

Supplementary material

Supplementary Table 1a. VNT titres against A₂₂/IRQ/64 vaccine strain in vaccinated and unvaccinated cattle in the full dose protection test (animal numbers in bold indicate cattle with clear or doubtful foot lesions).

Groups	Animal	Days post challenge															
		-21	-18	-14	-11	-7	-4	0	1	2	3	4	5	6	7	8	
A ₂₂ /IRQ/64	1227	<0.3	<0.3	1.20	1.80	2.10	2.10	2.10	2.10	2.10	2.25	2.40	2.40	>2.7	>2.7	>2.7	
	1228	<0.3	<0.3	1.65	2.40	2.10	2.10	2.10	2.10	2.10	2.25	2.40	2.40	>2.7	>2.7	>2.7	
	1229	<0.3	<0.3	1.35	2.10	1.95	1.95	2.25	2.10	2.25	2.40	2.40	2.40	>2.7	>2.7	>2.7	
	1230	<0.3	<0.3	1.05	2.10	2.10	1.80	2.10	1.95	2.10	2.25	2.40	2.55	>2.7	>2.7	>2.7	
	1231	<0.3	<0.3	1.50	1.95	2.10	1.80	2.10	1.95	1.95	2.25	2.10	2.25	>2.7	>2.7	>2.7	
	1232	<0.3	<0.3	1.50	2.10	1.80	2.10	2.25	2.10	2.10	2.10	2.10	2.40	>2.7	>2.7	>2.7	
	1233	<0.3	<0.3	1.35	1.35	1.50	1.65	1.65	1.50	1.65	1.65	1.65	1.80	2.40	>2.7	>2.7	>2.7
	A/MAY/97	1234	<0.3	<0.3	<0.6	<0.6	<0.6	0.60	0.60	0.75	0.90	0.90	1.05	1.80	1.50	1.95	1.80
1235		<0.3	<0.3	0.60	0.90	0.90	0.90	0.60	0.90	0.90	0.90	0.90	2.10	1.95	2.10	2.25	
1236		0.45	<0.3	<0.6	0.75	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1.50	1.80	2.40	2.40	
1237		<0.3	<0.3	<0.6	0.75	<0.6	<0.6	0.60	0.75	0.75	0.75	0.90	1.80	1.65	1.80	1.80	
1238		0.30	<0.3	<0.6	0.75	0.75	1.05	0.90	0.90	0.90	0.90	0.90	1.80	1.65	1.95	1.80	
1239		<0.3	<0.3	0.60	0.90	0.60	0.60	0.60	0.60	0.90	0.90	0.75	1.50	1.65	1.80	2.10	
1240		<0.3	<0.3	<0.6	0.60	0.60	0.60	0.90	0.90	0.90	1.20	0.90	1.50	1.80	1.95	1.80	
Unvaccinated Controls		1241						<0.6	<0.6	0.60	<0.6	<0.6	1.80	1.65	1.65	1.50	
	1242						<0.6	<0.6	<0.6	<0.6	<0.6	1.50	1.50	1.65	1.50		
	1243						<0.6	<0.6	0.60	<0.6	<0.6	1.50	1.65	1.50	1.50		

Supplementary Table 1b. VNT titres against A/MAY/97 vaccine strain in vaccinated and unvaccinated cattle in the full dose protection test

