



Summary of Studies Supporting USDA Product Licensure

Establishment Name	Elanco US Inc.
USDA Vet Biologics Establishment Number	196
Product Code	45J9.20
True Name	Canine Distemper-Adenovirus Type 2-Coronavirus-Parvovirus Vaccine, Modified Live & Killed Virus, Leptospira Canicola-Grippytyphosa-Icterohaemorrhagiae-Pomona Bacterial Extract
Tradename(s) / Distributor or Subsidiary (if different from manufacturer)	ULTRA Duramune DAP + C4L - Elanco US Inc.
Date of Compilation Summary	December 19, 2019

Disclaimer: Do not use the following studies to compare one product to another. Slight differences in study design and execution can render the comparisons meaningless.

Study Type	Efficacy									
Pertaining to	Infectious Canine Hepatitis Virus									
Study Purpose	To demonstrate effectiveness against Infectious Canine Hepatitis (ICH)									
Product Administration	Two doses were administered subcutaneously (SC) 21 days apart									
Study Animals	Seventeen (17) 6-week-old puppies, seronegative for ICH, were randomly sorted into one group of 11 SC vaccinates and one group of 6 controls.									
Challenge Description	21 days after second vaccination all dogs were challenged with Infectious Canine Hepatitis Virus.									
Interval observed after challenge	Puppies were observed for 21 days after challenge for clinical signs.									
Results	<p>The study was satisfactory per the criteria in 9 CFR 113.305 (1)(ii) (A)(B)</p> <table border="1" data-bbox="582 920 1227 1115"> <thead> <tr> <th></th> <th>Mortality</th> <th>Clinical Signs of CDV Infection</th> </tr> </thead> <tbody> <tr> <td>SC Vaccinates</td> <td>0/11 (0%)</td> <td>0/11 (0%)</td> </tr> <tr> <td>Controls</td> <td>6/6 (100%)</td> <td>6/6 (100%)</td> </tr> </tbody> </table>		Mortality	Clinical Signs of CDV Infection	SC Vaccinates	0/11 (0%)	0/11 (0%)	Controls	6/6 (100%)	6/6 (100%)
	Mortality	Clinical Signs of CDV Infection								
SC Vaccinates	0/11 (0%)	0/11 (0%)								
Controls	6/6 (100%)	6/6 (100%)								
USDA Approval Date	March 31, 1998									

Canine Infectious Hepatitis Clinical Signs Observed Post Challenge																				
Dog	Treatment	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC	15DPC	16DPC		
1	Control					22	N/A	NA												
2	Control					1,4,7,20	1,3,5,6,15,17,20,22***													
3	Control				3,13,23**	1,3,23,22***	N/A													
4	Control				23**	1,3,7	1,3,6,7,17,20,22***													
5	Control			23*	3	22	N/A													
6	Control			7	7	22	N/A													
19	SC Vac																			
20	SC Vac																			
21	SC Vac																			
22	SC Vac																			
23	SC Vac																			
24	SC Vac										6									
25	SC Vac																			
26	SC Vac																			
27	SC Vac																			
28	SC Vac																			
29	SC Vac									6									6	
	1 - Depression/Lethargy					6 - Serous ocular discharge				15 - Excessive Salivation					23 - Other					
	3- Dehydration					7 - Mild/Moderate mucopurulent Ocular Discharge				17 - Icteric Gums					* Icteric Lumbar only					
	4 - Mild/Moderate Conjunctivitis					13 - Vomiting				20 - Petechial Pain / Ecchymotic					** Icteric lumbar and ears					
	5 - Severe Conjunctivitis														***- moribund and euthanization					
					NO Clinical signs observed in any group after 16DPC						22 - Death				DPC – Days post challenge					

Study Type	Efficacy
Pertaining to	Canine Adenovirus Type II
Study Purpose	To demonstrate effectiveness against Canine Adenovirus Type II (CAV2)
Product Administration	Two doses were administered subcutaneously 21 days apart
Study Animals	Twenty-two (22) 6 week old puppies seronegative for CAV2 were randomly sorted into one group of 11 SC vaccinates and one group of 11 controls.
Challenge Description	21 days after second vaccination all dogs were challenged with CAV2
Interval observed after challenge	Puppies were observed for 21 days after challenge for clinical signs.
Results	<p>The study was considered satisfactory by the reduction in clinical signs and virus shedding in the vaccinates when compared to the control animals.</p> <p>Raw Data: Data tables are appended to the end of this summary</p>
USDA Approval Date	April 3, 1998

CAV2 Clinical Signs Observed Post Challenge

Dog	Group	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC	15DPC	16DPC	17DPC	18DPC	19DPC	20DPC	21DPC
1	Control						1	1,2			2	2											
2	Control						1	1,2	1,2	1,2	2	2											
3	Control						1	1,2	1	1	1	1											
4	Control						1,2	1,2	1,2,4	1,2,	2	2											
5	Control						1	1	1,4	1	1	1											
6	Control					2		4			1	1								1	1		
7	Control						1	1,2,4	1,2,4,5,6	1	1	2,4	1	1,2	1	1,2							
8	Control		1	1,2	1,2	1	1,2	1,6	1	1	1	1	1	1	1	1	1	1	1				
9	Control						1	1	1	4	4	4											
10	Control						1	1	1	1	1,2			1									
11	Control					2		1,2	1,2	1	1	1											
23	SC																						
24	SC																						
25	SC						1			1													
26	SC																						
27	SC																						
28	SC							1															
29	SC							1	1														
30	SC		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
31	SC						1	1	1	1	1,2												
32	SC																						
33	SC																						
		1 - Ocular Discharge		3 - Sneezing		5 - Retching		7 - Inappetence															
		2 - Nasal Discharge		4 - Coughing		6 - depression/lethargy		Blank - No Clinical signs observed															

CAV2 Isolation from Nasal Swab Samples (TCID₅₀/100ul)

Dog	Group	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC	15DPC	16DPC	17DPC	18DPC	19DPC	20DPC	21DPC	
1	Control				2	2.5	3.63	3.5	≤1.83															
2	Control				2	2.83	3.5	3.83	2.17								≤1.83							
3	Control				≤1.63	3.5	4.17	3.38								2.17								
4	Control					2.63	3.38	4.31	2.35				≤1.63											≤1.63
5	Control				2.38	2.6	4.38	3.6	≤2.63															
6	Control				≤1.83	≤1.83	4.5	3.63	3.63															
7	Control				≤1.63	2.75	4.5	4.5	≤1.83															
8	Control				2.38	2.83	3.63	3.17																
9	Control				≤1.63	2.83	2.83	4.38																
10	Control				≤1.63	2.17	3.63	3.5					≤1.63	2.38	2.5	≤1.83								
11	Control				≤1.83	2.5	4.5	4.38						≤1.63	≤1.83	≤1.63	≤1.63			≤1.63				
23	SC																							
24	SC		≤1.6				2.38																	
25	SC					≤1.63																		
26	SC								2.63															≤1.63
27	SC																							
28	SC											≤1.63												
29	SC					2	≤1.83																	
30	SC																							
31	SC																							
32	SC						≤1.83	2.63	2.5															
33	SC																							
Blank - No CAV2 titer detected																								
DPC - Days Post Challenge																								

