

Republic of North Macedonia

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

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

IN 2018

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 Republic of North Macedonia during the year 2018.

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.

* 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			
		holding	animal	slaughter animal (heads)	herd/flock
Antelopes	Antelopes - zoo animal - oryx		1		
Bears	Bears - zoo animal		7		
Bison	Bison - zoo animals		2		
Buffalos	Buffalos		44		
	Buffalos - zoo animal		1		
Cats	Cats - pet animals		1,160		
Cattle (bovine animals)	Cattle (bovine animals)	21,209			
	Cattle (bovine animals) - adult cattle over 2 years		104,655	3,449	
	Cattle (bovine animals) - breeding bulls		34,019		
	Cattle (bovine animals) - calves (under or around 1 year)		42,073		
	Cattle (bovine animals) - dairy cows - young cattle (1-2 years)		16,478		
	Cattle (bovine animals) - young cattle (1-2 years)				8,187
Crocodile	Crocodile - zoo animals		2		
Deer	Deer - zoo animals - fallow deer		22		
Dogs	Dogs - pet animals		23,767		
Eagle	Eagle - zoo animals		25		
Elephants	Elephants - zoo animals		2		
Fish	Fish - aquarium fish	10			
	Fish - farmed - carp	36			
	Fish - farmed - salmon	30			
Foxes	Foxes		5		
Gallus gallus (fowl)	Gallus gallus (fowl) - broilers		110,123	110,123	3
	Gallus gallus (fowl) - laying hens		750,455		133
	Gallus gallus (fowl) - laying hens - adult			389,035	
Giraffes	Giraffes - zoo animal		3		
Goats	Goats - animals over 1 year		15,991	145	
	Goats - animals under 1 year		64,471	509	
Guinea fowl	Guinea fowl		6		
Guinea pigs	Guinea pigs		20		
Jaguar	Jaguar - zoo animals		1		
Kangaroos	Kangaroos - zoo animal		8		

Animal species	Category of animals	Population		
		holding	animal	slaughter animal (heads) herd/flock
Lamas	Lamas - zoo animal		11	
Leopards	Leopards - zoo animals		3	
Lion	Lion - zoo animals		6	
Lynx	Lynx - zoo animal		5	
Monkeys	Monkeys - zoo animal		88	
Mouflons	Mouflons - zoo animal		8	
Ostriches	Ostriches - zoo animals		2	
Owls	Owls - zoo animals		2	
Parrots	Parrots - zoo animals		6	
Peafowl	Peafowl - zoo animal		15	
Pheasants	Pheasants - zoo animals		12	
Pigs	Pigs - fattening pigs		58,537	
	Pigs - mixed herds - raised under controlled housing conditions - boars		616	
	Pigs - mixed herds - raised under controlled housing conditions - gilts		3,453	
	Pigs - mixed herds - raised under controlled housing conditions - piglets		53,076	
	Pigs - mixed herds - raised under controlled housing conditions - sows		12,902	
	Pigs - mixed herds - unspecified	3,078		190,738
Rabbits	Rabbits - farmed	15		1,235
Sheep	Sheep - animals over 1 year		560,282	1,657
	Sheep - animals under 1 year (lambs)		123,256	231,992
Sheep and goats	Sheep and goats	7,340		
Snakes	Snakes - zoo animal		15	
Solipeds, domestic	Solipeds, domestic			4,297
	Solipeds, domestic - donkeys		890	
	Solipeds, domestic - horses		5,269	
	Solipeds, domestic - mule		483	
Swans	Swans - zoo animals		4	
Tiger	Tiger - zoo animals		4	
Turtles	Turtles - pet animals			13
	Turtles - zoo animals		20	
Wild animals	Wild animals	80		
Wolves	Wolves - zoo animal		9	

DISEASE STATUS TABLES

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

Region	Number of herds with status officially free	Number of infected herds	Total number of animals	Number of herds tested under surveillance	Number of animals tested under surveillance	Total number of herds
North Macedonia	0	55	177,200	17,307	140,979	19,949

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

Region	Number of herds with status officially free	Number of infected herds	Total number of animals	Number of herds tested under surveillance	Number of animals tested under surveillance	Total number of herds
North Macedonia	0	112	809,548	5,873	412,091	7,340

DISEASE STATUS TABLES

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

Region	Number of herds with status officially free	Number of infected herds	Total number of animals	Number of animals tested with tuberculin routine testing	Total number of herds
North Macedonia	0	58	177,200	155,624	17,592

PREVALENCE TABLES

Table Bacillus:BACILLUS 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
North Macedonia	Cattle (bovine animals) - Farm - Republic of North Macedonia - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	N_A	Not Available	animal	5	0	Bacillus anthracis	0
	Goats - Farm - Republic of North Macedonia - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	N_A	Not Available	animal	1	0	Bacillus anthracis	0
	Sheep - Farm - Republic of North Macedonia - animal sample - blood - Clinical investigations - Official sampling - Suspect sampling	N_A	Not Available	animal	1	0	Bacillus anthracis	0

Table Bacillus:BACILLUS 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
North Macedonia	Other products of animal origin - gelatin and collagen - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Bacillus cereus	0

Table Campylobacter:CAMPYLOBACTER 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
North Macedonia	Goats - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	1	0	Campylobacter, unspecified sp.	0
	Sheep - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	1	0	Campylobacter, unspecified sp.	0

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 bovine animals - fresh - frozen - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	11	0	Campylobacter, unspecified sp.	0
	Meat from bovine animals - fresh - frozen - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Campylobacter, unspecified sp.	0
	Meat from broilers (Gallus gallus) - carcase - chilled - Processing plant - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	1	Campylobacter, unspecified sp.	1
	Meat from broilers (Gallus gallus) - mechanically separated meat (MSM) - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Campylobacter, unspecified sp.	0
	Meat from pig - fresh - chilled - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Campylobacter, unspecified sp.	0
	Meat from pig - fresh - frozen - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Campylobacter, unspecified sp.	0
	Meat from pig - meat products - fermented sausages - Processing plant - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	2	0	Campylobacter, unspecified sp.	0
	Meat from pig - meat products - meat specialities - Processing plant - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	6	0	Campylobacter, unspecified sp.	0
	Meat from poultry, unspecified - carcase - chilled - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Campylobacter, unspecified sp.	0
	Meat from poultry, unspecified - carcase - frozen - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	6	4	Campylobacter, unspecified sp.	4
	Meat from poultry, unspecified - fresh - chilled - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Campylobacter, unspecified sp.	0
	Meat from poultry, unspecified - fresh - frozen - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	217	10	Campylobacter, unspecified sp.	10
	Meat from poultry, unspecified - meat preparation - intended to be eaten cooked - frozen - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	3	0	Campylobacter, unspecified sp.	0
	Meat from poultry, unspecified - meat preparation - intended to be eaten raw - Processing plant - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	5	0	Campylobacter, unspecified sp.	0
	Meat from poultry, unspecified - offal - liver - frozen - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	21	0	Campylobacter, unspecified sp.	0
	Meat from poultry, unspecified - offal - unspecified - frozen - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	2	0	Campylobacter, unspecified sp.	0
North Macedonia	Meat from broilers (Gallus gallus) - carcase - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	1	Campylobacter, unspecified sp.	1

Table Chlamydia/ Chlamydomphila:CHLAMYDIA/ CHLAMYDOPHILA 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
North Macedonia	Cattle (bovine animals) - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	6	1	Chlamydia, unspecified sp.	1
	Goats - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	27	10	Chlamydia, unspecified sp.	10
	Pigs - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	5	5	Chlamydia, unspecified sp.	5
	Sheep - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	78	51	Chlamydia, unspecified sp.	51

Table Clostridium:CLOSTRIDIUM 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
North Macedonia	Goats - Farm - Republic of North Macedonia - animal sample - organ/tissue - Clinical investigations - Official sampling - Suspect sampling	N_A	Not Available	animal	6	0	Clostridium perfringens	0
	Sheep - Farm - Republic of North Macedonia - animal sample - organ/tissue - Clinical investigations - Official sampling - Suspect sampling	N_A	Not Available	animal	17	0	Clostridium perfringens	0

Table Clostridium:CLOSTRIDIUM 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
North Macedonia	Honey - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	Sulfite reducing clostridia	Not Available	2	0	Clostridium spp., unspecified	0
	Honey - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	Sulfite reducing clostridia	Not Available	15	0	Clostridium spp., unspecified	0

Table Clostridium:CLOSTRIDIUM in 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	N of units positive
North Macedonia	Compound feedingstuffs, not specified - Processing plant - Republic of North Macedonia - feed sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	Sulfite reducing clostridia	Not Available	3	0	Clostridium spp., unspecified	0

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
North Macedonia	Cattle (bovine animals) - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	animal	N.A	Indirect ELISA (I-ELISA)	41	2		Coxiella burnetii	2
	Goats - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	animal	N.A	Indirect ELISA (I-ELISA)	51	22		Coxiella burnetii	22
	Sheep - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	animal	N.A	Indirect ELISA (I-ELISA)	49	3		Coxiella burnetii	3

Table Ehrlichia:EHRlichIA 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
North Macedonia	Dogs - pet animals - Veterinary clinics - Republic of North Macedonia - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	N.A	Not Available	animal	1	0	Ehrlichia	0

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	Fishery products, unspecified - ready-to-eat - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	Canned fish	Not Available	3	0	Escherichia coli	0
	Meat from bovine animals - fresh - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Meat from poultry, unspecified - fresh - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
North Macedonia	Cheeses made from cows' milk - curd - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	4	1	Escherichia coli	1
	Cheeses made from cows' milk - fresh - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	8	1	Escherichia coli	1
	Cheeses made from cows' milk - hard - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	10	4	Escherichia coli	4
	Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Cheeses made from goats' milk - fresh - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	5	0	Escherichia coli	0
	Cheeses made from sheep's milk - fresh - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	8	2	Escherichia coli	2
	Cheeses, made from mixed milk from cows, sheep and/or goats - fresh - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	3	0	Escherichia coli	0
	Cheeses, made from mixed milk from cows, sheep and/or goats - hard - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	5	0	Escherichia coli	0
	Dairy products (excluding cheeses) - fermented dairy products - fermented milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	4	0	Escherichia coli	0
	Meat from bovine animals - fresh - chilled - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Meat from bovine animals - meat preparation - intended to be eaten cooked - chilled - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Meat from broilers (Gallus gallus) - meat preparation - intended to be eaten cooked - chilled - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	2	0	Escherichia coli	0

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
North Macedonia	Meat from pig - meat preparation - intended to be eaten cooked - chilled - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Meat from pig - meat preparation - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Meat from pig - meat preparation - intended to be eaten cooked - frozen - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Meat from pig - meat products - fermented sausages - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	2	0	Escherichia coli	0
	Meat from pig - minced meat - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0
	Meat from poultry, unspecified - meat preparation - intended to be eaten raw - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Escherichia coli	0

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
North Macedonia	Meat from bovine animals - meat preparation - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	1	0	Verocytotoxi genic E. coli (VTEC)	Not Available	Not Available	Not Available	0
	Meat from pig - fresh - chilled - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	1	0	Verocytotoxi genic E. coli (VTEC)	Not Available	Not Available	Not Available	0
	Meat from pig - meat preparation - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	4	0	Verocytotoxi genic E. coli (VTEC)	Not Available	Not Available	Not Available	0
	Meat from pig - meat preparation - intended to be eaten cooked - frozen - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	1	0	Verocytotoxi genic E. coli (VTEC)	Not Available	Not Available	Not Available	0
	Meat from pig - meat products - fermented sausages - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	1	0	Verocytotoxi genic E. coli (VTEC)	Not Available	Not Available	Not Available	0
	Meat from pig - minced meat - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	7	0	Verocytotoxi genic E. coli (VTEC)	Not Available	Not Available	Not Available	0
	Meat from pig - minced meat - intended to be eaten cooked - frozen - Retail - Republic of North Macedonia - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	single (food/feed)	25	Gram	N_A	ISO/TS 13136:2012 (including the EU-RL adaptation for O104:H4)	2	0	Verocytotoxi genic E. coli (VTEC)	Not Available	Not Available	Not Available	0

Table Escherichia coli:ESCHERICHIA COLI in 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	N of units positive
Not Available	Compound feedingstuffs for fish - final product - pelleted - Border inspection activities - Not Available - feed sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N.A	Not Available	1	0	Escherichia coli	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 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 - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	Canned fish	5	0	<= 100	Histamine	5	0
								>100 TO <= 200	Histamine	5	0
								>200	Histamine	5	0
								<= 100	Histamine	1	0
	Fish - raw - Border inspection activities - Not Available - food sample - meat - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N.A	1	0	>100 TO <= 200	Histamine	1	0
								>200	Histamine	1	0
								>200	Histamine	1	0

