European Food Safety Authority

ZOONOSES MONITORING

Switzerland

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

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

IN 2017

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 Switzerland during the year 2017.

The information covers the occurrence of these diseases and agents in animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and indicator bacteria as well as information on epidemiological investigations of foodborne outbreaks.
Complementary data on susceptible animal populations in the country is also given. The information given covers both zoonoses that are important for the public health in the whole European Union as well as zoonoses, which are relevant on the basis of the national epidemiological situation.
The report describes the monitoring systems in place and the prevention and control strategies applied in the country. For some zoonoses this monitoring is based on legal requirements laid down by the European Union legislation, while for the other zoonoses national approaches are applied.

The report presents the results of the examinations carried out in the reporting year. A national evaluation of the epidemiological situation, with special reference to trends and sources of zoonotic infections, is given. Whenever possible, the relevance of findings in foodstuffs and animals to zoonoses cases in humans is evaluated.
The information covered by this report is used in the annual European Union Summary Reports on zoonoses and antimicrobial resistance that are published each year by EFSA.

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

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

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ANIMAL POPULATION TABLES

Table Susceptible animal population

Animal species	Category of animals	Population: holding	Population: animal	Population: slaughter animal (heads)
Cattle (bovine animals)	Cattle (bovine animals)	35,513	1,544,612	608,666
Gallus gallus (fowl)	Gallus gallus (fowl) - breeding flocks, unspecified	1,703	177,571	
	Gallus gallus (fowl) - broilers	1,052	7,153,341	69,540,476
	Gallus gallus (fowl) - laying hens	19,957	4,050,389	
Goats	Goats	6,364	78,146	37,905
Pigs	Pigs	6,406	1,444,591	2,661,544
Sheep	Sheep	8,315	342,419	224,598
Solipeds, domestic	Solipeds, domestic - horses	8,435	55,535	2,194
Turkeys	Turkeys - fattening flocks	318	77,854	

DISEASE STATUS TABLES

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

Region	Number of animals serologically tested under investigations of suspect cases	Number of suspended herds under investigations of suspect cases	Number of seropositive animals under investigations of suspect cases	Number of animals positive to BST under investigations of suspect cases	Number of animals positive in microbiological testing under investigations of suspect cases	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	Number of infected herds tested under surveillance	Number of herds tested under surveillance by bulk milk	Number of animals or pools tested under surveillance by bulk milk	Number of infected herds tested under surveillance by bulk milk	Number of notified abortions whatever cause	Number of isolations of Brucella infections	Number of abortions due to Brucella abortus	Number of animals tested by microbiology under investigations of suspect cases
SWITZERLAND	781	0	0	0	0	35,513	0	1,544,612	0	0	35,513	0	0	0	0	4,679	0	0	0

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

Region	Number of animals serologically tested under investigations of suspect cases	Number of suspended herds under investigations of suspect cases	Number of seropositive animals under investigations of suspect cases	Number of animals positive in microbiological testing under investigations of suspect cases	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	Number of infected herds tested under surveillance	Number of animals tested by microbiology under investigations of suspect cases
SWITZERLAND	77	0	0	0	14,679	0	420,565	1,237	14,163	14,679	0	0

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	Interval between routine tuberculin tests	Number of animals tested with tuberculin routine testing	Number of tuberculin tests carried out before the introduction into the herds	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination	Total number of herds
SWITZERLAND	35,513	0	1,544,612	0	0	0	166	0	35,513

PREVALENCE TABLES

Table Brucella:BRUCELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling Details	Method	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
SWITZERLAND	Alpacas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	1	0	Brucella	0
	Pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	28	0	Brucella	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
SWITZERLAND	Alpacas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	5	0	Campylobacter	0
	Bears - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	3	0	Campylobacter	0
	Birds - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Bison - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	6	0	Campylobacter	0
	Budgerigars - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Camels - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	4	1	Campylobacter	1
	Capybaras - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Cats - pet animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	466	10	Campylobacter	7
							Campylobacter jejuni	2
							Campylobacter upsaliensis	1
	Cattle (bovine animals) - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	64	22	Campylobacter	13
							Campylobacter hyointestinalis	1
							Campylobacter jejuni	8
	Cheetahs - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	1	Campylobacter jejuni	1
	Crocodile - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Deer - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Dogs - pet animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	868	84	Campylobacter	64
							Campylobacter jejuni	13
							Campylobacter upsaliensis	7
	Ducks - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Elephants - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Ferrets - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	8	0	Campylobacter	0
	Finches - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Foxes - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Gallus gallus (fowl) - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	13	3	Campylobacter	2
							Campylobacter jejuni	1
	Geese - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Giraffes - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	4	2	Campylobacter	2
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	9	0	Campylobacter	0
	Guinea pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	7	1	Campylobacter jejuni	1
	Hedgehogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Kangaroos - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Marten - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Monkeys - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	23	1	Campylobacter jejuni	1
	Oscine birds - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Other carnivores - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	1	Campylobacter upsaliensis	1
	Other ruminants - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Campylobacter	0
	Owls - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Parrots - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	20	0	Campylobacter	0
	Pigs - Slaughterhouse - Switzerland - animal sample - caecum - Monitoring - Official sampling - Objective sampling	N_A	Detection method of microorganisms	animal	296	170	Campylobacter	0
							Campylobacter coli	161
							Campylobacter jejuni	9
	Pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	9	1	Campylobacter	1
	Quails - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	1	Campylobacter jejuni	1
	Rabbits - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	11	0	Campylobacter	0

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
SWITZERLAND	Reptiles - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	4	0	Campylobacter	0
	Rhinoceros - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Rodents - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	3	0	Campylobacter	0
	Snakes - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	9	1	Campylobacter	1
	Solipeds, domestic - horses - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	48	0	Campylobacter	0
	Squirrels - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Campylobacter	0
	Zoo animals, all - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	11	0	Campylobacter	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
SWITZERLAND	Meat from broilers (Gallus gallus) - carcase - Slaughterhouse - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	10	Gram	N_A	ISO 10272-1:2006 Campylobacter	235	115	Campylobacter	82
									Campylobacter coli	4
									Campylobacter jejuni	29
	Meat from broilers (Gallus gallus) - fresh - skinned - Cutting plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 10272-1:2006 Campylobacter	79	34	Campylobacter	15
									Campylobacter coli	7
									Campylobacter jejuni	12
	Meat from broilers (Gallus gallus) - fresh - skinned - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 10272-1:2006 Campylobacter	13	1	Campylobacter	1
		single (food/feed)	10	Gram	N_A	ISO 10272-1:2006 Campylobacter	42	16	Campylobacter	10
									Campylobacter coli	1
									Campylobacter jejuni	5
	Meat from broilers (Gallus gallus) - fresh - with skin - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 10272-1:2006 Campylobacter	25	3	Campylobacter	3
		single (food/feed)	10	Gram	N_A	ISO 10272-1:2006 Campylobacter	58	28	Campylobacter	20
									Campylobacter coli	1
									Campylobacter jejuni	7
	Meat from broilers (Gallus gallus) - fresh - with skin - Slaughterhouse - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 10272-1:2006 Campylobacter	210	97	Campylobacter	59
									Campylobacter coli	12
									Campylobacter jejuni	26
	Meat from broilers (Gallus gallus) - meat preparation - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 10272-1:2006 Campylobacter	19	4	Campylobacter	4
	Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 10272-1:2006 Campylobacter	444	0	Campylobacter	0
	Meat from broilers (Gallus gallus) - meat products - raw but intended to be eaten cooked - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	10	Gram	N_A	ISO 10272-1:2006 Campylobacter	66	5	Campylobacter	3
									Campylobacter jejuni	2
	Meat from turkey - carcase - Slaughterhouse - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	10	Gram	N_A	ISO 10272-1:2006 Campylobacter	27	19	Campylobacter	1
									Campylobacter coli	2
									Campylobacter jejuni	16
	Meat from turkey - fresh - skinned - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	10	Gram	N_A	ISO 10272-1:2006 Campylobacter	14	4	Campylobacter	0
									Campylobacter jejuni	4

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
SWITZERLAND	Alpacas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Staining	2	0		Coxiella	0
	Cattle (bovine animals) - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Staining	3051	42		Coxiella burnetii	42
	Cattle (bovine animals) - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Real-Time PCR (qualitative or quantitative)	139	19		Coxiella burnetii	19
	Elephants - zoo animals - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Staining	1	0		Coxiella	0
	Elephants - zoo animals - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Real-Time PCR (qualitative or quantitative)	1	0		Coxiella	0
	Gallus gallus (fowl) - unspecified - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Staining	1	0		Coxiella	0
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Staining	199	20		Coxiella burnetii	20
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Real-Time PCR (qualitative or quantitative)	12	4		Coxiella burnetii	4
	Lamas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Staining	1	0		Coxiella	0
	Other ruminants - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	yak	Staining	1	0		Coxiella	0
	Pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Staining	4	0		Coxiella	0
	Pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Real-Time PCR (qualitative or quantitative)	3	0		Coxiella	0
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Staining	166	5		Coxiella burnetii	5
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	N_A	Real-Time PCR (qualitative or quantitative)	21	5		Coxiella burnetii	5
	Zoo animals, all - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	zebra	Staining	1	0		Coxiella	0

Table Echinococcus:ECHINOCOCCUS 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
SWITZERLAND	Alpine chamois - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	1	0	Echinococcus	0
	Beavers - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	1	1	Echinococcus multilocularis	1
	Cats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	5	0	Echinococcus	0
	Dogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	21	3	Echinococcus	0
							Echinococcus multilocularis	3
	Foxes - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	6	2	Echinococcus	0
							Echinococcus multilocularis	2
	Foxes - wild - Unspecified - Switzerland - animal sample - Unspecified - Not applicable - Not specified	research project	Magnetic stirrer method for pooled sample digestion	animal	201	93	Echinococcus multilocularis	93
	Lamas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	1	0	Echinococcus	0
	Monkeys - zoo animal - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunoblotting (IB)	animal	2	0	Echinococcus	0
	Monkeys - zoo animal - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	1	1	Echinococcus multilocularis	1
	Pigs - Slaughterhouse - Switzerland - animal sample - Unspecified - Not applicable - Not specified	research project	Real-Time PCR (qualitative or quantitative)	animal	662	137	Echinococcus multilocularis	137
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	2	0	Echinococcus	0
	Solipeds, domestic - horses - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	2	0	Echinococcus	0

Table FLAVIVIRUS in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Vaccination status	Sampling Details	Method	Total units tested	Total units positive	Zoonoses		N of units positive
SWITZERLAND	Birds - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal	No	N_A	Real-Time PCR (qualitative or quantitative)	2	0		Flavivirus	0
	Gallus gallus (fowl) - laying hens - Unspecified - Switzerland - animal sample - blood - Unspecified - Not applicable - Not specified	animal	No	research project, laying hens are free-ranged	Enzyme-linked immunosorbent assay (ELISA)	349	0		Flavivirus	0
	Solipeds, domestic - horses - Unspecified - Switzerland - animal sample - blood - Clinical investigations - Not applicable - Not specified	animal	No	N_A	Real-Time PCR (qualitative or quantitative)	5	0		Flavivirus	0
	Solipeds, domestic - horses - Unspecified - Switzerland - animal sample - organ/tissue - Clinical investigations - Not applicable - Not specified	animal	No	liquor	Real-Time PCR (qualitative or quantitative)	2	0		Flavivirus	0
	Turkeys - Unspecified - Switzerland - animal sample - blood - Unspecified - Not applicable - Not specified	animal	No	research project	Enzyme-linked immunosorbent assay (ELISA)	101	0		Flavivirus	0

Table Francisella:FRANCISELLA 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
SWITZERLAND	Hares - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	5	2	Francisella tularensis	2
	Hares - zoo animal - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	1	1	Francisella tularensis	1
	Lynx - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	1	0	Francisella	0
	Monkeys - zoo animal - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	2	1	Francisella tularensis	1
	Squirrels - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	2	1	Francisella tularensis	1

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
SWITZERLAND	Alpacas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	1	0	Listeria	0
	Cats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	3	0	Listeria	0
	Cattle (bovine animals) - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	23	10	Listeria monocytogenes	10
	Deer - wild - red deer - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	2	0	Listeria	0
	Dogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	3	0	Listeria	0
	Elephants - zoo animals - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	2	0	Listeria	0
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Microbiological tests	animal	1	0	Listeria	0
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	1	0	Listeria	0
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Histology	animal	2	2	Listeria monocytogenes	2
	Hares - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	1	1	Listeria monocytogenes	1
	Pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	16	0	Listeria	0
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Histology	animal	9	1	Listeria	1
	Solipeds, domestic - horses - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Detection method of microorganisms	animal	3	0	Listeria	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
SWITZERLAND	Cheeses made from cows' milk - hard - made from raw or low heat-treated milk - Processing plant - Switzerland - food sample - Monitoring - Industry sampling - Selective sampling	single (food/feed)	25	Gram	N_A	537	1	detection	Listeria monocytogenes	537	1
	Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk - Processing plant - Switzerland - food sample - Monitoring - Industry sampling - Selective sampling	single (food/feed)	25	Gram	N_A	896	0	detection	Listeria monocytogenes	896	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
SWITZERLAND	Badgers - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Bats - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	21	1	European bat lyssavirus 1	1
							Lyssavirus	0
	Cats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	7 samples originated from illegal imported cats from rabies risk countries.	Immunofluorenscence assay tests (IFA)	animal	25	0	Lyssavirus	0
	Cattle (bovine animals) - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	3	0	Lyssavirus	0
	Deer - wild - roe deer - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	2	0	Lyssavirus	0
	Dogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	31 samples originated from illegal imported dogs from rabies risk countries.	Immunofluorenscence assay tests (IFA)	animal	65	0	Lyssavirus	0
	Ferrets - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	1	0	Lyssavirus	0
	Foxes - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	14	0	Lyssavirus	0
	Squirrels - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	2	0	Lyssavirus	0

Table Mycobacterium:MYCOBACTERIUM in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling Details	Method	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
SWITZERLAND	Alpacas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	2	0	Mycobacterium	0
	Alpine chamois - Unspecified - Switzerland - animal sample - Unspecified - Not applicable - Not specified	project LYMON	Real-Time PCR (qualitative or quantitative)	animal	1	0	Mycobacterium	0
	Capybaras - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	1	0	Mycobacterium	0
	Cats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	1	0	Mycobacterium	0
	Cats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	5	1	Mycobacterium	1
	Deer - wild - red deer - Unspecified - Switzerland - animal sample - Unspecified - Not applicable - Not specified	project LYMON	Real-Time PCR (qualitative or quantitative)	animal	230	0	Mycobacterium	0
	Deer - wild - roe deer - Unspecified - Switzerland - animal sample - Unspecified - Not applicable - Not specified	project LYMON	Real-Time PCR (qualitative or quantitative)	animal	4	0	Mycobacterium	0
	Dogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	1	0	Mycobacterium	0
	Ducks - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	1	0	Mycobacterium	0
	Elephants - zoo animals - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	5	0	Mycobacterium	0
	Elephants - zoo animals - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	18	0	Mycobacterium	0
	Gallus gallus (fowl) - unspecified - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	1	0	Mycobacterium	0
	Lamas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	2	1	Mycobacterium	1
	Pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	1	0	Mycobacterium	0
	Rabbits - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	1	0	Mycobacterium	0
	Reptiles - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	1 iguana, 1 saurian	Staining	animal	2	0	Mycobacterium	0
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	1	0	Mycobacterium	0
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	2	0	Mycobacterium	0
	Snakes - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Staining	animal	1	0	Mycobacterium	0
	Steinbock - wild - Unspecified - Switzerland - animal sample - Unspecified - Not applicable - Not specified	project LYMON	Real-Time PCR (qualitative or quantitative)	animal	1	0	Mycobacterium	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
SWITZERLAND	Alpacas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	9	0	Salmonella	0
	Alpine chamois - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Bats - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Bears - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0
	Beavers - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Birds - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	11	3	Salmonella	3
	Birds - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	15	3	Salmonella	2
									Salmonella Enteritidis	1
	Bison - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0
	Bison - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	5	0	Salmonella	0
	Budgerigars - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	5	0	Salmonella	0
	Camels - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	6	0	Salmonella	0
	Capybaras - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Cats - pet animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	485	11	Salmonella	9
									Salmonella Dublin	1
									Salmonella Enteritidis	1
	Cattle (bovine animals) - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2811	580	Salmonella	533
									Salmonella Dublin	2
									Salmonella Enteritidis	8
									Salmonella Napoli	1
									Salmonella Newport	1
									Salmonella Typhimurium	28
									Salmonella Typhimurium, monophasic	7
	Cheetahs - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0
	Crocodile - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Deer - farmed - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	5	0	Salmonella	0
	Deer - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0
	Deer - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	3	0	Salmonella	0
	Dogs - pet animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	874	22	Salmonella	16
									Salmonella Agona	1
									Salmonella Albany	1
									Salmonella Chester	1
									Salmonella Isangi	1
									Salmonella Typhimurium	1
									Salmonella Typhimurium, monophasic	1
	Ducks - pet animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0
	Elephants - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	3	0	Salmonella	0
	Ferrets - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	8	0	Salmonella	0
	Finches - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Finches - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	3	0	Salmonella	0
	Foxes - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Switzerland - animal sample - organ/tissue - Control and eradication programmes - Official sampling - Suspect sampling	herd/flock	3604	N	N_A	ISO 6579:2002 Salmonella	4	1	Salmonella	0
									Salmonella Typhimurium	1

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
SWITZERLAND	Gallus gallus (fowl) - broilers - before slaughter - Farm - Switzerland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock	3604	N	N_A	ISO 6579:2002 Salmonella	460	5	Salmonella	0
									Salmonella 13,23:i:-	1
									Salmonella Oranienburg	1
									Salmonella Typhimurium	1
									Salmonella Typhimurium, monophasic	2
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Switzerland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	3604	Y	N_A	ISO 6579:2002 Salmonella	499	1	Salmonella	0
									Salmonella Typhimurium	1
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Switzerland - environmental sample - boot swabs - Control and eradication programmes - Official sampling - Census	herd/flock	3604	N	N_A	ISO 6579:2002 Salmonella	39	2	Salmonella	0
									Salmonella Fresno	1
									Salmonella Tennessee	1
	Gallus gallus (fowl) - laying hens - adult - Farm - Switzerland - animal sample - organ/tissue - Control and eradication programmes - Official sampling - Suspect sampling	herd/flock	812	N	N_A	ISO 6579:2002 Salmonella	11	4	Salmonella	0
									Salmonella Enteritidis	4
	Gallus gallus (fowl) - laying hens - adult - Farm - Switzerland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	812	Y	N_A	ISO 6579:2002 Salmonella	384	4	Salmonella	0
									Salmonella Enteritidis	4
				N	N_A	ISO 6579:2002 Salmonella	384	14	Salmonella	0
									Salmonella Enteritidis	2
									Salmonella Livingstone	1
									Salmonella Mbandaka	5
									Salmonella Senftenberg	1
									Salmonella Typhimurium	4
									Salmonella Typhimurium, monophasic	1
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult - Farm - Switzerland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	66	Y	N_A	ISO 6579:2002 Salmonella	50	0	Salmonella	0
				N	N_A	ISO 6579:2002 Salmonella	50	1	Salmonella	0
									Salmonella Veneziana	1
	Gallus gallus (fowl) - parent breeding flocks for egg production line - adult - Farm - Switzerland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	116	Y	N_A	ISO 6579:2002 Salmonella	30	0	Salmonella	0
				N	N_A	ISO 6579:2002 Salmonella	30	10	Salmonella	0
									Salmonella Ajiobo	1
									Salmonella Fluntern	1
									Salmonella Havana	1
									Salmonella Mbandaka	5
									Salmonella Menston	1
									Salmonella Newport	1
	Geese - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	3	0	Salmonella	0
	Giraffes - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	7	0	Salmonella	0
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	54	2	Salmonella	1
									Salmonella Typhimurium	1
	Guinea fowl - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Guinea pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	8	0	Salmonella	0
	Hedgehogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	7	0	Salmonella	0
	Kangaroos - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	3	0	Salmonella	0
	Lamas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Lynx - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Marten - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Mice - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Monkeys - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	23	0	Salmonella	0
	Mouflons - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Ostriches - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Other carnivores - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	6	0	Salmonella	0
	Other ruminants - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	4	0	Salmonella	0
	Otter - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0

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
SWITZERLAND	Owls - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0
	Parrots - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	23	0	Salmonella	0
	Peafowl - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Penguin - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	3	0	Salmonella	0
	Pigeons - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	5	0	Salmonella	0
	Pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	259	31	Salmonella	19
									Salmonella Bredeney	1
									Salmonella Derby	4
									Salmonella Enteritidis	1
									Salmonella Typhimurium, monophasic	6
	Quails - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	4	0	Salmonella	0
	Rabbits - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	16	0	Salmonella	0
	Rats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	2	0	Salmonella	0
	Reindeers - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Reptiles - pet animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	8	3	Salmonella	3
	Reptiles - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	19	17	Salmonella	4
									Salmonella enterica, subsp. houtenae	3
									Salmonella enterica, subspecies diarizonae	5
									Salmonella enterica, subspecies enterica	5
	Rodents - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	Aguti	Not Available	1	0	Salmonella	0
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	77	14	Salmonella	3
									Salmonella enterica, subspecies diarizonae	11
	Snakes - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	21	11	Salmonella	11
	Solipeds, domestic - donkeys - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	5	0	Salmonella	0
	Solipeds, domestic - horses - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	155	5	Salmonella	0
									Salmonella Typhimurium	5
	Squirrels - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Steinbock - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Swans - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Turkeys - fattening flocks - before slaughter - Farm - Switzerland - animal sample - organ/tissue - Control and eradication programmes - Official sampling - Suspect sampling	herd/flock	92	N	N_A	ISO 6579:2002 Salmonella	1	1	Salmonella Typhimurium	1
	Turkeys - fattening flocks - before slaughter - Farm - Switzerland - environmental sample - boot swabs - Control and eradication programmes - Industry sampling - Census	herd/flock	92	N	N_A	ISO 6579:2002 Salmonella	18	3	Salmonella	0
									Salmonella Albany	2
									Salmonella Typhimurium	1
	Turkeys - fattening flocks - before slaughter - Farm - Switzerland - environmental sample - boot swabs - Control and eradication programmes - Official and industry sampling - Census	herd/flock	92	Y	N_A	ISO 6579:2002 Salmonella	18	1	Salmonella	0
									Salmonella Typhimurium	1
	Turtles - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	13	0	Salmonella	0
	Wild boars - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	1	0	Salmonella	0
	Zoo animals, all - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	animal		N_A	N_A	Not Available	6	0	Salmonella	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
SWITZERLAND	Meat from broilers (Gallus gallus) - carcase - Slaughterhouse - Switzerland - food sample - neck skin - Surveillance - based on Regulation 2073 - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	416	6	Salmonella	0
									Salmonella Chester	1
									Salmonella enterica	2
									Salmonella Typhimurium	2
									Salmonella Welikade	1
	Meat from broilers (Gallus gallus) - fresh - skinned - Cutting plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	214	1	Salmonella	0
									Salmonella Typhimurium	1
	Meat from broilers (Gallus gallus) - fresh - skinned - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	17	0	Salmonella	0
		single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	182	2	Salmonella	1
									Salmonella Typhimurium	1
	Meat from broilers (Gallus gallus) - fresh - with skin - Cutting plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	46	0	Salmonella	0
	Meat from broilers (Gallus gallus) - fresh - with skin - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	24	0	Salmonella	0
		single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	175	0	Salmonella	0
	Meat from broilers (Gallus gallus) - fresh - with skin - Slaughterhouse - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	219	0	Salmonella	0
	Meat from broilers (Gallus gallus) - meat preparation - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	388	1	Salmonella	0
									Salmonella Infantis	1
		single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	11	0	Salmonella	0
	Meat from broilers (Gallus gallus) - meat products - cooked, ready-to-eat - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	444	0	Salmonella	0
	Meat from broilers (Gallus gallus) - meat products - raw but intended to be eaten cooked - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	145	0	Salmonella	0
	Meat from broilers (Gallus gallus) - mechanically separated meat (MSM) - Cutting plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	245	0	Salmonella	0
	Meat from broilers (Gallus gallus) - minced meat - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	280	0	Salmonella	0
		single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	256	0	Salmonella	0
	Meat from pig - carcase - Slaughterhouse - Switzerland - food sample - carcase swabs - Surveillance - based on Regulation 2073 - HACCP and own check - Objective sampling	single (food/feed)	400	Square centimetre	N_A	ISO 6579:2002 Salmonella	1020	0	Salmonella	0
	Meat from turkey - carcase - Slaughterhouse - Switzerland - food sample - neck skin - Surveillance - based on Regulation 2073 - HACCP and own check - Objective sampling	batch (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	135	8	Salmonella	0
									Salmonella Albany	8
	Meat from turkey - fresh - skinned - Cutting plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	185	9	Salmonella	0
									Salmonella Albany	9
	Meat from turkey - meat products - raw but intended to be eaten cooked - Processing plant - Switzerland - food sample - Monitoring - HACCP and own check - Objective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	150	0	Salmonella	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
SWITZERLAND	Compound feedingstuffs for cattle - final product - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	2	0	Salmonella	0
	Compound feedingstuffs for cattle - final product - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	144	0	Salmonella	0
	Compound feedingstuffs for fish - final product - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	9	0	Salmonella	0
	Compound feedingstuffs for fish - final product - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
	Compound feedingstuffs for horses - final product - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
	Compound feedingstuffs for horses - final product - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	2	0	Salmonella	0
	Compound feedingstuffs for pigs - final product - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	10	0	Salmonella	0
	Compound feedingstuffs for poultry (non specified) - final product - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	45	0	Salmonella	0
	Compound feedingstuffs, not specified - final product - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	6	0	Salmonella	0
	Feed material of cereal grain origin - barley derived - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	3	0	Salmonella	0
	Feed material of cereal grain origin - barley derived - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
	Feed material of cereal grain origin - maize derived - Border inspection activities - Non European Union - feed sample - Monitoring - Not applicable - Not specified	single (food/feed)	25	Gram	screening	ISO 6579:2002 Salmonella	3	0	Salmonella	0
	Feed material of cereal grain origin - maize derived - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	5	0	Salmonella	0
	Feed material of cereal grain origin - maize derived - Feed mill - Non European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	5	0	Salmonella	0
	Feed material of cereal grain origin - maize derived - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	2	0	Salmonella	0
	Feed material of cereal grain origin - maize derived - Feed mill - Unknown - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	4	0	Salmonella	0
	Feed material of cereal grain origin - wheat derived - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
	Feed material of land animal origin - dairy products - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	7	0	Salmonella	0
	Feed material of oil seed or fruit origin - rape seed derived - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	10	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
			25	Gram	N_A	ISO 6579:2002 Salmonella	5	0	Salmonella	0
	Feed material of oil seed or fruit origin - rape seed derived - Feed mill - Non European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
	Feed material of oil seed or fruit origin - rape seed derived - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	4	0	Salmonella	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
SWITZERLAND	Feed material of oil seed or fruit origin - soya (bean) derived - Border inspection activities - European Union - feed sample - Monitoring - Not applicable - Not specified	single (food/feed)	10	Gram	screening	ISO 6579:2002 Salmonella	1	1	Salmonella	0
									Salmonella enterica subsp. enterica rough	1
			25	Gram	screening	ISO 6579:2002 Salmonella	3	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Border inspection activities - Non European Union - feed sample - Monitoring - Not applicable - Not specified	single (food/feed)	25	Gram	screening	ISO 6579:2002 Salmonella	27	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	9	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Feed mill - Non European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	10	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
			25	Gram	N_A	ISO 6579:2002 Salmonella	16	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	6	0	Salmonella	0
	Feed material of oil seed or fruit origin - soya (bean) derived - Feed mill - Unknown - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	2	0	Salmonella	0
	Feed material of oil seed or fruit origin - sunflower seed derived - Feed mill - European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
	Feed material of oil seed or fruit origin - sunflower seed derived - Feed mill - Non European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
	Feed material of oil seed or fruit origin - sunflower seed derived - Feed mill - Switzerland - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	1	0	Salmonella	0
	Other feed material - tubers, roots and similar products - Feed mill - Non European Union - feed sample - Monitoring - Official sampling - Selective sampling	single (food/feed)	25	Gram	N_A	ISO 6579:2002 Salmonella	2	0	Salmonella	0