Study Type	Efficacy
Pertaining to	Canine coronavirus
Study Purpose	To demonstrate effectiveness against intestinal disease due to canine coronavirus
Product Administration	
Study Animals	
Challenge Description	
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance. Study data, however, are no longer available.
USDA Approval Date	December 3, 1984

Study Type	Efficacy
Pertaining to	<i>Leptospira canicola</i>
Study Purpose	To demonstrate effectiveness against <i>Leptospira canicola</i> in 6 week old dogs.
Product Administration	Two doses were administered subcutaneously (SC) 3 weeks apart.
Study Animals	Twenty-three (23) 6 week old puppies serologically negative for <i>Leptospira</i> were randomized into one group of 11 SC vaccinates and one group of 12 controls.
Challenge Description	Twenty-one (21) days after second vaccination all animals were challenged with <i>Leptospira canicola</i> organisms.
Interval observed after challenge	Dogs were observed daily for 21 days after challenge for clinical signs associated with <i>L. canicola</i> . Blood samples were collected through 14 days after challenge.
Results	<p>Efficacy was determined by comparing vaccinates versus controls in clinical signs, thrombocytopenia, and leukopenia.</p> <p>A dog was considered to have thrombocytopenia if the platelet count dropped below 200 k/μL and the count was less than 50% of the baseline value.</p> <p>A dog was considered to have leukopenia if the platelet count dropped below 6 k/μL and the count was less than 50% of the baseline value.</p> <p>Data tables are appended to the end of this summary.</p>
USDA Approval Date	April 3, 1998

Leptospira canicola Clinical Signs Observed Post Challenge

Dog	Controls																						
	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC	15DPC	16DPC	17DPC	18DPC	19DPC	20DPC	21DPC	
23					A,D,K,M,N4																		
24			D,G,N3		A,D,G,J	A,D,G	A,D,K	C,D,G,L,N4															
25			N2	B	G		A,K	A,G	A	D		A,D,N1	D		G								
26		A,G	D,G,N1	D,G,N1	G	D	A,D,J	A,G,K	A,D,K	A,D		G	D,G										B
27			N1	A	A	A,N1	A,K	A,D,G								A		A,G					
28		A	GN2	A	A,G,L	A,D,G,K,L,M,N4	A,D,E2,M,N4																
29			D,N2	J,K	A,B,D,G,L	D,G,K,L,N4	A,D,E1,K,L,M,N4																
30		G	N2			G,K	A,D,G,K	G	G,K				G		G	G							
31	H		N2	G,K	B,D,X,L	D,G,K,L,N4																	
32			N1	G	G,L	D,X,L	A,D,G,K,L,M,N4																
33	G	G	G,N2	A,G,N1	A,G	A,B,J	A,D,G,K,L	A,D,G,K,L	A,D,G,K,L	A,D,G,K,L	A,K	G	G			G,L		A,G	G				
34			A,N1	A,G,N2		G	A,D,G,K,L	A,D,K,L,N1	A,D,G,L,N1	A,D,G,K,L	A,K	G,K	G,K										
	A-inappetance				G - Ocular Discharge Muroid																		
	B-Vomiting				H - Nasal Discharge Serous																		
	C-Labored Breathing				I - Nasal Discharge Muroid																		
	D - Depression/Lethargy				J - Diarrhea Mild (loose stool)																		
	E1 - Conjunctivitis Mild/Moderate				K - Diarrhea Severe (bloody stool)																		
	E2 - Conjunctivitis Severe				L - Bloody Urine																		
	F - Ocular Discharge Serous				M - Icterus																		

DPC = Day post-challenge

Leptospira canicola White Blood Cell Count Post Challenge

Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	SC Vaccinates													
		1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
12	22.1	25.8	15.1	17	20.3	19.3	20	20.7	16.5	19.4	19.3	10.7	17.2	19.6	16.6
13	12.3	12.4	9.3	9.6	10.5	9	8	12.5	11.8	10.4	8.8	12.7	10.2	9.7	9.1
14	21.7	19.8	12.3	12.9	14	15.5	13.6	17.4	19.2	19.3	16.9	15.3	14	23.2	15.7
15	13.3	8.8	9.6	12.7	8.2	11.5	12.2	13.1	11.8	8.5	8.5	13.1	9.2	10.2	9.4
16	14	13.2	9.5	7.6	8.4	10.1	10.2	9.4	11.4	9.7	11.3	9.3	10.1	10.8	10.5
17	14.3	16.1	12.8	11.8	12.2	10.7	13.2	12.5	9.8	7.3	8.8	9.5	10.3	9.9	12.3
18	11	11.4	10.6	10.1	10.2	9.4	11.7	9.7	9.3	9.3	9.1	11.6	11.7	17.2	17.6
19	8.9	8.4	8	9.1	8.4	6.6	7.2	7.5	6.4	8.2	7	8.8	7.3	12.3	13.4
20	11.2	15.8	10.7	9.1	7.6	8	9	9.2	10.5	11.4	7	13	9.3	7.6	12.7
21	11	10.5	9.5	15.1	14.6	14.1	13.9	13.4	20.7	14.9	11.7	16.5	13.2	14.7	21.7
22	10.2	15.6	9.4	12.1	9.5	12.7	11	7.3	8.3	11.7	7.7	10.2	9.2	11	11.5

DPC = Day post-challenge. Values reported as k/ μ L.

Leptospira canicola White Blood Cell Count Post Challenge

Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	Controls																	
		1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC				
23	18.3	21.7	14.2	7.4	21.7	.	.	.	.	.	.	.	.	.	.	.	.	.	.
24	16.1	20	16.7	6.1	11.5	14.6	20.5												
25	17.1	11.3	13	8.3	10	13.6	17	26	28.1	36.6	36.7	26.2	29.4	21.9					
26	9	7.9	9.6	5.6	5.7	6.7	8	11.7	13.8	16.6	9.6	11.5	12.7	13.9					
27	10.4	8.9	5.5	4.1	5.2	8.6	19.4	21	16.2	11.3	13.9	15	11.5	13.3					
28	9.6	18.4	6.4	3.9	7	19.4	13.2												
29	12.2	19.4	7.8	4.2	5	5.3	17.5												
30	9.5	11.9	9.5	3.2	6.1	7.9	10.6	11.1	10.4	11.4	9.2	12.69	16.7	12.2					
31	8.9	10.6	6.4	4	6	10.3													
32	11.9	12.2	11.5	5.3	6	6.6	15.8												
33	11.8	17.5	6.1	2.6	5.3	4.4	8.7	13	22.8	20.5	31.5	26.3	17.4	16.9					
34	7	9.6	10.1	3.4	5.6	3.8	6	12	12.6	15.3	10.9	15.7	15.9	20.2					

DPC = Day post-challenge. Values reported as k/ μ L.

