

Animal Health Surveillance

The following tables present animal health data collected by MPI from various sources during 2018.

Table 1 is a summary of the numbers of laboratory submissions from sick farmed animals, from the major livestock and avian populations.

Table 2 lists the number of *Salmonella* serotypes by animal species diagnosed by veterinary pathology laboratories.

Table 3 presents a summary of results from the salmon surveillance programme run annually in approved

establishments for the export of salmon for human consumption in Australia. In all, 21 salmon farms were tested and none recorded significant mortalities.

Table 4a presents a cumulative list of investigations conducted by Incursion Investigators from MPI's Biosecurity Surveillance and Incursion Investigation animal health and aquatic and environment health teams during the period 2013–2018 that have resulted in exclusion of OIE-notifiable diseases or other significant exotic diseases.

Table 4b presents a list of significant investigations conducted during 2018 by MPI's Biosecurity Surveillance and Incursion Investigation animal health, and aquatic and environment health teams, into suspected exotic or emerging diseases that have been confirmed as positive. These include exotic disease or vector incursions or newly emerged diseases, occurrences of diseases in new host species, first detections of disease agents established in New Zealand, and interceptions with no resulting transmission or establishment of organisms.

Table 1: Numbers of cases and diagnoses received from veterinary pathology laboratories during 2018

Cattle		<i>Campylobacter fetus</i> spp. <i>fetus</i>		Ill thrift/diarrhoea	
Total sick animal cases	18,855		32		1,190
Abnormalities of reproductive system	119	Other <i>Campylobacter</i> spp.	5	Gastrointestinal parasitism	19
<i>Neospora caninum</i>	13	<i>Toxoplasma gondii</i>	46	Nervous signs	188
<i>C. fetus</i> ssp. <i>venerealis</i>	0	<i>Salmonella</i> Brandenburg	13	Respiratory disease	680
Pestivirus infection	4	Congenital defects	0	Streptococcal infection	74
Abortion	691	Ill thrift/diarrhoea	466	Sudden death	24
<i>Neospora caninum</i>	121	Johne's disease	12	Pigs	
Mycotic abortion	3	Trace element deficiency	20	Total sick animal cases	53
Pestivirus infection	7	Gastrointestinal parasitism	36	Abortion	0
<i>Leptospira</i> spp.	17	Nervous signs	74	Ill thrift/diarrhoea	17
Congenital defects	7	<i>Listeria monocytogenes</i>	6	Nervous signs	2
Ill thrift/diarrhoea	9,664	Polioencephalomalacia	0	Sudden death	15
Pestivirus infection	142	<i>Clostridium</i> spp.	3	Goats	
Gastrointestinal parasitism	18	Respiratory disease	48	Total sick animal cases	580
Johne's disease – suspicious and confirmed	2,263	Sudden death	294	Abortion	9
Trace element deficiency	232	Gastrointestinal parasitism	5	Ill thrift/diarrhoea	300
<i>Yersinia</i> spp.	378	Farmed deer		Gastrointestinal parasitism	3
Rotavirus	355	Total sick animal cases	155	Respiratory disease	24
Nervous signs	384	Abortion	1	Nervous signs	25
<i>Listeria monocytogenes</i>	4	<i>S. zooepidemicus</i>	0	<i>Listeria monocytogenes</i>	4
Hepatic encephalopathy	2	Congenital defects	0	Caprine arthritis encephalitis	1
Metabolic disease	34	Ill thrift/diarrhoea	76	Sudden death	40
Malignant catarrhal fever	7	Johne's disease	10	<i>Clostridium perfringens</i> D (enterotoxaemia)	0
Polioencephalomalacia	0	Trace element deficiency	9	Gastrointestinal parasitism	1
<i>Histophilus somnus</i>	0	<i>Yersinia</i> spp.	8	Lamoids	
Sudden death	1,017	Nervous signs	7	Total sick animal cases	277
<i>Clostridium</i> spp.	9	Malignant catarrhal fever	0	Abortion	2
Respiratory disease	638	Sudden death	59	Ill thrift/diarrhoea	123
Sheep		Gastrointestinal parasitism	1	Gastrointestinal parasitism	1
Total sick animal cases	1,524	Malignant catarrhal fever	3	Nervous signs	17
Abnormalities of reproductive system	33	Horses		Respiratory disease	10
<i>Brucella ovis</i>	1	Total sick animal cases	5,767	Sudden death	26
Abortion	247	Abortion	36	Avian species	
		<i>S. zooepidemicus</i>	2	Total number of submissions	785
		Circulatory disease	35		