Groups	Animal	Days post challenge															
		-21	-18	-14	-11	-7	-4	0	1	2	3	4	5	6	7	8	
A ₂₂ /IRQ/64	1227	<0.3	<0.3	0.60	0.75	0.60	1.20	0.75	0.90	1.20	1.05	1.20	2.25	2.70	>2.7	>2.7	
	1228	<0.3	<0.3	1.05	1.35	1.20	0.75	0.90	0.75	1.20	1.20	1.20	2.40	>2.7	>2.7	>2.7	
	1229	0.30	<0.3	<0.6	1.50	1.20	1.35	1.35	1.20	1.20	1.35	1.20	2.55	2.55	>2.7	>2.7	
	1230	0.30	<0.3	0.60	1.05	0.75	0.90	0.60	0.60	0.60	1.05	1.35	2.55	>2.7	>2.7	>2.7	
	1231	<0.3	<0.3	0.60	1.80	1.50	1.20	1.05	0.90	1.05	1.20	1.05	1.65	2.70	>2.7	>2.7	
	1232	<0.3	<0.3	0.90	1.05	1.20	1.20	0.75	0.90	1.05	1.05	1.20	1.65	2.70	2.70	>2.7	
	1233	<0.3	<0.3	0.60	1.05	0.75	0.90	<0.6	0.60	0.60	<0.6	0.75	1.80	2.70	2.70	>2.7	
	1234	<0.3	<0.3	1.80	1.80	1.80	1.80	2.10	1.80	2.25	1.95	2.40	2.55	>2.7	2.70	>2.7	
A/MAY/97	1235	<0.3	<0.3	1.80	2.25	2.25	2.40	2.40	2.40	2.40	2.55	2.55	2.70	>2.7	>2.7	>2.7	
	1236	0.30	<0.3	1.05	1.50	1.65	1.65	1.80	1.80	1.80	1.80	1.80	2.40	>2.7	>2.7	>2.7	
	1237	<0.3	<0.3	1.05	1.65	1.50	1.50	2.10	2.10	2.40	2.40	2.40	2.70	>2.7	2.70	>2.7	
	1238	0.30	<0.3	1.20	2.10	2.10	1.95	2.40	2.25	2.40	2.40	2.55	2.70	>2.7	>2.7	>2.7	
	1239	<0.3	<0.3	1.20	1.65	1.80	1.80	1.95	1.80	2.40	2.55	2.40	2.70	2.70	2.70	>2.7	
	1240	<0.3	<0.3	1.20	1.80	2.10	1.95	1.95	1.95	2.25	2.40	2.55	>2.7	2.70	>2.7	>2.7	
	1241							<0.6	<0.6	0.90	0.60	0.75	1.50	1.80	1.80	1.95	
Unvaccinated Controls	1242							<0.6	<0.6	0.60	0.75	0.60	1.20	1.80	1.50	2.10	
	1243							<0.6	<0.6	0.90	0.75	0.60	1.20	1.50	1.65	1.80	

Supplementary Table 1c. VNT titres against A/IRN/22/2015 challenge strain in vaccinated and unvaccinated cattle in the full dose protection test (animal numbers in bold indicate cattle with clear or doubtful foot lesions).

Groups	Animal	Days post challenge														
		-21	-18	-14	-11	-7	-4	0	1	2	3	4	5	6	7	8
A ₂₂ /IRQ/64	1227	0.75	<0.3	1.35	1.95	1.95	1.80	1.20	1.50	1.65	2.10	1.95	2.70	>2.7	>2.7	>2.7
	1228	<0.3	<0.3	1.65	2.25	1.95	1.80	1.05	1.50	1.65	1.65	2.10	2.70	>2.7	>2.7	>2.7
	1229	0.75	<0.3	1.35	1.95	1.65	1.50	1.50	1.65	1.50	1.95	2.10	2.70	>2.7	>2.7	>2.7
	1230	0.90	<0.3	1.20	2.10	1.95	1.65	1.50	1.35	1.50	1.50	2.10	2.70	>2.7	>2.7	>2.7
	1231	<0.3	<0.3	1.80	2.40	1.95	1.95	1.05	1.50	1.35	1.50	1.65	2.10	>2.7	>2.7	>2.7
	1232	<0.3	<0.3	1.50	2.10	2.10	1.80	1.20	1.65	1.65	1.95	2.25	2.70	>2.7	>2.7	>2.7
	1233	<0.3	<0.3	1.20	1.65	1.50	1.20	0.60	0.90	1.05	1.35	1.80	2.70	>2.7	>2.7	>2.7
A/MAY/97	1234	<0.3	0.90	2.40	2.10	1.95	1.80	1.95	2.25	2.40	2.55	2.70	2.55	>2.7	>2.7	>2.7
	1235	<0.3	<0.3	1.80	2.70	2.40	2.10	1.95	2.40	2.10	2.25	2.40	2.70	>2.7	>2.7	>2.7
	1236	1.20	<0.3	1.50	2.25	2.25	2.70	2.10	2.40	2.55	2.40	2.70	2.70	>2.7	>2.7	>2.7
	1237	<0.3	<0.3	1.35	1.50	1.50	1.20	2.10	2.10	2.70	2.70	2.70	2.70	>2.7	>2.7	>2.7
	1238	1.05	<0.3	1.35	2.25	2.10	2.10	2.10	2.25	2.55	2.70	2.70	2.70	>2.7	>2.7	>2.7
	1239	0.30	0.45	1.50	1.65	1.50	1.20	1.50	1.50	1.65	1.65	1.65	2.70	>2.7	>2.7	>2.7
	1240	<0.3	<0.3	1.65	2.25	1.95	1.35	1.80	1.80	1.95	1.80	2.10	2.70	>2.7	>2.7	>2.7
Unvaccinated Controls	1241							<0.6	<0.6	1.35	0.90	1.65	2.70	>2.7	>2.7	>2.7
	1242							<0.6	<0.6	0.75	0.75	1.20	2.25	>2.7	>2.7	>2.7
	1243							<0.6	<0.6	1.35	0.75	1.65	2.10	>2.7	>2.7	>2.7

Supplementary Table 2. Results of virus isolation and titration (VI; log₁₀ PFU/ml) and viral RNA detected by real-time PCR (PCR; C_p values) from serum of vaccinated and unvaccinated cattle in in the full dose protection test with A₂₂/IRQ/64 and A/MAY/97 vaccines (animal numbers in bold indicate cattle with clear or doubtful foot lesions).