Leptospira canicola Platelet Counts Post Challenge

SC Vaccinates

Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
12	444.3	538	480	452	473	512	531	582	478	631	512	381	483	511	470
13	551.3	679	559	573	576	539	467	636	565	470	501	616	550	510	467
14	473.3	571	452	505	444	536	497	604	693	695	567	568	508	802	640
15	459.7	407	381	543	421	503	612	633	576	497	482	560	438	463	461
16	477.3	377	409	452	456	492	555	558	655	512	519	302	428	399	390
17	318	243	247	311	324	329	389	351	314	288	270	261	232	257	278
18	425.7	331	356	381	398	453	542	247	463	483	405	480	406	554	572
19	348.7	330	353	324	403	375	376	375	379	476	381	414	418	516	524
20	555.3	494	497	530	483	523	538	706	704	662	493	601	462	464	469
21	378.3	332	354	476	447	469	441	514	650	581	501	521	429	474	583
22	469.3	413	455	581	478	576	517	469	473	597	492	500	497	495	593

DPC = Day post-challenge. Values reported as k/ μ L.

Leptospira canicola Platelet Counts Post Challenge

Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	Controls														
		1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC	
23	300	238	148	11	7.7	D	D	D	D	D	D	D	D	D	D	D
24	342	204	161	64.1	40.5	45.3	123	207	D	D	D	D	D	D	D	D
25	519.7	267	213	187	134	117	160	285	497	710	714	823	738	810	717	
26	404.7	278	279	196	150	172	194	ND	302	441	721	648	599	590	588	
27	482.7	281	225	119	55	49.9	100	157	405	455	492	552	528	428	435	
28	242.3	209	60.4	45.9	3.9	11.1	11.3	D	D	D	D	D	D	D	D	D
29	529.7	521	305	195	37.6	15.8	42.2	D	D	D	D	D	D	D	D	D
30	329.3	292	167	107	61.7	81.6	122	242	412	518	697	504	632	596	551	
31	432.7	327	150	80.2	38	14	D	D	D	D	D	D	D	D	D	D
32	395.7	329	195	103	33.3	14.2	44.1	D	D	D	D	D	D	D	D	D
33	563.7	409	182	115	67.1	8.5	2.4	11.4	87.1	235	417	744	701	726	714	
34	232.7	174	150	64.5	41.6	8.3	6.8	82.8	142	273	310	383	479	475	564	
ND= No Data																
D = dead																

DPC = Day post-challenge. Values reported as k/ μ L.

Study Type	Efficacy
Pertaining to	<i>Leptospira grippotyphosa</i>
Study Purpose	To demonstrate effectiveness against <i>Leptospira grippotyphosa</i> in 6-week-old dogs.
Product Administration	Two doses were administered subcutaneously (SC) 3 weeks apart.
Study Animals	Twenty (20) 6-week-old puppies were randomized into one group of 10 SC vaccinates and one group of 10 controls.
Challenge Description	Fifteen (15) days after second vaccination all animals were challenged with <i>Leptospira grippotyphosa</i> organisms.
Interval observed after challenge	Dogs were observed daily for 21 days after challenge
Results	<p>Efficacy was based on the reduction in spirochetemia in vaccinates when compared to controls.</p> <p>A data table is appended to the end of this summary.</p>
USDA Approval Date	January 12, 1999

Isolation of Leptospira from Blood Collected from Dogs Post Challenge

Control Animals													
Dog	0DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
1						+							
2					+		+	+					
3				+	+								
4					+	+							
5				+	+	+							
6						+	+	+	+	+	NA	NA	NA
7				+	+	+	+	+	+	NA	NA	NA	NA
8					+	+	+	+	+	+	NA	NA	NA
9				+	+	+	+	+	+	+	NA	NA	NA
10					+	+	+	+	+	+	NA	NA	NA

NA - Animal Dead or euthanized / no sample taken

+ - Positive for Leptospira

*Leptospira was not isolated in any of the SC vaccinates

Study Type	Efficacy
Pertaining to	<i>Leptospira icterohaemorrhagiae</i>
Study Purpose	To demonstrate effectiveness against <i>Leptospira icterohaemorrhagiae</i> in 6 week old dogs.
Product Administration	Two doses were administered subcutaneously (SC) 3 weeks apart.
Study Animals	Twenty-two (22) 6 week old puppies serologically negative for <i>Leptospira icterohaemorrhagiae</i> were randomized into one group of 10 SC vaccinates and one group of 12 controls.
Challenge Description	Twenty-one (21) days after second vaccination all animals were challenged with <i>Leptospira icterohaemorrhagiae</i> organisms.
Interval observed after challenge	Dogs were observed daily for 21 days after challenge for clinical signs associated with <i>L. icterohaemorrhagiae</i> . Blood samples were collected through 14 days after challenge.
Results	<p>Efficacy was determined by comparing vaccinates versus controls in clinical signs, thrombocytopenia, and leukopenia.</p> <p>A dog was considered to have thrombocytopenia if the platelet count dropped below 200 k/μL and the count was less than 50% of the baseline value.</p> <p>A dog was considered to have leukopenia if the platelet count dropped below 6 k/μL and the count was less than 50% of the baseline value.</p> <p>Data tables are appended to the end of this summary.</p>
USDA Approval Date	March 31, 1998

Leptospira Ictero Clinical Signs Observed Post Challenge

Dog	SC Vaccinates																							
	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC	15DPC	16DPC	17DPC	18DPC	19DPC	20DPC	21DPC		
11							A																	
12																								
13				E		D							E		E					D		E		
14				E			E		F											D	E	E		
15		A,E							E				D									E		
16																							A	
17																								
18																					D			
19																								
20			D	D		D	D							E						D		E		
A-inappetance																								
B-Vomiting																								
C- Depression/Lethargy																								
D- Ocular Discharge Serous																								
E- Ocular Discharge Mucoïd																								
F- Nasal Discharge Serous																								
G- Nasal Discharge Mucoïd																								
H- Diarrhea Mild (loose stool)																								
I- Diarrhea Moderate (Watery stool)																								
J- Diarrhea Severe (bloody stool)																								

DPC = Day post-challenge

Leptospira Ictero Clinical Signs Observed Post Challenge

		Controls																													
Dog	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC	15DPC	16DPC	17DPC	18DPC	19DPC	20DPC	21DPC									
21					F		A																								
22					F					B											E										
23			L	L								E			E	E	E	E													
24			L	L																											
25																															
26																															
27			L	D	D	E		J	A				E			D															
28			L,E	K	A,C,D,J						M																				
29			L			D																									
30				L,D	A,E						M																				
31			L	E			A					E					E														
32							E																								
	A-inappetance																														
	B-Vomiting																														
	C-Depression/Lethargy																														
	D-Ocular Discharge Serous																														
	E-Ocular Discharge Mucoid																														
	F - Nasal Discharge Serous																														
	G - Nasal Discharge Mucoid																														
	H- Diarrhea Mild (loose stool)																														
	I- Diarrhea Moderate (Watery stool)																														
	J- Diarrhea Severe (bloody stool)																														
	K - Bloody Urine																														
	L - Fever >103.0°F																														
	M - Death																														
	Blank - no clinical sign observed																														