Table Leishmania:LEISHMANIA 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
North Macedonia	Dogs - pet animals - Veterinary clinics - Republic of North Macedonia - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	N_A	Indirect Immunofluorescent Antibody test (IFAT)	animal	1136	162	Leishmania	162
	Dogs - stray dogs - Veterinary clinics - Republic of North Macedonia - animal sample - blood - Clinical investigations - Private sampling - Suspect sampling	N_A	Indirect Immunofluorescent Antibody test (IFAT)	animal	834	38	Leishmania	38

Table Listeria: LISTERIA 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
North Macedonia	Fish - farmed - carp - Farm - Republic of North Macedonia - animal sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	N_A	Detection method presence in x g	animal	2	0	Listeria monocytogenes	0
	Goats - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	2	0	Listeria spp., unspecified	0
	Sheep - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	N_A	Not Available	animal	10	0	Listeria spp., unspecified	0

Table Listeria: 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	Eggs - table eggs - whole - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	3	0	detection	Listeria monocytogenes	3	0
	Fish - raw - chilled - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	1	0	detection	Listeria monocytogenes	1	0
	Fish - raw - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	7	1	detection	Listeria monocytogenes	7	1
	Fish - smoked - hot-smoked - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	1	0	detection	Listeria monocytogenes	1	0
	Fishery products, unspecified - ready-to-eat - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	6	0	detection	Listeria monocytogenes	6	0
	Meat from bovine animals - fresh - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	2	0	detection	Listeria monocytogenes	2	0
	Meat from bovine animals - meat products - fermented sausages - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	1	0	detection	Listeria monocytogenes	1	0
	Meat from broilers (Gallus gallus) - fresh - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	1	0	detection	Listeria monocytogenes	1	0
	Meat from pig - meat preparation - intended to be eaten cooked - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	9	0	detection	Listeria monocytogenes	9	0
	Roe - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	1	0	detection	Listeria monocytogenes	1	0
North Macedonia	Cheeses made from cows' milk - curd - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	4	0	detection	Listeria monocytogenes	4	0
	Cheeses made from cows' milk - hard - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	13	0	detection	Listeria monocytogenes	13	0
	Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	16	0	detection	Listeria monocytogenes	16	0
	Cheeses made from goats' milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	4	0	detection	Listeria monocytogenes	4	0
	Cheeses made from sheep's milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	11	0	detection	Listeria monocytogenes	11	0
	Cheeses, made from mixed milk from cows, sheep and/or goats - hard - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	4	0	detection	Listeria monocytogenes	4	0
	Cheeses, made from mixed milk from cows, sheep and/or goats - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	6	0	detection	Listeria monocytogenes	6	0
	Dairy products (excluding cheeses) - chocolate milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Millilitre	N_A	1	0	detection	Listeria monocytogenes	1	0
	Dairy products (excluding cheeses) - cream - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	1	0	detection	Listeria monocytogenes	1	0
	Dairy products (excluding cheeses) - cream - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	2	0	detection	Listeria monocytogenes	2	0
	Dairy products (excluding cheeses) - dairy desserts - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	2	0	detection	Listeria monocytogenes	2	0

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
North Macedonia	Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	6	0	detection	Listeria monocytogenes	6	0
	Dairy products (excluding cheeses) - milk-based drinks - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Millilitre	N_A	1	0	detection	Listeria monocytogenes	1	0
	Dairy products (excluding cheeses) - yoghurt - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Millilitre	N_A	10	0	detection	Listeria monocytogenes	10	0
	Eggs - table eggs - whole - Packing centre - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	30	0	detection	Listeria monocytogenes	30	0
	Fish - smoked - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	1	1	detection	Listeria monocytogenes	1	1
	Fish - smoked - hot-smoked - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	1	0	detection	Listeria monocytogenes	1	0
	Meat from bovine animals - meat products - cooked, ready-to-eat - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	14	2	detection	Listeria monocytogenes	14	2
	Meat from bovine animals - meat products - fermented sausages - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	2	0	detection	Listeria monocytogenes	2	0
	Meat from bovine animals - meat products - fresh raw sausages - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	2	0	detection	Listeria monocytogenes	2	0
	Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	12	0	detection	Listeria monocytogenes	12	0
	Meat from pig - meat products - cooked ham - sliced - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	2	0	detection	Listeria monocytogenes	2	0
	Meat from pig - meat products - cooked, ready-to-eat - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	32	0	detection	Listeria monocytogenes	32	0
	Meat from pig - meat products - fermented sausages - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	16	0	detection	Listeria monocytogenes	16	0
	Meat from pig - meat products - fresh raw sausages - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	6	0	detection	Listeria monocytogenes	6	0
	Milk, cows' - pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Millilitre	N_A	1	0	detection	Listeria monocytogenes	1	0
	Milk, cows' - UHT milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Millilitre	N_A	7	0	detection	Listeria monocytogenes	7	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 tested	Total units positive	Zoonoses	N of units positive
North Macedonia	Foxes - wild - Hunting - Republic of North Macedonia - animal sample - Monitoring - Official sampling - Objective sampling	N_A	Not Available	animal	175	0	Rabies virus	0
	Marten - wild - Hunting - Republic of North Macedonia - animal sample - Monitoring - Official sampling - Objective sampling	N_A	Not Available	animal	3	0	Rabies virus	0
	Wolves - wild - Hunting - Republic of North Macedonia - animal sample - Monitoring - Official sampling - Objective sampling	N_A	Not Available	animal	44	0	Rabies virus	0

Table Salmonella:SALMONELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Sampling Details	Method	Total units tested	Total units positive	Zoonoses	N of units positive
North Macedonia	Cattle (bovine animals) - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	animal		N_A	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Fish - farmed - carp - Farm - Republic of North Macedonia - animal sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	animal		N_A	N_A	Not Available	2	0	Salmonella spp., unspecified	0
	Gallus gallus (fowl) - laying hens - adult - Farm - Republic of North Macedonia - environmental sample - boot swabs and dust - Control and eradication programmes - Official sampling - Objective sampling	herd/flock	133	N_A	N_A	Not Available	230	1	Salmonella spp., unspecified	0
									Salmonella Typhimurium	1
	Gallus gallus (fowl) - laying hens - adult - Farm - Republic of North Macedonia - environmental sample - boot swabs and dust - Monitoring - Industry sampling - Census	herd/flock	133	N_A	N_A	Not Available	732	8	Salmonella Bredeney	1
									Salmonella Enteritidis	4
									Salmonella Livingstone	1
									Salmonella Oranienburg	1
									Salmonella Senftenberg	1
									Salmonella spp., unspecified	0
	Goats - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	animal		N_A	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Sheep - Veterinary clinics - Republic of North Macedonia - animal sample - Clinical investigations - Private sampling - Suspect sampling	animal		N_A	N_A	Not Available	1	0	Salmonella spp., unspecified	0

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	Crustaceans - prawns - raw - chilled - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Dairy products (excluding cheeses) - butter - made from pasteurised milk - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Dairy products (excluding cheeses) - dairy desserts - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	10	0	Salmonella spp., unspecified	0
	Egg products - dried - Processing plant - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	16	0	Salmonella spp., unspecified	0
	Fish - raw - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	7	0	Salmonella spp., unspecified	0
	Fishery products, unspecified - cooked - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	3	0	Salmonella spp., unspecified	0
	Meat from bovine animals - fresh - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	5	0	Salmonella Enteritidis	0
Salmonella Typhimurium									0	
	Meat from bovine animals - fresh - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	19	0	Salmonella spp., unspecified	0
	Meat from bovine animals - meat products - fermented sausages - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	2	0	Salmonella spp., unspecified	0
	Meat from broilers (Gallus gallus) - carcase - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	3	0	Salmonella Enteritidis	0
Salmonella Typhimurium									0	
	Meat from broilers (Gallus gallus) - carcase - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Meat from broilers (Gallus gallus) - fresh - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	64	0	Salmonella Enteritidis	0
Salmonella Typhimurium									0	
	Meat from broilers (Gallus gallus) - fresh - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	155	16	Salmonella spp., unspecified	16
	Meat from broilers (Gallus gallus) - meat products - raw but intended to be eaten cooked - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Meat from broilers (Gallus gallus) - mechanically separated meat (MSM) - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella Enteritidis	0
Salmonella Typhimurium									0	
	Meat from broilers (Gallus gallus) - mechanically separated meat (MSM) - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	15	7	Salmonella spp., unspecified	7
	Meat from broilers (Gallus gallus) - offal - unspecified - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	2	0	Salmonella Enteritidis	0
Salmonella Typhimurium									0	
	Meat from pig - fresh - frozen - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	3	0	Salmonella Enteritidis	0
Salmonella Typhimurium									0	

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 pig - fresh - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	4	2	Salmonella spp., unspecified	2
	Meat from pig - fresh - Processing plant - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella Enteritidis	0
	Meat from pig - meat products - cooked, ready-to-eat - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Meat from poultry, unspecified - offal - liver - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	9	0	Salmonella Enteritidis	0
									Salmonella Typhimurium	0
	Meat from poultry, unspecified - offal - liver - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	9	2	Salmonella spp., unspecified	2
	Roe - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
North Macedonia	Cheeses made from cows' milk - curd - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Cheeses made from cows' milk - hard - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	5	0	Salmonella spp., unspecified	0
	Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Cheeses made from sheep's milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	3	0	Salmonella spp., unspecified	0
	Cheeses, made from mixed milk from cows, sheep and/or goats - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	3	0	Salmonella spp., unspecified	0
	Dairy products (excluding cheeses) - chocolate milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Dairy products (excluding cheeses) - dairy desserts - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	2	0	Salmonella spp., unspecified	0
	Dairy products (excluding cheeses) - ice-cream - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	7	0	Salmonella spp., unspecified	0
	Eggs - table eggs - whole - Packing centre - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	33	0	Salmonella spp., unspecified	0
	Meat from bovine animals - carcass - Slaughterhouse - Republic of North Macedonia - food sample - carcass swabs - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	slaughter animal batch	400	Square centimetre	N_A	Not Available	10	0	Salmonella spp., unspecified	0
	Meat from bovine animals - fresh - chilled - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	6	0	Salmonella spp., unspecified	0
	Meat from bovine animals - fresh - chilled - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella Enteritidis	0
									Salmonella Typhimurium	0
	Meat from bovine animals - meat preparation - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fee d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0

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
North Macedonia	Meat from bovine animals - meat preparation - intended to be eaten raw - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	2	0	Salmonella spp., unspecified	0
	Meat from broilers (Gallus gallus) - fresh - chilled - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	3	0	Salmonella Enteritidis Salmonella Typhimurium	0 0
	Meat from broilers (Gallus gallus) - fresh - chilled - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	1	0	Salmonella Enteritidis Salmonella Typhimurium	0 0
	Meat from broilers (Gallus gallus) - fresh - frozen - Border inspection activities - Brazil - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	4	4	Salmonella Enteritidis	4
	Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	8	0	Salmonella spp., unspecified	0
	Meat from broilers (Gallus gallus) - mechanically separated meat (MSM) - Border inspection activities - Czech Republic - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	1	1	Salmonella spp., unspecified	1
	Meat from pig - carcass - Slaughterhouse - Republic of North Macedonia - food sample - carcass swabs - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	slaughte r animal batch	100	Square centimetre	N_A	Not Available	11	0	Salmonella spp., unspecified	0
	Meat from pig - fresh - chilled - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Meat from pig - fresh - frozen - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	2	0	Salmonella spp., unspecified	0
	Meat from pig - fresh - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	1	0	Salmonella Typhimurium	0
	Meat from pig - meat preparation - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	5	0	Salmonella spp., unspecified	0
	Meat from pig - meat preparation - intended to be eaten cooked - frozen - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	10	Gram	N_A	Not Available	1	1	Salmonella spp., unspecified	1
	Meat from pig - meat products - cooked ham - non-sliced - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	2	0	Salmonella spp., unspecified	0
	Meat from pig - meat products - cooked ham - sliced - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Meat from pig - meat products - cooked, ready-to-eat - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	8	0	Salmonella spp., unspecified	0
	Meat from pig - meat products - fermented sausages - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Meat from pig - minced meat - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	10	Gram	N_A	Not Available	9	2	Salmonella spp., unspecified	2
	Meat from pig - minced meat - intended to be eaten cooked - frozen - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	2	0	Salmonella spp., unspecified	0
	Meat from poultry, unspecified - offal - liver - frozen - Border inspection activities - Brazil - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	N_A	Not Available	1	1	Salmonella spp., unspecified	1
	Meat from sheep - carcass - Slaughterhouse - Republic of North Macedonia - food sample - carcass swabs - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	slaughte r animal batch	100	Square centimetre	N_A	Not Available	9	0	Salmonella spp., unspecified	0

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
North Macedonia	Other products of animal origin - gelatin and collagen - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0

