0	0	0	2	0	26	0	925	0	0	0	0
S. Litchfield	0	0	0	0	1	0	0	0	0	0	0	0	1

Table Salmonella serovars in food

Serovars	Bakery products		Other food		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**
Number of isolates in the laboratory													
Number of isolates serotyped	**0**	**0**	**0**	**0**	**15**	**0**	**128**	**0**	**967**	**0**	**0**	**0**	**48**
Number of isolates per serovar													
S. Livingstone	0	0	0	0	0	0	1	0	0	0	0	0	0
S. London	0	0	0	0	0	0	2	0	0	0	0	0	0
S. Mbandaka	0	0	0	0	0	0	0	0	3	0	0	0	0
S. Ohio	0	0	0	0	0	0	4	0	0	0	0	0	0
S. Rissen	0	0	0	0	0	0	7	0	0	0	0	0	0
S. Saintpaul	0	0	0	0	0	0	0	0	1	0	0	0	0
S. Typhimurium	0	0	0	0	2	0	48	0	4	0	0	0	3
S. Paratyphi B var. Java	0	0	0	0	0	0	0	0	4	0	0	0	0

Table Salmonella serovars in food

Serovars	Other products of animal origin	Meat from geese		Meat from duck		Meat from turkey	
Sources of isolates	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory							
Number of isolates serotyped	**0**	**2**	**0**	**32**	**0**	**285**	**0**
Number of isolates per serovar							
S. Agona	0	0	0	0	0	1	0
S. Anatum	0	0	0	0	0	0	0
S. Blockley	0	0	0	1	0	13	0
S. Bovismorbificans	0	0	0	0	0	18	0
S. Brandenburg	0	0	0	0	0	0	0
S. Bredeney	0	0	0	0	0	177	0
S. Derby	0	0	0	0	0	14	0
S. Enteritidis	0	0	0	0	0	6	0
S. Hadar	0	0	0	5	0	3	0
S. Infantis	0	0	0	0	0	32	0
S. Litchfield	0	0	0	0	0	0	0
S. Livingstone	0	0	0	6	0	0	0

Table Salmonella serovars in food

Serovars	Other products of animal origin	Meat from geese		Meat from duck		Meat from turkey	
Sources of isolates	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory							
Number of isolates serotyped	**0**	**2**	**0**	**32**	**0**	**285**	**0**
Number of isolates per serovar							
S. London	0	0	0	0	0	0	0
S. Mbandaka	0	0	0	0	0	0	0
S. Ohio	0	0	0	0	0	0	0
S. Rissen	0	0	0	0	0	0	0
S. Saintpaul	0	1	0	1	0	21	0
S. Typhimurium	0	1	0	19	0	0	0
S. Paratyphi B var. Java	0	0	0	0	0	0	0

Table Salmonella Enteritidis phagetypes in animals

Phagetype	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens
Sources of isolates	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring
Number of isolates in the laboratory	**0**	**61**	**0**	**1**	**0**	**61**	**2**	**11**	**6**	**4**	**15**	**0**	**92**
Number of isolates phagetyped	**0**	**55**	**0**	**1**	**0**	**55**	**2**	**11**	**6**	**3**	**8**	**0**	**53**
Number of isolates per type													
PT 1				0		0	0	0	0	0	0		2
PT 4		14		0		14	0	2	1	1	3		13
PT 5		1		0		1	0	0	0	0	0		2
PT 21		4		0		4	0	0	0	0	0		3
Not typeable		1		0		1	0	0	0	0	1		4
PT 1b		1		0		1	0	0	0	0	0		0
PT 21c		3		0		3	0	0	0	0	0		1
PT 13a		7		0		7	0	0	5	2	0		0
PT 6a		0		1		0	1	0	0	0	0		1
PT RDNC		0		0		0	0	2	0	0	1		2
6c		1		0		1	1	3	0	0	0		0

Table Salmonella Enteritidis phagetypes in animals

Phagetype	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Turkeys		Gallus gallus (fowl) - broilers		Gallus gallus (fowl) - laying hens
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**
Number of isolates in the laboratory	**0**	**61**	**0**	**1**	**0**	**61**	**2**	**11**	**6**	**4**	**15**	**0**	**92**
Number of isolates phagetyped	**0**	**55**	**0**	**1**	**0**	**55**	**2**	**11**	**6**	**3**	**8**	**0**	**53**
Number of isolates per type													
6		7		0		7	0	2	0	0	0		5
8		15		0		15	0	2	0	0	3		13
PT 7a		1		0		1	0	0	0	0	0		2
PT 13				0		0	0	0	0	0	0		1
PT 1d				0		0	0	0	0	0	0		4

Phagetype	Gallus gallus (fowl) - laying hens
Sources of isolates	**Clinical**
Number of isolates in the laboratory	**0**
Number of isolates phagetyped	**0**
Number of isolates per type	
PT 1	

Table Salmonella Enteritidis phagetypes in animals

Phagetype	Gallus gallus (fowl) - laying hens
Sources of isolates	Clinical
Number of isolates in the laboratory	0
Number of isolates phagetyped	0
Number of isolates per type	
PT 4	
PT 5	
PT 21	
Not typeable	
PT 1b	
PT 21c	
PT 13a	
PT 6a	
PT RDNC	
6c	
6	

Table Salmonella Enteritidis phagetypes in animals

Phagetype	Gallus gallus (fowl) - laying hens
Sources of isolates	Clinical
Number of isolates in the laboratory	0
Number of isolates phagetyped	0
Number of isolates per type	
8	
PT 7a	
PT 13	
PT 1d	

Table Salmonella Enteritidis phagetypes in food

Phagetype	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin		Meat from turkey	
Sources of isolates	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	4	0	1	0	25	0	0	0	14	0	6	0
Number of isolates phagetyped	3	0	1	0	25	0	0	0	14	0	6	0
Number of isolates per type												
PT 1	0		0		1				0		0	
PT 4	0		0		6				2		1	
PT 6	0		1		1				7		0	
PT 8	0		0		8				3		0	
Not typeable	0		0		2				0		0	
PT 1b	0		0		1				0		0	
PT 13a	3		0		1				0		5	
PT 23	0		0		1				1		0	
PT 7	0		0		1				0		0	
PT 6c	0		0		3				1		0	
PT 13	0		0		0				0		0	

Table Salmonella Enteritidis phagetypes in food

Footnote:

Category of products of other animal origin contains data on food containing egg.

Table Salmonella Enteritidis phagetypes in humans

Phagetype	humans	
Sources of isolates	Monitoring	Clinical
Number of isolates in the laboratory	**1131**	**627**
Number of isolates phagetyped	**1131**	**627**
Number of isolates per type		
PT 1	11	12
PT 4	188	95
PT 6	93	54
PT 8	418	230
PT 14b	7	4
PT 21	84	47
Not typeable	25	3
PT 1b	7	15
PT 13a	9	10
PT 2	217	133
Other	36	14
PT RDNC	16	4

Table Salmonella Enteritidis phagetypes in humans

Phagetype	humans	
Sources of isolates	Monitoring	Clinical
Number of isolates in the laboratory	**1131**	**627**
Number of isolates phagetyped	**1131**	**627**
Number of isolates per type		
PT 33	12	5
PT 32a	8	1

Table Salmonella Typhimurium phagetypes in animals

Phagetype	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Geese		Ducks	
Sources of isolates	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**	**Monitoring**	**Clinical**
Number of isolates in the laboratory		**5**		**19**		**8**		**6**		**68**		**19**
Number of isolates phagetyped	**0**	**5**	**0**	**13**	**0**	**5**	**0**	**4**	**0**	**47**	**0**	**11**
Number of isolates per type												
DT 8		0		0		0		0		7		6
DT 9		0		0		0		0		0		1
DT 68		2		0		0		0		0		0
DT 104		1		3		0		0		2		0
DT 193		0		1		0		0		0		2
U 302		0		3		0		0		0		0
Not typeable		0		2		0		0		0		0
DT 22		0		0		0		0		3		0
DT 193a		0		1		0		0		0		0
DT 46a		0		0		0		0		1		0
DT 3		0		0		4		0		0		0
DT 135		0		0		0		0		1		0

Table Salmonella Typhimurium phagetypes in animals

Phagetype	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Geese		Ducks	
Sources of isolates	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory		5		19		8		6		68		19
Number of isolates phagetyped	0	5	0	13	0	5	0	4	0	47	0	11
Number of isolates per type												
DT 2		0		0		0		3		1		0
DT 29		0		1		0		0		0		1
RDNC		2		2		1		1		32		1

Table Salmonella Typhimurium phagetypes in food

Phagetype	Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Other poultry		Other products of animal origin	
Sources of isolates	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical	Monitoring	Clinical
Number of isolates in the laboratory	2	0	47	0	5	0	20	0	3	0
Number of isolates phagetyped	2	0	33	0	4	0	7	0	1	0
Number of isolates per type										
DT 8	0		0		1		1		0	
DT 46	0		0		0		1		0	
DT 104	0		7		2		0		0	
DT 120	0		2		0		0		0	
DT 193	1		1		0		0		0	
Not typeable	0		1		0		0		1	
DT 41	0		3		0		0		0	
RDNC	0		2		1		2		0	
DT U302	1		17		0		3		0	

Footnote:

Monitoring category contains the data on strains coming from food business operators programms as well.

Table Salmonella Typhimurium phagetypes in humans

Phagetype	humans	
Sources of isolates	**Monitoring**	**Clinical**
Number of isolates in the laboratory	**263**	**98**
Number of isolates phagetyped	**263**	**98**
Number of isolates per type		
DT 9	15	1
DT 104	44	14
DT 104b	36	21
DT 193	83	30
U 302	22	2
Not typeable	7	3
DT RDNC	3	7
DT 193a	4	5
DT 46a	6	6
Other	29	9
DT 36	5	0
DT 14	9	0

2.1.7 Antimicrobial resistance in Salmonella isolates

A. Antimicrobial resistance in Salmonella in poultry

Sampling strategy used in monitoring

Methods used for collecting data

Testing and data collection was the task of the NRL Salmonella.

Laboratory methodology used for identification of the microbial isolates

ISO 6579 - isolation, biochemical and serological confirmation. ISO 6579 - isolation, biochemical and serological confirmation.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Disc diffusion method according to NCCLS is used. The inhibitive zone diameters are measured by a computerised system.

Results of the investigation

B. Antimicrobial resistance in Salmonella in foodstuff derived from poultry

Sampling strategy used in monitoring

Frequency of the sampling

Frequency: as described previously in prevalence tables. As only Salmonella Enteritidis and Typhimurium strains are involved in the resistence monitoring program in foodstuff, and the number of isolates belonging to these serovars is very limited because of the 90% dominance of Salmonella Infantis in broiler chicken, only a limited number of isolates are available for the tests.

Type of specimen taken

Fresh meat at slaughterhouses, minced meat, meat preparations, meat products at processing level and at the market. There is no direct sampling program for antimicrobial resistance, it is connected to prevalence monitoring.

Methods of sampling (description of sampling techniques)

As described earlier.

Procedures for the selection of isolates for antimicrobial testing

S. Enteritidis and Salmonella Infantis strains are selected. All the S. Enteritidis strains of broiler origin were tested. As S. Infantis shows a characteristic dominance in Hungary, the number of the strains available is just 2000. Therefore only 10 % of the isolates were selected for testing.

Methods used for collecting data

All the strains isolated from food are serotyped in the NRL Salmonella. Antimicrobial resistence testing is performed in the NRL.

Laboratory methodology used for identification of the microbial isolates

ISO 6579 - isolation, biochemical and serological confirmation.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Disc diffusion method according to NCCLS is used. The inhibitive zone diameters are measured by a computerised system.

Preventive measures in place

There are no specific preventive measures in place.

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

Because of the very low number of Salmonella Enteritidis isolates the information available is limited. There is no significant change in level of resistance in the past four years.

Table Antimicrobial susceptibility testing of S. Agona in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Agona		Gallus gallus (fowl) - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0															1								
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0											1												
Amphenicols	Chloramphenicol		1	0															1								
	Florfenicol		1	0																			1				
Cephalosporins	3rd generation cephalosporins		1	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																							1
Penicillins	Ampicillin		1	0																			1				
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		1	0																						1	
Tetracyclines	Tetracyclin		1	0																	1						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Agona in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Agona		Gallus gallus (fowl) - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)							
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins				1			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Agona in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Agona		Cattle (bovine animals) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0																1							
Aminoglycosides	Kanamycin		0	0																							
Aminoglycosides	Neomycin		0	0																							
Aminoglycosides	Streptomycin		1	0											1												
Amphenicols	Chloramphenicol		1	0															1								
Amphenicols	Florfenicol		1	0																	1						
Cephalosporins	3rd generation cephalosporins		1	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
Fluoroquinolones	Enrofloxacin		1	0																						1	
Penicillins	Ampicillin		1	0															1								
Quinolones	Nalidixic acid		1	0															1								
Sulfonamides	Sulfonamide		1	0																	1						
Tetracyclines	Tetracyclin		1	0														1									
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Agona in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Agona		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	1						
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Agona in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Agona		Pigs - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	5																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		0	0																							
	Kanamycin		0	0																							
	Neomycin		4	0														2	2								
	Streptomycin		5	0										5													
Amphenicols	Chloramphenicol		4	0														2	1	1							
	Florfenicol		4	0														3	1								
Cephalosporins	3rd generation cephalosporins		4	0																3	1						
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		4	0																				1	2	1	
Penicillins	Ampicillin		4	0													3	1									
Quinolones	Nalidixic acid		4	0														1	3								
Sulfonamides	Sulfonamide		4	0													1		1		1		1				
Tetracyclines	Tetracyclin		0	0																							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Agona in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Agona		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	5						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Agona in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Agona		Gallus gallus (fowl) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0															1								
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0										1													
Amphenicols	Chloramphenicol		1	0														1									
	Florfenicol		1	0														1									
Cephalosporins	3rd generation cephalosporins		1	0																				1			
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																					1		
Penicillins	Ampicillin		1	0													1										
Quinolones	Nalidixic acid		1	0															1								
Sulfonamides	Sulfonamide		1	0												1											
Tetracyclines	Tetracyclin		1	0												1											
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Agona in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Agona		Gallus gallus (fowl) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Anatum in Ducks - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Anatum		Ducks - at slaughterhouse - Clinical investigations																								
	Isolates out of a monitoring program (yes/no)	no																								
	Number of isolates available in the laboratory	15																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		15	0											1			3	6	1	3	1					
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		13	0							1			7	5												
Amphenicols	Chloramphenicol		15	0																			1	3	3	1	5
	Florfenicol		15	0																			2		5		3
Cephalosporins	3rd generation cephalosporins		14	0																			1	2	1	1	2
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		15	0																					1		
Penicillins	Ampicillin		15	0													2		1	3	2	4	3				
Quinolones	Nalidixic acid		10	0										1					1	2		2	3			1	
Sulfonamides	Sulfonamide		15	0	1											1	2	2		1	1	2	2	2	1		
Tetracyclines	Tetracyclin		13	0								1					2	1	3	2	3		1				
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Anatum in Ducks - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Anatum		Ducks - at slaughterhouse - Clinical investigations						
Isolates out of a monitoring program (yes/no)		no						
Number of isolates available in the laboratory		15						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol		1		1			
	Florfenicol		4		1			
Cephalosporins	3rd generation cephalosporins	3	1				2	1
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	3	4		4		3	
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Anatum in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Anatum		Turkeys - at farm - Clinical investigations																								
	Isolates out of a monitoring program (yes/no)	no																								
	Number of isolates available in the laboratory	2																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		2	0															2								
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		2	0										2													
Amphenicols	Chloramphenicol		2	0																			1				1
	Florfenicol		2	0																					1	1	
Cephalosporins	3rd generation cephalosporins		2	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		2	0																							
Penicillins	Ampicillin		2	0																1	1						
Quinolones	Nalidixic acid		2	0																			2				
Sulfonamides	Sulfonamide		2	0							1												1				
Tetracyclines	Tetracyclin		2	0												1					1						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Anatum in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Anatum		Turkeys - at farm - Clinical investigations						
Isolates out of a monitoring program (yes/no)		no						
Number of isolates available in the laboratory		2						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins		1		1			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin		2					
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Anatum in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Anatum		Cattle (bovine animals) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	4																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		4	0													3	1									
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		4	0								1	1	2													
Amphenicols	Chloramphenicol		4	0																			1	1		1	1
	Florfenicol		4	0																		1			2		1
Cephalosporins	3rd generation cephalosporins		4	0																					2		1
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		4	0																				1	2	1	
Penicillins	Ampicillin		4	0															1	1	1			1			
Quinolones	Nalidixic acid		4	0														1	3								
Sulfonamides	Sulfonamide		3	0													1				1		1				
Tetracyclines	Tetracyclin		4	0															1	3							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Anatum in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Anatum		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	4						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	1						
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Bovismorbificans in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Bovismorbificans		Turkeys - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	9																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		9	0															2	3	1	1	1				
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		9	0										3	4		1										
Amphenicols	Chloramphenicol		7	0																				1	2	1	1
	Florfenicol		8	0																1							2
Cephalosporins	3rd generation cephalosporins		8	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		8	0																							
Penicillins	Ampicillin		7	0																1		4	1	1			
Quinolones	Nalidixic acid		1	0																1							
Sulfonamides	Sulfonamide		9	0												2	1			1			4				
Tetracyclines	Tetracyclin		9	0																	4	1	3				
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Bovismorbificans in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Bovismorbificans		Turkeys - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)							
	Number of isolates available in the laboratory	9						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							1
	Kanamycin							
	Neomycin							
	Streptomycin							1
Amphenicols	Chloramphenicol	1			1			
	Florfenicol	1	1		2		1	
Cephalosporins	3rd generation cephalosporins		3	2	2			1
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	2	2		3			1
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							1
Tetracyclines	Tetracyclin							1
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Bovismorbificans in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Bovismorbificans		Cattle (bovine animals) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	3																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		3	0															1	2							
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		3	0	1									1	1												
Amphenicols	Chloramphenicol		3	0																							2
	Florfenicol		3	0	1																						1
Cephalosporins	3rd generation cephalosporins		3	0																							1
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		3	0																							1
Penicillins	Ampicillin		3	0																1			1	1			
Quinolones	Nalidixic acid		3	0																			2		1		
Sulfonamides	Sulfonamide		3	0	2												1										
Tetracyclines	Tetracyclin		3	0	3																						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Bovismorbificans in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Bovismorbificans		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	3						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol		1					
	Florfenicol		1					
Cephalosporins	3rd generation cephalosporins	1		1				
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	2						
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Bovismorbificans in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Bovismorbificans		Pigs - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0															1								
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0											1												
Amphenicols	Chloramphenicol		1	0																						1	
	Florfenicol		0	0																							
Cephalosporins	3rd generation cephalosporins		0	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																							
Penicillins	Ampicillin		1	0																			1				
Quinolones	Nalidixic acid		1	0																				1			
Sulfonamides	Sulfonamide		1	0															1								
Tetracyclines	Tetracyclin		1	0	1																						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Bovismorbificans in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Bovismorbificans		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1						
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Bredeney in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Bredeney		Pigs - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0																1							
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0			1																				
Amphenicols	Chloramphenicol		1	0																	1						
	Florfenicol		1	0																	1						
Cephalosporins	3rd generation cephalosporins		0	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																							1
Penicillins	Ampicillin		1	0															1								
Quinolones	Nalidixic acid		1	0															1								
Sulfonamides	Sulfonamide		1	0											1												
Tetracyclines	Tetracyclin		1	0	1																						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Bredeney in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Bredeney		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Bredeney in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Bredeney		Cattle (bovine animals) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0																1							
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0										1													
Amphenicols	Chloramphenicol		1	0																							
	Florfenicol		1	0																				1			
Cephalosporins	3rd generation cephalosporins		1	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																							
Penicillins	Ampicillin		1	0																					1		
Quinolones	Nalidixic acid		1	0																				1			
Sulfonamides	Sulfonamide		1	0																		1					
Tetracyclines	Tetracyclin		1	0																1							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Bredeney in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Bredeney		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	1						
	Florfenicol							
Cephalosporins	3rd generation cephalosporins			1				
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1						
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Bredeney in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Bredeney		Turkeys - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	17																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		16	0													2	2	5	2	4		1				
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		17	0	1									1	7	3	5										
Amphenicols	Chloramphenicol		17	0											1		2	1	3	2	5	1	1		1		
	Florfenicol		17	0												2		3	5	1	2		3	1			
Cephalosporins	3rd generation cephalosporins		17	0			1																		3	1	4
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		17	0													2	3	5	2		5					
Penicillins	Ampicillin		17	0	17																						
Quinolones	Nalidixic acid		9	0	9																						
Sulfonamides	Sulfonamide		17	0										1			1		2	1	4	1	1	1	1	1	2
Tetracyclines	Tetracyclin		17	0	17																						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Bredeney in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Bredeney		Turkeys - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	17						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	2	4		1		1	
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide	1						
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Choleraesuis in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Choleraesuis		Pigs - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	no																								
	Number of isolates available in the laboratory	10																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		10	0										1			1		3	1	1	1	2				
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		10	0	5					2		2	1														
Amphenicols	Chloramphenicol		10	0	7																					1	2
	Florfenicol		10	0	7																					1	2
Cephalosporins	3rd generation cephalosporins		10	0																		1					
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		10	0																		2	3		1		
Penicillins	Ampicillin		10	0	7																	1			1	1	
Quinolones	Nalidixic acid		6	0	4													1					1				
Sulfonamides	Sulfonamide		10	0	7														1								
Tetracyclines	Tetracyclin		9	0	7													1							1		
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Choleraesuis in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Choleraesuis		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	10						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins		2		1		2	4
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin		1		2		1	
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide				2			
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Derby in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Derby		Pigs - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	3																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		3	0						1							1										
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		3	0						1							1			1							
Amphenicols	Chloramphenicol		3	0																			1	1			1
	Florfenicol		3	0																			2				1
Cephalosporins	3rd generation cephalosporins		0	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		3	0																					1	1	1
Penicillins	Ampicillin		3	0	1																1	1					
Quinolones	Nalidixic acid		3	0					1													1				1	
Sulfonamides	Sulfonamide		3	0													2	1									
Tetracyclines	Tetracyclin		3	0	1				1					1													
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Derby in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Derby		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	3						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin		1					
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Derby in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Derby		Gallus gallus (fowl) - at farm - Clinical investigations																								
	Isolates out of a monitoring program (yes/no)	no																								
	Number of isolates available in the laboratory	1																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0																	1						
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0											1												
Amphenicols	Chloramphenicol		1	0																			1				
	Florfenicol		1	0																	1						
Cephalosporins	3rd generation cephalosporins		1	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																							
Penicillins	Ampicillin		1	0																			1				
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		1	0																				1			
Tetracyclines	Tetracyclin		1	0																1							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Derby in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Derby		Gallus gallus (fowl) - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins				1			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin				1			
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Enteritidis in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Enteritidis		Gallus gallus (fowl) - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	11																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		11	0													1	1	3	3	2						
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		11	0												2	1	4	3								
Amphenicols	Chloramphenicol		11	0													1					2	3		1		2
	Florfenicol		10	0									1								1		3		3		
Cephalosporins	3rd generation cephalosporins		10	0																				1			1
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		10	0						1													1		2	1	2
Penicillins	Ampicillin		11	0										1							2	3	1	2	1		
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		11	0	1				1					1		1	1	1	1			1	1				2
Tetracyclines	Tetracyclin		10	0												1				1	5	1	1				
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Enteritidis in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Enteritidis		Gallus gallus (fowl) - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)							
	Number of isolates available in the laboratory	11						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							1
	Kanamycin							
	Neomycin							
	Streptomycin							1
Amphenicols	Chloramphenicol		1					1
	Florfenicol				1			1
Cephalosporins	3rd generation cephalosporins	1		1	2	3		1
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1					1	1
Penicillins	Ampicillin							1
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							1
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Enteritidis in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Enteritidis		Geese - at slaughterhouse - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	6																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		5	0										1				1	1	1	1						
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		6	0										1			3	1		1							
Amphenicols	Chloramphenicol		5	0															1					2	1		1
	Florfenicol		6	0																	1				4		
Cephalosporins	3rd generation cephalosporins		5	0																		1					
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		6	0																			1				
Penicillins	Ampicillin		6	0														1				2	2		1		
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		6	0	1												1	1	1	1	1						
Tetracyclines	Tetracyclin		6	0													1		1		3	1					
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Enteritidis in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Enteritidis		Geese - at slaughterhouse - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	6						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol		1					
Cephalosporins	3rd generation cephalosporins		2	1	1			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin			2		1	1	1
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Enteritidis in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Enteritidis		Turkeys - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	2																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		2	0													1		1								
Aminoglycosides	Kanamycin		0	0																							
Aminoglycosides	Neomycin		0	0																							
Aminoglycosides	Streptomycin		2	0													1	1									
Amphenicols	Chloramphenicol		2	0	1																				1		
Amphenicols	Florfenicol		2	0	1																				1		
Cephalosporins	3rd generation cephalosporins		2	0																							1
Fluoroquinolones	Ciprofloxacin		0	0																							
Fluoroquinolones	Enrofloxacin		2	0																				1			
Penicillins	Ampicillin		2	0	1																				1		
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		2	0	1															1							
Tetracyclines	Tetracyclin		2	0																	1	1					
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Enteritidis in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Enteritidis		Turkeys - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	2						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins						1	
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin						1	
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