Groups	Animal		0 DPC	1 DPC	2 DPC	3 DPC	4 DPC	5 DPC	6 DPC	7 DPC	8 DPC
A ₂₂ /IRQ/64	1227	PCR	-	33.08	31.67	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1228	PCR	-	32.68	31.87	32.16	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1229	PCR	-	-	-	32.49	31.57	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1230	PCR	-	32.73	-	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1231	PCR	-	-	32.23	-	31.77	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1232	PCR	-	32.76	32.08	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1233	PCR	-	31.50	31.98	31.11	31.68	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
A/MAY/97	1234	PCR	-	-	-	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1235	PCR	-	-	-	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1236	PCR	-	-	-	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1237	PCR	-	-	32.14	-	31.78	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1238	PCR	-	-	-	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1239	PCR	-	-	-	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
	1240	PCR	-	-	-	-	-	-	-	-	-
		VI	-	-	-	-	-	-	-	-	-
Unvaccinated Controls	1241	PCR	-	21.92	20.71	22.64	29.54	31.73	-	-	-
		VI	-	3.33	3.31	2.74	-	-	-	-	-
	1242	PCR	-	24.21	18.95	19.38	24.66	-	-	-	-
		VI	-	2.60	3.41	3.03	-	-	-	-	-
	1243	PCR	-	20.01	19.50	20.90	29.88	31.80	-	-	-
		VI	-	3.77	2.94	2.61	-	-	-	-	-

Supplementary Table 3. Results of virus isolation and titration (VI; log₁₀ PFU/ml) and viral RNA detected by real-time PCR (PCR; C_p values) from nose swabs of vaccinated and unvaccinated cattle in the full dose protection test with A₂₂/IRQ/64 and A/MAY/97 vaccines (animal numbers in bold indicate cattle with clear or doubtful foot lesions).

Groups	Animal		0 DPC	1 DPC	2 DPC	3 DPC	4 DPC	5 DPC	6 DPC	7 DPC	8 DPC
A ₂₂ /IRQ/64	1227	PCR	-	-	28.84	27.66	32.13	31.94	31.69	-	-
		VI	-	-	-	-	-	-	-	-	-
	1228	PCR	-	25.63	29.66	25.72	31.09	30.99	32.67	32.46	31.83
		VI	-	2.64	1.90	-	-	-	-	-	-
	1229	PCR	-	31.97	24.93	30.46	31.63	31.74	31.67	-	31.74
		VI	-	-	2.14	1.18	-	-	-	-	-
	1230	PCR	-	-	29.80	29.90	30.32	30.17	31.70	32.57	32.42
		VI	-	-	1.24	0.70	-	-	-	-	-
	1231	PCR	-	31.71	21.57	28.16	26.91	29.27	29.91	28.23	31.48
		VI	-	1.00	3.25	2.18	2.49	1.00	-	-	-
	1232	PCR	-	32.25	29.46	29.90	28.29	30.56	31.83	33.43	-
		VI	-	-	0.88	-	1.70	-	-	-	-
	1233	PCR	-	31.92	29.11	26.99	23.43	18.87	30.73	18.70	-
		VI	-	1.00	2.42	-	2.61	1.88	-	-	-
A/MAY/97	1234	PCR	-	31.99	28.05	31.25	29.23	29.76	31.82	-	-
		VI	-	-	1.24	-	1.10	-	-	-	-
	1235	PCR	-	32.80	29.61	30.65	30.60	30.71	32.11	-	-
		VI	-	-	1.44	1.35	0.40	-	-	-	-
	1236	PCR	-	31.78	30.54	31.81	31.69	33.05	32.01	-	-
		VI	-	-	-	-	0.40	-	-	-	-
	1237	PCR	-	32.09	31.07	30.26	31.75	32.10	32.23	31.82	-
		VI	-	-	0.40	-	-	-	-	-	-
	1238	PCR	-	-	31.00	-	32.14	32.20	-	-	-
		VI	-	-	0.40	-	-	-	-	-	-
	1239	PCR	-	-	31.32	31.59	30.00	31.75	31.71	28.56	-
		VI	-	-	0.70	-	1.65	-	-	-	-
	1240	PCR	-	-	30.45	31.25	29.88	28.29	30.11	-	-
		VI	-	-	0.88	0.40	0.88	1.76	-	-	-
Unvaccinated Controls	1241	PCR	-	31.72	21.59	18.20	24.07	18.07	31.07	32.62	30.84
		VI	-	-	3.45	2.80	2.99	3.05	-	-	-
	1242	PCR	-	30.43	20.45	24.68	24.30	25.10	30.23	30.18	31.82
		VI	-	1.54	3.74	2.55	2.60	2.12	1.00	-	-
	1243	PCR	-	-	20.89	24.76	17.72	19.71	26.93	27.44	31.70
		VI	-	-	3.79	2.23	3.35	3.10	1.44	-	-