Table Salmonella:SALMONELLA in 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	N of units positive
North Macedonia	Compound feedingstuffs for cattle - final product - Farm - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	2	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for fish - final product - Farm - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for pigs - final product - Farm - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	4	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for pigs - final product - Processing plant - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	28	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for poultry (non specified) - final product - Farm - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	16	0	Salmonella spp., unspecified	0
	Compound feedingstuffs for poultry (non specified) - final product - Processing plant - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	14	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - Farm - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	3	0	Salmonella spp., unspecified	0
	Feed material of cereal grain origin - Processing plant - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	34	0	Salmonella spp., unspecified	0
	Premixtures - final product - Processing plant - Republic of North Macedonia - feed sample - Surveillance - Official sampling - Objective sampling	batch (food/feed)	50	Gram	N_A	Not Available	1	0	Salmonella spp., unspecified	0

Table Staphylococcus:STAPHYLOCOCCUS AUREUS METICILLIN RESISTANT (MRSA) 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
North Macedonia	Cheeses made from cows' milk - curd - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	4	0	Staphylococcus spp., unspecified	0
	Cheeses made from cows' milk - hard - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	10	0	Staphylococcus spp., unspecified	0
	Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	11	0	Staphylococcus spp., unspecified	0
	Cheeses made from goats' milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	5	0	Staphylococcus spp., unspecified	0
	Cheeses made from sheep's milk - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	7	0	Staphylococcus spp., unspecified	0
	Cheeses, made from mixed milk from cows, sheep and/or goats - hard - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	3	0	Staphylococcus spp., unspecified	0
	Cheeses, made from mixed milk from cows, sheep and/or goats - soft and semi-soft - made from pasteurised milk - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	3	0	Staphylococcus spp., unspecified	0
	Dairy products (excluding cheeses) - ice-cream - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	1	0	Staphylococcus spp., unspecified	0
	Dairy products (excluding cheeses) - yoghurt - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	4	0	Staphylococcus spp., unspecified	0
	Other products of animal origin - gelatin and collagen - Processing plant - Republic of North Macedonia - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/fe d)	25	Gram	Coagulase positive staphylococci	Not Available	1	0	Staphylococcus spp., unspecified	0

Table Trichinella:TRICHINELLA 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
North Macedonia	Pigs - fattening pigs - raised under controlled housing conditions - Slaughterhouse - Republic of North Macedonia - animal sample - Monitoring - Official sampling - Census	N_A	Not Available	animal	190738	0	Trichinella	0
	Wild boars - wild - Hunting - Republic of North Macedonia - animal sample - Monitoring - Official sampling - Objective sampling	N_A	Not Available	animal	698	13	Trichinella Trichinella, unspecified sp.	0 13

Table Vibrio:VIBRIO 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	Crustaceans - unspecified - raw - chilled - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Vibrio parahaemolyticus	0
	Fishery products, unspecified - Border inspection activities - Not Available - food sample - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	3	0	Vibrio parahaemolyticus	0

Table Yersinia:YERSINIA 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 - fresh - chilled - Retail - Republic of North Macedonia - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Yersinia enterocolitica	0
	Meat from bovine animals - fresh - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	3	0	Yersinia enterocolitica	0
	Meat from pig - fresh - chilled - Retail - Republic of North Macedonia - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	2	0	Yersinia enterocolitica	0
	Meat from pig - meat preparation - intended to be eaten cooked - Retail - Republic of North Macedonia - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	7	0	Yersinia enterocolitica	0
	Meat from pig - meat products - fresh raw sausages - Processing plant - Republic of North Macedonia - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	4	0	Yersinia enterocolitica	0
	Meat from pig - meat products - meat specialities - Processing plant - Republic of North Macedonia - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	7	0	Yersinia enterocolitica	0
	Meat from pig - minced meat - intended to be eaten cooked - chilled - Retail - Republic of North Macedonia - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	3	0	Yersinia enterocolitica	0
	Meat from pig - minced meat - intended to be eaten cooked - frozen - Retail - Republic of North Macedonia - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	2	0	Yersinia enterocolitica	0
	Meat from poultry, unspecified - carcass - chilled - Border inspection activities - Bulgaria - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Yersinia enterocolitica	0
	Meat from poultry, unspecified - fresh - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	24	0	Yersinia enterocolitica	0
	Meat from poultry, unspecified - meat preparation - intended to be eaten cooked - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	1	0	Yersinia enterocolitica	0
	Meat from poultry, unspecified - meat preparation - intended to be eaten raw - Processing plant - Republic of North Macedonia - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	6	0	Yersinia enterocolitica	0
	Meat from poultry, unspecified - offal - liver - frozen - Border inspection activities - Not Available - Not Available - Surveillance - based on Regulation 2073 - Official sampling - Objective sampling	batch (food/feed)	25	Gram	N_A	Not Available	3	0	Yersinia enterocolitica	0

FOODBORNE OUTBREAKS TABLES

Foodborne Outbreaks: summarized data

Causative agent	Food vehicle	Outbreak strenght		Strong				Weak			
		N outbreaks	N human cases	N	N deaths	N outbreaks	N human cases	N	N deaths		
Escherichia coli	Unknown					1	45	0	0		
Salmonella Enteritidis	Other or mixed red meat and products thereof	1	9	1	0						
	Mixed food	5	154	40	0						
Staphylococcal enterotoxins	Mixed food	1	13	13	0						

Strong Foodborne Outbreaks: detailed data

Causative agent	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	N_A	General	Other or mixed red meat and products thereof	Hamburger	Descriptive environmental evidence; Detection of causative agent in food chain or its environment - Symptoms and onset of illness pathognomonic to causative agent; Descriptive epidemiological evidence	Take-away or fast-food outlet	Unknown; Take-away or fast-food outlet	Republic of North Macedonia	Unknown	N_A	1	9	1	0
				Mixed food	N_A	Descriptive environmental evidence; Detection of causative agent in food chain or its environment - Symptoms and onset of illness pathognomonic to causative agent; Descriptive epidemiological evidence	Not Available	Canteen or workplace catering	Republic of North Macedonia	Infected food handler	N_A	1	84	9	0
						Descriptive environmental evidence; Detection of causative agent in food chain or its environment - Symptoms and onset of illness pathognomonic to causative agent; 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; School or kindergarten	Republic of North Macedonia	Other contributory factor	N_A	1	17	5	0
					Rolled pancakes with cheese	Descriptive environmental evidence; Detection of causative agent in food chain or its environment - Symptoms and onset of illness pathognomonic to causative agent; Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Canteen or workplace catering; Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Republic of North Macedonia	Storage time/temperature abuse; Inadequate heat treatment	N_A	3	53	26	0

Causative agent	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
Staphylococcal enterotoxins	Not Available	N_A	General	Mixed food	N_A	Descriptive environmental evidence; Detection of causative agent in food chain or its environment - Symptoms and onset of illness pathognomonic to causative agent; Descriptive epidemiological evidence	Not Available	School or kindergarten	Republic of North Macedonia	Infected food handler; Cross-contamination	N_A	1	13	13	0

Weak Foodborne Outbreaks: detailed data

Causative agent	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
Escherichia coli	Not Available	N_A	General	Unknown	N_A	Descriptive environmental evidence;Detection of causative agent in food chain or its environment - Symptoms and onset of illness pathognomonic to causative agent;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	Republic of North Macedonia	Unknown	N_A	1	45	0	0

ANTIMICROBIAL RESISTANCE TABLES FOR CAMPYLOBACTER

Table Antimicrobial susceptibility testing of *Campylobacter jejuni* in *Gallus gallus* (fowl) - broilers

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling details:

AM substance	Ciprofloxacin	Erythromycin	Gentamicin	Nalidixic acid	Streptomycin	Tetracycline
ECOFF	0.5	4	2	16	4	1
Lowest limit	0.12	1	0.12	1	0.25	0.5
Highest limit	16	128	16	64	16	64
N of tested isolates	1	1	1	1	1	1
N of resistant isolates	0	0	0	0	0	0
MIC						
<=0.12			1			
0.25	1					
<=0.5						1
<=1		1				
1					1	
4				1		

ANTIMICROBIAL RESISTANCE TABLES FOR SALMONELLA

Table Antimicrobial susceptibility testing of Salmonella Bredeney in Gallus gallus (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs and dust

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIC														
<=0.03									1					
0.03						1								
<=0.25			1										1	1
<=0.5				1										
<=1							1							
1								1						
2	1													
<=4										1				
4		1												
<=8					1									
8												1		
64											1			

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Gallus gallus (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs and dust

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	4	4	4	4	4	4	4	4	4	4	4	4	4	4
N of resistant isolates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIC														
<=0.03									4					
0.03						4								
<=0.25			4										3	2
<=0.5				4				4						
0.5													1	2
<=1	3						4							
<=2												4		
2	1													
<=4										4				
<=8					4									
8		4												
64											1			
128											2			
256											1			

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Meat from broilers (Gallus gallus) - carcase - chilled

Sampling Stage: Slaughterhouse

Sampling Type: food sample - neck skin

Sampling Context: Monitoring

Sampler: HACCP and own check

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	5	5	5	5	5	5	5	5	5	5	5	5	5	5
N of resistant isolates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIC														
<=0.015						1								
<=0.03									4					
0.03						3								
0.064						1			1					
<=0.25			5										5	1
<=0.5				5				3						
0.5														4
<=1	4						5							
1								2						
<=2												5		
2	1													
<=4										3				
4		1												
<=8					5									
8		4								2				
64											1			
128											3			
256											1			

Table Antimicrobial susceptibility testing of Salmonella Livingstone in Gallus gallus (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs and dust

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIC														
<=0.03									1					
0.03						1								
<=0.25			1										1	
<=0.5				1										
0.5														1
<=1	1						1							
1								1						
<=4										1				
4												1		
<=8					1									
8		1												
128											1			

Table Antimicrobial susceptibility testing of Salmonella Newport in Meat from pig - carcase

Sampling Stage: Slaughterhouse

Sampling Type: food sample - carcase swabs

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	1	0	0	0	0	1	0	0	0	1	0	1	0	0
MIC														
<=0.03									1					
<=0.25			1											
<=0.5				1										
0.5						1							1	1
<=1							1							
1								1						
<=8					1									
8		1												
32										1				
>64	1												1	
128											1			

Table Antimicrobial susceptibility testing of Salmonella Senftenberg in Gallus gallus (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs and dust

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON pn12

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
Cefotaxime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
ECOFF	0.12	0.5	0.5	8	2	2	0.064	1	0.125	32
Lowest limit	0.064	0.25	0.064	0.5	0.25	0.12	0.015	0.12	0.03	0.5
Highest limit	32	64	64	64	128	128	2	16	16	64
N of tested isolates	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	1	1	1	1	1	1	0	0	0	0
MIC										
<=0.03									1	
0.064							1			
0.25								1		
0.5	1									
8										1
16		1	1			1				
32					1					
>64				1						

Table Antimicrobial susceptibility testing of Salmonella Senftenberg in Gallus gallus (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs and dust

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	1	0	1	1	0	1	0	0	0	0	1	1	0	0
MIC														
<=0.03									1					
0.25						1								
0.5														1
<=1							1							
1													1	
2								1						
4		1												
>4			1											
<=8					1									
>8				1										
16										1				
>64	1											1		
>1024											1			

Table Antimicrobial susceptibility testing of *Salmonella* spp., unspecified in *Gallus gallus* (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs and dust

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIC														
<=0.015						1								
<=0.03									1					
<=0.25			1										1	1
<=0.5				1										
<=1	1						1							
1								1						
<=2												1		
<=4										1				
<=8					1									
8		1												
128											1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Gallus gallus (fowl) - laying hens

Sampling Stage: Farm

Sampling Type: environmental sample - boot swabs and dust

Sampling Context: Control and eradication programmes

Sampler: Official and industry sampling

Sampling Strategy: Census

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIC														
<=0.03									1					
0.03						1								
<=0.25			1										1	
<=0.5				1										
0.5														1
<=1	1						1							
1								1						
<=2												1		
<=4										1				
<=8					1									
8		1												
64											1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Meat from broilers (Gallus gallus) - carcase - chilled

Sampling Stage: Slaughterhouse

Sampling Type: food sample - neck skin

Sampling Context: Monitoring

Sampler: HACCP and own check

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.5	2	16	0.064	2	2	0.125	16	256	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	1	0	0	0	0	0	0	0	0	0	1	1	0	0
MIC														
<=0.03									1					
0.03						1								
<=0.25			1											1
<=0.5				1										
0.5													1	
<=1							1							
1								1						
<=4										1				
<=8					1									
8		1												
>64	1												1	
>1024											1			

ANTIMICROBIAL RESISTANCE TABLES FOR INDICATOR ESCHERICHIA COLI

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Cattle (bovine animals) - calves (under 1 year)