DPC = Day post-challenge

Leptospira ictero White Blood Cell Count Post Challenge

SC Vaccinates

Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
11	7.2	7.3	12.4	7.9	6.8	10.1	6.4	6.4	6.4	8.5	8.9	9.7	9.6	7.2	6.4
12	10	13.9	10.4	8.9	9.1	12.4	15.2	8.2	11.1	8.6	7.7	10.2	9	9.1	12.3
13	7.6	15.4	9.6	13.2	9.1	14.2	8.8	9.2	9.6	8.3	10.6	6.7	7.8	7.8	8.4
14	13.4	7.6	12.6	8.2	12.6	11.3	9.3	7.3	11.8	8	13.2	9.8	10	12.8	9.1
15	9.8	11.4	9.8	9	8	8.3	11.2	10.2	8	7.5	10.4	7.7	11.1	7.5	10.9
16	9.1	8.8	9.5	6.8	8.1	9.1	9.4	8.4	10.1	7.7	8.7	9.5	10	8.3	8.3
17	9.1	7.1	7.8	8.1	7.5	7.2	10.5	9.4	11.4	7.6	11.7	7.1	10.2	7.5	7.3
18	7.2	7.7	10.5	9.1	6.6	7.3	7.1	8.4	7.4	8	9	8.1	6.5	7.8	6.4
19	9.5	13.8	8.4	11.7	11.7	8.7	6.7	10.5	7.5	8.2	7.7	7.8	7	8.8	6.7
20	13.1	9.9	5.3	9.1	11.9	14.8	14.4	6.4	9.1	8.7	12.5	12.6	7.6	8.1	8.9

DPC = Day post-challenge. Values reported as k/ μ L.

Leptospira ictero White Blood Cell Count Post Challenge

Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	Controls													
		1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
21	7.4	6.6	9.6	6.7	8.2	6.2	8.6	6.7	6.5	8.1	10.4	6.4	8.5	6.5	6.2
22	7.4	8.5	9.3	8.2	6.5	7.3	13.4	9.4	7.2	8.2	13.4	10.1	7.7	7.6	9.4
23	9.3	12.2	9.4	11.6	7.1	9	10	7	6.5	7.1	11.9	7	9.6	11	11.8
24	13.7	19.6	10.6	7.8	11.8	15.3	16.7	19.8	16	13.7	19.2	24.9	13.3	24.4	12.3
25	10	13.9	8.5	6.9	9.1	7	10.9	12.8	9.6	10	13.9	9.4	8.3	9	7.1
26	8.4	8.6	9	3.9	11.8	12.2	15.4	11.3	11.8	9	10.2	13.3	8.6	8.9	10.5
27	7.8	7.5	9.4	15.8	14.6	10.7	9.8	7.5	8.6	12.1	8.6	8.3	11.4	7.4	9.5
28	7.8	8.8	6.7	4.5	7.3	7.3	8.8	14.7	10	11.6	11.7	14	8.3	7.8	7.7
29	7.8	6.7	5.8	4.1	26.4	D									
30	8.8	7.6	5	7.2	7.8	7.5	7.8	6.2	9.9	8	10.3	10.1	9.9	9.4	9.6
31	11	8.1	8.3	4.2	19	D									
32	8.3	9.3	6.2	5	10.7	12.6	10.6	13.5	14.5	9.6	14.1	9.9	10	10.1	9.3
D = dead															

DPC = Day post-challenge. Values reported as k/ μ L.

Leptospira ictero Platelet Counts Post Challenge

Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	SC Vaccinates													
		1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
11	449.7	432	619	476	440	667	457	447	488	442	591	586	536	471	359
12	518.3	475	456	447	428	526	645	435	480	505	487	453	473	461	517
13	489.3	595	425	560	424	580	445	517	416	508	522	415	347	337	349
14	451.7	258	413	349	457	374	344	335	376	331	431	330	263	351	281
15	357.7	380	297	286	275	282	435	400	314	285	388	288	401	290	369
16	369	264	298	217	264	278	308	268	281	253	316	258	286	284	294
17	473.7	407	400	386	332	214	542	457	513	436	529	417	498	373	381
18	506	482	569	392	397	351	393	419	327	424	406	388	283	391	287
19	477	467	386	552	529	417	459	500	378	489	356	383	331	406	352
20	502.3	412	506	483	525	515	555	352	392	358	488	501	325	340	378

DPC = Day post-challenge. Values reported as k/ μ L.

Leptospira ictero Platelet Counts Post Challenge

Controls															
Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
21	534.3	291	315	207	301	341	545	506	529	537	575	434	399	414	410
22	428.7	238	250	168	126	184	261	288	340	412	520	421	369	386	367
23	411.3	374	307	265	289	362	393	361	369	447	546	444	422	583	535
24	344.7	251	130	99.5	116	189	312	497	440	480	618	635	461	658	451
25	566	401	220	146	189	288	483	611	458	466	660	519	427	432	409
26	392	302	213	94.9	84.5	210	361	381	421	444	467	578	513	452	388
27	475.7	399	423	483	413	335	386	437	465	575	469	461	540	372	474
28	411.7	214	93.5	60.5	128	213	307	332	467	612	622	618	495	467	383
29	332	136	101	6.7	11.2										
30	421.9	204	80.9	53.9	119	231	379	512	549	516	642	494	411	421	427
31	319.3	163	94.4	36.7	11.9										
32	267	184	55	7.7	88.8	196	257	347	525	430	529	360	337	287	301
D = Dead															

DPC = Day post-challenge. Values reported as k/μL.

Study Type	Efficacy
Pertaining to	<i>Leptospira pomona</i>
Study Purpose	To demonstrate effectiveness against <i>Leptospira pomona</i> in 6 week old dogs.
Product Administration	Two doses were administered subcutaneously (SC) 3 weeks apart.
Study Animals	Twenty (20) 6 week old puppies serologically negative for <i>Leptospira</i> were randomized into one group of 10 SC vaccinates and one group of 10 controls.
Challenge Description	Twenty-five (25) days after second vaccination all animals were challenged with <i>Leptospira pomona</i> organisms.
Interval observed after challenge	Dogs were observed daily for 21 days after challenge. Blood samples were collected through 14 days after challenge.
Results	<p>Efficacy was based on the reduction in spirochetemia in vaccinates when compared to controls.</p> <p>A Data table is appended to the end of this summary.</p>
USDA Approval Date	January 12, 1999

Isolation of Leptospira from Blood Collected from Dogs Post Challenge

Control Animals															
Dog	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
1			+	+	+	+									
2															
3			+	+	+										
4				+	+										
5			+	+	+	+									
6			+	+											
7		+	+	+											
8			+	+	+										
9		+	+	+	+										
10		+		+	+										