Table Staphylococcus:STAPHYLOCOCCUS AUREUS METICILLIN RESISTANT (MRSA) in animal

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 Attribute	Total Units Positive Attribute	Zoonoses	CC	Spa type	ML	Units positive
SWITZERLAND	Cattle (bovine animals) - calves (under 1 year) - Slaughterhouse - Switzerland - animal sample - nasal swab - Monitoring - Official sampling - Objective sampling	animal		Not Available	N_A	Detection method of microorganisms	297	24	Methicillin resistant Staphylococcus aureus (MRSA)		11		14
											34		7
											127		1
											17339		2
													0
	Pigs - fattening pigs - Slaughterhouse - Switzerland - animal sample - nasal swab - Monitoring - Official sampling - Objective sampling	animal		Not Available	N_A	Detection method of microorganisms	298	131	Methicillin resistant Staphylococcus aureus (MRSA)		11		61
											34		63
											899		2
											1451		3
											2330		1
											2876		1
													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 Attribute	Total Units Positive Attribute	Zoonoses	CC	Spa type	ML	Units positive
SWITZERLAND	Meat from bovine animals - Retail - Switzerland - food sample - meat - Monitoring - Official sampling - Objective sampling	single (food/feed)	5	Gram	N_A	Detection method of microorganisms	299	0	Methicillin resistant Staphylococcus aureus (MRSA)				0
	Meat from pig - Retail - Switzerland - food sample - meat - Monitoring - Official sampling - Objective sampling	single (food/feed)	5	Gram	N_A	Detection method of microorganisms	301	2	Methicillin resistant Staphylococcus aureus (MRSA)		2		1
											11		1
													0

Table Toxoplasma:TOXOPLASMA 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
SWITZERLAND	Cats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	243	76	Toxoplasma gondii	76
	Cats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	PCR	animal	1	0	Toxoplasma gondii	0
	Dogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	43	13	Toxoplasma gondii	13
	Foxes - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	PCR	animal	1	0	Toxoplasma	0
	Giraffes - zoo animal - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	PCR	animal	1	0	Toxoplasma	0
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	PCR	animal	8	0	Toxoplasma	0
	Monkeys - zoo animal - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	PCR	animal	1	0	Toxoplasma	0
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Immunofluorenscence assay tests (IFA)	animal	21	5	Toxoplasma gondii	5
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	PCR	animal	14	0	Toxoplasma	0
	Zoo animals, all - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	fox	PCR	animal	1	0	Toxoplasma	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
SWITZERLAND	Badgers - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Magnetic stirrer method for pooled sample digestion	animal	4	0	Trichinella	0
	Foxes - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Magnetic stirrer method for pooled sample digestion	animal	2	0	Trichinella	0
	Lynx - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Real-Time PCR (qualitative or quantitative)	animal	4	3	Trichinella	0
							Trichinella britovi	3
	Lynx - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Magnetic stirrer method for pooled sample digestion	animal	21	4	Trichinella	4
	Pigs - breeding animals - not raised under controlled housing conditions - Slaughterhouse - Switzerland - animal sample - Surveillance - Official sampling - Census	not raised under controlled housing conditions as requirements in Regulation (EU) No 216/2014 are not fully met	Magnetic stirrer method for pooled sample digestion	animal	32613	0	Trichinella	0
	Pigs - fattening pigs - not raised under controlled housing conditions - Slaughterhouse - Switzerland - animal sample - Surveillance - Official sampling - Census	not raised under controlled housing conditions as requirements in Regulation (EU) No 216/2014 are not fully met	Magnetic stirrer method for pooled sample digestion	animal	2476085	0	Trichinella	0
	Solipeds, domestic - horses - Slaughterhouse - Switzerland - animal sample - Surveillance - Official sampling - Census	N_A	Magnetic stirrer method for pooled sample digestion	animal	2055	0	Trichinella	0
	Wild boars - wild - Hunting - Switzerland - animal sample - Unspecified - Not applicable - Census	N_A	Magnetic stirrer method for pooled sample digestion	animal	6176	0	Trichinella	0
	Wolves - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Magnetic stirrer method for pooled sample digestion	animal	1	0	Trichinella	0

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
SWITZERLAND	Alpacas - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	4	0	Yersinia	0
	Bats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Bears - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	3	0	Yersinia	0
	Birds - wild - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	bird of prey	Not Available	animal	2	0	Yersinia	0
	Bison - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Budgerigars - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Camels - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	3	0	Yersinia	0
	Capybaras - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Cats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	423	0	Yersinia	0
	Cattle (bovine animals) - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	41	0	Yersinia	0
	Crocodile - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Deer - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Dogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	758	0	Yersinia	0
	Ducks - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Elephants - zoo animals - Zoo - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Ferrets - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	6	0	Yersinia	0
	Foxes - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Gallus gallus (fowl) - unspecified - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	8	0	Yersinia	0
	Geese - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Giraffes - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Goats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	9	0	Yersinia	0
	Guinea pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	7	0	Yersinia	0
	Hedgehogs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Kangaroos - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Marten - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Monkeys - zoo animal - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	18	0	Yersinia	0
	Octodons - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Oscine birds - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Other animals - unspecified - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	3x big cat, 2x sloths	Not Available	animal	5	0	Yersinia	0
	Other carnivores - zoo animals - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	suricate	Not Available	animal	3	0	Yersinia	0
	Owls - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Parrots - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	18	0	Yersinia	0
	Passeriformes, unspecified - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Pigs - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	23	1	Yersinia enterocolitica - biotype 3	1
	Quails - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	0	Yersinia	0
	Rabbits - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	14	0	Yersinia	0
	Rats - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	2	0	Yersinia	0
	Reptiles - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	2xlizards, 2xchameleon	Not Available	animal	4	0	Yersinia	0
	Rodents - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	Aguti	Not Available	animal	1	0	Yersinia	0
	Sheep - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	3	0	Yersinia	0
	Snakes - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	9	0	Yersinia	0
	Solipeds, domestic - horses - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	49	0	Yersinia	0
	Squirrels - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	N_A	Not Available	animal	1	1	Yersinia enterocolitica	1
	Zoo animals, all - Unspecified - Switzerland - animal sample - Clinical investigations - Not applicable - Not specified	Rüsselspringer, Klippschleifer	Not Available	animal	2	0	Yersinia	0

FOODBORNE OUTBREAKS TABLES

Foodborne Outbreaks: summarized data

	Outbreak strenght	Strong				Weak			
Causative agent	**Food vehicle**	**N outbreaks**	**N human cases**	**N hospitalized**	**N deaths**	**N outbreaks**	**N human cases**	**N hospitalized**	**N deaths**
Bacillus cereus	Mixed food	1	30	0	0				
Campylobacter jejuni	Tap water, including well water					1	20	2	0
Hepatitis virus	Meat and meat products	1	24	24	0				
Histamine	Fish and fish products	2	32	0	0				
Listeria monocytogenes	Vegetables and juices and other products thereof	1	2	1	0				
Norovirus	Tap water, including well water					1	160	3	0
	Unknown					1	12	0	0
Salmonella Enteritidis	Bakery products					1	30	30	0
Staphylococcus aureus	Fish and fish products	1	2	0	0				
	Meat and meat products	1	4	3	0				
Unknown	Dairy products (other than cheeses)					1	3	0	0
	Cheese	1	2	0	0				
	Vegetables and juices and other products thereof					2	16	1	0
	Mixed food	3	28	7	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
Bacillus cereus	Not Available	N_A	General	Mixed food	Ingredients: pasta, bacon/ham, sauce (cream, milk, salt, nutmeg, bouillon powder)	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent	Canteen or workplace catering	Not Available	Not Available	Inadequate chilling	N_A	1	30	0	0
Hepatitis virus	Not Available	N_A	General	Meat and meat products	Liver mortadella, wild boar salami, pâté with pork liver	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent	Multiple places of exposure in one country	Not Available	Not Available	Unprocessed contaminated ingredient	N_A	1	24	24	0
Histamine	Not Available	N_A	General	Fish and fish products	Fish in sauce	Descriptive epidemiological evidence	School or kindergarten	Not Available	Not Available	Unknown	N_A	1	30	0	0
					Tuna	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Storage time/temperature abuse	N_A	1	2	0	0
Listeria monocytogenes	Not Available	N_A	Unknown	Vegetables and juices and other products thereof	Leaf lettuce	Analytical epidemiological evidence	Unknown	Not Available	Not Available	Cross-contamination	N_A	1	2	1	0
Staphylococcus aureus	Histamine	N_A	General	Fish and fish products	Raw tuna carpaccio and salmon tartare (raw)	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Other contributory factor	N_A	1	2	0	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
Staphylococcus aureus	Not Available	N_A	General	Meat and meat products	Chicken kebab and lamb kebab (sliced)	Detection of causative agent in food vehicle or its component - Symptoms and onset of illness pathognomonic to causative agent	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Storage time/temperature abuse	N_A	1	4	3	0
Unknown	Not Available	N_A	General	Mixed food	Barbecue with meat, meat products and other grilling foods	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Unknown	N_A	1	15	1	0
					Falafel	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Unknown	N_A	1	11	6	0
					Pizza	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Unknown	N_A	1	2	0	0
			Household	Cheese	N_A	Descriptive epidemiological evidence	Household	Not Available	Not Available	Unknown	N_A	1	2	0	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
Campylobacter jejuni	Not Available	N_A	General	Tap water, including well water	Drinking water	Descriptive epidemiological evidence	Camp or picnic	Not Available	Not Available	Water treatment failure	N_A	1	20	2	0
Norovirus	Not Available	N_A	General	Tap water, including well water	Drinking water	Descriptive epidemiological evidence	Multiple places of exposure in one country	Not Available	Not Available	Unknown	N_A	1	160	3	0
				Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Unknown	N_A	1	12	0	0
Salmonella Enteritidis	Not Available	N_A	General	Bakery products	Wedding pie with raw eggs	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Unknown	N_A	1	30	30	0
Unknown	Not Available	N_A	General	Dairy products (other than cheeses)	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Unknown	N_A	1	3	0	0
				Vegetables and juices and other products thereof	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Not Available	Not Available	Unknown	N_A	2	16	1	0

ANTIMICROBIAL RESISTANCE TABLES FOR CAMPYLOBACTER

Table Antimicrobial susceptibility testing of Campylobacter coli in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling details:

	AM substance	Ciprofloxacin	Erythromycin	Gentamicin	Nalidixic acid	Streptomycin	Tetracycline
	ECOFF	**0.5**	**8**	**2**	**16**	**4**	**2**
	Lowest limit	**0.12**	**1**	**0.12**	**1**	**0.25**	**0.5**
	Highest limit	**16**	**128**	**16**	**64**	**16**	**64**
	N of tested isolates	**161**	**161**	**161**	**161**	**161**	**161**
MIC	**N of resistant isolates**	**81**	**3**	**2**	**84**	**131**	**100**
<=0.12		66		21			
0.25		11		68			
<=0.5							54
0.5		3		66			
<=1			109				
1				4		13	4
2			34		5	14	3
4		8	11		45	3	1
8		29	4	2	23	5	4
16		40			4	31	23
>16		4				95	
32					3		41
64					15		17
>64					66		14
>128			3				

Table Antimicrobial susceptibility testing of Campylobacter jejuni in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

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	**9**	**9**	**9**	**9**	**9**	**9**
MIC	**N of resistant isolates**	**2**	**0**	**0**	**2**	**2**	**2**
<=0.12		5		4			
0.25		2		3			
<=0.5							6
0.5				2		2	
<=1			9				
1						4	1
2					2	1	
4					2		
8		1			3		
16		1				1	
>16						1	
32							2
>64					2		

ANTIMICROBIAL RESISTANCE TABLES FOR SALMONELLA

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Birds - zoo animal

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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**
<=0.03										1					
0.03							1								
<=0.25				1										1	1
<=0.5					1				1						
<=1								1							
<=2													1		
2		1													
<=4											1				
<=8						1									
8			1												
32												1			

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Cats - pet animals

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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**
<=0.015							1								
<=0.03										1					
<=0.25				1										1	
<=0.5					1				1						
0.5															1
<=1								1							
<=2													1		
2		1													
<=4											1				
4			1												
<=8						1						1			

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Cattle (bovine animals) - unspecified

Sampling Stage: Unspecified | Sampling Type: animal sample | Sampling Context: Unspecified

Sampler: Not applicable | Sampling Strategy: Not specified | Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
	N of resistant isolates	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							2								
<=0.03										8					
0.03							7								
0.064										1					
<=0.25				8										9	8
<=0.5					9				8						
0.5				1											1
<=1		3						3							
1									1						
<=2													9		
2		6						6							
<=4											8				
4			7												
<=8						9									
8			2								1				
16												6			
32												1			
128												1			
256												1			

Table Antimicrobial susceptibility testing of Salmonella Enteritidis in Pigs - unspecified

Sampling Stage: Unspecified | Sampling Type: animal sample | Sampling Context: Unspecified

Sampler: Not applicable | Sampling Strategy: Not specified | Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										2					
0.03							2								
<=0.25				2										2	2
<=0.5					2				2						
<=1								2							
<=2													2		
2		2													
<=4											2				
4			2												
<=8						2									
16												1			
32												1			

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

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

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	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							3								
<=0.03										12					
0.03							12								
0.064										3					
<=0.25				15										13	12
<=0.5					15				14						
0.5														2	3
<=1		4						12							
1									1						
<=2													15		
2		11						3							
<=4											14				
4			12												
<=8						15						2			
8			3								1				
16												7			
32												2			
64												4			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Cattle (bovine animals) - unspecified

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**39**	**39**	**39**	**39**	**39**	**39**	**39**	**39**	**39**	**39**	**39**	**39**	**39**	**39**
MIC	**N of resistant isolates**	**3**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**7**	**0**	**0**
<=0.015							7								
<=0.03										37					
0.03							32								
0.064										2					
<=0.25				39										31	38
<=0.5					39				39						
0.5														8	1
<=1		26						37							
<=2													32		
2		10						2							
<=4											38				
4			33												
<=8						37						1			
8			6								1				
16												9	2		
32												21	2		
64												5	1		
>64		3											2		
>128						2									
>1024												3			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Dogs - pet animals

Sampling Stage: Unspecified | Sampling Type: animal sample | Sampling Context: Unspecified

Sampler: Not applicable | Sampling Strategy: Not specified | Programme Code: OTHER AMR MON pnl2

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid	Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Negative/Absent	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	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	32	0.5	0.5	8	2	2	0.06	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
0.064								1		1	
0.25									1		
0.5		1									
16											1
32					1						
64				1			1				
>64			1								
>128						1					

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Dogs - pet animals

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

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**
MIC	**N of resistant isolates**	**1**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**
0.064										1					
<=0.25														1	1
0.25							1								
<=0.5									1						
<=1								1							
4			1												
>4				1											
>8					1										
>64		1											1		
>128						1					1				
>1024												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Turkeys - unspecified

Sampling Stage: Unspecified | Sampling Type: animal sample | Sampling Context: Unspecified

Sampler: Not applicable | Sampling Strategy: Not specified | Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

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**
MIC / **N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=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									
32											1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Solipeds, domestic - horses

Sampling Stage: Unspecified | Sampling Type: animal sample | Sampling Context: Unspecified

Sampler: Not applicable | Sampling Strategy: Not specified | Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	N of resistant isolates	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							1								
<=0.03										1					
0.03							1								
0.064										1					
<=0.25				2										1	1
<=0.5					2				2						
0.5														1	1
<=1		1						1							
<=2													2		
2		1						1							
<=4											2				
4			2												
<=8						2									
16												1			
64												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Oscine birds

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	N of resistant isolates	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.015							2								
<=0.03										1					
0.064										1					
<=0.25				2										2	2
<=0.5					2				2						
<=1		2						2							
<=2													2		
<=4											2				
4			2												
<=8						2									
32												1			
128												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Goats

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										1					
0.03							1								
<=0.25				1											1
<=0.5					1				1						
0.5														1	
<=1		1						1							
<=2													1		
<=4											1				
4			1												
<=8						1									
32												1			

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

Sampling Stage: Unspecified | Sampling Type: animal sample | Sampling Context: Unspecified

Sampler: Not applicable | Sampling Strategy: Not specified | Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

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	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
MIC / **N of resistant isolates**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
<=0.015						1								
<=0.03									11					
0.03						11								
0.064									1					
<=0.25			12										6	10
<=0.5				12				12						
0.5													6	2
<=1	6						11							
<=2												12		
2	5													
<=4										12				
4		10					1							
<=8					12									
8		2												
16											4			
32											4			
64											2			
>64	1													
128											1			
>1024											1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium, monophasic in Cattle (bovine animals) - unspecified

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

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	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**
MIC / **N of resistant isolates**	**17**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**16**	**0**	**0**
<=0.015						4								
<=0.03									18					
0.03						13								
0.064						1								
<=0.25			17										13	18
<=0.5				18				18						
0.5			1										5	
<=1	1						18							
<=2												2		
<=4										17				
4		13												
<=8					18									
8		5								1				
>64	17											16		
512											1			
>1024											17			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium, monophasic in Dogs - pet animals

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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**
<=0.03										1					
0.03							1								
<=0.25				1										1	1
<=0.5					1				1						
<=1								1							
<=4											1				
4			1												
<=8						1									
>64		1											1		
>1024												1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium, monophasic in Pigs - unspecified

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
	N of resistant isolates	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**8**	**0**	**0**
<=0.015							1								
<=0.03										8					
0.03							7								
<=0.25				8										1	8
<=0.5					8				8						
0.5														6	
<=1								8							
1														1	
<=4											8				
4			6												
<=8						8									
8			2												
>64		8											8		
>1024												8			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium, monophasic in Gallus gallus (fowl) - unspecified

Sampling Stage: Unspecified

Sampling Type: animal sample

Sampling Context: Unspecified

Sampler: Not applicable

Sampling Strategy: Not specified

Programme Code: OTHER AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**3**	**0**	**0**
<=0.015							1								
<=0.03										3					
0.03							3								
0.064										1					
<=0.25				4										1	4
<=0.5					4				4						
0.5														3	
<=1		1						4							
<=2													1		
<=4											4				
4			2												
<=8						4									
8			2												
>64		3											3		
1024												1			
>1024												3			

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 - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**
	N of resistant isolates	**75**	**0**	**0**	**0**	**19**	**7**	**0**	**9**	**0**	**7**	**91**	**80**	**0**	**37**
<=0.015							168								
<=0.03										194					
0.03							17								
0.064							2								
0.12							3								
<=0.25				194										169	72
0.25							2								
<=0.5					194				165						
0.5														23	64
<=1		3						192							
1									19					2	17
<=2			13										98		
2		38						2	1						4
<=4											183				
4		72	101										15		
<=8						171						24			
8		6	68				1				3		1		
>8							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	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**	**194**
MIC	**N of resistant isolates**	**75**	**0**	**0**	**0**	**19**	**7**	**0**	**9**	**0**	**7**	**91**	**80**	**0**	**37**
16			12			4					1	40			
32						3			1			33			1
>32									8						36
64						4					2	6	25		
>64		75											55		
128						2					3	3			
>128						10					2				
1024												1			
>1024												87			

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 - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Positive/Present	Negative/Absent	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	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.125	0.25	0.25	0.25	8	0.5	0.5	0.5	0.06	0.5	0.125	32
	Lowest limit	0.064	0.25	0.064	0.064	0.5	0.25	0.12	0.12	0.015	0.12	0.03	0.5
	Highest limit	32	64	64	64	64	128	128	128	2	16	16	64
	N of tested isolates	101	101	101	101	101	101	101	101	101	101	101	101
	N of resistant isolates	62	100	39	39	47	93	37	37	0	0	0	0
<=0.015										73			
<=0.03												100	
0.03										21			
<=0.064		19		46									
0.064										7		1	
<=0.12								31	7		78		
0.12		20		9									
<=0.25			1				1						
0.25		3		1	6			16	2		22		
0.5		5	5		15		7	2	6		1		
1		4	22	2	13		16		11				
2		10	9		7	4	18		15				6
4		19	12		1	33	25		5				55
8		12	6		1	17	22		5				36

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	**Not Available**	**Not Available**	**Positive/Present**	**Negative/Absent**	**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**	**Positive/Present**	**Negative/Absent**	**Not Available**	**Not Available**	**Not Available**	**Not Available**
	ECOFF	**0.125**	**0.25**	**0.25**	**0.25**	**8**	**0.5**	**0.5**	**0.5**	**0.06**	**0.5**	**0.125**	**32**
	Lowest limit	**0.064**	**0.25**	**0.064**	**0.064**	**0.5**	**0.25**	**0.12**	**0.12**	**0.015**	**0.12**	**0.03**	**0.5**
	Highest limit	**32**	**64**	**64**	**64**	**64**	**128**	**128**	**128**	**2**	**16**	**16**	**64**
	N of tested isolates	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**
MIC	**N of resistant isolates**	**62**	**100**	**39**	**39**	**47**	**93**	**37**	**37**	**0**	**0**	**0**	**0**
16		8	11			16	11		1				4
32		1	11			15	1						
64			16			10							
>64			8			6							

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 - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**
	N of resistant isolates	**101**	**7**	**100**	**93**	**26**	**49**	**0**	**36**	**0**	**31**	**83**	**87**	**0**	**52**
<=0.015							45								
<=0.03										99					
0.03							7								
0.064										2					
0.12							2								
<=0.25				1										76	17
0.25							17								
<=0.5					8				60						
0.5				6			9							21	25
<=1								100							
1				19	16		1		5					4	5
<=2			4										14		
2				12	18		2	1							2
<=4											56				
4			42	10	22										
>4				53											
<=8						72						5			
8			42		23		4		5		9				
>8					14		14								
16			6			3			6		5	1			
32		3				2			7			7	1		

MIC	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	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**	**101**
MIC	**N of resistant isolates**	**101**	**7**	**100**	**93**	**26**	**49**	**0**	**36**	**0**	**31**	**83**	**87**	**0**	**52**
>32									18						52
64		4	7			1					5	5	29		
>64		94											57		
128						8					4	2			
>128						15					22				
>1024												81			

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 - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**
	N of resistant isolates	**28**	**1**	**0**	**0**	**10**	**5**	**0**	**6**	**0**	**4**	**71**	**41**	**0**	**30**
<=0.015							177								
<=0.03										194					
0.03							14								
0.064							1			3					
<=0.25				197										178	83
0.25							4								
<=0.5					197				168						
0.5														16	69
<=1		7						196							
1									23					3	14
<=2			14										134		
2		67						1							1
<=4											191				
4		91	113										21		
<=8						181						41			
8		4	68				1		3		2		1		
16			1			6						37	2		
32			1			3			2			33	1		
>32									1						30
64		1				5						15	16		
>64		27											22		

	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	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**
MIC	**N of resistant isolates**	**28**	**1**	**0**	**0**	**10**	**5**	**0**	**6**	**0**	**4**	**71**	**41**	**0**	**30**
128											3	1			
>128						2					1				
256												1			
512												1			
1024												1			
>1024												67			