Table 2: *Salmonella* serotypes isolated from animals during 2018

Serotype	Avian	Bovine	Canine	Cervine	Equine	Feline	Ovine	Reptile
<i>Salmonella</i> Abortusequi	0	0	0	0	0	0	0	0
<i>Salmonella</i> Abortusovis	0	0	0	0	0	0	0	0
<i>Salmonella</i> Adelaide	0	0	0	0	0	0	0	0
<i>Salmonella</i> Agona	0	12	1	0	0	0	0	0
<i>Salmonella</i> Albany	0	0	0	0	0	0	0	0
<i>Salmonella</i> Amager	0	0	0	0	0	0	0	0
<i>Salmonella</i> Amsterdam	0	1	0	0	0	0	0	0
<i>Salmonella</i> Anatum	0	2	0	0	0	0	0	0
<i>Salmonella</i> Arizonae	0	0	0	0	0	0	0	0
<i>Salmonella</i> Banana	0	0	0	0	0	0	0	0
<i>Salmonella</i> Bareilly	0	0	0	0	0	0	0	0
<i>Salmonella</i> Barranquilla	0	0	0	0	0	0	0	0
<i>Salmonella</i> Bere	0	0	0	0	0	0	0	0
<i>Salmonella</i> Bovismorbificans	0	229	3	0	2	3	3	0
<i>Salmonella</i> Brancaster	0	0	0	0	0	0	0	0
<i>Salmonella</i> Brandenburg	0	73	1	0	0	0	13	0
<i>Salmonella</i> Bredeney	0	0	0	0	0	0	0	0
<i>Salmonella</i> California	0	0	0	0	0	0	0	0
<i>Salmonella</i> Choleraesuis	0	0	0	0	0	0	0	0
<i>Salmonella</i> Cubana	0	0	0	0	0	0	0	0
<i>Salmonella</i> Derby	0	0	0	0	0	0	0	0
<i>Salmonella</i> Dublin	0	0	0	0	0	0	0	0
<i>Salmonella</i> Eastbourne	0	0	0	0	0	0	0	0
<i>Salmonella</i> Emek	0	5	0	0	0	0	0	0
<i>Salmonella</i> Enterica	0	4	0	0	0	0	0	0
<i>Salmonella</i> Enterica subsp. Salamae	0	0	0	0	0	0	0	0
<i>Salmonella</i> Enteritidis	0	3	1	0	0	0	0	0
<i>Salmonella</i> Fresno	0	0	0	0	0	0	0	0
<i>Salmonella</i> Give	0	0	0	0	0	0	0	0
<i>Salmonella</i> Hadar	0	0	0	0	0	0	0	0
<i>Salmonella</i> Havana	0	0	0	0	0	0	0	0
<i>Salmonella</i> Heidelberg	0	1	0	0	0	0	0	0
<i>Salmonella</i> Hindmarsh	0	0	0	0	0	0	23	0
<i>Salmonella</i> Houtenae	0	0	0	0	0	0	0	0
<i>Salmonella</i> Hvittingfoss	0	0	0	0	0	0	0	0
<i>Salmonella</i> Infantis	0	2	2	0	0	0	0	0
<i>Salmonella</i> Johannesburg	0	0	0	0	0	0	0	0
<i>Salmonella</i> Kedougou	0	0	0	0	0	0	0	0
<i>Salmonella</i> Kentucky	0	1	0	0	0	0	0	0
<i>Salmonella</i> Kiambu	0	0	0	0	0	0	0	0
<i>Salmonella</i> Kottbus	0	0	0	0	0	0	0	0
<i>Salmonella</i> Lexington	0	0	0	0	0	0	0	0
<i>Salmonella</i> Litchfield	0	0	0	0	0	0	0	0
<i>Salmonella</i> Liverpool	0	0	0	0	0	0	0	0
<i>Salmonella</i> Livingstone	0	0	0	0	0	0	0	0
<i>Salmonella</i> London	0	0	0	0	0	0	0	0
<i>Salmonella</i> Luckenwalde	0	0	0	0	0	0	0	0