DPC= Day post challenge

*Leptospira was not isolated from blood in any of the SC vaccinates

Study Type	Efficacy									
Pertaining to	Cannie Distemper Virus (CDV)									
Study Purpose	To demonstrate effectiveness against CDV									
Product Administration	Two doses were administered subcutaneously 21 days apart									
Study Animals	Seventeen (17) 6 week old puppies seronegative for CDV were randomly sorted into one group of 11 SC vaccinates and one group of 6 controls.									
Challenge Description	21 days after second vaccination all dogs were challenged with CDV.									
Interval observed after challenge	Dogs were observed for 42 days after challenge for clinical signs of CDV.									
Results	<p>The study was satisfactory per the criteria in 9 CFR 113.306 (b)(3) (i-ii)</p> <table border="1" data-bbox="582 884 1228 1075"> <thead> <tr> <th></th> <th>Mortality</th> <th>Clinical Signs of CDV Infection</th> </tr> </thead> <tbody> <tr> <td>SC Vaccinates</td> <td>0/11 (0%)</td> <td>0/11 (0%)</td> </tr> <tr> <td>Controls</td> <td>5/6 (83%)</td> <td>6/6 (100%)</td> </tr> </tbody> </table> <p>Raw Data: Data tables are appended to the end of this summary</p>		Mortality	Clinical Signs of CDV Infection	SC Vaccinates	0/11 (0%)	0/11 (0%)	Controls	5/6 (83%)	6/6 (100%)
	Mortality	Clinical Signs of CDV Infection								
SC Vaccinates	0/11 (0%)	0/11 (0%)								
Controls	5/6 (83%)	6/6 (100%)								
USDA Approval Date	April 6, 1998									

CDV Clinical Signs Observed Post Challenge - Control Dogs

Dog	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
1			10,12,18	10,12,18	10,11,12	10	2,12	10,12,16,17,Euth	20	20	20
2			2,10,12	2,10,12	10	2,10,12	1,2,10,12	14	8,10,12,14,16,17,18, Euth	20	20
3			2,10,12	2,10,12		10,12	12	14	8,10,11,14	1,8,10,11,12	2,8,10,12
4			2,10,12	2,10,12		2,10,12	10	10,12	1,2,8,10,12	2,8,17	20
5							10,12		10,11	2,10,12	10,12
6					2,12	2,10,12	2,10,12	11,12	12,2	2,10,12	2,8,10,12
Dog	11DPC	12DPC	13DPC	14DPC	15DPC	16DPC-26DPC	27DPC	28-29DPC	30DPC	31-42DPC	
1	20	20	20	20	20	20	20	20	20	20	
2	20	20	20	20	20	20	20	20	20	20	
3	8,10,12	1,8,10	8,10,11	1,8,9,10,12	20	20	20	20	20	20	
4	20	20	20	20	20	20	20	20	20	20	
5	8,10,12,14		2,11		11,12		10,12		10,12		
6	1,2,8,10,12	1,2,8,12	20	20	20	20	20	20	20	20	
1 - Depression/Lethargy					14 - Vomiting						
2- Mild/Mod. Ocular Discharge Mucoïd					16 - Excessive Salivation					Intermittent minor stool abnormalities observed were not considered clinical signs of CDV infection.	
8 - Dehydration					17 - Chewing gum fits						
10-Mucous stool					18 - neuromuscular Tics						
11-watery Stool					20 - death						
12-Bloody stool					Blank - No Clinical signs observed						

DPC – Days post-challenge

CDV Clinical Signs Observed Post Challenge - Vaccinated Dogs

Dog	SC Vaccinates																						
	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC	15DPC	16DPC	17DPC	18DPC	19DPC	20DPC	21DPC	
18																							10,12
19																			14				
20																				10			
21																							
22																							
23					10																		
24																							
25																							
26																							
27																							12
28																		10,12	11,12	11,12	10,12	12	12
		1 - Depression/Lethargy						14 - Vomiting															
		2 - Mild/Mod. Ocular Discharge						16 - Excessive Salivation															
		8 - Dehydration						17 - Chewing gum fits															
		10-Mucous stool						18 - neuromuscular Tics															
		11-watery Stool						20 - death															
		12-Bloody stool						Blank - No Clinical signs observed															

DPC – Days post-challenge

CDV Clinical Signs Observed Post Challenge - Vaccinated Dogs

Dog	SC Vaccinates																													
	22DPC	23DPC	24DPC	25DPC	26DPC	27DPC	28DPC	29DPC	30DPC	31DPC	32DPC	33DPC	34DPC	35DPC	36DPC	37DPC	38DPC	39DPC	40DPC	41DPC	42DPC									
18	11																													
19																														
20																														
21																														
22				10,12													14													
23	10				10	10	10																							
24																														
25																														
26						10			10	10																				
27	11,12		10,12		10,12	10,11,12	12																							
28	11	10,12	10,12					10,12					12	12	12	12														12
<p>1 - Depression/Lethargy 2- Mild/Mod. Ocular Discharge Mucoïd 8 - Dehydration 10-Mucous stool 11-watery stool 12-Bloody stool</p>																														
<p>14 - Vomiting 16 - Excessive Salivation 17 - Chewing gum fits 18 - neuromuscular Tics 20 - death Blank - No Clinical signs observed</p>																														
<p>Intermittent minor stool abnormalities observed were not considered clinical signs of CDV infection.</p>																														

DPC – Days post-challenge

Study Type	Efficacy
Pertaining to	Canine Parvovirus (CPV)
Study Purpose	To demonstrate effectiveness against CPV in 6-week-old puppies.
Product Administration	Two doses, given at an interval of 21 days, were administered subcutaneously (SC).
Study Animals	Study analysis was conducted on twenty-one 6-week-old puppies seronegative for CPV, 17 vaccinates and 4 non-vaccinated controls.
Challenge Description	Twenty-one (21) days after second vaccination puppies were challenged with CPV 2b strain.
Interval observed after challenge	Puppies were observed daily for 14 days after challenge
Results	<p>The data were analyzed according to 9CFR 113.317</p> <p>Number affected by challenge according to 9CFR 113.317: Vaccinates: 0/17 (0%) Controls: 2/4 (50%)</p> <p>Raw data: Data table are appended to the end of this summary.</p>
USDA Approval Date	August 31, 2001

CPV Post Challenge Daily Observations

Non-Vaccinated Controls															
Dog ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
1		D					E,H								
2							B,C,H	C	C						
3					H	D	B,G,H	I							
4						G,H	B,C,D,F,G,H	I							

Vaccinates															
Dog ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
1															
2															
3	D						H				E				
4															
5											D				
6															
7												E			
8															
9															
10										D					
11		D				D									
12															
13			D												
14															
15															
16															
17															

B - Lethargy
 C - Dehydration
 D - Mucous Stool
 E - Watery Stool
 F - Bloody Stool
 G - Anorexia
 H - Vomiting
 I - Death
 DPC = Days Post Challenge

Daily Rectal Temperature (°F)

Non-Vaccinated Controls															
Cat ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
1	100.4	101.3	101.3	101.1	102.1	101.9	100.7	101.3	101.3	101.0	100.8	101.4	100.6	101.4	101.2
2	99.7	101.2	101.7	100.9	103.0	102.6	99.3	101.0	101.0	101.0	101.5	101.6	101.3	102.4	102.0
3	101.2	101.6	102.5	101.3	104.5	101.3	100.0	Na	Na	Na	Na	Na	Na	Na	Na
4	100.4	101.2	101.4	101.2	104.1	101.7	93.4	Na	Na	Na	Na	Na	Na	Na	Na

