

Serbia

TRENDS AND SOURCES OF ZOONOSES AND  
ZOOTIC AGENTS  
IN FOODSTUFFS, ANIMALS AND  
FEEDSTUFFS

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

IN 2023

## 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 2023.

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)	725,000
Gallus gallus (fowl)	Gallus gallus (fowl)	13,913,000
Pigs	Pigs	2,141,000
Small ruminants	Sheep and goats	1,864,000

**DISEASE STATUS TABLES**

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

**DISEASE STATUS TABLES**

PREVALENCE TABLES

Table BRUCELLA:Brucella in animal

Area of sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler						total units tested	total units positive	Zoonoses	N units positive			
	- Sampling strategy												
Not Available	Cattle (bovine animals) - Farm - Not Available - Not Available - Surveillance - Official sampling - Census						N_A	Not Available	animal	433415	9	Brucella abortus	9
	Sheep and goats - Farm - Not Available - Not Available - Surveillance - Official sampling - Census						N_A	Not Available	animal	1220364	7	Brucella melitensis	7

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 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	245	104	Campylobacter, unspecified sp.	104



Table COXIELLA: in animal

Area of sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Method	total units tested	total units positive	Number of Clinical Affected Herds	Zoonoses	N units positive
Not Available	Cattle (bovine animals) - Farm - Not Available - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	animal	PCR	2	2		Coxiella burnetii	2
	Sheep - Farm - Not Available - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	animal	PCR	6	6		Coxiella burnetii	6

Table ESCHERICHIA COLI:Escherichia coli in food

Section: STEC - food and feed

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	ANTH	VTX	AG	N 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)	155	0	Shiga toxin-producing Escherichia coli (STEC)	Not Available	Not Available	Not Available	0

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 units tested	N units positive
Not Available	Fish - Fishery products from fish species associated with a high amount of histidine - not enzyme matured - Retail - Not Available - Not Available - Surveillance - Official sampling - Objective sampling	single (food/feed)	100	Gram	N_A	55	0	<=100	Histamine	55	0
								>100 TO <=200	Histamine	55	0
								>200	Histamine	55	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 units tested	N 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	249	0	detection	Listeria monocytogenes	249	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	60	0	detection	Listeria monocytogenes	60	0
	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	151	1	detection	Listeria monocytogenes	151	1
	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	57	1	detection	Listeria monocytogenes	57	1
	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	10	0	detection	Listeria monocytogenes	10	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	18	0	detection	Listeria monocytogenes	18	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	10	0	detection	Listeria monocytogenes	10	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	14	0	detection	Listeria monocytogenes	14	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	9	0	detection	Listeria monocytogenes	9	0
	Fish - smoked - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	46	1	detection	Listeria monocytogenes	46	1
	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	142	1	detection	Listeria monocytogenes	142	1
	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	3	0	detection	Listeria monocytogenes	3	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	10	0	detection	Listeria monocytogenes	10	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	2	0	detection	Listeria monocytogenes	2	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	172	3	detection	Listeria monocytogenes	172	3
	Milk, cows' - pasteurised milk - Retail - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Millilitre	N_A	113	0	detection	Listeria monocytogenes	113	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	99	1	detection	Listeria monocytogenes	99	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	23	0	detection	Listeria monocytogenes	23	0

Table LYSSAVIRUS:Lyssavirus in animal

Area of sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling Details	Method	Sampling unit	total units	total units	Zoonoses	N units positive
					tested	positive		
Serbia	Cats - Veterinary clinics - Not Available - animal sample - brain - Monitoring - passive - Official sampling - Suspect sampling	N_A	Direct fluorescent antibody test (FAT)	animal	20	0	Lyssavirus	0
	Cattle (bovine animals) - Veterinary clinics - Not Available - animal sample - brain - Clinical investigations - Official sampling - Suspect sampling	N_A	Direct fluorescent antibody test (FAT)	animal	1	0	Lyssavirus	0
	Dogs - Veterinary clinics - Not Available - animal sample - brain - Monitoring - passive - Official sampling - Suspect sampling	N_A	Direct fluorescent antibody test (FAT)	animal	18	0	Lyssavirus	0
	Foxes - wild - Natural habitat - Not Available - animal sample - brain - Monitoring - passive - Official sampling - Suspect sampling	N_A	Direct fluorescent antibody test (FAT)	animal	9	0	Lyssavirus	0
	Jackals - wild - Natural habitat - Not Available - animal sample - brain - Monitoring - passive - Official sampling - Suspect sampling	N_A	Direct fluorescent antibody test (FAT)	animal	4	0	Lyssavirus	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 units positive
Not Available	Cattle (bovine animals) - Farm - Not Available - Not Available - Surveillance - Official sampling - Census	N_A	Skin test	animal	768142	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 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	14	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	9	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	24	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	12	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	2	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	1	Salmonella spp., unspecified	1
	Meat from bovine animals - 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	274	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	104	1	Salmonella spp., unspecified	1
	Meat from broilers (Gallus gallus) - carcase - chilled - Slaughterhouse - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official, based on Regulation 2019/627 - Objective sampling	slaughter animal batch	25	Gram	N_A	ISO 6579-1:2017 Salmonella	245	4	Salmonella spp., unspecified	4
	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	191	0	Salmonella	0
	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	123	5	Salmonella spp., unspecified	5
	Meat from pig - 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	197	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	126	0	Salmonella	0
	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	153	3	Salmonella spp., unspecified	3
	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	73	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	33	0	Salmonella	0
	Meat from sheep - 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	1	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	5	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	13	0	Salmonella	0
	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	27	0	Salmonella	0
	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	121	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 units positive
Not Available	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	9	0	Salmonella	0