Supplementary Table 4. Results of virus isolation and titration (VI; log₁₀ PFU/ml) and viral RNA detected by real-time PCR (PCR; C_p values) from mouth swabs of vaccinated and unvaccinated cattle in the full dose protection test with A₂₂/IRQ/64 and A/MAY/97 vaccines (animal numbers in bold indicate cattle with clear or doubtful foot lesions).

Groups	Animal		0 DPC	1 DPC	2 DPC	3 DPC	4 DPC	5 DPC	6 DPC	7 DPC	8 DPC	
A ₂₂ /IRQ/64	1227	PCR	-	14.04	14.86	14.67	20.69	16.85	24.16	-	-	
		VI	-	6.13	5.00	3.70	2.61	3.96	1.63	-	-	
	1228	PCR	-	10.57	10.83	16.74	19.56	19.89	28.89	30.20	26.39	
		VI	-	6.79	6.22	3.86	3.36	2.30	-	-	-	
	1229	PCR	-	9.34	16.56	18.27	15.90	16.01	18.16	23.04	27.44	
		VI	-	7.44	3.44	3.54	4.48	3.55	2.00	-	-	
	1230	PCR	-	31.84	10.50	15.13	23.72	21.02	20.53	27.46	27.96	
		VI	-	-	5.49	4.00	2.10	1.68	-	-	-	
	1231	PCR	-	21.82	15.61	17.66	17.06	16.12	18.76	25.83	29.09	
		VI	-	5.23	5.22	4.40	4.50	4.13	4.23	-	-	
	1232	PCR	-	13.52	8.15	23.08	14.23	11.87	22.56	30.86	-	
		VI	-	6.56	7.93	4.10	5.48	5.14	1.57	-	-	
	1233	PCR	-	8.86	14.96	16.67	18.90	23.56	27.71	27.29	31.82	
		VI	-	6.72	4.64	3.88	2.96	2.01	-	-	-	
	A/MAY/97	1234	PCR	-	24.45	17.69	20.71	28.42	29.18	31.80	31.74	-
			VI	-	2.78	4.44	4.10	2.06	1.51	-	-	-
1235		PCR	-	30.63	11.64	11.90	16.90	15.62	18.58	29.63	31.77	
		VI	-	1.24	5.90	5.83	4.48	3.97	2.24	-	-	
1236		PCR	-	27.14	16.49	23.53	17.05	28.56	30.52	32.14	-	
		VI	-	2.64	4.47	1.30	4.90	0.40	0.70	-	-	
1237		PCR	-	25.81	9.77	17.79	13.00	17.98	19.53	24.67	31.73	
		VI	-	2.68	6.60	4.35	6.06	3.07	2.28	-	-	
1238		PCR	-	25.68	17.51	27.59	30.86	29.96	-	-	-	
		VI	-	2.48	4.53	1.48	1.22	1.00	-	-	-	
1239		PCR	-	20.92	10.87	17.66	20.79	22.72	27.62	29.56	30.68	
		VI	-	3.25	6.65	4.18	2.00	2.57	1.78	-	-	
1240		PCR	-	11.46	8.62	19.92	20.02	15.16	22.44	27.63	31.83	
		VI	-	6.47	7.53	3.13	3.54	4.66	-	-	-	
Unvaccinated Controls		1241	PCR	-	30.52	15.83	19.61	19.01	18.58	22.47	21.49	22.60
			VI	-	2.71	4.53	3.35	2.80	3.04	2.67	2.08	1.51
	1242	PCR	-	23.47	12.41	15.96	20.21	14.03	25.30	24.70	21.66	
		VI	-	2.89	5.04	2.92	3.40	4.61	2.12	1.54	0.88	
	1243	PCR	-	26.80	12.59	17.33	18.08	18.09	18.71	18.93	20.64	
		VI	-	2.60	4.68	2.66	3.43	3.51	3.60	1.40	0.88	

Supplementary Table 5a. VNT titres against A/MAY/97 vaccine strain in vaccinated and unvaccinated cattle in the heterologous potency test (animal numbers in bold indicate cattle with foot lesions).