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

S. Enteritidis		Gallus gallus (fowl) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	4																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		4	0													2		1							1	
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		4	0										1		1	1			1							
Amphenicols	Chloramphenicol		4	0																1			1	1			
	Florfenicol		4	0																1				2			
Cephalosporins	3rd generation cephalosporins		4	0																							3
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		4	0																				1			1
Penicillins	Ampicillin		4	0															1	1	1	1					
Quinolones	Nalidixic acid		4	0																		1	1	1			1
Sulfonamides	Sulfonamide		4	0	2						1					1											
Tetracyclines	Tetracyclin		4	0										1						1	2						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

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

S. Enteritidis		Gallus gallus (fowl) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)							
	Number of isolates available in the laboratory	4						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol		1					
	Florfenicol		1					
Cephalosporins	3rd generation cephalosporins							1
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin		1				1	
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Enteritidis - qualitative data

S. Enteritidis		Meat from other poultry species		Meat from broilers (Gallus gallus)		Meat from pig		Meat from bovine animals		Other processed food products and prepared dishes	
	Isolates out of a monitoring program (yes/no)	yes		yes		yes		yes		yes	
	Number of isolates available in the laboratory	8		27		2		2		12	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	8	0	27	0	2	0	2	0	12	0
	Kanamycin	8	2	27	4	2	1	2	0	12	2
	Neomycin	1	0	9	0	1	0	0	0	2	0
	Streptomycin	8	0	27	0	2	0	2	0	12	0
Amphenicols	Chloramphenicol	8	0	27	0	2	0	2	0	12	0
Cephalosporins	Cefotaxim	7	0	18	0	1	0	2	0	10	0
	Ceftiofur	7	0	19	0	1	0	2	0	10	0
	Ceftriaxon	3	0	12	0	1	0	1	0	10	0
	Cephalothin	3	0	12	0	1	0	1	0	10	0
Fluoroquinolones	Ciprofloxacin	3	0	12	3	1	0	1	0	10	1
	Enrofloxacin	7	0	19	4	1	0	2	0	10	1
Fully sensitive	Fully sensitive	8	6	27	17	2	1	2	2	12	8
Penicillins	Amoxicillin / Clavulanic acid	8	0	27	2	2	0	2	0	12	0
	Ampicillin	8	0	27	1	2	0	2	0	12	1
Quinolones	Nalidixic acid	8	0	27	6	2	0	2	0	12	1
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	8	2	27	3	2	1	2	0	12	3
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	8	0	27	6	2	0	2	0	12	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	8	0	27	1	2	0	2	0	12	1
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	8	0	27	0	2	0	2	0	12	0

Table Antimicrobial susceptibility testing of S. Enteritidis - qualitative data

S. Enteritidis		Meat from other poultry species		Meat from broilers (Gallus gallus)		Meat from pig		Meat from bovine animals		Other processed food products and prepared dishes	
	Isolates out of a monitoring program (yes/no)	yes		yes		yes		yes		yes	
	Number of isolates available in the laboratory	8		27		2		2		12	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	8	0	27	0	2	0	2	0	12	0
Sulfonamides	Sulfadiazin	1	0	9	0	1	0	0	0	2	0
Tetracyclines	Tetracyclin	8	0	27	0	2	0	2	0	12	0
Trimethoprim	Trimethoprim	6	0	20	0	2	0	2	0	12	0
Trimethoprim + sulfonamides	Trimethoprim + Sulfamethoxazol	8	0	27	0	2	0	2	0	12	0

Table Antimicrobial susceptibility testing of Salmonella in humans, Salmonella Enteritidis

S. Enteritidis		humans	
	Isolates out of a monitoring program (yes/no)	no	
	Number of isolates available in the laboratory	36	
Antimicrobials:		N	n
Aminoglycosides	Gentamicin	36	1
	Kanamycin	36	1
	Streptomycin	36	2
Amphenicols	Chloramphenicol	36	2
Cephalosporins	3rd generation cephalosporins	36	0
Fluoroquinolones	Ciprofloxacin	36	0
Fully sensitive	Fully sensitive	36	21
Penicillins	Ampicillin	36	2
Quinolones	Nalidixic acid	36	6
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	36	11
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	36	1
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	36	2
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	36	0
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	36	1
Sulfonamides	Sulfonamide	36	4
Tetracyclines	Tetracyclin	36	4
Trimethoprim	Trimethoprim	36	2
Trimethoprim + sulfonamides	Trimethoprim + Sulfonamide	36	1

Table Antimicrobial susceptibility testing of S. Hadar in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Hadar		Turkeys - at farm - Clinical investigations																									
Isolates out of a monitoring program (yes/no)		no																									
Number of isolates available in the laboratory		1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0															1								
Aminoglycosides	Kanamycin		0	0																							
Aminoglycosides	Neomycin		0	0																							
Aminoglycosides	Streptomycin		1	0	1																						
Amphenicols	Chloramphenicol		1	0																					1		
Amphenicols	Florfenicol		1	0																			1				
Cephalosporins	3rd generation cephalosporins		1	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
Fluoroquinolones	Enrofloxacin		1	0																							
Penicillins	Ampicillin		1	0																1							
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		1	0															1								
Tetracyclines	Tetracyclin		1	0						1																	
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Hadar in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Hadar		Turkeys - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins		1					
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							1
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Indiana in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Indiana		Gallus gallus (fowl) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0														1									
Aminoglycosides	Kanamycin		0	0																							
Aminoglycosides	Neomycin		0	0																							
Aminoglycosides	Streptomycin		1	0										1													
Amphenicols	Chloramphenicol		1	0																				1			
Amphenicols	Florfenicol		1	0																		1					
Cephalosporins	3rd generation cephalosporins		1	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
Fluoroquinolones	Enrofloxacin		1	0																						1	
Penicillins	Ampicillin		1	0	1																						
Quinolones	Nalidixic acid		1	0																			1				
Sulfonamides	Sulfonamide		1	0									1														
Tetracyclines	Tetracyclin		1	0	1																						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Indiana in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Indiana		Gallus gallus (fowl) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)							
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	1						
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Infantis in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Infantis		Gallus gallus (fowl) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	62																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		62	0												2	3	12	23	6	5	4	3		3	1	
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		62	0	1	1	1	3	6	27	1	9		11	1		1										
Amphenicols	Chloramphenicol		62	0													4	6	6	7	6	8	12	4	7	1	1
	Florfenicol		62	0											1	2		13	7	5	10	7	9	5	3		
Cephalosporins	3rd generation cephalosporins		60	0																			1	5	10	9	8
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		58	0			1								1		2	9	7	4	1	18	8	4	2		1
Penicillins	Ampicillin		53	0	6											3	3	10	9	4	5	11	2				
Quinolones	Nalidixic acid		62	0	61																		1				
Sulfonamides	Sulfonamide		62	0	58										1		1								1		
Tetracyclines	Tetracyclin		62	0	52		6	1		1								2									
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Infantis in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Infantis		Gallus gallus (fowl) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)							
	Number of isolates available in the laboratory	62						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	7	9	2	5		3	1
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide	1						
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Infantis in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Infantis		Turkeys - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	8																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		8	0											1		1	3	2	1							
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		8	0	1					2	1	1		3													
Amphenicols	Chloramphenicol		8	0													1		1	1	1		2		2		
	Florfenicol		8	0														2			1		4		1		
Cephalosporins	3rd generation cephalosporins		7	0																				1	1		2
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		7	0													1	1				2	2			1	
Penicillins	Ampicillin		7	0	1													1	1	2		1		1			
Quinolones	Nalidixic acid		3	0	3																						
Sulfonamides	Sulfonamide		8	0	6											1			1								
Tetracyclines	Tetracyclin		8	0	6			1		1																	
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Infantis in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Infantis		Turkeys - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	8						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	1		1	1			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Infantis in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Infantis		Pigs - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	4																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		4	0														1	2	1							
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		4	0						2					2												
Amphenicols	Chloramphenicol		4	0													1			1		1	1				
	Florfenicol		4	0														2			1		1				
Cephalosporins	3rd generation cephalosporins		4	0																			2				
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		4	0														1				1					1
Penicillins	Ampicillin		4	0														1	1	2							
Quinolones	Nalidixic acid		3	0	1																			1	1		
Sulfonamides	Sulfonamide		3	0	1																1			1			
Tetracyclines	Tetracyclin		4	0	3														1								
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Infantis in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Infantis		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	4						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	1	1					
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin		1					
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Infantis in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Infantis		Gallus gallus (fowl) - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	25																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		25	0													1	1	7	4	7	4		1			
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		25	0						6	3	9	1	3	1	1	1										
Amphenicols	Chloramphenicol		25	0													1	4	3	2	1	3	6	2	2		1
	Florfenicol		25	0											1			5	4	2	6	1	4	1	1		
Cephalosporins	3rd generation cephalosporins		25	0																					1	2	9
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		25	0													2	2	3	4		6	3	3	1		
Penicillins	Ampicillin		25	0													1	1	2	6	6	3	4	2			
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		25	0	18	6										1											
Tetracyclines	Tetracyclin		24	0	15	4	2	2	1																		
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Infantis in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Infantis		Gallus gallus (fowl) - at farm - Clinical investigations						
Isolates out of a monitoring program (yes/no)		no						
Number of isolates available in the laboratory		25						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	6	6	1				
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1						
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Infantis in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Infantis		Cattle (bovine animals) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	4																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		4	0													1	3									
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		4	0						1				2	1												
Amphenicols	Chloramphenicol		4	0																	1	1	2				
	Florfenicol		4	0																1	1		2				
Cephalosporins	3rd generation cephalosporins		4	0																				1	2		1
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		4	0																		3					
Penicillins	Ampicillin		4	0	1															2		1					
Quinolones	Nalidixic acid		4	0	3																			1			
Sulfonamides	Sulfonamide		3	0	1												1						1				
Tetracyclines	Tetracyclin		4	0					2										2								
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Infantis in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Infantis		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)							
	Number of isolates available in the laboratory	4						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1						
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Infantis in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Infantis		Geese - at slaughterhouse - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0																	1						
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0												1											
Amphenicols	Chloramphenicol		1	0																					1		
	Florfenicol		1	0																							1
Cephalosporins	3rd generation cephalosporins		1	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																							
Penicillins	Ampicillin		1	0																					1		
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		1	0																							
Tetracyclines	Tetracyclin		1	0																					1		
Trimethoprim	Trimethoprim		1	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Infantis in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Infantis		Geese - at slaughterhouse - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins				1			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							1
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide	1						
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim	1						
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Infantis - qualitative data

S. Infantis		Meat from other poultry species		Meat from broilers (Gallus gallus)		Meat from bovine animals		Other processed food products and prepared dishes		Meat from pig	
	Isolates out of a monitoring program (yes/no)	yes		yes		yes		yes		yes	
	Number of isolates available in the laboratory	29		171		1		4		11	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	29	0	171	0	1	0	4	0	11	0
	Kanamycin	28	2	139	14	1	0	4	0	9	0
	Neomycin	11	1	63	0	1	0	2	0	5	0
	Streptomycin	29	20	171	160	1	1	4	3	11	7
Amphenicols	Chloramphenicol	29	0	171	0	1	0	4	0	11	0
Cephalosporins	Cefotaxim	25	0	152	1	1	0	4	0	8	0
	Ceftiofur	18	0	120	0	1	0	3	0	9	0
	Ceftriaxon	22	0	127	1	1	0	4	0	11	0
	Cephalothin	10	0	34	0	1	0	1	0	3	0
Fluoroquinolones	Ciprofloxacin	27	22	117	117	1	1	4	4	11	7
	Enrofloxacin	26	23	155	155	1	1	4	4	11	7
Fully sensitive	Fully sensitive	29	4	171	0	1	0	4	0	11	4
Penicillins	Amoxicillin / Clavulanic acid	29	1	171	2	1	0	4	0	11	0
	Ampicillin	29	1	171	5	1	0	4	0	11	0
Quinolones	Nalidixic acid	29	24	171	171	1	1	4	4	11	7
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	29	1	171	1	1	0	4	0	11	0
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	19	0	171	0	1	0	4	0	11	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	29	1	171	3	1	0	4	1	11	0
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	29	1	171	48	1	0	4	0	11	0

Table Antimicrobial susceptibility testing of S. Infantis - qualitative data

S. Infantis		Meat from other poultry species		Meat from broilers (Gallus gallus)		Meat from bovine animals		Other processed food products and prepared dishes		Meat from pig	
	Isolates out of a monitoring program (yes/no)	yes		yes		yes		yes		yes	
	Number of isolates available in the laboratory	29		171		1		4		11	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	29	22	171	119	1	1	4	3	11	7
Sulfonamides	Sulfadiazin	28	19	137	111	1	1	4	3	11	6
Tetracyclines	Tetracyclin	29	22	164	154	1	1	4	2	11	7
Trimethoprim	Trimethoprim	27	2	127	0	1	0	4	0	11	0
Trimethoprim + sulfonamides	Trimethoprim + Sulfamethoxazol	29	2	169	0	1	0	4	0	11	0

Table Antimicrobial susceptibility testing of S. Kottbus in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Kottbus		Geese - at slaughterhouse - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	2																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		2	0															1		1						
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		2	0										2													
Amphenicols	Chloramphenicol		2	0																							
	Florfenicol		2	0																							1
Cephalosporins	3rd generation cephalosporins		0	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		2	0																					1	1	
Penicillins	Ampicillin		2	0																			1				
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		2	0																	2						
Tetracyclines	Tetracyclin		2	0																	1	1					
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Kottbus in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Kottbus		Geese - at slaughterhouse - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	2						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	1	1					
	Florfenicol		1					
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin		1					
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Livingstone in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Livingstone