Vaccinates

Cat ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
5	101.1	101.9	101.2	101.3	101.7	101.5	101.0	101.0	101.5	101.7	101.1	101.8	101.7	101.3	101.8
6	101.1	100.5	101.5	101.3	101.1	101.5	101.5	101.3	101.7	101.6	101.4	101.7	101.7	101.3	102.1
7	101.0	100.5	101.0	100.8	101.3	101.1	100.6	100.5	101.4	101.2	100.9	101.0	101.3	101.4	100.8
8	100.7	100.9	101.4	101.7	101.4	101.1	101.3	101.3	101.7	101.4	101.3	101.4	101.2	100.9	102.3
9	101.0	101.0	101.4	101.5	101.2	101.0	101.3	101.1	101.3	101.5	101.6	101.7	101.5	101.3	101.8
10	101.3	101.9	102.1	101.5	102.0	101.6	101.1	101.4	101.5	101.8	102.3	102.4	102.5	102.7	102.0
11	100.5	100.8	101.0	101.2	100.9	100.8	100.8	101.2	101.3	101.0	101.2	101.0	101.3	101.1	101.6
12	99.7	100.7	101.5	101.1	101.1	101.3	100.9	101.0	101.1	101.1	101.1	101.3	101.0	101.3	101.2
13	100.5	101.6	102.1	101.0	101.2	101.0	101.1	100.9	101.5	101.3	101.7	102.3	101.4	101.8	102.1
14	101.3	100.8	101.6	101.4	101.2	101.2	100.6	100.9	101.1	101.1	101.1	101.2	101.1	101.0	101.6
15	101.3	101.5	10.2	101.8	102.1	102.2	101.8	101.5	102.3	102.3	101.7	102.5	101.9	102.1	102.2
16	100.9	102.2	101.4	101.5	101.4	101.8	101.3	101.5	101.0	101.2	101.3	101.6	101.4	101.8	101.9
17	99.9	100.4	101.8	101.3	101.0	101.5	100.3	101.7	101.1	101.3	101.1	101.1	101.2	101.1	101.3
18	99.7	101.1	101.0	101.4	101.0	101.4	101.5	100.7	100.7	100.4	101.4	100.8	101.0	100.5	101.7
19	100.7	101.2	101.1	101.0	101.6	101.4	100.8	100.7	101.4	101.8	101.2	101.4	101.3	101.7	102.3
20	100.9	102.1	101.9	101.7	101.8	102.5	100.9	101.3	101.6	101.9	101.7	101.3	101.4	101.8	102.3
21	101.8	101.6	102.0	102.1	101.2	101.9	100.8	101.3	101.7	101.4	101.6	101.2	101.4	101.2	101.7

DPC = Days Post Challenge

Total White Blood Cell Counts (x1000/uL)

Non-Vaccinated Controls											
CatID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
1	12.3	10.7	13.2	11.5	11.2	13.9	8.2	9.0	9.7	10.5	10.3
2	9.9	12.3	14.4	11.7	17.0	12.7	13.0	7.5	10.0	9.0	12.9
3	20.6	18.0	23.0	Na	30.2	15.6	13.7	Na	Na	Na	Na
4	14.7	18.4	17.4	17.4	19.9	6.3	0.3	Na	Na	Na	Na

Vaccinates

CatID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
5	10.2	11.8	11.8	8.4	10.3	12.7	9.18	9.1	9.8	10.3	10.7
6	11.0	10.2	12.7	11.0	9.3	10.1	9.61	9.8	10.3	9.3	10.0
7	13.5	9.0	9.3	9.1	9.4	10.2	8.73	8.9	10.9	10.0	8.4
8	11.9	10.4	10.2	10.0	9.0	9.3	8.40	8.6	8.2	8.4	9.7
9	12.5	12.8	12.8	10.3	9.7	9.3	8.17	8.1	8.2	7.3	7.3
10	12.7	13.7	15.1	12.3	9.9	10.0	8.00	10.2	20.3	12.0	9.9
11	11.3	11.7	9.8	Na	9.4	8.8	7.71	10.7	18.9	8.8	14.9
12	27.2	18.5	21.8	15.3	13.9	10.4	10.70	12.1	11.2	10.8	10.1
13	7.8	17.6	16.1	15.1	11.0	11.2	11.80	11.5	14.1	13.9	9.5
14	20.4	21.6	17.6	Na	20.4	14.0	17.10	14.1	11.4	10.0	10.3
15	16.7	17.6	14.5	12.6	10.6	10.9	11.0	10.4	10.3	14.2	23.2
16	21.6	18.5	16.0	16.0	16.0	14.7	12.6	15.4	12.0	12.8	13.1
17	13.6	10.8	9.1	Na	9.3	12.7	7.8	9.9	11.0	14.4	8.5
18	12.4	14.8	11.0	14.6	14.7	14.9	11.8	9.4	9.4	10.0	8.8
19	37.0	28.2	27.7	20.0	21.9	28.6	17.2	20.3	16.3	17.7	16.2
20	19.0	21.3	18.7	17.4	18.9	28.2	14.1	19.6	18.3	19.6	16.2
21	16.7	11.6	14.3	15.9	12.8	14.4	12.9	14.5	10.1	12.1	14.3

DPC = Days Post Challenge

CPV Titer From Fecal Material (Log FAID₅₀/mg Feces)

Non-Vaccinated Controls											
Cat ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
1	<1.5	<1.5	<1.5	<1.5	2.4	4.2	5.8	5.5	5.2	2.0	1.5
2	<1.5	<1.5	<1.5	<1.5	1.5	3.8	5.6	5.4	4.5	3.5	3.4
3	<1.5	<1.5	<1.5	<1.5	3.2	5.5	NS	NS	NS	NS	NS
4	<1.5	<1.5	<1.5	<1.5	3.5	NS	6.2	NS	NS	NS	NS

Vaccinates											
Cat ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
5	<1.5	<1.5	<1.5	<1.5	<1.5	NS	<1.5	<1.5	<1.5	<1.5	<1.5
6	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
7	<1.5	<1.5	<1.5	<1.5	<1.5	NS	<1.5	<1.5	<1.5	<1.5	<1.5
8	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
9	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
10	<1.5	<1.5	<1.5	<1.5	<1.5	NS	<1.5	<1.5	<1.5	<1.5	<1.5
11	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
12	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
13	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
14	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
15	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
16	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
17	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
18	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
19	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
20	<1.5	<1.5	<1.5	<1.5	<1.5	NS	<1.5	<1.5	<1.5	<1.5	<1.5
21	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5

<1.5 is considered negative
 NS = No sample
 DPC = Days Post Challenge

C

Study Type	Efficacy
Pertaining to	Canine Parvovirus (CPV)
Study Purpose	To demonstrate effectiveness against CPV
Product Administration	Two doses given at an interval of 28 days were administered subcutaneously (SC).
Study Animals	6-week old puppies seropositive for parvovirus, 20 vaccinates and 5 non-vaccinated controls.
Challenge Description	Fifty-six days (56) after second vaccination puppies were challenged with CPV type 2c strain.
Interval observed after challenge	Puppies were observed for clinical signs daily for 14 days after challenge
Results	<p>Dogs were determined affected by the criteria of 9CFR 113.317(c)(3)(i)</p> <p>Number affected: Vaccinates: 1/20 (5%) Controls: 4/5 (80%)</p> <p>Requirements of 9CFR 113.317 (c)(3)(i) were met.</p> <p>Raw data: Data tables are appended to the end of this summary.</p>
USDA Approval Date	January 31, 2012