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 - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Positive/Present	Negative/Absent	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	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.125	0.25	0.25	0.25	8	0.5	0.5	0.5	0.06	0.5	0.125	32
	Lowest limit	0.064	0.25	0.064	0.064	0.5	0.25	0.12	0.12	0.015	0.12	0.03	0.5
	Highest limit	32	64	64	64	64	128	128	128	2	16	16	64
	N of tested isolates	52	52	52	52	52	52	52	52	52	52	52	52
	N of resistant isolates	37	51	15	15	17	50	16	16	0	0	0	0
<=0.015										40			
<=0.03												48	
0.03										9			
<=0.064		4		31									
0.064										3		4	
<=0.12								20	1		28		
0.12		11		4	1								
<=0.25			1										
0.25		3			1			8	4		20		
0.5			2		2		2	2	1		4		
1			5		11		17		3				
2		7	9		1	2	4		8				
4		15			1	15	16		4				29
8		9	4			18	10		1				17

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	**Not Available**	**Not Available**	**Positive/Present**	**Negative/Absent**	**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**	**Positive/Present**	**Negative/Absent**	**Not Available**	**Not Available**	**Not Available**	**Not Available**
	ECOFF	**0.125**	**0.25**	**0.25**	**0.25**	**8**	**0.5**	**0.5**	**0.5**	**0.06**	**0.5**	**0.125**	**32**
	Lowest limit	**0.064**	**0.25**	**0.064**	**0.064**	**0.5**	**0.25**	**0.12**	**0.12**	**0.015**	**0.12**	**0.03**	**0.5**
	Highest limit	**32**	**64**	**64**	**64**	**64**	**128**	**128**	**128**	**2**	**16**	**16**	**64**
	N of tested isolates	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**
MIC	**N of resistant isolates**	**37**	**51**	**15**	**15**	**17**	**50**	**16**	**16**	**0**	**0**	**0**	**0**
16		3	10			5	3						5
32			10			5							1
64			9			7							
>64			2										

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 - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**
	N of resistant isolates	**51**	**4**	**51**	**50**	**5**	**19**	**0**	**11**	**0**	**17**	**29**	**32**	**0**	**13**
<=0.015							31								
<=0.03										49					
0.03							2								
0.064										3					
<=0.25				1										41	20
0.25							3								
<=0.5					2				35						
0.5				1										8	15
<=1								52							
1				4	14				6					3	4
<=2			2										18		
2				11	8		4								
<=4											34				
4			21		17		3						2		
>4				35											
<=8						47						7			
8		1	24		8		2				1				
>8					3		7								
16			1									8			
32			1						4			5	1		
>32									7						13

	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	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**
MIC	**N of resistant isolates**	**51**	**4**	**51**	**50**	**5**	**19**	**0**	**11**	**0**	**17**	**29**	**32**	**0**	**13**
64		2	3									3	12		
>64		49											19		
128						1					5				
>128						4					12				
>1024												29			

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

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Positive/Present	Negative/Absent	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	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.125	0.25	0.25	0.25	8	0.5	0.5	0.5	0.06	0.5	0.125	32
	Lowest limit	0.064	0.25	0.064	0.064	0.5	0.25	0.12	0.12	0.015	0.12	0.03	0.5
	Highest limit	32	64	64	64	64	128	128	128	2	16	16	64
	N of tested isolates	2	2	2	2	2	2	2	2	2	2	2	2
	N of resistant isolates	1	2	1	1	1	2	1	1	0	0	0	0
<=0.015										1			
<=0.03												2	
<=0.064				1									
0.064										1			
<=0.12											2		
0.12		1											
0.25								1					
1					1								
2			1						1				
4		1					1						
8						1	1						1
16			1										1
32						1							

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

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	N of resistant isolates	**2**	**0**	**2**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
<=0.03										2					
0.03							1								
<=0.25														2	
0.25							1								
<=0.5									1						
<=1								2							
1									1						2
<=2													1		
2				1											
<=4											2				
4					1								1		
>4				1											
<=8						2									
8			1		1										
16			1												
32												1			
64												1			
>64		2													

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 - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method:

Country of Origin: Switzerland

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**	**Positive/Present**	**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**	**Positive/Present**	**Not Available**	**Not Available**	**Not Available**	**Not Available**
ECOFF	**0.125**	**0.25**	**0.25**	**8**	**0.5**	**0.5**	**0.06**	**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**
MIC / **N of resistant isolates**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
<=0.015							1			
<=0.03									1	
0.12			1							
0.25								1		
0.5						1				
4					1					
8	1			1						
16										1
32		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 - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method:

Country of Origin: Switzerland

Sampling Details:

MIC	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	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	N of resistant isolates	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**1**
<=0.03										1					
<=0.25														1	
<=0.5									1						
<=1								1							
4					1										
>4				1											
8							1								
>32															1
64			1												
>64		1											1		
>128						1					1				
>1024												1			

OTHER ANTIMICROBIAL RESISTANCE TABLES

Table Antimicrobial susceptibility testing of Enterococcus, non-pathogenic - E. faecalis in Cattle (bovine animals) - calves (under 1 year)

Sampling Stage: Slaughterhouse | Sampling Type: animal sample - caecum | Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method:

Country Of Origin:Switzerland

Sampling Details:

	AM substance	Ampicillin	Chloramphenicol	Ciprofloxacin	Daptomycin	Erythromycin	Gentamicin	Linezolid	Quinupristin/Dalfopristin	Teicoplanin	Tetracycline	Tigecycline	Vancomycin
	ECOFF	**4**	**32**	**4**	**4**	**4**	**32**	**4**	**0.5**	**2**	**4**	**0.25**	**4**
	Lowest limit	**0.5**	**4**	**0.12**	**0.25**	**1**	**8**	**0.5**	**0.5**	**0.5**	**1**	**0.03**	**1**
MIC	**Highest limit**	**64**	**128**	**16**	**32**	**128**	**1024**	**64**	**64**	**64**	**128**	**4**	**128**
<=0.03												2	
0.064												9	
0.12												26	
0.25				1								8	
<=0.5		5								46			
0.5				26	11								
<=1						27					15		31
1		39		17	31			21				1	
2		2		1	3			25	4				15
<=4			27										
4					1	2			19				
<=8							27						
8			10						16				
16							7		7		1		
>16				1									
32			1				1						
64			8								22		
128											8		
>128						17							
256							1						
512							1						
1024							2						
>1024							7						

Table Antimicrobial susceptibility testing of Enterococcus, non-pathogenic - E. faecium in Cattle (bovine animals) - calves (under 1 year)

Sampling Stage: Slaughterhouse | Sampling Type: animal sample - caecum | Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method:

Country Of Origin:Switzerland

Sampling Details:

MIC	AM substance	Ampicillin	Chloramphenicol	Ciprofloxacin	Daptomycin	Erythromycin	Gentamicin	Linezolid	Quinupristin/Dalfopristin	Teicoplanin	Tetracycline	Tigecycline	Vancomycin
	ECOFF	**4**	**32**	**4**	**4**	**4**	**32**	**4**	**1**	**2**	**4**	**0.25**	**4**
	Lowest limit	**0.5**	**4**	**0.12**	**0.25**	**1**	**8**	**0.5**	**0.5**	**0.5**	**1**	**0.03**	**1**
	Highest limit	**64**	**128**	**16**	**32**	**128**	**1024**	**64**	**64**	**64**	**128**	**4**	**128**
<=0.03												18	
0.064												50	
0.12												44	
<=0.25					1								
0.25												13	
<=0.5		13							3	127			
0.5				66								3	
<=1						3					122		127
1		60		56	18			2	2	2		1	
2		55		3	8	9		119	12		1		2
<=4			84										
4				3	100	91		8	112				
<=8							100						
8		1	43	1	1	23							
16			1		1	1	29						
32			1								1		
64											2		
128											3		
>128						2							

Table Antimicrobial susceptibility testing of Methicillin resistant Staphylococcus aureus (MRSA) in Cattle (bovine animals) - calves (under 1 year)

Sampling Stage: Slaughterhouse | Sampling Type: animal sample - nasal swab | Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling | Sampling Strategy: Objective sampling | Programme Code: OTHER AMR MON

Analytical Method:

Country Of Origin:Switzerland

Sampling Details:

Spa Type	Multilocularis Seq	Clonal Complex	MIC	Cefoxitin	Chloramphenicol	Ciprofloxacin	Clindamycin	Erythromycin	Fusidic acid	Gentamicin	Kanamycin	Linezolid	Mupirocin	Penicillin	Quinupristin/Dalfopristin	Rifampicin	Streptomycin
			Performed CC MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
			Performed MLST MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
			ECOFF	4	16	1	0.25	1	0.5	2	8	4	1	0.12	1	0.03	16
			Lowest limit	0.5	4	0.25	0.12	0.25	0.5	1	4	1	0.5	0.12	0.5	0.016	4
			Highest limit	16	64	8	4	8	4	16	64	8	256	2	4	0.5	32
11			<=0.016													14	
			<=0.12				6										
			<=0.25			6		1									
			<=0.5						14				14		6		
			0.5					6									
			<=1							11		2					
			1												8		
			2			4						12					
			>2											14			
			<=4		1						11						3
			>4				8										
			8	4	13	1											4
			>8			3		7									
			16	10						1							
			>16							2							
			>32														7
			64								1						
			>64								2						
34			<=0.016													7	
			<=0.25			5											
			<=0.5						7				7				
			0.5			2											
			<=1							5		1					
			2									6			1		
			>2											7			
			<=4								5						1
			4												3		
			>4				7								3		
			8	3	5												1
			>8					7									
			16	4	2					1							
			>16							1							
			32														1
			>32														4
			>64								2						
127			<=0.016													1	
			<=0.12				1										
			<=0.5						1				1		1		
			0.5			1											
			<=1							1							
			2									1					
			>2											1			

				AM Substance	Cefoxitin	Chloramphenicol	Ciprofloxacin	Clindamycin	Erythromycin	Fusidic acid	Gentamicin	Kanamycin	Linezolid	Mupirocin	Penicillin	Quinupristin/Dalfopristin	Rifampicin	Streptomycin
				Performed CC MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
				Performed MLST MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
				ECOFF	4	16	1	0.25	1	0.5	2	8	4	1	0.12	1	0.03	16
				Lowest limit	0.5	4	0.25	0.12	0.25	0.5	1	4	1	0.5	0.12	0.5	0.016	4
Spa Type	Multilocu laris Seq	Clonal Complex	MIC	Highest limit	16	64	8	4	8	4	16	64	8	256	2	4	0.5	32
127			8			1												
			>8						1									
			16		1													
			>32															1
			>64									1						
17339			<=0.016														2	
			<=0.5							2				2				
			<=1								2		1					
			2										1					
			>2												2			
			<=4									2						
			>4					2								2		
			8		2	1	1											
			>8				1		2									
			16			1												
			>32															2

Sampling Stage: Slaughterhouse | Sampling Type: animal sample - nasal swab | Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling | Sampling Strategy: Objective sampling | Programme Code: OTHER AMR MON

Analytical Method:

Country Of Origin:Switzerland

Sampling Details:

Spa Type	Multilocu laris Seq	Clonal Complex	MIC	Cefoxitin	Chloramphenicol	Ciprofloxacin	Clindamycin	Erythromycin	Fusidic acid	Gentamicin	Kanamycin	Linezolid	Mupirocin	Penicillin	Quinupristin/Dalfopristin	Rifampicin	Streptomycin
			Performed CC MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
			Performed MLST MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
			ECOFF	4	16	1	0.25	1	0.5	2	8	4	1	0.12	1	0.03	16
			Lowest limit	0.5	4	0.25	0.12	0.25	0.5	1	4	1	0.5	0.12	0.5	0.016	4
			Highest limit	16	64	8	4	8	4	16	64	8	256	2	4	0.5	32
11			<=0.016													59	
			<=0.12				57										
			<=0.25			41		20									
			<=0.5						59				59		55		
			0.5			10		37								1	
			>0.5													1	
			<=1							48		14					
			1			1									2		
			2			1				1		44		1	3		
			>2											60			
			<=4		11						48						12
			4			1	1		2			3			1		
			>4				3										
			8	28	50	5		1		1							23
			>8			2		3									
			16	29						4	1						4
			>16	4						7							
			32								1						1
			>32														21
			>64								11						
			256										1				
			>256										1				
34			<=0.016													62	
			<=0.12				4										
			<=0.25			24		2									
			<=0.5						61				62		4		
			0.5			34		8								1	
			<=1							60		11					
			1						1								
			2							1		50		1	38		
			>2											62			
			<=4		9						59						9
			4				7		1			2			15		
			>4				52								6		
			8	20	49	3				2	2						11
			>8			2		53									
			16	38	3												1
			>16	5													
			32		1						1						
			>32														42
			64		1						1						
			256										1				

Spa Type	Multilocu laris Seq	Clonal Complex	MIC	Cefoxitin	Chloramphenicol	Ciprofloxacin	Clindamycin	Erythromycin	Fusidic acid	Gentamicin	Kanamycin	Linezolid	Mupirocin	Penicillin	Quinupristin/Dalfo pristin	Rifampicin	Streptomycin
			AM Substance	**Cefoxitin**	**Chloramphenicol**	**Ciprofloxacin**	**Clindamycin**	**Erythromycin**	**Fusidic acid**	**Gentamicin**	**Kanamycin**	**Linezolid**	**Mupirocin**	**Penicillin**	**Quinupristin/Dalfo pristin**	**Rifampicin**	**Streptomycin**
			Performed CC MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
			Performed MLST MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
			ECOFF	4	16	1	0.25	1	0.5	2	8	4	1	0.12	1	0.03	16
			Lowest limit	0.5	4	0.25	0.12	0.25	0.5	1	4	1	0.5	0.12	0.5	0.016	4
			Highest limit	16	64	8	4	8	4	16	64	8	256	2	4	0.5	32
899			<=0.016													2	
			<=0.25			2											
			<=0.5						2				2				
			0.5				1	2									
			<=1							2		1					
			1				1										
			2									1			2		
			>2											2			
			<=4								2						1
			8	1	2												1
			16	1													
1451			<=0.016													3	
			<=0.12				3										
			<=0.25			2		2									
			<=0.5						3				3		3		
			0.5					1									
			<=1							3		2					
			2									1					
			>2											3			
			<=4		2						2						
			8	3	1	1					1						
			>32														3
2330			<=0.016													1	
			<=0.25			1											
			<=0.5						1				1				
			<=1									1					
			1												1		
			>2											1			
			>4				1										
			8		1												1
			>8					1									
			16	1													
			>16							1							
			>64								1						
2876			<=0.016													1	
			<=0.25			1											
			<=0.5						1				1				
			<=1							1		1					
			>2											1			
			<=4								1						1
			4												1		
			>4				1										
			8	1	1												
			>8					1									

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring - EFSA specifications

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER AMR MON

Analytical Method:

Country Of Origin:Switzerland

Sampling Details:

Spa Type	Multilocularis Seq	Clonal Complex	MIC / AM Substance	Cefoxitin	Chloramphenicol	Ciprofloxacin	Clindamycin	Erythromycin	Fusidic acid	Gentamicin	Kanamycin	Linezolid	Mupirocin	Penicillin	Quinupristin/Dalfopristin	Rifampicin	Streptomycin
			Performed CC MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
			Performed MLST MRSA characterisation	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
			ECOFF	4	16	1	0.25	1	0.5	2	8	4	1	0.12	1	0.03	16
			Lowest limit	0.5	4	0.25	0.12	0.25	0.5	1	4	1	0.5	0.12	0.5	0.016	4
			Highest limit	16	64	8	4	8	4	16	64	8	256	2	4	0.5	32
2			<=0.016													1	
			<=0.12				1										
			<=0.25			1											
			<=0.5						1				1		1		
			0.5					1									
			2									1					
			>2											1			
			<=4		1												1
			16	1						1							
			64								1						
11			<=0.016													1	
			<=0.12				1										
			<=0.5						1				1		1		
			0.5			1		1									
			2									1					
			>2											1			
			<=4														1
			4							1							
			8	1	1												
			32								1						

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

Programme Code	Matrix Detailed	Zoonotic Agent Detailed	Sampling Strategy	Sampling Stage	Sampling Details	Sampling Context	Sampler	Sample Type	Sampling Unit Type	Sample Origin	Comment	Total Units Tested	Total Units Positive
CARBA MON	Cattle (bovine animals) - calves (under 1 year)	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Slaughterhouse	N_A	Monitoring - EFSA specifications	Official sampling	animal sample - caecum	animal	Switzerland	ChromID Carba and ChromID Oxa-48 agar	304	0
	Meat from bovine animals - fresh - chilled	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Retail	N_A	Monitoring - EFSA specifications	Official sampling	food sample - meat	single (food/feed)	Switzerland	ChromID Carba and ChromID Oxa-48 agar	299	0
	Meat from pig - fresh - chilled	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Retail	N_A	Monitoring - EFSA specifications	Official sampling	food sample - meat	single (food/feed)	Switzerland	ChromID Carba and ChromID Oxa-48 agar	302	0
	Pigs - fattening pigs	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Slaughterhouse	N_A	Monitoring - EFSA specifications	Official sampling	animal sample - caecum	animal	Switzerland	ChromID Carba and ChromID Oxa-48 agar	296	0

European Food Safety Authority

Latest Transmission set

Table Name	Last submitted dataset transmission date
Antimicrobial Resistance	20-Dec-2018
Esbl	20-Jul-2018
Animal Population	20-Jul-2018
Disease Status	20-Jul-2018
Food Borne Outbreaks	20-Jul-2018
Prevalence	20-Jul-2018

CH_Text_Form_Data 2017

Institutions and Laboratories involved in zoonoses monitoring and reporting
1: Centre for Zoonoses, Bacterial Animal Diseases Antimicrobial Resistance (ZOBA) at the Institute of Veterinary Bacteriology, Vetsuisse Faculty, University of Bern National Reference Laboratory for Brucellosis, Salmonellosis, Campylobacteriosis, Listeriosis, Yersiniosis, Tularemia, Coxiellosis, Antimicrobial Resistance 2. Institute for Food Safety and Hygiene (ILS), Vetsuisse Faculty University of Zurich, National Reference Laboratory for STEC, enteropathogenic bacteria 3. Institute of Veterinary Bacteriology (IVB) Vetsuisse Faculty University of Zurich National Reference Laboratory for Tuberculosis 4. Institute of Parasitology IPB, Vetsuisse Faculty and Faculty of Medicine University of Bern National Reference Laboratory for Trichinellosis, Toxoplasmosis 5. Swiss Rabies Center (SRC) at the Institute of Veterinary Virology, Vetsuisse Faculty University of Bern National Reference Laboratory for Rabies 6. Institute of Parasitology (IPZ), Vetsuisse Faculty University of Zurich, National Reference Laboratory for Echinococcosis 7. Research Station Agroscope Liebefeld-Posieux (ALP) Official feed inspection service and Listeria Monitoring 8. Institute for Virology and Immunology (IVI) National Reference Laboratory for West Nil Fever
Short description of the institutions and laboratories involved in data collection and reporting

Animal population
1. Sources of information and the date(s) (months, years) the information relates to[(a)]
Number of animals held in farms in Switzerland in 2017 (data status May 2018). Number of animals slaughtered in the year 2017. Living animals and herds: Coordinated census of agriculture. Swiss federal office of agriculture and Swiss federal office of statistics. Slaughtered animals: Official meat inspection statistics (FSVO) and monthly agricultural statistics (Swiss Farmer's Federation).
2. Definitions used for different types of animals, herds, flocks and holdings as well as the production types covered
The indicated number of holdings is identical to the number of farms holding respective species. Agriculture census counts the number of farms.
3. National changes of the numbers of susceptible population and trends
In general, the number of animal holdings is decreasing slightly year by year (exception: holding with goats). Poultry industry: the number of holdings with laying hens increased by 10.1% and the one with broilers increased by 4.4%. Over 90% of poultry meat is produced by 4 major meat producing companies. The number of holdings with breeding hens have a large fluctuation due to a large number of very small flocks on farms which are counted in agricultural census. However, the number of holdings with more than 250 breeding hens is quite constant (2017 it were 37) keeping over 90% of all breeding hens.
4. Geographical distribution and size distribution of the herds, flocks and holdings[(b)]
Average size of the farms in 2017: 43 cattle, 226 pigs, 41 sheep, 12 goats, 203 laying hens and 6800 broilers.
5. Additional information
Day-old chicks and hatching eggs are imported on a large scale to Switzerland. In the broiler sector far more fertilized eggs than day-old chicks are imported. Whereas the number of imported fertilized eggs of the broiler type decreased from 34 in 2016 to 31 million in 2017 (-8.3%), the number of imported day-old chicks of the broiler type decreased slightly from 76'262 to 74'041. Day-old chicks of the laying hens were imported more (18'576 in 2017 instead of 16'290 in 2016).
(a): National identification and registration system(s), source of reported statistics (Eurostat, others) (b): Link to website with density maps if available, tables with number of herds and flocks according to geographical area

General evaluation*: Brucella

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

Brucellosis in humans is notifiable (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases). The number of detections of *Brucella* (B.) spp. in humans has been rare for many years.

Brucellosis in animals is notifiable (TSV, Article 3: disease to be eradicated: bovine brucellosis since 1956, in sheep and goats since 1966; Article 4: disease to be controlled: brucellosis in rams). Government measures are applied to control brucellosis in sheep and goats (*B. melitensis*, TSV, Articles 190-195), in cattle (*B. abortus*, TSV, Articles 150-157), in pigs (*B. suis* as well as *B. abortus* and *B. melitensis*, TSV, Articles 207 – 211) and in rams (B. ovis, TSV, Articles 233-236). Cattle, pigs, sheep and goats must be tested for brucellosis in cases where the causes of abortion are being investigated (TSV, Article 129). Vaccination is prohibited since 1961. Switzerland is officially recognized as free of brucellosis in cattle, sheep and goats by the EU (Bilateral Agreement on Agriculture, Veterinary Annex). Requirements of section 3.2.1.5 of the OIE International Animal Health Code are fulfilled since 1963. *B. abortus* in bovines was last reported in 1996, *B. melitensis* in small ruminants in 1985.

Freedom from bovine brucellosis was proven the last time in 1997 when a random sample of 139‘655 cows (in general older than 24 months) from 4’874 farms was tested negative using a serological test.

Since 1998 the freedom of the sheep and goat population from brucellosis is documented annually with serological testing of randomly selected farms according to EU regulation 91/68/EEC.

B. suis in pigs is very rare. However, it is known that *B. suis* Biovar 2 is prevalent in wild boars [1]. Outdoor pigs which are outside the whole day, close to the forest (<50m) and with low fences (<60cm) have the highest risk of contact with wild boars. From 252 wild boars tested from 2008 until 2010 28.8% (95% CI 23.0%-34.0%) were *B. suis* Biovar 2 positive by culture and PCR and 35.8% (95% CI 30.0%-42.0%) had antibodies against *B. suis* [6]. These findings were significantly higher than in previous studies indicating a spread of *B. suis* Biovar 2 in Swiss wild boars. A questionnaire revealed that 31% of the gamekeeper and 25% of outdoor pig holders observed at least 1 interaction between wild boars and pigs in the past 20 years. 5% of holdings reported hybrids [7]. After a reported case in wild boars in 2001, the first outbreak since many years with *B. suis* Biovar 2 occurred in domestic pigs in 2009. The primary case was in a farm with Mangalitza pigs, which were reared outdoor and contact to wild boars was very likely. Two secondary farms were infected via animal traffic of the diseased boar. The outbreak isolates constituted a unique cluster by Multi locus variable number of tandem repeats (MLVA) and was distinct from that of isolates obtained from wild boars, suggesting that direct transmission of the pathogen from wild boars to domestic pigs was not responsible for this outbreak [5]. In 2010, *B. suis* Biovar 2 was again detected in one wild boar.

A clinical case of *B. ovis* in rams was detected in 2010, after 9 years of no reported cases. *B. ovis* in rams was mainly detected between 1994 and 2001. In this time period 101 cases were reported, ranging from 1 to 34 per year.

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

In 2017 9 brucellosis cases in humans were reported (in 2016: 7 cases). In 1 case *B. melitensis* could be identified. Affected were 7 men and 2 women between the age of 34 and 65 years. In the last 10 years the notified cases ranged between 1 and 14 cases per year.

In 2017, no cases of brucellosis in animals were reported by the cantonal veterinarians. In the yearly national survey also all blood samples from sheep and goats tested negative for *B. melitensis.*

In veterinary diagnostic laboratories antigen testing for brucellosis was carried out in 28 pigs and 1 alpaca in the context of clinical investigations.

Human infections with *Brucella* spp. through the consumption of Swiss raw milk or dairy products from non-heat-treated milk (for example sheep or goat cheese) is considered to be of negligible risk because its prevalence is close to zero in the Swiss animal population as no new cases in dairy livestock have been found for many years. Cases of brucellosis in humans are anticipated to be attributable to stays abroad or to the consumption of foreign products.

B. suis Biovar 2 seem to occur occasionally in holdings which keep pigs of special breed, such as Mangalitza. *B. suis* Biovar 2 is very rarely notified in humans, probably as it is known to be less virulent to humans than Biovar 1 and 3.

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

National surveys on a yearly basis are carried out to document freedom from brucellosis in sheep and goat. A research study was conducted in 2008 -2010 to obtain recent *B. suis* prevalence data in wild boars and to evaluate risk factors for the infection of pigs which are reared outdoor (results see above).

4. Additional information

[1] Leuenberger R, Boujon P, Thür B, Miserez R, Garin-Bastuji B, Rüfenacht J, Stärk KD (2007): Prevalence of classical swine fever, Aujeszky's disease and brucellosis in a population of wild boar in Switzerland, Vet Rec; 160(11):362-8.

[2] Hinić V., Brodard I., Thomann A., Cvetnić Z., Makaya P.V., Frey J., Abril C. (2008): Novel identification and differentiation of *Brucella melitensis*, *B. abortus*, *B. suis*, *B. ovis*, *B. canis*, and *B. neotomae* suitable for both conventional and real-time PCR systems; J Microbiol Methods Oct 75(2):375-8.