Pigs - at slaughterhouse - Monitoring

Isolates out of a monitoring program (yes/no)		yes																									
Number of isolates available in the laboratory		1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0																1							
Aminoglycosides	Kanamycin		0	0																							
Aminoglycosides	Neomycin		0	0																							
Aminoglycosides	Streptomycin		1	0										1													
Amphenicols	Chloramphenicol		1	0																		1					
Amphenicols	Florfenicol		1	0																		1					
Cephalosporins	3rd generation cephalosporins		0	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
Fluoroquinolones	Enrofloxacin		0	0																							
Penicillins	Ampicillin		1	0																				1			
Quinolones	Nalidixic acid		1	0																					1		
Sulfonamides	Sulfonamide		1	0																		1					
Tetracyclines	Tetracyclin		1	0																1							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Livingstone in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Livingstone		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Livingstone in Ducks - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Livingstone		Ducks - at slaughterhouse - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	11																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		10	0										1			1	2	2	1		1	1		1		
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		10	0	1									2	4	1	2										
Amphenicols	Chloramphenicol		10	0	1			1							1							1		3	1	2	
	Florfenicol		10	0	1		1							1						1	1	1	2		1	1	
Cephalosporins	3rd generation cephalosporins		9	0									1	1						1					1		1
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		10	0														2									1
Penicillins	Ampicillin		10	0	1			1							1				1	1	2		1	1	1		
Quinolones	Nalidixic acid		4	0																			1	2		1	
Sulfonamides	Sulfonamide		11	0	1												2		1		1	1		2			1
Tetracyclines	Tetracyclin		8	0	1				1								1		1	3	1						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Livingstone in Ducks - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Livingstone		Ducks - at slaughterhouse - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	11						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins			1	3			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1	3	2				1
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide			1				1
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Livingstone in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Livingstone		Gallus gallus (fowl) - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	3																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		3	0															1	1	1						
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		3	0											1	1	1										
Amphenicols	Chloramphenicol		3	0																			2		1		
	Florfenicol		3	0															1		1		1				
Cephalosporins	3rd generation cephalosporins		3	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		3	0																							
Penicillins	Ampicillin		3	0																	1		1		1		
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		3	0																			1			1	1
Tetracyclines	Tetracyclin		3	0														1	1	1							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Livingstone in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Livingstone		Gallus gallus (fowl) - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	3						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	1	1		1			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1	1		1			
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Mbandaka in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Mbandaka		Gallus gallus (fowl) - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	4																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		4	0											1	1	2										
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		4	0								1	1	1	1												
Amphenicols	Chloramphenicol		4	0																1	1	2					
	Florfenicol		4	0														1	1	1	1						
Cephalosporins	3rd generation cephalosporins		4	0																			1	1	1	1	
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		4	0																						1	
Penicillins	Ampicillin		4	0																	3	1					
Quinolones	Nalidixic acid		4	0																		2	1	1			
Sulfonamides	Sulfonamide		4	0	2											1									1		
Tetracyclines	Tetracyclin		4	0														1		2	1						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Mbandaka in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Mbandaka		Gallus gallus (fowl) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	4						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	3						
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Saintpaul in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Saintpaul		Turkeys - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	6																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		6	0													1	2	3								
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		6	0	1								1	2	2												
Amphenicols	Chloramphenicol		6	0																			3	1		2	
	Florfenicol		6	0																			1	3		1	
Cephalosporins	3rd generation cephalosporins		6	0																							1
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		6	0																		2			1		1
Penicillins	Ampicillin		6	0	1																2	2	1				
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		6	0	4															1					1		
Tetracyclines	Tetracyclin		6	0	2														1	1	2						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Saintpaul in Turkeys - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Saintpaul		Turkeys - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	6						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol		1					
Cephalosporins	3rd generation cephalosporins	2	2			1		
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1	1					
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Senftenberg in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Senftenberg		Gallus gallus (fowl) - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0												1											
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0										1													
Amphenicols	Chloramphenicol		1	0																		1					
	Florfenicol		1	0																	1						
Cephalosporins	3rd generation cephalosporins		1	0																			1				
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																				1			
Penicillins	Ampicillin		1	0													1										
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		1	0						1																	
Tetracyclines	Tetracyclin		1	0														1									
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Senftenberg in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Senftenberg		Gallus gallus (fowl) - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Thompson in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Thompson		Cattle (bovine animals) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0															1								
Aminoglycosides	Kanamycin		0	0																							
Aminoglycosides	Neomycin		0	0																							
Aminoglycosides	Streptomycin		1	0										1													
Amphenicols	Chloramphenicol		1	0																			1				
Amphenicols	Florfenicol		1	0																			1				
Cephalosporins	3rd generation cephalosporins		1	0																	1						
Fluoroquinolones	Ciprofloxacin		0	0																							
Fluoroquinolones	Enrofloxacin		1	0																							1
Penicillins	Ampicillin		1	0																	1						
Quinolones	Nalidixic acid		1	0																				1			
Sulfonamides	Sulfonamide		1	0																			1				
Tetracyclines	Tetracyclin		1	0																	1						
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Thompson in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Thompson		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Thompson in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Thompson		Geese - at slaughterhouse - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	1																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		1	0												1											
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		1	0											1												
Amphenicols	Chloramphenicol		1	0																			1				
	Florfenicol		1	0																1							
Cephalosporins	3rd generation cephalosporins		1	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		1	0																							
Penicillins	Ampicillin		1	0																			1				
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		1	0																			1				
Tetracyclines	Tetracyclin		1	0																1							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Thompson in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Thompson		Geese - at slaughterhouse - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	1						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins		1					
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin		1					
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Thompson in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Thompson		Gallus gallus (fowl) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	2																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		2	0													1	1									
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		2	0										2													
Amphenicols	Chloramphenicol		2	0																1		1					
	Florfenicol		2	0																	1		1				
Cephalosporins	3rd generation cephalosporins		2	0																							2
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		2	0																							1
Penicillins	Ampicillin		2	0															1	1							
Quinolones	Nalidixic acid		2	0																		1	1				
Sulfonamides	Sulfonamide		2	0															1	1							
Tetracyclines	Tetracyclin		2	0															1	1							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Thompson in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Thompson		Gallus gallus (fowl) - at slaughterhouse - Monitoring						
Isolates out of a monitoring program (yes/no)								
Number of isolates available in the laboratory		2						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1						
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Typhimurium in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Typhimurium		**Gallus gallus (fowl) - at farm - Clinical investigations**																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	4																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		4	0															1	1	1		1				
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		4	0										1	1	1	1										
Amphenicols	Chloramphenicol		4	0																					1	1	2
	Florfenicol		4	0																			1		2		
Cephalosporins	3rd generation cephalosporins		4	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		4	0																							2
Penicillins	Ampicillin		4	0																		2		1	1		
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		4	0	1											1					1						1
Tetracyclines	Tetracyclin		4	0													1		2			1					
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Typhimurium in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

S. Typhimurium		Gallus gallus (fowl) - at farm - Clinical investigations						
Isolates out of a monitoring program (yes/no)		no						
Number of isolates available in the laboratory		4						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol		1					
Cephalosporins	3rd generation cephalosporins		1	1	2			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin				1		1	
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Typhimurium in Ducks - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Typhimurium		Ducks - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	no																								
	Number of isolates available in the laboratory	21																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		21	0														3	6		5	3	3	1			
Aminoglycosides	Kanamycin		0	0																							
Aminoglycosides	Neomycin		0	0																							
Aminoglycosides	Streptomycin		21	0	1								2	7	7	3	1										
Amphenicols	Chloramphenicol		20	0																1		1	3			7	2
Amphenicols	Florfenicol		21	0															1	1		1			6	2	5
Cephalosporins	3rd generation cephalosporins		19	0									1									1			2		1
Fluoroquinolones	Ciprofloxacin		0	0																							
Fluoroquinolones	Enrofloxacin		21	0																		2					2
Penicillins	Ampicillin		21	0	1														1	1	3		8	4	2	1	
Quinolones	Nalidixic acid		10	0																2	1	1	3	1		2	
Sulfonamides	Sulfonamide		21	0	6									1		1			4	1	2			2	1		2
Tetracyclines	Tetracyclin		20	0	1												2	1	1	1	6	3	4		1		
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Typhimurium in Ducks - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Typhimurium		Ducks - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	21						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	1	4			1		
	Florfenicol		2	1			1	1
Cephalosporins	3rd generation cephalosporins	1	3	5	3	2		
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin		7	1	3	2	4	
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide		1					
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Typhimurium in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Typhimurium		Pigs - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	12																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		12	0						1					1			3	4	2	1						
	Kanamycin		0	0																							
	Streptomycin		12	0	3		5		1					1	2												
Amphenicols	Chloramphenicol		12	0	8																		2			2	
	Florfenicol		12	0	1					1	3	1	1								1			1		2	1
Cephalosporins	3rd generation cephalosporins		11	0																				1	1	1	3
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		12	0																				1		1	2
Penicillins	Ampicillin		12	0	10															1	1						
Quinolones	Nalidixic acid		12	0													1				2	2	5	1		1	
Sulfonamides	Sulfonamide		12	0	10												1								1		
Tetracyclines	Tetracyclin		0	0																							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Typhimurium in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

S. Typhimurium		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	12						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins	3	1		1			
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	2	5			1		
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Typhimurium in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Typhimurium		Geese - at slaughterhouse - Clinical investigations																								
	Isolates out of a monitoring program (yes/no)	no																								
	Number of isolates available in the laboratory	55																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		55	0					1								2	6	8	9	13	6	6	1	2		
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		54	0	2	1		1	1	1				14	16	13	3	2									
Amphenicols	Chloramphenicol		55	0	6															1	2		2	1	13	2	4
	Florfenicol		55	0							2		3						1		1	4	3	3	6	3	7
Cephalosporins	3rd generation cephalosporins		54	0																						1	5
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		55	0																		1		1	1	1	2
Penicillins	Ampicillin		55	0	7															2	7	4	10	9	7	3	3
Quinolones	Nalidixic acid		9	0																	3		1	4	1		
Sulfonamides	Sulfonamide		55	0	11						1			2		4		1	5	1	5	4	2	2	3		7
Tetracyclines	Tetracyclin		54	0	5		1		1	1	1	1		1			1	4	6	6	13	7	3	2	1		
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Typhimurium in Geese - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Typhimurium		Geese - at slaughterhouse - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	55						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin		1					
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	3	11	3	3		4	
	Florfenicol	4	10		6		2	
Cephalosporins	3rd generation cephalosporins	3	7	2	13	3	8	12
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	1	12	4	12		10	10
Penicillins	Ampicillin	2		1				
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide		4		1		2	
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Typhimurium in Ducks - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Typhimurium		Ducks - at slaughterhouse - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory																										
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		0	0																							
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		0	0																							
Amphenicols	Chloramphenicol		0	0																							
	Florfenicol		0	0																							
Cephalosporins	3rd generation cephalosporins		0	0																							
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		0	0																							
Penicillins	Ampicillin		0	0																							
Quinolones	Nalidixic acid		0	0																							
Sulfonamides	Sulfonamide		0	0																							
Tetracyclines	Tetracyclin		0	0																							
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of S. Typhimurium in Ducks - at slaughterhouse - Clinical investigations - quantitative data [Diffusion method]

S. Typhimurium		Ducks - at slaughterhouse - Clinical investigations						
	Isolates out of a monitoring program (yes/no)							
	Number of isolates available in the laboratory							
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol							
	Florfenicol							
Cephalosporins	3rd generation cephalosporins							
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin							
Penicillins	Ampicillin							
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide							
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of S. Typhimurium - qualitative data

S. Typhimurium		Meat from other poultry species		Meat from broilers (Gallus gallus)		Meat from bovine animals		Meat from pig		Other processed food products and prepared dishes	
	Isolates out of a monitoring program (yes/no)	yes		yes		yes		yes		yes	
	Number of isolates available in the laboratory	13		7		3		53		6	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	13	0	7	0	3	0	53	1	6	0
	Kanamycin	13	1	7	0	2	0	49	0	6	0
	Neomycin	5	0	1	0	0	0	9	0	2	0
	Streptomycin	13	3	7	2	3	1	53	44	6	3
Amphenicols	Chloramphenicol	13	0	7	1	3	1	53	32	6	2
Cephalosporins	Cefotaxim	9	0	7	0	3	1	50	3	5	0
	Ceftiofur	9	0	7	0	3	0	51	0	5	0
	Ceftriaxon	7	0	2	0	1	0	29	0	3	0
	Cephalothin	7	0	1	1	0	0	23	3	3	0
Fluoroquinolones	Ciprofloxacin	7	0	2	0	1	0	48	3	5	1
	Enrofloxacin	9	0	7	2	3	0	51	2	3	1
Fully sensitive	Fully sensitive	13	10	7	4	3	0	53	1	6	1
Penicillins	Amoxicillin / Clavulanic acid	13	0	7	2	3	2	53	40	6	4
	Ampicillin	13	0	7	2	3	2	53	49	6	4
Quinolones	Nalidixic acid	13	0	7	2	3	0	53	4	6	1
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	13	2	7	0	3	1	53	1	6	1
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	13	1	7	0	3	0	53	1	6	0
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	13	0	7	1	3	0	53	4	6	1
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	13	0	7	0	3	1	53	6	6	0

Table Antimicrobial susceptibility testing of S. Typhimurium - qualitative data

S. Typhimurium		Meat from other poultry species		Meat from broilers (Gallus gallus)		Meat from bovine animals		Meat from pig		Other processed food products and prepared dishes	
	Isolates out of a monitoring program (yes/no)	yes		yes		yes		yes		yes	
	Number of isolates available in the laboratory	13		7		3		53		6	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	13	0	7	2	3	1	53	40	6	3
Sulfonamides	Sulfadiazin	5	0	2	2	3	1	9	9	6	4
Tetracyclines	Tetracyclin	13	0	7	0	3	3	53	47	6	4
Trimethoprim	Trimethoprim	10	0	3	0	3	1	53	7	6	0
Trimethoprim + sulfonamides	Trimethoprim + Sulfamethoxazol	13	0	7	0	3	0	53	7	6	0

Footnote:

Data of Central Agricultural Office, Food and Feed Safety Directorate

Table Antimicrobial susceptibility testing of Salmonella in humans, Salmonella Typhimurium

S. Typhimurium		humans	
	Isolates out of a monitoring program (yes/no)	no	
	Number of isolates available in the laboratory	361	
Antimicrobials:		N	n
Aminoglycosides	Gentamicin	361	0
	Kanamycin	361	4
	Streptomycin	361	195
Amphenicols	Chloramphenicol	361	108
Cephalosporins	3rd generation cephalosporins	361	0
Fluoroquinolones	Ciprofloxacin	361	0
Fully sensitive	Fully sensitive	361	71
Number of multiresistant S. Typhimurium	resistant to other antimicrobials	361	22
	with penta resistance	361	47
Penicillins	Ampicillin	361	266
Quinolones	Nalidixic acid	361	27
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	361	69
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	361	18
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	361	56
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	361	78
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	361	69
Sulfonamides	Sulfonamide	218	102
Tetracyclines	Tetracyclin	361	198
Trimethoprim	Trimethoprim	241	25
Trimethoprim + sulfonamides	Trimethoprim + Sulfonamide	361	37

Table Antimicrobial susceptibility testing of Salmonella spp. in food

Salmonella spp.		Other processed food products and prepared dishes		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Meat from other poultry species	
	Isolates out of a monitoring program (yes/no)	yes		yes		yes		yes		yes	
	Number of isolates available in the laboratory	3		3		30		12		66	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Aminoglycosides	Gentamicin	3	0	3	0	30	0	12	0	66	0
	Kanamycin	3	0	3	0	30	0	12	1	66	5
	Neomycin	3	0	0	0	10	0	4	0	50	4
	Streptomycin	3	2	3	0	30	0	12	4	66	24
Amphenicols	Chloramphenicol	3	0	3	0	30	0	12	0	66	3
Cephalosporins	Cefotaxim	3	0	3	0	22	0	11	2	43	0
	Ceftiofur	2	0	3	0	26	0	11	1	41	0
	Ceftriaxon	2	0	1	0	30	0	10	1	26	0
	Cephalothin	3	0	1	0	30	0	12	2	66	3
Fluoroquinolones	Ciprofloxacin	3	0	3	0	30	0	12	2	66	39
	Enrofloxacin	3	0	3	0	27	0	12	1	51	28
Fully sensitive	Fully sensitive	3	1	3	2	30	15	12	4	66	6
Penicillins	Amoxicillin / Clavulanic acid	3	0	3	0	30	0	12	0	66	8
	Ampicillin	3	0	3	0	30	0	12	5	66	35
Quinolones	Nalidixic acid	3	0	3	0	30	0	12	3	66	42
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	3	2	3	1	30	3	12	1	66	2
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	3	0	3	0	30	3	12	0	66	7
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	3	0	3	0	30	3	12	1	66	14
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	3	0	3	0	30	3	12	1	66	5

Table Antimicrobial susceptibility testing of Salmonella spp. in food

Salmonella spp.		Other processed food products and prepared dishes		Meat from bovine animals		Meat from pig		Meat from broilers (Gallus gallus)		Meat from other poultry species	
	Isolates out of a monitoring program (yes/no)	yes		yes		yes		yes		yes	
	Number of isolates available in the laboratory	3		3		30		12		66	
Antimicrobials:		N	n	N	n	N	n	N	n	N	n
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	3	0	3	0	30	3	12	5	66	32
Sulfonamides	Sulfadiazin	3	0	0	0	30	0	12	5	50	21
Tetracyclines	Tetracyclin	3	0	3	0	30	0	12	3	66	53
Trimethoprim	Trimethoprim	3	0	3	0	30	0	12	5	66	10
Trimethoprim + sulfonamides	Trimethoprim + Sulfamethoxazol	3	0	3	0	30	0	12	5	66	10

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

Salmonella spp.		humans	
	Isolates out of a monitoring program (yes/no)	no	
	Number of isolates available in the laboratory	297	
Antimicrobials:		N	n
Aminoglycosides	Gentamicin	297	1
	Kanamycin	297	27
	Streptomycin	297	191
Amphenicols	Chloramphenicol	297	22
Cephalosporins	3rd generation cephalosporins	297	0
Fluoroquinolones	Ciprofloxacin	297	0
Fully sensitive	Fully sensitive	297	74
Penicillins	Ampicillin	297	46
Quinolones	Nalidixic acid	297	198
Resistant to 1 antimicrobial	Resistant to 1 antimicrobial	297	27
Resistant to 2 antimicrobials	Resistant to 2 antimicrobials	297	7
Resistant to 3 antimicrobials	Resistant to 3 antimicrobials	297	69
Resistant to 4 antimicrobials	Resistant to 4 antimicrobials	297	78
Resistant to >4 antimicrobials	Resistant to >4 antimicrobials	297	42
Sulfonamides	Sulfonamide	174	82
Tetracyclines	Tetracyclin	297	190
Trimethoprim	Trimethoprim	202	15
Trimethoprim + sulfonamides	Trimethoprim + Sulfonamide	297	28

Footnote:

tested strains: S. Agona, S. Bareilly, S. Blockley, S. Bovismorbificans, S. Bredeney, S. Braenderup, S. Choleraesuis, S. Derby, S. Give, S. Goldcoast, S. Hadar, S. Haifa, S. Infantis, S. Kentucky, S. Kottbus, S. Litschfield, S. Livingstone, S. London, S. Manhattan, S. Newport, S. Paratyphi B, S. Paratyphi B var d-tartarate +, S. Potsdam, S. Saintpaul, S. Stanley, S. Thompson, S. Virchow.

Table Breakpoints for antibiotic resistance testing

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

Standards used for testing
EFSA-Q-2006-046_

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**		2.0	0	2.0	0.5	8.0	10	16	0	15
	Kanamycin		16	0	16	0	0	30	18	0	17
	Neomycin		16	0	16	0	0	30	18	0	17
	Streptomycin		32	0	32	4.0	128.0	10	13	0	12
Amphenicols	**Chloramphenicol**		16	0	16	2.0	64.0	30	16	0	15
Cephalosporins	**Cefotaxim**		0.5	0	0.5	0.06	2.0	30	28	0	27
	Ceftiofur		8.0	0	8.0	0	0	30	14	0	13
	Ceftriaxon		0.1	0	0.1	0.06	4.0	30	26	0	25
	Cephalothin		8.0	0	8.0	0	0	30	18	0	17
Fluoroquinolones	**Ciprofloxacin**		0.06	0	0.06	0.06	8.0	5	31	0	30
	Enrofloxacin		0.5	0	0.5	0	0	5	23	0	22
Penicillins	**Amoxicillin / Clavulanic acid**		4.0	0	4.0	0	0	10	23	0	22
	Ampicillin		4.0	0	4.0	1.0	256	10	21	0	20
Quinolones	**Nalidixic acid**		16	0	16	8.0	256.0	30	19	0	18

Table Breakpoints for antibiotic resistance testing

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Sulfonamides	**Sulfadiazin**		256	0	256	0	0	250	16	0	15
Tetracyclines	**Tetracyclin**		8.0	0	8.0	2.0	256.0	30	16	0	15
Trimethoprim + sulfonamides	**Trimethoprim + Sulfamethoxazol**		4.0	0	4.0	0	0	1.25	11	0	10
Trimethoprim	**Trimethoprim**		2.0	0	2.0	0.06	2.0	5	10	0	9

Table Breakpoints for antibiotic resistance testing

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

Standards used for testing
NCCLS

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**							10	15	13	12
	Kanamycin							30	18	14	13
	Streptomycin							10	15	12	11
Amphenicols	**Chloramphenicol**							30	18	13	12
Cephalosporins	**Cefotaxim**							30	23	15	14
Fluoroquinolones	**Ciprofloxacin**							5	21	16	15
Penicillins	**Ampicillin**							10	17	14	13
Quinolones	**Nalidixic acid**							30	19	14	13
Sulfonamides	**Sulfonamide**							300	17	13	12
Tetracyclines	**Tetracyclin**							30	15	12	11
Trimethoprim	**Trimethoprim**							5	16	11	10
Trimethoprim + sulfonamides	**Trimethoprim + sulfonamides**							23.75	16	11	10

2.2 CAMPYLOBACTERIOSIS

2.2.1 General evaluation of the national situation

A. Thermophilic Campylobacter general evaluation

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

The main source of human campylobacter infections in Hungary is raw meat especially poultry meat. The seasonal prevalence of campylobacters in raw chicken meat shows a strong correlation with the seasonal distribution of human cases. The prevalence in raw milk is low, but it can mean a possible source in some cases. As typing of Campylobacter of food origin is not performed at a large scale, PFGE and other molecular based methods are used mainly for outbreak invetigations and in small scale regional studies, the identification of sources should be improved in the future.

