

## Bovine viral diarrhoea viruses from New Zealand belong predominantly to the BVDV-1a genotype

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**Table S1. Available details for samples used in the analyses. All samples from 2019, 2020 and 2022 represented submissions to the veterinary diagnostic laboratories. Samples from before 2019 or of unknown age represent archival virus isolates. The 5' UTR genotype and E2 clades are given for samples from which the specific bands were amplified and sequenced.**

Sample No	Sample ID	Location	Year	Farm ID	Farm Type	5' UTR Type	5' UTR Hap	E2 clade
1	CA1	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
2	CA2	Canterbury	2022	Farm 01	UNK	1a	38	EXL
3	CA3	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
4	CA4	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
5	CA5	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
6	CA6	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
7	CA7	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
8	CA8	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
9	CA9	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
10	CA10	Canterbury	2022	Farm 01	UNK	1a	38	1a (NZ1)
11	SL1	Southland	2022	Farm 06	UNK	1a	41	1a (NZ1)
12	SL2	Southland	2022	Farm 07	UNK	EXL		1a (NZ1)
13	SL3	Southland	2022	Farm 07	UNK	1a	41	1a (NZ1)
14	SL4	Southland	2022	Farm 07	UNK	1a	5	1a (NZ2)
15	OTP1	Otago	2022	Farm 04	UNK	1a	41	1a (NZ1)
16	OTP2	Otago	2022	Farm 04	UNK	1a	38	1a (NZ1)
17	OT1	Otago	2022	Farm 02	UNK	1a	41	1a (NZ1)
18	OT2	Otago	2022	Farm 03	UNK	1a	5	1a (NZ2)
19	OT3	Otago	2022	Farm 05	Beef	1a	38	1a (NZ2)
20	OT4	Otago	2022	Farm 05	Beef	1a	38	1a (NZ2)
21	OT5	Otago	2022	Farm 05	Beef	1a	38	1a (NZ2)
22	SLP1	Southland	2022	Farm 06	UNK	EXL		1a (NZ2)
23	SLP2	Southland	2022	Farm 07	UNK	1a	27	EXL
24	OTP3	Otago	2022	Farm 05	Beef	EXL		1a (NZ1)
25	Calf 47	Taranaki	1997	UNK	UNK	1a	5	1a (NZ2)
26	7923	Taranaki	1992	UNK	UNK	1c	50	1c
27	Bovax P1	Manawatū	1967	UNK	UNK	1a	51	1a (other)
28	20625-197	Manawatū	2020	Farm 16D	Dairy	1a	6	EXL
29	20625-275	Manawatū	2020	Farm 16D	Dairy	1a	7	Neg
30	9895-30-1	Auckland	2020	Farm 29D	Dairy	1a	3	EXL