[3] Hinić V, Brodard I, Thomann A, Holub M, Miserez R, Abril C. (2009a): IS*711*-based real-time PCR assay as a tool for detection of *Brucella* spp. in wild boars and comparison with bacterial isolation and serology; BMC Veterinary Research. Jul 14; 5:22.

[4] Hinić V., Brodard I., Petridou E., Filiousis G., Contos V., Frey J., Abril C. (2009b): Brucellosis in a dog caused by *Brucella melitensis* Rev 1, Vet Microbiol, Sept 26.

[5] Abril C, Thomann A, Brodard I, Wu N, Ryser-Degiorgis MP, Frey J, Overesch G. (2011): A novel isolation method of Brucella species and molecular tracking of *Brucella suis* biovar 2 in domestic and wild animals, Vet Microbiol. 2011 Mar 5.

[6] Wu, N Abril, C., Hinic, V., Brodard, I., Thür, B., Fattebert, J., Hüssy, D., Ryser-Degiorgis, M.P. (2011): Free-ranging wild boar may represent a threat to disease freedom in domestic pigs in Switzerland. J Wildl Dis.

[7] Wu, N., Abril, C., Thomann, A., Grosclaude, E., Doherr, M.G., Boujon, P., Ryser-Degiorgis, M.P. (2012): Risk factors for contacts between wild boar and outdoor pigs in Switzerland and investigations on potential *Brucella suis* spill-over. BMC Vet Res.

[8] Further information can be found on the FSVO website www.blv.admin.ch.

* **For each zoonotic agent**

(a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official “disease status” to be specified for the whole country and/or specific regions within the country

(b): If applicable

Description of Monitoring/Surveillance/Control programmes system*: Cattle and Brucella abortus
1. Monitoring/Surveillance/Control programmes system[(a)]
Switzerland is officially acknowledged as free from bovine brucellosis since 1959. Bovine brucellosis is notifiable since 1956. Requirements of section 3.2.1.5 of the OIE International Animal Health Code are fulfilled since 1963. Free status is recognized by EU (Bilateral Agreement on Agriculture, Veterinary Annex). Freedom from disease has been proven in 1997 conducting a survey in a randomized sample of 4874 farms. 139'655 cows (in general older than 24 months) were tested using serological test. Tests were performed in blood samples from 31042 animals and in 18952 bulk milk samples. There were no positive findings in these samples.
2. Measures in place[(b)]
Vaccination is prohibited since 1961. Actions to be taken in suspicious farms are the ban of all animal traffic and investigation of the whole herd as well as the placenta of calving cows. In confirmed cases (herds) all diseased cattle have to be killed. All placentas, abortion material and the milk of diseased and suspicious cows have to be disposed of. The barn has to be disinfected. Official meat inspection includes each carcass, its organs and lymphatic tissue on the prevalence of abnormal alterations. Whole carcasses need to be destroyed if lesions typical for brucellosis are confirmed positive by a laboratory test. Without lesions or in case of unclear laboratory results the udder, genitals and the blood need to be destroyed (VHyS, Annex 7).
3. Notification system in place to the national competent authority[(c)]
Notification of suspicious cases and outbreaks is mandatory since 1956. Brucellosis in bovine animals is regulated as zoonosis to be eradicated (TSV, Art. 150 - Art. 157).
4. Results of investigations and national evaluation of the situation, the trends [(d)] and sources of infection[(e)]
No cases occurred in the passive surveillance after 1997, when freedom was proven in a nationwide survey. There are no observations that would challenge the freedom of Swiss cattle population from brucellosis.
5. Additional information
None.

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

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No.

(d): Minimum five years.

(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

Description of Monitoring/Surveillance/Control programmes system*: Sheep and Goats and Brucella melitensis
1. Monitoring/Surveillance/Control programmes system[(a)]
Switzerland is officially acknowledged as free from ovine and caprine brucellosis. Since 1998 every year a survey in a randomized sample of farms is conducted proving freedom from disease. Free status is recognized by the EU (Bilateral Agreement on Agriculture, Veterinary Annex). EU regulation 91/68/EEC that defines populations of sheep and goat as one epidemiological unit is the basis of the survey, following a risk-based design of repeated surveys for the documentation of freedom from non-highly contagious diseases [1].
2. Measures in place[(b)]
Vaccination is prohibited since 1961. Actions to be taken in suspicious farms are ban of all animal traffic and the investigation of the whole herd. In confirmed cases the whole herd has to be killed immediately. All placentas, abortion material and the milk of diseased and suspicious animals have to be disposed of. The barn has to be disinfected. Official meat inspection is investigating each carcass, its organs and lymphatic tissue on the prevalence of abnormal alterations. Whole carcasses need to be destroyed if lesions typical for brucellosis could be confirmed by a laboratory test. Without lesions or in case of unclear laboratory results the udder, genitals and the blood need to be destroyed (VHyS, Annex 7).
3. Notification system in place to the national competent authority[(c)]
Notification of suspicious cases and outbreaks is mandatory since 1966. Brucellosis in sheep and goats is regulated as zoonosis to be eradicated (TSV, Art. 190 - Art. 195).
4. Results of investigations and national evaluation of the situation, the trends [(d)] and sources of infection[(e)]
In the yearly national survey a randomized sample of 494 sheep farms (6788 blood samples) and 743 goat farms (7375 blood samples) were tested negative for *B. melitensis* using serological tests. In addition, no cases of brucellosis in sheep and goats were reported. There are no observations that would challenge the freedom of Swiss sheep and goat population from brucellosis.
5. Additional information
[1] Hadorn et al. (2002): Risk-based design of repeated surveys for the documentation of freedom from non-highly contagious diseases. Preventive Veterinary Medicine (2002) 56: 179-192.
* **For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent** (a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website. (b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website. (c): Mandatory: Yes/No. (d): Minimum five years. (e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

General evaluation*: Mycobacterium

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

Tuberculosis in humans is notifiable (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases). Human tuberculosis cases due to *Mycobacterium* (*M.*) *bovis* are reported on a low scale (not more than 15 cases per year since 2005), which corresponds to less than 2% of all reported tuberculosis cases.
In animals, tuberculosis is notifiable (TSV, Article 3: disease to be eradicated and 158 – 159). Vaccination is prohibited. Requirements of section 3.2.3.10 of the OIE International Animal Health Code are fulfilled since 1959. Free status is recognized by EU (Bilateral Agreement on Agriculture, Veterinary Annex). Between 1960 and 1980, the entire bovine population was tested every other year in an active surveillance program. Since 1980, passive surveillance at the slaughterhouse is performed. Isolated cases of bovine tuberculosis have been found, which were partly due to reactivation of *M. bovis* infections in geriatric humans with subsequent transmission of the agent to bovines.
In 1997 a survey in a randomized sample of about 10% of farms (4874 farms) was conducted to prove freedom from disease. 111'394 cattle were tested using the comparative cervical intradermal test. On 72 farms, tests had to be repeated. All farms were negative. In 1998, lymph nodes from slaughtered captive deer from 124 sampled holdings (from a total of 485 farmed deer holdings) showed no lesions typical of bovine tuberculosis and were tested negative in culture for *M. bovis* and *M. tuberculosis* [1].
In a study conducted in 2010, 23 of 582 cattle of the Canton St. Gallen, which had spent the Alpine pasturing season 2009 on Alpine pastures in Austria, reacted with an unclear result in the comparative cervical intradermal test, but were negative after retesting with the comparative cervical intradermal test and/or the Interferon-gamma test. In addition, in 6 of 165 wild boars (4%) bacteria from the MTBC complex were detected, but none of these tested positive for *M. bovis* or *M. caprae*. 269 wild red deer were tested negative for tuberculosis [2].
Since 1991 tuberculosis cases in animals were reported extremely rarely (not more than 2 cases per year). Only in 2013 more cases (in total 10) were reported due to two outbreaks in cattle (one due to *M. bovis*, the other due to *M. caprae*). Whereas the origin of infection of the first outbreak (*M. bovis*) remained unclear, the origin of infection of the *M. caprae* outbreak was deer in Austria. All infected animals of the second *M. caprae* outbreak were kept during summer on Alpine pastures in Austria in regions where *M. caprae* is endemic. These cases were the first in cattle since 1998. Next to these bovine cases other reports in the last 10 years (2008 to 2017) affected cats (6x), dogs, horses, elephants and lamas (each 1x).

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

In 2017, 500 diagnostically confirmed human cases of tuberculosis and 51 non-laboratory confirmed cases were reported. 380 of the laboratory confirmed cases were caused by *M. tuberculosis*, 3 by *M. bovis* and 3 by *M. africanum*. 141 strains were *M. tuberculosis*-complex positive, but could not be identified further. From the 3 human cases of *M. bovis* all were over 80 years old. All were Swiss.
In animals, 1 tuberculosis outbreak was reported in 2017 in a cat (*M. tuberculosis complex).* There were no further outbreaks in cattle after the two outbreaks in 2013/2014.
Human tuberculosis cases due to *M. bovis / M. caprae* were reported on a low scale and corresponded to less than 2% of all reported tuberculosis cases over the last 10 years. 2017 they comprised less than 0.5%. Swiss livestock is recognized free of bovine tuberculosis. The outbreaks in 2013/2014 showed that isolated TB cases can occur. The risk of a TB infection by contact with infected bovines or by consumption of food products containing mycobacteria (like raw milk, which is however mostly pasteurised) within Switzerland is negligible. Raw milk is not ready for consumption and needs to be

heat treated (minimum 70°C) before consumption. Products from pasteurized milk are no risk as bacteria are inactivated through the heat treatment. Infections over contact (aerogen transmission) are more likely to take place as only a few bacteria are needed. Human cases of tuberculosis are anticipated to be mainly attributable to stays abroad or to the consumption of foreign food products. However, natives aged over 65 years could have been infected in their childhood, when the disease in Swiss cattle was more frequent. Risk factors for the incursion of the disease are international trade with animals and summer grazing of Swiss cattle in risk areas such as the border areas with Austria and Germany where contact with infected cattle or wildlife cannot be excluded. The cases in 2013 in eastern Switzerland proved, that summer grazing in Tyrolia and Vorarlberg, Austria, where *M. caprae* infection in red deer is endemic in these regions since the 90ties, is a risk for infection for Swiss cattle. Although the source of infection of the first outbreak with *M. bovis* remains unclear, international trade needs to be looked at closer. In some member states like in UK, France, Italy, Spain and Portugal tuberculosis cases seem to be increasing in the recent years according to the EU ADNS system. Infected wild animals are a potential reservoir and were found in all these countries (wild boar, deer, badgers), especially in areas with high wildlife densities.

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

As detecting suspect cases during meat inspection in slaughterhouses is a challenge in a country with a very low prevalence disease, awareness at slaughterhouses was strengthened. In 2013, after the detection of the first case in cattle since 1998, a new project was lanced in Switzerland to improve the disease awareness at the meat inspection in slaughterhouses, called LyMON. A manual with pictures on how bovine TB looks like was distributed to all meat inspectors at the slaughterhouse. In addition, submission of lymphatic tissue with unspecific alterations for analysis was enhanced. 2017 lymphatic tissue with unspecific alterations of 108 cattle were analysed using Ziehl-Neelsen staining and a genus-specific mycobacterial PCR (2016: 121; 2015: 119). All samples were negative for bacteria of the M. tuberculosis-complex. In 2014 an early detection and monitoring programme for bovine TB in wildlife was launched in the eastern part of Switzerland and the Principality of Liechtenstein in areas bordering Austria. Lymphatic tissue and organ material were analysed in a multi-step diagnostic scheme consisting of a detailed pathological investigation, Ziehl-Neelsen staining, a genus-specific mycobacterial PCR and MTBC culture. 2017 230 red deer, 4 roe deer, 1 ibex and 1 chamoix were investigated (2016: 166 red deer, 5 roe deer, 1 ibex; 2015: 260 red deer, 4 chamoix, 5 ibex, 2 roe deer; 2014: 97 red deer, 1 roe deer, 1 ibex). No Bovine TB was detected in wildlife.
In 2010 a study investigated cattle which were kept on Alpine pastures in Austria 2009 as well as red deer and wild boar in the Alpine region in 2010. All animals were tested negative.

4. Additional information

[1] Wyss D., Giacometti M., Nicolet J., Burnens A., Pfyffer GE., Audige L., (2000). Farm and slaughter survey of bovine tuberculosis in captive deer in Switzerland. Vet. Rec. 147,713 -717.
[2] Schöning, J. 2012: Untersuchungen zum Vorkommen der Rindertuberkulose bei Wildtieren und zum Risiko der Entwicklung eines Reservoirs bei Wildungulaten in der Schweiz und im Fürstentum Liechtenstein. Inauguraldissertation der Vetsuisse Fakultät der Universität Bern, 2012.
[3] Further information can be found on the FSVO website
http://www.blv.admin.chwww.blv.admin.ch.

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

Description of Monitoring/Surveillance/Control programmes system*: Cattle and M. bovis
1. Monitoring/Surveillance/Control programmes system[(a)]
Switzerland is officially acknowledged as free from bovine tuberculosis since 1959. Freedom from disease has been proven in 1997 conducting a survey in a randomized sample of 4874 farms. 111'394 cattle were tuberculin tested. In 72 farms tests had to be repeated. All farms were negative.
2. Measures in place[(b)]
Actions to be taken in suspicious farms are ban of all animal traffic and investigation of the whole herd. In confirmed cases (herds) all diseased or suspicious cattle has to be slaughtered and the milk of them is disposed. The barn has to be disinfected.
3. Notification system in place to the national competent authority[(c)]
Bovine tuberculosis is notifiable since 1950 (TSV, Art. 3: disease to be eradicated and Art. 158 - Art. 165). Notifications of suspicious cases are mandatory.
4. Results of investigations and national evaluation of the situation, the trends [(d)] and sources of infection[(e)]
In 2017 no cases in cattle were reported.
5. Additional information
None.

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

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No.

(d): Minimum five years.

(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

General evaluation*: Campylobacter

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

Human campylobacteriosis is notifiable (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases). In the 1980s, campylobacteriosis was the second most reported food borne disease in humans behind salmonellosis. In 1995 the case curve for campylobacteriosis crossed over that for enteric S*almonellae*. Since then campylobacteriosis has been the main reported food-borne infectious disease in Switzerland. After reaching a peak in 2000 with 97 reports per 100,000 inhabitants, the incidence declined steadily until 2005, always remaining over 65 reports per 100,000 inhabitants. From 2005 until 2012 an increasing trend could be observed, reaching its peak of 105 reports per 100,000 inhabitants in 2012. *C. jejuni* has always been the most isolated species in humans.
Campylobacteriosis in animals is notifiable (TSV, Article 5: disease to be monitored). In poultry and pigs *Campylobacter jejuni/coli* are commensals. Other animal species, i.e. dogs and calves, show mild clinical signs of diarrhoea. Thus, only a few campylobacteriosis cases were reported by cantonal veterinarians. From 2004 until 2012 the reports ranged between 5 and 26 per year. Since 2013 case numbers increased and reached a peak of about 160 cases per year in 2014 and 2015. In the past 10 years (2008 – 2017) reported cases fluctuated between 8 and 164 per year, affecting mainly dogs (66%), cattle (16%) and cats (11%).
Fresh poultry meat represents the most important reservoir of human campylobacteriosis. The occurrence of this pathogen in broiler chicken farms is studied since 2002 as part of the antimicrobial resistance monitoring programme. From 2002 until 2007 sampling took place only during 2 months in spring. The percentage of positive flocks was approximately 25%, in 2002 and 2007 it was higher with roughly 40%. The EU-wide baseline study in 2008 revealed that there are remarkable differences in the percentages of positive flocks during the year. From 2009 onwards samples were taken evenly distributed throughout the year. In caecum samples in 2009 the obtained prevalence was 44%. 2010 to 2014 cloacal swabs resulted in a slightly lower prevalence ranging between 33% and 38%. Since 2015 the antimicrobial resistance programme foresees, that poultry are sampled every second year and that again caecal samples are taken. 2016 the prevalence in caecal samples was within the range of the previous years (35%), when cloacal swabs were taken. 2015 and 2017 there are no poultry data.
In the EU-wide baseline study in 2008 71% of the broiler carcasses at the slaughter house were *Campylobacter*-positive (cumulated qualitative and quantitative approach). The prevalence of *Campylobacter* in poultry meat at retail in 2007 and in broiler meat at retail in 2009/2010 was estimated to be 44% and 38%, respectively. In both studies it could be shown that frozen products and products without skin have a smaller risk to be contaminated with Campylobacter than fresh products and products with skin.
A survey conducted in 2006 in calves revealed a *Campylobacter* prevalence of 40%. In the framework of the antimicrobial resistance monitoring the prevalence in calves in 2010 was much lower (15%, 37 of 245; *C. jejuni (*25x) and *C. coli (*12x)). Prevalence was also lower in meat producing cattle (>12 months): 10% in 2008 (10 of 100, *C. jejuni (*10x)) and 13% in 2012 (48 of 373; *C. jejuni* (38x) and *C. coli* (10x)).
The *Campylobacter* prevalence in pigs was between 65% and 68% in 2009, 2010, 2011 and 2013 (N=348). 2012 and 2015 it was lower and ranged between 48% (N= 305) and 52% (N=298). The random sample of pigs were investigated at slaughter in the framework of the antimicrobial resistance monitoring programme using caecal samples. The main species in pigs is *C. coli*.

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

The number of notified human campylobacteriosis cases decreased from 7980 in 2016 to 7219 reported cases in 2017 (2017: 85 new infections per 100’000 inhabitants; 2016: 94 infections per 100‘000). 2012 remains the year with the highest rate of new infections since the introduction of mandatory notification (8442 cases or 105 per 100‘000 inhabitants). Similar to previous years, the most affected age group was adults aged 15 to 24 years (115/100’000). Within the past two decades, there was a notable increase in case reports among the elderly aged $\geq$ 65: the notification rate more than doubled (from 43/100‘000 in 1997 to 103/100‘000 in 2017). Whereas over the same time period the notification rate in children under the age of 5 decreased (from 147 to 94 cases per 100‘000). With 3896 cases (55%) slightly more men than women (3206 cases; 45%) were affected. In accordance with previous years, most cases were caused by *C. jejuni* (60% of all cases, in 16% of cases no distinction was made between *C. jejuni* and *C. coli*). In 2017 the typical summer peak occurred in the months of July and August accounting for 1945 cases. The winter peak stretched from December 16 to January 17 leading to 1082 cases.
In 2017, a random sample of pigs was investigated at slaughter in the framework of the antimicrobial resistance monitoring programme using caecal samples. 170 of 298 pigs (57%) were *Campylobacter*-positive (*161x C. coli*, 9x *C. jejuni)*.
122 cases of campylobacteriosis were reported in animals by cantonal veterinarians in 2017, corresponding to a slight decline in notifications since 2013. As usual, mainly dogs (65x), cattle (34x) and cats (10x) were affected. The increase in reported cases from 2013 onwards was mainly due to an increase in reported cases in dogs. An increase in the number of cases is likely, as the number of tests on Campylobacter undertaken in 2013 until 2015 only varied slightly. Risk factors for Campylobacter infections in dogs are age, poor hygiene, high density of dogs (i.e. shelters) and the feeding of raw meat (i.e. barf diet). The latter has become more popular in recent years. However, dogs play a small role as source of infections in humans (only 9% of the cases were dog-related in a study in 2013, see Kittl et al, 2013).
Mainly the handling of raw poultry meat and the consumption of undercooked contaminated poultry meat and poultry liver leads to campylobacteriosis cases in humans. Cattle and the contact to pets was shown to be less important. Molecular typing of Swiss isolates from humans and animals collected between 2001 and 2012 identified chickens as the main source for human campylobacteriosis (71% of the human cases were attributed to chickens, 19% to cattle, 9% to dogs and 1% to pigs [2]. It is assumed that the high rate of disease in young adults aged 15-24 years is attributable to less regard for kitchen hygiene at this age and increased travel. Data from 2009 indicated that approximately 18% of the cases were travel associated (Niederer et al. 2012). Infections above average in summer (July/August) could be related to the higher infection rate in poultry flocks, higher barbecue activities and travels abroad, the peak around New Year Eve to increased consumption of meat dishes such as “Fondue Chinoise” and travelling abroad.

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

Three legal regulations were put into place. One of them decrees that from January 1st 2014 poultry liver from *Campylobacter*-positive herds can only be sold frozen (SR 817.024.1, Ordinance on Hygiene, article 33a). As there is no official method in Switzerland for testing *Campylobacter* freedom on herd level poultry liver is sold only frozen. According to the second regulation, pre-packed fresh poultry meat and meat preparations need a label informing the consumers to thoroughly cook the products before consumption and to follow certain rules of kitchen hygiene (SR 817.022.108, Ordinance on Food of Animal Origin, article 9). Since 01.05.2017 a process hygiene criteria was put into place for poultry carcasses (with a transition period until 30.04.2018). A certain number of poultry carcasses needs to be tested for Campylobacter after cooling. A certain microbiological count is not allowed to be exceeded. If not, the slaughterhouse must take measures to reduce the microbiological count.

In addition a communication campaign was launched to improve the kitchen hygiene in private households (www.sichergeniessen.ch).
4. Additional information
[1] Jonas et al. 2015. Genotypes and antibiotic resistance of bovine Campylobacter and their contribution to human campylobacteriosis. Epidemiol Infect. 2015 Aug; 143(11):2373-80. doi: 10.1017/S0950268814003410. Epub 2014 Dec 16. [2] Amar et al 2014. Genotypes and antibiotic resistance of canine Campylobacter jejuni isolates. Vet Microbiol. 2014 Jan 10; 168(1):124-30. doi: 10.1016/j.vetmic.2013.10.006. Epub 2013 Oct 22. [3] Kittl et al. (2013a). Source attribution of human *Campylobacter* isolates by MLST and fla-typing and association of genotypes with quinolone resistance. PLoS One 8(11): e81796. [4] Kittl S, Korczak BM, Niederer L, Baumgartner A, Buettner S, Overesch G, Kuhnert P., (2013b): Comparison of genotypes and antibiotic resistances of *Campylobacter jejuni* and *Campylobacter coli* on chicken retail meat and at slaughter. Appl Environ Microbiol. Jun 2013; 79(12): 3875–3878. [5] Niederer L, Kuhnert P, Egger R, Büttner S, Hächler H, Korczak, BM., 2012: Genotypes and antibiotic resistances of *Campylobacter jejuni* and *Campylobacter coli* isolates from domestic and travel-associated human cases. Appl Environ Microbiol.Jan; 78(1):288-91. [6] Wirz SE, Overesch G, Kuhnert P, Korczak BM, (2010): Genotype and antibiotic resistance analysis of *Campylobacter* isolates from ceaca and the carcasses of slaughtered broiler flocks. Appl Environ Microbiol. 2010 Oct; 76(19):6377-86. [7] Kittl S, Kuhnert P, Hächler H, Korczak BM., 2011: Comparison of genotypes and antibiotic resistance of *Campylobacter jejuni* isolated from humans and slaughtered chickens in Switzerland. J Appl Microbiol. 2011 Feb; 110 (2):513-520. [8] Egger R, Korczak BM, Niederer L, Overesch G, Kuhnert P. (2011): Genotypes and antibiotic resistance of *Campylobacter coli* in fattening pigs. Vet Microbiol. 2011 Aug 19. [9] Further information can be found on the FSVO website www.blv.admin.ch.
* **For each zoonotic agent** (a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official “disease status” to be specified for the whole country and/or specific regions within the country (b): If applicable

Description of Monitoring/Surveillance/Control programmes system*: Fresh poultry meat, poultry meat preparations and poultry meat products and Campylobacter
1. Monitoring/Surveillance/Control programmes system(a)
The industry takes responsibility for the monitoring of poultry meat production in a system of self-auditing following the HACCP principles. Results of the Campylobacter monitoring of the largest poultry producers and abattoirs are available covering more than 92% of the production. Samples are taken several times a year at random. Fresh poultry meat, poultry meat preparations and poultry meat products were tested at different stages such as slaughterhouse, cutting plant and processing plant. No imported meat samples were included in the data analysis.
2. Measures in place(b)
Since 01.05.2017 a process hygiene criteria was put into place for poultry carcasses (with a transition period until 30.04.2018). A certain number of poultry carcasses needs to be tested for Campylobacter after cooling. A certain microbiological count is not allowed to be exceeded. If not, the slaughterhouse must take measures to reduce the microbiological count along the slaughter and production chain.
3. Notification system in place to the national competent authority(c)
None.
4. Results of investigations and national evaluation of the situation, the trends (d) and sources of infection(e)
In the framework of the self-auditing system of the poultry meat industry in total 1232 tests were done in 2017. 326 (27%) of them proved positive for *Campylobacter* spp. [*C. jejuni* (101x; 31%), *C. coli* (27x; 8%) and unspecified (198x; 61%), see also Campylobacter poultry meat table]. 1191 samples of broiler meat were tested for Campylobacter in 2017 of which 303 (25%) were *Campylobacter* spp. positive. Furthermore, 23 of 41 samples (56%) of turkey meat tested *Campylobacter* spp. positive.
5. Additional information
The poultry industry encourages farmers to lower the Campylobacter-burden by incentives for negative herds at slaughter. No immunoprophylactic measures are allowed.
* **For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent** (a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website. (b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website. (c): Mandatory: Yes/No. (d): Minimum five years. (e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

General evaluation*: Coxiella

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

A big outbreak occurred back in 1983 when 12 flocks of sheep apparently shedding *Coxiella (C.) burnetii* were descending from mountain pastures. During this outbreak over 400 human cases were registered. Most of them lived close to the roads where the sheep passed through. From 1989 to 1991, 32 to 52 human cases were reported per year. Mandatory notification was discontinued in 1999 as the number of reported cases decreased. After a small outbreak in 2012 notification of Q-fever was reintroduced in November 2012 (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases).

