

Summary of Studies Supporting USDA Product Licensure

Establishment Name	Boehringer Ingelheim Animal Health USA Inc.
USDA Vet Biologics Establishment Number	124
Product Code	2668.05
True Name	Leptospira Canicola-Grippotyphosa-Icterohaemorrhagiae- Pomona Bacterial Extract
Tradename(s) / Distributor or Subsidiary (if different from manufacturer)	LeptoVax 4 - Boehringer Ingelheim (Canada) Ltd. LeptoVax 4 - No distributor specified
Date of Compilation Summary	December 16, 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.

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Study Type	Efficacy
Pertaining to	Leptospira canicola
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 Leptospira 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	Efficacy was determined by comparing vaccinates versus controls in clinical signs, thrombocytopenia, and leukopenia.
	A dog was considered to have thrombocytopenia if the platelet count dropped below 200 k/ μ L and the count was less than 50% of the baseline value.
	A dog was considered to have leukopenia if the platelet count dropped below 6 $k/\mu L$ and the count was less than 50% of the baseline value.
	See the next page for data.
USDA Approval Date	April 3, 1998

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		21DPC											П							
		100PC 11DPC 12DPC 13DPC 14DPC 15DPC 17DPC 18DPC 19DPC 20DPC 21DPC		ŋ	8								П							
		19DPC	Г		60			П		Г		Г	П							
		18DPC				ဖ								9						
		17DPC							AG					lleng	0					
		16DPC				ဗ							±	DPC = Day post-challenge						
		15DPC			A	AG			A					av po						
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		13DPC)dQ						
		12DPC																		
llenge		11DPC																		
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Signs Obs	SC Vaccinates	8DPC												.0-103.9 ⁴ F)	.0-104.94F)	.0-105.9 ⁴ F)			ical signs o	
cola Clinical	SCV	7DPC									9			N1 - Fever (103.0-103.9 ² F)	N2 - Fever (104.0-104.9 ¹ F)	N3 - Fever (105.0-105.9 ¹ F)	N4 - <99.6°F	P - Death	Blank - no clinical signs observed	
Leptospira canicola Clinical Signs Observed Post Challenge		OPC				9						Ą						(0		
Lep		SDPC									9	9		G - Ocular Discharge Mucoid	H - Nasal Discharge Serous	 Nasal Discharge Mucoid 	J - Diarrhea Mild (loose stool)	K - Diarrhea Severe (bloody stool	ė	
		4DPC						9	٧		9			G - Ocular Dis	H - Nasal Disc	I - Nasal Disch	J - Diamhea M	K - Diarrhea Se	L - Bloody Urine	M - Icterus
		3DPC						g				g						derate		
		2DPC					9				9	AD				hing	D - Depression/Lethargy	E1 - Conjunctivitis Mild/Moderate	E2 - Conjunctivitis Severe	F- Ocular Discharge Serous
		1DPC		٨	A	٥	٥					٧		etance	90	d Breat	ession/	unctivit	unctivit	r Discha
		ODPC				ဖ			g		g	g		A-inappetance	B-Vomiting	C-Labored Breathing	O-Depr	1-Con	2-Con	- Ocula
		Dog	12	13	14	15	16	17	18	19	20	71	22			_				