Groups	Animal	Days post challenge											
		-21	-14	-7	0	1	2	3	4	5	6	7	8
Full Dose (2ml)	1566	<0.3	1.20	1.65	2.10	2.10	2.25	2.40	2.25	>2.4	>2.4	>2.4	>2.4
	1567	<0.3	1.05	2.25	2.25	2.40	2.40	2.40	2.40	>2.4	>2.4	>2.4	>2.4
	1568	<0.3	1.05	1.50	2.40	2.40	2.40	2.40	2.25	>2.4	>2.4	>2.4	>2.4
	1569	<0.3	1.50	1.80	2.10	2.40	2.40	2.40	2.40	>2.4	>2.4	>2.4	>2.4
	1570	<0.3	0.90	1.95	2.25	2.40	2.40	2.40	2.40	>2.4	>2.4	>2.4	>2.4
1/3 Dose (0.66 ml)	1571	<0.3	0.90	1.65	2.10	2.10	2.40	2.40	2.40	>2.4	>2.4	>2.4	>2.4
	1572	<0.3	1.05	1.65	2.25	2.10	2.40	2.25	2.25	>2.4	>2.4	>2.4	>2.4
	1573	<0.3	0.90	1.80	2.40	2.40	2.40	2.40	2.40	>2.4	>2.4	>2.4	>2.4
	1574	<0.3	0.30	0.90	1.50	1.80	2.40	1.95	1.95	>2.4	>2.4	>2.4	>2.4
	1575	<0.3	0.60	2.10	2.10	2.10	2.10	1.80	2.40	>2.4	>2.4	>2.4	>2.4
1/9 Dose (0.22ml)	1576	<0.3	0.75	1.20	1.65	1.65	1.65	1.50	1.80	>2.4	>2.4	>2.4	>2.4
	1577	<0.3	1.05	1.50	1.65	1.50	2.25	1.65	1.95	>2.4	>2.4	>2.4	>2.4
	1578	<0.3	0.45	0.75	1.20	1.80	1.95	1.80	1.80	>2.4	>2.4	>2.4	>2.4
	1579	<0.3	0.30	<0.3	1.05	1.50	1.50	1.20	1.80	>2.4	>2.4	>2.4	>2.4
	1580	<0.3	0.30	0.75	1.20	1.35	1.35	1.05	1.65	>2.4	>2.4	>2.4	>2.4
Unvaccinated Controls	1581			<0.3	<0.3	0.30	1.05	<0.3	0.90	1.65	2.10	2.10	
	1582			<0.3	0.30	0.30	0.75	<0.3	0.90	1.65	1.80	1.95	2.10
	1583			<0.3	<0.3	0.30	1.35	<0.3	1.05	1.35	1.95	2.10	2.25

Supplementary Table 5b. VNT titres against A/IRN/22/2015 in vaccinated and unvaccinated cattle in the heterologous potency test vaccines (animal numbers in bold indicate cattle with foot lesions).

Groups	Animal	Days post challenge											
		-21	-14	-7	0	1	2	3	4	5	6	7	8
Full Dose (2ml)	1566	<0.3	0.60	1.05	1.20	1.05	1.05	1.50	1.35	1.95	2.10	>2.4	>2.4
	1567	<0.3	0.45	1.35	1.50	1.05	1.35	1.80	1.95	>2.4	>2.4	>2.4	>2.4
	1568	<0.3	0.90	0.75	1.20	1.20	1.20	1.35	1.35	>2.4	>2.4	>2.4	>2.4
	1569	<0.3	1.65	1.80	1.65	1.65	1.65	1.65	1.80	2.25	2.25	>2.4	>2.4
	1570	<0.3	0.30	1.20	1.35	1.35	1.65	2.10	1.95	>2.4	>2.4	>2.4	>2.4
1/3 Dose (0.66 ml)	1571	<0.3	0.30	0.90	1.35	1.20	1.35	1.50	1.50	2.25	>2.4	>2.4	>2.4
	1572	<0.3	1.20	0.90	1.05	1.05	1.20	1.20	1.80	>2.4	>2.4	>2.4	>2.4
	1573	<0.3	0.45	1.80	1.65	1.50	1.95	1.65	2.25	>2.4	>2.4	>2.4	>2.4
	1574	<0.3	<0.3	0.45	0.75	0.75	0.90	0.90	1.65	2.25	>2.4	>2.4	>2.4
	1575	<0.3	<0.3	0.60	0.60	0.75	1.05	0.75	1.50	>2.4	>2.4	>2.4	>2.4
1/9 Dose (0.22ml)	1576	<0.3	0.30	1.05	0.90	0.60	0.90	0.75	0.90	1.50	>2.4	>2.4	>2.4
	1577	<0.3	0.60	1.05	1.20	1.05	1.05	1.35	1.35	1.50	>2.4	>2.4	>2.4
	1578	<0.3	<0.3	<0.3	0.75	1.05	1.20	1.20	1.05	1.80	2.25	>2.4	>2.4
	1579	<0.3	<0.3	<0.3	0.30	0.90	1.35	0.75	1.35	1.95	2.25	>2.4	>2.4
	1580	<0.3	0.30	0.45	0.30	0.45	0.90	0.30	0.90	1.80	>2.4	>2.4	>2.4
Unvaccinated Controls	1581				<0.3	0.30	1.05	0.30	0.75	1.50	2.25	>2.4	>2.4
	1582				<0.3	0.30	0.90	0.30	1.35	1.80	2.25	>2.4	>2.4
	1583				<0.3	0.30	1.05	0.45	1.35	1.80	>2.4	>2.4	>2.4

