ZOONOSES MONITORING

Serbia

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

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

IN 2021

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 Serbia during the year 2021.

The information covers the occurrence of these diseases and agents in animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and indicator 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 Union 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 European Union 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 European Union Summary Reports on zoonoses and antimicrobial resistance that are published each year by EFSA.

The national report contains two parts: tables summarising data reported in the Data Collection Framework and the related text forms. The text forms were sent by email as pdf files and they are incorporated at the end of the report.

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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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ANIMAL POPULATION TABLES

Table Susceptible animal population

Animal species	Category of animals	Population animal
Cattle (bovine animals)	Cattle (bovine animals)	860,000
Gallus gallus (fowl)	Gallus gallus (fowl)	15,348,000
Pigs	Pigs	2,868,000
Small ruminants	Sheep and goats	1,890,000

DISEASE STATUS TABLES

DISEASE STATUS TABLES

PREVALENCE TABLES

Table Brucella:BRUCELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling Details	Method	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cattle (bovine animals) - Farm - Not Available - Not Available - Surveillance - Official sampling - Census	N_A	Not Available	animal	488587	13	Brucella abortus	13
	Sheep and goats - Farm - Not Available - Not Available - Surveillance - Official sampling - Census	N_A	Not Available	animal	1406330	8	Brucella melitensis	8

Table Campylobacter:CAMPYLOBACTER in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Meat from broilers (Gallus gallus) - carcase - chilled - Slaughterhouse - Not Available - Not Available - Surveillance - Official sampling - Objective sampling	slaughter animal batch	25	Gram	N_A	Not Available	131	29	Campylobacter, unspecified sp.	29
	Meat from poultry, unspecified - mechanically separated meat (MSM) - Processing plant - Not Available - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	10	Gram	N_A	Not Available	51	1	Campylobacter, unspecified sp.	1

Table COXIELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sampling Details	Method	Total units tested	Total units positive	N of clinical affected herds	Zoonoses	N of units positive
Not Available	Cattle (bovine animals) - Farm - Not Available - Not Available - Clinical investigations - Official sampling - Suspect sampling	animal	N_A	PCR	2	2		Coxiella burnetii	2
	Sheep - Farm - Not Available - Not Available - Clinical investigations - Official sampling - Suspect sampling	animal	N_A	PCR	36	36		Coxiella burnetii	36

Table Escherichia coli:ESCHERICHIA COLI in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Meat from bovine animals - minced meat - intended to be eaten cooked - Retail - Not Available - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	185	47	STEC O103	3
									STEC O116	1
									STEC O145	7
									STEC O157	11
									STEC O26	7
									STEC other than O157 O26 O103 O111 O145	18

Table HISTAMINE in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Total units tested	Total units positive	Method	Zoonoses	N of units tested	N of units positive
Not Available	Fish - Fishery products from fish species associated with a high amount of histidine - not enzyme maturated - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	100	Gram	N_A	57	0	<=100	Histamine	57	0
								>100 TO <=200	Histamine	57	0
								>200	Histamine	57	0

Table LISTERIA in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Total units tested	Total units positive	Method	Zoonoses	N of units tested	N of units positive
Not Available	Cheeses made from cows' milk - fresh - made from pasteurised milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	323	0	detection	Listeria monocytogenes	323	0
	Cheeses made from cows' milk - unspecified - made from raw or low heat-treated milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	48	1	detection	Listeria monocytogenes	48	1
	Cheeses made from cows' milk - unspecified - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	153	0	detection	Listeria monocytogenes	153	0
	Cheeses made from goats' milk - soft and semi-soft - made from pasteurised milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	70	0	detection	Listeria monocytogenes	70	0
	Cheeses made from goats' milk - soft and semi-soft - made from raw or low heat-treated milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	13	0	detection	Listeria monocytogenes	13	0
	Cheeses made from sheep's milk - soft and semi-soft - made from pasteurised milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	32	0	detection	Listeria monocytogenes	32	0
	Cheeses made from sheep's milk - soft and semi-soft - made from raw or low heat-treated milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	3	0	detection	Listeria monocytogenes	3	0
	Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	16	0	detection	Listeria monocytogenes	16	0
	Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	4	0	detection	Listeria monocytogenes	4	0
	Fish - smoked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	39	4	detection	Listeria monocytogenes	39	4
	Meat from bovine animals - meat products - fermented sausages - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	188	9	detection	Listeria monocytogenes	188	9
	Meat from other animal species or not specified - meat products - cooked, ready-to-eat - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	5	0	detection	Listeria monocytogenes	5	0
	Meat from other animal species or not specified - meat products - fermented sausages - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	8	0	detection	Listeria monocytogenes	8	0
	Meat from other animal species or not specified - meat products - raw and intended to be eaten raw - Retail - Not Available - Not Available - Surveillance - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	1	0	detection	Listeria monocytogenes	1	0
	Meat from pig - meat products - fermented sausages - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	222	3	detection	Listeria monocytogenes	222	3
	Milk, cows' - pasteurised milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	117	0	detection	Listeria monocytogenes	117	0
	Other processed food products and prepared dishes - sandwiches - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	89	1	detection	Listeria monocytogenes	89	1
	Other processed food products and prepared dishes - sushi - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	32	0	detection	Listeria monocytogenes	32	0

Table Mycobacterium:MYCOBACTERIUM in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling Details	Method	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cattle (bovine animals) - Farm - Not Available - Not Available - Surveillance - Official sampling - Census	N_A	Skin test	animal	854150	11	Mycobacterium bovis	11