## Supplementary Information

Sample No	Sample ID	Location	Year	Farm ID	Farm Type	5' UTR Type	5' UTR Hap	E2 clade
31	9895-87	Auckland	2020	Farm 29D	Dairy	1a	3	EXL
32	5757-955	Otago	2020	Farm 2D	Dairy	1a	5	EXL
33	5757-960	Otago	2020	Farm 2D	Dairy	1a	5	Neg
34	13078-7RIY	UNK	2020	UNK	UNK	1a	5	EXL
35	22906-101	UNK	2020	UNK	UNK	1a	5	EXL
36	2470-19/16	Manawatū	2020	Farm 17D	Dairy	1a	5	1a (NZ2)
37	2470-19/2	Manawatū	2020	Farm 17D	Dairy	1a	5	1a (NZ2)
38	15398-85	Waikato	2020	Farm 24D	Dairy	1a	28	EXL
39	16709-196	Southland	2020	Farm 5D	Dairy	1a	41	1a (NZ1)
40	23564-30	UNK	2020	UNK	UNK	1a	32	1a (NZ2)
41	23564-111	Waikato	2019	Farm 18R	Beef	EXL		NT
42	20696-106	Waikato	2020	Farm 27D	Dairy	1a	30	1a (NZ2)
43	21290-1100	Bay of Plenty	2020	Farm 32D	Dairy	1a	5	EXL
44	20203	Manawatū	2022	UNK	UNK	1a	5	1a (NZ2)
45	19408	Manawatū	2022	UNK	UNK	1a	5	1a (NZ2)
46	20901	Manawatū	2022	UNK	UNK	1a	12	1a (NZ2)
47	19991	Bay of Plenty	2022	UNK	UNK	1a	14	1a (NZ2)
48	20333	Taranaki	2022	UNK	UNK	1a	5	1a (NZ2)
49	13720	Waikato	2022	UNK	UNK	1a	11	1a (NZ2)
50	20901	Manawatū	2022	UNK	UNK	1a	5	Neg
51	Calf 1389	UNK	UNK	UNK	UNK	1a	5	EXL
52	15173-739	Waikato	2020	Farm 25D	Dairy	1a	5	EXL
53	23439-574	Waikato	2020	Farm 20D	Dairy	EXL		1a (NZ2)
54	9894-86	Auckland	2020	Farm 28D	Dairy	1a	5	EXL
55	9896-29	Auckland	2020	Farm 30D	Dairy	1a	3	Neg
56	9896-7	Auckland	2020	Farm 30D	Dairy	1a	3	EXL
57	9890-443	Otago	2020	Farm 4D	Dairy	1a	41	EXL
58	H1527-10	UNK	2022	UNK	UNK	1a	5	EXL
59	74	UNK	2022	UNK	UNK	1a	22	1a (NZ2)
60	76	UNK	2022	UNK	UNK	EXL		1a (NZ1)
61	118	UNK	2022	UNK	UNK	1a	47	EXL
62	232	UNK	2022	UNK	UNK	EXL		EXL
63	20580-205	UNK	2020	UNK	Dairy	1a	23	EXL
64	21182-17-50	Bay of Plenty	2020	Farm 31D	Dairy	1a	1	EXL
65	21379-189	Waikato	2020	Farm 19D	Dairy	1a	10	EXL
66	5757-Black	Otago	2020	Farm 3D	Dairy	1a	5	1a (NZ2)
67	QWVM 19.224	Canterbury	2020	Farm 6D	Dairy	1a	18	1a (NZ2)
68	QWYP19.320	Canterbury	2020	Farm 7D	Dairy	1a	42	1a (NZ1)
69	RENW19-252	Canterbury	2020	Farm 8D	Dairy	1a	5	1a (NZ2)
70	QWYP130	Canterbury	2020	Farm 9D	Dairy	1a	42	1a (NZ1)
71	JJNW104	Wellington	2020	Farm 11D	Dairy	1a	24	1a (NZ2)
72	11663-50	Manawatū	2020	Farm 13D	Dairy	1a	16	EXL
73	11868	Manawatū	2020	Farm 14D	Dairy	1a	19	1a (NZ2)
74	18498-C106	Canterbury	2020	Farm 10D	Dairy	1a	38	EXL
75	12658-A15864	Manawatū	2020	Farm 15D	Dairy	1a	8	1a (NZ2)
76	23564-419	Northland	2020	Farm 34D	Dairy	1a	33	EXL