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		100PC 110PC 120PC 130PC 140PC 150PC 170PC 130PC 190PC 200PC 210PC		р	9 0	D,G	A A,G	d	d	9 9 9		d	6 G,1 A,G G	G,K	DPC = Day post-challenge						
enge		11DPC 12			A,D,N1	9					Р		ŋ	G,K							
t Challe		10DPC	a.		1								A,K	A,K							
erved Pos		9DPC			0	A,D							A,D,G,K,L	A,D,G,K,L						bserved	
Signs Obs	Controls	8DPC			A	A,D,K				G,K			A,D,G,K,L	A,D,G,L,N1	3.0-103.9°F)	4.0-104.9°F)	5.0-105.9°F)			nical signs o	
ola Clinica		7DPC		C,D,G,L,N4	A,G	A,G,K	A,D,G			9			A,D,G,K,L	A,D,K,L,N1	N1 - Fever (103.0-103.9°F)	N2 - Fever (104.0-104.9°F)	N3 - Fever (105.0-105.9°F)	N4 - <99.6°F	P - Death	Blank - no clinical signs observed	
Leptospira canicola Clinical Signs Observed Post Challenge		2409		A,D,K	A,K	A,D,J	A,K	A,D,E2,M,N4	A,D,E1,K,L,M,N4	A,D,G,K		A,D,G,K,L,M,N4	A,D,G,K,L	A,D,G,K,L					ol)		
Lep		SDPC		A,D,G		0	A,N1	A,D,G,K,L,M,N4	D,G,K,L,N4	G,K	D,G,K,L,N4	D,K,L	A,B,J	ŋ	harge Mucoid	narge Serous	arge Mucoid	J - Diarrhea Mild (loose stool)	vere (bloody stool)	au	
		4DPC	A,D,K,M,N4	A,D,G,J	9	9	A	A,G,L	A,B,D,G,L		8,D,K,L	1'9	A,G		G - Ocular Discharge Mucoid	H - Nasal Discharge Serous	I - Nasal Discharge Mucoid	J - Diarrhea Mi	K - Diarrhea Severe (b)	L - Bloody Urine	M - Icterus
		3DPC			8	D,G,N1	A	A	J,K		G,K	9	A,G,N1	A,G,N2							
		2DPC		D,G,N3	N2	D,G,N1	NI	GN2	D,N2	N2	N2	N1	G,N2	A,N1			Bu	ethargy	E1 - Conjunctivitis Mild/Moderate	Severe	F- Ocular Discharge Serous
		1DPC				A,G		A		9			9		etance	9	C-Labored Breathing	D - Depression/Lethargy	unctivitis	E2 - Conjunctivitis Severe	Dischar
		ODDC									Н		9		A-inappetance	B-Vomiting	C-Labore	D - Depr	E1-Conj	E2-Conj	F. Ocula
		Dog	23	24	25	26	27	28	29	30	31	32	33	34							

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		14DPC	16.6	9.1	15.7	9.4	10.5	12.3	17.6	13.4	12.7	21.7	11.5
		13DPC	19.6	9.7	23.2	10.2	10.8	6.6	17.2	12.3	7.6	14.7	11
		120PC	17.2	10.2	14	9.2	10.1	10.3	11.7	7.3	9.3	13.2	9.2
		11DPC	10.7	12.7	15.3	13.1	9.3	9.5	11.6	80	13	16.5	10.2
		100PC	19.3	89.8	16.9	8.5	11.3	89.89	9.1	7	7	11.7	7.7
Challenge		90PC	19.4	10.4	19.3	8.5	6.7	7.3	9.3	8.2	11.4	14.9	11.7
Leptospira canicola White Blood Cell Count Post Challenge		8DPC	16.5	11.8	19.2	11.8	11.4	8.6	9.3	6.4	10.5	20.7	8.3
od Cell Co	inates	7DPC	20.7	12.5	17.4	13.1	9.4	12.5	5.5	7.5	9.2	13.4	7.3
White Blo	SC Vaccinates	60PC	20	80	13.6	12.2	10.2	13.2	11.7	7.2	6	13.9	11
canicola \		SDPC	19.3	6	15.5	11.5	10.1	10.7	9.4	9.9	80	14.1	12.7
ptospira		4DPC	20.3	10.5	14	8.2	8.4	12.2	10.2	8.4	9.7	14.6	9.5
r		3DPC	17	9.6	12.9	12.7	9.7	11.8	10.1	9.1	9.1	15.1	12.1
		2DPC	15.1	9.3	12.3	9.6	9.5	12.8	10.6	00	10.7	9.5	9.4
		1DPC	25.8	12.4	19.8	00 00	13.2	16.1	11.4	8.4	15.8	10.5	15.6
		Baseline (Avg2DPC, -1DPC, 0DPC)	22.1	12.3	21.7	13.3	14	14.3	11	8.9	11.2	11	10.2
		Dog	12	13	14	15	16	17	18	19	20	21	22