In 2005-2006 various foodstuff (bovine, ovine, caprine milk and egg shells) where screened for *C. burnetii* using PCR. In 4.7% (N=359) bovine milk samples *C. burnetii* could be detected, corresponding to 8 from 27 (29.6%) farms. 504 egg shells, 81 resp. 39 samples from 13 sheep resp. 39 goat farms tested negative [2]. In 2007, 49,5% (N=872) bulk tank milk samples, each representing one farm, were positive using a different PCR method with a higher sensitivity. The prevalence of *C. burnetii* in bovine bulk tank milk was estimated to be between 30% and 50% [3].

Coxiellosis in animals is notifiable (TSV, Article 5: disease to be monitored). Cumulative abortions in cattle after three months of pregnancy and every abortion in sheep, goats and pigs have to be reported to a veterinarian. If more than one animal in a holding of ruminants aborts within the space of four months, or if an abortion occurs in a dealer’s stable or during alpine pasturing, cattle, sheep and goats undergo laboratory investigation. If clinically suspected cases are confirmed by a laboratory, the cantonal veterinarian is notified.

At the beginning of the 1990s the number of notifications was high with about 100 reported cases a year. Notifications then steadily declined to about 40 cases per year in the time period 1996 to 2005. In 2006 coxiellosis reports rose again to above 60 cases per year. Since then cases were never below 60 cases per year. In 2012 a peak with 86 cases was reached, but case reports dropped again. Since 2015 a rising trend can be observed, reaching again over 100 cases as in the 1990. In the past 10 years (2008-2017) the average of case reports was 80 per year (Min: 58, Max: 113). Affected were mainly cattle (84%), while in goats (11%) and sheep (5%) less cases were reported.

The seroprevalence of the pathogen is estimated about 30% in cattle and about 1–3% in sheep and goats (data from the Swiss reference laboratory). In 2011 the herd seroprevalence of coxiellosis was 11% in goat farms (N=72) and 5% in sheep farms (N=100). At animal level the seroprevalence was 3.5% in goats (11/321) and 1.8% in sheep (9/500). In 97 collected abortion samples (43 from goats and 54 from sheep) the bacterial load was quantified by real-time PCR. In 13% of the tested samples a high amount of >104 bact/mg placenta was detected.

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

In 2017, 42 human cases were reported with a notification rate of 0.5 per 100’000 inhabitants. The number of reported cases stayed rather low as in the year before, suggesting that cases with severe clinical symptoms are not that frequent in Switzerland. The last outbreak occurred from February to August 2012. 17 human Q-Fever cases were registered in the canton of Vaud, of which 10 people were hospitalised. In 12 cases an epidemiological link could be established to an infected sheep herd with roughly 200 sheep. Only 4 cases lived next to this sheep herd, most other patients came from the surrounding area.

In 2017, 113 cases of coxiellosis in ruminants (93 in cattle, 14 in goats, 6 in sheep) were reported to the FSVO by cantonal veterinarians. In sheep and goats underreporting is estimated to be higher than in cattle. Since 2015 the number of case reports rose steadily and reached again the high levels of over 100 cases last seen in the 1990ies. As usual, mainly cases in cattle were reported.

In veterinary diagnostic laboratories 3603 tests for *Coxiella spp.* were carried out in the context of clinical investigations. Samples were derived from cattle (89%), sheep (5%) and goats (6%). *Coxiella burnetii* as a cause of abortions seems to be more frequent in cattle. However, infected cattle are less dangerous for humans than infected sheep and goats. Although the seroprevalence of *C. burnetii* in the Swiss small ruminant population is rather low, Q-fever in small ruminants remains under certain epidemiological circumstances a public health threat**.**
3. Any recent specific action in the Member State or suggested for the European Union[(b)]
Due to the outbreak in 2012 Q-Fever in humans is again notifiable since November 2012. Disease awareness and knowledge how to avoid infections must be improved. Farmers need to be motivated to send abortion material to the laboratories for further investigation.
4. Additional information
[1] Metzler AE *et al*., 1983: Distribution of Coxiella burnetii: a seroepidemiological study of domestic animals and veterinarians [in German]. Schweizer Archiv für Tierheilkunde, 125, 507-517. [2] Fretz, R., Schaeren, W., Tanner, M., Baumgartner, A., 2007: Screening of various foodstuffs for occurrence of Coxiella burnetii in Switzerland. Int J Food Microbiol 116, 414-418. [3] Baumgartner, A., Niederhauser, I., Schaeren, W. 2011: Occurrence of Coxiella burnetii DNA in bulk tank milk samples in Switzerland. Archiv für Lebensmittelhygiene 62, 200-204. [4] Further information can be found on the FSVO website www.blv.admin.ch.
*** For each zoonotic agent** (a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official “disease status” to be specified for the whole country and/or specific regions within the country (b): If applicable

General evaluation*: Cysticercus
1. History of the disease and/or infection in the country[(a)]
Cysticercosis in animals and humans is not notifiable. Cattle, small ruminants and swine are inspected at slaughter for lesions of Cysticerci. According to the ordinance of 23 November 2005 on hygiene in the slaughter process (VhyS; SR 817.190.1), all cattle older than 6 months must be checked with incisions into the jaw muscles and heart. Carcasses with few lesions are frozen, carcasses with massive lesions condemned. Studies in six Swiss abattoirs from 2002 until 2005 showed that in about 0.58% of livestock animal lesions in the muscles caused by *T. saginata* cysticerci were found. This estimate was constant in these years. The animals most heavily infected were cows. However, the routinely performed standard meat inspection protocol has a low diagnostic sensitivity for the detection of *T. saginata* cysticerci infections. In an abattoir trial 2008/2009 several additional heart incisions were performed in 1088 slaughtered cattle originating from 832 farms throughout Switzerland. With the EU-approved routine meat inspection, bovine cysticercosis was diagnosed in 1.8% (20/1088) of the slaughtered animals. Additional incisions into the heart muscle revealed a further 29 cases, indicating that the prevalence was at least 4.5%. All infected animals originated from individual farms) [2]. Data on carcasses with massive lesions are documented in the FLEKO (meat inspection statistics), however without precise species diagnosis. In pigs it is known that *T. hydatigena* is found, because this can be morphologically differentiated from the zoonotic *T. suis*. No data exist on carcasses with few lesions which need to be frozen. Data of the Fleko (meat inspection statistics) from 2006 until 2017 support that cows are the most affected species: of 366 carcasses with massive lesions 82% were cattle, 15% sheep, 4% pigs and 0.3% goats. On average 33 carcasses (ranging from 13 to 45) with massive lesions are detected each year. This corresponds to at most 0.05% of the total slaughtered population.
2. Evaluation of status, trends and relevance as a source for humans
The illness for intestinal *Taenia saginata* infections in humans is mostly of mild character and can be treated. Intestinal *Taenia* sp. infections in humans are occasionally treated in Switzerland, but no prevalence has so far been recorded. No autochthon cases of cysticercosis caused by *T. solium* are known, but single imported cases do occur in humans. *Taenia saginata* cysticerci infection in cattle remains an economically important parasitic disease for the livestock industry by affecting food safety. Based on the routine abattoir reports the prevalence of this zoonotic parasite in the cattle population is underestimated. Only a fraction of infected slaughter cattle are identified during meat inspection. The sensitivity of the used methods at slaughter is estimated to be 15.6% (95% CI; 13-21 [3]). The sensitivity could be improved with additional several heart incisions. 2017, 31 carcasses with massive lesions were entered in the Fleko (27 cattle, 4 sheep), which lies within the normal yearly fluctuation. Again, mainly cattle were affected. Unfortunately, a precise species diagnosis in the slaughterhouses is not performed. In pigs however, it is known that *T. hydatigena* is found, because this can be morphologically differentiated from the zoonotic *T. suis*. As data on cases with few lesions are not gathered in the Fleko, general data are lacking to describe the whole picture. A modeled prevalence in dairy cows was recently estimated to be 16.5% [3]. A case-control study in 2005/2006 considered the risk of infection for bovines to be primarily dependent on external factors: pastures bordering a railway line, the location of the pasture close to a recreational area with parking spaces and leisure activities, farmyard visitors and raw feed that has been bought to

be statistically significant risk factors. In heavily infected cases, other aspects may also play a role, such as not being connected up to the sewage system or the presence of a tapeworm carrier on the farm.
3. Any recent specific action in the Member State or suggested for the European Union(b)
None.
4. Additional information
[1] Flütsch et al.:2008. Case-control study to identify risk factors for bovine cysticercosis on farms in Switzerland; Parasitology. 2008 Apr; 135 (5):641-6. Epub 2008 Mar 27. [2] Eichenberger et al, 2011. Increased sensitivity for the diagnosis of *Taenia saginata* cysticercus infection by additional heart examination compared to the EU-approved routine meat inspection. Food Control 22, 989-992. [3] Eichenberger et al., 2013. Multi-test analysis and model-based estimation of the prevalence of *Taenia saginata* cysticercus infection in naturally infected dairy cows in the absence of a gold standard reference test. International Journal for Parasitology, 43 (2013) 853–859. [4] Further information can be found on the FSVO website www.blv.admin.ch.
* **For each zoonotic agent** (a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official “disease status” to be specified for the whole country and/or specific regions within the country (b): If applicable

General evaluation*: Echinococcus

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

Echinococcus granulosus sensu lato, the causative agent of Cystic Echinococcosis has nearly been extinct in Switzerland, sporadically imported cases are diagnosed in humans or animals (dogs or cattle and sheep, probably infected from imported infected dogs).

Alveolar echinococcosis (AE) is caused by the fox tapeworm *Echinococcus multilocularis*. An infection results in disease with severe consequences for the person concerned. Since 1999 no official data of human cases of Echinococcosis are available, as they are no longer notifiable to FOPH. However, the Institute of Parasitology of the University of Zurich collects data on human cases from cohorts of large treatment centres and centres for serodiagnosis of the disease. The frequency of AE increased between 2001 and 2005 by the 2.5-fold compared to the time period 1990-2000. From 2006-2010 the average incidence was 0.25 cases per 100'000 inhabitants per year, adding up to approximately 20 newly diagnosed cases annually. From 1984 to 2010 the average age at time of diagnosis was roughly 55 years. With every 20 years of life the age specific incidence increased significantly. 55% had been diagnosed in patients living in urban areas. However, the incidence in rural areas was still significantly higher (0.26 per 100'000 per year compared to 0.12 in urban areas). Incidence increased mainly in 6 major agglomeration areas: around Constanz, Zurich, Bern, Basel, Lausanne and Geneva. 55% were female cases.

Data on hospitalisations due to alveolar echinococcosis are available at the Federal Statistical Office (FSO) from 2008 until 2015 [6]. The numbers are comparable to the aforementioned data. From 2008 to 2009 11 new cases more were registered, until 2013 cases still increased by 3 to 4 new cases per year (28, 31, 35, 38 and 45 cases). 2015 the number of people hospitalized the first time even increased further to 55 patients. Thus cases of people being hospitalised the first time ranged from 17 to 55 people in 2008 to 2015, corresponding to an incidence rate of 0.32 to 0.67 cases per 100'000 inhabitants per year. Although cases can occur already at the age of 19, the data from 2008 until 2014 of the FSO show that the risk of infection rose constantly the older the people were (0.2 cases per 100000 in the age group 15-24, 0.3 in the age group 25-44, 0.5 in the age group 45-64, 1.3 > 65 years old).

In animals, echinococcosis is notifiable (TSV, Article 5: disease to be monitored). In the past ten years (2008 to 2017) on average 7 cases per year were reported in animals excluding pigs (Min: 1, Max: 11), affecting mainly dogs (38%) and foxes (26%). Unusual is the high number of reported pigs since 2016. This is due to a research project, for which 2016 a pilot study started including laboratory testing. Organs with lesions of parasites are not fit for human consumption and are destroyed at slaughterhouse. Without laboratory confirmation, these alterations do not need to be reported. Due to the laboratory confirmation in the pilot study these liver lesions became cases with an obligation to be reported. In 2017 the research study was ongoing to examine the prevalence in pigs further. Its aim is to be able to roughly estimate the contamination of *E. multilocularis eggs* in the environment.

In 2007 and 2008, the Institute of Parasitology of the University of Zurich tested mice and faecal fox samples in the region of Zurich. About 17% of the mice (100 mice from 634 in 2007 resp. 66 from 393 in 2008) were positive for *E. multilocularis*. In the fox faecal samples the number of positive samples declined in general from 26% in 2007 to 19% in 2008 (361/1376 in 2007 resp. 202/1044 in 2008). However in regions without deworming baits containing praziquantel fox faecal samples remained at the same level (63/254 (25%)).

In a dog survey in 2009 the prevalence of *E. multilocularis* (determined by egg isolation and species specific PCR) was found to be 0% (0.0/0.0-2.5) in 118 randomly collected pet dogs, but 2.4% (0.5-6.9%) in 124 farm dogs with free access to the surrounding fields. Eggs were also isolated from hair samples

of dogs: no taeniid-eggs were found on the surface of pet dogs, whereas in 2 cases (1.6%) taeniid-eggs were isolated from farm dogs. Species identification in these two cases could not be achieved by PCR. In 2012, the first reported case of probably cystic echinococcosis in a cow since 1991 was detected during meat inspection. No laboratory data was available for this case.
2. Evaluation of status, trends and relevance as a source for humans
The hospitalization rate of human AE-cases (patients who were hospitalized for the first time due to AE) rose steadily since 2008 and was 0.6 cases per 100'000 inhabitants in 2016 (hospital-based data). Albeit the increased risk of infection, an infection of humans with *E. multilocularis* is rare. The increased risk was probably caused by a general increase of the fox population from 1984 to 2000 due to the successful immunization campaigns against rabies in foxes, and by the encroachment of foxes to the urban areas. The prevalence of *E. multicularis* in foxes is estimated to lie between 30% and 70%. The Institute of Parasitology of the University of Zurich found in a research project 2016 25% (20 of 79) hunted foxes only from the Zurich region positive for *E. multilocularis*, 2012 53% (105 of 200) and 2013 57% (57 of 100) of hunted foxes from Eastern Switzerland positive for *E. multilocularis.* 2013 the prevalence in rodents in the Zürich region was low: only 3 of 200 *A. scherman* or 6 of 259 *M. arvalis* were infected. 2017 3 outbreaks in animals other than pigs were registered: 2 in monkeys and 1 in beavers. The reported cases were within the range of previous years. Due to the ongoing research project the number of reported cases in pigs increased again in 2017 to 89 cases. Pigs are - like humans - an incidental host for *E. multilocularis*. Thus, infected pigs are no source of infection for humans. The aim of the research project is to estimate the burden of *E. multilocularis* eggs in the environment. The life cycle of the zoonotic cestode *E. multilocularis* depends on canids (mainly red foxes) as definitive hosts and on their specific predation on rodent species (intermediate hosts). Host densities and predation rates are key drivers for infection with parasite eggs. Vaccination against rabies in wildlife, elimination of top predators and changing attitude towards wildlife (feeding and lower hunting rates) contribute to high fox densities and modify their anti-predator response ('landscape of fear'), promoting their tameness, which in turn facilitates the colonization of residential areas and modifies parasite transmission. These factors should be considered in the assessment of any intervention and prevention strategy. Thus, promoting the wariness of foxes by public campaigns that ask people not to feed or tame foxes, and to keep at a distance, is a recommended part of every prevention strategy [1]. In fresh foodstuffs, outdoor cultivation for example can lead to the occurrence of fox tapeworm eggs. The scientific literature provides several reports on microscopic findings of taeniid eggs in vegetables (reviewed Alvarez Rojas est al., 2018). Presently, there is no standardized methodology for the detection of taeniid eggs in food samples and some moleculare approaches have been critically discussed in the recent literature. An investigation in Switzerland on the presence of cestode eggs in feed (vegetables, fruits) was triggered by frequent cases of alveolar echinococcosis in primates kept in captivity at a Zoo (Federer et al., 2016). Egg-DNA PCR using multiplex PCR/sequencing on filtered samples revealed non-zoonotic *Taenia* spp. of dogs, foxes, or cats in 14 of the total 95 samples (each consisting of the washing of around 40 heads of lettuce enriched with a day ration of fruits and vegetables) originating from Switzerland. Taeniid-DNAwas further detected in 13 (28%) of 46 samples of vegetables originating from different parts of Europe (vegetables and fruits as mentioned above), including *E. granulosus s.l*. (2), T. crassiceps (1), *T. hydatigena* (2), *T. multiceps/serialis* (2), *T. saginata* (1) and *T. taeniaeformis* (5). Although DNA of *E. multilocularis* was not identified in this study, the detection of DNA of other taeniids of foxes reveals that feed potentially pose a source for *E. multilocularis* eggs. So far, methods used to estimate the environmental or food contamination with taeniid eggs/DNA are not allowing to assess their viability, and hence, the results of all studies have to be carefully interpreted.

Moreover, people can also become infected through contact with soil, shoes and also dogs that are contaminated with fox tapeworm eggs. Pigs are – like humans – dead-end-hosts for *E. multilocularis* Infected Pigs are no threat for human health. The aim of the research project is to use the number of infected pigs as an indirect measure how contaminated the environment is with *E. multilocularis* eggs.

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

Owners from dogs which are hunting mice are encouraged to deworm their dogs regularly [5]. The public is advised, not to feed or tame foxes and to keep at a distance. The Institute of Parasitology of the University of Zurich evaluated the control of the disease in the urban periphery of Zurich from 2006-2011 [2]. The monthly distribution of anthelmintic baits (Praziquantel) for foxes proved to be effective. Areas with bait distribution showed a significant decrease of the *E. multilocularis* egg contamination. However, the positive effect lasts only a few years. Therefore the distribution of anthelmintic baits needs to be repeated regularly which is expensive. All in all these experiments and studies in Germany, France and Japan confirmed the feasibility of this approach. Regarding the long latency of 5 –15 years of alveolar echinococcosis, however, such measures can only be cost effective if they are pursued for several decades and concentrate on highly endemic areas in densely populated zones. Thus, the implementation of this approach strongly depends on factors such as public attitude, available financial resources and priority setting of political decision-makers.

4. Additional information

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[7] Information on fox tapeworm: www.paras.uzh.ch/infos, Expert group ESCCP_CH and guidelines for deworming of dogs and cats: http://www.esccap.ch
[8] Data for hospitalisation due to Echinococcosis (FSO): www.bfs.admin.ch.
[9] Further information can be found on the FSVO website www.blv.admin.ch.

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

General evaluation*: Francisella

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

Tularemia in humans is a notifiable disease since 2004 (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases). Positive test results have to be declared to the Federal Office of Public health (FOPH) and the cantonal physicians. Physicians have to fill in a form concerning information on manifestation and exposure and to send it to the cantonal physician who forwarded this form to the Federal Office of Public Health. At the Federal Office of Public Health all laboratory and clinical information is collated in a centralized database. Tularemia is also notifiable in animals (TSV, Article 5: disease to be monitored).
Tularemia in humans is sporadic. Until 2010, the annual number of human cases usually was below 10 confirmed cases. However, since 2012 more cases were reported than the years before. In 2012 there were 40 confirmed cases, in 2016 already 55 confirmed cases. There are regional differences with most cases reported in the north-east of Switzerland. Tick bites were the most often reported infection route.
In the past ten years (2008-2017) on average 4 cases per year were reported in animals by cantonal veterinarians (Min: 0, Max: 9 cases). In 85% of the cases hares were affected and in 10% monkeys (from zoos). The maximum of 9 cases in 2012 were detected due to a research project at the University of Bern.
In 2012, also wild mice which had died in a research barn in the canton of Zurich were tested positive for *F. tularensis.* The wild mice had free access to go in and out of this barn. None of the researchers from the research barn in the canton of Zurich developed tularemia and there was no link to any of the human cases reported in the canton of Zürich.
The biological cycle of *F. tularensis* is not well understood. To better understand the source of infection as well as the ecology of this bacterium including the maintenance of *F. tularensis* and its boosting in the environment which are a matter of biological safety, a project aiming to dissect the life cycle of this microorganism *sensu lato* was performed between 2012 and 2014 at the University of Bern (Paola Pilo: “Ecology of *Francisella tularensis* and its impact on biological safety”). 2012 24 mice, 18 hares, 2 monkeys and 1 stone marten, 2013 9 hares and 2014 1 hare tested positive for *F. tularensis.*

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

130 cases of tularemia were registered at the Federal Office of Public Health in 2017. The case numbers more than doubled compared to 2016. The notification rate was 1.5 cases per 100’000 inhabitants. 84 cases were men and 47 women, aged between 1 and 88 years old. Half of the cases were less than 49 years. The cases cluster in the canton of Zurich, Bern and St. Gallen.
The reasons for the increase of reported cases is unclear. Tick bite was the most frequent single source of infection (2012: 9/40; 2013: 19/29; 2014: 7/39; 2015: 16/50; 2016: 21/55, 2017: 33/131). Other reported sources of infection for humans are contact to wild animals (mainly mice and hares), bites of insects as well as the inhalation of dust/aerosol and contaminated water or food. Those at risk are mainly gamekeepers, hunters, people who work in agriculture or forestry, wild animal veterinary practitioners and laboratory staff.
Tularemia affects mainly wild animals, especially hares and rodents but also zoo animals. 2017 4 cases in animals were reported by cantonal veterinarians. Affected were 2 hares, 1 squirrel and 1 monkey. Voluntary testing of wild animals found dead or hunted is a big challenge of the monitoring in place. Results of the passive surveillance in wild animals need to be considered as rather poor and inconsistent. It can only be concluded, that tularemia is present in the Swiss wild hare population.

To obtain more detailed understanding of tick-associated diseases Spiez Laboratory launched a study in 2009 to collect samples of ticks from all over Switzerland in collaboration with NBC Defence Lab 1. It was possible to define six regions (3 in canton ZH, confirming the epidemiological data in humans, where most case were registered in Zürich, and 1 each in St. Gallen, Obwalden and Basel-Landschaft) where there is an increased prevalence of *F. tularensis holarctica (Fth)*. Well over 100'000 ticks were analysed. Only 0.01‰ proved to be positive for *Fth*. In collaboration with the Robert Koch Institute in Berlin it was possible to cultivate and isolate *F. tularensis* from positive tick lysates for the first time. The successful cultivation has confirmed the role of ticks as vectors and is prerequisite for the subsequent phylogenetic typing with next generation sequencing methods. To determine the epidemiological connection between tick isolates and human infections more precisely, a total of 59 *Fth* isolates were obtained from castor bean ticks (*Ixodes ricinus)*, animals and humans and a high resolution phylogeny was inferred using WGS methods. The majority of the *Fth* population in Switzerland belongs to the west European B.11 clade and shows an extraordinary genetic diversity underlining the old evolutionary history of the pathogen in the alpine region. Moreover, a new B.11 subclade was identified which was not described so far. The combined analysis of the epidemiological data of human tularemia cases with the whole genome sequences of the 59 isolates provide evidence that ticks play a pivotal role in transmitting *Fth* to humans and other vertebrates in Switzerland. This is further underlined by the correlation of disease risk estimates with climatic and ecological factors influencing the survival of ticks.

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

None.

4. Additional information

[1] Wittwer et al, 2018: Population Genomics of Francisella tularensis subsp. holarctica and its implication on the eco-epidemiology of Tularemia in Switzerland; Frontiers in Cellular and Infection Microbiology, Volume 8, Article 89.
[2] Origgi et al, 2016: Francisella tularensis clades B.FTN002-00 and B.13 are associated with distinct pathology in the European brown hare (Lepus europaeus). Veterinary Pathology 2016, Vol. 53(6) 1220-1232
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[6] https://www.frontiersin.org/articles/10.3389/fcimb.2018.00089/full
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[8] Publication in the FOPH Bulletin 18/18 from 30.04.2018.
[9] Further information can be found on the FSVO website www.blv.admin.ch and the FOPH website www.bag.admin.ch.

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

General evaluation*: Listeria

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

Listeriosis in humans is notifiable (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases). People mainly affected are adults aged over 60. In the 1990s human listeriosis cases fluctuated between 19 and 45 cases per year, from 2000 onwards between 28 and 76 cases per year.

The last outbreaks, leading most times to an increased number of cases, occurred 2013/2014 (Serotyp 4b, most probable cause was ready-to-eat salad), 2011 (Serotyp 1/2a, imported boiled ham) and 2005 (Serotyp 1/2a; cheese). The biggest epidemic outbreak (Serotyp 4b) in Switzerland with 122 cases and 33 deaths took place in the 1980s due to contaminated cheese. In the aftermath of the epidemic outbreak in the late 1980s the Swiss government decreed the creation of appropriate means to prevent a repetition of such a case. Agroscope Food Microbial Systems (MSL) was given the order to create a Listeria Monitoring Program (LMP) in cooperation with the Swiss dairy industry. From 1990 on milk and milk products have been tested for *Listeria* spp. as part of quality assurance programs. Since 2007 *Listeria monocytogenes* was present in less than in 1% of the samples in all years. Usually samples from the environment were tested positive. If rarely cheese samples were positive, *L. monocytogenes* was only found on the cheese surface. A Listeria Advisory Team can be called in for planning and consultation in decontamination of facilities and providing checkups of company safety concepts. An evaluation in 2008 showed that in 85% of cases the measures advised proved successful over the subsequent years of operation. In addition, from 2002 until 2011 several hundred samples of semi-hard and soft-cheese from either raw or pasteurized cow's, sheep's and goat's milk were tested every year for *Listeria* spp. within the framework of the national testing program in the dairy industry by official food control. As only a few samples were positive each year the program was stopped 2011.

Listeriosis in animals is notifiable (TSV, Article 5: disease to be monitored). From 1991 until 1995 not more than 3 cases of listeriosis per year were reported. Between 1999 and 2004 it were 27 to 34 per year. In the last ten years (2008-2017) on average 12 listeriosis cases per year were notified (Min: 6, Max: 21). 97% of them affected ruminants (39% cattle, 32% sheep and 26% goats).