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Sample No	Sample ID	Location	Year	Farm ID	Farm Type	5' UTR Type	5' UTR Hap	E2 clade
77	9894-27-1	UNK	2020	UNK	Dairy	1a	3	1a (NZ2)
78	17541-7BRT	UNK	2020	UNK	Dairy	1a	5	1a (NZ2)
79	28906-76	UNK	2020	UNK	Dairy	1a	7	1a (NZ2)
80	22461-R7	UNK	2020	UNK	Dairy	1a	26	1a (NZ2)
81	10166-79	UNK	2020	UNK	Dairy	1a	5	1a (NZ2)
82	11617-443	Otago	2020	Farm 4D	Dairy	1a	5	1a (NZ1)
83	16709-205	UNK	2020	UNK	Dairy	1a	41	EXL
84	14034-574	UNK	2020	UNK	Dairy	1a	5	EXL
85	22561-89	UNK	2020	UNK	Dairy	1a	5	EXL
86	21941-69	UNK	2020	UNK	Dairy	1a	10	EXL
87	19893-CBHC	UNK	2020	UNK	Dairy	1a	8	EXL
88	21622-27-2	UNK	2020	UNK	Dairy	1a	46	EXL
89	14075-57	UNK	2020	UNK	Dairy	1a	5	EXL
90	CA11	Canterbury	2022	Farm 09	Beef	1a	9	EXL
91	CA12	Canterbury	2022	Farm 09	Beef	1a	5	1a (NZ2)
92	CA13	Canterbury	2022	Farm 16	Diary	1a	39	Neg
93	CA14	Canterbury	2022	Farm 14	Beef	1a	5	EXL
94	CA15	Canterbury	2022	Farm 14	Beef	1a	5	1a (NZ2)
95	OT6	Otago	2022	Farm 08	UNK	1a	48	EXL
96	OTP4	Otago	2022	Farm 04	UNK	1a	41	1a (NZ1)
97	OTP5	Otago	2022	Farm 04	UNK	1a	41	EXL
98	OTP6	Otago	2022	Farm 04	UNK	EXL		1a (NZ1)
99	SL5	Southland	2022	Farm 10	Beef	1a	27	1a (NZ2)
100	SL6	Southland	2022	Farm 10	Beef	1a	27	1a (NZ2)
101	SL7	Southland	2022	Farm 10	Beef	1a	27	1a (NZ2)
102	SL8	Southland	2022	Farm 10	Beef	1a	27	1a (NZ2)
103	SL9	Southland	2022	Farm 11	UNK	1a	7	EXL
104	SL10	Southland	2022	Farm 11	UNK	1a	7	EXL
105	SL11	Southland	2022	Farm 11	UNK	1a	7	1a (NZ2)
106	SL12	Southland	2022	Farm 11	UNK	1a	7	1a (NZ2)
107	SL13	Southland	2022	Farm 12	Beef	1a	36	1a (NZ2)
108	SL14	Southland	2022	Farm 12	Beef	1a	35	1a (NZ2)
109	SL15	Southland	2022	Farm 12	Beef	1a	35	1a (NZ2)
110	SL16	Southland	2022	Farm 13	Beef	1a	4	1a (NZ2)
111	SL18	Southland	2022	Farm 17	Dairy	1a	44	1a (NZ1)
112	SL19	Southland	2022	Farm 18	Dairy	1a	41	EXL
113	SL20	Southland	2022	Farm 19	Dairy	1a	19	1a (NZ2)
114	SL21	Southland	2022	Farm 19	Dairy	1a	19	EXL
115	SL22	Southland	2022	Farm 19	Dairy	1a	5	Neg
116	SL23	Southland	2022	Farm 19	Dairy	1a	19	EXL
117	SL24	Southland	2022	Farm 19	Dairy	1a	19	1a (NZ2)
118	SL25	Southland	2022	Farm 19	Dairy	1a	19	EXL
119	SL26	Southland	2022	Farm 19	Dairy	1a	19	EXL
120	SL27	Southland	2022	Farm 20	Dairy	1a	40	EXL
121	SL28	Southland	2022	Farm 21	Dairy	EXL		1a (NZ2)
122	SL31	Southland	2022	Farm 24	Dairy	EXL		EXL

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Sample No	Sample ID	Location	Year	Farm ID	Farm Type	5' UTR Type	5' UTR Hap	E2 clade
123	CA16	Canterbury	2022	Farm 14	Beef	EXL		EXL
124	SL34	Southland	2022	Farm 28	Dairy	1a	44	1a (NZ1)
125	SL35	Southland	2022	Farm 29	Dairy	1a	5	1a (NZ2)
126	SL36	Southland	2022	Farm 30	Dairy	1a	19	1a (NZ2)
127	CA18	Canterbury	2022	UNK	UNK	1a	43	1a (NZ1)
128	14-173	Waikato	2020	Farm 21D	Dairy	EXL		NT
129	15-424	Otago	2020	Farm 1D	Dairy	1a	45	NT
130	17-Y39	Waikato	2020	Farm 26D	Dairy	1a	37	NT
131	18-111	Waikato	2020	Farm 22D	Dairy	1a	5	NT
132	1779	Waikato	2019	Farm 10R	Beef	1a	5	NT
133	2141	Waikato	2019	Farm 12R	Beef	1a	41	NT
134	2693	Waikato	2019	Farm 7R	Beef	1a	19	NT
135	6103	Northland	2019	Farm 4R	Beef	1a	17	NT
136	31	Manawatū	2019	Farm 31R	Beef	1a	43	NT
137	39	Waikato	2019	Farm 11R	Beef	1a	37	NT
138	17-17	Otago	2019	Farm 40R	Beef	1a	25	NT
139	18-127	Northland	2020	Farm 36D	Dairy	1a	20	NT
140	7778	Waikato	2019	Farm 6R	Beef	1a	29	NT
141	445	Waikato	2019	Farm 16R	Beef	1a	9	NT
142	7881	Manawatū	2019	Farm 33R	Beef	1a	7	NT
143	95	Manawatū	2019	Farm 25R	Beef	1c	49	NT
144	113	Manawatū	2019	Farm 25R	Beef	1c	49	NT
145	572	Manawatū	2019	Farm 24R	Beef	1c	49	NT
146	28326	UNK	UNK	UNK	UNK	1a	13	1a (NZ2)
147	CH4	Waikato	2019	Farm 8R	Beef	1a	31	NT
148	603	Otago	2019	Farm 34R	Beef	1a	15	NT
149	114	Manawatū	2019	Farm 24R	Beef	1c	49	NT
150	142	Northland	2019	Farm 1R	Beef	1a	5	NT
151	176	Northland	2019	Farm 1R	Beef	EXL		NT
152	744	Northland	2019	Farm 3R	Beef	1a	17	NT
153	6075	Manawatū	2019	Farm 27R	Beef	1a	5	NT
154	748	Manawatū	2019	Farm 28R	Beef	1a	34	NT
155	370	Otago	2020	Farm 2D	Dairy	1a	5	NT
156	374	Otago	2020	Farm 2D	Dairy	1a	5	NT
157	381	Otago	2020	Farm 2D	Dairy	1a	5	NT
158	475	Otago	2020	Farm 2D	Dairy	1a	5	NT
159	28-373	Manawatū	2020	Farm 18D	Dairy	1a	21	NT
160	911	Otago	2020	Farm 2D	Dairy	1a	5	NT
161	HW7	Bay of Plenty	2019	Farm 19R	Beef	1a	2	NT
162	N127	Northland	2019	Farm 2R	Beef	1a	20	NT
163	354	Otago	2019	Farm 38R	Beef	EXL		NT