Table Salmonella:SALMONELLA in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Dairy products (excluding cheeses) - butter - made from raw or low heat-treated milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	16	0	Salmonella	0
	Dairy products (excluding cheeses) - cream - made from raw or low heat-treated milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	4	0	Salmonella	0
	Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	44	0	Salmonella	0
	Dairy products (excluding cheeses) - milk powder and whey powder - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	42	0	Salmonella	0
	Egg products - dried - Processing plant - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	5	0	Salmonella	0
	Egg products - dried - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	5	0	Salmonella	0
	Egg products - liquid - Processing plant - Not Available - Not Available - Surveillance - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	1	0	Salmonella	0
	Meat from bovine animals - carcase - Slaughterhouse - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	slaughter animal batch	2000	Square centimetre	N_A	ISO 6579-1:2017 Salmonella	152	0	Salmonella	0
	Meat from bovine animals - meat preparation - intended to be eaten cooked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	10	Gram	N_A	ISO 6579-1:2017 Salmonella	106	2	Salmonella spp., unspecified	2
	Meat from broilers (Gallus gallus) - carcase - chilled - Slaughterhouse - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	slaughter animal batch	25	Gram	N_A	ISO 6579-1:2017 Salmonella	131	2	Salmonella spp., unspecified	2
	Meat from broilers (Gallus gallus) - fresh - chilled - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	368	4	Salmonella spp., unspecified	4
	Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	181	3	Salmonella spp., unspecified	3
	Meat from pig - carcase - Slaughterhouse - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	slaughter animal batch	2000	Square centimetre	N_A	ISO 6579-1:2017 Salmonella	162	0	Salmonella	0
	Meat from pig - meat preparation - intended to be eaten cooked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	10	Gram	N_A	ISO 6579-1:2017 Salmonella	181	5	Salmonella spp., unspecified	5
	Meat from pig - minced meat - intended to be eaten cooked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	10	Gram	N_A	ISO 6579-1:2017 Salmonella	236	4	Salmonella spp., unspecified	4
	Meat from poultry, unspecified - mechanically separated meat (MSM) - Processing plant - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	10	Gram	N_A	ISO 6579-1:2017 Salmonella	51	4	Salmonella spp., unspecified	4
	Meat from sheep - carcase - Slaughterhouse - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	slaughter animal batch	400	Square centimetre	N_A	ISO 6579-1:2017 Salmonella	25	0	Salmonella	0
	Meat from turkey - carcase - chilled - Slaughterhouse - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	slaughter animal batch	25	Gram	N_A	ISO 6579-1:2017 Salmonella	3	0	Salmonella	0
	Meat from turkey - meat preparation - intended to be eaten cooked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	15	1	Salmonella spp., unspecified	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Meat from turkey - minced meat - intended to be eaten cooked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	30	1	Salmonella spp., unspecified	1
	Meat, mixed meat - minced meat - intended to be eaten cooked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	10	Gram	N_A	ISO 6579-1:2017 Salmonella	163	4	Salmonella spp., unspecified	4
	Other products of animal origin - gelatin and collagen - Processing plant - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579-1:2017 Salmonella	8	1	Salmonella spp., unspecified	1

FOODBORNE OUTBREAKS TABLES

Foodborne Outbreaks: summarized data

when numbers referring to cases, hospitalized people and deaths are reported as unknown, they will be not included in the sum calculation

		Outbreak strenght	Strong				Weak			
Causative agent	Food vehicle		N outbreaks	N human cases	N hospitalized	N deaths	N outbreaks	N human cases	N hospitalized	N deaths
Campylobacter, unspecified sp.	Meat and meat products		1	5	0	0				
Salmonella Enteritidis	Meat from broilers (Gallus gallus)		1	24	3	0				
Salmonella group C1	Meat and meat products						2	18	0	0

Strong Foodborne Outbreaks: detailed data

Causative agent	H	AG	VT	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Campylobacter, unspecified sp.	unk	Not Available	Not Available	Not Available	N_A	General	Meat and meat products	N_A	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans;Descriptive epidemiological evidence	School or kindergarten	Unknown	Not Available	Other contributory factor	N_A	1	5	0	0
Salmonella Enteritidis	unk	Not Available	Not Available	Not Available	N_A	General	Meat from broilers (Gallus gallus)	Fried chicken wings	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans;Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans;Descriptive epidemiological evidence;Descriptive epidemiological evidence	Canteen or workplace catering	Not Available	Not Available	Other contributory factor	N_A	1	24	3	0

Weak Foodborne Outbreaks: detailed data

Causative agent	H	AG	VT	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Salmonella group C1	unk	Not Available	Not Available	Not Available	N_A	General	Meat and meat products	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Other contributory factor	N_A	1	10	0	0
						Household	Meat and meat products	N_A	Descriptive epidemiological evidence	Domestic premises	Household	Not Available	Other contributory factor	N_A	1	8	0	0

ANTIMICROBIAL RESISTANCE TABLES FOR CAMPYLOBACTER

ANTIMICROBIAL RESISTANCE TABLES FOR SALMONELLA

ANTIMICROBIAL RESISTANCE TABLES FOR INDICATOR ESCHERICHIA COLI

OTHER ANTIMICROBIAL RESISTANCE TABLES

Specific monitoring of ESBL-/AmpC-/carbapenemase-producing bacteria and specific monitoring of carbapenemase-producing bacteria, in the absence of isolate detected

No data returned for this view. This might be because the applied filter excludes all data.

Specific monitoring of ESBL-/AmpC-/carbapenemase-producing bacteria and specific monitoring of carbapenemase-producing bacteria, in the absence of isolate detected

Latest Transmission set

Table Name	Last submitted dataset transmission date
Animal Population	25-Jul-2022
Food Borne Outbreaks	25-Jul-2022
Prevalence	25-Jul-2022

ZOONOSES MONITORING

SERBIA

TEXT FORMS FOR THE TRENDS AND SOURCES OF ZOONOSES AND ZOONOTIC AGENTS IN FOODSTUFFS, ANIMALS AND FEEDINGSTUFFS

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

IN 2021

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1. Institutions and Laboratories involved in zoonoses monitoring and reporting

Veterinary Directorate, Ministry of Agriculture, Forestry and Water management is responsible for reporting the data to EFSA. Collections of most zoonoses data reported in 2021 are going through Central data base of Veterinary Directorate. Some data are collect manually and that process goes though Veterinary Institutes who are involved in the process of laboratory testing.