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

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		14DPC			21.9	13.9	13.3			12.2			16.9	20.2
		13DPC			29.4	12.7	11.5			16.7			17.4	15.9
		120PC			26.2	11.5	15			12.69			26.3	15.7
		11DPC			36.7	9.6	13.9			9.2			31.5	10.9
9		10DPC			9.98	16.6	11.3			11.4			20.5	15.3
Challeng		3DPC			28.1	13.8	7.9			8.7			22.8	17.3
ount Post		80PC			26	11.7	16.2			10.4			22.8	12.6
od Cell C	Controls	7DPC		20.5	17		21			11.1			13	12
White Blo	Cont	OPO-		14.6	13.6	8	19.4	13.2	17.5	10.6		15.8	8.7	9
canicola		SDPC		15.6	12.6	6.7	8.6	19.4	5.3	7.9	10.3	9.9	4.4	3.8
Leptospira canicola White Blood Cell Count Post Challenge		4DPC	21.7	11.5	10	5.7	5.2	7	5	6.1	9	9	5.3	5.6
1		3DPC	7.4	6.1	8.3	5.6	4.1	3.9	4.2	3.2	4	5.3	2.6	3.4
		2DPC	14.2	16.7	13	9.6	5.5	6.4	7.8	9.5	6.4	11.5	6.1	10.1
		1DPC	21.7	20	11.3	7.9	8.9	18.4	19.4	11.9	10.6	12.2	17.5	9.6
		Baseline (Avg -2DPC, -1DPC, 0DPC)	18.3	16.1	17.1	6	10.4	9.6	12.2	9.5	8.9	11.9	11.8	7
		Dog	23	24	25	26	22	28	29	30	31	32	33	34

DPC = Day post-challenge. Values reported as $k/\mu L$.