## 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

Causative agent	Food vehicle	Outbreak strenght							
		Strong				Weak			
		N outbreaks	N human cases	N hospitalized	N deaths	N outbreaks	N human cases	N hospitalized	N deaths
Bacterial toxins	Meat and meat products	1	17	2	0				
	Cheeses made from cows' milk					1	5	3	0
Clostridium botulinum	Cured seasoned pork meat	1	2	1	0	1	5	4	0
Salmonella	Mayonnaise, hollandaise and related sauces	1	7	3	0				
Salmonella enterica, subspecies enterica	Meat from pig	1	15	5	0				
Salmonella Enterica, unspecified	Eggs and egg products	1	2	2	0				
	Dairy products (excluding cheeses) - butter - made from pasteurised milk	1	19	6	0				
Salmonella Enteritidis	Eggs and egg products	4	28	6	1				
	Bakery products - pastry - with egg filling	2	8	7	0				
	Cheeses made from cows' milk	1	16	2	0				
	Mayonnaise, hollandaise and related sauces	1	16	12	0				
Staphylococcus aureus	Bakery products - cakes	2	13	0	0				
Trichinella spiralis	Meat from pig	2	12	5	0				
Unknown	Eggs and egg products					1	4	0	0
	Meat and meat products					1	15	1	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
Bacterial toxins	Not Available	Not Available	Not Available	Not Available	732	General	Meat and meat products	meat salad	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Serbia	Not Available	N_A	1	17	2	0
Clostridium botulinum	Not Available	Not Available	Not Available	Not Available	940	Household	Cured seasoned pork meat	N_A	Descriptive epidemiological evidence	Domestic premises	Domestic premises	Serbia	Inadequate heat treatment	N_A	1	2	1	0
Salmonella	Not Available	Not Available	Not Available	Not Available	978	General	Mayonnaise, hollandaise and related sauces	N_A	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Domestic premises	Serbia	Unprocessed contaminated ingredient; Inadequate heat treatment	N_A	1	7	3	0
Salmonella enterica, subspecies enterica	Not Available	Not Available	Not Available	Not Available	1005	Household	Meat from pig	N_A	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Serbia	Cross-contamination	N_A	1	15	5	0
Salmonella Enterica, unspecified	Not Available	Not Available	Not Available	Not Available	1025	Household	Eggs and egg products	N_A	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Domestic premises	Farm	Serbia	Storage time/temperature abuse; Inadequate heat treatment	N_A	1	2	2	0
					834	General	Dairy products (excluding cheeses) - butter - made from pasteurised milk	milk dressing with truffles	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent; Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Serbia	Storage time/temperature abuse	N_A	1	19	6	0

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 Enteritidis	Not Available	Not Available	Not Available	Not Available	1082	General	Cheeses made from cows' milk	N_A	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Serbia	Cross-contamination	N_A	1	16	2	0
					1167	General	Eggs and egg products	N_A	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Domestic premises	Domestic premises	Serbia	Inadequate heat treatment	N_A	1	17	5	1
					1182	Household	Eggs and egg products	N_A	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent; Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Domestic premises	Domestic premises	Serbia	Unprocessed contaminated ingredient; Inadequate heat treatment	N_A	1	4	0	0
					1188	General	Mayonnaise, hollandaise and related sauces	N_A	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Serbia	Unprocessed contaminated ingredient; Inadequate heat treatment	N_A	1	16	12	0