Supplementary Table 6. Results of virus isolation and titration (VI; log₁₀ PFU/ml) and viral RNA detected by real-time PCR (PCR; C_p values) from serum of vaccinated and unvaccinated cattle in the heterologous potency test vaccines (animal numbers in bold indicate cattle with foot lesions).

Group	Animal		0 DPC	1 DPC	2 DPC	3 DPC	4 DPC	5 DPC	6 DPC	7 DPC	8 DPC	
Full dose (2 ml)	1566	PCR	-	-	-	-	32.37	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	1567	PCR	-	-	-	-	32.24	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	1568	PCR	-	-	-	-	-	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	1569	PCR	-	-	-	31.92	-	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	1570	PCR	-	-	-	32.02	32.45	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	1/3 dose (0.66 ml)	1571	PCR	-	-	30.29	-	-	-	-	-	-
			VI	-	-	-	-	-	-	-	-	-
1572		PCR	-	-	29.87	32.03	-	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
1573		PCR	-	-	-	-	-	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
1574		PCR	-	-	-	32.09	-	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
1575		PCR	-	-	-	30.83	-	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
1/9 dose (0.22 ml)		1576	PCR	-	31.56	29.53	28.68	31.73	-	-	-	-
			VI	-	-	-	-	-	-	-	-	-
	1577	PCR	-	-	-	32.55	31.94	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	1578	PCR	-	-	-	-	-	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	1579	PCR	-	28.66	30.81	29.81	29.72	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	1580	PCR	-	30.81	30.40	26.93	30.96	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
	Unvaccinated Controls	1581	PCR	-	17.1	14.79	14.56	25.5	-	-	-	†
			VI	-	>10.00	>10.00	>10.00	-	-	-	-	-
1582		PCR	-	19.68	17.70	19.47	29.00	31.94	-	-	-	
		VI	-	>10.00	>10.00	>10.00	-	-	-	-	-	
1583		PCR	-	17.86	19.46	18.80	29.18	-	-	-	-	
		VI	-	>10.00	>10.00	>10.00	-	-	-	-	-	

Supplementary Table 7. Results of virus isolation and titration (VI; log₁₀ PFU/ml) and viral RNA detected by real-time PCR (PCR; Cp values) from nose swabs of vaccinated and unvaccinated cattle in the heterologous potency test vaccines (animal numbers in bold indicate cattle with foot lesions).