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		_	_	_	_	_	_	_	_	_	_	_
	14DPC	470	467	640	461	390	278	572	524	469	583	593
	13DPC	511	510	802	463	399	257	554	516	464	474	495
	12DPC	483	550	508	438	428	232	406	418	462	429	497
	11DPC	381	616	268	260	302	261	480	414	601	521	200
	10DPC	512	501	267	482	519	270	405	381	493	501	492
	9DPC	631	470	969	497	512	288	483	476	662	581	597
	8DPC	478	565	693	576	655	314	463	379	704	650	473
cinates	7DPC	582	636	604	633	558	351	247	375	706	514	469
SC Vac	6DPC	531	467	497	612	555	389	542	376	538	441	517
	SDPC	512	539	536	503	492	329	453	375	523	469	576
	4DPC	473	576	444	421	456	324	398	403	483	447	478
	3DPC	452	573	505	543	452	311	381	324	530	476	581
	20PC	480	559	452	381	409	247	356	353	497	354	455
	1DPC	538	629	571	407	377	243	331	330	494	332	413
	Baseline (Avg -2DPC, -1DPC, 0DPC)	444.3	551.3	473.3	459.7	477.3	318	425.7	348.7	555.3	378.3	469.3
	Dog	12	13	14	15	16	17	18	19	20	21	22
	SC Vaccinates	SC Vaccinates SC Vaccinate	SSC Vaccinates SC Vaccinat	SSC Vaccinates SC Vaccinat	Baseline	Baseline (ANE-2DPC, -1DPC) 1DPC 2DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC 1DPC 1DPC 12DPC 13DPC 444.3 538 480 452 473 531 582 478 631 512 381 483 510 473.3 571 551 539 467 636 565 470 501 616 550 510 473.3 571 536 444 536 497 604 693 695 567 568 508 500	Baseline (ANG-2DPC, -1DPC) 3DPC 4DPC 5DPC 5DPC 7DPC 8DPC 9DPC 1DPC 1DPC <th< td=""><td>Secritical Baseline (Awg-2DPC, 1DPC 2DPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC 1DDPC 1DPC 1DPC 1DPC 1DPC 1DPC 444.3 538 480 452 473 512 531 585 647 693 695 567 568 580 510 445.3 571 452 551 551 551 551 571 457.3 571 457.3 571 457.3 572 445 572 572 572 572 572 572 572 572 572 57</td><td>Baseline (Awg-2DPC), -1DPC, -1DPC,</td><td>Baseline (Avg7DPC, -1DPC) 10PC 50PC ATA AT</td><td>Seseline Avg2DPC, 1DPC 2DPC 2DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC 1DDPC 11DPC 13DPC 13DPC </td><td>Baseline (AWE-2DPC, -1DPC) 10PC 3DPC 4DPC 3DPC 3DPC 3DPC 3DPC 3DPC 3DPC 3DPC 3DPC 3DPC <th< td=""></th<></td></th<>	Secritical Baseline (Awg-2DPC, 1DPC 2DPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC 1DDPC 1DPC 1DPC 1DPC 1DPC 1DPC 444.3 538 480 452 473 512 531 585 647 693 695 567 568 580 510 445.3 571 452 551 551 551 551 571 457.3 571 457.3 571 457.3 572 445 572 572 572 572 572 572 572 572 572 57	Baseline (Awg-2DPC), -1DPC,	Baseline (Avg7DPC, -1DPC) 10PC 50PC ATA AT	Seseline Avg2DPC, 1DPC 2DPC 2DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC 1DDPC 11DPC 13DPC 13DPC	Baseline (AWE-2DPC, -1DPC) 10PC 3DPC 4DPC 3DPC 3DPC 3DPC 3DPC 3DPC 3DPC 3DPC 3DPC 3DPC <th< td=""></th<>

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

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					_	_				_		_	_			
		14DPC	Q	Q	717	588	435	O	O	551	O	Q	714	564		
		13DPC	O	Q	810	290	428	O	O	965	Q	Q	726	475		
		120PC	D	D	738	599	528	D	D	632	D	D	701	479		
		11DPC	O	O	823	648	552	D	D	504	D	D	744	383		
		10DPC	O	O	714	721	492	D	D	269	O	O	417	310		
llenge		9DPC	O	O	710	441	455	D	D	518	D	D	235	273		
Leptospira canicola Platelet Counts Post Challenge		80PC	O	O	497	302	405	D	D	412	D	D	87.1	142		
let Counts	Controls	7DPC	O	207	285	ND	157	D	D	242	D	D	11.4	82.8		
ola Plate	Con	60PC	Q	123	150	194	100	11.3	42.2	122	0	44.1	2.4	6.8		
pira canio		SDPC	O	45.3	117	172	49.9	11.1	15.8	81.6	14	14.2	8.5	8.3		
Leptos		4DPC	7.7	40.5	134	150	55	3.9	37.6	61.7	38	33.3	67.1	41.6		
		3DPC	11	64.1	187	196	119	45.9	195	107	80.2	103	115	64.5		
		20PC	148	161	213	279	225	60.4	305	167	150	195	182	150		
		1DPC	238	204	267	278	281	209	521	292	327	329	409	174		
		Baseline (Avg -2DPC, -1DPC, 0DPC)	300	342	519.7	404.7	482.7	242.3	529.7	329.3	432.7	395.7	563.7	232.7	ata	
		Dog	23	24	25	26	27	28	29	30	31	32	33	34	ND= No Data	D = dead