Ten Veterinary Specialized Institutes and two Scientific Veterinary Institutes, on the basis of territorial jurisdiction (in epizootiological area for which they are established) covering the whole region of Republic of Serbia, continuously involved in preventing the occurrence, early detection, spread, monitoring and control of animal health situation also were involved in process of collecting the zoonoses data. Some of the Institute are National reference laboratory for some diseases, depending on causative agents.

Veterinary Institutes which are involved:

Veterinary Specialized Institutes “Subotica”, Veterinary Specialized Institutes “Sombor”, Veterinary Specialized Institutes “Šabac”, Veterinary Specialized Institutes “Zrenjanin”, Veterinary Specialized Institutes “Pančevo”, Veterinary Specialized Institutes “Jagodina”, Veterinary Specialized Institutes “Požarevac”, Veterinary Specialized Institutes “Zaječar”, Veterinary Specialized Institutes “Kraljevo”, Veterinary Specialized Institutes “Niš”, Scientific Veterinary Institute “Novi Sad” and Scientific Institute of Veterinary Medicine of Serbia and Pasteur Institute in Novi Sad.

Veterinary Directorate/VD, Ministry of Agriculture, Forestry and Water Management is responsible for reporting the prevalence data on food-borne pathogens in food to EFSA on annual basis.
The surveillance program is based on the Regulation EC, No. 2073/2005 and assessed microbiological risks from previous years. In accordance with surveillance program for followed year, the official veterinary inspectors/VI from each region for randomly providing sampling on the spot, send these sample to the authorized laboratories, which are obliged to send back results to the VI. All data gathered at regional level are sent to the Veterinary Directorate where the data are aggregated.

Laboratory analysis of samples can be done in one of the 16 laboratories which filled out the necessary conditions and which had been authorized through public procurement by side of VD.
Laboratories that meet the requirements for laboratory testing in the field of food and feed safety are: Veterinary Specialistic Institute “Subotica”, Veterinary Specialistic Institute “Sombor”, Veterinary Specialistic Institute “Šabac”, Veterinary Specialistic Institute “Zrenjanin”, Veterinary Specialistic Institute “Pančevo”, Veterinary Specialistic Institute “Jagodina”, Veterinary Specialistic Institute “Zaječar”, Veterinary Specialistic Institute “Kraljevo”, Veterinary Specialistic Institute “Niš”, Scientific Veterinary Institute “Novi Sad” and Scientific Veterinary Institute of Serbia, “Institute for the Meat Hygiene and Technology”; “Centar za ispitivanje namirnica/Centre for Food Tasting”; “Jugoinspekt” Belgrade d.o.o; “SP Laboratory”; “Profilab DOO”.

Data for foodborne outbreaks are collected by the Institute of Public Health of Serbia „Dr. Milan Jovanovic Batut”, District Institutes of Public Health, reference laboratories for zoonotic diseases (a number of different laboratories in institutes of public health, Institute of Virology, Vaccines and Sera “Torlak” Belgrade, Medical faculty in Belgrade, Clinical Center of Serbia, Pasteur Institute in Novi Sad, Institute for medical research Belgrade, Institute “INEP” Zemun), hospitals, primary health care institutions, and other medical institutions in accordance with Law for protection of the population against communicable diseases.

FBOs are investigated at the district level by an epidemiology team of district public health Institutes. Laboratory tests are provided by either microbiological laboratories of district institutes or by reference laboratories for different agents. Institute of Public Health of Serbia aggregates all reported data,

analyse and disseminates reports on a weekly, monthly and annual basis to all relevant public health authorities/partners.

Short description of the institutions and laboratories involved in data collection and reporting

2. Animal population

2.1. Sources of information and the date(s) (months, years) the information relates to [(a)]

Source of data on animal population is Statistical Office of the Republic of Serbia. Data are for 2021.

2.2. Definitions used for different types of animals, herds, flocks and holdings as well as the production types covered

Number of herds for cattle, pigs and sheep and goats are the same as number of holdings. One herd is considering as one holding.

(a): National identification and registration system(s), source of reported statistics (Eurostat, others)
(b): Link to website with density maps if available, tables with number of herds and flocks according to geographical area

3. General evaluation: *Mycobacterium tuberculosis* complex (MTC) in animal - Cattle (bovine animals)

3.1. History of the disease and/or infection in the country[(a)]

Serbia is not recognized as country officially tuberculosis free according to Directive 64/432/EEC

* **For each zoonotic agent**
(a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official "disease status" to be specified for the whole country and/or specific regions within the country
(b): If applicable

4. General evaluation: *Brucella abortus* in animal - Cattle (bovine animals)

1. History of the disease and/or infection in the country

Serbia is not recognized as country officially bovine brucellosis free according to Directive 64/432/EEC.

5. General evaluation: *Brucella melitensis* in animal - Sheep and goats

1. History of the disease and/or infection in the country

Serbia is not recognized as country officially ovine/caprine brucellosis free.

6. General evaluation: *Salmonella* in humans

1. History of the disease and/or infection in the country[(a)]

The most frequent zoonotic agent in humans.

2. Evaluation of status, trends and relevance as a source for humans

Total number of reported cases was 678 in 2021. Annual notification rate for 2021 was 9.8.
A decreasing trend of reported cases during the last decade.

7. General evaluation: *Campylobacter* in humans

1. History of the disease and/or infection in the country[(a)]

More frequent in northern parts of the country.

2. Evaluation of status, trends and relevance as a source for humans

Total number of reported cases was 444 in 2021. One outbreak (household). Annual notification rate for 2021 was 6,4.
Increasing trend of reported cases during last decade.