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON pnl2

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
Cefotaxime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
ECOFF	0.125	0.25	0.25	8	0.5	0.5	0.064	0.5	0.125	32
Lowest limit	0.064	0.25	0.064	0.5	0.25	0.12	0.015	0.12	0.03	0.5
Highest limit	32	64	64	64	128	128	2	16	16	64
N of tested isolates	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	0	0	0	0	0	0	0	0	0	0
MIC										
<=0.015							1			
<=0.03									1	
<=0.064	1		1							
<=0.12						1		1		
<=0.25		1			1					
2				1						
4										1

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Cattle (bovine animals) - calves (under 1 year)

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Collistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.125	16	64	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	42	42	42	42	42	42	42	42	42	42	42	42	42	42
N of resistant isolates	5	0	1	0	1	0	0	0	0	0	11	10	0	4
MIC														
<=0.015						36								
<=0.03									41					
0.03						6								
0.064									1					
<=0.25			41										35	16
<=0.5				42				11						
0.5			1										7	11
<=1	8						41							
1								24						10
<=2		2										30		
2	21						1	7						1
<=4										37				
4	8	21										1		
<=8					38						3			
8		19								5		1		
16					3						5	1		
32					1						17	1		
>32														4
64											6	5		
>64	5											3		
128											2			

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.125	16	64	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	42	42	42	42	42	42	42	42	42	42	42	42	42	42
N of resistant isolates	5	0	1	0	1	0	0	0	0	0	11	10	0	4
MIC														
256											1			
>1024											8			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON pn12

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
Cefotaxime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
ECOFF	0.125	0.25	0.25	8	0.5	0.5	0.064	0.5	0.125	32
Lowest limit	0.064	0.25	0.064	0.5	0.25	0.12	0.015	0.12	0.03	0.5
Highest limit	32	64	64	64	128	128	2	16	16	64
N of tested isolates	2	2	2	2	2	2	2	2	2	2
N of resistant isolates	1	2	0	0	2	0	0	0	0	0
<=0.015							1			
<=0.03									2	
0.03							1			
<=0.064	1		2							
<=0.12						2		2		
1		1			1					
2				1						1
4	1			1						1
8					1					
64		1								

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Collistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.125	16	64	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	41	41	41	41	41	41	41	41	41	41	41	41	41	41
N of resistant isolates	28	4	2	2	18	25	2	5	0	13	28	28	1	18
MIC														
<=0.015						12								
<=0.03									39					
0.03						2								
0.064						2			2					
0.12						4								
<=0.25			39										33	12
0.25						4								
<=0.5				39				7						
0.5						8							7	8
<=1	4						38							
1			1					23						2
<=2		3										13		
2	9			1		1	1	6					1	1
<=4										18				
4		16					1	2						1
>4			1											
<=8					23						2			
8		13		1		2				8				
>8						6								
16		5								2	2			
>16							1							

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.125	16	64	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	41	41	41	41	41	41	41	41	41	41	41	41	41	41
N of resistant isolates	28	4	2	2	18	25	2	5	0	13	28	28	1	18
32	1	3			2			1			4			
>32								2						17
64					2					1	5	8		
>64	27	1										20		
128					5					3				
>128					9					9				
256											1			
>1024											27			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from broilers (Gallus gallus) - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pn12

Analytical Method:

Country of Origin: Bulgaria

Sampling Details:

AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
Cefotaxime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
ECOFF	0.125	0.25	0.25	8	0.5	0.5	0.064	0.5	0.125	32
Lowest limit	0.064	0.25	0.064	0.5	0.25	0.12	0.015	0.12	0.03	0.5
Highest limit	32	64	64	64	128	128	2	16	16	64
N of tested isolates	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	1	1	0	0	1	0	0	0	0	0
<=0.03									1	
0.03							1			
<=0.064			1							
<=0.12						1		1		
2					1					1
4				1						
8	1									
64		1								

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from broilers (Gallus gallus) - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Bulgaria

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Collistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.125	16	64	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	1	0	1	1	0	1	0	0	0	0	1	0	0	1
MIC														
<=0.03									1					
<=0.25													1	
0.5						1								
<=1							1							
1								1						
<=2												1		
2				1										
>4			1											
<=8					1									
8		1												
16										1				
>32														1
>64	1													
>1024											1			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Gallus gallus (fowl) - broilers

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Collistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.125	16	64	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	4	4	4	4	4	4	4	4	4	4	4	4	4	4
N of resistant isolates	0	0	0	0	0	0	0	1	0	0	0	0	0	0
MIC														
<=0.015						4								
<=0.03									4					
<=0.25			4										4	
<=0.5				4										
0.5														3
<=1	1						4							
1								2						1
<=2		2										4		
2	2							1						
<=4										4				
4	1	2						1						
<=8					4						1			
16											2			
64											1			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from pig - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin	
Cefotaxime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	
Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	
ECOFF	0.125	0.25	0.25	8	0.5	0.5	0.064	0.5	0.125	32	
Lowest limit	0.064	0.25	0.064	0.5	0.25	0.12	0.015	0.12	0.03	0.5	
Highest limit	32	64	64	64	128	128	2	16	16	64	
N of tested isolates	1	1	1	1	1	1	1	1	1	1	
N of resistant isolates	1	1	0	0	1	0	0	0	0	0	
MIC											
<=0.03									1		
0.03							1				
<=0.064			1								
<=0.12					1		1				
2				1							
4										1	
16	1					1					
>64	1										

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from pig - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Republic of North Macedonia

Sampling Details:

AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Collistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.125	16	64	8	1	2
Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
N of tested isolates	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N of resistant isolates	1	0	1	1	1	1	0	0	0	0	1	1	0	1
MIC														
<=0.03									1					
<=0.25													1	
0.25						1								
<=1							1							
2								1						
4		1												
>4			1											
8										1				
>8				1										
>32														1
>64	1											1		
128					1									
>1024											1			

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
Antimicrobial Resistance	15-Jul-2019
Esbl	07-Jan-2020
Animal Population	26-Jul-2019
Disease Status	26-Jul-2019
Food Borne Outbreaks	26-Jul-2019
Prevalence	29-Jul-2019

Ss. Cyril and Methodius University Faculty of Veterinary Medicine – Skopje

Faculty of Veterinary Medicine – Skopje performs educational, research and applicative activities in the field of veterinary medicine and veterinary public health.

For educational and research activities, the Faculty of Veterinary Medicine-Skopje is organized in scientific and educational unit- Institutes. There are three educational - scientific organizational units within FVM-S. All Institutes of the Faculty are consisted of different departments, laboratories and clinics where the processes of education, research and application are conducted.

Within the Veterinary Institute the following departments are organized:

- Department of farm animals-Internal medicine
- Department of small animal internal medicine and horses
- Department of biology and pathology of fish, bees and wild animals
- Department of veterinary surgery
- Department for infectious diseases and epidemiology
- Department of avian diseases
- Department of parasitology and parasitic diseases
- Department of pathology and forensic medicine
- Department of pathophysiology
- Department of animal hygiene and environmental

Within the Institute of Food, the following departments are organized:

- Department of food safety and veterinary public health
- Department of nutrition of farm animals
- Department of Chemistry
- Department of Pharmacology and Toxicology
- Department of economics and management
- Department of Veterinary Legislation

Within the Institute of Reproduction and Biomedicine the following departments are organized:

- Department of Biochemistry and cell biology
- Department of functional morphology
- Department of animal science
- Department of reproduction

Within the Veterinary Institute the following Centres are organized:

- Zoonosis centre
- Center for side effects and information for veterinary medical products
- Education center for food safety and veterinary public health
- Center for artificial insemination
- Center for animal welfare

Within the Institute for Veterinary following laboratories are included:

- Laboratory for Microbiology
- Laboratory for serology and molecular diagnostics
- Laboratory for parasitology and parasitic diseases
- Laboratory for TSE
- Laboratory for diagnosis fish, bees and hunting wild game diseases
- Laboratory for Pathology and patohystology
- Laboratory for Pathophysiology
- Laboratory for rabies
- Laboratory for Animal Hygiene and Environmental
- Cabinet for visual diagnostics
- Reception office

Within the Institute for Food following laboratories are included:

- Laboratory for microbiology of food and feed
- Laboratory for quality control of food and feed
- Laboratory for residues and contaminants
- Laboratory for raw milk quality
- Laboratory for Pharmacology and Toxicology

Within the Institute for Reproduction and Biomedicine following laboratories are included:

- Laboratory for production, cryoconservation and control of semen
- Laboratory for assisted reproduction
- Plastination laboratory
- Laboratory for histology and embryology
- Laboratory for Biochemistry and Cell Biology

The capacities of the Veterinary Institute give opportunity for students to learn the fundamental principles of the veterinary medicine by the educational process in the clinical departments. This Institute incorporates laboratories for diagnosis of infectious diseases affecting farm animals and humans, being included and regulated by the state policies. Another unit of the veterinary Institute is the University Veterinary Clinic which offers a wide range of diagnostic, surgical and therapeutical prospects.

The Food Institute includes departments focusing on food safety, food quality and veterinary public health issues. The laboratories are specialized in testing the safety and quality of food for human consumption, using different microbiological, chemical and nutritive analysis methods. They also offer an opportunity for animal feed and water analysis.

The Institute for Reproduction and Biomedicine incorporates departments and laboratories which focus on issues regarding animal breeding, reproduction and animal welfare, but also the fundamentals of veterinary medicine by pre-clinical subjects. The laboratory for Semen evaluation, Cryopreservation and Assisted Reproduction

performs a wide range of scientific studies in the field of Andrology. Plastination laboratory produce anatomical models which are widely used for the education process. Department for Histology, Embryology as well the laboratories for Clinical Biochemistry are fully engaged in the work process of the University Veterinary Clinic of the Faculty of veterinary medicine in Skopje.

Within the application activities, the Faculty of veterinary medicine in Skopje (FVMS), has operational well-equipped laboratories. They all offer and carry out different services to external customers. The main commitment of the FVMS is to increase the quality of service, production and testing, as well as customer satisfaction and national and international legal requirements of competent authorities. Therefore, a priority commitment of the management team of FVMS is the introduction of management systems and quality control.

The quality management system according the International Standard MKC EN ISO 9001:2008 in the FVMS was introduced and certified on 02/05/2005 by the international certification body BSI (British Standard Institution – Cert. No. FS 74597), recertified on 26.03.2008, with validation date 01.03.2014.

FVMS (Institute for food and Veterinary institute) is accredited by the Institute for Accreditation of R. Macedonia (certificate.no. LT-006), which confirms that the requirements of the international standard „MKC EN ISO/IEC 17025:2006” in the field of testing food products, beverages, water and examination of animal diseases, are fulfilled.

Implementation of international standards „MKC EN ISO/IEC 17025:2006” in the Institute for food and Veterinary institute in the FVMS for our customers means a guarantee for the reliability of results for all samples tested within. That is also the guarantee that tests will be conducted in accordance with the latest national and international standards and regulations. FVMS will also maintain a high level of reliability to customers for testing results, and high level of services depending on the customer requirements.

Accredited laboratories of FMVS are proposed to be “National Reference Laboratory” for control of food safety and monitoring of residues, zoonoses and antimicrobial resistance, as provided in Regulation EC/882/2004. In its vision and mission, FVMS declares that it will be competitive, internationally accredited laboratory that performs routine tests to monitor food safety, animal health and welfare in their varieties in Republic of North Macedonia.

Animal population
1. Sources of information and the date(s) (months, years) the information relates to^(a)
Source of information is Information system of Food and Veterinary Agency ISAHV – Identification and registration system since 2004, starts with bovine.
2. Definitions used for different types of animals, herds, flocks and holdings as well as the production types covered
<p>”Farm animal” shall mean a domestic animal of the bovine species including the species <i>Bubalus bubalis</i> and <i>Bison bison</i>, ovine, caprine, porcine and equidae species.</p> <p>”Other animal” shall mean an animal which is not covered under the term farm animal of the species defined in indent (2) above , but which shall be identified and registered under this law depending on circumstances.</p> <p>”Holding” shall mean any establishment, construction or, in the case of an open-air farm, any place in which animals covered by this law are held, kept or handled.</p>
3. National changes of the numbers of susceptible population and trends
<p>One of the more important activities carried out in previous period (2018) is the census of bovine animals during the vaccination campaign of bovine animals against the Lumpy skin disease. The purpose of the census was to improve the quality of the data stored in Information System of the Food and Veterinary Agency where the movements were not reported in the database. After completion of the census, it was identified that there are more than 30,000 so-called animal ghosts (animals already dead, but not reported in the database) that were removed from the electronic database and the number of bovine population has decreased.</p> <p>During the census, the Food and Veterinary Agency ordered the collection of data on the geographical coordinates of the registered holdings this is for the first time a spatial insight of the bovine holdings in the Republic of North Macedonia was received, which will improve the control of infectious diseases.</p>
4. Geographical distribution and size distribution of the herds, flocks and holdings^(b)
5. Additional information

General evaluation Mycobacterium**1. History of the disease and/or infection in the country^(a)**

Republic of North Macedonia is not officially free of bovine tuberculosis according to Directive 64/432/EEC.