Recent actions taken to control the zoonoses

Actions specifically used for the control of campylobacters are not implemented in Hungary. Hygienic measurements used in the primary production (all in -all out systems, cleaning, desinfection, pest control)HACCP and GHP systems at slaughterhouses, improvement of the packaging of raw meat, labelling the minced meat and meat preparations with the requirement of heat treatment before consumption are the main actions in use.

2.2.2 Campylobacteriosis in humans

A. Thermophilic Campylobacter in humans

Reporting system in place for the human cases

There are around 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer's Service (NPHMOS). Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic system for registering and analysing data of communicable diseases in a combined national database, so the system provides online connection between the three levels (municipal, regional and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: a clinically compatible case when the campylobacter infection is laboratory confirmed.
Probable case: a clinically compatible case that is not confirmed by laboratory investigation, but it has an epidemiological link to a confirmed campylobacter outbreak.

Diagnostic/analytical methods used

Campylobacter isolates are obtained by culturing the faeces samples of the patients on selective-differentiating media, using reduced oxigen tension and special incubation temperature, followed by biochemical tests.

Notification system in place

The laboratories of NPHMOS have been able to identify campylobacters since 1987. Human cases have been notifiable since 1998. The physician reports data of case on a "case report form" by mail to the municipal institute of NPHMOS. The specialist of the institute records data immediately in the electronic system of the NPHMOS. Hungary has also a laboratory based surveillance system, and the NPHMOS has representative dataset from most of the microbiological laboratories about the laboratory investigated cases (since 2003 antibiotic resistances have also been reported from 5 regional laboratories of NPHMOS and from a number of laboratories of universities or hospitals). The illness is reported first as enteritis infectiosa syndrome on the basis of the symptoms. Having the results of the laboratory tests this syndrome-based diagnose is modified to etiology-based diagnose. In some cases the reporting follows only the available laboratory test results.

History of the disease and/or infection in the country

The laboratories of NPHMOS have been able to identify campylobacters since 1987. In 1990 the National Centre for Epidemiology prepared a guideline on campylobacter enteritis, and then the collection of data on campylobacteriosis was started on this basis. The number of isolates increased from 5 500/year in 1990 to 12 000/year in 1996. Since 1998 this number has varied between 9 500 – 11 500 /year. Human cases have been notifiable since 1998, so the laboratory and clinical surveillance have been linked in this year.
The number of registered cases remained around 8 300-9 200 between 1998 and 2004 (incidence: 81,6 – 91,0 /100 000 inhabitants/year).
Altogether four death cases were registered between 1998 and 2004 (case fatality rate ranged between 0,0 – 0,02%/year). The highest age-specific incidence was observed among children under five years in all periods, and the incidence has declined with the progressing of the age.
The 95% of cases were sporadic, widespread outbreaks were observed very rarely; outbreaks mostly appeared in families (200 – 300/year). The most of the outbreaks were caused by poultry prepared with inadequate heat treatment or additionally contaminated food. There has not been any evidence in Hungary for outbreaks caused by ready-to-eat foods of industrial origin.
[In 1998 a single outbreak was investigated that occurred among consumers exposed to non-pasteurised milk (cow) consumed on a livestock market and exhibition (51 cases)]
75-80% of isolated strains were C.jejuni, around 10% were C.coli, 4-5% were C.lari, the distribution of campylobacter specieses did not changed significantly during the last five years.

Relevance as zoonotic disease

It is supposed that person-to-person transmission of campylobacter occur only in very few cases (infants, etc). Most of the outbreaks originated from poultry, via contaminated food. However, this facts have not based on statistical or laboratory evidences in Hungary.

2.2.3 Campylobacter in foodstuffs

A. Thermophilic Campylobacter in Broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

There is an annual monitoring program based on the production capacity of the region. The monitoring plan is prepared by the central authority. The samples are taken by the regional authorities. Only one sample unit is taken from a batch, 25 grams are examined in the laboratory. These official samples are examined in the NRL Campylobacter with a presence-absence test followed by species identification and antimicrobial resistance.

At retail

To be reported via ECDC.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Fresh meat

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

At least 500 grams of fresh meat is sampled in a sterile plastic bag. The sample is transported to the laboratory in a cool box by courier.

Definition of positive finding

At slaughterhouse and cutting plant

When a strain of thermophilic Campylobacter is isolated from the sample (25g) after enrichment.

Diagnostic/analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 10272:1995

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

Thermophilic Campylobacter - as in many countries - shows a high prevalence in broiler meat with a marked sesonal disribution of 30 % in winter to more than 60% in the summer months.

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus) - fresh - at slaughterhouse - Survey - EU baseline survey (neck skin)	CAO FFSD	slaughter	25 g	321	180	64	108	2	0	6
Meat from duck - at slaughterhouse - Monitoring - official sampling - objective sampling (meat)	CAO FFSD	single	25 g	82	1	1	0	0	0	0
Meat from geese - at slaughterhouse - Monitoring - official sampling - objective sampling (meat)	CAO FFSD	single	25 g	70	1	1	0	0	0	0
Meat from turkey - fresh - at slaughterhouse - Monitoring - official sampling - objective sampling (meat)	CAO FFSD	single	25 g	219	10	8	1	0	0	1

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Meat from bovine animals - fresh - at slaughterhouse - Monitoring - official sampling - objective sampling (meat)	CAO FFSD	single	25 g	198	0	0	0	0	0	0
Meat from pig - fresh - at slaughterhouse - Monitoring - official sampling - objective sampling (meat)	CAO FFSD	single	25 g	207	1	0	0	0	0	1
Milk, cows' - raw - - milk - Monitoring - official sampling - objective sampling (milk)	CAO FFSD	single	50 ml	80	2	0	2	0	0	0
Milk, cows' - raw - intended for direct human consumption - at retail - Monitoring - official sampling - objective sampling (milk)	CAO FFSD	single	50 ml	2	0	0	0	0	0	0
Milk, goats' - raw - intended for direct human consumption - at retail - Monitoring - official sampling - objective sampling (milk)	CAO FFSD	single	50 ml	1	0	0	0	0	0	0

2.2.4 Campylobacter in animals

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. jejuni	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Cats - in total	CAO VDD	animal	1	0	0	0	0	0	0
Cattle (bovine animals) - dairy cows - at slaughterhouse (colon)	CAO VDD	animal	234	22	0	19	0	0	3
Dogs - in total	CAO VDD	animal	4	0					
Gallus gallus (fowl) - at slaughterhouse - animal sample - caecum - Survey - EU baseline survey	CAO FFSD	batch	321	162	85	73	0	0	4
Gallus gallus (fowl) - broilers - - organ/tissue	CAO VDD	animal	174	73	23	42	0	0	8
Gallus gallus (fowl) - broilers - at farm - animal sample	CAO VDD	animal	151	103	55	45	0	0	3
Pigs - in total	CAO VDD	animal	225	53	33	6	0	0	14
Turkeys - - organ/tissue	CAO VDD	animal	21	6	3	2	0	0	1

2.2.5 Antimicrobial resistance in Campylobacter isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in foodstuff derived from poultry

Sampling strategy used in monitoring

Frequency of the sampling

Isolates derive from monitoring system performed for measurement of prevalence of campylobacters in fresh poultry meat. The sampling is random , performed by the regional competent authorities. The samples are taken in slaughterhouses, and is a part of a permanent monitoring scheme.

Type of specimen taken

500 grams of fresh poultry meat.

Procedures for the selection of isolates for antimicrobial testing

Almost every isolated strains are tested.

Methods used for collecting data

All the tests are performed by the NRL.

Laboratory methodology used for identification of the microbial isolates

Disc diffusion method on horseblood agar plates. Control strains are used.

Table Antimicrobial susceptibility testing of C. coli in Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken) - quantitative data [Dilution method]

C. coli		Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken)																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	21																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		3	3							3															
Fluoroquinolones	Ciprofloxacin		3	3								1			2											
Macrolides	Erythromycin		16	16				1	7		2	2	2	1						1						
Penicillins	Ampicillin	32	18	1								1	5	6	1	3	1	1								
Quinolones	Nalidixic acid		21	21									2	2			4	4	2	7						
Tetracyclines	Tetracyclin		18	18				1	1	4	4			1	1	2	2	1		1						

Table Antimicrobial susceptibility testing of C. coli in Gallus gallus (fowl) - at farm - Monitoring - quantitative data [Dilution method]

C. coli		Gallus gallus (fowl) - at farm - Monitoring																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	89																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		89	89				3	1	22	46	13	2	1	1											
Fluoroquinolones	Ciprofloxacin		89	89			11	5	2	1	1	2	3	19	39		6									
Macrolides	Erythromycin		89	89					2	70	4	8	1					4								
Penicillins	Ampicillin	32	0	0																						
Quinolones	Nalidixic acid		89	89								2	2	11	4		7	39	21	3						
Tetracyclines	Tetracyclin		89	89				2	47	2	2		1				33	2								

Footnote:

Data from the 2008 years baseline study.

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

C. coli		Pigs - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	29																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		7	7							4	3														
Fluoroquinolones	Ciprofloxacin		6	6				1						1	4											
Macrolides	Erythromycin		23	23			1			1	10	8	2				1									
Penicillins	Ampicillin	32	22	1					3	2	2	4	4	5	1					1						
Quinolones	Nalidixic acid		28	28								1	5	6		1	1	2	5	7						
Tetracyclines	Tetracyclin		29	29				1		1		1	2		2	4	5	8	2	3						

Table Antimicrobial susceptibility testing of C. jejuni in Gallus gallus (fowl) - at farm - Monitoring - quantitative data [Dilution method]

C. jejuni		Gallus gallus (fowl) - at farm - Monitoring																							
	Isolates out of a monitoring program (yes/no)	yes																							
	Number of isolates available in the laboratory	70																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		70	70				7		23	21	15	1			2	1									
Fluoroquinolones	Ciprofloxacin		70	70			9	2	4			2	4	12	32		5									
Macrolides	Erythromycin		70	70			2		3	47	2	7		1			2	5		1						
Penicillins	Ampicillin	32	0	0																						
Quinolones	Nalidixic acid		70	70					1			2	1	6	6		5	17	27	5						
Tetracyclines	Tetracyclin		70	70			1	1	29	2	3	1	2		2	3	23			3						

Footnote:

Data from the 2008 years baseline study.

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

C. jejuni		Cattle (bovine animals) - at slaughterhouse - Monitoring																							
	Isolates out of a monitoring program (yes/no)	yes																							
	Number of isolates available in the laboratory	6																							
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		0	0																						
Fluoroquinolones	Ciprofloxacin		0	0																						
Macrolides	Erythromycin		6	6					1		1	2	2													
Penicillins	Ampicillin	32	6	1							2		1		1	1				1						
Quinolones	Nalidixic acid		6	6								1	2	2	1											
Tetracyclines	Tetracyclin		6	6		1		1	1		1	1								1						

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

C. jejuni		Pigs - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	7																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		0	0																						
Fluoroquinolones	Ciprofloxacin		0	0																						
Macrolides	Erythromycin		6	6					2	1	2	1														
Penicillins	Ampicillin	32	6	0				1		1		3	1													
Quinolones	Nalidixic acid		6	6						1		2			1	1				1						
Tetracyclines	Tetracyclin		7	7			1	1			1	1	1			1				1						

Table Antimicrobial susceptibility testing of C. jejuni in Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken) - quantitative data [Dilution method]

C. jejuni		Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken)																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	40																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		4	4						1	3															
Fluoroquinolones	Ciprofloxacin		4	4								1		1	2											
Macrolides	Erythromycin		37	37			1		2	15	9	5			2					3						
Penicillins	Ampicillin	32	36	8					1	1	7	6	7	1	1	3	1	2	1	5						
Quinolones	Nalidixic acid		40	40							1	1	4	2	2	2	3	4	6	15						
Tetracyclines	Tetracyclin		37	37			3	3	4	5	5	3		1	2		3	2	1	5						

Table Antimicrobial susceptibility testing of Campylobacter spp., unspecified in Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken) - quantitative data [Dilution method]

Campylobacter spp., unspecified		Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken)																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	5																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		0	0																						
Fluoroquinolones	Ciprofloxacin		4	4				1	2		1															
Macrolides	Erythromycin		5	5		1				2	2															
Penicillins	Ampicillin	32	4	1							1		1	1				1								
Quinolones	Nalidixic acid		5	5								1								4						
Tetracyclines	Tetracyclin		5	5					3									1		1						

Table Antimicrobial susceptibility testing of Campylobacter spp., unspecified in Pigs - at slaughterhouse - Monitoring - quantitative data [Dilution method]

Campylobacter spp., unspecified		Pigs - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	12																								
Antimicrobials:		break points	N	n	<=0.008	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048	lowest	highest
Aminoglycosides	Gentamicin		0	0																						
Fluoroquinolones	Ciprofloxacin		0	0																						
Macrolides	Erythromycin		11	11				2	4	2		1					1			1						
Penicillins	Ampicillin	32	12	0					2		6	1	2	1												
Quinolones	Nalidixic acid		0	0																						
Tetracyclines	Tetracyclin		12	12					1	1					1		1	1	2	5						

Table Breakpoints used for antimicrobial susceptibility testing

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

Standards used for testing

			Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		Disk content	Breakpoint Zone diameter (mm)		
		Standard for breakpoint	Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Aminoglycosides	**Gentamicin**		1								
Fluoroquinolones	**Ciprofloxacin**		1								
Macrolides	**Erythromycin**		4								
Penicillins	**Ampicillin**		8		32						
Quinolones	**Nalidixic acid**		16								
Tetracyclines	**Tetracyclin**		2								

Footnote:

Nalidixic acid: C.j.:16,C.c.:32
Gentamicin:C.j.:1,C.c.:2
Erythromycin:C.j.:4,C.c.:32

2.3 LISTERIOSIS

2.3.1 General evaluation of the national situation

A. Listeriosis general evaluation

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

Testing of ready-to-eat products for the presence/and/or the determination of the number of Listeria monocytogenes is obligatory for food business operators based on Reg.2073/2005/EC. The official monitoring program concentrates to take samples from these products on a risk based approach as well. Only the data of official control are presented in this report, because only these data are collected in the database of the authority. The legislative background has changed a lot, because before 2006 only milk and milk products were regularly tested for Listeria monocytogenes and only by presence absence tests. In the frame of USDA-FSIS monitoring obligatory for US exporting establishments raw cured products were tested as well with presence-abscence tests and MPN based method suitable for enumeration of low numbers of the microorganism
From 2006, those RTE products that not support the growth of Listeria, are examined by the enumeration method ISO 11290:2 (e.g.salami, raw smoked ham). If the product is able to support the growth of the pathogen, presence-abscence test is used as a first step (ISO 11290:1), or the two method run paralel (depending on the expiry date, the amount of sample is enough to perform an enumeration test if the first test is positive). The pathogen is enumerated from all the positive samples.
Based on the past decade's USDA Listeria monitoring data, Listeria monocytogenes can be frequently isolated from traditional raw and smoked meat products as salami and sausages, but the highest contamination level was 2.3 cells (MPN method)/gram. Therefore this product group certainly does not play an important role in human infections.
Listeria monocytogenes can be isolated from mixes salads as well, but because of low pH and preservatives charateristic for this product group generally do not support the growth of the pathogen, and only level of <10 cells per gram was measured from the positive samples.
Milk products are characteristically made of pasteurised milk in Hungary, therefore these types of foodstuff are practically free from Listeria.
Consumers show an increasing interest to by raw milk for consumption in the past few years. Despite of the obligatory labelling to call the consumers' attention for heat treating of raw milk, this product can be considered as a potential source of infection in the future.

Recent actions taken to control the zoonoses

Based on Reg. 2073/2005/EC.

2.3.2 Listeriosis in humans

A. Listeriosis in humans

Reporting system in place for the human cases

There are around 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer’s Service (NPHMOS). Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic reporting system for registering and analysing data of communicable diseases in a combined national database, so the system provides online connection amid the three levels (municipal, regional and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: Clinical picture of an invasive illness (meningitis purulenta, sepsis, stillbirth etc.), and L.monocytogenes has been isolated from invasive sample (liquor, blood, amniotic fluid etc.)

Diagnostic/analytical methods used

The samples are cultivated on enriched medium. The isolation is followed by the biochemical tests, and antimicrobial susceptibility testing.

Notification system in place

Listeriosis has been notifiable since 1998 in Hungary. The physician reports data of case on a “case report form” by mail to the municipal institute of NPHMOS. The specialist of the institute records data immediately in the electronic system of the NPHMOS. Hungary also has a laboratory based surveillance system, and the NPHMOS has representative dataset from most of the microbiological laboratories about the investigated cases (since 2003 antibiotic resistances has also been reported from 20 county institutes and 12 laboratories from universities or hospitals).
The illness is reported first as meningitis purulenta syndrome on the basis of the symptoms. Having the results of the laboratory tests this syndrome-based diagnose is modified to etiology-based diagnose (listeriosis).

History of the disease and/or infection in the country

Listeriosis has been notifiable since 1998 in Hungary, there have been 91 cases registered since then. The number of yearly registered cases ranged between 4 – 25 (incidence 0,04 – 0,2/100 000 inhabitants/year; median: 14 cases), the case fatality rate ranged between 0 – 50% (median 22,2%). The age-distribution of cases: 12% infants, 1 – 14 year 3,4%, 15 – 19 year 0%, 20 – 49 year 20%, 50 – 59 year 20%, > 60 year 43%. Most of the cases are meningitis, less of them are sepsis.

Relevance as zoonotic disease

Listeriosis is underreported in Hungary. No evidence has been found for a food-borne case based on laboratory tests in Hungary.

2.3.3 Listeria in foodstuffs

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Cheeses made from cows' milk - hard - made from pasteurised milk - Monitoring - official sampling	CAO FFSD	single	25 gramms	5	0	4	0	1	0	0
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - Monitoring - official sampling 1)	CAO FFSD	single	25 gramms	220	2	168	0	52	2	0
Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - Monitoring - official sampling - objective sampling 2)	CAO FFSD	single	25 gramms	216	0	216	0	0	0	0
Cheeses made from goats' milk - hard - made from pasteurised milk - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	18	0	10	0	5	0	0
Cheeses made from sheep's milk - soft and semi -soft - made from pasteurised milk - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	15	0	15	0	0	0	0
Dairy products (excluding cheeses) - butter - made from pasteurised milk - Monitoring - official sampling	CAO FFSD	single	25 gramms	130	0	109	0	21	0	0
Dairy products (excluding cheeses) - dairy desserts - chilled - Monitoring - official sampling	CAO FFSD	single	25 gramms	104	0	104	0	0	0	0
Dairy products (excluding cheeses) - fermented dairy products - Monitoring - official sampling	CAO FFSD	single	25 gramms	427	2	330	1	97	1	0
Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - Monitoring	CAO FFSD	single	25 gramms	226	1	226	1	0	0	0
Dairy products (excluding cheeses) - milk powder and whey powder - Monitoring	CAO FFSD	single	25 gramms	33	0	33	0	0	0	0
Infant formula - dried - Monitoring - official sampling	CAO FFSD	batch	10x25	60	0	60	0	0	0	0

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Milk, cows' - pasteurised milk - Monitoring - official sampling - objective sampling	CAO FFSD	batch	25 ml or 5x	143	0	143	0	0	0	0
Milk, cows' - raw - intended for direct human consumption - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 ml	34	0	34	0	0	0	0
Milk, cows' - raw milk for manufacture - intended for manufacture of raw or low heat-treated products - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 ml	112	3	112	3	0	0	0
Milk, sheep's - raw - Monitoring - official sampling	CAO FFSD	batch	25 ml	3	0	3	0	0	0	0

Comments:

[1] soft cheeses
[2] semi soft cheeses

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Chocolate - Monitoring	CAO FFSD	single	25 gramms	19	0	19	0	0	0	0
Confectionery products and pastes - Monitoring	CAO FFSD	single	25 gramms	490	1	431	1	59	0	0
Crustaceans - unspecified - cooked - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	11	0	11	0	0	0	0
Fish - smoked - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	15	1	14	1	1	0	0
Foodstuffs intended for special nutritional uses - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	7	0	7	0	0	0	0
Meat from bovine animals - meat products - cooked, ready-to-eat - Monitoring - official sampling	CAO FFSD	single	25 gramms	16	1	13	1	3	0	0
Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - Monitoring - official sampling	CAO FFSD	single	25 gramms	184	13	162	11	22	2	0
Meat from horse - meat products - Monitoring - official sampling	CAO FFSD	single	25 gramms	3	0	3	0	0	0	0
Meat from pig - meat products - cooked, ready-to -eat - Monitoring - official sampling	CAO FFSD	single	25 gramms	368	22	316	18	52	4	0
Meat from pig - meat products - fermented sausages - Monitoring - official sampling	CAO FFSD	batch	25 gramms	153	27	142	27	11	0	0
Meat from pig - meat products - raw and intended to be eaten raw - Monitoring	CAO FFSD	single	25 gramms	223	26	164	22	59	4	0
Meat from pig - meat products - raw and intended to be eaten raw - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	348	20	298	18	52	3	0
Meat from pig - meat products - raw but intended to be eaten cooked - Monitoring - official sampling	CAO FFSD	single	25 gramms	27	2	25	1	2	1	0

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/g	L. monocytogenes > 100 cfu/g
Meat from turkey - meat products - cooked, ready-to-eat - Monitoring - official sampling	CAO FFSD	single	25 gramms	84	2	80	1	4	1	0
Molluscan shellfish - cooked - at retail - Monitoring - official sampling	CAO FFSD	single	25 gramms	30	0	30	0	0	0	0
Other processed food products and prepared dishes - sandwiches - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	122	1	89	1	33	0	0
Ready-to-eat salads - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	497	15	377	15	120	0	0
Sauce and dressings - Monitoring - official sampling	CAO FFSD	single	25 gramms	29	0	24	0	5	0	0
Vegetables - pre-cut - at retail - Monitoring - official sampling - objective sampling	CAO FFSD	single	25 gramms	54	2	42	2	12	0	0

2.4 E. COLI INFECTIONS

2.4.1 General evaluation of the national situation

2.4.2 E. coli infections in humans

2.4.3 Escherichia coli, pathogenic in foodstuffs

Table VT E. coli in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC)- VTEC O157	Verotoxigenic E. coli (VTEC)- VTEC non-O157	Verotoxigenic E. coli (VTEC)- VTEC, unspecified
Meat from bovine animals - fresh - at slaughterhouse - Monitoring - official sampling - objective sampling (meat)	CAO FFSD	single	25 g	219	1	1	0	0
Meat from bovine animals - meat preparation - intended to be eaten cooked - at retail - Monitoring - official sampling - objective sampling (meat)	CAO FFSD	single	25 g	16	0	0	0	0
Meat from bovine animals - minced meat - intended to be eaten cooked - at retail - Monitoring - official sampling - objective sampling (meat)	CAO FFSD	single	25 g	81	0	0	0	0
Milk, cows' - raw - - milk - Monitoring - official sampling - objective sampling (milk)	CAO FFSD	single	25 ml	38	0	0	0	0
Milk, cows' - raw - intended for direct human consumption - at retail - Monitoring - official sampling - objective sampling (milk)	CAO FFSD	single	25 ml	4	0	0	0	0

Footnote:

The samples were tested according to EN ISO 16654 standard for presence of E. coli 0157.