8. General evaluation: Anthrax in humans

1. History of the disease and/or infection in the country[(a)]

No human cases in 2021 (4 human cases (only cutaneous form) in 10 years, no deaths reported)

9. General evaluation: Leptospirosis in humans

1. History of the disease and/or infection in the country[(a)]

3 cases, 1 death

2. Evaluation of status, trends and relevance as a source for humans

Decreasing trend of the notification rate over the last decade.

10. General evaluation: Trichinellosis in humans

1. History of the disease and/or infection in the country[(a)]

No registered cases in humans in 2021.

2. Evaluation of status, trends and relevance as a source for humans

Decreasing trend over the last decade.

11. General evaluation: Echinococcosis in humans

1. History of the disease and/or infection in the country[(a)]

4 registered cases in 2021, no deaths.

2. Evaluation of status, trends and relevance as a source for humans

Decreasing trend of the notification rate over the last decade.

12. General evaluation: Brucellosis in humans

1. History of the disease and/or infection in the country[(a)]

1 human case in 2021.

2. Evaluation of status, trends and relevance as a source for humans

Notification rate varies from year to year.

13. General evaluation: Toxoplasmosis in humans

1. History of the disease and/or infection in the country[(a)]

13 reported cases in 2021.

14. General evaluation: Q fever in humans

1. History of the disease and/or infection in the country[(a)]

No human cases in last year.

2. Evaluation of status, trends and relevance as a source for humans

During the last decade most reports came from four subnational territories. In other regions rarely diagnosed. Significantly higher incidence rates recorded in 2012 and 2013;

15. General evaluation: Tularemia in humans

1. History of the disease and/or infection in the country[(a)]

1 case in 2021.

2. Evaluation of status, trends and relevance as a source for humans

Incidence of the disease varies from one year to another. Significant outbreaks registered in 2014, 2015 and 2019.

16. FOOD PREVALENCE DATA

16.1. General evaluation: *Salmonella* in poultry meat

1. History of the disease and/or infection in the country[)]

368 total units tasted in 2021, from retail.
The matrix was meat from broilers (Gallus Gallus), fresh-chilled.
Sampling unit is batch.
4 units positive on Salmonella spp. unspecified.

16.2. General evaluation: Shigatoxin *E.coli* in bovine minced meat

1. History of the disease and/or infection in the country[)]

185 total units tasted in 2021, from retail.
The matrix was minced bovine meat, intended to be eaten cooked.
Sampling unit is batch.
47 total units positive on E. coli:

- 13 STEC other than O157 O26 O103 O111 O145, positive adhesion gene;
- 5 STEC other than O157 O26 O103 O111 O145, negative adhesion gene;
- 10 STEC O157, positive adhesion gene;
- 1 STEC O157, negative adhesion gene;
- 5 STEC O26, positive adhesion gene;
- 2 STEC O26, negative adhesion gene;
- 7 STEC O145, positive adhesion gene;
- 1 STEC O111, positive adhesion gene;
- 3 STEC O103, positive adhesion gene.

16.3. General evaluation: *Salmonella* in pig minced meat

1. History of the disease and/or infection in the country)

236 total units tasted in 2021, from retail.
The matrix was minced pig meat, intended to be eaten cooked.
Sampling unit is batch.
4 units positive on Salmonella spp. unspecified.

16.4. General evaluation: *Salmonella* in mechanically separated meat (MSM)

1. History of the disease and/or infection in the country)

51 total units tasted in 2021, from processing plant.
The matrix was mechanically separated poultry meat.
Sampling unit is batch.
4 units positive on Salmonella spp., unspecified.
1 unit positive on Campylobacter, unspecified sp.

16.5. General evaluation: *Salmonella* in turkey minced meat

1. History of the disease and/or infection in the country)

30 total units tasted in 2021, from retail.
The matrix was turkey minced meat, intended to be eaten cooked.
Sampling unit is batch.
1 unit positive on Salmonella spp., unspecified.

16.6. General evaluation: *Salmonella* in mixed minced meat

1. History of the disease and/or infection in the country)

163 total units tasted in 2021, from retail.
The matrix was minced mixed meat, intended to be eaten cooked.
Sampling unit is batch.
4 units positive on Salmonella spp., unspecified.

16.7. General evaluation: *Salmonella* in bovine preparation meat

1. History of the disease and/or infection in the country)

106 total units tasted in 2021, from retail.
The matrix was meat preparation from bovine intended to be eaten cooked.
Sampling unit was batch.
2 units positive on Salmonella spp., unspecified.

16.8. General evaluation: *Salmonella* in pig preparation meat

1. History of the disease and/or infection in the country)

181 total units tasted in 2021, from retail.
The matrix was meat preparation from pigs intended to be eaten cooked.
Sampling unit was batch.
5 total units positive on Salmonella spp. unspecified.

16.9. General evaluation: *Salmonella* in turkey meat preparation

1. History of the disease and/or infection in the country)

15 total units tasted in 2021, from retail.
The matrix was meat preparation from turkey intended to be eaten cooked.
Sampling unit was batch.
1 total unit positive on Salmonella spp. unspecified.

16.10. General evaluation: *Salmonella* in broilers meat preparation

1. History of the disease and/or infection in the country)

181 total units tasted in 2021, from retail.
The matrix was meat preparation from broilers (Gallus Gallus), intended to be eaten cooked.
Sampling unit was batch.
3 total units positive on Salmonella spp. unspecified.