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 Enteritidis	Not Available	Not Available	Not Available	Not Available	1208	Household	Eggs and egg products	N_A	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent; Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Domestic premises	Domestic premises	Serbia	Unprocessed contaminated ingredient; Inadequate heat treatment	N_A	1	4	1	0
					1239	Household	Bakery products - pastry - with egg filling	cream pie	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Domestic premises	Domestic premises	Serbia	Inadequate heat treatment	N_A	1	4	3	0
					887	Household	Bakery products - pastry - with egg filling	cream pie	Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Domestic premises	Domestic premises	Serbia	Unprocessed contaminated ingredient; Inadequate heat treatment	N_A	1	4	4	0
					921	Household	Eggs and egg products	N_A	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent; Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Domestic premises	Domestic premises	Serbia	Unprocessed contaminated ingredient; Inadequate heat treatment	N_A	1	3	0	0

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
Staphylococcus aureus	Not Available	Not Available	Not Available	Not Available	926	Household	Bakery products - cakes	N_A	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent	Domestic premises	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Serbia	Storage time/temperature abuse;Inadequate heat treatment;Inadequate chilling	N_A	2	13	0	0
Trichinella spiralis	Not Available	Not Available	Not Available	Not Available	860	General	Meat from pig	N_A	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent	Domestic premises	Farm	Serbia	Unprocessed contaminated ingredient	N_A	1	9	4	0
					920	Household	Meat from pig	N_A	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent	Domestic premises	Farm	Serbia	Unprocessed contaminated ingredient	N_A	1	3	1	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
Bacterial toxins	Not Available	Not Available	Not Available	Not Available	932	Household	Cheeses made from cows' milk	N_A	Descriptive epidemiological evidence	Domestic premises	Domestic premises	Serbia	Storage time/temperature abuse	N_A	1	5	3	0
Clostridium botulinum	Not Available	Not Available	Not Available	Not Available	1010	Household	Cured seasoned pork meat	N_A	Descriptive epidemiological evidence	Domestic premises	Domestic premises	Serbia	Unprocessed contaminated ingredient;Storage time/temperature abuse	N_A	1	5	4	0
Unknown	Not Available	Not Available	Not Available	Not Available	937	General	Meat and meat products	N_A	Descriptive epidemiological evidence	Mobile retailer or market/street vendor	Domestic premises	Serbia	Storage time/temperature abuse	N_A	1	15	1	0
					984	Household	Eggs and egg products	N_A	Descriptive epidemiological evidence	Domestic premises	Farm	Serbia	Inadequate heat treatment	N_A	1	4	0	0

## ANTIMICROBIAL RESISTANCE TABLES FOR SALMONELLA

## ANTIMICROBIAL RESISTANCE TABLES FOR 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

<b>Table Name</b>	<b>Last submitted dataset transmission date</b>
Animal Population	15-Jul-2024
Food Borne Outbreaks	16-Jul-2024
Prevalence	15-Jul-2024

# 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 2023

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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 2023 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 randomly taking samples 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”.

Seven more laboratories were added for chemical testing –pesticide residues and contaminants of food and feed safety. Laboratories that meet the requirements for chemical laboratory testing are: “Anahem laboratory”, Belgrade; “Rea Lab”, Belgrade; “In Vitro Lab”, Šabac; “Institute for protection at work”, Novi Sad; “Miphem d.o.o.”, Belgrade; “Eko Lab”, Belgrade; “Field test doo”, Belgrade.

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 <sup>(a)</sup>

Source of data on animal population is Statistical Office of the Republic of Serbia. Data are for 2023.

### 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<sup>(a)</sup>**

Serbia is not recognized as country officially tuberculosis free.

**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.

**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. FOOD PREVALENCE DATA, number from 1 to 43**

**6.1. General evaluation\*: *Salmonella* in poultry meat**

**1. History of the disease and/or infection in the country<sup>1)</sup>**

191 total units tasted in 2023, from retail.  
The matrix was meat from broilers (*Gallus Gallus*), fresh-chilled.  
Sampling unit is batch.  
0 units positive on *Salmonella* spp.

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

**1. History of the disease and/or infection in the country<sup>1)</sup>**

155 total units tasted in 2023, from retail.  
The matrix was minced bovine meat, intended to be eaten cooked.  
Sampling unit is batch.  
0 units positive on STEC.