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Table 2 (continued)

Serotype	Avian	Bovine	Canine	Cervine	Equine	Feline	Ovine	Reptile
<i>Salmonella</i> Mana	0	0	0	0	0	0	0	0
<i>Salmonella</i> Mbandaka	0	2	1	0	0	0	0	0
<i>Salmonella</i> Meleagridis	0	0	0	0	0	0	0	0
<i>Salmonella</i> Minnesota	0	0	0	0	0	0	0	0
<i>Salmonella</i> Mississippi	0	0	0	0	0	0	0	1
<i>Salmonella</i> Molade	0	0	0	0	0	0	0	0
<i>Salmonella</i> Montevideo	0	0	0	0	0	0	0	0
<i>Salmonella</i> Muenster	0	0	0	0	0	0	0	0
<i>Salmonella</i> Nchanga	0	0	0	0	0	0	0	0
<i>Salmonella</i> Newton	0	0	0	0	0	0	0	0
<i>Salmonella</i> Newport	0	0	0	0	0	0	0	0
<i>Salmonella</i> Onderstepoort	0	0	0	0	0	0	0	3
<i>Salmonella</i> Oranienburg	0	0	0	0	0	0	0	0
<i>Salmonella</i> Orion	0	0	0	0	0	0	0	0
<i>Salmonella</i> Paratyphi	0	0	0	0	0	0	0	0
<i>Salmonella</i> Poona	0	0	0	0	0	0	0	0
<i>Salmonella</i> Potsdam	0	0	0	0	0	0	0	0
<i>Salmonella</i> Pullorum	0	0	0	0	0	0	0	0
<i>Salmonella</i> Reading	0	0	0	0	0	0	0	0
<i>Salmonella</i> Rideauf	0	0	0	0	0	0	0	0
<i>Salmonella</i> Rissen	0	0	0	0	0	0	0	0
<i>Salmonella</i> Rough	0	0	0	0	0	0	0	0
<i>Salmonella</i> Ruiru	0	7	0	0	0	0	0	0
<i>Salmonella</i> Saintpaul	0	2	0	0	0	1	0	0
<i>Salmonella</i> Salford	0	0	0	0	0	0	0	0
<i>Salmonella</i> Schwarzengrund	0	0	0	0	0	0	0	0
<i>Salmonella</i> Senftenberg	0	3	0	0	0	0	0	0
<i>Salmonella</i> Singapore	0	0	0	0	0	0	0	0
<i>Salmonella</i> Stanley	0	2	0	0	0	0	0	0
<i>Salmonella</i> Tennessee	0	0	0	0	0	0	0	0
<i>Salmonella</i> Thompson	0	0	0	0	0	0	0	0
<i>Salmonella</i> Typhi	0	0	0	0	0	0	0	0
<i>Salmonella</i> Typhimurium	1	169	11	1	10	11	7	0
<i>Salmonella</i> Typhisuis	0	0	0	0	0	0	0	0
<i>Salmonella</i> Uganda	0	0	0	0	0	0	0	0
<i>Salmonella</i> Victoria	0	0	0	0	0	1	0	0
<i>Salmonella</i> Virchow	0	0	0	0	0	0	0	0
<i>Salmonella</i> Wangata	0	0	0	0	0	0	0	1
<i>Salmonella</i> Warragul	0	0	0	0	0	0	0	0
<i>Salmonella</i> Weltevreden	0	0	0	0	0	0	0	0
<i>Salmonella</i> Westhampton	0	0	0	0	0	0	0	0
<i>Salmonella</i> Worthington	1	0	0	0	0	0	0	0
<i>Salmonella</i> Yoruba	0	0	0	0	0	0	0	0
<i>Salmonella</i> Zanzibar	0	0	0	0	0	0	0	0
<i>Salmonella</i> species unspecified	1	8	4	0	5	1	1	0
Total	3	526	24	1	17	17	47	5