16.11. General evaluation: *Listeria monocytogenes* in meat or meat products, raw

1. History of the disease and/or infection in the country)

1 total units tasted in 2021, from retail.
The matrix was meat from other animal species or not specified meat products, raw and intended to be eaten raw.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.12. General evaluation: *Listeria monocytogenes* in meat and meat products, cooked

1. History of the disease and/or infection in the country)

5 total units tasted in 2021, from retail.
The matrix was meat from other animal species or not specified meat products, cooked, ready-to-eat.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.13. General evaluation: *Listeria monocytogenes* in bovine meat products

1. History of the disease and/or infection in the country)

188 total units tasted in 2021, from retail
The matrix was meat from bovine animals in meat products, fermented sausages.
Sampling unit was single.
9 total units positive on Listeria monocytogenes.

16.14. General evaluation: *Listeria monocytogenes* in pig meat products

1. History of the disease and/or infection in the country)

222 total units tasted in 2021, from retail.
The matrix was pig meat in meat products, fermented sausages.
Sampling unit was single.
3 total units positive on Listeria monocytogenes.

16.15. General evaluation: *Listeria monocytogenes* in meat from other animal species

1. History of the disease and/or infection in the country)

8 total units tasted in 2021, from retail.
The matrix was meat from other animal species or not specified meat products, fermented sausages.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.16. General evaluation: *Listeria monocytogenes* in cows' milk

1. History of the disease and/or infection in the country)

117 total units tasted in 2021, from retail.
The matrix was cows' pasteurised milk.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.17. General evaluation: *Listeria monocytogenes* in cheese from cows' milk

1. History of the disease and/or infection in the country)

48 total units tasted in 2021, from retail.
The matrix was cheese made from cows' milk- unspecified, made from raw or low heat-treated milk.
Sampling unit was single.
1 total unit positive on Listeria monocytogenes.

16.18. General evaluation: *Listeria monocytogenes* in cheese from cows' milk, unspecified

1. History of the disease and/or infection in the country)

153 total units tasted in 2021, from retail.
The matrix was cheese made from cows' milk-unspecified.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.19. General evaluation: Listeria monocytogenes in cheese from sheep's milk

1. History of the disease and/or infection in the country)

3 total units tasted in 2021, from retail.
The matrix was cheese made from sheep's milk, soft and semi soft, made from raw or low heat-treated milk.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.20. General evaluation: *Listeria monocytogenes* in cheese from goats' milk

1. History of the disease and/or infection in the country)

13 total units tasted in 2021, from retail.
The matrix was cheese made from goats' milk, soft and semi soft, made from raw or low heat-treated milk.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.21. General evaluation: *Listeria monocytogenes* in cheese from cows' pasteurised milk

1. History of the disease and/or infection in the country)

323 total units tasted in 2021, from retail.
The matrix was cheese made from fresh cows' milk, made from pasteurised milk.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.22. General evaluation: *Listeria monocytogenes* in cheese from sheep's pasteurised milk

1. History of the disease and/or infection in the country)

32 total units tasted in 2021, from retail.
The matrix was cheese made from sheep's milk, soft and semi soft, made from pasteurised milk.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.23. General evaluation: *Listeria monocytogenes* in cheese from goat's pasteurised milk

1. History of the disease and/or infection in the country)

70 total units tasted in 2021, from retail.
The matrix was cheese made from goat's milk, soft and semi soft, made from pasteurised milk.
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.24. General evaluation: *Salmonella* in dairy products (excluding cheeses), ice-cream

1. History of the disease and/or infection in the country)

44 total units tasted in 2021, from retail.
The matrix was dairy products (excluding cheeses), ice-scream made from pasteurised milk.
Sampling unit was batch.
0 total unit positive on Salmonella spp.

16.25. General evaluation: *Salmonella* in dairy products (excluding cheeses), milk and whey powder

1. History of the disease and/or infection in the country)

42 total units tasted in 2021, from retail.
The matrix was dairy products (excluding cheeses), milk powder and whey powder
Sampling unit was batch.
0 total unit positive on Salmonella spp.

16.26. General evaluation: *Salmonella* in dairy products (excluding cheeses), butter

1. History of the disease and/or infection in the country)

16 total units tasted in 2021, from retail.
The matrix was dairy products (excluding cheeses), butter made from raw or low treated milk
Sampling unit was batch.
0 total unit positive on Salmonella spp.

16.27. General evaluation: *Listeria monocytogenes* in dairy products (excluding cheeses), butter

1. History of the disease and/or infection in the country)

16 total units tasted in 2021, from retail.
The matrix was dairy products (excluding cheeses), butter made from raw or low treated milk
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.28. General evaluation: *Salmonella* in dairy products (excluding cheeses), cream

1. History of the disease and/or infection in the country)

4 total units tasted in 2021, from retail.
The matrix was dairy products (excluding cheeses), cream made from raw or low heat treated milk
Sampling unit was batch.
0 total unit positive on Salmonella spp.

16.29. General evaluation: *Listeria monocytogenes* in dairy products (excluding cheeses), cream

1. History of the disease and/or infection in the country)

4 total units tasted in 2021, from retail.
The matrix was dairy products (excluding cheeses), cream made from raw or low heat treated milk
Sampling unit was single.
0 total unit positive on Listeria monocytogenes.

16.30. General evaluation: *Salmonella* in eggs, liquid

1. History of the disease and/or infection in the country)

1 total unit tasted in 2021, from processing plant.
The matrix was liquid egg products.
Sampling unit was batch.
0 total unit positive on Salmonella spp.

16.31. General evaluation: *Salmonella* in eggs, dried

1. History of the disease and/or infection in the country)

1 total unit tasted in 2021, from processing plant;
4 total units tasted in 2021, from retail.
The matrix was dried egg products.
Sampling unit was batch.
0 total unit positive on Salmonella spp.

16.32. General evaluation: *Listeria monocytogenes* in smoked fish

1. History of the disease and/or infection in the country)

39 total units tasted in 2021, from retail.
The matrix was smoked fish.
Sampling unit was single.
4 total units positive on Listeria monocytogenes.