**6.3. General evaluation\*: *Salmonella* in pig minced meat**

<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
153 total units tasted in 2023, from retail. The matrix was minced pig meat, intended to be eaten cooked. Sampling unit is batch.
3 units positive on Salmonella spp. unspecified.
<b>6.4 General evaluation*: Salmonella in sheep minced meat</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
_____
<b>1 total units tasted in 2023, from retail</b> The matrix was minced sheep meat, intended to be eaten cooked. <b>Sampling unit is batch.</b> <b>0 units positive on Salmonella</b>
<b>6.5.General evaluation*: Salmonella in mechanically separated meat (MSM)</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
73 total units tasted in 2023, from processing plant. The matrix was mechanically separated poultry meat. Sampling unit is batch. 4 units positive on Salmonella spp, unspecified
<b>6.6.General evaluation*: Salmonella in turkey minced meat</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
27 total units tasted in 2023, from retail. The matrix was turkey minced meat, intended to be eaten cooked. Sampling unit is batch. 0 unit positive on Salmonella
<b>6.7.General evaluation*: Salmonella in mixed minced meat</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
121 total units tasted in 2023, from retail. The matrix was minced mixed meat, intended to be eaten cooked. Sampling unit is batch. 1 units positive on Salmonella spp., unspecified.
<b>6.8.General evaluation*: Salmonella in bovine preparation meat</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
104 total units tasted in 2023, from retail. The matrix was meat preparation from bovine intended to be eaten cooked. Sampling unit was batch. 1 units positive on Salmonella spp., unspecified
<b>6.9.General evaluation*: Salmonella in pig preparation meat</b>

<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>126 total units tasted in 2023, from retail.</p> <p>The matrix was meat preparation from pigs intended to be eaten cooked.</p> <p>Sampling unit was batch.</p> <p>0 units positive on Salmonella</p>
<b>6.10.General evaluation*: Salmonella in turkey meat preparation</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>13 total units tasted in 2023, from retail.</p> <p>The matrix was meat preparation from turkey intended to be eaten cooked.</p> <p>Sampling unit was batch.</p> <p>0 total unit positive on Salmonella.</p>

<b>6.11.General evaluation*: Salmonella in broilers meat preparation</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>123 total units tasted in 2023, from retail.</p> <p>The matrix was meat preparation from broilers (Gallus Gallus), intended to be eaten cooked.</p> <p>Sampling unit was batch.</p> <p>5 total units positive on Salmonella spp. unspecified.</p>
<b>6.12.General evaluation*: Listeria monocytogenes in meat or meat products, raw</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>2 total units tasted in 2023, from retail.</p> <p>The matrix was meat from other animal species or not specified meat products, raw and intended to be eaten raw.</p> <p>Sampling unit was single.</p> <p>0 total unit positive on Listeria monocytogenes.</p>
<b>6.13.General evaluation*: Listeria monocytogenes in meat and meat products, cooked</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>3 total units tasted in 2023, from retail.</p> <p>The matrix was meat from other animal species or not specified meat products, cooked, ready-to-eat.</p> <p>Sampling unit was single.</p> <p>0 unit positive on Listeria monocytogenes.</p>
<b>6.14.General evaluation*: Listeria monocytogenes in bovine meat products</b>

<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>142 total units tasted in 2023, from retail</p> <p>The matrix was meat from bovine animals in meat products, fermented sausages.</p> <p>Sampling unit was single.</p> <p>1 total units positive on <i>Listeria monocytogenes</i>.</p>
<b>6.15.General evaluation*: <i>Listeria monocytogenes</i> in pig meat products</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>172 total units tasted in 2023, from retail.</p> <p>The matrix was pig meat in meat products, fermented sausages.</p> <p>Sampling unit was single.</p> <p>3 total units positive on <i>Listeria monocytogenes</i>.</p>
<b>6.16.General evaluation*: <i>Listeria monocytogenes</i> in meat from other animal species</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>10 total units tasted in 2023, from retail.</p> <p>The matrix was meat from other animal species or not specified meat products, fermented sausages.</p> <p>Sampling unit was single.</p> <p>0 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.17.General evaluation*: <i>Listeria monocytogenes</i> in cows' milk</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>113 total units tasted in 2023, from retail.</p> <p>The matrix was cows' pasteurised milk.</p> <p>Sampling unit was single.</p> <p>0 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.18.General evaluation*: <i>Listeria monocytogenes</i> in cheese from cows' milk</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>60 total units tasted in 2023, from retail.</p> <p>The matrix was cheese made from cows' milk- unspecified, made from raw or low heat-treated milk.</p> <p>Sampling unit was single.</p> <p>0 total units positive on <i>Listeria monocytogenes</i>.</p>
<b>6.19.General evaluation*: <i>Listeria monocytogenes</i> in cheese from cows' milk, unspecified</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>151 total units tasted in 2023, from retail.</p> <p>The matrix was cheese made from cows' milk-unspecified.</p> <p>Sampling unit was single.</p> <p>1 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.20.General evaluation*: <i>Listeria monocytogenes</i> in cheese from sheep's milk</b>