Table 3: Salmonid surveillance during 2018

Pathogen tested for	No of farms	No of samples	No of positives
Viral cultures	21	1,740	0
<i>Myxobolus cerebralis</i>	7	420	0
<i>Yersinia ruckeri</i>	21	1,740	3*
<i>Aeromonas salmonicida</i>	21	1,740	0
<i>Renibacterium salmoninarum</i>	7	420	0
* The endemic strain of <i>Yersinia ruckeri</i> (serotype O1b) was isolated (serotyped by AAHL in Geelong, Australia).			
Number of salmon farms tested			21
Number of farms reporting significant mortalities			0
Number of farms where significant infectious disease was detected through this scheme			0

Table 4a: Cumulative list of significant (*A) negative investigations of suspected exotic diseases, 2013–2018

Disease agents investigated and confirmed as negative	2013	2014	2015	2016	2017	2018	Total
<i>Aeromonas salmonicida</i> (fish) *B		2		3	1	1	7
African horse sickness	2						2
Africanised honeybee (<i>Apis mellifera scutella</i>) and Cape bee (<i>Apis mellifera capensis</i>) *B			3		1	3	7
Akabane virus	1	1	1		1		4
Anaplasmosis	3	2	2	1	10		18
Anthrax	3	4	2	4		7	20
Avian influenza: highly pathogenic notifiable avian influenza & Newcastle disease *B	4	3	5	3	3	6	24
Avian influenza: low-pathogenicity notifiable avian influenza *B	2	2	1		1	1	7
Avian polyomavirus *C	2			2			4
<i>Babesia canis</i> , <i>B. gibsoni</i> and <i>B. felis</i>	2	1	1	2	4		10
Bluetongue		2	4	1	1		8
<i>Brucella abortus</i>	2	2	1	1	1	1	8
<i>Brucella canis</i>	6	5	9	12	6	6	44
<i>Brucella melitensis</i>		1	1	1		1	4
Bovine herpesvirus type 5	2	2					4
Bovine theileriosis and babesiosis (exotic strains)	6	1			1	2	10
Bovine viral diarrhoea type 2a		6	1	6			13
<i>Burkholderia mallei</i> (glanders) and <i>B. pseudomallei</i> (melioidosis)		1	2	1			4
Canine distemper virus	1	2	3	1	1	3	11
Canine influenza			2			2	4
<i>Chlamydia abortus</i> (enzootic abortion)		1		2	1	1	5
Contagious bovine pleuropneumonia	1			1			2
<i>Ehrlichia canis</i>	1	1		3	5	1	11
Equine piroplasmiasis	3	2	3	1	5	4	18
Equine herpesvirus type 1 (abortifacient strains, neuropathogenic strains)	1	6	1	9	4	1	22
Equine infectious anaemia and equine viral arteritis	17	4	7	11	10	6	55
Equine influenza	2	3	2	2	2	1	12
European foulbrood (bees) *B	3	7	8	6	4	6	34
Exotic ticks	3	3	15	11	11	5	48
Fish, shellfish and crustacean mortality (wild or managed, marine) – for exclusion of exotic and novel infectious disease agents not otherwise listed	5	4	11	2	10	16	48
Haemorrhagic septicaemia (<i>Pasteurella multocida</i> – toxigenic strains)	3		1	1	1	1	7

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Table 4a (continued)