Abbreviations: EXL = positive but excluded from the analyses either due to poor-quality sequence or poor amplification with only a weak band of the correct size; Neg = negative; NT = not tested; UNK = unknown

**Table S2. Distribution of samples across regions and years. The number of cattle in each region was obtained from Stats New Zealand (<https://www.stats.govt.nz/indicators/livestock-numbers>).**

Region	Number of samples	Number of 5' UTR sequences	Number of E2 sequences	Cattle numbers 2019
Auckland	5	5	0	241,683
2020	5	5	0	
Bay of Plenty	4	4	1	424,435
2019	1	1	0	
2020	2	2	0	
2022	1	1	1	
Canterbury	22	21	16	1,737,163
2020	5	5	4	
2022	17	16	12	
Manawatū	21	21	8	1,042,515
1967	1	1	1	
2019	8	8	0	
2020	8	8	4	
2022	4	4	3	
Northland	7	6	0	716,857
2019	5	4	0	
2020	2	2	0	
Otago	26	23	12	678,071
2019	3	2	0	
2020	11	11	2	
2022	12	10	10	
Southland	34	30	23	827,744
2020	1	1	1	
2022	33	29	22	
Taranaki	3	3	3	712,178
1992	1	1	1	
1997	1	1	1	
2022	1	1	1	
Waikato	17	14	3	2,369,884
2019	8	7	0	
2020	8	6	2	
2022	1	1	1	
Wellington	1	1	1	232,755
2020	1	1	1	
Unknown	23	21	9	
2020	16	16	6	
2022	5	3	2	
Unknown	2	2	1	
Grand total	163	149	76	10,150,891

**Table S3. Number of samples with specified bovine viral diarrhoea virus 5' UTR haplotypes (Hap) detected on farms in New Zealand for which at least two samples were sequenced, categorised by whether single or multiple haplotypes were identified.**

Farm ID	N	Hap 1	Hap 3	Hap 5	Hap 6	Hap 7	Hap 9	Hap 19	Hap 27	Hap 35	Hap 36	Hap 38	Hap 41	Hap 49
Multiple haplotypes														
Farm 04	4											1	3	
Farm 07	3			1					1				1	
Farm 09	2			1			1							
Farm 12	3									2	1			
Farm 19	7			1				6						
Farm 31D	2	1		1										
Farm 4D	2			1									1	
Farm 16D	2				1	1								
Single haplotype														
Farm 01	10											10		
Farm 05	3											3		
Farm 10	4								4					
Farm 11	4					4								
Farm 14	2			2										
Farm 17D	2			2										
Farm 24R	2													2
Farm 25R	2													2
Farm 29D	2		2											
Farm 2D	7			7										
Farm 30D	2		2											