<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>10 total units tasted in 2023, from retail.</p> <p>The matrix was cheese made from sheep's milk, soft and semi soft, made from raw or low heat-treated milk.</p> <p>Sampling unit was single.</p> <p>0 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.21.General evaluation*: <i>Listeria monocytogenes</i> in cheese from goats' milk</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>10 total units tasted in 2023, from retail.</p> <p>The matrix was cheese made from goats' milk, soft and semi soft, made from raw or low heat-treated milk.</p> <p>Sampling unit was single.</p> <p>0 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.22.General evaluation*: <i>Listeria monocytogenes</i> in cheese from cows' pasteurised milk</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>249 total units tasted in 2023 from retail.</p> <p>The matrix was cheese made from fresh cows' milk, made from pasteurised milk.</p> <p>Sampling unit was single.</p> <p>0 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.23.General evaluation*: <i>Listeria monocytogenes</i> in cheese from sheep's pasteurised milk</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>18 total units tasted in 2023, from retail.</p> <p>The matrix was cheese made from sheep's milk, soft and semi soft, made from pasteurised milk.</p> <p>Sampling unit was single.</p> <p>0 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.24.General evaluation*: <i>Listeria monocytogenes</i> in cheese from goat's pasteurised milk</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>57 total units tasted in 2023, from retail.</p> <p>The matrix was cheese made from goat's milk, soft and semi soft, made from pasteurised milk.</p> <p>Sampling unit was single.</p> <p>1 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.25.General evaluation*: <i>Salmonella</i> in dairy products (excluding cheeses), ice-cream</b>

<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>24 total units tasted in 2023, from retail.</p> <p>The matrix was dairy products (excluding cheeses), ice-scream made from pasteurised milk.</p> <p>Sampling unit was batch.</p> <p>0 total unit positive on Salmonella.</p>
<b>6.26.General evaluation*: Salmonella in dairy products (excluding cheeses), milk and whey powder</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>12 total units tasted in 2023, from retail.</p> <p>The matrix was dairy products (excluding cheeses), milk powder and whey powder</p> <p>Sampling unit was batch.</p> <p>0 total unit positive on Salmonella.</p>
<b>6.27.General evaluation*: Salmonella in dairy products (excluding cheeses), butter</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>14 total units tasted in 2023, from retail.</p> <p>The matrix was dairy products (excluding cheeses), butter made from raw or low treated milk</p> <p>Sampling unit was batch.</p> <p>0 total unit positive on Salmonella.</p>
<b>6.28.General evaluation*: Listeria monocytogenes in dairy products (excluding cheeses), butter</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>14 total units tasted in 2023, from retail.</p> <p>The matrix was dairy products (excluding cheeses), butter made from raw or low treated milk</p> <p>Sampling unit was single.</p> <p>0 total unit positive on Listeria monocytogenes.</p>
<b>6.29.General evaluation*: Salmonella in dairy products (excluding cheeses), cream</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>9 total units tasted in 2023, from retail.</p> <p>The matrix was dairy products (excluding cheeses), cream made from raw or low heat treated milk</p> <p>Sampling unit was batch.</p> <p>0 total unit positive on Salmonella.</p>
<b>6.30.General evaluation*: Listeria monocytogenes in dairy products (excluding cheeses), cream</b>

<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>9 total units tasted in 2023, from retail.</p> <p>The matrix was dairy products (excluding cheeses), cream made from raw or low heat treated milk</p> <p>Sampling unit was single.</p> <p>0 total unit positive on <i>Listeria monocytogenes</i>.</p>
<b>6.31.General evaluation*: Salmonella in eggs, liquid</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>1 total unit tasted in 2023, from processing plant.</p> <p>The matrix was liquid egg products.</p> <p>Sampling unit was batch.</p> <p>1 total unit positive on <i>Salmonella</i> spp., unspecified</p>
<b>6.32.General evaluation*: Salmonella in eggs, dried</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>2 total units tasted in 2023, from retail.</p> <p>The matrix was dried egg products.</p> <p>Sampling unit was batch.</p> <p>0 total unit positive on <i>Salmonella</i>.</p>
<b>6.33.General evaluation*: Listeria monocytogenes in smoked fish</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>46 total units tasted in 2023, from retail.</p> <p>The matrix was smoked fish.</p> <p>Sampling unit was single.</p> <p>1 total units positive on <i>Listeria monocytogenes</i>.</p>
<b>6.34.General evaluation*: Histamine in fish</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>55 total units tasted in 2023, from retail.</p> <p>The matrix was fish-fishery products from fish species associated with a high amount of histidine-not enzyme matured</p> <p>Sampling unit was single.</p> <p>0 total unit positive on Histamine.</p>
<b>6.35.General evaluation*: Listeria monocytogenes, sandwiches</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>99 total units tasted in 2023, from retail.</p> <p>The matrix was other processed food products and prepared dishes-sandwiches</p> <p>Sampling unit was single.</p> <p>1 total unit positive for <i>Listeria monocytogenes</i>.</p>
<b>6.36.General evaluation*: Listeria monocytogenes, sushi</b>