All regions are not officially free of bovine tuberculosis according to Directive 64/432/EEC

In the last several years, the Food and Veterinary Agency implements programs for control and eradication of the disease.

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

The control of bovine tuberculosis is based on Council Directive 64/432/EEC, which is implemented and adapted in National legislation in Program for control and eradication of Bovine Tuberculosis is in place since 2007.

All bovine animals older than 6 weeks were tested once a year in the whole country. Animals with suspected tuberculin skin test, are retested after 42 days with comparative tuberculin test.

3. Any recent specific action in the Member State or suggested for the European Union^(b)**4. Additional information**

General evaluation Brucella

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

1. Bovine brucellosis – B. Abortus

Republic of North Macedonia is not officially free from bovine brucellosis
All regions are not officially free of bovine brucellosis according to Directive 64/432/EEC.

2. Brucellosis in small ruminants – B. melitensis

Republic of North Macedonia is not recognized as country officially free from sheep and goat brucellosis according to Directive 91/68/EEC.

Republic of North Macedonia has no regions officially free from sheep and goat brucellosis according to Directive 91/68/EEC.

In the last several years, the Food and Veterinary Agency implements programs for control of the disease.

The surveillance program for brucellosis in sheep and goats has been systematically implemented since 2008 when an individual identification of sheep and goats started. After several years of implementation of the program's provisions, in 2010 and 2014 after the conducted analysis of the results, certain corrections were made to the program.

The application of the new strategy resulted with division of the territory of the country into certain number of individual regions i.e. epidemiological units where depending of the widespread of the disease in the country, the prevalence, different measures for control of Brucellosis in sheep and goats apply. After 2008 mass vaccination against brucellosis in sheep and goats was implemented and country was divided into three regions.

In the following years, vaccination of replacement animals and test and slaughter of adult animals have been implemented.

In 2016 new programme for control and eradication of brucellosis in small ruminants were implemented and two municipalities (these are municipalities where mass vaccination was carried out in 2008) as a pilot project have been introduced in the scheme for testing of the animals and applying test and slaughter policy. The aim of this program is public and animal health protection and providing pre-requisites for placing on the market of sheep and goats and products thereof, and at same time achievement and maintenance of the status of the holdings of sheep and goats "officially free from Brucellosis in according to Directive 91/68/EEC.

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

1. Bovine brucellosis – B. abortus

Regular annual diagnostic tests for Bovine Brucellosis were performed on all cattle older than six months while retest of all positive herds continuously performed during the year.

Testing of cattle is done annually according to the national control programme for control and eradication of bovine brucellosis.

Blood sampling and for isolation of Brucella abortus uterine discharges, aborted fetuses, udder secretions or selected tissues, such as lymph nodes.

Methods of sampling is Blood sampling.

An animal is defined as infected if Brucella spp. has been isolated by culture and identified. A herd is defined as infected if one of its animals is positive by bacteriological examination for Brucellosis.

2. Brucella in sheep and goats – B. melitensis

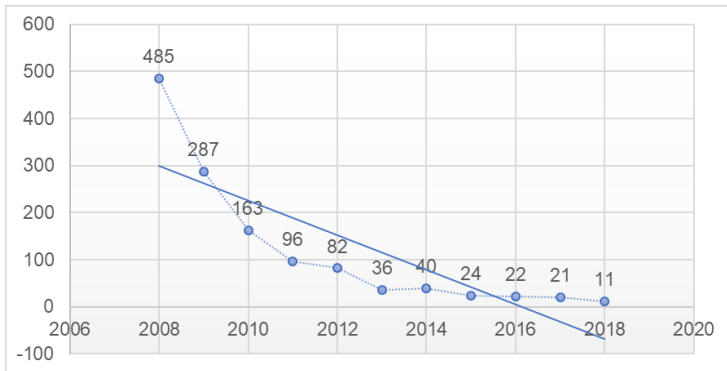
In 2016 new programme for control and eradication of brucellosis in small ruminants were implemented and two municipalities (these are municipalities where mass vaccination was carried out in 2008) as a pilot project have been introduced in the scheme for testing of the animals and applying test and slaughter policy. The aim of this program is public and animal health protection and providing pre-requisites for placing on the market of sheep and goats and products thereof, and at same time achievement and maintenance of the status of the holdings of sheep and goats "officially free from Brucellosis in according to Directive 91/68/EEC. The measures applied under the new program are at the holding level.

1. Testing and slaughtering of the ovine and caprine animals older than 6 months and
2. Combination of vaccination against brucellosis in ovine and caprine/testing and slaughtering

By applying this strategy

- ✓ Reduce the further spreading of the brucellosis in sheep and goats
- ✓ Decrease the absolute number of positive animals
- ✓ Decrease the number of positive humans. In the last 10 years, the number of humane cases shows a decreasing trend.

Year	No. of infected people
2008	485
2009	287
2010	163
2011	96
2012	82
2013	36
2014	40
2015	24
2016	22
2017	21
2018	11



A sheep/goat is defined as infected with brucellosis if positive in too tests, Rose Bengal test as a screening, and Complement Fixation test as confirmation method, ELISA and isolation of *Brucella melitensis* by culture after slaughter.

Notifications are made according Law of veterinary health and Book of rules for compulsory notification animal diseases.

The overall strategy is to be compliance with European legislation and to strengthen the surveillance and control program for brucellosis in sheep and goats.

The specific aims will be:

- 1) To assess the epidemiological situation in areas in which mass vaccination was previously performed and to apply nationwide a test and slaughter policy and
- 2) To evaluate if, according to epidemiological situation, it is possible to stop or reduce vaccination of replacements in order to pose the bases for claiming the Officially Brucellosis Free (OBF) status in selected regions and then progressively in all the country.

3. Any recent specific action in the Member State or suggested for the European Union^(b)

4. Additional information

Bovine Tuberculosis- Mycobacterium bovis

1. Monitoring/Surveillance/Control programmes system^(a)

The control of tuberculosis is based on Council Directive 64/432/EEC, which is implemented and adapted in National legislation in Program for control and eradication of Bovine Tuberculosis is in place since 2007.

All bovine animals older than 6 weeks were tested once a year in the whole country. Animals with suspected of intradermal tuberculin test, are retested after 42 days with comparative tuberculin test.

Frequency of testing depends on:
- the results of tuberculin testing

Testing of cattle is done annually according to the national control and eradication programme.

Tuberculin skin testing: single (bovine tuberculin) or comparative (bovine/avian tuberculin).

Private Veterinary organization is responsible for application of single intradermal tuberculin test. Faculty of veterinary medicine Skopje-responsible for comparative intradermal test (re - tuberculinisation) with avian and bovine tuberculin after at least 6 weeks.

A 'bovine' is defined as infected with bovine tuberculosis if the animal is positive by skin testing or if Mycobacterium bovis is isolated by culture or confirmed by laboratory analysis (PCR).

A 'holding' is defined as infected if Mycobacterium bovis was isolated from an animal of the holding.

Bovine tuberculosis is considered to be confirmed if:

- a) Laboratory examination has confirmed agent from M. tuberculosis complex in tissue material from bovine animal,
 - b) Post mortem examination shows typical pathological changes, and agent from M. tuberculosis complex is confirmed by the laboratory examination
 - c) Post mortem veterinary control at slaughter line found typical pathological changes, and agent from M. tuberculosis complex is confirmed by the laboratory examination.
- Mycobacterium tuberculosis complex: Mycobacterium tuberculosis, Mycobacterium bovis, Mycobacterium caprae.

2. Measures in place^(b)

National surveillance program by the Competent Authority on mandatory legal base. In case of positive result, official veterinarian should order measures as follows:

- 1) The herd is placed under official surveillance.

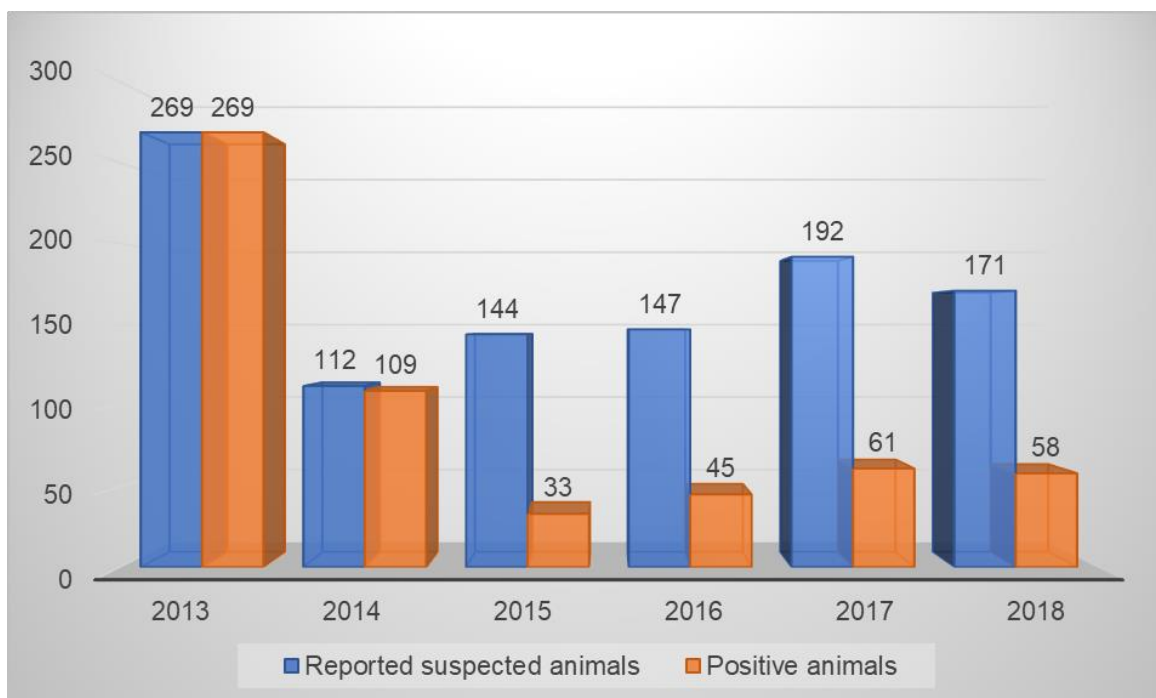
- 2) The implementation of the epidemiological examination in order to identify the source, the time and the method of infection and the previous and the further spread of the infection
- 3) Isolation of all positive animals within the herd.
- 4) Prohibition of any movement into or out of the herd, unless authorised by the CA, for the purpose of slaughter without delay.
- 5) Isolation, until the further testing or sending to slaughter.
- 6) Milk from the infected cows may only be fed to animals on the same farm, after suitable heat treatment.
- 7) Milk from cows from the infected herd (without prejudice to national provisions concerning foodstuffs) cannot be delivered to a dairy, except to undergo suitable heat treatment
- 8) Carcasses, half-carcasses, quarters, pieces and offal from infected cattle intended for use as feed for animals are treated in such a way to avoid contamination.
- 9) All positive animals must be slaughtered as soon as possible, but not later than 30 days after the owner was officially notified about the disease and his obligation.
- 10) After the slaughter of all positive animals and prior to restocking, general cleaning and disinfection of all herd and equipment should be performed, under official supervision and in accordance with the instructions of the official veterinarian.

3. Notification system in place to the national competent authority^(c)

According Law of veterinary health and Book of rules for compulsory notification animal diseases.

4. Results of investigations and national evaluation of the situation, the trends^(d) and sources of infection^(e)

Year	Tested animals	Reported suspected animals	Reported suspected animal holding	Positive animals	% of positive animals
2013	167.128	269	184	269	0.002%
2014	180.902	112	71	109	0.061%
2015	187.601	144	52	33	0.04%
2016	188.519	147	81	45	0.04%
2017	174.967	192	78	61	0.03%
2018	155.624	171	64	58	0.04%



5. Additional information

Rabies

1. Monitoring/Surveillance/Control programmes system^(a)

The program for oral vaccination of foxes against rabies started in 2011 under the EU funded project “**Capacity building of the veterinary service for implementation of EU Acquis EuropeAid/124586/C/SER/MK**” (16 August 2010-15 December 2012). The program is comprised of two vaccination campaigns per year (spring and autumn) during the six consecutive years, taking into consideration the epidemiological situation in the neighboring countries. So far, twelve vaccination campaigns have been implemented.

The contract is signed in July 2017, and it covers 4 campaigns for oral vaccination of foxes. During 2018, the following activities were implemented:

A spring campaign for oral vaccination of foxes was completed, whereby 500,000 vaccine bites were distributed in the entire territory of the Republic of North Macedonia,

A autumn campaign for oral vaccination of foxes was completed, whereby 500,000 vaccine bites were distributed in the entire territory of the Republic of North Macedonia.