16.33. General evaluation: Histamine in fish

1. History of the disease and/or infection in the country)

57 total units tasted in 2021, from retail.
The matrix was fish-fishery products from fish species associated with a high amount of histidine-not enzyme maturated
Sampling unit was single.
0 total unit positive on Histamine.

16.34. General evaluation: *Listeria monocytogenes*, sandwiches

1. History of the disease and/or infection in the country)

89 total units tasted in 2021, from retail.
The matrix was other processed food products and prepared dishes-sandwiches
Sampling unit was single.
1 total unit positive for Listeria monocytogenes.

16.35. General evaluation: *Listeria monocytogenes*, sushi

1. History of the disease and/or infection in the country)

32 total units tasted in 2021, from retail.
The matrix was other processed food products and prepared dishes- sushi.
Sampling unit was single.
0 total unit positive for Listeria monocytogenes.

16.36. General evaluation: *Salmonella* in gelatine and collagen

1. History of the disease and/or infection in the country)

8 total units tasted in 2021, from retail.
The matrix was other products of animal origin-gelatine and collagen.
Sampling unit was batch.
1 total unit positive on Salmonella spp., unspecified.

16.37. General evaluation: *Salmonella* from bovine carcases

1. History of the disease and/or infection in the country)

152 total units tasted in 2021, from slaughterhouses.
The matrix was bovine carcases.
Sampling unit was slaughter animal batch.
0 total unit positive on Salmonella spp.

16.38. General evaluation: *Salmonella* from pig carcases

1. History of the disease and/or infection in the country)

162 total units tasted in 2021, from slaughterhouses.
The matrix was pig carcases.
Sampling unit was slaughter animal batch.
0 total unit positive on Salmonella spp.

16.39. General evaluation: *Salmonella* from sheep carcases

1. History of the disease and/or infection in the country)

25 total units tasted in 2021, from slaughterhouses.
The matrix was sheep carcases.
Sampling unit was slaughter animal batch.
0 total unit positive on Salmonella spp.

16.40. General evaluation: *Salmonella* from broilers carcases

1. History of the disease and/or infection in the country)

131 total units tasted in 2021, from slaughterhouses.
The matrix was meat from broilers (Gallus Gallus) chilled carcases
Sampling unit was slaughter animal batch.
2 total units positive on Salmonella spp., unspecified.

16.41. General evaluation: Campylobacter from broilers carcases

1. History of the disease and/or infection in the country)

131 total units tasted in 2021, from slaughterhouses.
The matrix was meat from broilers (Gallus Gallus) chilled carcases.
Sampling unit was slaughter animal batch.
29 total units positive for Campylobacter, unspecified sp.

16.42. General evaluation: Salmonella from turkey carcases

1. History of the disease and/or infection in the country)

3 total units tasted in 2021, from slaughterhouses.
The matrix was meat from turkey chilled carcases.
Sampling unit was slaughter animal batch.
0 total unit positive on Salmonella spp.

17. Description of Monitoring/Surveillance/Control programmes system: Please add the matrix and zoonotic agent - Prevalence data of food –borne pathogens

17.1. Monitoring/Surveillance/Control programmes system(a)

Reporting of prevalence data of food-borne pathogens in Serbia is regulated by the Law of Food Safety (OG RS No.41/09 and 17/19), the Rulebook on determining the Program for Monitoring Food Safety of animal origin (OG RS No.69/21), and the Rulebook on General and Special conditions of Food Hygiene in any phase of production, processing and trade (OG RS No.72/10 and 62/18)- Microbiological Criteria for food.
The Rulebook on General and Special conditions of Food Hygiene in any phase of production, processing and trade (OG RS No.72/10 and 62/18) is in accordance with Commission Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs.
According to the above mentioned regulations each foodborne pathogen is reported to the Veterinary Directorate, Ministry of Agriculture, Forestry and Water Management

Surveillance program in accordance with Rulebook determining the Program for Monitoring Food Safety of animal origin (OG RS No.69/21) is implementing every year and covers all foods from animal origin which are produced on the Republic of Serbia:
1) production
2) storage and distribution
3) products of animal origin
Also this Programme includes the food of animal origin which is import into the Republic of Serbia:
1) mechanically separated meat
2) milk powder and whey powder
3) liquid eggs products
4) fish
5) cooked fishery products
6) gelatine and collagen
Surveillance program is prepared related to:

- data on unsafe food on the local market, at the regions and from imports
- production and consumption data on food of animal origin
- previously identified non-compliances data during official controls of food of animal origin
- information from RASFF system

Surveillance program contains a monitoring plan for taking samples for microbiological and chemical testing and conditions for taking and storing the samples, laboratory methods and the way of reporting.

Sampling strategySampling strategy is in accordance to the Rulebook on determining the Program for Monitoring Food Safety of animal origin (OG RS No.69/21) and National Guideline on microbiological criteria for food, as well as international standards for sampling (e.g. ISO).

The type and choice of samples, place in production or distribution, temperature of storage and transport are based on risk assessment and prescribed in documents mentioned above.
Samples are taken by Veterinary inspector.

In case of determination of microbiological, chemical and biological hazards, targeted and enforced sampling is performed, in amount of five sample units.

17.2. Measures in place[(b)]

This surveillance program contains the measures that should be taken in the case of findings of microbiology, chemical and biological contaminants and in line with legislation which regulates official controls.
These measures include:

- providing the additional, enforced official sampling which CA considers necessary to check food safety,
- the prohibition of placing the targeted food on the market,
- measures permitting the use of food of animal origin for a purpose other than food for human consumption.
- taking into account previous cases of non-compliance by the same food business operator and the degree (level) of non-compliance.

17.3. Notification system in place to the national competent authority[(c)]

Yes.