2.4.4 Escherichia coli, pathogenic in animals

A. Verotoxigenic Escherichia coli in cattle (bovine animals)

Monitoring system

Frequency of the sampling

Animals at slaughter (herd based approach)

Sampling distributed evenly throughout the year

Type of specimen taken

Animals at slaughter (herd based approach)

Other: meat, minced meat

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

500 gram meat sample is taken (from one animal), the weight of test portion is 25 grams (cutted from the surface of meat).
The samples are examined by ISO 16654:2001 Standard. Immuno-magnetic concentration is used for the detection of the most important serotype O157. If a strain belongig to the O 157 serotype is isolated, the toxin production is detected by a latex based agglutination test.

Case definition

Animals at slaughter (herd based approach)

The sample is considered to be positive if E. coli O157 was isolated, and the strain produces verotoxin (VT-1, VT-2 or both)

2.5 TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1 General evaluation of the national situation

A. Tuberculosis general evaluation

History of the disease and/or infection in the country

In bovine populations, eradication measures for tuberculosis started in 1962. The eradication of bovine tuberculosis was considered to be completed at the end of 1980. Since then, only sporadic cases occur.

As regards of tuberculosis in man, the favourable tendency which could be observed from the 1950s in the epidemiology of tuberculosis seemed to stop and getting worse in 1990. (Incidence raised by 19% between 1990 and 1995.)In order to lower the incidence and improve the situation, a National Tuberculosis Programme was adopted in 1994 which also incorporated a national surveillance programme based on a central, computerised database.

Recent actions taken to control the zoonoses

Regular screening of the human population is provided. All farm workers have to be checked by the competent public health authority for their compliance with the rules set for persons dealing with animals and food intended for human consumption. The documents proving their compliance are subject to on farm checks performed by the veterinary service. Each county veterinary authority has the right to set further health requirements for persons dealing with animals kept on small size farms.

2.5.2 Tuberculosis, mycobacterial diseases in humans

2.5.3 Mycobacterium in animals

A. Mycobacterium bovis in bovine animals

Status as officially free of bovine tuberculosis during the reporting year

The entire country free

The nationwide program for eradication of bovine tuberculosis in Hungary has successfully been completed by 31 December 1980 and the tuberculosis free status of the country were declared to the OIE. Since then no evidence of the presence of infection in more than 0,1 % of our herds has been found.

Monitoring system

Sampling strategy

Post mortem inspections
According to the meat inspection rules in force in Hungary, based on a tradition of at least a century, each animal for slaughter is to be checked individually ante and post mortem. Technical methods applied at meat inspection is suitable to detect even the slightest tuberculotic lesions. The legal provisions for tuberculosis require that the organs, together with the lymphnodes belonging to them, shall be sent to the Central Agricultural Office, Veterinary Diagnostic Directorate (former Central Veterinary Institute) for further laboratory examination, if during post mortem inspection of a slaughtered animal the tuberculotic lesions are revealed. In case of animals ordered to be slaughtered for establishing the reason for unclarified positive or inconclusive reactions during intradermal tuberculin testing, a set of lymph nodes belonging to several organs and systems, as listed in the Annex 3 of the Decree No. 65/2002. (VIII. 9.) FVM and in the Technical Guideline, shall be sent to the Central Agricultural Office, Veterinary Diagnostic Directorate.

Intradermal tuberculin testing
Together with the post mortem control program, the compulsory intradermal tuberculin testing with a yearly interval of the whole Hungarian cattle population (older than six weeks), as well as case by case testing of animals moved from one herd to another, has been maintained and executed.

Frequency of the sampling

See above.

Methods of sampling (description of sampling techniques)

According to the Annex 3 of the Decree No. 65/2002. (VIII.9) FVM the rules of taking samples are the followings:

Â·samples taken from animals with a large body (cattle, swine) must include the organs showing signs of the disease and the adjacent lymphatic glands, in case of birds and smaller animals the sample must be an entire carcass;

Â·samples used for confirming paraallergic reaction must include the tonsils, pharyngal, mesenteric and portal lymphatic glands of the slaughtered animal;

Â·the purpose of detecting the presence of mycobacteria from the feedingstuffs, litter, soil etc. 20-50 gramm samples must be taken, 20 gramm samples from faeces, 50cm3 from urine and 5 litres from drinking water. The samples must be sent to the CVI with a view to carry out tests to detect tuberculosis and confirm the presence of mycobacteria.

Case definition

An animal is considered a positive case, if the presence of tuberculosis is confirmed by the isolation of M. bovis from its lymph node(s) or parenchymatous organs on laboratory examination.
Suspension or withdrawal of the free status of a herd is based upon the analysis of the results of the intradermal tuberculin tests (if necessary, repeated and completed by simultaneous testing), post mortem examinations and laboratory tests. According to the Annex 1 of the Decree No. 65/2002. (VIII.9) the officially tuberculosis -free status of the herd have to be withdrawn if the presence of tuberculosis is confirmed by the isolation of M. bovis on laboratory examination.

Diagnostic/analytical methods used

The identification of Mycobacterium bovis is carried out only the Central Agricultural Office, Veterinary Diagnostic Directorate(VDD) (Budapest). The VDD works according to the OIE Manual of Standards for Diagnostic tests and Vaccines, Forth Edition, Chapter 2.3.3. (bovine tuberculosis).

Annex 7. of the Decree No. 65/2002. (VIII.9) FVM contains the standards for the tuberculin (bovine and avian) to be used during the intradermal tests. These rules are fully compatible with Annex B point 2.1. of Council Directive 64/432/EEC.
Annex 2., which contains the standards for the test procedures is fully compatible with Council Directive 64/432/EEC.

Vaccination policy

Preventive vaccination against M. bovis is prohibited by Decree No. 65/2002. (VIII. 9.) FVM.

Control program/mechanisms

The control program/strategies in place

The whole cattle population is continuously monitored for bovine tuberculosis on

a yearly basis by the intradermal tuberculine tests and by post-mortem inspections.
For measures taken in case of single cases, see "Measures in case of the positive findings or single cases".

Recent actions taken to control the zoonoses

Guidelines have been issued by the Ministry of Agriculture and Rural Development (in 2005 and 2006) about the carrying out the tuberculin test in cattle herds taking into consideration the fals positive or interference reactions as well as the data collection, and reporting by the regional authorities. A modified technical guideline has been issued by Central Agricultural Office in 2007.

Measures in case of the positive findings or single cases

When an animal is considered to be a positive reactor in the intradermal tests, it is removed from the herd and slaughtered. The post-mortem, laboratory and epidemiological examinations shall be carried out. The status of the herd will remain suspended until the all laboratory examinations have been completed. If the presence of tuberculosis is not confirmed, the suspension of the officially tuberculosis -free status may be lifted following a test of all animals over six weeks of age with negative results at least 42 days after the removal of the reactor animal.
According to the Annex 1 of the Decree No. 65/2002. (VIII.9) the officially tuberculosis -free status of the herd have to be withdrawn if the presence of tuberculosis is confirmed by the isolation of M. bovis on laboratory examination.

The district chief veterinarian may initiate a procedure to withdraw the tuberculosis-free status of the herd, and the animal health and food control station may withdraw the status, if
Â·the conditions for retention of the officially free status are not complied with, or
Â·classical lesions of tuberculosis are seen at post-mortem examination,
Â·an epidemiological enquiry establishes the likelihood of infection,
Â·it is deemed necessary to control of bovine tuberculosis in the herd for any other reason.

Notification system in place

Bovine tuberculosis is compulsory notifiable by virtue of the Veterinary Act No CLXXVI. of 2005, which replaced the Veterinary Act No XCI of 1995, from 1 September 2008 by the Decree No 113/2008 (VIII. 30.) of the Ministry of Agriculture and Rural Development (MARD) on notification of animal diseases. The detailed rules regarding bovine tuberculosis are laid down by the Decree No. 65/2002. (VIII.9) FVM of the Minister of Agriculture and Rural Development, which texts replaced the relevant parts of the Zoo-Sanitary Code implemented by the Decree No 41/1997. (V. 28.) FM of the Minister of Agriculture. As regards keeping and movements of the bovine animals the Zoosanitary Code is applied further. Before the 1st of July of 1997 the Decree No. 28/1981. (XII. 30.) MÃ‰M of the Minister of Agriculture and Alimentation contained the rules for the bovine tuberculosis and keeping or movements of the bovine animals. It is very important that the former legislative rules were essentially the same as the current ones.

Results of the investigation

During the past consecutive seven years the rate of herds infected with bovine tuberculosis has never reached 0,1 % and at least 99,9% of herds have achieved officially tuberculosis free status each year during this period.

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

Hungary is free of bovine tuberculosis. However, sporadic cases are reported.

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium spp.	M. bovis	M. tuberculosis	M. avium complex	M. kansasii	M. scrofulaceum	Mycobacterium spp., unspecified	M. fortuitum	M. avium complex-M. avium subsp. paratuberculosis
Badgers	CAO VDD	animal	2	0								
Deer - Clinical investigations	CAO VDD	animal	50	14	5		4			5		
Deer - Monitoring	CAO VDD	animal	35	5			1			2		2
Foxes	CAO VDD	animal	10	2			1			1		
Pigs - Clinical investigations	CAO VDD	animal	15	12	0		12					
Sheep - Clinical investigations	CAO VDD	animal	1	0								
Wild boars - Clinical investigations	CAO VDD	animal	53	22	12		6			4		
Wild boars - wild - Monitoring	CAO VDD	animal	225	84	18		7		1	55	3	

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/432/EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests	Number of animals tested			
Fejer	569	44708	568	99.82	1	.18	1	41160	1203	58	9
Komarom-Esztergom	240	13304	237	98.75	2	.83	1	11961	186	24	3
Veszprem	529	41357	529	100	0	0	1	39636	4595	9	0
Gyor-Moson-Sopron	1005	53486	1005	100	0	0	1	48518	2285	1	0
Vas	744	29523	744	100	0	0	1	28156	836	5	0
Zala	544	25477	543	99.82	0	0	1	19130	1286	13	0
Baranya	549	30342	546	99.45	1	.18	1	24549	403	89	1
Somogy	535	35577	532	99.44	1	.19	1	35635	8357	91	3
Tolna	472	29598	472	100	0	0	1	24308	1193	0	0
Borsod-Abauj-Zemplen	1073	41979	1073	100	0	0	1	37846	1796	72	0
Heves	389	14614	389	100	0	0	1	11949	227	12	0
Nograd	334	15866	334	100	0	0	1	13225	766	57	0
Hajdu-Bihar	2303	94315	2303	100	0	0	1	73674	110	32	0
Jasz-Nagykun-Szolnok	1438	56505	1438	100	0	0	1	44919	5383	45	0
Szabolcs-Szatmar-Bereg	1150	42689	1148	99.83	0	0	1	33292	1040	12	0
Bacs-Kiskun	2304	70555	2303	99.96	1	.04	1	53900	151	52	1
Bekes	1623	58506	1623	100	0	0	1	49725	626	32	0

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/432/EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests	Number of animals tested			
Csongrad	1638	42342	1638	100	0	0	1	29671	1359	54	0
Pest	1401	48162	1397	99.71	2	.14	1	45063	5694	216	7
Budapest	29	1131	29	100	0	0	1	1049	6	0	0
Total	18869	790036	18851	99.9	8	0.04	20	667366	37502	874	24
Total - 1											

Footnote:

•Beside the officially free and infected herds there were 10 herds where the officially free status were suspended.
Over the above mentioned histopathological and bacteriological investigations 61 samples were tested from healthy slaughtered cattle without any lesions in the framework of monitoring programme with negative results.
Source of information: CAO VDD, CAO AHAWD

2.6 BRUCELLOSIS

2.6.1 General evaluation of the national situation

A. Brucellosis general evaluation

History of the disease and/or infection in the country

Hungary is practically free of Brucellosis in bovine, ovine and caprine populations. For detailed information, please refer to the specific texts.

2.6.2 Brucellosis in humans

A. Brucellosis in humans

Reporting system in place for the human cases

1. Reporting system in place for the human cases:
There are around 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer's Service (NPHMOS). Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic system for registering and analysing data of communicable diseases in a combined national database, so the system makes online connection amid the three levels (municipal, county and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: a clinically compatible case and the infection is laboratory confirmed.

Diagnostic/analytical methods used

A serological test (Widal type tube agglutination) is used to confirm the brucellosis diagnose in Hungary. The test preparation is a TTC stained B. melitensis biovar. abortus HNCMB 93007 strain (internationally used diagnostic strain). Result is positive: titre 1:80; uncertain: titre 1:40; negative titre between 1:20 - 1:10. The acute illness is confirmed by the increasing titre of paired sera.

Notification system in place

The disease has been notifiable since 1950 in Hungary. The physician reports data of case on a "case report form" by mail to the municipal institute of NPHMOS. The specialist of the institute records data immediately in the electronic system of the NPHMOS. Hungary has also a laboratory based surveillance system, and the NPHMOS has representative dataset from most of the microbiological laboratories about the cases investigated by the laboratory

History of the disease and/or infection in the country

The disease has been notifiable since 1950 in Hungary. The annual number of reported cases ranged between 0 – 132 (incidence: 0 – 1.3/100 000 inhabitants/year, median 21 case/year – 0.2/100 000 inhabitant/year). In the 1950s and 1960s the number of registered cases was about 40 – 60/year. The most cases were registered between 1970 and 1975 (110 – 135 cases/year – incidence:1.1 – 1.3/100 000 inhabitant/year). Between 1976 and 1986 the number of registered cases decreased to 10 cases/year. 11 death cases occurred between 1950 and 1978. The case fatality rate ranged between 0 – 6.5% (median 0%).

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

There were five cases registered in 2000 - 2001 (2000: 1, 2001: 4 cases), no case was reported between 2002 and 2004 , in 2006 and 2008, and only 1-1 case was identified in 2005 and 2007 in Hungary. (The data of laboratory surveillance: 2000 – 4 800 tests, 23 positive; 2001 - 4 900 tests, 30 positive; between 2002 and 2003: about 3 900 tests/year, 6 – 9 /year positive.) No death was registered in this period. One case in 2001 was imported from abroad, in the four other cases between 2000-2001 the place and source of infection could not be identified. Cases registered in 2005 and 2007 were imported cases.

2.6.3 Brucella in animals

A. Brucella abortus in bovine animals

Status as officially free of bovine brucellosis during the reporting year

The entire country free

The nationwide programme for eradication of bovine brucellosis in Hungary has successfully been completed by the 31st of August 1985. and the brucellosis free status of the country were declared to the OIE. Since then no evidence of the presence of infection in more than 0,2 % of our herds has been found.

Monitoring system

Sampling strategy

Together with the random blood sampling of the Hungarian cattle population, as well as case-by-case testing of animals moved from one herd to another, a system of checking abortions and irregular parturition has been maintained.

Frequency of the sampling

The whole cattle population in Hungary is subject to regular checks. Investigation of abortion and related cases is the key point of the system. Random, yearly serological testing is a complementary element. 10 % of cows in herds containing 50 or more animals shall be tested yearly, after calving. If necessary, the district veterinary officer is entitled to extend the testing to the whole herd.

Small herds are serologically tested every three years, linked to the EBL screening.

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Blood, milk and semen samples are taken at farm. In case of abortion, the aborted fetus, its chorions and a blood sample from the aborted cattle shall be sent to the laboratory.

Case definition

An animal is considered to be infected with B. abortus, when
- it shows clinical signs of the disease and pathological lesions can be detected on its internal organs or on its fetus or on the chorions; or
- bacteria of B. abortus could be isolated from its body fluids, its chorions or from the organs of the fetus, or
- it was suspected to be infected with B. abortus and the serological or bacteriological investigations were positive for that animal.

Diagnostic/analytical methods used

For the diagnosis of B. abortus the following diagnostic methods are used:

-pathology
-bacteriology
-immunology (CFT, ELISA, SAT)

Vaccination policy

Preventive vaccination against B. abortus is prohibited in the whole territory of Hungary.

Control program/mechanisms

Recent actions taken to control the zoonoses

Continuous monitoring of bovine herds and investigation of aborted fetuses as well as pre-movement checks are continued.

Measures in case of the positive findings or single cases

Infected male animals are
to be killed as soon as possible but not later than five days or,
to be castrated and placed under movement prohibition until it is slaughtered.
Female animals must be placed under breeding prohibition and movement control. They must be slaughtered within 15 days after the acute period or the recovery after the abortion.

Notification system in place

Bovine brucellosis (B. abortus) is compulsorily notifiable by virtue of the Act on Food Chain Safety and its official control No XLVI of 2008 that is effective since 1 September 2008 and the Decree of the Minister of Agriculture No 12/2008 (II. 14.) on detailed rules of the protection regarding certain Brucella species.
Notification, as well as investigation of cases of abortion is compulsory. In case of abortion or irregular parturition, the veterinarian in charge has to send a set of samples, listed in the decree mentioned above, for further laboratory examination. Until thorough clarification of the case, the animal is kept separated and, if necessary, repeatedly tested.

Results of the investigation

During the last 24 years no infection of B. abortus has been found.

B. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

The entire country free

Ovine and caprine brucellosis (B. melitensis) has been a compulsorily notifiable animal disease in Hungary since 1982. Further to the existing rules laid down in the Zoo-Sanitary Code, the recent legal provisions give the power to the Ministry of Agriculture to introduce any additional measures, should an outbreak of a disease caused by B. melitensis occur in our country.

Neither a single clinical case, nor any positive serological or bacteriological test result for B. melitensis has ever occurred in Hungary.

Monitoring system

Sampling strategy

Given, that B. melitensis is not an agent which can be spread under Hungaryâ€™s geographical and climatic conditions, furthermore no sign of the disease has ever been revealed, there was no scientifically based reason for an extended serological survey. However, between 1997 and 2000 a limited serological screening was carried out and all results were negative. Since 2001 an extended serological survey has been started to demonstrate the B. melitensis free status of Hungary. During 2001, 2002 and 2003 more than 10% of the ovine animals over six months of age were tested serologically for B. melitensis and all results were negative. In 2007, all ovine animals tested for B. melitensis were negative.