Rabies – Diagnostic tests used

- Fluorescent Antibody Test (FAT, accredited 2013), *Protocol: Laboratory SOP* (references: OIE manual and EURL SOPs)

- Biomarker Detection (accredited 2013), *Protocol*: Laboratory SOP (references: OIE manual and EURL SOPs)
- Rabies Tissue Culture Infection Test (RTCIT), *Protocol*: Laboratory SOP (references: OIE manual and EURL SOPs)
- *Cells*: Neuroblastoma cell line (N2a)
- *Conjugate*: Fujirebio Diagnostics FITC Anti-Rabies Monoclonal Globulin
- Vaccine titer
- *Vaccine*: Fuchsoral SAD B19, IDT Biologika and Lysvulpen (Bioveta, Czech Republic),
- *Cells*: BHK 21
- *Protocol*: supplied by Manufacturer
- ELISA (accredited 2013)
- *Test*: BioPro Rabies ELISA Ab kit
- *Protocol*: supplied by Manufacturer
- Real Time (one step) RT-PCR
- *Species amplified*: RABV, DUVV, EBLV-1, EBLV-2, ABLV
- *Protocol*: Laboratory SOP (reference: EURL SOP)

Rabies – cases

Date of occurrence	Animal species	Village	Municipality	History
26.07.2011	Fox	Stari Grad	Veles	The fox enter the backyard of the village house during the day and bite a dog. The fox (and the dog) were shot.
03.08.2011	Fox	Martolci	Veles	The fox enter the backyard of the village house during the day and bite a dog. The fox (and the dog) were shot.
08.09.2011	Wolf	Istibanja	Vinica	The wolf enter the backyard of the village house during the day and bite a dog. The wolf (and the dog) were shot.
11.09.2011	Wolf (young)	Istibanja	Vinica	The young wolf came close to the village house in the evening (not entering the backyard). The dog start to bark. The owner came out, saw the young wolf and kill it with a hey fork.

17.11.2011	Fox	Selemlji	Gevgelija	Regular monitoring for vaccination efficacy (shot during hunting)
30.11.2011	Fox	Dulica	Makedonska Kamenica	Found dead, together with one wolf, one dog and one sheep. The wolf and the dog were also investigated for rabies but were negative.
19.01.2012	Wolf	Banja	Chesinovo Obleshevo	Regular monitoring for vaccination efficacy (shot during hunting)
23.02.2012	Wolf	Glavovica	Kochani	Regular monitoring for vaccination efficacy (shot during hunting)
02.03.2012	Cat	Jargulica	Radovish	The cat bite and scratch the owners. The cat and two other animals (dog and cat in the same yard) were euthanised.

Rabies – cases



2.Measures in place^(b)

Rabies - Awareness Campaign

Various communication tools for general public & professionals on human and animal rabies: posters, leaflets, TV advertisements, radio and TV spots

Trainings for veterinary practitioners, official veterinarians and hunting inspectors, hunters and medical doctors (more than 1000 people trained)

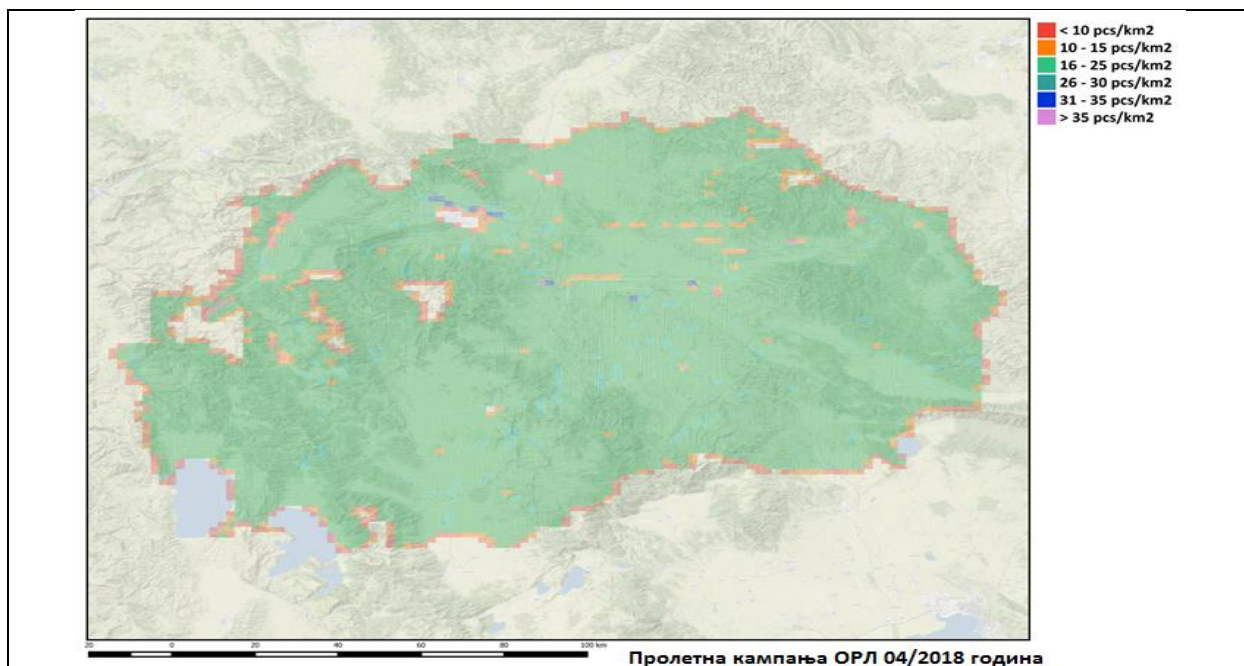
Marking of the World Rabies Day – September 28 (press conference, and open public event “promotion of the vaccination against rabies of pets and stray animals”

National committee for Rabies control: parties involved in animal rabies control and human prevention to exchange information and to coordinate rabies activities

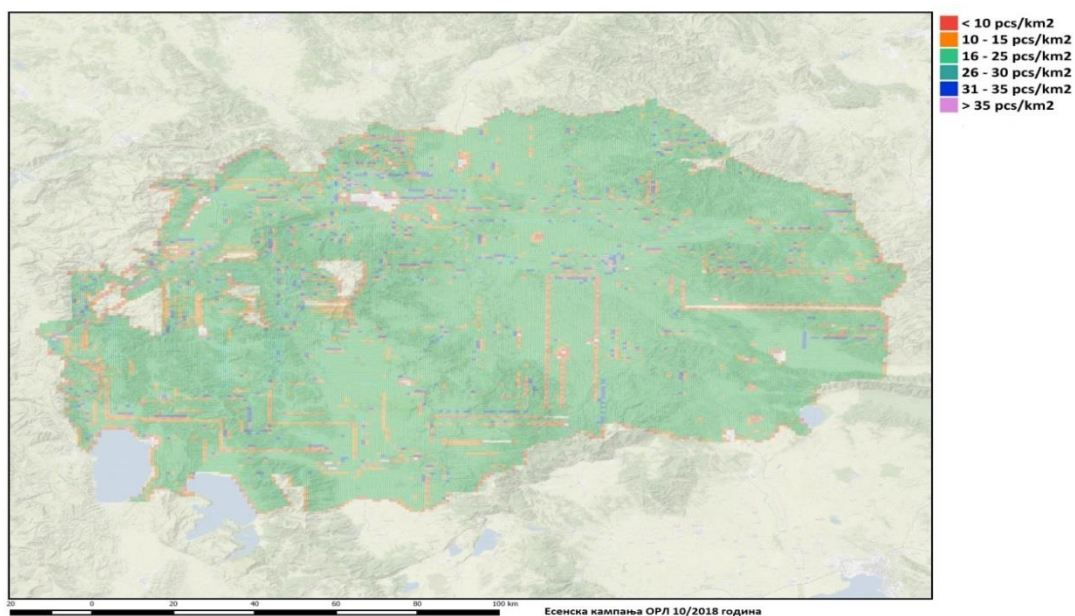
- a) Quality controls on arrival of vaccines
- b) Quality controls prior distribution
- c) Quality controls during distribution

Before delivery, vaccine baits are stored and stored at -20°C and tested for virus titre control from the Institute for State Control of Veterinary Biological Materials and Medicines, Brno, Czech Republic and the National Reference Laboratory in the Republic of Macedonia. During the whole process, cold chain monitoring was carried out (transport-storage - delivery of vaccine baits to the plane). Three aircrafts were used for the implementation of the campaigns, such as Cessna and Piper PA, and distribution was carried out by two sports airports in Skopje and Stip. During oral vaccination, aircraft flying in parallel lines at 500-600 m distance between them by tracking the flying line with a built-in GPS system. The baits were emptied using SURVIS, an automated system, with anticipated evacuation to reach a density of 20 baht / km². Each dropped bait was registered using the GPS system, and the data were transferred to the Food and Veterinary Agency. In order to cover the entire territory of the Republic of North Macedonia, during both campaigns, 144 campaigns were conducted per campaign. Distribution of vaccine baits was carried out on the entire territory of the Republic of Macedonia (on an area of 23.628 km²) to an altitude of 2,000 meters, with the exception of settlements and water surfaces. GPS system has data for dumping 495.142 vaccine baits. The average density of distributed baits was 21 baht / km² with a standard deviation (SD) of 7 baht / km².

Preview of the geographical distribution of baits for oral vaccination against rabies in foxes's spring campaign in 2018.



On the graph below representation of geographical distribution of baits for oral vaccination against rabies in foxes Autumn campaign 2018



Monitoring the oral vaccination of foxes against rabies

The Agency monitors the control of the success of oral vaccination.

Agency in 2018 concluded for the period of 2018 to 2022 with 66 concessionaires on hunting grounds in the country for shooting a number of foxes (4 handcuffs 100km² per year in hunting, or 2 handcuffs 100km² for each campaign) and sampling for laboratory

examination. Monitoring is carried out by determining the rate of consumption of bait by a vaccine through the detection of tetracycline in the teeth of fired foxes, and determining the rate of immunity achieved by detecting the presence of antibodies in the blood.

The results of the monitoring of the presence of tetracycline in the teeth and the detection of antibodies in the tested samples of the conducted campaigns of oral vaccination against rabies against rabies for the period from 2011 to 2018 are shown in Tables below.

Evaluation of the consumption of the vaccine by the detection of tetracycline in the examined fox samples

Year	No. Of tested animal	positive animals	negative animals	% of positive tetracycline
2011	141	86	55	60,99
2012	205	188	17	91,7
2013	479	403	76	84,13
2014	197	181	17	91,87
2015	221	206	15	93,21
2016	140	133	7	95
2017	216	101	115	46,75
2018	222	158	59	71,17
Total	1821	1456	361	79,95

Detection of an immune response or antibody level in the examined fox samples

Year	No. Of tested animal	positive animals	negative animals	% of antibody respond
2011	45	4	41	8,9
2012	37	22	15	59,5
2013	59	21	38	35,6
2014	113	54	59	47,8
2015	39	20	19	51,3
2016	37	13	24	35,1
2017	81	33	48	40,7
2018	96	35	61	36,5
Total	507	202	305	39,8

3. Notification system in place to the national competent authority^(c)

Yes, the obligation for mandatory reporting of rabies is prescribed in the Law on Veterinary Health, the Rulebook on the manner and procedure for reporting rabies in domestic and wild animals and measures to be taken for the eradication and eradication of rabies, and in accordance with the Annual Order for animal health.

4. Results of investigations and national evaluation of the situation, the trends (d) and sources of infection(e)

YEAR	Dates of ORV campaign	Vaccine used	No. of baits/ per campaign	No. of baits	Vaccination area/ km ²	
	spring/autumn					
2011	<u>19 May - 09 June</u>	Fuchsoral SAD B19, IDT Biologika Germany	484.000	22	21.407 km ²	
	<u>11 - 31 October</u>		516.000	22	23.248 km ²	
2012	<u>Missed-delay in tendering procedure</u>		528.000	22	23.248 km ²	
	<u>19 October - 03 November</u>					
2013	<u>04 - 28 April</u>		501.119	22	22.186 km ²	
	<u>28 September - 22 November</u>		510.400	22	23.248 km ²	
2014	<u>22 April - 06 June</u>		500.000	21	23.218 km ²	
	<u>25 September - 10 October</u>		500.000	21	23.569 km ²	
2015	<u>Missed-delay in tendering procedure</u>		Lysvulpen SAD Bern, Bioveta Check Republic	497.900	21	23.235 km ²
	<u>05-18 November</u>					
2016	<u>On 11 – 27 April 2016</u>			500.738	21	23.235 km ²
	<u>On 1-12 October 2016</u>			500.000	22	23.235 km ²
2017	<u>On 20 – 28 April 2017</u>			497.306	22	23.569 km ²
2018	<u>On 20 – 28 April 2018</u>			500.000	21	23.235 km ²
	<u>On 11 – 18 November 2018</u>	500.000		21	23.235 km ²	

5. Additional information

Brucella in small ruminates - Brucella melitensis

1. Monitoring/Surveillance/Control programmes system^(a)

Republic of North Macedonia is not recognized as country officially free from sheep and goat brucellosis according to Directive 91/68/EEC.