<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>23 total units tasted in 2023, from retail.</p> <p>The matrix was other processed food products and prepared dishes- sushi.</p> <p>Sampling unit was single.</p> <p>0 total unit positive for <i>Listeria monocytogenes</i>.</p>
<b>6.37.General evaluation*: Salmonella in gelatine and collagen</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>9 total units tasted in 2023, from processing plant.</p> <p>The matrix was other products of animal origin-gelatine and collagen.</p> <p>Sampling unit was batch.</p> <p>0 total unit positive on <i>Salmonella</i>.</p>
<b>6.38.General evaluation*: Salmonella from bovine carcasses</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>274 total units tasted in 2023, from slaughterhouses.</p> <p>The matrix was bovine carcasses.</p> <p>Sampling unit was slaughter animal batch.</p> <p>0 total unit positive on <i>Salmonella</i></p>
<b>6.39.General evaluation*: Salmonella from pig carcasses</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>197 total units tasted in 2023, from slaughterhouses.</p> <p>The matrix was pig carcasses.</p> <p>Sampling unit was slaughter animal batch.</p> <p>0 total unit positive on <i>Salmonella</i></p>
<b>6.40.General evaluation*: Salmonella from sheep carcasses</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>33 total units tasted in 2023, from slaughterhouses.</p> <p>The matrix was sheep carcasses.</p> <p>Sampling unit was slaughter animal batch.</p> <p>0 total unit positive on <i>Salmonella</i>.</p>
<b>6.41.General evaluation*: Salmonella from broilers carcasses</b>
<b>1. History of the disease and/or infection in the country<sup>1)</sup></b>
<p>245 total units tasted in 2022, from slaughterhouses.</p> <p>The matrix was meat from broilers (<i>Gallus Gallus</i>) chilled carcasses</p> <p>Sampling unit was slaughter animal batch.</p> <p>4 total units positive on <i>Salmonella</i> spp., unspecified.</p>
<b>6.42.General evaluation*: Campylobacter from broilers carcasses</b>

<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>245 total units tasted in 2023, from slaughterhouses.</p> <p>The matrix was meat from broilers (Gallus Gallus) chilled carcasses.</p> <p>Sampling unit was slaughter animal batch.</p> <p>104 total units positive for Campylobacter, unspecified sp.</p>
<b>6.43.General evaluation*: Salmonella from turkey carcasses</b>
<b>1. History of the disease and/or infection in the country<sup>1</sup></b>
<p>5 total units tasted in 2023, from slaughterhouses.</p> <p>The matrix was meat from turkey chilled carcasses.</p> <p>Sampling unit was slaughter animal batch.</p> <p>0 total unit positive on Salmonella.</p>

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

## **7.1. Monitoring/Surveillance/Control programmes system<sup>(a)</sup>**

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.54/23) 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)- Microbiological Criteria for food.

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.54/23) 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 strategy**

Sampling strategy is in accordance to the Rulebook on determining the Program for Monitoring Food Safety of animal origin (OG RS No.54/23) 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.

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**7.2. Measures in place<sup>(b)</sup>**

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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.

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**7.3. Notification system in place to the national competent authority<sup>(c)</sup>**

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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).

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

### 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).

## 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.

## 3. Notification system in place to the national competent authority

Yes

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

### 9.1. 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.

## **9.2. 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.

**9.3. Notification system in place to the national competent authority**

Yes

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

**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.

**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.

### **3. Notification system in place to the national competent authority**

Yes

### **11. Description of Monitoring/Surveillance/Control programmes system: Lyssavirus (rabies) in animal - All animals**