Frequency of the sampling

Approximately 10% of the ovine population were tested.

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Blood samples are taken at farm.

Case definition

An animal is considered to be infected with B. melitensis, when
- it shows clinical signs of the disease and pathological lesions can be detected on its internal organs or on its fetus or on the chorions; or
- bacteria of B. melitensis could be isolated from its body fluids, its chorions or from the organs of the fetus, or
- it was suspected to be infected with B. melitensis and the serological or bacteriological investigations were positive for that animal.

Diagnostic/analytical methods used

For the diagnostic serological tests of B. melitensis the CFT is used.

Vaccination policy

Vaccines for B. melitensis have never been registered in Hungary and the using of vaccines without the registration is banned in the country. Therefore no vaccination against this disease has ever been practised in the territory of Hungary.

Control program/mechanisms

The control program/strategies in place

In 2007, Hungary was free of B. melitensis. However, monitoring of ovine and caprine populations is continuously done.

Measures in case of the positive findings or single cases

In case of positive findings the positive animals have to be killed without delay. The herd containing the positive animal is subject to movement control. The further measures affecting the herd shall be decided following screening of the animals and epidemiological investigation.

Notification system in place

Ovine and caprine brucellosis (B. melitensis) are compulsorily notifiable by virtue of the Veterinary Act No CLXXVI. of 2005 (which replaced the Veterinary Act No XCI of 1995) and the Zoo-Sanitary Code implemented by the Decree No 41/1997. (V. 28.) FM of the Minister of Agriculture. These legal texts replaced the former regulations, namely Law Decree No 3. of 1981. and Decree No. 28/1981. (XII. 30.) MÃ‰M of the Minister of Agriculture and Alimentation, which have contained the same provisions for the diseases mentioned above. Therefore we can declare that ovine and caprine brucellosis is compulsory since 1 January 1982 on the basis of Decree No. 28/1981. (XII. 30.) MÃ‰M of the Minister of Agriculture and Alimentation.

Results of the investigation

No evidence of infection with B. melitensis were found.

C. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

The entire country free

Ovine and caprine brucellosis (B. melitensis) has been a compulsorily notifiable animal disease in Hungary since 1982. Further to the existing rules laid down in the Zoo-Sanitary Code, the recent legal provisions give the power to the Ministry of Agriculture to introduce any additional measures, should an outbreak of a disease caused by B. melitensis occur in our country.

Neither a single clinical case, nor any positive serological or bacteriological test result for B. melitensis has ever occurred in Hungary.

Monitoring system

Sampling strategy

Given, that B. melitensis is not an agent which can be spread under Hungaryâ€™s geographical and climatic conditions, furthermore no sign of the disease has ever been revealed, there was no scientifically based reason for an extended serological survey. In 2007, all caprine animals tested for B. melitensis were negative.

Frequency of the sampling

Approximately 5% of the caprine population is sampled and tested for B. melitensis.

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Blood samples are taken at farm.

Case definition

An animal is considered to be infected with B. melitensis, when
- it shows clinical signs of the disease and pathological lesions can be detected on its internal organs or on its fetus or on the chorions; or
- bacteria of B. melitensis could be isolated from its body fluids, its chorions or from the organs of the fetus, or
- it was suspected to be infected with B. melitensis and the serological or bacteriological investigations were positive for that animal.

Diagnostic/analytical methods used

For the diagnosis of B. melitensis in goats, the CFT is used.

Vaccination policy

Vaccines for B. melitensis have never been registered in Hungary and the using of vaccines without the registration is banned in the country. Therefore no vaccination against this disease has ever been practised in the territory of Hungary.

Control program/mechanisms

The control program/strategies in place

In 2007, Hungary was free of B. melitensis. However, monitoring of ovine and caprine populations is continuously done.

Measures in case of the positive findings or single cases

In case of positive findings the positive animals have to be killed without delay. The herd containing the positive animal is subject to movement control. The further measures affecting the herd shall be decided following screening of the animals and epidemiological investigation.

Notification system in place

Ovine and caprine brucellosis (B. melitensis) are compulsorily notifiable by virtue of the Veterinary Act No CLXXVI. of 2005 (which replaced the Veterinary Act No XCI of 1995) and the Zoo-Sanitary Code implemented by the Decree No 41/1997. (V. 28.) FM of the Minister of Agriculture. These legal texts replaced the former regulations, namely Law Decree No 3. of 1981. and Decree No. 28/1981. (XII. 30.) MÃ‰M of the Minister of Agriculture and Alimentation, which have contained the same provisions for the diseases mentioned above. Therefore we can declare that ovine and caprine brucellosis is compulsory since 1 January 1982 on the basis of Decree No. 28/1981. (XII. 30.) MÃ‰M of the Minister of Agriculture and Alimentation.

Results of the investigation

No evidence of infection with B. melitensis were found in 2007.

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. abortus	B. melitensis	B. suis	Brucella spp., unspecified
Pigs (Antibody detection)	CAO VDD	animal	74537	615	0	0	615	0
Pigs (Bacteriology)	CAO VDD	animal	143	7	0	0	7	0

Footnote:

In the column named "Total units positive for Brucella spp." also contains the repeated samples of seropositive animals.

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance						Investigations of suspect cases								
							Serological tests			Examination of bulk milk			Information about			Epidemiological investigation					
																		Number of positive animals			
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Sero logically	BST	Number of animals examined microbio logically	Number of animals positive microbio logically
MAGYARORSZÁG	18869	790036	18867	99.99	0	0	13976	366535	0	17	1152	0	1520	0	0	0	0	0	0	0	0
Total	18869	790036	18867	99.99	0	0.0	13976	366535	0	17	1152	0	1520	0	0	0	0	0	0	0	0
Total - 1																					

Footnote:

On 22nd February 2008 the decree of the Minister of Agriculture No 12/2008 (II. 14.) on detailed rules of the protection against certain Brucella species came into force. The new Hungarian rule for investigation of bovine brucellosis is: investigation of the reported abortions + serological investigation of all cattle over 24 months of age in every year.

The column "Number of officially free herds" contains 18867 herds, because two herds' officially free status was suspended. In case of these 2 herds it was not possible to carry out entirely the serological investigations, therefore the officially free status was suspended.

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

Region	Total number of existing		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases				
	Herds	Animals	Number of herds	%	Number of herds	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbio logically	Number of animals positive microbio logically	Number of suspended herds
MAGYARORSZÁG	7518	1129563	7518	100	0	0	2901	55488	0	0	0	0	0	0
Total	7518	1129563	7518	100.0	0	0.0	2901	55488	0	0	0	0	0	0
Total - 1														

2.7 YERSINIOSIS

2.7.1 General evaluation of the national situation

2.7.2 Yersiniosis in humans

A. Yersinosis in humans

Reporting system in place for the human cases

There are around 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer's Service (NPHMOS). Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic system for registering and analysing data of communicable diseases in a combined national database, so the system makes online connection between the three levels (municipal, regional and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: a clinically compatible case when the Yersinia infection is laboratory confirmed.

Diagnostic/analytical methods used

Yersinia isolates are obtained by culturing the faeces samples of the patients on selective -differentiating media, which is followed by biochemical tests and serotyping. Earlier the sera of the patient was tested by Widal-typed method, beside this test the ELISA method has been also in use since 2003.

Notification system in place

Human cases have been notifiable since 1998. The physician reports data of case on a "case report form" by mail to the municipal institute of NPHMOS. The specialist of the institute records data immediately in the electronic system of the NPHMOS. Hungary has also a laboratory based surveillance system, and the NPHMOS has representative dataset from most of the microbiological laboratories about the laboratory investigated cases (since 2003 antibiotic resistances has also been reported from 20 county institutes and 12 laboratories from universities or hospitals).

The illness is reported firstly as enteritis infectiosa syndrome on the basis of the symptoms. Having the results of the laboratory tests this syndrome-based diagnose is modified to etiology-based diagnose. There is a part of the cases which are reported only subsequently when the result of the laboratory test is available.

History of the disease and/or infection in the country

The human cases have been notifiable since 1998. The number of cases varied between 68 – 176/year (incidence: 0,7 – 1,7/100 000 inhabitant/year, median 125 cases/year - 1,3/100 000 inhabitant/year). There was no death registered. A few number of family outbreaks were investigated, community or institutional outbreaks did not occur. Laboratory or epidemiological evidences are not available to assess the source of infection.

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

Yersiniosis do not influence significantly the epidemiological situation of the human acut gastroenteritis caused by zoonotic agents. Between 2000 -2004 the dominant serotype is Y.enterocolitica O3. It is confirmed also by the results of culture and serologic methods.

2.7.3 Yersinia in animals

Table Yersinia in animals

	Source of information	Sampling unit	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica-O:3	Y. enterocolitica-O:9	Y. enterocolitica-unspecified
Cattle (bovine animals) - at farm - Clinical investigations	CAO VDD	animal	1	0					
Zoo animals, all - at zoo - Clinical investigations	CAO VDD	animal	14	0					

2.8 TRICHINELLOSIS

2.8.1 General evaluation of the national situation

A. Trichinellosis general evaluation

History of the disease and/or infection in the country

In Hungary, mandatory testing for Trichinella spp. is in place since 1960. Between 1960 and 1974, 32 cases were confirmed, while no positive finding were reported between 1975-1999.
In 2000, 4 cases were reported from wild game and 1 case from domestic animal. In 2001, 14 wild game cases and 0 cases from domestic animals were reported. As regards 2002, only 2 cases were reported, both from wild game. In 2003, 3 cases were reported from wild game and 2 cases in domestic animals. Slaughtered susceptible animals intended to be placed on the market or for private consumption, are subject to mandatory testing for Trichinella spp.

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

Trichinellosis was a significant zoonotic disease in Hungary in the 1950â€™s and 1960â€™s. Due to the introduction of control strategies, the average annual incidence of trichinellosis decreased to 0-0.7 cases per 100,000 for the 1980â€™s and early 1990â€™s. In the past 10 years, the annual incidence dropped to 0-0.07 cases per 100,000 and no mortality in men caused by the parasite was observed in the same period. In contrast with some other countries in Central Eastern Europe (e.g. Poland, Slovak Republic), the taxonomic status of the human isolates was not determined in the past years. Therefore, it is unknown, which Trichinella spp. was responsible for human infections. The decrease of incidence observed in men is similar to that of prevalence seen in swine at slaughterhouses. Nevertheless, some increasing trends of incidence might be observed in both men and swine in the past five years. As the taxonomic status of swine and wild boar isolates was not determined in recent years, it was unknown whether Trichinella spiralis still persists in the synanthropic or sylvatic cycle. Typing of isolates began in 2006. Sporadic Trichinella infections (in average few cases per year) were also detected in wild boars and in less than 1% of foxes. In foxes Trichinella britovi was responsible for all infections.

Recent actions taken to control the zoonoses

Mandatory testing during meat inspection in all susceptible cases (swine, horses, nutria, wild boars).

Suggestions to the Community for the actions to be taken

In positive human and animal cases the national reference laboratories and public health and veterinary authorities should be immediately notified.Human and animals isolates should be sent for verification of diagnosis to the national reference laboratories with all background information. All te samples from human cases are sent to Natinal Centre for Epidemiology. Animal isolates are sent to the national reference laboratory (Central Agricultural Office, Veterinary Diagnostic Directorate).

2.8.2 Trichinellosis in humans

A. Trichinellosis in humans

Reporting system in place for the human cases

There are about 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer’s Service (NPHMOS). Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic system for registering and analysing data of communicable diseases in a combined national database, so the system provides online connection between the three levels (municipal, regional and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: a clinically compatible case when the Trichinella infection is laboratory confirmed.
Probable case: a clinically compatible case that is not confirmed by laboratory investigation, but it has an epidemiological link to a confirmed trichinellosis outbreak.

Diagnostic/analytical methods used

Microprecipitic test on live larvae as diagnostic method has been used since 1983 in the Helmithozoonotic Reference Laboratory of the National Centre of Epidemiology. Parallel with this test an ELISA test (NOVATEC TRICHINELLA SPIRALIS IgG-ELISA, NovaTec Immundiagnostica, Germany) was introduced in 2002. The positive results of the previously mentioned tests have been confirmed by WB (TRICHINELLA WESTERN BLOT IgG, Ldbio Diagnostics, France) since 2004.

Notification system in place

Human cases have been notifiable since 1960. The physician reports data of case on a “case report form” by mail to the municipal institute of NPHMOS. The specialist of the institute records data immediately in the electronic system of the NPHMOS. Hungary has also a laboratory based surveillance system.

History of the disease and/or infection in the country

Human cases have been notifiable since 1960. The number of cases varied

between 0 – 121 (incidence 0 – 1,2/100 000 inhabitants/year – the highest one was registered in 1964). Between 1960 and 2004 the 85% of cases had epidemiological link to an outbreak. Only one death case has been registered during the Hungarian history of trichinellosis.
Between 1960 and 1975 the swine were the source of infection in 18 outbreaks (83% of all outbreaks) and wild boar in 17% of outbreaks. The significance of swine as the source of infection decreased between 1976 and 1995: 3 outbreaks (23%) were caused by swine, and 10 outbreaks (77%) were associated with consumption of wild boar meat.
(Indigenous swine were the source of two outbreaks in 1978 and 1990, and swine imported from Romania and processed at home were the source of one outbreak in 1995).

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

In the last ten years the number of reported cases ranged between 0 – 7/year (incidence 0 – 0,07/100 000 inhabitants/year), there was no death in this period. All cases linked to family outbreaks and most of sporadic cases were imported from the neighbouring counties. The indigenous cases were linked to the consumption of indigenous wild boar meat. All human cases were caused by T.spiralis.

2.8.3 Trichinella in animals

A. Trichinella in pigs

Monitoring system

Sampling strategy

Trichinella sampling and testing is mandatory for all slaughtered pigs.The number of slaughtered pigs in 2008 was 4575737.

Frequency of the sampling

Every slaughtered animal is sampled

Type of specimen taken

Diaphragm muscle

Methods of sampling (description of sampling techniques)

Methods specified in Regulation 2075/2005/EC

Case definition

Animal with one or more Trichinella larva in the official examination.

Diagnostic/analytical methods used

Artificial digestion method of collective samples

Vaccination policy

None.

Control program/mechanisms

The control program/strategies in place

See above.

Measures in case of the positive findings or single cases

Positive cases are considered not to be eligible for human consumption.

Results of the investigation

All slaughtered swine were investigated in 2008, there was no positive finding for Trichinella.

B. Trichinella in horses

Monitoring system

Sampling strategy

Trichinella testing is mandatory, all animal is sampled.

Frequency of the sampling

Every slaughtered animal is sampled

Type of specimen taken

Diaphragm muscle

Methods of sampling (description of sampling techniques)

2075/2005/EC regulation

Case definition

Animal with one or more Trichinella larva in the official examination

Diagnostic/analytical methods used

Artificial digestion method of collective samples

Vaccination policy

None.

Measures in case of the positive findings or single cases

Positive cases are considered not to be eligible for human consumption.

Results of the investigation

All the 36 slaughtered horses (as all other susceptible animals) were investigated in 2008. Thers was no positive finding for trichinella.

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	Trichinella spp., unspecified
Foxes - from hunting	CAO VDD	animal	1046	25		
Pigs - Surveillance - official controls - suspect sampling	CAO VDD	animal	1	0		
Wild boars - wild - from hunting - Surveillance - official controls - suspect sampling	CAO FFSD	animal	9	4		

2.9 ECHINOCOCCOSIS

2.9.1 General evaluation of the national situation

2.9.2 Echinococcosis in humans

A. Echinococcus spp. in humans

Reporting system in place for the human cases

There are about 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer’s Service (NPHMOS). Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic system for registering and analysing data of communicable diseases in a combined national database, so the system provides online connection amid the three levels (municipal, regional and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: a clinically compatible case when the Echinococcus infection is laboratory confirmed

Diagnostic/analytical methods used

The punctatum originated from cyst or sample from extracted cyst is investigated by microscopic methods. IHA (CELLOGNOST ECHINOCOCCOSIS for IHA, Dade Behring, Germany) and ELISA (HYDATIDOSIS ELISA IgG, Vircell, Spain) screening methods have been used parallel since 2002 in the Helminthozoonoses Reference Laboratory in ’Johan Béla’ National Centre for Epidemiology. The positive results are confirmed by Western blot method (WB) (ECHINOCOCCUS WESTERN BLOT IgG, Ldbio Diagnostics, France).

Notification system in place

The disease has been notifiable since 1950 in Hungary. The physician reports data of case on a “case report form” by mail to the municipal institute of NPHMOS. The specialist of the institute records data immediately in the electronic system of the NPHMOS.

History of the disease and/or infection in the country

Complement-fixed test has been used since 1934 in Hungary to identify the presence of anti-Echinococcus antibody titre. The human cases have been notifiable since 1960. The „home made” indirect hemagglutination (IHA) was introduced in 1985, and the „home made” ELISA method in 1987. The number of registered cases ranged between 0 – 18 /year (more then 10 cases registered in the 1980s only), the incidence varied between 0 – 0.2 cases/100 000 inhabitants/year. There were 0 – 4 death cases reported yearly (the median of case fatality rate: 20%). Since 1991 there has not been any death case with this diagnosis.

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

The number of annually reported cases varied between 5 and 13 in the last five years, there was no death registered. All the reported cases were caused by E. granulosus confirmed in the reference laboratory by Western immunoblot method. In Hungary a human case has not been identified as E. multilocularis infection.

2.9.3 Echinococcus in animals

Table Echinococcus in animals

	Source of information	Sampling unit	Units tested	Total units positive for Echinococcus spp.	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Pigs - at farm - Clinical investigations	CAO VDD	animal	2	0			
Sheep - at farm - Clinical investigations	CAO VDD	animal	5	0			

2.10 TOXOPLASMOSIS

2.10.1 General evaluation of the national situation

2.10.2 Toxoplasmosis in humans

A. Toxoplasmosis in humans

Reporting system in place for the human cases

There are around 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer's Service (NPHMOS). Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic system for registering and analysing data of communicable diseases in a combined national database, so the system makes online connection amid the three levels (municipal, regional and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: a clinically compatible case when the Toxoplasma infection is laboratory confirmed.

Diagnostic/analytical methods used

The anti-Toxoplasma ELISA IgG and IgM methods (TOXONOSTIKA IgG, TOXONOSTIKA IgM, Organon Teknika, Hollandia) are used in the everyday diagnostic work since 1986 in Hungary. Today the specific anti-Toxoplasma IgG (PLATELIA® Toxo IgG, Bio-Rad, France), IgM (PLATELIA® Toxo IgM, Bio-Rad, France), IgA ELISA-t (PLATELIA® Toxo IgA, Bio-Rad, France), IgG avidity identification (VIDAS, BioMérieux S/A, France) is used to test for the anti-Toxoplasma serologic profile.
The PCR method (classical: PRODECT TOXO B1, Bioanalisi Centro Sud s.n.c., Italy; and the light cycler method: LIGHTCYCLER FASTSTART DNA MASTERPLUS HYBRIDIZATION PROBES, Roche (Hungary) Ltd.), further the IgG/IgM Western blot test comparing the immunprofile of mother and child (TOXOPLASMA WESTERN BLOT IgG/IgM, Ldbio Diagnostics, France) are applied. For quality assurance purposes the Toxoplasma Reference Laboratory participate twice in a year in proficiency test, and the Reference Laboratory also

organise proficiency tests for laboratory of NPHMOS.

History of the disease and/or infection in the country

Anti-Toxoplasma antibody assay (Sabin-Feldman dye test) has been in use since 1958 in Hungary. The human cases have been notifiable since 1967. The „home made” complement-fixed assay and indirect hemagglutination methods (IHA) were introduced in 1969.
The annual number of registered cases ranged between 0 – 333 (median: 136 case/year), so the incidence varied 0 – 3.1/100 000 inhabitants/year (median 1.3/100 000/year). Between 1970 and 1985 the highest number of death cases reported was 1 – 5 deaths/year (max. case fatality rate 10%). Only two death cases occurred between 1985 and 2004.

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

The number of annually registered cases ranged between 292 - 107 /year (incidence 2,9 – 1,1/100 000 inhabitant/year – median 1,8/100 000 inhabitant/year), the trend of the incidence is decreasing. There was no death registered in this period. It was a seroprevalence survey performed by Helmithozoonotic Reference Laboratory of National Centre for Epidemiology in 2001. 6 985 persons without sings or symptoms were tested by serologic method for the presence of Toxoplasma antibodies. The proportion of positive persons ranged between 22,8% - 41,3% by county. The proportion of positive persons was 75% among pupils aged more than 60 years.