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

In 2017, 45 human cases were reported (notification rate: 0.5 per 100'000 inhabitants). After a significant increase of cases in 2014 due to an outbreak with Serotype 4b, the number of notifications lies again within the range of normal annual fluctuations. Persons over 65 years of age remain the most affected age group. Like in previous years the two most frequently identified serovars were 1/2a (37.5%) and 4b (45%).

In the framework of the Listeria Monitoring Program (LMP) 1657 samples (224 environmental samples, and 1433 cheese samples) were tested for the presence of Listeria spp. in 2017. *L. monocytogenes* were detected in 4 samples (0.2%): 3 environmental samples, 1 surface sample from hard cheese. Other species of *Listeria* spp. were found in 25 samples (1.5%).

In 2017, 8 cases of animal listeriosis were registered, all in ruminants (5 in cattle, 2 in sheep, 1 in goats). In the context of clinical investigations diagnostic tests in veterinary laboratories were mainly carried out in ruminants. In 2017 in total 67 tests for listeriosis were carried out (cattle, goats and sheep, 53%), pigs (24%), dogs and cats (8%) and horses (4%).

L. monocytogenes is repeatedly leading to disease in humans. Even if the number of cases is relatively small, the high mortality, especially in older people, makes it very significant. Monitoring the occurrence of *Listeria* spp. at different stages in the food chain is extremely important to prevent infections with contaminated food. Milk products and cheeses are a potential source of infection. With regard to *Listeria* spp. in the dairy industry, the situation has remained on a constantly low level for

many years. In animals, the reported listeriosis cases have remained stable at a low level over the last years.	
3. Any recent specific action in the Member State or suggested for the European Union[(b)]	
None.	
4. Additional information	
Further information can be found on the FSVO website www.blv.admin.ch.	
* **For each zoonotic agent** (a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official “disease status” to be specified for the whole country and/or specific regions within the country (b): If applicable	

Description of Monitoring/Surveillance/Control programmes system*: Dairy products and Listeria monocytogenes

1. Monitoring/Surveillance/Control programmes system[(a)]

Agroscope Food Microbial Systems (MSL) is running a Listeria monitoring program (LMP) for early detection of *Listeria* in production facilities since 2007. Products are tested for Listeria as part of quality assurance programs.

2. Measures in place[(b)]

The concerned food has to be confiscated and destroyed. Depending on the situation the product is recalled and a public warning is submitted.
The implementation of a hygiene concept in order to control the safety of the products is in the responsibility of the producers. All larger cheese producers run a certified quality management fulfilling ISO 9000.

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

None.

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

In the framework of the Listeria Monitoring Program (LMP) 1657 samples (224 environmental samples, and 1433 cheese samples) were tested for the presence of Listeria spp. in 2017. *L. monocytogenes* were detected in 4 samples (0.2%): 3 environmental samples, 1 surface sample from hard cheese. Other species of *Listeria* spp. were found in 25 samples (1.5%).

5. Additional information

None.

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

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

General evaluation*: Salmonella

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

Salmonellosis in humans is notifiable (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases)). In the 80s salmonellosis in humans was the most reported food borne disease. After reaching a peak in 1992 with 113 reports per 100,000 inhabitants the incidence declined steadily and in 1995 campylobacteriosis took over to be the most reported food borne disease. Since 2003 the incidence of salmonellosis was never over 30 reports per 100,000 inhabitants. *S.* Enteritidis was the most frequently isolated serovar followed by *S.* Typhimurium including the monophasic variant S. enterica serovar 4,[5],12:i:-.

From 1995 until 2006 the infection of chicken with *S.* Enteritidis was notifiable and a control program for *S.* Enteritidis was in place for breeding flocks and laying hen flocks (TSV, Article 255-261). During this period the incidence of *S.* Enteritidis infection in breeding and laying hen flocks steadily declined from 38 to 3 infected flocks per year. Since 2007 Salmonella infection in poultry is notifiable according to the regulation 2160/2003 of the European community. The control program covers the detection of *S.* Enteritidis and *S.* Typhimurium, including the monophasic variant S. enterica serovar 4,[5],12:i:- , in breeding flocks with over 250 places, laying hen flocks with over 1000 places, broiler flocks with over 5000 places and turkey flocks with over 500 places. For breeding flocks *S.* Hadar, *S.* Virchow and *S.* Infantis are included additionally. In the last 10 years, not more than 8 cases per year were reported. Most cases covered by the control program occurred in laying hens. In broiler chickens controlled serovars were found 2010, 2011, 2014 and 2017 (in each year one case except in 2014, when 4 broiler flocks were affected in one outbreak). The first and only case in breeding flocks (S. Enteritidis) in the control program was found in 2012, in fattening turkeys 2017.

Baseline studies were carried out in 2005 – 2008 resulting in the following prevalence estimates: in laying hens 1.3% (3 of 235 flocks; 2006), in broilers 0.3% (1 of 299 flocks; 2007), in slaughter pigs 2.3% (14 of 615; 2007) and in breeding pigs 13.0% (29 of 223; 2008). In laying hens and broilers all isolates were either *S.* Enteritidis or *S.* Typhimurium. In slaughter pigs 60% and in breeding pigs 27% of the detected serovars were *S.* Enteritidis or *S.* Typhimurium - proving again the presence of these two serovars in the pig population. The prevalence in slaughter pigs in 2007 was equal as in previous research studies. As breeding pigs have not been addressed before the prevalence obtained 2008 cannot be compared with previous data. As there are not many turkey flocks and Salmonella did not appear to be a specific problem in turkeys in Switzerland, the baseline study on the prevalence of Salmonella in turkey flocks was not conducted.

From 2002 until 2009 cheese production in cheese-making facilities was officially sampled and monitored for Salmonella in a national surveillance program. As since 2004 no Salmonella were detected, the official testing on Salmonella in dairy products was stopped in 2009. In an additional study to the listeria monitoring program conducted 2016 the prevalence of certain pathogenic organisms (including Salmonella) was evaluated to examine Swiss cheese made out of raw or low heat-treated milk. In 2016 104 samples were examined for the presence of Salmonella. No Salmonella could be detected.

In 2007 a study in broiler meat at retail showed that Salmonella prevalence was low (0.4%) in Swiss products compared to 15.3% within imported products. In 2008 a baseline study of *Salmonella* spp. in neck skin from broiler carcasses resulted in a Salmonella prevalence of 2.6%.

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

In 2017, 1848 human cases were reported representing a notification rate of 22 cases per 100’000 inhabitants (2016: 1531 cases or 18/100’000) which is a marked increase. As in previous years the most affected age group was children under 5 years (<1 year: 56/100‘000, 1 to 4 years: 53/100‘000). The

typical seasonal increase of notifications during summer and autumn was observable also in 2017. The most frequently reported serovars remained *S.* Enteritidis (38%), *S.* Typhimurium (13%) and the monophasic strain 4,12:i:- (11%). The longstanding S. Enteritidis control program showed its effect in the decline of human cases. However, salmonellosis is still the second most frequent zoonosis in Switzerland. While reported human cases stagnated from 2009 until 2015, an increase in numbers of cases can be seen in 2017. The reason for this is unknown. It remains unclear to what extent pigs and cattle play a role as source of infection for humans. Stepping up and expanding the national control program might be needed in order to further reduce human salmonellosis cases.
3. Any recent specific action in the Member State or suggested for the European Union(b)
Control measures were implemented according to following Commission Regulations (EC): No. 200/2010 (breeding flocks), No. 517/2011 (laying hen flocks), No. 200/2012 (broilers) and No. 1190/2012 (turkeys). The Hygiene Ordinance lays down limits for Salmonella in various foods. If these limits are exceeded, the cantonal laboratories are required to report this to the FSVO. The foods affected are confiscated and destroyed. Depending on the situation, the products may be recalled, and a warning is issued to the population. All larger cheese manufacturers have a hygiene management system in place that conforms to ISO 9000.
4. Additional information
[1] In a *S.* Kentucky study conducted in 2010 (Bonalli *et al.*) 106 human *S.* Kentucky strains, isolated from patients between 2004 and 2009, were genotyped using PFGE. There was some evidence of a non-recognised outbreak of *S.* Kentucky in 2006. Travels to North Africa were a risk factor for *S.* Kentucky infection [Bonalli et al.; *S.* Kentucky associated with human infections in Switzerland: genotype and resistance trends 2004-2009, International Food Research (May 2011)]. [2] Further information can be found on the FSVO website www.blv.admin.ch.
* **For each zoonotic agent** (a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official "disease status" to be specified for the whole country and/or specific regions within the country (b): If applicable

Description of Monitoring/Surveillance/Control programmes system*: All animals and Salmonella spp

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

Salmonellosis is notifiable in all animals (passive surveillance). Animal keepers, livestock inspectors, AI technicians, animal health advisory services, meat inspectors, abattoir personnel, police and customs officers have to report any suspected case of salmonellosis in animals to a veterinarian. If Salmonella are confirmed by a diagnostic laboratory, this must be reported to the cantonal veterinarian. Cases in cows, goats or dairy sheep must be reported to the cantonal health and food safety authorities.

2. Measures in place(b)

If biungulates are affected, the sick animals must be isolated and the whole herd and the environment must be tested. Healthy animals from this herd may be slaughtered with a special official permit and subject to appropriate precautions at the abattoir. Milk from animals that are excreting Salmonella must not be used for human consumption and may only be used as animal feed after pasteurisation or boiling. If the disease occurs in animals other than biungulates, appropriate action must likewise be taken to prevent any risk to humans.

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

Salmonellosis in animals is notifiable (TSV, Art. 4: diseases to be controlled and Article 222-227).

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

Salmonellosis in all animals is regularly reported. In the past 10 years (2008-2017) on average 77 salmonellosis cases per year were recorded by cantonal veterinarians (Min: 50, Max: 127). Mainly cows (34%), reptiles (29%), dogs/cats (19%) and sheep (4%) were affected.

2017, 105 salmonellosis cases in animals were reported. As usual mainly cows (52x), reptiles (23x) and dogs/cats (17x) were affected.

After the increase of reported cases in 2016 the number of cases declined a bit in 2017, but stayed over 100 cases per year, which is higher than the years before 2016.

The rise in the number of salmonellosis reports since 2016 is mainly linked to the cattle population. The positivity rate in cattle animals is in general higher than in other non-farmed animals, as often several animals are infected on a positive farm. In 2016 there was an outbreak in a clinic for ruminants, in which several cows from different farms were affected. Thus also the number of laboratory tests carried out in cattle rose in 2016. Animals from some holdings were tested more than once positive during this time period. Serovars found in cattle are mainly S. Typhimurium and the monophasic variant 4,[5],12:i:-.

In 2017 the reported cases in cattle remained on the same higher level as in 2016.

In veterinary diagnostic laboratories 5011 tests for salmonellosis were carried out in the context of clinical investigations, mainly in cattle (56%) and dogs/cats (27%).

In 2016 and 2017 there were outbreaks of S. Newport and S. Typhimurium in one horse holding each, affecting 6 and 5 horses, respectively.

5. Additional information

Further information can be found on the FSVO website www.blv.admin.ch.

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

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No. (d): Minimum five years. (e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

Description of Monitoring/Surveillance/Control programmes system*: Poultry and Salmonella spp
1. Monitoring/Surveillance/Control programmes system[(a)]
There is a control programme in place based on Commission Regulation (EC) No. 200/2010 regarding breeding flocks with more than 250 places, Commission Regulation (EC) No. 517/2011 regarding laying hen flocks with more than 1000 places, Commission Regulation (EC) No. 200/2012 regarding broilers with more than 5000 places and Commission Regulation (EC) No. 1190/2012 regarding fattening turkeys with more than 500 places. Subject to state control measures are *S.* Enteritidis, *S.* Typhimurium and the monophasic variant 4,[5],12:i:- ; for breeding flocks additionally *S.* Hadar, *S.* Infantis and *S.* Virchow.
2. Measures in place[(b)]
Control measures are taken according to the Swiss ordinance of epizootics (TSV, Article 255-261). If Salmonella serotypes subject to control measures are detected in the environment, there is a suspicion of Salmonella infection. In the event of a suspected infection, the official veterinarian samples 20 killed animals or fallen stock per flock and submits the meat and organs to bacteriological testing for Salmonella. If *S.* Enteritidis, *S.* Typhimurium or the monophasic variant 4,[5],12:i:- are detected in the animal samples, or in the case of breeding flocks *S.* Hadar, *S.* Infantis and/or *S.* Virchow, a case of Salmonella infection is reported. In this case animal movements from this holding are prohibited (Article 69 TSV) in order to prevent spread of disease. The quarantined flocks must not be changed either by moving animals to other flocks or by introducing animals from other flocks. In breeding flocks the animals are culled and the eggs are no longer allowed to be used for breeding purposes. If laying hens, broilers or fattening turkeys are affected the flocks can be culled or slaughtered. Fresh meat and eggs either have to be disposed of or subjected to treatment in order to destroy the Salmonella before being marketed as food. The quarantine conditions are lifted when all animals have been culled or slaughtered and the premises were cleaned, disinfected and freedom from Salmonella of the premises by means of bacteriological testing was proven. Vaccination is prohibited.
3. Notification system in place to the national competent authority[(c)]
Salmonella infection in poultry is notifiable (TSV, Art. 4 and Article 255-261).
4. Results of investigations and national evaluation of the situation, the trends [(d)] and sources of infection[(e)]
In 2017 5 cases were reported in the framework of the control program affecting laying hens > 1000 places (4x *S.* Enteritidis) broilers > 5000 places (1x *S.* Typhimurium). Further 11 suspect cases (positive environmental samples not confirmed in animal samples) were detected: 7 in laying hens > 1000 places (*S.* Enteritidis (2x), *S.* Typhimurium (4x), *S.* Typhimurium monophasic variant 4,[5],12:i:- (1x), 3 in broilers > 5000 places (*S.* Typhimurium (1x), *S.* Typhimurium monophasic variant 4,[5],12:i:- (2x); 1 in turkeys > 500 places (*S.* Typhimurium (1x)). In addition, several serovars not covered in the control program were detected in environmental samples: 11 in breeding flocks: S. Ajobo (1x), S. Fluntern (1x), S. Havana (1x); S. Mbandaka (5x), S. Menston (1x), S. Newport (1x), S. Veneziana (1x). 7 in laying hens: S. Livingstone (1x), S. Mbandaka (5x), S. Senftenberg (1x) 4 in broilers: S. Tenessee (1x), *S.* Fresno (1x); *S.* Oranienburg (1x), *S.* monophasic (13,23:i:-) (1x). 2 in fattening turkeys: S. Albany (2x). Outside from the control program, 3 very small laying hen flocks (28, 85 and 100 animals, respectively) were tested positive for *S.* Enteritidis in animal samples. In addition, following serovars

were detected in environmental samples in small flocks: S. Typhimurium (5), S. Typhimurium monophasic (1x), Salmonella monophasic (-11:-:e,n,x)((1x) and S. Napoli (1x). The results of the control program show that the Salmonella prevalence in Switzerland is low. The target of max. 1% Salmonella positive flocks regarding the controlled serovars in broilers, turkeys and breeding flocks as well as max. 2 % in laying hens could be reached each year. Most cases occurred in laying hens. In broiler chickens controlled serovars were found one each in 2010, 2011 and 2017 as well as in 2014, when one outbreak affecting 4 broiler flocks was detected, which might have had its source in the EU. The first and only case in breeding flocks (S. Enteritidis) in the control program was found in 2012. It is assumed, that this was a rare event. It was unusual in 2017 to find 11 times exotic serovars in breeding flocks. The source for these is unknown. Expert opinion suggests feed as source of infection for such kind of serovars. However, the Salmonella situation in breeding flocks in Switzerland remains good. Switzerland wants to maintain the current situation by applying the aforementioned control measures.
5. Additional information
Further information can be found on the FSVO website www.blv.admin.ch.

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

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No.

(d): Minimum five years.

(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

Description of Monitoring/Surveillance/Control programmes system*: Poultry meat and Salmonella
1. Monitoring/Surveillance/Control programmes system[(a)]
It is the responsibility of the producers to implement a hygiene concept that guarantees the safety of their products. The Hygiene Ordinance lays down limits for Salmonella in various foods. Results of the Salmonella monitoring of the largest poultry producers and abattoirs are available covering more than 92% of the production. Samples are taken several times a year at random. Fresh poultry meat, poultry meat preparations and poultry meat products were tested at different stages such as slaughterhouse, cutting plant and processing plant. No imported meat samples were included in the data analysis.
2. Measures in place[(b)]
If these limits are exceeded, the cantonal laboratories are required to report this to the FSVO. The foods affected are confiscated and destroyed. Depending on the situation, the products may be recalled, and a warning is issued to the population.
3. Notification system in place to the national competent authority[(c)]
None.
4. Results of investigations and national evaluation of the situation, the trends [(d)] and sources of infection[(e)]
In the framework of the self-auditing system of the poultry meat industry in total 3532 tests were done in 2017 (52% single samples and 48 batch-related) of which 27 (0.8%) proved positive for Salmonella (S. Typhimurium (4), S. Albany (17), S. Welikade (1), S. Chester (1), S. Infantis (1), and *Salmonella* spp (3)). 3 of these 27 positive samples were batch samples. 17 of 470 samples of turkey meat (4%, all 17 S. Albany) and 10 of 3062 samples of broiler meat (0.3%; S. Typhimurium (4x), S. Chester (1x), S. Welikade (1x), S. Infantis (1x), *Salmonella* spp. (3)) were positive. Positive samples were neck skin samples (6x broilers, 8x turkeys), fresh meat (3x broiler, 9x turkey), and meat preparation (1x).
5. Additional information
None.

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

(a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website.

(c): Mandatory: Yes/No.

(d): Minimum five years.

(e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

General evaluation*: Rabies virus

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

Rabies in humans is a notifiable disease (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases). In the period from 1967 until 1999, an estimated number of some 25 000 postexposure treatments in humans were done due to the increased risk of rabies infections. Rabies caused in 1977 three human deaths. The last imported human rabies case in Switzerland was reported 2012. An American citizen was transferred of a hospital in Dubai to a hospital in Zurich, where he died. He was bitten by a bat in California 3 months before onset of the first symptoms.

Rabies in animals is a disease to be eradicated (TSV, Art. 3, Art. 142-149). Government action is taken to control the disease. An animal is rabies diseased if the analytical method (see additional information) gives a positive result. Anyone who sees a wild animal or stray pet that behaves in a way that appears suspiciously like rabies is required to report this to the police, hunting authorities or a veterinarian. Also animal keepers must report pets that behave in a way that is suspiciously like rabies to a veterinarian.

The last case of fox rabies occurred in 1996. The European fox rabies epizootic started in 1939 at the eastern border of Poland and reached Switzerland on March 3, 1967. From 1967 until 1999 a total of 17’108 rabies cases, of which 73% in foxes and 14% in domestic animals were diagnosed. To eliminate rabies, in 1978 the first field trial world-wide for the oral immunization of foxes against rabies was conducted in Switzerland. Between 1978 and 1998 a total of 2.8 million baits containing a modified live virus were distributed. The 1990s were characterized by a recrudescence of rabies in spite of regular oral immunization of foxes.

Since 1976 bat rabies has been diagnosed in one bat each in 1992, 1993, 2002 and 2017. 2017 European Bat Lyssavirus 1, which commonly circulates in Europe, was detected in Switzerland for the first time. The cases from 1992, 1993 and 2002 all belonged to the European Bat Lyssavirus 2.

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

According to the definitions of the OIE and WHO (no cases for at least two years) the territory of Switzerland is considered to be free of rabies since 1999. In addition, Switzerland’s neighboring countries were free from European fox rabies in recent years.

In 2017 a rare event occurred in Switzerland. A citizen found a weak and disorientated bat on a pavement in Neuenburg. The person picked up the bat with his hands and was bitten by it. After the bite the bat died. The person luckily went immediately to hospital and got a post exposure prophylaxis for rabies after consultation with the Swiss Rabies Center. The bat was sent to the national reference laboratory and tested positive for European Bat Lyssavirus 1. It was the first time that European Bat Lyssavirus type 1 was detected in Switzerland. Cases rabies in bats in 1992, 1993 and 2002 all belonged to the European Bat Lyssavirus 2.

Rabies in bats in Switzerland is a very rare event. In the last 40 years 4 bats were tested positive for rabies. Thus, bat rabies remains a source, albeit little, of infection for animals and humans in Switzerland. Abroad (i.e. in North- and South-America) the prevalence of rabies virus in the bat population can be quite high. Travelling to countries with rabies can pose a threat to people, especially if they are unaware of this risk. Human infections of tourists (who usually are not vaccinated against rabies) in rabies countries were reported in the past. In 2014, one man from France died after exposition in Mali and one woman from the Netherlands, after being bitten by an infected stray dog in India. In Switzerland, the last imported human case occurred in 2012, after being bitten by an infected bat in California). Thus, people travelling into rabies risk countries/areas should be better informed.

2017, 984 sera from humans were tested for neutralizing antibodies at the national reference laboratory for rabies (Swiss Rabies Center). In 517 cases (53%) antibody titers were controlled after

pre-expositional immunization, in 457 of cases (46%) the blood was checked after post exposure prophylaxis (PEP) and in 9 cases no reason for the investigation was given. This amount of testing is comparable with the previous years.
135 animals were tested for rabies at the national reference laboratory (Swiss Rabies Center) in 2017. The samples originated mainly from dogs (48%), cats (19%), bats (16%) and foxes (10%). One bat tested positive for European Bat Lyssavirus 1 (see above). 1220 sera of dogs and cats were tested in the context of travelling procedures in order to detect the level of neutralising antibodies. This was in the range of the previous years. In 2012 there was drop in testing numbers due to the fact that the blood test for travelling to England, Ireland and Scandinavia was no longer mandatory for domestic rabies free countries like Switzerland.
Dogs and cats are regularly illegal imported from rabies risk countries. In Switzerland, 31 dogs and 7 cats were detected in 2017. None of these 38 animals were rabies cases. However, illegal imported rabies cases into the EU were reported in the past (2015 in France, 2013 in Spain, Germany and France). The last case in a dog in Switzerland was reported 2003. The dog was a foundling picked up close to the French border with a viral sequence closely related to North African strains from dogs. This did not indicate a focus of rabies infection in Switzerland but an illegal import. Such illegal imported animals pose a certain risk for pets and their owners in the EU and Switzerland and lead to timely investigations, euthanisation of contact animals, post exposure prophylaxis (PEP) and prophylactic vaccinations.
Vaccination of dogs is recommended (and common) in Switzerland, but not mandatory, if the dog does not travel abroad. (Re-)Import conditions for cats, dogs and ferrets were implemented in 2003 and adapted in 2004 according to the EU regulation 998/2003/EC.

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

Close collaboration with neighboring countries is important especially with regards to control measures in wild animals. Animals with suspect symptoms originating from countries with urban rabies are tested for rabies. Furthermore, the situation in neighboring countries and the EU is closely monitored. Due to the incident in 2017, when a person in the canton Neuenburg was bitten by a bat information for the public was published, to be cautious in the handling of diseased and abnormally behaving wild animals.

4. Additional information

[1] Diagnostic/analytical methods used: All tests concerning rabies are carried out in the reference laboratory, the Swiss Rabies Center
http://www.ivv.unibe.ch/Swiss_Rabies_Center/swiss_rabies_center.html. It is authorized by the EU for rabies testing, see http://ec.europa.eu/food/animal/liveanimals/pets/approval_en.htm. For rabies virus detection immunfluorescence (FAT) and virus isolation using murine neuroblastoma cell culture (RTCIT) is used and the rabies antibody detection is carried out using the rapid fluorescent focus inhibition test (RFFIT) as described in the OIE manual, see
http://www.oie.int/eng/normes/mmanual/a_00044.htm.
[2] Swiss Rabies Center: http://www.ivv.unibe.ch/content/diagnostics/swiss_rabies_center/
[3] http://www.promedmail.org/direct.php?id=20130623.1787886
[4] http://www.gideononline.com/tag/rabies/
[5] http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20474
[6] http://www.who-rabies-bulletin.org/
[7] Further information can be found on the FSVO website www.blv.admin.ch.

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

General evaluation*: Toxoplasma

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

Toxoplasmosis in humans is not notifiable. Thus, no data on the frequency of human toxoplasmosis are available. Some sporadic human cases have however been reported.

In animals, toxoplasmosis is notifiable (TSV, Article 5: disease to be monitored and Article 291). Veterinarians and diagnostic laboratories must report any suspected case of toxoplasmosis to the cantonal veterinarian, who may issue an order for the suspected case to be investigated. In the past ten years (2008-2017) never more than 7 cases per year were recorded (on average 3 cases per year). Affected animals were goats (21%), sheep (18%), cats (12%), monkeys (9%), suricates (9%), kangaroo (6%), lemurs (6%), as well as, marmots, singing birds, ibis, chicken and other species (each 3%).