#### **1. Monitoring/Surveillance/Control programmes system**

Lyssavirus (rabies) - general evaluation

History of the disease and/or infection in the country

The number of rabies cases in Serbia has been relatively high and was increasing at the beginning of 21st century. In period 2000- 2009 approximately 160 to 200 cases per year was notified in the country, registered via passive surveillance. Mandatory notification and investigation of the any rabies suspected animal, wild or domestic, is introduce in former SFRJ legislation and is presently implemented with no interruption. Serbia has started to adopt European standards in veterinary policies and legislation in 2005 when the Serbian Parliament adopted the Law on Veterinary Matters (Official Gazette of RS No. 91/2005). This law was further amended (Official Gazette of RS No 91/05, 30/2010, 93/2012). In accordance with the Veterinary Law, notification of animal disease including rabies is compulsory, also permanent identification and registration of dogs and issuing of dog passport is mandatory. The Minister/Ministry of Agriculture for each year has adopted an annual Rulebook on establishing Program of Animal Health Protection Measures. In line with the Program of Measures of 2010, the oral rabies vaccination of foxes and other wild carnivores has been initiated for the first time in 2010. In every consecutive year, legal base for ORV was ensured in the Program of measures as well as resources for its implementation and monitoring of its effectiveness. At the same year, the Strategy and operational multi annual action plan for eradication, control and monitoring of rabies was developed and officially adopted. The Strategy is based on the Serbian veterinary legislation, which is harmonised with the EU Acquis and is in compliance with the recommendations of the OIE Terrestrial Animal Health Code, OIE Manual of Standards for Diagnostic Tests and Vaccines for Terrestrial Animals. Thus in 2010, Veterinary Directorate has started multiannual project of oral rabies vaccination of wild carnivore animals (e.g. foxes), as support of long-term program of eradication of rabies in Serbia, co-funded by the EU.

Fox population act as a reservoir for rabies and presents a permanent risk for transmission to humans, either directly or via domestic carnivores. Results from the oral rabies vaccination campaigns are very positive as they led to a dramatic and non-interrupted decrease of the disease incidence. During the recent years the number of the detected positive cases remained under five cases. In the calendar years 2013 we have 5 cases, in 2014 - 3, in 2015 - 3, in 2016 – 4, in 2017 – 1, in 2018 just 1 positive case have been detected and from 2019 no case has been detected in wild foxes for the whole territory of the country.

### *Sampling strategy*

Passive surveillance of dead foxes and all susceptible species (suspect animals as well as road kills) in the whole territory of the country.

Active monitoring to control the effectiveness of oral vaccination in the vaccinated area after each oral vaccination campaigns. In the dedicated period of the year in a definite number of shot wild animals/foxes and jackals: sampling period starts 21 days after the completion of each vaccination campaign and the minimum number of foxes is sampled is 4 animals/100 km<sup>2</sup> per year

Whole fox carcasses are submitted to the veterinary laboratory by hunters in the framework of Plan of monitoring of ORV. Transversal tooth section is performed to detect presence of tetracycline, and ELISA test is carried out to detect antibodies from the samples.

Whole carcasses of healthy shot foxes, suspect foxes or suspect animals of other species are submitted to the laboratory. Brain tissue sample is taken in the laboratory from all categories. Mandible and other sample are taken in the laboratory from foxes/jackals shot in the framework of monitoring of effectiveness of ORV.

The whole territory of Serbia excluding the urban settlements, main roads and water areas are designated for ORV, app. 73 000 km. Two vaccination campaigns per year (spring and autumn)

## **2. Measures in place**

Rulebook on establishing the measures for early detection, diagnostics, spreading prevention, suppression, and eradication of the Rabies, and the manner of their implementation (Official Gazette RS No78/09)

Tracing human contacts, animal contacts. Obligatory vaccination of dogs and cats, and farm animals upon the decision of the veterinary authority.

All positive cases shall be reported to the human health service according to national legislation. Decision about immunization of a person in contact with a rabies positive animal is the competence of the human health authorities.

## **3. Notification system in place to the national competent authority**

Yes

## **12. Description of Monitoring/Surveillance/Control programmes system: Lyssavirus (rabies) in animal - Dogs**

### **1. Monitoring/Surveillance/Control programmes system<sup>(a)</sup>**

In case of dogs and other domestic animals, only suspect animals are sampled. In cases of suspicion of rabies, epizootiological investigation and clinical examination of the animal shall be performed in order to establish whether the suspicion is justified. If it is established that the suspicion was justified, head or carcass of the animal shall be

sent to an accredited laboratory for examination. When clinically healthy dogs or cats, vaccinated against rabies, injure people, these dogs or cats must be put immediately under control for ten days. During the control, three clinical examinations shall be carried out, on the first, fifth, and tenth day. The animal is considered infected with rabies if laboratory examination with the fluorescence method or the biological experiment on white mice confirms rabies. The biological experiment on white mice is carried out in the following cases:

- 1) If a human came into contact with the animal under suspicion of rabies infection, and the results obtained with fluorescence method are negative or suspicious,
- 2) When it is first confirmation of rabies in one animal species on a territory of a municipality,
- 3) In other justified cases

Passive surveillance sampling and investigations only in case of suspicion.

Types of specimens taken are whole carcass or head/ brain tissue and are submitted to the laboratory.