* **For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent**

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, limit of detection of the method, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.
(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.
(c): Mandatory: Yes/No.
(d): Minimum five years.
(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

18. Description of Monitoring/Surveillance/Control programmes system: *Mycobacterium* tuberculosis complex (MTC) in animal - Cattle (bovine animals)

18.1 Monitoring/Surveillance/Control programmes system

With the purpose of early detection of tuberculosis and determining the status of a farm a free from tuberculosis, diagnostic tests of all bovine animals older than 6 weeks in performed by application of intradermal tuberculin tests. Tuberculin skin test is performed by authorized veterinary organizations. Skin fold thickness on each spot of application is measured again 72 hours (4 hours) after application, and measured value is registered in the records. All slaughtered bovine animals and pigs will be tested for presence of post-mortem lesions typical for tuberculosis. In case during the inspection at a slaughterhouse changes on internal organs (lungs, lymph nodes, bones, etc.) typical for tuberculosis are noticed, samples taken from slaughtered animals are to be delivered to authorized laboratory for tuberculosis for further tests. Slaughterhouse prepares separate report on every determined case of tuberculosis in bovine animals and pigs and notifies the veterinary inspector on the place of origin of infected animal. With the purpose of determining the greatest possible number of infected animals in the herd, epidemiological unit or area, apart from tuberculin tests, gamma-interferon test can also be used in the manner prescribed in the last edition of OIE Manual of Standards for Diagnostic Tests and Vaccines.

Bovine animals are subject to diagnostic tests one a year. Bovine animals are tested tuberculosis whereas period since previous test must not be less than 6 and more than 12 months.

Case definition
According the Rule book laying down establishing measures for early detection, diagnostics, prevention of spread, control and eradication of infective disease bovine tuberculosis, methods of their enforcement, including method for establishing status of holding free of bovine tuberculosis(Official Gazette RS, number 51/09) Confirmed case of bovine tuberculosis is confirmation of disease, if one of the following conditions is met:
1) diagnostic method of intra-dermal tuberculin application had established positive reaction;
2) laboratory testing of secretions, excretions or tissues establishes existence of bovine tuberculosis cause (Mycobacterium bovis or other micro-bacteria species belonging to M. Tuberculosis complex);
3) pathoanatomical examination establishes pathomorphological changes specific for tuberculosis, and laboratory testing establishes existence of bovine tuberculosis cause (Mycobacterium bovis or other micro-bacteria species belonging to M. Tuberculosis complex);
4) veterinary-hygiene examination on slaughtering establishes pathomorphological changes specific for tuberculosis, and laboratory testing establishes existence of bovine tuberculosis cause (Mycobacterium bovis or other micro-bacteria species belonging to M. Tuberculosis complex).

18.2. Measures in place

Cattle where tuberculosis was confirmed shall not be treated. Animals with confirmed tuberculosis are dispatched as soon as possible and within 30 days at the latest to a slaughterhouse by the competent veterinary inspector. In case the animals cannot be dispatched to slaughter, inspector may approve their killing in welfare manner.

18.3. Notification system in place to the national competent authority

Yes

19. Description of Monitoring/Surveillance/Control programmes system: *Brucella abortus* in animal - Cattle (bovine animals)

19.1. Monitoring/Surveillance/Control programmes system

Diagnostic tests of bovine animals, except fattening bulls, are performed in all animals older than 12 months. Competent scientific and specialist veterinary institutes perform diagnostic tests of properly labelled samples of blood serum of bovine animals by application of fast methods (fast serum agglutination, that is, Rose Bengal test or fluorescence polarization) and in case of positive test result, by application of confirmation serological method (indirect ELISA). In case of positive test results, sampling is repeated with the presence of epidemiologist and veterinary inspector and confirmation tests for presence of specific antibodies against Brucella by serological method (competitive ELISA or RVK) are performed at competent veterinary institute. Bovine animals with confirmed infection by brucellosis are immediately, or within 7 days at the latest, slaughtered in welfare manner, with the presence of veterinary inspector, and the carcasses are disposed in proper manner. Upon implementation of measures state above, repeated tests shall be performed in all seronegative bovine animals two times at an interval of 30 days, to determine the spread of the disease.

Type of specimen taken
The identification of the bovine Brucella by modified acid-fast or immune specific staining of organisms of Brucella morphology in abortion material, vaginal discharge or milk provides a credible evidence of brucellosis, especially in conjunction with immunological testing. The methods of polymerase chain reaction may be used as additional diagnostic tool for identifying the virus. When possible, Brucella spp. Shall be isolated by application of simple or selective media; by cultivating the discharge from uterus, aborted fetuses, secrete from udder or tissues such as lymphatic glands and reproductive male and female organs. After isolation, the species and biovar should be identified by phagelysis, oxidative metabolism tests, cultural, biochemical and serological criteria. Polymerase chain reaction may serve as an additional method and as biotype method based on genomic sequences. The techniques and media used, their standardization and the interpretation of results must conform to that specified in the OIE Manual of Standards for Diagnostic Tests and Vaccines for Terrestrial Animals.

19.2. Measures in place

Measures in case of the positive findings or single cases
In case brucellosis is suspected, the veterinary inspector shall immediately order taking of blood samples and diagnostic testing in order to confirm or rule out the presence of brucellosis in the herd. In case the contagious disease of bovine brucellosis is suspected the following measures shall be taken:
1. The herd shall be put under surveillance;
2. A ban shall be placed on introducing new animals into the herd or placing animals from the herd on the market, with the exception of situations where animals must be sent for emergency slaughter;
3. Separation and isolation within the herd, of animals suspected to have brucellosis;
4. A ban shall be placed on insemination and natural mating of animals suspected to have brucellosis;
5. A ban shall be placed on using the milk from cows suspected to have brucellosis; Measures provided above shall be applied until official confirmation of bovine brucellosis is ruled out in a herd.
When bovine brucellosis has been officially confirmed in a herd, the veterinary inspector, in addition to the above measures, orders the following measures for prevention of spreading and control of disease on the infected holding:
1. Separation and isolation of animals officially confirmed to have brucellosis and animals those were in contact with infected animals;
2. Killing of infected animals and harmless disposal of carcasses under the supervision of the veterinary inspector within 7 days;
3. Immediate diagnostic testing for brucellosis of all susceptible animals on the holding;
4. Prohibition of use of milk from all diseased cows from the infected herd;
5. Urgent harmless disposal and destruction of aborted fetuses, stillborn calves, and calves died of Brucellosis after calving, as well as placentas, unless they are intended for diagnostic examination;

6. Disinfection and harmless disposal of hay, manure and upper layers of ground, as well as other objects that have come in contact with the infected animal, placentas or other infected material;
7. Packing or disinfection and disposal of manure from the infected objects at a site inaccessible to animals. Disinfection of liquid feces of infected animals and prohibition of using manure as a fertilizer for at least three weeks.