Republic of Macedonia has no regions officially free from sheep and goat brucellosis according to provision laid down in Directive 91/68/EEC.

In the last several years, the Food and Veterinary Agency implements programs for control and eradication of the disease. The application of the new strategy resulted with division of the territory of the country into certain number of individual regions i.e. epidemiological units where depending of the widespread of the disease in the country, the prevalence, different measures for control of Brucellosis in sheep and goats apply.

1. Testing and slaughtering of the ovine and caprine animals older than 6 months and
2. Combination of vaccination against brucellosis in ovine and caprine/testing and slaughtering

The type of specimen taken is Blood and method of sampling is Blood sampling.

A sheep is defined as infected with brucellosis if positive in two tests: iElisa, Rose Bengal test and Complement Fixation test and isolation of *Brucella melitensis* by culture after test slaughter.

Complement Fixation Test CFT
Rose Bengal Test RBT
Indirect ELISA
Culture for isolation

2. Measures in place^(b)

According Program for control and eradication measures for control of Brucellosis in sheep and goats have been implemented on based on the risk assessment and the status of the disease and the prevalence in the country, the following measures have been implemented:

1. Vaccination of replacement animals at age of 3-6 months with Rev 1 vaccine through the conjunctival route. All the non-vaccinated animals, and all the animals older than 18 months which have been vaccinated up to their six months of age, are serologically tested

2. Testing and slaughter of adult animals (blood samples are collected from all animals in all flocks older than 6 months during the year).

Measures in case of the positive findings or single cases

1. The holding shall be placed under official surveillance.

2. The implementation of the epidemiological examination in order to identify the source, the time and the method of infection and the previous and the further spread of the infection and

3. It is prohibited to introduce into or to take out from the holding all susceptible animals.

4. The sheep and goats in cases of which the Brucellosis is officially confirmed sed must be isolated, and the positive animals must be visibly identified.

5. The animals in case of which the Brucellosis in sheep and goats is officially confirmed, shall be slaughtered under official supervision as soon as possible, and not later than 30 days from the day when the owner of the animal or the responsible person has been informed about the presence of the disease and the obligation for slaughtering according to the programme for eradication.

6. The milk obtained from the positive animals must be safely disposed or may be used for nutrition of the animals from the same holding following the appropriate heat treatment.

The milk obtained from the positive animals is not used for human consumption. The milk obtained from animals with negative result and the milk obtained from vaccinated animals, according to this programme, may be used for human consumption in accordance with the provisions set out in the veterinary legislation.

7. Safe disposal of aborted fetuses, still born lambs and kids and placentas.
8. Daily collection of the manure and litter/bedding and burial thereof or disinfection. The manure and the litter/bedding must not be taken out at least three weeks following their collection.
9. The hay, the litter/bedding and all the other objects which came into contact with the positive animals, fetuses or placenta must be buried after previous submersion in disinfectant.
10. The premises and the area in which the animals have been present, must be thoroughly cleaned and disinfected with a disinfectant which is registered for use in the Republic of Macedonia.
11. The objects which came into contact with the diseased animals must be thoroughly cleaned and disinfected. If this activity is not possible, they must be disposed.
12. In case of complete depopulation of the holding, the repopulation can take place four weeks following the disinfection.
13. Re-testing of the animals at least 15 and maximum 30 days following the removal of the diseased animals and the disinfection. In case if the animals give negative result, they shall be tested two more times with negative results in such a way that the first testing shall be one month following the last negative result and the second shall be three months later

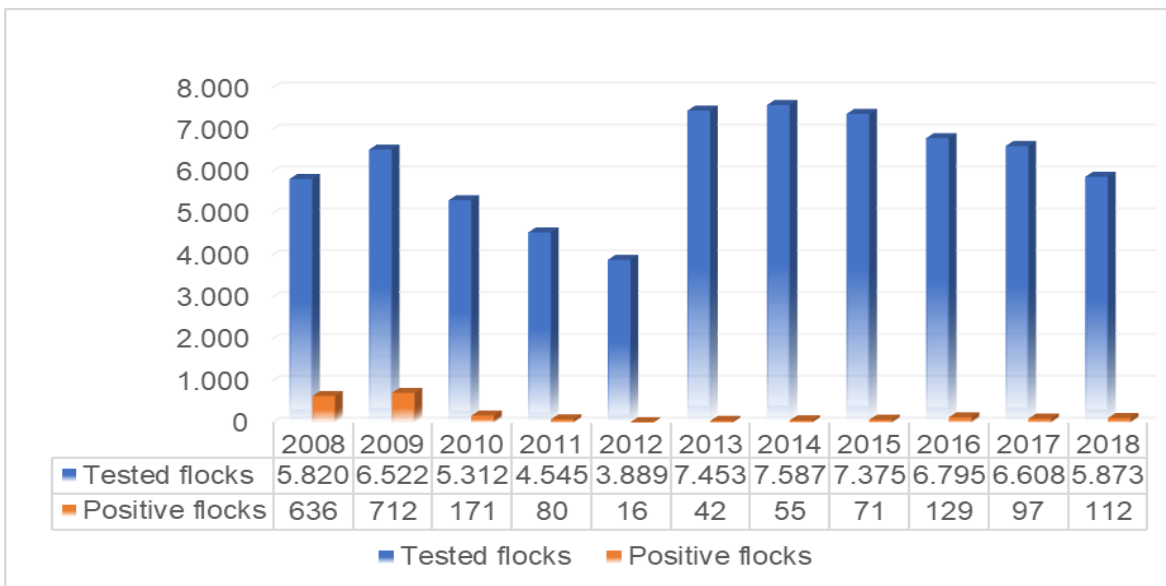
3. Notification system in place to the national competent authority^(c)

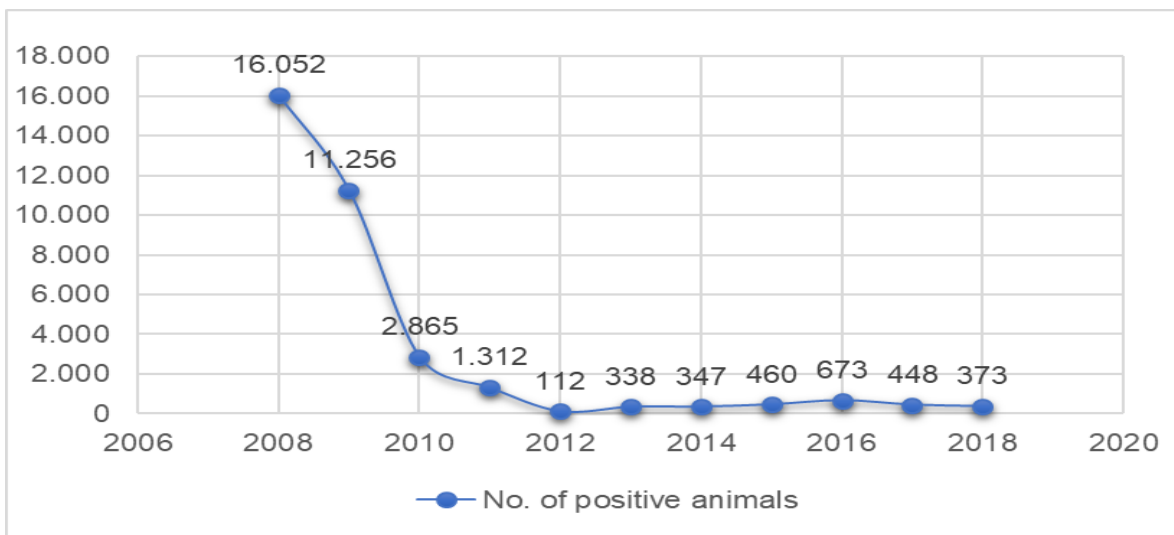
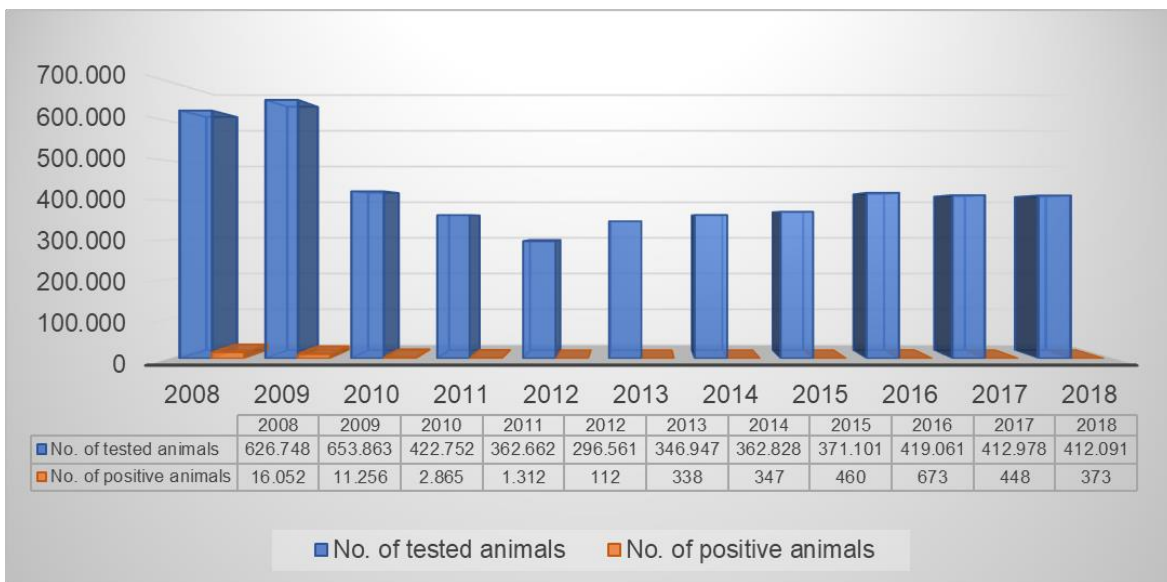
Yes, according Law of veterinary health and Book of rules for compulsory notification animal diseases.

4. Results of investigations and national evaluation of the situation, the trends^(d) and sources of infection^(e)

Reduce the further spreading of the brucellosis in sheep and goats
 Decrease the absolute number of positive animals
 Decrease the number of positive humans

Year	Tested flocks	Positive flocks	% of positive flocks	No. of tested animals	No. of positive animals	% of positive animals
2008	5.820	636	10,93%	626.748	16.052	2,56%
2009	6.522	712	10,92%	653.863	11.256	1,72%
2010	5.312	171	3,22%	422.752	2.865	0,68%
2011	4.545	80	1,76%	362.662	1.312	0,36%
2012	3.889	16	0,41%	296.561	112	0,04%
2013	7.453	42	0,56%	346.947	338	0,10%
2014	7.587	55	0,72%	362.828	347	0,10%
2015	7.375	71	0,96%	371.101	460	0,12%
2016	6.795	129	1,89%	419.061	673	0,16%
2017	6.608	97	1,47%	412.978	448	0,11%
2018	5.873	112	1,64%	412.091	373	0,09%





5. Additional information

Food-borne Outbreaks

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

There are several systems for detections of outbreaks (including food borne outbreaks - FBO) in Macedonia:

Case based surveillance is based on the universal system for reporting communicable diseases, where each medical doctor is obliged to report one of the 64 mandatory reported communicable diseases (including diseases or syndromes of food poisoning). National case definitions are fully aligned with ECDC/EU case definitions form 2012.

Laboratories are obliged to report on 56 microbiological agents (including causes for FBO).

Cases detected by physicians are reported to centers for public Health on local and regional level, while national communicable disease surveillance is responsibility of National Institute of Public Health, where the national case-based database is located. FBO are detected by detecting clusters of reported cases on local/regional level.

In addition, there is syndromic surveillance in place (EWARN – Early Warning and Response System for communicable diseases) were 75% of general practitioners are participating. Reporting is based on weekly aggregated data. The main purpose is to detect clusters of combinable diseases including FBO.

From 2018 as part of event-based surveillance Institute of Public Health is running weekly epidemiological teleconference with regional level epidemiologists, the purpose is timely information exchange and detection of potential clusters or linked cases from different regions.

Finally, there is system for 24/7 response, where teams (epidemiologists and laboratory experts) for Centres for Public Health can lunch outbreak investigation upon call from medical doctors for clustering of cases with food poisoning symptoms.

All outbreaks are reported on outbreak reporting forms by Centres for public health to the Ministry of health and to the Institute of Public Health. FBO are reported to the Food and Veterinary Agency as well.

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

3. National evaluation of the reported outbreaks in the country^(a)

In 2018, 8 food or water borne outbreaks have been reported in the country, with 221 registered cases, of them 54 cases were hospitalized, no deaths were reported. Of the reported outbreaks, Salmonella was implicated in six food borne outbreaks, food

poisoning with Staphylococcal enterotoxins in one outbreak and Escherichia coli in one outbreak.