Disease agents investigated and confirmed as negative	2013	2014	2015	2016	2017	2018	Total
Heartworm (<i>Dirofilaria immitis</i>)			3	1	2	2	8
Hydatids (<i>Echinococcus</i> spp.)			1	4	2	2	9
Infectious bovine rhinotracheitis (exotic strains)	1		2	1	1		5
Infectious bursal disease	5	1	3	1		2	12
Israeli acute paralysis virus (bees) *B	1	3	7	1			12
Leishmaniasis				5	6	3	14
<i>Leptospira</i> (exotic strains)	1	3	1		3	2	10
<i>Mycoplasma bovis</i>	1	4		6	2 *C	Under response	Under response
Myxomatosis	2		1			1	4
<i>Nosema ceranae</i> (bees) *C	1	2	2	2	1		8
<i>Perkinsus marinus</i> (molluscs)	2	2		3	6	6	19
Porcine reproductive and respiratory syndrome		1	2		1	2	6
Poxviruses (ruminants and camelids)	1	1	2	1		1	6
Psittacine herpesvirus (incl. Pacheco's disease)	2			3	1		6
Jaagsiekte sheep retrovirus (pulmonary adenomatosis virus)					2	1	3
Q fever (<i>Coxiella burnetii</i>)	1	2		2		1	6
Rabies	1						1
Rinderpest							
Ross River virus				1	2		3
<i>Salmonella</i> (exotic strains)	4	2	1	1	1	2	11
Small hive beetle (<i>Aethina tumida</i>) (bees) *B		2	1	1	2	3	9
Swine fever viruses (African and classical swine fever viruses)				1		2	3
Tracheal mite (<i>Acarapis woodi</i>) (bees) *B	1	3	9	3	2	5	23
Transmissible spongiform encephalopathy agents (scrapie, BSE; chronic wasting disease, FSE) *B	4	3	5	1		2	15
<i>Trichinella spiralis</i> (trichinosis)	1				1	1	3
<i>Tropilaelaps clareae</i> and <i>T. koenigerum</i> (bees) *B	1		4	1	1	1	8
Tularaemia (<i>Francisella tularensis</i>)			2		1		3
Viral haemorrhagic septicaemia (fish)		1		1			2
Viral vesicular disease	5	4	9	16	7	7	48
West Nile virus		4	1	3	2	1	11
Enteric redmouth (<i>Yersinia ruckeri</i> – exotic strains) (fish)			1	1	2	2	6
Total	110	106	143	147	132	124	749

Table 4b: List of significant positive investigations of suspected exotic diseases, 2018

Disease agents/vectors investigated and confirmed as positive, and host species	Number of positive investigations in 2018
Canine influenza (dog) *D (Bingham, 2018b)	1
Infectious bursal disease virus serotype 2 (IBDV-2) (poultry) (Rawdon, 2019)	1
American dog tick (<i>Dermacentor variabilis</i>) (human) *E (Bingham, 2018b)	1
Castor bean tick (<i>Ixodes ricinus</i>) (human) *E	1
Paralysis tick (<i>Ixodes holocyclus</i>) (human) *E (Bingham, 2018c, 2019)	2
<i>Ixodes</i> spp. tick (not otherwise able to be identified) *E (Bingham, 2019)	1
<i>Culex sitiens</i> (human)*D	1

Notes to Tables 4a and 4b

- *A The investigations listed in **Table 4a** are those that have resulted in exclusion of an OIE-notifiable disease or other significant diseases investigated more than once in the time period. This is not a definitive list of all investigations conducted. Some investigations resulted in multiple exclusions using specific laboratory methods, and these are recorded against each disease. The data were retrieved and analysed from the Notification and Investigation Manager Application database. Regular quarterly investigation reports are published in *Surveillance*: see Bingham (2018a,b,c, 2019) and Taylor (2018a,b, 2019).
- *B Investigations reported here are in addition to the testing in the MPI active surveillance programmes for these disease agents. See Phiri (2018) (honey bee exotic pest and disease surveillance), Stanislawek *et al.* (2018) (avian influenza surveillance), Watts (2018) (TSE surveillance) and **Table 3** above (salmon surveillance).
- *C These previously exotic disease agents have become established in New Zealand, either during the 2018 year (if indicated in a time column), or previously if indicated next to the disease agent name. They may remain the subject of exotic disease investigation for the purpose of describing an emerging disease, potential new animal host species, or as suspected new incursions.
- *D An MPI biosecurity response was established for this unwanted organism. The response ensured that the unwanted organism never established.
- *E This confirmed exotic tick was intercepted soon after entry to NZ. Transmission or establishment of organisms did not occur.

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