Group	Animal		0 DPC	1 DPC	2 DPC	3 DPC	4 DPC	5 DPC	6 DPC	7 DPC	8 DPC	
Full dose (2 ml)	1566	PCR	-	9.45	12.75	14.53	15.68	19.22	21.76	31.10	27.85	
		VI	-	7.68	6.80	6.00	4.70	3.13	3.24	-	-	
	1567	PCR	-	11.60	13.64	21.81	20.45	23.24	25.50	32.32	-	
		VI	-	7.44	5.83	2.40	3.35	3.00	0.40	0.40	-	
	1568	PCR	-	14.75	14.85	20.42	20.99	31.74	32.09	32.32	-	
		VI	-	5.24	5.24	3.10	3.13	-	-	-	-	
	1569	PCR	-	8.13	16.76	17.59	16.90	23.59	27.09	30.00	31.43	
		VI	-	8.28	4.01	4.96	3.74	3.13	1.74	-	-	
	1570	PCR	-	8.01	17.04	16.89	19.80	22.64	28.20	32.60	-	
		VI	-	7.04	3.94	6.64	7.57	2.51	-	-	-	
	1/3 dose (0.66 ml)	1571	PCR	-	6.00	13.46	18.44	11.74	22.53	21.21	25.88	31.25
			VI	-	8.00	5.30	3.11	7.39	-	1.54	-	-
1572		PCR	-	8.01	16.93	14.06	19.95	23.39	24.52	29.70	31.23	
		VI	-	7.93	3.92	5.09	4.24	2.17	-	-	-	
1573		PCR	-	30.00	16.60	17.32	20.74	29.25	32.47	-	-	
		VI	-	1.10	5.00	3.26	2.70	0.40	-	-	-	
1574		PCR	-	7.56	13.90	18.06	19.87	23.83	31.73	-	-	
		VI	-	7.08	4.83	3.68	4.13	2.40	-	-	-	
1575		PCR	-	8.86	9.58	9.56	21.80	22.84	26.47	30.45	31.56	
		VI	-	7.07	6.35	7.07	5.18	2.10	0.88	0.40	-	
1/9 dose (0.22 ml)		1576	PCR	-	18.54	9.92	17.48	17.55	25.16	31.07	32.71	33.84
			VI	-	4.05	6.16	5.10	5.95	3.10	0.70	-	-
	1577	PCR	-	7.47	10.27	17.98	15.08	20.07	21.11	24.70	28.91	
		VI	-	7.51	6.89	5.10	6.10	2.70	2.70	1.00	-	
	1578	PCR	-	11.76	13.67	19.57	20.75	21.79	25.00	21.24	32.55	
		VI	-	6.38	5.31	3.11	2.88	3.00	-	-	-	
	1579	PCR	-	9.94	11.56	18.72	19.73	25.70	31.75	32.55	34.12	
		VI	-	6.95	6.04	3.44	3.26	1.86	-	-	-	
	1580	PCR	-	6.93	16.96	19.23	18.91	26.16	30.87	32.26	33.78	
		VI	-	7.44	3.89	3.48	3.92	2.02	0.70	-	-	
	Unvaccinated Controls	1581	PCR	-	9.56	12.85	16.56	15.21	19.99	24.55	29.68	+
			VI	-	6.72	4.32	4.94	5.24	3.98	2.55	1.63	
1582		PCR	-	8.09	13.87	17.64	19.94	22.62	25.84	28.75	27.24	
		VI	-	7.13	3.89	3.77	3.76	3.00	1.54	-	-	
1583		PCR	-	20.81	14.25	17.72	18.03	23.80	29.50	27.02	27.71	
		VI	-	3.68	4.88	3.88	3.90	2.15	0.70	0.40	-	

Supplementary Table 8. Results of virus isolation and titration (VI; log₁₀ PFU/ml) and viral RNA detected by real-time PCR (PCR; Cp values) from mouth swabs of vaccinated and unvaccinated cattle in the heterologous potency test vaccines (animal numbers in bold indicate cattle with foot lesions).