Brain tissue sample is taken in the laboratory.

#### Case definition

According Rulebook on establishing the measures for early detection, diagnostics, spreading prevention, suppression, and eradication of the rabies infectious disease, and the manner of their implementation (Official Gazette of the Republic of Serbia no.78/09) case definition is define as:

- Case of rabies is a case when rabies is established and confirmed in a virusologic examination performed by a competent accredited laboratory.
- Suspected case of rabies is a case when the results of clinical examination and epizootiological investigation indicate that there is a danger of rabies, up to obtaining a confirmation from a competent accredited laboratory

#### Investigations of the human contacts with positive cases

All positive cases shall be reported to the human health service according to national legislation. Decision about immunization of a person in contact with a rabies positive animal is the competence of the human health authorities

#### Vaccination policy

Dogs and cats older than three months must be vaccinated once a year by inactivated vaccine against rabies, in accordance with manufacturer's instructions. Vaccination of dogs younger than three months may be performed provided there are justified reasons for such procedure, also in accordance with the manufacturer's instructions. Oral vaccination of foxes and other wild carnivores is performed twice a year, in spring and autumn, within the project of rabies eradication supported by European Union. Vaccines are distributed via plains or helicopters, or manually in some areas where aerial vaccination cannot be completed.

## 2. Measures in place

*Rulebook on establishing the measures for early detection, diagnostics, spreading prevention, suppression, and eradication of the Rabies, and the manner of their implementation (Official Gazette RS No78/09)*

Tracing human contacts, animal contacts. Obligatory vaccination of dogs and cats, and farm animals upon the decision of the veterinary authority.

All positive cases shall be reported to the human health service according to national legislation. Decision about immunization of a person in contact with a rabies positive animal is the competence of the human health authorities.

**3. Notification system in place to the national competent authority<sup>(c)</sup>**

Yes

**13. Description of Monitoring/Surveillance/Control programmes system: Q Fever**

**1. Monitoring/Surveillance/Control programmes system**

Tests for Q fever are performed for detection of source of the disease in humans and people professionally exposed to infection, as well as in case of every miscarriage in bovine animals, sheep and goats.

**2. Measures in place**

In case breeding bovine animals, sheep and goats originate from infected holdings, after undertaken measures and provided they have not been vaccinated, they can be marketed only if their test results are negative for Q fever, whereas test results may not be older than one month from the date of placing on the market.

The method of testing and treatment of Q fever is prescribed in more detail in the Operational Manual (professional methodological instructions) for Q fever.

**3. Notification system in place to the national competent authority<sup>(c)</sup>**

YES

## 14. Food-borne Outbreaks

#### **14.1 System in place for identification, epidemiological investigations and reporting of food-borne outbreaks**

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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 incriminated food samples for laboratory investigation.

#### **14.2. Description of the types of outbreaks covered by the reporting**

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12 food-borne outbreaks were caused by *Salmonella*, affecting 111 people, out of which 43 were hospitalized. (in 8 outbreaks the agent was *Salmonella enteritidis*, in 3 outbreaks *Salmonella enterica subsp. enterica* was identified agent, and in one outbreak the causative agent was identified as *Salmonella spp.*).

There were two outbreaks of *Trichinellosis* caused by *Trichinella spiralis*, with 12 cases in total (3 cases were from a household, 9 cases in an outbreak in general population). Meat from domestic pigs was confirmed as a vehicle in both outbreaks.

In one of these outbreak *Staphylococcus aureus* was confirmed as the causative agent.

There were two outbreaks caused by bacterial toxins, and two outbreaks in which the causative agent was not identified.

One death was reported in relation to food-borne outbreaks.

#### **14.3. National evaluation of the reported outbreaks in the country<sup>(a)</sup>**

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Food items suspected or confirmed as a source of food-borne outbreaks were meat and meat products in 7 outbreaks while in 8 outbreaks egg and eggs products were source of the infection. Three outbreaks have been related to the consumption of cheeses and other dairy products. Also, mayonnaise, hollandaise and related sauces

were linked to two outbreaks. Finally, bakery products (cakes) were the vehicle in one outbreak.

Place of exposure in 14 outbreaks was in households, while 6 outbreaks were linked to the consumption of food items in public facilities (restaurants etc.). In one outbreak food was prepared by a mobile retailer or by a market/street vendor.

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#### **14.4.Descriptions of single outbreaks of special interest**

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

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#### **14.5.Control measures or other actions taken to improve the situation**

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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.

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#### **14.4. Additional information**

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Two foodborne outbreaks more have been registered in 2023 compared to the previous year, but with a significantly smaller number of ill persons (111:405).