2.10.3 Toxoplasma in animals

Table Toxoplasma in animals

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma	T. gondii
Cats - - blood	CAO VDD	animal	3	0	
Dogs - - blood	CAO VDD	animal	5	0	
Sheep - at farm - animal sample	CAO VDD	animal	5	0	
Zoo animals, all - at zoo - Clinical investigations	CAO VDD	animal	1	1	1

2.11 RABIES

2.11.1 General evaluation of the national situation

A. Rabies general evaluation

History of the disease and/or infection in the country

At the beginning of the twentieth century, rabies predominantly occurred in Hungary in its urban form and was transmitted to humans mainly by dogs. Therefore, in the 1930's strict animal health regulations were introduced, the main elements of these remained unchanged till recent days. These measures included nationwide mandatory regular vaccination of dogs over three months of age.
During World War II, epidemiological actions were hindered, which resulted in a re-emergence of urban rabies in 1946-47.
The re-introduction of regulatory measures as well as mandatory preventive vaccination, urban rabies seems to be sporadic in Hungary. The register of the annual vaccination of dogs show that around 1.5 Million of dogs are vaccinated every year.
In recent days, together with the disappearing of rabies from dogs, rabies in cats is considered to be of high importance. Preventive vaccination of cats against rabies is recommended but not mandatory and special epidemiological aspects are to be considered. (The movement of animals is hard to control and there is a relative large number of semi-wild living animals of this species.)
Sylvatic rabies reached the North-Eastern part of Hungary in the year 1954. Until 1966 cases remained sporadic (a total of 97 foxes, 16 badgers and wild cats confirmed positive for rabies). In the same timeframe, 35 dogs and 96 domestic cats were confirmed positive for the disease.
In 1967, sylvatic rabies crossed the Danube and by 1971 the whole country was infected. At this time, intensive attempts were executed in order to lower the number of foxes, with minimum results. These actions were suspended in 1987.
Between 1988 and 1996 around 1000 rabies cases in foxes were diagnosed per year. Oral vaccination of foxes was introduced in Hungary in 1997. From that year, the rabies cases in foxes decreased year by year, as the vaccination zone was extended from the western part of the country to the whole territory of Hungary. From 1988, rabies cases in foxes decreased by 90%.

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

It is of high importance that the countrywide oral vaccination of foxes is continued. This practice should be extended to neighbouring countries which do not apply such measures.

Recent actions taken to control the zoonoses

In order to eradicate rabies from Hungary and to protect public health, regulatory measures on domestic animals are in place. Regular preventive vaccination of dogs is mandatory from 3 months of age. Unattended dogs are removed from public areas and are vaccinated against the disease.
Oral vaccination of foxes is done on the whole territory of Hungary.

2.11.2 Rabies in humans

A. Rabies in humans

Reporting system in place for the human cases

There are around 80 communicable diseases notifiable in Hungary based on legal background. The physician (in primary health care, specialist care, inpatient medical institution or pathology) who first diagnoses a case of a notifiable communicable disease (even the suspicion of the disease!) immediately reports data of case to the first level of the epidemiological network (municipal institute) of National Public Health and Medical Officer’s Service (NPHMOS). The suspicion of the human lyssa is obligatory to be reported immediately also by telephone. Data must be reported both at the beginning and at end of the illness (recovery/death, result of laboratory test). The NPHMOS has a nationwide electronic system for registering and analysing data of communicable diseases in a combined national database, so the system provides online connection between the three levels (municipal, regional and national level – National Centre of Epidemiology - NCE) of the organization. The NCE prepares reports regularly (weekly, monthly, yearly) to the Chief Medical Officer, the MoH and the Hungarian Central Statistical Office.

Case definition

Confirmed case: Clinical picture compatible with human lyssa and the antigen/genetic material/specific antibodies are identified or viruses have been isolated from appropriate sample.
Suspected case: Clinical picture compatible with human lyssa and the patient has anamnestic data about exposure by a rabies suspected animal

Diagnostic/analytical methods used

The identification of the virus in vivo from cornea imprint of the patient by immunofluorescence method, or to determine the specific antibody titre of the blood or liquor by immunofluorescence method during the second week of the illness. Post mortem: detection of the Negri-body in the brain tissue, or the antigen by immunofluorescence method, or identification of the viral genetic material by PCR, or isolation of the virus in mouse.

Notification system in place

Human cases have been notifiable since 1950 in Hungary, injury suspected to lyssa-infection has been notifiable since 1964. The physician reports data of case on a “case report form” by mail to the municipal institute of NPHMOS. The suspicion of the human lyssa is obligatory to be reported immediately also by telephone. The specialist of the institute records data immediately in the electronic system of the NPHMOS.

History of the disease and/or infection in the country

Human cases have been notifiable since 1950 in Hungary, injury suspect to human lyssa-infection has been notifiable since 1964. 8 human lyssa cases have been reported since 1950 in Hungary. Seven cases were indigenous; only one case was presumably imported from Africa. Cat was the source of infection in four of the cases, fox in two cases, and one case was caused by a dog. The origin of the imported case remained unknown. The vaccine based on brain-extract was used for post exposure prophylaxis in Hungary until 1989. Since then the cell cultured vaccine has been used. The change in the vaccine used and not in the epidemiological situation of lyssa is reflected in the statistics of vaccinated persons (1985 – 1988.: 2000 – 3000 person vaccinated/year, 1994 – 1998. 8000 – 10 500/year, 1999 - 2003.: 9 500 – 11 000/year).

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

No human lyssa case has been registered since 1994 in Hungary.

2.11.3 Lyssavirus (rabies) in animals

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	Unspecified Lyssavirus	Classical rabies virus (genotype 1)	European Bat Lyssavirus - unspecified
Badgers - wild - in total	CAO VDD	animal	84	0	0		
Bats - wild - in total	CAO VDD	animal	6	0			
Cats - in total	CAO VDD	animal	564	0	0		
Cattle (bovine animals) - in total	CAO VDD	animal	21	0			
Deer - wild - red deer - in total	CAO VDD	animal	2	0			
Deer - wild - roe deer - in total	CAO VDD	animal	43	0			
Dogs - at farm - Clinical investigations	CAO	animal	323	1	1		
Foxes - wild - in total	CAO VDD	animal	8542	6	6		
Goats - in total	CAO VDD	animal	8	0			
Pigs - in total	CAO VDD	animal	4	0			
Raccoon dogs - wild - in total	CAO VDD	animal	2	0			
Sheep - in total	CAO VDD	animal	20	0			
Wild boars - wild - in total	CAO VDD	animal	4	0			

2.12 Q-FEVER

2.12.1 General evaluation of the national situation

2.12.2 Coxiella (Q-fever) in animals

Table Coxiella burnetii (Q fever) in animals

	Source of information	Sampling unit	Units tested	Total units positive for Coxiella (Q-fever)	C. burnetii
Cattle (bovine animals) - at farm - Clinical investigations	CAO VDD	animal	4	0	
Goats - at farm - Clinical investigations	CAO VDD	animal	14	0	
Sheep - at farm - Clinical investigations	CAO VDD	animal	4	0	

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1 ENTEROCOCCUS, NON-PATHOGENIC

3.1.1 General evaluation of the national situation

3.1.2 Antimicrobial resistance in Enterococcus, non-pathogenic isolates

Table Antimicrobial susceptibility testing of Enterococcus spp., unspecified in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

Enterococcus spp., unspecified		Pigs - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	57																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Tetracyclines	Tetracyclines		57	0	24	2	7		2									4	1	2	3	5	5		1		1

Enterococcus spp., unspecified		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	57						
Antimicrobials:		29	30	31	32	33	34	>=35
Tetracyclines	Tetracyclines							

Table Antimicrobial susceptibility testing of Enterococcus spp., unspecified in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

Enterococcus spp., unspecified		Gallus gallus (fowl) - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	no																								
	Number of isolates available in the laboratory	72																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Tetracyclines	Tetracyclines		72	0	32		4	3	4	3		1	3			1		4	4		2	4	4	2			1

Enterococcus spp., unspecified		Gallus gallus (fowl) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	72						
Antimicrobials:		29	30	31	32	33	34	>=35
Tetracyclines	Tetracyclines							

Table Antimicrobial susceptibility testing of Enterococcus spp., unspecified in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

Enterococcus spp., unspecified		Cattle (bovine animals) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	53																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Tetracyclines	Tetracyclines		52	0	8	1	4		3	2						1			1	1	4	5	5	7	2	3	4

Enterococcus spp., unspecified		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	53						
Antimicrobials:		29	30	31	32	33	34	>=35
Tetracyclines	Tetracyclines			1				

Table Antimicrobial susceptibility testing of E. faecalis in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. faecalis		Cattle (bovine animals) - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	31																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Tetracyclines	Tetracyclines		31	0	12		4		1	1						1			1	3	1	1	3	2			1

E. faecalis		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	31						
Antimicrobials:		29	30	31	32	33	34	>=35
Tetracyclines	Tetracyclines							

Table Antimicrobial susceptibility testing of E. faecalis in Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken) - quantitative data [Diffusion method]

E. faecalis		Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken)																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	78																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Tetracyclines	Tetracyclines		78	0	33		6		3	2	3		1		2	1		2	4	2	5	3	4	2	2	1	1

E. faecalis		Gallus gallus (fowl) - at slaughterhouse - Monitoring (broiler chicken)						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	78						
Antimicrobials:		29	30	31	32	33	34	>=35
Tetracyclines	Tetracyclines			1				

Table Antimicrobial susceptibility testing of E. faecalis in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. faecalis		Pigs - at slaughterhouse - Monitoring																								
	Isolates out of a monitoring program (yes/no)	yes																								
	Number of isolates available in the laboratory	49																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Tetracyclines	Tetracyclines		49	0	24	1	7	2	1	1	1						1	2	1	1	2	1	2				2

E. faecalis		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	49						
Antimicrobials:		29	30	31	32	33	34	>=35
Tetracyclines	Tetracyclines							

3.2 ESCHERICHIA COLI, NON-PATHOGENIC

3.2.1 General evaluation of the national situation

3.2.2 Antimicrobial resistance in Escherichia coli, non-pathogenic

Table Antimicrobial susceptibility testing of E. coli in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. coli		Pigs - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	212																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		212	0					1		4			12	17	21	52	48	30	12	11	3	1				
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		187	0	29	2	5	5	12	5	10	3		58	20	19	14	4	1								
Amphenicols	Chloramphenicol		212	0	21		1		2		1		1				3	3	10	13	16	14	44	31	24	2	19
	Florfenicol		212	0	19									1				14	30	16	26	19	45	10	16	3	9
Cephalosporins	3rd generation cephalosporins		212	0																	1	1	3	5	6	1	62
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		211	0	1						1	1					2		1	2		10	9	10	6	11	24
Penicillins	Ampicillin		212	0	60				1			4	2	4	3	36	28	26	19	13	11	1	2	1	1		
Quinolones	Nalidixic acid		211	0	4				1		1			1				8	8	13	17	24	33	34	21	21	16
Sulfonamides	Sulfonamide		212	0												6	5	106	8	14	7	18	10	13	5	12	2
Tetracyclines	Tetracyclin		212	0	134	2	5	3	7	2				2	1	1	2	7	15	15	10	4	2				
Trimethoprim	Trimethoprim		0	0																							

Table Antimicrobial susceptibility testing of E. coli in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. coli		Pigs - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	212																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

E. coli		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	212						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	2	4		1			
	Florfenicol	1	3					
Cephalosporins	3rd generation cephalosporins	26	43	10	23	4	14	13
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	16	35	13	26	8	21	14
Penicillins	Ampicillin							
Quinolones	Nalidixic acid	3	6					
Sulfonamides	Sulfonamide		1	4		1		
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							

Table Antimicrobial susceptibility testing of E. coli in Pigs - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. coli		Pigs - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	212						
Antimicrobials:		29	30	31	32	33	34	>=35
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. coli		Gallus gallus (fowl) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	169																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		169	0					2					11	14	19	33	37	30	20	1	2					
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		169	0	16		5	3	7	7	2	5	3	54	34	17	13	2	1								
Amphenicols	Chloramphenicol		168	0	14					1							1	1	14	18	13	22	27	19	18	2	8
	Florfenicol		169	0	3													11	20	20	26	19	32	7	16	4	9
Cephalosporins	3rd generation cephalosporins		168	0					1							1	2	4	2	1	3	1	2	6	3		48
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		169	0	4	1	3	4	9	7	7	4		2	11		4	8	11	10	2	28	13	4	5	2	8
Penicillins	Ampicillin		169	0	84							2		3	1	20	18	18	9	5	3		4	1			
Quinolones	Nalidixic acid		169	0	88	1	4	6	8	5	2	1		2	1			3	1	4	4	7	11	8	8	2	1
Sulfonamides	Sulfonamide		169	0	49								1			4	5	4	10	9	16	12	15	9	15	1	12
Tetracyclines	Tetracyclin		166	0	61		4	1	5	1						1	5	13	24	27	12	6	4	1			
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. coli		Gallus gallus (fowl) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	169						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	1	7	1	1			
	Florfenicol		2					
Cephalosporins	3rd generation cephalosporins	21	27	10	22	2	6	6
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	5	9	3	5			
Penicillins	Ampicillin				1			
Quinolones	Nalidixic acid	1	1					
Sulfonamides	Sulfonamide		3	2			1	1
Tetracyclines	Tetracyclin		1					
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of E. coli in Sheep - at farm - Clinical investigations - quantitative data [Diffusion method]

E. coli		Sheep - at farm - Clinical investigations																								
	Isolates out of a monitoring program (yes/no)	no																								
	Number of isolates available in the laboratory	23																								
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		22	0											1	1	2	8	4	3	1	1				1	
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		23	0	1									1				1	3	2	4	2	6	2			
Amphenicols	Chloramphenicol		21	0															1	1	4	1	1	4	3	2	3
	Florfenicol		22	0														2	1		1	1	7	1	4	2	1
Cephalosporins	3rd generation cephalosporins		21	0																		1					4
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		22	0														1					2		1		2
Penicillins	Ampicillin		23	0	6									1		2	3	2	3	2		1		1			1
Quinolones	Nalidixic acid		6	0																	1	1	1	2		1	
Sulfonamides	Sulfonamide		16	0										1				1	1				3	1	2		4
Tetracyclines	Tetracyclin		23	0	6					1					1		1		6	2	3		1	1			
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of E. coli in Sheep - at farm - Clinical investigations - quantitative data [Diffusion method]

E. coli		Sheep - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	23						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							1
Amphenicols	Chloramphenicol		1					
	Florfenicol	1	1					
Cephalosporins	3rd generation cephalosporins	2	5	1	4		1	3
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin		8	1	4	2	1	
Penicillins	Ampicillin							1
Quinolones	Nalidixic acid							
Sulfonamides	Sulfonamide	2			1			
Tetracyclines	Tetracyclin							1
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

E. coli		Gallus gallus (fowl) - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)																										
	Number of isolates available in the laboratory	391																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		391	0					2		1			13	21	33	50	65	72	55	40	19	11	6	1		1
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		391	0	42	1	7	5	13	18	3	8	4	80	69	49	45	28	14	1	2	1			1		
Amphenicols	Chloramphenicol		391	0	47	1	1		2	1		1			1		2	4	17	21	29	31	32	38	47	12	43
	Florfenicol		391	0	15		1							1				15	30	26	41	34	64	27	45	12	41
Cephalosporins	3rd generation cephalosporins		390	0					1	1						2	3	5	7	9	9	8	7	11	4		66
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		390	0	11	1	7	11	15	13	14	8	2	5	4	1	5	9	13	16	5	51	30	22	25	9	16
Penicillins	Ampicillin		331	0	198				1			3		5	2	32	35	21	18	5	7	2	1				
Quinolones	Nalidixic acid		257	0	137	2		8	13	6	5	2		2	1			3	1	4	7	9	14	14	14	5	3
Sulfonamides	Sulfonamide		391	0	118							1	1			4	7	5	15	11	23	18	30	22	31	6	40
Tetracyclines	Tetracyclin		389	0	147		6	1	6	1	1			1	3	3	9	18	45	36	39	37	19	10	4	1	1
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl) - at farm - Clinical investigations - quantitative data [Diffusion method]

E. coli		Gallus gallus (fowl) - at farm - Clinical investigations						
Isolates out of a monitoring program (yes/no)								
Number of isolates available in the laboratory		391						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							1
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	22	6	22	6	4	1	
	Florfenicol	2	26	2	9			
Cephalosporins	3rd generation cephalosporins	30	54	20	63	8	51	31
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	8	26	5	17	3	20	18
Penicillins	Ampicillin				1			
Quinolones	Nalidixic acid	3	4					
Sulfonamides	Sulfonamide	4	30	7	12		5	1
Tetracyclines	Tetracyclin		1					
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of E. coli in Pigs - at farm - Clinical investigations - quantitative data [Diffusion method]

E. coli		Pigs - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	312																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		312	0				2	1	2	7			20	25	29	62	64	50	17	20	4	5	1			1
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		308	0	57	3	11	9	17	35	7	11	5	71	31	24	17	5	1	1	2		1				
Amphenicols	Chloramphenicol		308	0	37		1		4		2		1				3	4	16	18	21	18	55	43	35	5	26
	Florfenicol		311	0	28		1					1	1	1				18	38	22	45	23	58	14	27	5	16
Cephalosporins	3rd generation cephalosporins		300	0											1				1		1	3	3	6	8	3	85
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		312	0	8	1				3	2	2					2		1	3		13	12	10	10	18	31
Penicillins	Ampicillin		307	0	114				2		1	4	2	7	4	44	32	31	26	18	14	2	3	2	1		
Quinolones	Nalidixic acid		244	0	11		1		1		1	1		1				8	8	15	18	26	36	39	25	23	17
Sulfonamides	Sulfonamide		266	0	132						1			1		5	6	11	8	9	17	13	22	16	2	9	3
Tetracyclines	Tetracyclin		306	0	205	2	6	3	7	3	2	1		2	1	1	3	9	20	17	17	5	2				
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of E. coli in Pigs - at farm - Clinical investigations - quantitative data [Diffusion method]

E. coli		Pigs - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	312						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							2
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	5	8		2	1	1	2
	Florfenicol	1	6		2		1	3
Cephalosporins	3rd generation cephalosporins	39	59	13	34	8	19	17
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	23	49	19	38	10	29	28
Penicillins	Ampicillin							
Quinolones	Nalidixic acid	4	8		1			
Sulfonamides	Sulfonamide	6					3	2
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals) - at farm - Clinical investigations - quantitative data [Diffusion method]

E. coli		Cattle (bovine animals) - at farm - Clinical investigations																									
	Isolates out of a monitoring program (yes/no)	no																									
	Number of isolates available in the laboratory	274																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		274	0	5		1		1	2	4		1	18	29	33	52	44	40	16	14	7	6		1		
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		270	0	18		1	1	9	14	5	11	6	88	57	31	17	8	2			1					
Amphenicols	Chloramphenicol		274	0	16			1				1		1	2		5	6	20	26	31	41	40	21	25	7	15
	Florfenicol		274	0	6										1		2	24	35	35	47	23	31	15	32	5	9
Cephalosporins	3rd generation cephalosporins		246	0						1	1	1			1		1			2	2	3	2	6	5		69
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		274	0	4			2	2	4	1							1			1	9	14	11	30	16	32
Penicillins	Ampicillin		270	0	48		1	1		5	4	11	3	16	5	64	27	41	22	10	7	4	1				
Quinolones	Nalidixic acid		107	0	2				1	1									5	6	13	20	23	10	10	2	6
Sulfonamides	Sulfonamide		159	0	31								2			7	7	2	12	10	19	7	13	5	20	2	12
Tetracyclines	Tetracyclin		268	0	48	1	1	2				1		3	6	7	27	38	58	30	19	14	9	2	2		
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals) - at farm - Clinical investigations - quantitative data [Diffusion method]