Group	Animal		0 DPC	1 DPC	2 DPC	3 DPC	4 DPC	5 DPC	6 DPC	7 DPC	8 DPC	
Full dose (2 ml)	1566	PCR	-	25.61	30.58	30.83	29.90	30.46	31.89	-	-	
		VI	-	2.69	1.51	1.81	0.88	0.40	-	-	-	
	1567	PCR	-	31.18	29.65	30.59	31.72	32.02	32.39	-	33.76	
		VI	-	0.40	1.10	0.40	-	-	-	-	-	
	1568	PCR	-	29.32	29.91	30.46	29.65	29.81	31.70	-	-	
		VI	-	1.00	1.86	-	-	0.88	-	-	-	
	1569	PCR	-	-	-	31.39	31.74	32.08	-	-	-	
		VI	-	-	-	-	0.70	-	-	-	-	
	1570	PCR	-	29.00	-	31.17	32.07	31.80	-	-	-	
		VI	-	0.88	-	-	-	-	-	-	-	
	1/3 dose (0.66 ml)	1571	PCR	-	30.93	31.21	31.23	30.52	31.63	32.61	32.45	-
			VI	-	0.88	-	-	-	-	-	0.40	-
1572		PCR	-	30.94	31.38	24.87	29.22	30.60	31.74	32.59	-	
		VI	-	-	-	2.56	1.00	-	-	-	-	
1573		PCR	-	-	31.22	31.75	30.20	-	-	-	-	
		VI	-	-	-	-	-	-	-	-	-	
1574		PCR	-	24.68	30.80	29.84	31.45	31.59	-	-	-	
		VI	-	3.30	-	0.70	-	-	-	-	-	
1575		PCR	-	30.04	31.11	31.29	30.99	31.85	31.87	32.72	33.46	
		VI	-	1.00	1.00	0.40	0.40	-	-	-	-	
1/9 dose (0.22 ml)		1576	PCR	-	30.41	31.22	31.66	31.42	-	31.94	-	32.04
			VI	-	0.88	-	-	0.70	-	-	-	-
	1577	PCR	-	-	-	31.45	31.63	30.78	-	32.58	-	
		VI	-	0.40	-	-	-	-	-	-	-	
	1578	PCR	-	-	23.70	29.89	32.00	31.48	-	-	-	
		VI	-	-	1.93	1.57	-	0.40	-	-	-	
	1579	PCR	-	30.92	24.19	29.26	30.01	29.27	30.88	32.73	-	
		VI	-	2.10	3.20	1.40	1.70	0.40	-	-	-	
	1580	PCR	-	-	24.45	31.84	29.22	31.74	32.40	-	-	
		VI	-	-	3.61	0.70	2.06	-	-	-	-	
	Unvaccinated Controls	1581	PCR	-	27.64	19.44	19.36	18.19	27.58	28.17	30.50	†
			VI	-	2.79	3.69	4.72	4.65	1.44	0.40	-	-
1582		PCR	-	31.06	21.55	23.46	21.63	26.62	25.99	29.58	29.04	
		VI	-	1.35	3.49	3.02	3.91	2.10	1.00	-	-	
1583	PCR	-	29.72	26.13	26.44	21.20	28.00	31.84	-	-		

Supplementary Table 9a. Percentage inhibition in the Priocheck NS ELISA in the full dose protection test. Positive values above 50% inhibition are indicated in yellow vaccines (animal numbers in bold indicate cattle with clear or doubtful foot lesions).

Groups	Animal	0 DPC	1 DPC	2 DPC	3 DPC	4 DPC	5 DPC	6 DPC	7 DPC	8 DPC	
Vaccine A ₂₂ /IRQ/64	1227	16	28	27	31	31	39	65	75	83	
	1228	37	38	39	35	37	40	60	71	82	
	1229	30	32	33	32	38	40	65	87	90	
	1230	35	34	34	37	37	27	47	76	91	
	1231	28	32	28	33	22	26	62	86	91	
	1232	30	32	31	21	29	33	61	84	86	
	1233	32	37	15	34	35	39	57	81	90	
	1234	24	12	20	19	22	28	44	60	68	
	1235	14	21	20	20	24	28	46	60	65	
	1236	26	31	27	28	30	32	45	70	84	
Vaccine A/MAY/97	1237	12	16	13	16	20	19	41	81	91	
	1238	27	25	28	28	26	18	32	45	55	
	1239	36	31	28	32	24	45	84	93	93	
	1240	19	16	16	6	18	35	63	74	78	
	Unvaccinated Controls	1241	-2	3	-6	7	16	26	42	64	75
		1242	22	8	19	26	25	29	37	68	89
		1243	18	26	23	27	28	40	60	87	93

Supplementary Table 9b. Percentage inhibition in the Priocheck NS ELISA in the heterologous protection test vaccines (animal numbers in bold indicate cattle with foot lesions).

Groups	Animal	0 DPC	1 DPC	2 DPC	3 DPC	4 DPC	5 DPC	6 DPC	7 DPC	8 DPC
Full Dose (2ml)	1566	21	19	16	19	24	30	79	92	93
	1567	32	28	27	28	29	32	59	78	85
	1568	15	17	14	15	18	13	32	55	70
	1569	37	40	42	40	41	35	44	64	80
	1570	41	40	41	42	43	61	81	90	93
1/3 Dose (0.66 ml)	1571	27	27	25	32	28	32	59	76	80
	1572	52	41	43	41	36	38	73	91	78
	1573	11	6	9	11	11	15	50	74	77
	1574	34	33	28	32	26	30	41	54	83
	1575	27	23	20	24	26	30	71	87	92
1/9 Dose (0.22ml)	1576	30	27	24	26	27	36	59	86	92
	1577	24	23	21	27	26	32	55	85	90
	1578	35	40	39	43	43	47	52	70	87
	1579	44	46	43	49	42	52	67	84	91
	1580	23	21	19	29	29	39	54	73	84
Unvaccinated Controls	1581	24	24	19	20	22	31	51	77	NA
	1582	31	26	27	34	32	41	63	84	90
	1583	29	23	20	28	22	34	44	77	89