CPV Post challenge Clinical Observations

Non-Vaccinated Controls															
Dog ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
9						1,2,3	1,2,3	1,2,3	2,3,4	Na	Na	Na	Na	Na	Na
11						1,2,3	1,2,3	1,2,3	2,3						
19							1	1	1						
21								2,3	1,3						
27															
Vaccinates															
Dog ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
1														1,3	
2															
3											1				
4															
5															
6															
7															
8															
10															
13															
14															
15														1	
16															1
17									1	2					
18															
20															
22															
23															
24															
28															

1 - Mucous Stool
2-Diarrhea (Watery stool)

3-Bloody Stool
4-Death

Blank - No clinical signs observed

DPC – Days Post Challenge

Serum Neutralization Titer								
Non-Vaccinated Controls								
Dog ID	-24DPV1	0DPV1	7PV1	28DPV1 (0DPV2)	41DPV1	56DPV1	70DPV1	84DPV1 (ODPC)
9	724	8	4	<2	<2	<2	<2	<2
11	91	4	3	<2	<2	<2	<2	<2
19	23	64	23	<2	<2	<2	<2	<2
21	<2	11	10	<2	<2	<2	<2	<2
27	10	8	6	<2	<2	<2	<2	<2

Vaccinates								
Dog ID	-24DPV1	0DPV1	7PV1	28DPV1 (0DPV2)	41DPV1	56DPV1	70DPV1	84DPV1 (ODPC)
1	91	32	8	<2	1024	11585	11585	=>23170
2	64	32	23	<2	362	6871	16384	16384
3	54	45	23	2	1024	5793	5793	6871
4	153	64	23	<2	724	19534	23170	=>46341
5	2048	45	16	<2	45	4096	8192	23170
6	1024	23	23	<2	<2	512	2896	9767
7	1448	6	4	<2	1024	8192	8192	=>23170
8	512	32	8	<2	<2	2896	11585	=>46341
10	128	45	64	2	<2	11585	11585	11585
13	181	6	6	<2	45	2048	5793	8192
14	32	8	16	2	<2	2896	4884	11585
15	23	6	2	<2	512	11585	11585	16384
16	8	11	11	2	<2	9767	11585	23170
17	32	32	23	5	<2	11585	8192	16384
18	16	23	19	<2	512	23170	11585	11585
20	45	11	4	<2	724	8192	16384	11585
22	<2	11	8	<2	4	8192	11585	8192
23	2	8	11	<2	1448	NO TEST	16384	11585
24	4	11	4	<2	1024	16384	23170	16384
28	128	32	16	<2	1448	4096	11585	9767

DPV1 - Days post first Vaccination ODPC - Days post challenge
 DPV2 - Days Post Second Vaccination

Lymphocyte Counts Post Challenge (x10³/µl)

Controls														
CatID	-2DPC	-1DPC	0DPC	Average	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
9	1.24	1.20	1.38	1.27	1.71	1.45	0.80	0.30	0.28	0.74	0.27	Na	Na	Na
11	2.24	2.59	2.07	2.30	2.28	2.36	1.82	0.29	0.58	0.69	1.04	1.17	1.27	2.13
19	1.57	2.14	1.87	1.86	2.32	2.26	2.42	1.42	0.70	1.59	1.66	1.52	2.11	2.70
21	1.67	2.19	2.52	2.13	2.68	1.92	2.31	1.17	0.67	1.75	2.03	1.52	2.09	3.35
27	2.68	2.26	2.30	2.41	2.29	2.37	2.25	0.92	1.00	1.09	2.04	1.74	2.08	2.60

Vaccinates

CatID	-2DPC	-1DPC	0DPC	Average	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
1	3.05	3.06	2.74	2.95	2.05	2.25	2.42	2.39	2.66	3.31	2.57	3.01	2.64	3.14
2	2.45	2.50	2.34	2.43	3.32	3.05	3.27	3.03	2.73	3.20	3.23	2.92	3.28	1.67
3	2.09	2.40	2.34	2.28	2.42	2.46	2.32	1.65	1.73	2.38	2.16	2.42	2.52	2.10
4	1.10	1.59	2.46	1.72	3.23	2.45	2.91	2.03	2.75	2.34	2.41	2.87	2.66	3.12
5	0.62	0.96	1.16	0.91	1.23	1.32	1.14	1.26	1.19	1.57	1.49	1.36	1.09	1.98
6	1.43	1.84	1.73	1.67	1.84	1.55	1.16	1.79	1.62	2.44	1.97	2.32	2.24	2.77
7	1.23	1.22	1.18	1.21	1.18	1.51	1.53	1.68	1.52	1.81	0.22	1.67	1.91	2.33
8	2.07	1.89	2.00	1.99	1.81	1.93	1.78	1.52	1.64	2.52	2.23	2.51	2.59	2.38
10	2.74	2.80	3.27	2.94	1.93	2.43	2.56	3.01	2.65	2.44	2.65	2.64	2.83	2.76
13	1.26	2.25	2.24	1.92	2.43	1.88	2.57	2.39	2.57	3.09	3.22	3.24	3.17	2.72
14	2.17	2.24	3.02	2.48	3.57	3.62	3.76	3.28	3.07	3.66	4.10	4.18	4.57	4.83
15	2.21	2.30	2.66	2.39	3.10	2.81	3.04	2.85	2.98	3.29	2.51	0.93	2.71	2.59
16	1.68	2.54	2.06	2.09	2.56	2.08	3.35	2.83	2.35	3.13	2.90	2.27	3.24	3.30
17	2.25	2.14	2.11	2.17	2.42	2.84	2.62	2.93	2.69	3.04	2.78	1.34	2.59	3.28
18	2.06	2.82	2.50	2.46	2.97	2.48	2.62	3.05	3.04	3.98	3.27	2.26	3.98	4.78
20	1.83	2.11	2.05	2.00	2.58	2.22	2.39	2.50	1.73	1.98	2.12	2.28	2.35	3.26
22	3.80	3.05	3.35	3.40	3.96	3.18	3.38	3.75	2.36	2.42	3.93	3.23	3.34	4.33
23	0.84	1.46	1.51	1.27	1.63	1.35	1.47	1.45	1.29	1.72	1.53	1.44	1.14	1.22
24	0.97	2.04	2.32	1.78	2.09	2.24	2.67	2.03	2.03	2.70	2.46	2.68	2.86	3.54
28	2.43	2.68	2.15	2.42	2.68	2.89	3.56	3.56	2.52	2.46	3.57	3.61	3.50	0.92