Infections with *Toxoplasma (T.) gondii* in meat-producing animals are widespread in Switzerland. In 2000, *Toxoplasma*-DNA in meat-producing animals was present in meat samples in 1% of the assessed cows, 0% of young cattle, 2% of young bulls, 1% of calves, 0% of pigs and 4% of ovine samples. *Toxoplasma* antibodies could be detected in 32% of cows and young cattle, 21% in young bulls, 4% in calves and 53% in sheep; in the breeding pigs 27% and in the fattening pigs 1% [6]. In 2009, again meat from various animal categories was sampled at the slaughterhouse. Using real-time PCR it could be shown that DNA of *T. gondii* was detectable in 4.7% of bovine, 2.2% of porcine, 2.0% of ovine and 0.7% of wild boar samples [3]. *Toxoplasma* antibodies were detected in 13% of calves (6/47), 37% of cattle (48/129), 62% of fattening bulls (62/100), 53% of cows (69/130), 14% of fattening pigs (7/50), 13% of free-ranging pigs (13/100), 36% of sows (43/120), 6.7% in wild boars (10/150), 33% of lambs (33/100) and 81% of ewes (121/150) [2]. As the same standardised ELISA was used and various other studies showed that both substrates (serum and meat juice) are directly comparable the *T. gondii* seroprevalence in all species rose over the past 10 years. With the switch from the conventional PCR to the real-time system, PCR has become more sensitive, so that the increase in the *T. gondii* DNA-prevalence in meat samples apparent in most species (except sheep) requires cautious interpretation. The difference in prevalence was only significant in calves. The increasing age of the animals was identified as a risk factor for *Toxoplasma* infection, while the housing conditions (conventional fattening pigs versus free-range pigs) appeared to have no influence on the results of serological testing. The low rate of infection in wild boars can most likely be explained by the fact that wild pigs normally live extensively in areas with low cat density. In addition, a study in free-ranging alpine ibex revealed very low numbers of *Toxoplasma gondii* antibody positive ibex [4]. It seems unlikely that alpine ibex are a reservoir for this abortive agent.

In order to address another source of human infection, faecal samples of 252 cats were investigated in the same study. Oocysts of *T. gondii* were found in 0.4% of the specimen. Genotyping of the isolates of the survey from 2009 indicated that all 3 classical genotypes (I, II, III) occur in Switzerland [3]. In general, findings of *Toxoplasma* oocysts in routine coprology of cats are notifiable. Each year, over 1000 routine coprology of cats are carried out.

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

In 2017, 4 cases in animals (goats (1), cats (1), beaver (1) and squirrel (1) were reported by cantonal veterinarians, which was within the range of the past 10 years.

In the context of clinical investigations 334 tests for toxoplasmosis were carried out in 2017 in veterinary diagnostic laboratories. 27 for the detection of the Toxoplasma agent (81% in goats and sheep) and 307 serological test (93% in cats and dogs).

There is a risk of exposure in Switzerland both from the consumption of meat and from cats as contaminators of the environment. The results of the last study from 2009 showed, that infections with *Toxoplasma gondii* in meat-producing animals are widespread in Switzerland and that the risk appears

to have increased in the past ten years. The oocyst excretion rate of 0.4 % found in cats may appear low. But when one considers that an infected cat may excrete large quantities of oocysts for up to 20 days, and these can survive for a year or more under favourable conditions (i.e. not too cold, hot or dry) the environmental contamination with *T. gondii* must not be underestimated.
Humans become infected by the oral route, either through the uptake of infectious oocysts from the environment or by means of tissue cysts from raw or insufficiently cooked meat. Pregnant women are informed about the recommendations from the FOPH to disclaim on raw or insufficient cooked meat and that caution is generally called for when faced with cat faeces (and potentially contaminated surroundings). The serosurveillance of pregnant women for anti-*Toxoplasma* antibodies has been discontinued since 2009.
In non-immune sheep and goats (first-time infection) Toxoplasma gondii is regarded as a major cause of abortion and loss of lambs.

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

None.

4. Additional information

[1] Frey CF, Berger-Schoch AE, Hermann DC, Schares G, Müller N, Bernet D, Doherr MG, Gottstein B (2012): Vorkommen und Genotypen von *Toxoplasma gondii* in der Muskulatur von Schaf, Rind und Schwein sowie im Katzenkot in der Schweiz. Schweiz. Arch. Tierheilk. 154: 251-255.
[2] Berger-Schoch A.E., Bernet D. *et al., (2011a)*, *Toxoplasma gondii* in Switzerland: A serosurvey based on meat juice analysis of slaughter pigs, wild boar, sheep and cattle. Zoonoses and Public Health, 58(7):472-8.
[3] Berger-Schoch A.E., Herrmann D.C. et al., (2011b) Molecular prevalence and genotypes of *Toxoplasma gondii* in feline faeces (oocysts) and meat from sheep, cattle and pigs in Switzerland. Veterinary Parasitology, 177: 290–297.
[4] Marreros, N. et al. (2011), Epizootiologic investigations of selected abortive agents in free-ranging Alpine ibex (Capra ibex ibex) in Switzerland, J Wildl Dis. 2011 Jul;47(3):530-43.
[5] Spycher A, Geigy C, Howard J, Posthaus H, Gendron K, Gottstein B, Debache K, Herrmann DC, Schares G, Frey CF (2011). Isolation and genotyping of *Toxoplasma gondii* causing fatal systemic toxoplasmosis in an immunocompetent 10-year-old cat. J Vet Diagn Invest. 23: 104-108.
[6] Wyss R., Sager H. et al. (2000): The occurrence of *Toxoplasma gondii* and *Neospora caninum* as regards meat hygiene. Schweiz. Arch. Tierheilkd. 142(3): 95-108.
[7] Further information can be found on the FSVO website www.blv.admin.ch.

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

General evaluation*: Trichinella

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

Trichinellosis in humans is notifiable since 1st January 2009 (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases), in animals since 1966 (TSV, Article 5: disease to be monitored). Since then the Federal Office of Public Health received very few reports of human trichinellosis, never exceeding 4 per year.

The testing on trichinellosis of all slaughter pigs is mandatory since 1st January 2007 according to Commission Regulation (EC) No. 2075/2005. Exceptions are made for slaughterhouses with a small capacity who do not export to the EU. Meat of pigs which have not been tested for trichinellosis from these small slaughterhouses are labeled with a special stamp and cannot be exported. *Trichinella* infections in pigs were not detected for many decades. From 2001 to 2004, between 400'000 and 490'000 pigs (15 to 19% of all slaughtered pigs) were tested per year without any positive findings. Since 2005 the number of slaughtered pigs tested increased steadily, all with negative results: 34% in 2005, 44% in 2006 and about 90% in 2007-2009. In 2009, 20'000 slaughter pigs were tested additionally with an improved digestion method. All animals were free of antibodies against *Trichinella (T.) spp*. [4]. Since 2010 the percentage of tested slaughter pigs and horses was around 93% and 85%, respectively. Furthermore, between 1700 and 6150 wild boars were tested each year for *Trichinella* with negative results.

Cases in the wildlife population concerned always carnivorous wild animals. In the last 10 years (2007-2016) never more than 5 cases per year were reported (on average 2 cases per year). Affected animal species were lynx (90%) and foxes (10%). The nematodes involved were all *T. britovi.*

A study conducted from 1999 until 2007 found that 15 of 55 (27.3%) assessed lynxes harbored *T. britovi* larvae. In 2006/2007 21 of 1298 (1.6%) assessed foxes proved positive for *T. britovi* larvae [2].

In a study conducted in 2008 1458 wild boars tested negative for *Trichinella* by artificial digestion, but 3 had antibodies against *Trichinella* (seroprevalence 0.2%). This illustrates that wild boars may come in contact with this nematode [3].

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

In 2017 1 human case was reported. The source of in infection is unknown, but is likely to have taken place abroad. Since the reinforcement of the notification in 2009, there were never more than 4 human cases notified per year. Usually the exact *Trichinella* species is not known as cases are only tested by serology. Most of the time infections are assumed to have been acquired abroad. Only in 2013 a 22 year old hunter/butcher from the French part of Switzerland got infected by eating raw sausage pastry containing wild boar meat. Again, the young man was tested positive only by serology with unknown *Trichinella* species. Although there were never reports of *Trichinella*-positive findings in Swiss wild boars it cannot be ruled out that the suspected source of infection was a Swiss wild boar.

In 2017, 2'508'698 slaughter pigs (94% of all slaughtered pigs) were tested for *Trichinella* with a negative result. Due to the extensive testing over the last years with only negative results, Swiss slaughter pigs are projected to be free of *Trichinella.* In addition, 2055 horses (94% of all slaughtered horses) and 6176 wild boars were also tested negative for trichinellosis.

However, *Trichinella* is sporadically detected in the wild animal population other than wild boars. 2017, 3 cases of *Trichinella* infections (T. britovi) in lynx were reported by cantonal veterinarians.

Trichinellosis in humans is very rare in Switzerland and often associated with infections abroad. As infections in wild animal populations can occur and infections in wild boars in Switzerland cannot be completely excluded, meat especially from wild boars should not be consumed raw. Although the risk of transmission from wild animals to domestic pigs is negligible, the surveillance of trichinellosis in wild

animals is vital. As all infections in wildlife in the past were *T. britovi*, Switzerland is considered free of *T. spiralis.*
3. Any recent specific action in the Member State or suggested for the European Union[(b)]
None.
4. Additional information
[1] Jakob et al., Schweiz. Arch. Tierheilk. 136: 298-308,1994. [2] Frey et al., Veterinary Parasitology, 2009. [3] Frey et al., Schweiz. Archiv für Tierheilkunde, 2009. [4] Schuppers et al., Zoonoses and Public Health, 2009. [5] Further information can be found on the FSVO website www.blv.admin.ch.
* **For each zoonotic agent** (a): Epidemiological evaluation (trends and sources) over time until recent/current situation for the different relevant matrixes (food, feed, animal). If relevant: the official "disease status" to be specified for the whole country and/or specific regions within the country (b): If applicable

Description of Monitoring/Surveillance/Control programmes system*: Horses and Trichinella
1. Monitoring/Surveillance/Control programmes system[(a)]
The investigation of horses is mandatory (Swiss ordinance of slaughter and meat control, VSFK, Art. 31). All slaughtered horses are tested during or immediately after the slaughter process. A piece of tongue is used to detect *Trichinella* spp. Larvae using the artificial digestion method according to Commission Regulation (EC) No. 2075/2005.
2. Measures in place[(b)]
A positive tested animal would be traced back and the contaminated carcass disposed.
3. Notification system in place to the national competent authority[(c)]
Trichinellosis in animals is notifiable (TSV, Article 5).
4. Results of investigations and national evaluation of the situation, the trends [(d)] and sources of infection[(e)]
In 2017, 2055 horses (94% of all slaughtered horses) were tested for *Trichinella* with negative results. There are no observations that would challenge the freedom of Swiss horses from trichinellosis.
5. Additional information
None.
* **For all combinations of zoonotic agents and matrix (Food, Feed and Animals) for 'Prevalence' and 'Disease Status': one text form reported per each combination of matrix/zoonoses or zoonotic agent** (a): Sampling scheme (sampling strategy, frequency of the sampling, type of specimen taken, methods of sampling (description of sampling techniques) + testing scheme (case definition, diagnostic/analytical methods used, diagnostic flow (parallel testing, serial testing) to assign and define cases. If programme approved by the EC, please provide link to the specific programme in the Commission`s website. (b): The control program/strategies in place, including vaccination if relevant. If applicable a description of how eradication measures are/were implemented, measures in case of the positive findings or single cases; any specific action decided in the Member State or suggested for the European Union as a whole on the basis of the recent/current situation, if applicable. If programme approved by the EC, please provide link to the specific programme in the Commission`s website. (c): Mandatory: Yes/No. (d): Minimum five years. (e): Relevance of the findings in animals to findings in foodstuffs and for human cases (as a source of infection).

Description of Monitoring/Surveillance/Control programmes system*: Pigs and Trichinella

1. Monitoring/Surveillance/Control programmes system[(a)]

The investigation of slaughtered pigs and wild boars is mandatory (Swiss ordinance of slaughter and meat control, VSFK, Art. 31). All pigs slaughtered in slaughterhouses that are approved to export in the EU are sampled for Trichinella examination. Exception of this test obligation is made for small slaughterhouses of the national market which do not export to the EU.
Census sampling with the exception of pigs slaughtered in small slaughterhouses and only produced for the local market, is done during or immediately after the slaughter process.
A piece of pillar of the diaphragm is taken at slaughter in order to detect *Trichinella* spp. Larvae using the artificial digestion method or the Latex agglutination test according to Commission Regulation (EC) No. 2075/2005.

2. Measures in place[(b)]

A positive tested batch at a slaughter house would be traced back and contaminated carcasses disposed.

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

Trichinellosis in animals is notifiable (TSV, Article 5).

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

In 2017, 2’508’698 slaughter pigs (94% of the total slaughter population) were tested and no Trichinella larvae were found.
Although the risk of the parasite cycle crossing from the wild animal population into the conventional domestic pig population can be regarded as negligible, the risk has to be categorised differently or higher with regard to the special situation of grazing pigs.
As all results were negative since many years in domestic pigs, it is highly unlikely that Trichinella infections acquired from domestic pig meat originating from Switzerland do occur.

5. Additional information

None.

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

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

General evaluation*:
Verocytotoxigenic E. coli (VTEC)

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

Detection of VTEC in humans is notifiable since 1999 (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases). Until 2013 the notification rate of VTEC infections was never above 1.1 reports per 100,000 inhabitants. Children under 5 years were the age group mostly affected, ranging between 3 and 9 reports per 100'000 inhabitant.
A recently performed study characterized a collection of 95 Shigatoxin-producing *E. coli* (STEC) isolated from human patients in Switzerland during 2010–2014 (Fierz et al. 2017) [4]. The five most common serogroups were O157, O145, O26, O103, and O146. Of the 95 strains, 35 (36.8%) carried *stx1* genes only, 43 strains (45.2%) carried *stx2* and 17 (17.9%) harbored combinations of *stx1* and *stx2* genes. *Stx1a* (42 strains) and *stx2a* (32 strains) were the most frequently detected *stx* subtypes. Genes for intimin (*eae*), hemolysin (*hly*), iron-regulated adhesion (*iha*) and the subtilase cytotoxin subtypes *subAB1*, *subAB2-1, subAB2-2* or *subAB2-3* were detected in 70.5%, 83.2%, 74.7% and 20% of the strains, respectively. Multilocus sequence typing assigned the majority (58.9%) of the isolates to five different clonal complexes (CC), 11, 32, 29, 20, and 165, respectively. CC11 included all O157:[H7] and O55:[H7] isolates. CC32 comprised O145:[H28] isolates, and O145:[H25] belonged to sequence type (ST) 342. CC29 contained isolates of the O26:[H11], O111:[H8] and O118:[Hnt] serogroups, and CC20 encompassed isolates of O51:H49/[Hnt] and O103:[H2]. CC165 included isolates typed O80:[H2]-ST301, all harboring *stx2d*, *eae-* ξ, *hly*, and 66.7% additionally harboring *iha*. All O80:[H2]-ST301 strains harbored at least 7 genes carried by pS88, a plasmid associated with extraintestinal virulence. Compared to data from Switzerland from the years 2000–2009 [7,8], an increase of the proportion of non-O157 STEC infections was observed as well as an increase of infections due to STEC O146. By contrast, the prevalence of the highly virulent German clone STEC O26:[H11]-ST29 decreased from 11.3% during 2000-2009 to 1.1% for the time span 2010-2014. The detection of O80:[H2]-ST301 harboring *stx2d*, *eae-* ξ, *hly*, *iha*, and pS88 related genes suggests an ongoing emergence in Switzerland of an unusual, highly pathogenic STEC serotype.
Ruminants, especially small ruminants, are an important reservoir for VTEC. In 2000, 14% of fecal samples from cattle, 30% from sheep and 22% from pigs were VTEC-positive. Younger bovines excrete VTEC more frequently. Thus, caution is needed when interpreting average figures on VTEC for the whole cattle population. Shiga toxin genes and the top-five serogroups were frequently found in young Swiss cattle at slaughter. 74.1% of the fecal samples tested positive for *vtx* genes. Moreover, 42% of these samples tested positive by PCR for O145, 26% for O103, 24% for O26, 8% for O157 and 1% for O111; N=563). Success rates for STEC strain isolation, however, were low. Only 17 O26 strains could be isolated. All of them were *eae*-positive, 9 strains harbored *vtx* (*vtx1 (*8x), *vtx2 (*1x)). Of the 28 isolated O145 strains, 10 were *eae*-positive including 4 harboring *vtx1* or *vtx2*. Of the 12 O157 strains 5 harbored *vtx2* and *eae* and were identified as VTEC O157:H7/H(-). The other 7 O157 strains were negative for *vtx* and *eae* or positive only for *eae* [6].
VTEC strains from fattening pigs are harboring mainly *vtx2e* and therefore belong to the low pathogenic VTEC group.
Wild boars and wild ruminants are also possible reservoirs. In wild boars from canton Geneva in 2007/2008, VTEC was detected in 9% (14/153) of the tonsils using real-time PCR. Fecal samples of 73 wild boars were all negative indicating that wild boars are carriers of foodborne pathogens in tonsils, but shedding in feces occurs rarely [10]. 2011, 33% of fecal samples of wild ruminants tested positive for *vtx*, 7% for *eae* and 14% for both (N=239). 45% harbored genes from the Vtx2 group, 30% from the Vtx1 group, and 21% from both (N=56). Strains were isolated from 18 red deer, 19 roe deer, 13 chamois and 6 ibex [5].

Rabbits are also a possible reservoirs. 2008, genes for Verotoxins have only been detected in a small minority of rabbit fecal samples (3%). *E. coli* harboring *eae* were found in a high prevalence in Swiss rabbits at slaughter representing a source for carcass contamination at slaughter [13]. From 2006 to 2008, VTEC strains were detected in 2% of raw milk cheese (N=1422; 24 semi-hard and 5 soft cheeses). All isolated strains belonged to non-O157 serotypes (13 strains belonged to the serogroups O2, O22 or O91; 9 strains harbored *hlyA*; none of the strains tested positive for *eae*). A study looking at the die-off behavior of VTEC during the ripening process of semi-hard raw milk cheeses in 2013 revealed that VTEC could be detected after 16 weeks of ripening irrespective of the selected burning temperature (40°C und 46°C) and the initial contamination level (low level and high level) [3]. In 2017, a total of 70 fresh herb samples collected at retail level were tested from which 16 were imported from foreign countries (Kindle, 2017). No STEC strains were isolated. Moreover, 51 raw milk cheeses and 53 raw meat products from 63 different farms in 9 different Swiss cantons were analysed (Spoerry Serrano, 2017). Shigatoxin-producing *Escherichia coli* strains were isolated in 2.0 % (1 out of 51) of the raw milk cheeses and in 1.9 % (1 out of 53) of the raw meat products.
2. Evaluation of status, trends and relevance as a source for humans
In 2017, 696 laboratory confirmed cases of human VTEC infections were registered. The notification rate was 8.2 per 100’000 inhabitants (2016: 463 cases, 5.5/100’000). This is the highest notification rate since the introduction of the notification in 1999. The number of reports continued to increase compared to the previous years. There were more women (N=390, 56 %) than men (N=306, 44%) affected. No source of infection could be identified. The number of HUS cases remained stable with 19 cases in 2017, thereof 7 were children under 5 years of age and 8 were adults over 64 years of age. Children under 5 years remained the most frequently affected age group (16.0 per 100’000 inhabitants) accounting for 10% of all cases. However, the biggest share of the rise in reports concerned adults comprising 82% of all cases. The notification rate in the age group “65 plus” rose from 8.2 per 100’000 inhabitants in 2016 to 13.2 in 2017. The more extensive usage of multiplex-PCR detecting toxins might be the main reason for this sharp increase. To examine Swiss cheese made out of raw or low heat-treated milk, 222 samples were examined 2014 for the presence of VTEC. 2 samples (0.9%) were PCR-positive for *vtx*-genes, but no isolates could be obtained for further characterization. In a study conducted in 2012 O26:H11/H^- isolates from human fecal samples having bloody diarrhea and/or HUS (27x) and fecal isolates from healthy cattle (11x) and sheep (1x) were further analysed. Within the *E. coli* O26 isolates more sequence type ST21 strains were identified than ST29 (60% and 75% of the human and animal isolates, respectively). Whereas all human isolates harbored at least one *vtx*, only one isolate each from one cattle and sheep did. Both animal strains harboring *vtx* belonged to ST29. Reported VTEC cases in humans are on the rise since 2014. As most of the laboratories did not routinely test for VTEC until then, it is very likely that the impact of VTEC was underestimated. New diagnostic tools might have led to more samples being analysed for VTEC. In view of the low infectious dose of VTEC (<100 microorganisms) an infection via contaminated food or water is easily possible. Strict maintenance of good hygiene practices at slaughter and in the context of milk production is of central importance to ensure both public health protection and meat quality. In addition, thorough cooking of critical foods prevents infection with VTEC originally present in raw products. Data from the national monitoring program for dairy products 2006-2008 confirm that raw milk cheese may constitute a possible source for VTEC infections and are a relevant hazard in this type of dairy product. Especially because VTEC can survive during the ripening process of semi-hard raw milk cheeses. Although O157:H7 is the predominant cause of HUS, O26:H11/H^- has emerged to the most common non-O157 serotype causing human bloody diarrhea and HUS in many countries. Cattle and sheep are a possible reservoir of the emerging O26:H11/H^- ST29 [2].

3. Any recent specific action in the Member State or suggested for the European Union[(b)]
Several studies relating to verotoxigenic *E. coli* in foodstuffs, in humans and animals were performed by the national reference laboratory to generate new information in the past 5 years [1-10].
4. Additional information
[1] Nüesch-Inderbinen, M. et al. (2015). Prevalence of Subtilase cytotoxin-encoding subAB variants among Shiga toxin-producing *Escherichia coli* strains isolated from wild ruminants and sheep differs from that of cattle and pigs and is predominated by the new allelic variant subAB2-2. International Journal of Medical Microbiology 305, 124-128. [2] Zweifel et al. (2013). Detection of the emerging Shiga toxin-producing *Escherichia coli* O26:H11/H-sequence type 29 (ST29) clone in human patients and healthy cattle in Switzerland. Applied and Environmental Microbiology 79(17): 5411-3. [3] Peng et al. (2013). Behavoiur of Shiga toxin-producing and generic *E. coli* during ripening of semi-hard raw milk cheese. Journal of Dairy Science 31, 117-120. [4] Fierz et al. (2017). Human infections with Shiga toxin-producing *Escherichia coli*, Switzerland, 2010-2014. Frontiers in Microbiology 8:1471. doi: 10.3389/fmicb.2017.01471. [5] Obwegeser et al. (2012). Shedding of foodborne pathogens and microbial carcass contamination of hunted wild ruminants. Veterinary Microbiology 159, 149–154. [6] Hofer et al. (2013). Application of a real-time PCR-based system for monitoring of O26, O103, O111, O145 and O157 Shiga Toxin-producing *Escherichia coli* in cattle at slaughter. Zoonoses and Public Health, 2013, 1863-2378 (electronic). [7] Käppeli et al. (2011a). Shiga toxin-producing *Escherichia coli* non-O157 strains associated with human infections in Switzerland: 2000-2009. Emerging Infectious Diseases 17, 180-185. [8] Käppeli et al. (2011b). Shiga toxin-producing *Escherichia coli* O157 associated with human infections in Switzerland, 2000-2009. Epidemiology and Infection 139, 1097–1104. [9] Zweifel et al. (2010). Characteristics of Shiga Toxin-Producing *Escherichia coli* isolated from Swiss raw milk cheese within a 3-year monitoring program. Journal of Food Protection, 73, 88-91. [10] Wacheck et al. (2010) Wild boars as an important reservoir for foodborne pathogens. Foodborne Pathogens and Disease, Volume 7, Number 3. [11] Stephan et al. (2008). Prevalence and characteristics of Shiga toxin-producing *Escherichia coli* in Swiss raw milk cheeses collected at producer level. Journal of Dairy Science 91, 2561-2565._ [12]. Federal Office of Public Health (2008). Enterohämorrhagische *Escherichia coli* (EHEC), epidemiologische Daten in der Schweiz von 1996 bis 2006. Bulletin of the FOPH; No. 14: 240-246._ [13] Kohler et al. (2008). Shedding of food-borne pathogens and microbiological carcass contamination in rabbits at slaughter. Veterinary Microbiology 132, 149–157. [14] Kaufmann et al. (2006). *Escherichia coli* O157 and non-O157 Shiga toxin-producing *Escherichia coli* in fecal samples of finished pigs at slaughter in Switzerland. Journal of Food Protection 69, 260–266. [15] Zweifel et al. (2006). Bedeutung von *Escherichia coli* O157 beim Schlachtschaf in der Schweiz. Schweizer Archiv für Tierheilkunde 148, 289–295 [16] Zweifel et al. (2004). Prevalence and characteristics of Shiga toxin-producing *Escherichia coli, Salmonella* spp. and *Campylobacter* spp. isolated from slaughtered sheep in Switzerland. International Journal of Food Microbiology 92, 45-53. [17] Al-Saigh et al (2004). Fecal shedding of *Escherichia coli* O157, Salmonella, and Campylobacter in Swiss cattle at slaughter. Journal of Food Protection 67, 2004, 679–684. [18] Schmid et al. (2002). Verocytotoxin-producing *Escherichia* coli in patients with diarrhoea in Switzerland. Eur J Clin Microbiol Infect Dis. 21:810-813.

[19] Stephan et al. (2000). Occurrence of verotoxin-producing *Escherichia coli* (VTEC) in fecal swabs from slaughter cattle and sheep – an observation from a meat hygiene view. Schweizer Archiv für Tierheilkunde 142, 110–114.
[20] Further information can be found on the FSVO website www.blv.admin.ch.

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

General evaluation*: West Nile virus

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

WNF in humans is notifiable since 2006 (ordinance of the Federal Department of Home Affairs (FDHA) on notification of observations on communicable diseases) and in animals since 2011 (TSV, Article 5: disease to be monitored). Up to date no autochthonous cases in humans or animals were reported in Switzerland.

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

Since 2010 two confirmed human cases were reported in Switzerland, both of whom acquired their infection abroad (2012: 1x Kosovo; 2013:1x Croatia). From 2015 to 2017 no human cases were reported.

Since 2011 never more than 6 suspicious horses or donkeys were analysed per year, 2017 it were 5 animals (2016: 4; 2015: 6; 2014: 4; 2013 and 2012: 2; 2011; 1). WNV was never detected.