E. coli		Cattle (bovine animals) - at farm - Clinical investigations						
	Isolates out of a monitoring program (yes/no)	no						
	Number of isolates available in the laboratory	274						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							1
Amphenicols	Chloramphenicol	6	6	1	2		1	
	Florfenicol	2	1	1	1		2	2
Cephalosporins	3rd generation cephalosporins	51	45	8	29	2	9	8
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	17	61	17	19	8	13	12
Penicillins	Ampicillin							
Quinolones	Nalidixic acid	3	1			2	2	
Sulfonamides	Sulfonamide	2	4		3			1
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. coli		Cattle (bovine animals) - at slaughterhouse - Monitoring																									
	Isolates out of a monitoring program (yes/no)	yes																									
	Number of isolates available in the laboratory	100																									
Antimicrobials:		break points	N	n	<=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Aminoglycosides	Gentamicin		98	0										7	11	14	24	13	18	6	1	3			1		
	Kanamycin		0	0																							
	Neomycin		0	0																							
	Streptomycin		98	0	2			1		2	1	3	3	43	19	13	7	2	2								
Amphenicols	Chloramphenicol		100	0	2										1	2	2	1	7	10	12	19	16	6	7	3	4
	Florfenicol		95	0											1		8	18	15	19	7	12	2	7	1	2	
Cephalosporins	3rd generation cephalosporins		98	0																		1	1	2	2		25
Fluoroquinolones	Ciprofloxacin		0	0																							
	Enrofloxacin		100	0																		6	9	3	6	4	16
Penicillins	Ampicillin		97	0	10			1		1				6	2	35	16	13	7	3	1	2					
Quinolones	Nalidixic acid		98	0					1	1									5	6	12	20	21	7	9	2	6
Sulfonamides	Sulfonamide		89	0	7								1			7	7	2	11	8	13	6	1	3	9	1	8
Tetracyclines	Tetracyclin		98	0	9			1	2			1		1	1	2	13	16	19	14	11	5	1		2		
Trimethoprim	Trimethoprim		0	0																							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides		0	0																							

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals) - at slaughterhouse - Monitoring - quantitative data [Diffusion method]

E. coli		Cattle (bovine animals) - at slaughterhouse - Monitoring						
	Isolates out of a monitoring program (yes/no)	yes						
	Number of isolates available in the laboratory	100						
Antimicrobials:		29	30	31	32	33	34	>=35
Aminoglycosides	Gentamicin							
	Kanamycin							
	Neomycin							
	Streptomycin							
Amphenicols	Chloramphenicol	2	3	1	1		1	
	Florfenicol			1	1		1	
Cephalosporins	3rd generation cephalosporins	24	16	2	14		4	7
Fluoroquinolones	Ciprofloxacin							
	Enrofloxacin	5	23	6	7	2	4	9
Penicillins	Ampicillin							
Quinolones	Nalidixic acid	3	1			2	2	
Sulfonamides	Sulfonamide		1		3			1
Tetracyclines	Tetracyclin							
Trimethoprim	Trimethoprim							
Trimethoprim + sulfonamides	Trimethoprim + sulfonamides							

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1 HISTAMINE

4.1.1 General evaluation of the national situation

4.1.2 Histamine in foodstuffs

Table Histamine in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units in non-conformity	<= 100 mg/kg	>100 - <= 200 mg/kg	>200 - <= 400 mg/kg	> 400 mg/kg
Fish - Fishery products from fish species associated with a high amount of histidine - not enzyme maturated - at catering - Surveillance - official controls - suspect sampling (outbreak investigation)	CAO FFSD	single	5g	6	3	3	1	0	2
Fish - Fishery products from fish species associated with a high amount of histidine - not enzyme maturated - at retail - imported - Monitoring - official sampling - objective sampling	CAO FFSD	single	5g	72	1	71	0	1	0

Footnote:

limit of detection: 1 mikrogram/kg

4.2 ENTEROBACTER SAKAZAKII

4.2.1 General evaluation of the national situation

4.2.2 Enterobacter sakazakii in foodstuffs

Table Enterobacter sakazakii in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Enterobacter sakazakii	E. sakazakii
Foodstuffs intended for special nutritional uses - at retail - Monitoring - official sampling - objective sampling	CAO FFSD	batch	30x10	22	0	0
Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months - at retail - Monitoring - official sampling - objective sampling	CAO FFSD	batch	30x10	31	0	0
Infant formula - dried - at retail - Monitoring - official sampling - objective sampling	CAO FFSD	batch	30x10	57	0	0
Infant formula - ready-to-eat - at retail - Monitoring - official sampling - objective sampling	CAO FFSD	batch	30x10	2	0	0

Footnote:

Source of information: CAO FFSD (Central Agricultural Office, Food and Feed Safety Directorate

4.3 STAPHYLOCOCCAL ENTEROTOXINS

4.3.1 General evaluation of the national situation

4.3.2 Staphylococcal enterotoxins in foodstuffs

A. Staphylococcal enterotoxins in foodstuffs

Monitoring system

Sampling strategy

There is no direct sampling strategy, samples containing more than 100.000 coagulase positive staphyloccocci/gram are tested for the presence of enterotoxin.
Only those product groups are routinely tested for coagulase positive staphyloccocci, for which there is a criterion in 2073/2005/EC.

Type of specimen taken

Other: milk products

Definition of positive finding

If ELFA test shows a positive result,the product is considered to be positive.

Diagnostic/analytical methods used

Validated detection method of the CRL based on VIDAS enterotoxin test is used.

Table Staphylococcal enterotoxins in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Staphylococcal enterotoxins
Dairy products (excluding cheeses) - fermented dairy products - Surveillance - official controls - suspect sampling	CAO FFSD	single	25 gramms	1	0
Meat from pig - meat products - at processing plant - Monitoring - industry sampling - Selective sampling (High S. aureus count, industry's own check for toxins)	CAO FFSD	batch	5 x 10	3	0

5. FOODBORNE

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

A. Foodborne outbreaks

System in place for identification, epidemological investigations and reporting of

Data on food-borne outbreaks are collected in Hungary since 1931 by legal background. There are three surveillance systems for identifying/recognition of food-borne outbreaks (the obligatory report of a physician / a food vendor / a drinking water supplier / a representative of an institution about an outbreak; the increasing number of cases in the communicable disease reporting system/ the increasing number of laboratory confirmed cases). The reporting systems belong to the National Public Health and Medical Officerâ€™s Service. The animal health authorities are involved in the investigation, if data indicate that the suspected food had been made by the food industry.
The physician reports data about the event by telephone to the municipal institute of NPHMOS. The specialist of the institute enter the data immediately in to the electronic system of the NPHMOS. A laboratory based surveillance system also exists in Hungary. The database on food-borne outbreaks is in the National Centre for Epidemiology and in the National Institute for Food Safety and Nutrition.

Description of the types of outbreaks covered by the reporting:

Outbreak: At least two cases of the disease with epidemiological link (exposed by the same food)/The number of cases are higher than expected (surveillance data). It is not necessary to identify the agent in the food sample.
Family outbreak: At least two cases of a foodborne disease in the same household, exposed by the same food.
Institutional outbreak: At least two cases of a foodborne disease in the same institute (school, kindergarten, hospital etc.) exposed by the same food.
Community outbreak: At least two cases of a foodborne disease in the community exposed by the same food.

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

Food-borne outbreaks in Hungary, 2008
National evaluation of the recent situation, the trends and sources of infection

In 2008 there were 273 verified or possible food-borne outbreaks (outbreak=two or more linked cases) registered by National Epidemiological Centre (NCE) and National Institute for Food Safety and Nutrition (NIFSN) in Hungary, and those represented altogether 3205 cases. Out of these 3205 cases 12% (386 people) were hospitalised. There was no lethal case. [In 2007 there were registered 269 outbreaks with 1818 cases of whom 426 persons (23%) were hospitalised.]
Out of the 273 registered outbreaks 69.2% were caused by Salmonella (189 outbreaks), 16,5% (45 outbreaks) by Campylobacter, 5,1% (14 outbreaks) by unknown origin and 4,8% (13 events) by mushroom toxins. The rest of the

outbreaks were caused by Clostridium perfringens (4 outbreaks - 1,5%), norovirus (3 outbreaks – 1,1%), S.aureus enterotoxin (3 outbreaks - 1,1%), C.botulinum (one outbreak – 0,4%), histamin (1 event – 0,4%).

In 13,2% of the outbreaks (36 outbreaks: 15 salmonellosis, 13 mushroom toxins, 3 Clostridium perfringens, 2 Staphylocuccus aureus, 1 norovirus outbreak, one outbreak of unknown etiology and one histamine event) there was laboratory or analytical epidemiological evidence for the food origin.
Out of the 3205 reported cases with food-borne origin 44,8% (1434 people) have suffered from salmonellosis and 19,4% (622 cases) from unknown agent, 19,2% (614 cases) from norovirus, 10,1% (324 cases) from C.perfringens, 3,5%-ában (113 cases) from Campylobacter, 1,7% (56 cases) from mushroom toxins, 1,2% (37 cases) from S.aureus enterotoxin, 0,1% (3 cases) from histamine and 0,1% (2 cases from C.botulinum.

Salmonellosis
In 2008 there were 7166 cases (2007: 6891 cases) and 243 outbreaks (2007: 233 outbreaks) of salmonellosis confirmed by laboratory and epidemiological investigation based on the register of the NCE. The most frequent serotypes of human isolets were: S. Enteritidis (72,7%; 2007: 76.3%), S. Typhimurium (10,5%; 2007: 7.9%) and S. Infantis (4,5%; 2007: 5.1%). The number of salmonellosis cases and outbreaks not changed significantly, both of them increased by 4% compared to the data of 2007 year.

Campylobacteriosis
On the basis of the laboratory or epidemiological data altogether 5563 campylobacteriosis cases (2007: 5856 cases) and 67 outbreaks (2007: 71, 2006: 60) were registered in the database of NCE in 2008. The dropping of the number of campylobacteriosis cases which began in 2004 continued also in 2008 with -5%. Whereas the number of outbreaks (67) did not changed dramatically compared to previous years (2007: 71; 2006: 60). The most frequent species of human isolets were: C.jejuni (26,5%), C.coli (3,4%), C.lari (2,5%); 67,6% of isolets were not typed.

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

Salmonellosis
As of the database of NCE and NIFSN out of the 7166 registered cases 1434 cases (20%, 2007: 16%) belonged to the 189 outbreaks that had food-borne origin (either verified or possible). 309 cases (21,5%) required hospitalization. Six salmonellosis outbreaks were multitudinous (No of cases >30) with

altogether 642 attached cases, out of which 83 ill persons required hospitalization.

In 15 outbreaks (8% of 189 outbreaks) the food-borne origin has been confirmed by either the identification of the outbreak strain in the processed food or in the raw material or by statistical analysis. In the rest 174 outbreaks data obtained by descriptive epidemiological methods were suggestive for the food-borne origin.

Out of the 189 food-borne salmonellosis outbreaks 84,1% was caused by S. Enteritidis and 6,9% by S. Typhimurium. 1-1-1% (2-2-2 outbreaks) by S.Derby, S.Bovismorbificans and by S.Kentucky, 4,2% by eight other serotypes (1-1 outbreaks by each of them), and 1,6% by Salmonella sp.
About two-third part (69,8%) of the outbreaks was caused by foods that were made by the use of inadequately heat-treated egg. In the rest of the outbreaks foods prepared from poultry (17%) or from other (4%) or unknown (9%) stuff – which most probably were contaminated subsequently- were the confirmed or probable sources of the infections.

Altogether 1758 isolated S. Enteritidis strains was subjected to phage typing (according to the Ward's scheme). In 2008 the most frequent phage type for S. Enteritidis was the PT8 (36.9%), which was followed by PT2 (20%), PT4 (16%) and PT6 (8,4%). Out of the 258 phage typed S. Typhimurium strains 31.3% belonged to the DT193 and 16,1% to the pandemic DT104, and 15,8% to the DT104b (according to the Anderson's scheme).

Campylobacteriosis
As of the database of NCE and NIFSN food-borne origin of 45 outbreaks had possible evidences for food-borne origin, it is two-third of the total number of campylobacteriosis outbreaks. This represented 2% (113) of the total campylobacteriosis cases. Four ill people required hospitalization. The agent was identified as C.jejuni of 20 outbreaks, and Campylobacter sp. was the etiology in 25 outbreaks. In 57,8% (26 outbreaks) of probably food-borne campylobacteriosis outbreaks the vehicle of the infection was most probably meals made of infected poultry.

Viral foodborne diseases

There were 6558 norovirus gastroenteritis cases reported in 2008 (4190 in 2007) linked to 272 outbreaks (157 in 2007) registered by NCE. In the case of two outbreaks the role of subsequently contaminated food was possible. In the third norovirus outbreak the consumption of the contaminated tap water caused 597 gastroenteritis cases in a village and statistical evidences were calculated for this outbreak.

Foodborne diseases caused by mushroom toxins

Altogether 73 poisoning cases caused by consumption of mushroom toxins were registered by NIFSN (149 in 2007) out of which 65 cases required hospitalization (127 in 2007). From the 73 cases 53 belong to 13 outbreaks (39 outbreaks in 2007). In all of outbreaks the investigation of the food samples has also confirmed the food-borne origin.

Foodborne Outbreaks: summarized data

	Total number of outbreaks	Outbreaks	Human cases	Hospitalized	Deaths	Number of verified outbreaks
Bacillus	0	0	0	0	0	0
Campylobacter	45	45	113	4	0	0
Clostridium	5	2	240	2	0	3
Escherichia coli, pathogenic	0	0	0	0	0	0
Foodborne viruses	3	2	17	1	0	1
Listeria	0	0	0	0	0	0
Other agents	16	0	0	0	0	16
Parasites	1	1	5	5	1	0
Salmonella	30	15	861	202	0	15
Staphylococcus	3	1	15	9	0	2
Unknown	14	13	599	4	0	1
Yersinia	0	0	0	0	0	0

Verified Foodborne Outbreaks: detailed data

PT 1b

	Value
Code	6
Subagent Choice	Salmonella; S. Enteritidis; PT 1b
Outbreak type	General
Human cases	11
Hospitalized	8
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	pancake filled with curd cheese and egg
Type of evidence	Laboratory detection in human cases, Laboratory characterization of food and human isolates, Laboratory detection in implicated food
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

PT 2

	Value
Code	8
Subagent Choice	Salmonella; S. Enteritidis; PT 2
Outbreak type	General
Human cases	376
Hospitalized	30
Deaths	0
Foodstuff implicated	Dairy products (other than cheeses)
More Foodstuff	curd cheese
Type of evidence	Analytical epidemiological evidence
Setting	School, kindergarten
Place of origin of problem	Processing plant
Origin of foodstuff	Domestic
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 2

	Value
Code	10
Subagent Choice	Salmonella; S. Enteritidis; PT 2
Outbreak type	General
Human cases	33
Hospitalized	9
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	roasted chicken, mayonaise
Type of evidence	Laboratory detection in human cases, Laboratory detection in implicated food, Laboratory characterization of food and human isolates
Setting	Take-away or fast-food outlet
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 2

	Value
Code	9
Subagent Choice	Salmonella; S. Enteritidis; PT 2
Outbreak type	General
Human cases	17
Hospitalized	4
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	calf stew with noodle
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases, Laboratory characterization of food and human isolates
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Cross-contamination
Outbreaks	1
Comment	

PT 2

	Value
Code	11
Subagent Choice	Salmonella; S. Enteritidis; PT 2
Outbreak type	General
Human cases	48
Hospitalized	31
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	roasted chicken with rice and peas
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases, Laboratory characterization of food and human isolates
Setting	Other setting
Place of origin of problem	Catering services, restaurant
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 2

	Value
Code	12
Subagent Choice	Salmonella; S. Enteritidis; PT 2
Outbreak type	General
Human cases	9
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	somlauer noodle (dessert), cesar salat, cold buffet
Type of evidence	Laboratory detection in implicated food, Laboratory characterization of food and human isolates, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 2

	Value
Code	7
Subagent Choice	Salmonella; S. Enteritidis; PT 2
Outbreak type	General
Human cases	10
Hospitalized	2
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	noodle with eggs
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases, Laboratory characterization of food and human isolates
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

PT 4

	Value
Code	13
Subagent Choice	Salmonella; S. Enteritidis; PT 4
Outbreak type	General
Human cases	12
Hospitalized	1
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	noodle (with egg)
Type of evidence	Laboratory detection in human cases, Laboratory characterization of food and human isolates, Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 6

	Value
Code	14
Subagent Choice	Salmonella; S. Enteritidis; PT 6
Outbreak type	General
Human cases	15
Hospitalized	0
Deaths	0
Foodstuff implicated	Sweets and chocolate
More Foodstuff	tiramisu,
Type of evidence	Analytical epidemiological evidence
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

PT 8

	Value
Code	16
Subagent Choice	Salmonella; S. Enteritidis; PT 8
Outbreak type	General
Human cases	19
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	turkey with cream
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases, Laboratory characterization of food and human isolates
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

PT 8

	Value
Code	15
Subagent Choice	Salmonella; S. Enteritidis; PT 8
Outbreak type	General
Human cases	19
Hospitalized	6
Deaths	0
Foodstuff implicated	Sweets and chocolate
More Foodstuff	dessert with eggs and milk
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases, Laboratory characterization of food and human isolates
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate chilling
Outbreaks	1
Comment	

PT 8

	Value
Code	17
Subagent Choice	Salmonella; S. Enteritidis; PT 8
Outbreak type	General
Human cases	39
Hospitalized	15
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	noodle (semolina with curd cheese and eggs)
Type of evidence	Analytical epidemiological evidence
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	18
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	roll filled with crude cheese and egg
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	

S. Typhimurium

	Value
Code	19
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	headcheese (home made)
Type of evidence	Laboratory detection in human cases, Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Inadequate heat treatment
Outbreaks	1
Comment	

S. Typhimurium

	Value
Code	20
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

C. perfringens

	Value
Code	2
Subagent Choice	
Outbreak type	General
Human cases	21
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	rice with pork meat
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

C. perfringens

	Value
Code	3
Subagent Choice	
Outbreak type	General
Human cases	49
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	chicken ragout with mushroom and cream and noodle
Type of evidence	Analytical epidemiological evidence
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

C. perfringens

	Value
Code	4
Subagent Choice	
Outbreak type	General
Human cases	16
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	beans with chili
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Canteen or workplace catering
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

S. aureus

	Value
Code	21
Subagent Choice	
Outbreak type	General
Human cases	6
Hospitalized	0
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	Raffaello cake with home made curd cheese
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

S. aureus

	Value
Code	22
Subagent Choice	
Outbreak type	General
Human cases	16
Hospitalized	3
Deaths	0
Foodstuff implicated	Mixed or buffet meals
More Foodstuff	potato salad with mayonese
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Residential institution (nursing home, prison, boarding school)
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

norovirus (Norwalk-like virus)

	Value
Code	1
Subagent Choice	
Outbreak type	General
Human cases	597
Hospitalized	4
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	contaminated tap water. The plumbing of the township was very old, and sewage system does not exist, so the ground water contaminated by human feces polluted the tap water through a lesion of the water system.
Type of evidence	Analytical epidemiological evidence
Setting	Other setting
Place of origin of problem	Water distribution system
Origin of foodstuff	Domestic
Contributory factors	Cross-contamination
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

Histamine

	Value
Code	36
Subagent Choice	
Outbreak type	Household
Human cases	3
Hospitalized	3
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	
Type of evidence	Laboratory detection in human cases, Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Unknown
Contributory factors	Inadequate chilling
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	23
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	2
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Inocybe fastigiata
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	24
Subagent Choice	
Outbreak type	Household
Human cases	5
Hospitalized	5
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Amanita phalloides
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	26
Subagent Choice	
Outbreak type	Household
Human cases	5
Hospitalized	5
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Omphalotus olearius
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	25
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	4
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Omphalotus olearius
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	28
Subagent Choice	
Outbreak type	Household
Human cases	3
Hospitalized	3
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Omphalotus olearius
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	27
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	1
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Omphalotus olearius
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	29
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	4
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Omphalotus olearius
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	30
Subagent Choice	
Outbreak type	Household
Human cases	13
Hospitalized	9
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Boletus luridus
Type of evidence	Laboratory detection in human cases
Setting	Household
Place of origin of problem	Other place of origin
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	31
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	4
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Amanita phalloides
Type of evidence	Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	32
Subagent Choice	
Outbreak type	Household
Human cases	3
Hospitalized	3
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Mycena pura
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	33
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Entoloma sinuatum
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	34
Subagent Choice	
Outbreak type	Household
Human cases	5
Hospitalized	5
Deaths	5
Foodstuff implicated	Other foods
More Foodstuff	Armillairella mellea
Type of evidence	Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	35
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	2
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	Agaricus xanthoderma
Type of evidence	Laboratory detection in implicated food, Laboratory detection in human cases
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Domestic
Contributory factors	Other contributory factor
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	
Subagent Choice	
Outbreak type	Unknown
Human cases	unknown
Hospitalized	unknown
Deaths	unknown
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	
Subagent Choice	
Outbreak type	Unknown
Human cases	unknown
Hospitalized	unknown
Deaths	unknown
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Verified Foodborne Outbreaks: detailed data

Unknown

	Value
Code	5
Outbreak type	General
Human cases	23
Hospitalized	0
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	veal stew, noodle with ewe-cheese
Type of evidence	Analytical epidemiological evidence
Setting	Canteen or workplace catering
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	