Body Temperature Post Challenge °F												
Non-Vaccinated Controls												
Dog ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	
9	102.0	102.0	102.6	102.9	103.2	104.6	103.2	100.9	Na	Na	Na	
11	102.6	102.9	102.6	102.6	103.1	103.4	102.8	102.2	101.3	101.5	102.2	
19	102.5	102.8	102.1	102.3	101.9	103.8	102.3	102.4	101.6	102.1	101.9	
21	102.2	102.3	101.3	101.4	102.0	103.4	102.0	101.8	101.5	101.5	101.4	
27	102.2	102.1	102.1	102.7	102.5	102.8	103.0	102.4	100.9	101.6	101.9	
Vaccinates												
Dog ID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC	
1	101.9	102.0	101.9	101.9	101.7	102.0	101.5	101.9	101.3	101.6	101.7	
2	102.7	103.5	103.1	103.1	103.5	102.3	103.1	102.9	102.4	102.6	102.6	
3	103.0	103.0	102.5	102.2	102.7	102.7	103.1	103.0	102.1	102.5	101.9	
4	101.6	102.4	102.3	102.1	102.4	102.1	103.4	102.7	102.1	102.1	102.1	
5	103.5	103.4	103.2	103.3	103.5	102.6	102.8	103.4	102.8	103.1	102.7	
6	102.7	102.6	101.7	102.8	102.4	102.4	102.8	102.7	102.2	102.4	102.1	
7	101.7	102.5	102.5	103.3	103.0	103.1	103.1	103.1	102.9	102.6	102.1	
8	102.7	102.9	102.5	102.4	102.6	102.2	102.2	102.5	101.7	101.2	102.2	
10	103.1	103.3	102.3	102.8	103.0	102.5	102.2	102.7	102.8	101.9	101.9	
13	103.0	102.5	102.8	102.2	103.2	102.6	102.7	103.0	102.4	102.9	102.7	
14	102.3	102.8	102.4	102.4	102.7	102.4	102.6	102.4	102.0	101.9	102.1	
15	102.5	102.7	102.3	102.0	102.8	102.2	102.4	102.4	101.9	102.2	101.7	
16	101.7	102.5	102.8	101.9	102.5	102.1	102.1	101.9	101.5	101.1	101.6	
17	101.9	102.8	102.3	102.6	102.7	102.1	102.0	101.9	102.0	101.7	102.1	
18	102.2	102.5	102.1	101.5	102.3	102.6	102.0	102.0	101.9	101.8	102.0	
20	102.2	101.9	101.9	102.0	102.2	101.8	101.8	101.9	101.6	101.4	101.9	
22	102.7	102.9	102.4	101.8	102.8	102.5	102.5	102.8	102.0	102.0	101.9	
23	102.5	102.8	102.7	102.7	103.2	102.4	102.7	103.1	102.1	102.4	102.2	
24	103.3	103.1	102.6	102.2	102.5	102.4	102.2	102.2	102.1	101.8	102.3	
28	102.2	102.1	102.0	102.4	102.2	102.2	102.0	102.0	101.8	101.5	101.6	

Fecal Virus Isolation Titer Post Challenge

Controls											
CatID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
9	≤1.5	≤1.5	≤1.5	≤1.5	≤2.5	6.6	7.6	5.2	≥9.2	Na	Na
11	≤1.5	≤1.8	≤1.5	≤1.5	5.5	7.2	7.5	≥8.5	≥8.6	≥7.6	6.6
19	≤1.5	≤1.5	≤1.5	≤1.5	2.5	4.2	7.5	7.6	4.2	4	≤1.5
21	≤1.5	≤1.5	≤1.5	≤1.8	4.3	4.7	6.3	6.8	≤2.8	4.5	3.6
27	≤1.5	≤1.5	≤1.5	≤1.5	≤2.8	5.2	7.4	6.6	5.2	≤3.0	≤1.5

Vaccinates											
CatID	0DPC	1DPC	2DPC	3DPC	4DPC	5DPC	6DPC	7DPC	8DPC	9DPC	10DPC
1	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
2	≤1.5	≤1.8	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
3	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
4	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
6	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
7	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
8	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
10	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
13	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
14	≤1.5	≤1.6	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
15	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
16	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
17	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
18	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
20	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
22	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
23	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
24	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5
28	≤1.5	≤1.5	≤1.5	≤1.5	≤1.5	≤2.5	≤1.5	≤2.5	≤1.5	≤1.5	≤1.5

Positive For CPV >1.5 log¹⁰ FAID₅₀/mL

DPC – Days Post Challenge

Study Type	Safety
Pertaining to	Canine Adenovirus Type 2 (CAV-2)
Study Purpose	Development of corneal opacity is not associated with the use of this product
Product Administration	
Study Animals	
Challenge Description	
Interval observed after challenge	
Results	Study data are not available

Study Type	Safety																																							
Pertaining to	ALL																																							
Study Purpose	Demonstrate safety of product under typical use conditions																																							
Product Administration	Two doses were administered subcutaneously approximately two weeks apart.																																							
Study Animals	A total of 675 dogs, privately owned and from commercial kennels were enrolled in the study. From these dogs 234 were 6 weeks of age or younger, at first vaccination. Three geographical sites were represented.																																							
Challenge Description	NA																																							
Interval observed after challenge	Animals were observed 30 minutes after each vaccination and daily for two (2) weeks after each vaccination.																																							
Results	<p>Frequency of adverse events:</p> <table border="1"> <thead> <tr> <th></th> <th>Number of Animals</th> <th>Percent of Animals</th> </tr> </thead> <tbody> <tr> <td>No observed adverse events</td> <td>628</td> <td>93.0%</td> </tr> <tr> <td>Injection Site Lesion</td> <td>1</td> <td>0.1%</td> </tr> <tr> <td>Diarrhea-one day of loose stools</td> <td>23</td> <td>3.4%</td> </tr> <tr> <td>Heavy Breathing</td> <td>1</td> <td>0.1%</td> </tr> <tr> <td>Death-Hit by Car *</td> <td>1</td> <td>0.1%</td> </tr> <tr> <td>Death-depression,decreased appetite, weight loss **</td> <td>1</td> <td>0.1%</td> </tr> <tr> <td>Lameness (leg cramp) *</td> <td>1</td> <td>0.1%</td> </tr> <tr> <td>Decreased appetite, weight loss, diarrhea, and dehydration *</td> <td>4</td> <td>0.6%</td> </tr> <tr> <td>Gastroenteritis (vomiting) *</td> <td>2</td> <td>0.3%</td> </tr> <tr> <td>Laceration *</td> <td>1</td> <td>0.1%</td> </tr> <tr> <td>Prolapsed nictitan gland *</td> <td>7</td> <td>1.0%</td> </tr> <tr> <td>Pyoderma *</td> <td>5</td> <td>0.7%</td> </tr> </tbody> </table> <p>*Affirmed by study investigator to have cause other than vaccination **Cause of death was not determined by study investigator. Signs appeared 4 days after vaccination and death 8 days later.</p> <p>The injection site lesion was detected after the second vaccination and resolved within 15 days.</p>		Number of Animals	Percent of Animals	No observed adverse events	628	93.0%	Injection Site Lesion	1	0.1%	Diarrhea-one day of loose stools	23	3.4%	Heavy Breathing	1	0.1%	Death-Hit by Car *	1	0.1%	Death-depression,decreased appetite, weight loss **	1	0.1%	Lameness (leg cramp) *	1	0.1%	Decreased appetite, weight loss, diarrhea, and dehydration *	4	0.6%	Gastroenteritis (vomiting) *	2	0.3%	Laceration *	1	0.1%	Prolapsed nictitan gland *	7	1.0%	Pyoderma *	5	0.7%
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