Usually, only a few wild birds found dead per year are analysed for WNV (2017:2; 2016:5; 2013: 6).

In the framework of a research project 2014 until 2016 brain and kidney samples of 432 wild birds (2016: 130; 2015: 67, 2014: 235) were tested for WNV with negative results.

Furthermore, no antibodies against WNV were found in 1455 blood samples from the active surveillance of avian influenza originating from free-range laying hens (2017: 349; 2016: 111; 2015: 894;) and fattening turkeys (2017: 101). In addition birds from zoological gardens (2015:23) as well as 45 backyard chicken, 7 quails, 1 guinea fowl and 1 black swan (2016) tested also negative.

In collaboration with Austria and Germany, Austrian sentinel ducks at the lake Constance were tested for WNV antibodies towards the end of the year between 2013 and 2017. No WNV antibodies were found in 2013, 2014 and 2016. 2015 not enough blood was available to allow also for the WNV testing. In 2017 the sentinel ducks were killed by predators and not replaced.

2011 until 2013 the following pools of mosquitos (Culex, Aedes vexans and Aedes albopictus) were analysed: 466 (2011), 1429 (2012), 605 (2013), with negative results. In 36 pools (2012) and 5 pools (2013) non-WNV-Mosquito-Flavivirus were detected. From Canton Geneva 62 (2011) and 214 (2012) pools (only Culex) were negative. Furthermore, 111 mosquito pool samples (Culex, Aedes vexans and Aedes albopictus) collected North of Alps in 2013 were all WNV-negative. In 2014 and 2015 the capture of mosquitos was optimized to be able to analyse greater numbers in future (collaboration between the Laboratorio microbiologia applicate SUPSI, the Labor Spiez, and the Swiss TPH). In 2016 from July to October about 1400 mosquitoes, mainly Aedes albopictus and Culex pipiens/torrentium, were collected from Canton Ticino, using different traps for adult mosquitoes. Female mosquitoes (slightly more than a thousand) were screened for flaviviruses and alphaviruses. No West Nile virus was detected (personal communication, V. Guidi).

Up to date there were no autochthonous cases of WNF reported. However, it cannot be excluded that WNV is circulating in Switzerland, especially in wild birds and mosquito populations. In Italy cases occurred in new regions which are close to the Swiss border. In eastern Austria, WNV is detected sporadically in dead found wild birds each year since 2012.

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

Disease awareness in Switzerland was strengthened. The WNF situation - with a special focus on neighbouring countries – is evaluated regularly. If cases in animals or humans appear, the Federal Food Safety and Veterinary Office and the Federal Office of Public Health will inform themselves immediately, as laid down in a concept of how to deal with WNF when it first occurs in Switzerland. A vaccine for horses was approved in 2011.

4. Additional information

[1] Engler et al. 2013: European Surveillance for West Nile Virus in Mosquito Populations. Int. J. Environ. Res. Public Health.
[2] Flacio et al. 2015: Strategies of a thirteen year surveillance programme on Aedes albopictus (Stegomyia albopicta) in southern Switzerland. Parasit Vectors 8: 208.
[3] Tran et al. 2014. Environmental predictors of West Nile fever risk in Europe. Int J Health Geogr 13: 26.
[4] Further information can be found on the FSVO website www.blv.admin.ch.

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

General evaluation*:
Yersinia

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

Since 1999 yersiniosis in humans is no longer notifiable. From 1988 until 1998 the number of reported cases dropped from about 170 to 50 cases per year. Since 2005 the national reference laboratory NENT analysed about 20 to 60 human samples per year, detecting mainly Y. *enterocolitica*. From 2001 to 2010 60% of the Y. *enterocolitica* belonged to the pathogenic biotypes 2, 3 or 4 and 40% to the apathogenic biotype 1A (N=128) [2]. 5% (6 of 128) of the people had an anamnesis with travelling before they got ill.

In animals, yersiniosis is notifiable (TSV, Article 5: disease to be monitored and Article 291). In the last 10 years (2008-2017) never more than 12 cases per year were reported, on average 4 cases per year: affected were mainly dogs (38%) monkeys (11%), cattle (11%), rabbits (5%) and guinea pigs (5%), as well as a single case in a hare, singing bird, wild bird, pigeon, cat, lama, horse, hedgehog, red deer and a bat from a zoo.

2001 64% (56 of 88) of fattening pig farms were *Yersinia* positive in faecal samples. 38% of the 352 faecal samples were *Y. enterocolitica* belonging to biotype 1A (37%), biotype 2/ neither O:3 nor O:9 (29%), biotype 2/O:9 (13,5%), biotype 4/O:3 (10%) and biotype 3/O:3 (4%). In this study the use of medical feed at beginning of housing was a potential risk factor.

2002 15,5% of 865 Swiss pig meat samples (Schnitzel, minced meat, chopped meat) collected in 283 different markets were *Y. enterocolitica* positive *(*mainly biotype 1A). Only in 0.7% potentially humanpathogenic *Y. enterocolitica* were isolated.

From 2003 until 2005 carcass surfaces of 80 slaughter pigs each year were sampled at the four largest slaughterhouses. From each pig samples from 4 different regions of the carcass were pooled. Between 1% and 6% of *Yersinia* contamination on the carcass surfaces were found.

In 2006, 88% of tonsils of 212 slaughter pigs representing 16 farms sampled in one single slaughterhouse were positive using real-time PCR. In culture prevalence rates were much lower (34%). 69 isolates (96%) were found to be biotype 4/O:3, 6 isolates were biotype 2/O:5;27 and 1 biotype 2/O:9 [6].

In 2007/2008 65% of 153 wild boars shot in the region of Geneva had antibodies in the tonsil fluids. Using PCR 44% of the tonsils were positive for *Yersinia* spp.: 35% for *Y. enterocolitica* and 20% for *Y. pseudotuberculosis*. In culture detection rates again were much lower: 9% for *Y. enterocolitica* and 3% for *Y. pseudotuberculosis.*

In a study conducted in 2012/2013 229 of 410 tonsils of slaughter pigs were positive for *Yersinia enterocolitica* using culture methods according to ISO 10273:2003 (56%; 95% CI 51-61%). All isolates except one belonged to the potentially humanpathogenic biotypes. 74% belonged to biotype 4/O:3 and 16% to biotype 3/O:5,27. Other rare biotypes were biotype 3/O:5, biotype 3/O:9, biotype 4/O:5 and biotype 4/O:5,27. Biotype 1A was detected only in one sample [2]. This prevalence was higher than the 34% estimate from 2006 [6].

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

No official data for human case reports are available because, in Switzerland, yersiniosis is not a notifiable disease. However, the number of human samples sent to the national reference laboratory NENT are at least an indicator for the recent situation. 2017, NENT tested 58 human samples positive for Yersinia which was within the range of the usual annual fluctuation. They found 53x *Y. enterocolitica, 4x Y. pseudotuberculosis* and 1x *Yersinia spp.*. Of the isolated *Y. enterocolitica* 32% belonged to biotype 1A, 24% to biotype 4/O:3, 15% to biotype 2/O:9, 8% to other biotypes and in 21% the biotyope could not be identified.

In 2017 5 cases of yersiniosis in animals were reported (3 in dogs, 1 each in pigs and cattle).

In reporting veterinary diagnostic laboratories 1445 tests for yersiniosis were carried out in the context of clinical investigations in 2017, mainly in dogs and cats (82%), horses (3%), cattle (3%), pigs (2%) and monkeys (1%).
It can be assumed that more than half of all slaughter pigs carry potentially humanpathogenic *Yersinia enterocolitica* in their tonsils. How often pig meat is contaminated and how often these agents cause disease in humans is not really known. Schneeberger et al. 2015 demonstrated that *Y. enterocolitica* BT 4 isolates from porcine tonsils, as well as from faeces, show the same virulence-associated gene pattern and antibiotic resistance properties as human isolates from clinical cases, consistent with the etiological role of porcine biotype 4 in human yersiniosis [1]. The number of tests carried out in the human reference laboratory NENT and the number of reported cases in animals are constant at a very low level in the recent years in Switzerland.
The reporting of *Yersinia pseudotuberculosis* in milk samples of three single mastitis cows remained an unusual event in 2013.

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

Switzerland carried out a *Yersinia* prevalence study in tonsils in slaughter pigs from March 2012 to February 2013 [2] according to the technical specifications for harmonized national surveys on *Yersinia enterocolitica* in slaughter pigs (EFSA Journal 2009; 7(11):1374).

4. Additional information

[1] Virulence-associated gene pattern of porcine and human Yersinia enterocolitica biotype 4 isolates. Schneeberger M, Brodard I, Overesch G. Int J Food Microbiol. 2015 Apr 2; 198:70-4. doi: 10.1016/j.ijfoodmicro.2014.12.029. Epub 2014 Dec 30.
[2] Meidinger, A. Countrywide survey on the detection and biotype distribution of Yersinia enterocolitica from slaughter pigs in Switzerland. Inauguraldissertation der Vetsuisse Fakultät der Universität Bern, 2013.
[3] Fredriksson-Ahomaa, M. et al., 2012: Yersinia enterocolitica strains associated with human infections in Switzerland, 2001-2010: Eur J Clin Microbiol Infect Dis (2012) 31:1543–1550.
[4] Fredriksson-Ahomaa, M. et al., 2011: Different enteropathogenic yersinia strains found in wild boars and domestic pigs. Foodborne Pathog Dis 8,733-7.
[5] Fredriksson-Ahomaa, M. et al., 2009: Prevalence of pathogenic Yersinia enterocolitica and Yersinia pseudotuberculosis in wild boars in Switzerland. Int J Food Microbiol, 135, 199-202.
[6] Fredriksson-Ahomaa, M. et al., 2007: Prevalence of pathogenic Yersinia enterocolitica in pigs slaughtered at a Swiss abattoir. Int J Food Microbiol, 119, 207-212.
[7] Further information can be found on the FSVO website www.blv.admin.ch.

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

Food-borne Outbreaks

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

The Swiss Federal Office of Public Health (FOPH) coordinates the national surveillance of communicable diseases. Notifications of physicians and laboratories are made to cantonal (regional) health authorities and to the FOPH under the provisions of the public health legislation, namely the Ordinance on Disease Notification of December 1 2015. Under this scheme, data provided for each notification depend on its supplier: (i) laboratories report diagnostic confirmations (subtype, method, material) while for selected diseases (ii) physicians additionally cover the subsidiaries of clinical diagnosis, exposition, development and measures. Besides the case-oriented reporting, physicians also have to report observations of unexpected clusters of any communicable disease. At the FOPH, the combined notifications of laboratories and physicians are analyzed and published in the weekly Bulletin.

The surveillance of food-borne infectious agents follows the mandatory system. The laboratories are required to report identifications of Salmonella causing gastroenteritis, Salmonella Typhi, Salmonella Paratyphi, Campylobacter spp., Shigella spp., verotoxin-positive Escherichia coli, Listeria monocytogenes, Clostridium botulinum and hepatitis A virus. A complementary notification by physicians is required for typhoid/paratyphoid fever, diseases associated with verotoxin-positive Escherichia coli, botulism and hepatitis A. Following a modification of the Ordinance on Disease Notification, laboratories are additionally required to report identifications of Trichinella spp. since January 1 2009.

Basically, the responsibility for outbreak investigations lies with the cantonal authorities. Relevant data of food-borne outbreaks are reported to the Federal Food Safety and Veterinary Office (FSVO) (formerly FOPH) in a standardized format as soon as the investigations are accomplished. On request, the FSVO and FOPH offer the cantons their expertise in epidemiology, infectious diseases, food microbiology, risk assessment and risk management. However, under the Federal Law on the Control of Transmissible Diseases of Man and the Federal Law on Food-Stuffs and Utility Articles, the central government, respectively the FSVO and FOPH, have the duty to supervise the enforcement of the concerned legislations. In cases of outbreaks which are not limited to the territory of one canton, the federal authorities have the competence to coordinate, and if necessary, to direct control actions and information activities of the cantons. In such a situation, the concerned federal offices can conduct their own epidemiological investigations in cooperation with national reference laboratories. In the field of food-borne diseases the Federal Offices are supported by the National Centre for Enteropathogenic Bacteria and Listeria (NENT). This reference laboratory disposes of the facilities, techniques and agents required not only to confirm results from other laboratories but also for epidemiological typing (serotyping and molecular typing) of various bacterial pathogens.

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

The outbreaks were categorized according to the Manual for reporting on food-borne outbreaks in accordance with Directive 2003/99/EC.

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

In 2017, 18 outbreaks have been reported throughout Switzerland by the supervisory authorities. In total, more than 383 people became ill and at least 70 people were hospitalized. The number of outbreaks decreased continuously since the mid 1980ies and now soundly remains on a low level. The implementation of HACCP-systems in food businesses may have had an influence.

Restaurants and similar settings for collective catering were the most frequent settings of outbreaks. The available clinical data are not very good since investigations in this field are not in the main focus of the competent authorities

In general, it is well known that systematic underestimation is made when monitoring food-borne illness (for example, not all patients consult a doctor and are not subject to biological fluid analysis). The announcement of the cases depends among other things on the number of patients, the severity of the disease, the possible hospitalizations associated with it as well as the collaboration of the various actors involved (patients, doctors, control authorities). Finally, outbreaks with a short incubation period are often detected faster than those with a longer incubation time. In recent months, a special effort has been made to raise the awareness of the various authorities concerned about the importance of announcing cases to the federal authorities. As such, one can naturally wonder if the number of outbreaks of collective intoxication slightly higher in 2017 (11 outbreaks in 2016) is not already a reflection of a better awareness. The figures for the next years may give us an answer.
4. Descriptions of single outbreaks of special interest
Deficiencies in hygiene during the storage and handling of foodstuffs led to 3 intoxications due to the development of coagulase-positive Staphylococci in kebabs and salmon tartars, as well as Bacillus cereus in a preparation of macaroni, consisting of macaroni, bacon / ham and a sauce (cream, milk, salt, nutmeg, broth powder). In the latter case, about 1 hour after eating the macaroni, the people affected had the first severe symptoms such as vomiting and diarrhea. The same day, the responsible company blocked the dishes and all the remaining ingredients. They were the subject of subsequent analyzes, which detected the abundant presence of Bacillus cereus (> 150,000 CFU / g), concordant with the clinical symptoms of the affected people. Another outbreak of special interest affected the guests of a wedding (more than 30 people affected). The exact number of patients could not be determined accurately, but 300 to 400 guests took part in this ceremony. On the basis of evidence, the investigating authorities suggested that the wedding cake, made from fresh eggs, caused the following symptoms: nausea, vomiting, diarrhea, abdominal cramps, fever, chills and dizziness. The sick persons had all eaten the wedding cake. However, no direct link could be established between this cake or the other foods of the meal and the salmonellosis of the guests, as no sample was any more available to carry out the relevant analyzes. Finally, the investigations carried out on the place of manufacture of the cake did not bring more information. In the field of viruses, hepatitis E (HEV) caused an outbreak affecting 24 people. This virus is present in countries with poor hygiene, in drinking water or contaminated food, but it is also found in pigs and wild boars in central Europe and also in Switzerland. In this case, the HEV contamination of patients was caused by the consumption of meat products containing raw or undercooked pork liver or wild boar.
5. Control measures or other actions taken to improve the situation
In Switzerland, the number of outbreaks settled down on low level and it is therefore difficult to get a further decrease.
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
None.
7. Additional information
None.
(a): Trends in numbers of outbreaks and numbers of human cases involved, relevance of the different causative agents, food categories and the agent/food category combinations, relevance of the different type of places of food production and preparation in outbreaks, evaluation of the severity of the human cases.

Institutions and laboratories involved in antimicrobial resistance monitoring and reporting
The department Animal Health of the Federal Food Safety and Veterinary Office (FSVO) is the competent authority to design, coordinate and report the AMR-Monitoring Program. The competent cantonal veterinary offices are responsible for taking the caecal and nasal samples in the slaughterhouses according to the sampling plan from the FSVO and sending them to the NRL. The competent cantonal laboratories are responsible for taking the meat samples in retail stores according to the sampling plan from the FSVO and sending them to the NRL. The Centre for Zoonoses, Bacterial Animal Diseases and Antibiotic Resistance, University of Bern, Switzerland (ZOBA) is the NRL and responsible for the isolation of the bacteria and the AMR testing. All Results are transmitted periodically to the Federal Laboratory Database Alis.
Short description of the institutions and laboratories involved in data collection and reporting

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
Overall the antimicrobial resistance situation in zoonotic and indicator bacteria isolated from fattening pigs, veal calves and meat thereof didn't change significantly in comparison to 2015. Antimicrobial resistance rates of porcine C*ampylobacter coli* showed no significant changes compared to 2015. Very high resistance rates were observed for ciprofloxacin (50%). Resistance rates to ciprofloxacin is low for indicator *E. coli* of bovine samples (4%) and porcine samples (3%), With selective enrichment the detection rate of ESBL producing *E. coli* were moderately high (18%) for fattening pigs and high for veal calves (34%). For pork and beef meat the detection rate was very low at 0.3% and 0.7%, respectively. No colistin-resistant or carbapenemase-producing *E. coli* or *Salmonella* isolate was detected. The MRSA prevalence in fattening pigs increased significantly from 26% in 2015 to 44% in 2017. The most frequently detected spa types were t034 and t011. No linezolid nor vancomycin resistant MRSA were detected.
2. Public health relevance of the findings on food-borne AMR in animals and foodstuffs
Although the resistance rate of porcine C*ampylobacter coli* to ciprofloxacin is very high, this is not of public health concern, as the prevalence of C*ampylobacter coli* is substantially reduced during the meat processing. Therefore, the relevance of pork as transmitter of resistant *Campylobacter coli* to humans is estimated to be small. MRSA prevalence in fattening pigs has significantly increased over the last years. In 2009, the prevalence was 2.2% and increased constantly to 44% in 2017. The increase is mainly due to a spread to CC398-t034 and t011 within the Swiss population of fattening pigs, which belonging to livestock-associated MRSA.
3. Recent actions taken to control AMR in food producing animals and food
No specific measures for MRSA in pig production are ongoing. A study on farm prevalence and transmission of MRSA showed an intermittent colonization throughout the entire production cycle in individual animals (Bangerter et a. 2014).
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
A national strategy to combat antibiotic resistance (StAR) has been developed and implemented. It follows the one health approach covering public and veterinary health and the environment as well. It

action fields in different sectors (regulatory, prudent use, surveillance, research, control in hospitals etc.) with the long-term objective to ensure the effectiveness of antimicrobials for humans and animals in order to preserve their health. For further information see https://www.star.admin.ch/star/en/home.html.
5. Additional information
Further information can be found in the bi-annual Swiss antibiotic resistance report 2018 on the usage of antibiotics and the occurrence of antibiotic resistance in Switzerland on the FSVO website www.blv.admin.ch.
(a): The CIAs depends on the bacterial species considered and the harmonised set of substances tested within the framework of the harmonised monitoring: • For *Campylobacter* spp., macrolides (erythromycin) and fluoroquinolones (ciprofloxacin); • For *Salmonella* and *E. coli*, 3rd and 4th generation cephalosporins (cefotaxime) and fluoroquinolones (ciprofloxacin) and colistin (polymyxin);

General Description of Antimicrobial Resistance Monitoring*;
1. General description of sampling design and strategy[(a)]
A stratified random sampling approach is used for taking samples within the active monitoring programme on antimicrobial resistance in Swiss food-producing animals and meat, except for Salmonella. The samples are taken by the competent authorities. The prevalence of Salmonella spp. in food-producing animals in Switzerland is very low as a consequence of long term control programs. Therefore, we include isolates from national disease control programs (breeding hens, laying hens, broilers and fattening turkeys, Swiss ordinance of epizootics (TSV, Article 255-261) and clinical investigations as far as they are available.
2. Stratification procedure per animal population and food category
Pig and veal calves (under 1 year): The slaughterhouses included in the monitoring program produce over 80% of slaughtered pigs and over 75% of slaughtered calves in Switzerland. The number of samples for each slaughterhouse is determined in proportion to the number of animals slaughtered per year. The samples are taken evenly distributed over the year, in order to exclude seasonal effects. Each herd should be sampled only once a year. Pork meat and beef samples: Meat samples were gathered in all Swiss cantons throughout the year. The applied sampling scheme considered each canton's population density and market shares of retailers. Only domestic samples are collected. For Salmonella all S. Typhimurium including its monophasic variant and S. Enteritidis isolates reaching the national reference laboratory are tested for AMR. To increase the number of these S*almonella* serovars tested for AMR, isolates obtained from clinical investigations in the national reference laboratory are included as well.
3. Randomisation procedure per animal population and food category
Slaughterhouse: A random sample of 216 caecal samples from fattening pigs and 204 veal calves for direct detection method of indicator *E. coli.* For *Campylobacter coli/jejuni* 296 porcine ceacal samples and for *Enterococcus faecalis/faecium* 296 bovine caecal samples were taken. For selective enrichment methods (ESBL-, Carbapenemase-producing *E. col*i) 296 porcine caeca and 304 bovine ceaca were investigated. For MRSA 298 nasal swabs from pig and 297 nasal swabs from veal calves were taken. The number of samples per month were defined in the sampling plan for each slaughterhouse, samples could be taken on Monday and Tuesday. Fresh meat at retail: A random sample of 302 pork meat and 299 beef samples for selective enrichment methods (ESBL-, Carbapenemase-producing *E. coli*) was investigated. The number of samples per week were defined in the sampling plan for each cantonal authority, samples could be taken on Monday and Tuesday.
4. Analytical method used for detection and confirmation[(b)]
Direct detection of *Campylobacter coli/jejuni* according to ISO 10272 (porcine caeca only). Direct detection of indicator *E. coli* on Mac Conkey Agar. Direct detection of *E. faecalis* and *E. faecium* on Slanetz Bartley Agar (bovine caeca only). Two step selective enrichment for MRSA defined by the EU-RL for Antimicrobial Resistance at the National Food Institute, Lyngby, DENMARK. Confirmation by PCR and spa typing using published methods (Stegger et al., 2011, Harmsen et al., 2103). Selective enrichment for ESBL- and carbapenemase-producing *E. coli* according to the protocols published by the EU-RL for Antimicrobial Resistance at the National Food Institute, Lyngby, DENMARK. Confirmation phenotypically with EUVSEC2 plate.

Species identification were performed by Matrix Assisted Laser Desorption Ionisation Time Of Flight Mass Spectrometry (MALDI TOF MS) using the direct transfer protocol recommended by the manufacturer (Biotyper 3.0, Bruker Daltonics GmbH, Bremen, Germany) and cryopreserved in tryptone soy bouillon containing 30% glycerol at a temperature of -80°C until antimicrobial resistance testing was performed.

5. Laboratory methodology used for detection of antimicrobial resistance[(C)]

MICs were determined by broth microdilution method using Sensititre susceptibility plates (EUVSEC, EUVSEC2, EUST, EUVENC, EUCAMP2) (TREK Diagnostic Systems Ltd, East Grinstead, United Kingdom). Resistance was defined following the epidemiological cut-off values according to the European directive EU/652/2013. For MRSA epidemiological cut-off values published by the European Committee on Antimicrobial Susceptibility Testing (EUCAST) were used.

6. Results of investigation

Antimicrobial resistance rates of porcine *Campylobacter coli* showed no significant changes compared to 2015. Very high resistance rates were observed for ciprofloxacin (50%) and extremely high resistance rates for streptomycin (81%).
Antimicrobial resistance rates of bovine *Enterococcus faecalis/faecium* showed no significant changes compared to 2015, except for erythromycin and *E. faecium*, as the rate decreased to 20%. Resistance to vancomycin was not detected.
Antimicrobial resistance rates of bovine indicator *E. coli* showed no significant changes compared to 2015. Resistance to cefotaxime, ceftazidime, meropenem and colistin was not detected.
Antimicrobial resistance rates of porcine indicator *E. coli* showed no significant changes compared to 2015. Resistance to cefotaxime, ceftazidime, meropenem and colistin was not detected.
With selective enrichment the detection rate of ESBL producing *E. coli* were moderately high (18%) for fattening pigs and high for veal calves (34%). For pork and beef meat the detection rate was very low at 0.3% and 0.7%, respectively.
With selective enrichment carbapenemase-producing *E. coli* were not detected.
With selective enrichment the MRSA prevalence in fattening pigs increased significantly from 26% in 2015 to 44% in 2017. The most frequently detected spa types were t034 and t011, belonging to livestock-associated MRSA. The MRSA prevalence in pork meat was very low (0.7%),
With selective enrichment the MRSA prevalence in veal calves increased from 6% in 2015 to 8% in 2017. The most frequently detected spa types were t034 and t011, belonging to livestock-associated MRSA. MRSA in beef meat was not detected.
No linezolid nor vancomycin resistant MRSA were detected.
In total 116 *Salmonella* isolates were tested, one canine isolate were confirmed as ESBL- producing strain. No colistin-resistant or carbapenemase-producing isolate was detected.

7. Additional information

Further information can be found in the bi-annual Swiss antibiotic resistance report 2018 on the usage of antibiotics and occurrence of antibiotic resistance on the FSVO website http://www.blv.admin.ch

*** to be filled in per combination of bacterial species/matrix**

(a): Method of sampling (description of sampling technique: stage of sampling, type of sample, sampler), Frequency of sampling, Procedure of selection of isolates for susceptibility testing, Method used for collecting data.
(b): Analytical method used for detection and confirmation: according to the legislation, the protocols developed by the EURL-AR should be used and reported here. In the case of the voluntary specific monitoring on Carbapenemase-producers, the selective media used (commercial plates, 'in house' media) should be also reported here. In general, any variation with regard to the EURL-AR protocols should be stated here, number of isolates isolated per sample, in particular for *Campylobacter* spp.
(c): Antimicrobials included, Cut-off values