Vaccination policy
Bovine animals shall not be vaccinated against brucellosis.

19.3. Notification system in place to the national competent authority

Yes

20. Description of Monitoring/Surveillance/Control programmes system: *Brucella melitensis* in animal - Sheep and goats

20.1. Monitoring/Surveillance/Control programmes system

Diagnostic tests of sheep and goats are performed in all animals older than six months. Competent scientific and specialist veterinary institutes perform diagnostic tests of properly labelled samples of blood serum of sheep and goats by application of fast methods (fast serum agglutination, that is, Rose Bengal test or fluorescence polarization) and in case of positive test result, by application of confirmation serological method (indirect ELISA). Samples taken from rams are specially labelled. All stud rams are tested for infection by B. ovis (Epididymitis). In case of positive test results, sampling is repeated with the presence of epidemiologist and veterinary inspector and confirmation tests for presence of specific antibodies against Brucella by serological method (competitive ELISA or RVK) are performed at competent veterinary institute. Sheep and goats with confirmed infection by brucellosis are immediately, or within 7 days at the latest, slaughtered humanely, with the presence of veterinary inspector, and the carcasses are disposed in proper manner. Upon implementation of measures stated in the paragraph 7 of this section, repeated tests shall be performed in all seronegative sheep and goats two times at an interval of 30 days, to determine the spread of the disease.

Sheep and goats are subject to diagnostic tests one a year. Sheep and goats are tested for brucellosis, whereas period since previous test must not be less than 6 and more than 12 months.

20.2. Measures in place

When brucellosis in sheep and goat has been officially confirmed in a herd, the veterinary inspector orders the following measures for prevention of spreading and control of disease on the infected holding:
1. Separation and isolation of animals officially confirmed to have brucellosis and animals those were in contact with infected animals;
2. Killing of infected animals and harmless disposal of carcasses under the supervision of the veterinary inspector;
3. Slaughter or killing all seronegative animals in the positive herd.
4. Immediate diagnostic testing for brucellosis of all susceptible animals on the holding;
5. Disinfection and harmless disposal of hay, manure and upper layers of ground, as well as other objects that have come in contact with the infected animal, placentas or other infected material;
6. Packing or disinfection and disposal of manure from the infected objects at a site inaccessible to animals.

20.3. Notification system in place to the national competent authority

Yes

21. Food-borne Outbreaks

21.1.System in place for identification, epidemiological investigations and reporting of food-borne outbreaks

Reporting of foodborne outbreaks in Serbia is regulated by the Law on Protection of the Population from Communicable Diseases (OG RS No. 15/2016, 68/2020 i 136/2020) and the Rulebook on reporting of Communicable Diseases or other cases laid down by the Law on Protection of the Population from Communicable Diseases (OG RS No. 44/2017 and 58/2018).
According to the above-mentioned regulations each foodborne outbreak (FBO) has to be reported to the Center for Prevention and Control of Communicable Diseases of the Institute of Public Health of Serbia by Public Health Institute at district level, immediately after the outbreak is detected.

FBOs are investigated at district level by epidemiology teams of district public health institute. They also cooperate with and notify sanitary and veterinary inspection (if food of animal origin is suspected to be a source of an outbreak). This approach also enables environmental analysis (inspection of food facilities) and taking samples for laboratory investigation.

21.2. Description of the types of outbreaks covered by the reporting

3 food-borne outbreaks were caused by *Salmonella,* affecting 42 people. (in one outbreak the agent was Salmonella enteritidis and in the other two outbreaks the agent was identified as Salmonella group C1).
There was one outbreak caused with Campylobacter, with 5 cases in one household.
No deaths were reported in relation with food-borne outbreaks.

21.3. National evaluation of the reported outbreaks in the country[(a)]

Food items suspected or confirmed as a source of food-borne outbreaks were meat and meat products in 3 cases, while in one outbreak fried chicken wings were source of the infection. One outbreak was in a household setting, and other were taking place in a restaurant, canteen at workplace and in a kindergarten.
In 2 of 4 registered food-borne outbreaks causative agent was detected in both food and from ill persons, while in other two outbreaks conclusions about food as a source of the infections was suggested by clinical and epidemiological investigations and by descriptive epidemiological evidence.

21.4. Descriptions of single outbreaks of special interest

There was no single food-borne outbreak of special interest last year. All outbreaks had common epidemiological and clinical characteristics.

21.5. Control measures or other actions taken to improve the situation

Education of population on safe practices regarding food preparation and storage, veterinary and phytosanitary measures related to food production, transport and trade, control of general hygiene and other conditions in food production, transport and trade, introduction and control of implementation of standards in food production and processing in all facilities where food is publicly served to the population (hotels, restaurants, cafes, schools and kindergartens, hospitals, residential facilities, canteens etc. Early detection and treatment of persons infected by agents that could be transmitted by food, in particularly if they are involved in food production and processing.

(a): Trends in numbers of outbreaks and numbers of human cases involved, relevance of the different causative agents, food categories and the agent/food category combinations, relevance of the different type of places of food production and preparation in outbreaks, evaluation of the severity of the human cases.