Of the four outbreaks where Salmonella was causative agent, one outbreak was related to food consumption in canteen - workplace catering, with 84 reported cases. Salmonella Enteritidis was causative agent, evidence is based on descriptive epidemiology and laboratory results. Three outbreaks from different towns with 53 cases were linked with food consumption from one catering service, salmonella enteritidis was identified as causative agent based on descriptive epidemiology and laboratory analysis. Two foodborne outbreaks with 29 cases were linked with food consumption from take-away (fast food outlet) restaurant, Salmonella Enteritidis was likely causative agent based on descriptive epidemiology and lab results.

Food borne outbreaks caused by Staphylococcal enterotoxins was reported in one kinder garten with 13 cases reported (no contaminated food was found).

One outbreak of Escherichia Coli was reported during sporting event, 45 cases were reported (no contaminated food was found). hospitalized, meet and meet products were implicated in both outbreaks (restaurant and fast food restaurant).

4. Descriptions of single outbreaks of special interest

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

For each identified outbreak control measures were put in place according to the type of the outbreak, according to the law and regulation in the country.

6. 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

7. Additional information

Institutions and laboratories involved in antimicrobial resistance monitoring and reporting

The authorization for performing the analysis foreseen with the Annual plan for monitoring of antimicrobial resistance is granted by the Director of the Food and Veterinary Agency on a basis of a signed contract awarded through a carried out tendering procedure.

The laboratory for microbiology of food and feed within the Food Institute – Faculty of veterinary medicine – Skopje, Ss Cyril and Methodius University, Skopje was the laboratory authorized for performing analysis foreseen with the Annual plan for monitoring of antimicrobial resistance for 2018.

Faculty of Veterinary Medicine - Skopje was accredited on June 25, 2008 by Accreditation Institute of the of Republic of North Macedonia for compliance with the requirements from the standard MKC EN ISO/IEC 17025:2006. (certificate no. LT-006).

The scope of accreditation of the Food Institute covers 139 methods, including microbiology, chemistry and residues and contaminants in food.

The laboratory for microbiology of food and feed is a modern equipped laboratory with trained staff, accredited according to ISO 17025. The laboratory services provided by this laboratory are in compliance with modern needs and requirements of food business operators in the validation of their procedures, as well as the competent inspection authorities performing controls on the safety of food imports and in the domestic market. The laboratory of microbiology of food and feed is a national testing laboratory in food pathogens (*Salmonella* spp., *Listeria monocytogenes*, *Campylobacter* spp., *E. Coli* O157:H7).

In this laboratory the following type of testing is performed:

- ✓ microbiological analysis of raw materials, food and feed,
- ✓ microbiological analysis of potable water and water used in food industry,
- ✓ microbiological analysis of swabs from surfaces and swabs from the carcasses of slaughtered animals,
- ✓ implementation of the activities of the National monitoring programme for testing *Salmonella* spp.,
- ✓ determination of antimicrobial resistance of isolates,
- ✓ screening tests for detection the presence of antimicrobial substances in foodstuffs.

All of the tests in the laboratory are performed according to ISO accredited methods or ISO methods or other internationally accepted standards, in constant communication with clients on the course and selection of analytical methods. Currently, the laboratory is working with 13 methods accredited according to ISO for testing food and feed and

materials taken from the food processing objects and 5 methods for testing water accredited according to ISO.

General Antimicrobial Resistance Evaluation

1. Situation and epidemiological evolution (trends and sources) regarding AMR to critically important antimicrobials^(a) (CIAs) over time until recent situation

In 2018 Republic of North Macedonia started with implementation of the Program for antimicrobial resistance in the period 2017 – 2021. In 2018 we have first results of the implementation of the program with the first results of detected AMR in isolates from food producing animals.

2. Public health relevance of the findings on food-borne AMR in animals and foodstuffs

All the finding and results about the antimicrobial resistance in 2018 in Republic of North Macedonia are public published on the official web side of the Food and Veterinary Agency of Republic of North Macedonia.

3. Recent actions taken to control AMR in food producing animals and food

The Agency adopted amendments of the Law for veterinary – medicinal products and were organized public campaigns for the awareness of the AMR in food producing animals last year.

4. Any specific action decided in the Member State or suggestions to the European Union for actions to be taken against food-borne AMR threat

5. Additional information

General Description of Antimicrobial Resistance Monitoring*

1. General description of sampling design and strategy^(a)

In 2017 Republic of North Macedonia has adopted the Program for antimicrobial resistance for the period 2017 – 2021. The Program for Antimicrobial Resistance for the period 2017 - 2021 is performing monitor of antimicrobial resistance in order to ensure compliance with the requirements stipulated by the Law on Food Safety for obtaining comparative data on the occurrence of antimicrobial resistance among agents of zoonoses, if they pose a threat to public health or other triggers. The Program lays down the detailed rules for the harmonised monitoring and reporting of antimicrobial resistance (AMR) to be carried out in accordance with the Book of rules on the manner of performing official controls and procedures for monitoring zoonoses and zoonotic agents and a list of zoonoses and zoonotic agents that are regularly monitored (Official Gazette of the Republic of Macedonia No. 80/11). The Book of rules on the manner of performing official controls and procedures for monitoring zoonoses and zoonotic agents and a list of zoonoses and zoonotic agents that are regularly monitored (Official Gazette of the Republic of Macedonia No. 80/11) is fully harmonized with the Directive 2003/99/EC of the European Parliament and of the Council of 17 November 2003 on the monitoring of zoonoses and zoonotic agents, amending Council Decision 90/424/EEC and repealing Council Directive 92/117/EEC.

The Program for Antimicrobial Resistance for the period 2017 – 2021 is fully harmonized with the Commission Implementing Decision 2013/652/EU of 12 November 2013 on the monitoring and reporting of antimicrobial resistance in zoonotic and commensal bacteria.

With the Program for Antimicrobial Resistance for the period 2017 – 2021 are cover the following bacteria obtained from samples from certain food-producing animal populations and certain food:

- (a) *Salmonella* spp.;
- (b) *Campylobacter jejuni* and *Campylobacter coli* (*C. jejuni* and *C. coli*);
- (c) Indicator commensal *Escherichia coli* (*E. coli*);
- (d) Indicator commensal *Enterococcus faecalis* and *Enterococcus faecium* (*E. faecalis* and *E. faecium*).

The Program lays down the specific requirements for the harmonised monitoring and reporting of the *Salmonella* spp., and *E. coli* producing the following enzymes in certain food-producing animal populations and in certain food:

- (a) Extended-Spectrum β -Lactamases (ESBL);
- (b) AmpC β -Lactamases (AmpC);
- (c) Carbapenemases.

Republic of North Macedonia in 2018 has collected representative isolates of the following bacteria in accordance with the technical requirements set out in the part A of the Annex of the Program:

- (a) Salmonella spp.;
- (b) C. jejuni;
- (c) Indicator commensal E. coli; and
- (d) ESBL- or AmpC- or carbapenemase-producing E. coli.

Due to a low bacterial prevalence, low number of epidemiological units and low number of production in the country, we have decided to collect samples each year for laying hens, broilers and fresh meat thereof, pigs, bovines under one year of age, pig meat and bovine meat in slaughterhouses and retail. Additional we included all the isolated obtained from National control plan for Salmonella spp. and isolates from the Book of rules on special requirements for microbiological criteria for food, that is harmonized with regulation 2073/2005 (points 2.1.3, 2.1.4 and 2.1.5 of Chapter 2 of Annex I to Regulation (EC) No 2073/2005).

Sample size, sample frequency and sampling design are in accordance with the Commission Implementing Decision 2013/652/EU.

2. Stratification procedure per animal population and food category

According to number of slaughter animals and the category of approved slaughterhouses, at the beginning of the year we prepare an Annual plan for AMR in accordance with the Program for Antimicrobial Resistance for the period 2017 – 2021, that is public published. Based on that, every epidemiological unit and slaughterhouse have defined number of samples to be collected per month. Samples originates from retail are divided based on consumption of different type of meat that is covered by the program.

3. Randomisation procedure per animal population and food category

See point 2.

4. Analytical method used for detection and confirmation^(b)

All the analytical method used for detection and confirmation are accredited. We used methods according to ISO and EURL AR (DTU DK). The broth microdilution method and commercial prepared plates in accordance with the Decision 2013/652 were used to test the antimicrobial susceptibility of bacteria.

5. Laboratory methodology used for detection of antimicrobial resistance^(c)

Broth microdilution method (Dilution – sensititre)

6. Results of investigation

Total number of 92 isolates were included in the Annual plan for monitoring of Antimicrobial resistance in 2018:

Bacterial	Population of animas	Number of taken samples	N (number of isolates)
<i>Salmonella spp.</i>	Broilers	4	1
	Fattening pigs	85	1
	Bovines under one year of age	30	0
<i>C. jejuni</i>	Broilers	4	1
Indicator commensal Escherichia coli (E. coli)	Broilers	4	4
	Fattening pigs	49	41
	Bovines under one year of age	46	42
ESBL- or AmpC- or carbapenemase-producing E. coli.	Broilers	11	1
	Fattening pigs	9	1
	Bovines under one year of age	6	0

Additional we included 9 isolates form the National monitoring plan for Salmonella spp. in laying hens (harmonized with the Regulation (EC) No 2160/2003 of the European Parliament and of the Council of 17 November 2003 on the control of salmonella and other specified food-borne zoonotic agents) and 5 isolates from point 2.1.5 of Chapter 2 of Annex I to Regulation (EC) No 2073/2005.

	Broilers
S. Enteritidis	8
S. Typhimurium	2
S. Newport	0
S. Livingstone	1
S. Bredeney	1
S. Senftenberg	1
O 6,7 :H mt : H /	1

List of Antimicrobials included and Cut-off values

Salmonella spp.			
First panel			
Substance	Cut off Value	Lowest concentration range	Highest concentration range
Ampicillin	8	1	64
Chloramphenicol	16	8	128
Ciprofloxacin	0.064	0.015	8
Gentamicin	2	0.5	32
Tetracycline	8	2	64
Tigecycline	1 **	0.25	8
Azithromycin	16 *	2	64

Colistin	2	1	16
Nalidixic acid	16	4	128
Sulfamethoxazole	256 *	8	1024
Ceftazidim	2	0.5	8
Trimethoprim	2	0.25	32
Cefotaxim	0.5	0.25	4
Meropenem	0.125	0.03	16
Second panel			
Ertapenem	0.064	0.015	2
Cefepime	0.12 *	0.064	32
Cefotaxim	0.5	0.25	64
Cefotaxime + Clavulanic acid	0.5 *	0.064	64
Cefoxitin	8	0.5	64
Imipenem	1	0.12	16
Meropenem	0.12	0.03	16
Ceftazidim	2	0.25	128
Ceftazidime + Clavulanic acid	2 *	0.12	128
Temocillin	32 *	0.5	64

* Complementary interpretative thresholds missing in Decision 2013/652/EU to be used for reporting AMR data in *Salmonella* spp.

** The ECOFF value of 1 mg/L applies to serovars Typhimurium, Typhi and Paratyphi, while for serovars Enteritidis, an ECOFF value of 2 mg/L should apply, according to the latest EUCAST recommendations.

Indicator commensal E.coli / ESBL- or AmpC- or carbapenemase-producing E. coli.			
First panel			
Substance	Cut off Value	Lowest concentration range	Highest concentration range
Ampicillin	8	1	64
Chloramphenicol	16	8	128
Ciprofloxacin	0.064	0.015	8
Gentamicin	2	0.5	32
Tetracycline	8	2	64
Tigecycline	1	0.25	8
Azithromycin	16 *	2	64
Colistin	2	1	16
Nalidixic acid	16	4	128
Sulfamethoxazole	64	8	1024
Ceftazidim	0.5	0.5	8
Trimethoprim	2	0.25	32
Cefotaxim	0.25	0.25	4
Meropenem	0.125	0.03	16
Second panel			
Ertapenem	0.064	0.015	2
Cefepime	0.12	0.064	32
Cefotaxim	0.25	0.25	64
Cefotaxime + Clavulanic acid	0.25 *	0.064	64

Cefoxitin	8	0.5	64
Imipenem	0.5	0.12	16
Meropenem	0.12	0.03	16
Ceftazidim	0.5	0.25	128
Ceftazidime + Clavulanic acid	0.5 *	0.12	128
Temocillin	32 *	0.5	64

* Complementary interpretative thresholds missing in Decision 2013/652/EU to be used for reporting AMR data in indicator commensal *E. coli*

C. jejuni			
Substance	Cut off Value	Lowest concentration range	Highest concentration range
Ciprofloxacin	0.5	0.12	16
Erythromycin	4	1	128
Gentamicin	2	0.12	16
Tetracycline	1	0.5	64
Nalidixic acid	16	1	64
Streptomycin	4	0.25	16

7. Additional information