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

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Study Type	Efficac	У														
Pertaining to	Leptos	pira	grip	pot	yph	osa										
Study Purpose	To den				fecti	iven	ess	agai	nst .	Lepi	tospir	a grip	potyp	<i>hosa</i> in		
	6-week															
Product Administration	Two do															
Study Animals	Twenty of 10 S	•	/			-							to one	group		
Challenge Description	Fifteen												were			
Chancinge Description	challen	,	*	•												
Interval observed after	Dogs v															
challenge	2082	. 010	002													
Results																
	vaccina	ates	whe	en co	omp	are	d to	con	trols	S.						
	T4	Leptospira was not isolated in any of the vaccinates receiving														
		Leptospira was not isolated in any of the vaccinates receiving vaccine by SC route.														
	vaccine	vaccine by SC route.														
	Lentos	vaccine by SC route. Leptospira was isolated from blood collected from dogs in the														
		Leptospira was isolated from blood collected from dogs in the control group after challenge, as shown in the following table														
	vaccine by SC route. Leptospira was isolated from blood collected from dogs in the control group after challenge, as shown in the following table for Days 0 – 14 (post-challenge):															
	Dog	vaccine by SC route. Leptospira was isolated from blood collected from dogs in the control group after challenge, as shown in the following table for Days $0-14$ (post-challenge):														
	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 is Ar	nima	l Dea	d or	euth	naniz	ed/	no sa	ampl	e tak	en					
	+ is Posi	tive	for L	epto	spira	a										
HCD A A DD A	T	. 10	1.04	00												
USDA Approval Date	January	y 12	, 19	99												

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Study Type	Efficacy
Pertaining to	Leptospira icterohaemorrhagiae
Study Purpose	To demonstrate effectiveness against <i>Leptospira</i>
	icterohaemorrhagiae 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
	Leptospira icterohaemorrhagiae 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	Dogs were observed daily for 21 days after challenge for
challenge	clinical signs associated with L. icterohaemorrhagiae. Blood
	samples were collected through 14 days after challenge.
Results	Efficacy was determined by comparing vaccinates versus
	controls in clinical signs, thrombocytopenia, and
	leukopenia.
	A dog was considered to have thrombocytopenia if the platelet count dropped below 200 k/ μ L and the count was less than 50% of the baseline value.
	A dog was considered to have leukopenia if the platelet count dropped below 6 k/ μ L and the count was less than 50% of the baseline value.
	See the next page for data.
USDA Approval Date	March 31, 1998

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		DPC															
		100PC 110PC 120PC 130PC 140PC 150PC 150PC 170PC 130PC 190PC 200PC 210PC			ш		ш					\vdash					
		3DPC 2				m		A				Н					
		18DPC 1			0	0				0		П					
		17DPC			m							П					
		16DPC										ш					
		15DPC															
		14DPC															
		13DPC															
		12DPC					٥					Ц					
enge		11DPC										٥					
S		10000										Ц					
rved Post		9DPC														served	
Signs Obse	SC Vaccinates	8DPC				F	3						rine	8.0°F		Blank - no clinical Sign observed	
ero Clinica	30	7090											K - Bloody Urine	L-Fever >103.0°F	M - Death	Blank - no c	
Leptospira Ictero Clinical Signs Observed Post Challenge		9090	A			3					3	0				(loots	(100
3		SDPC			0							Q	harge Serous	G - Nasal Discharge Mucoid	ild (loose stool)	I- Diarrhea Moderate (Watery stool)	J - Diarrhea Severe (bloody stool)
		4DPC											F - Nasal Discharge Serous	G - Nasal Disc	H- Diarrhea Mild loose	I- Diambea Mo	J - Diamhea Se
		30PC			ш	ш						۵				v	.0
		20PC										0			ethargy	D- Ocular Discharge Serous	E - Ocular Discharge Mucoid
		ODPC 1DPC					ĄE						tance	20	Ssion/L	rDischa	r Dischi
		ODPC											A-inappetance	B-Vomiting	C - Depression/Lethargy	D-Ocula	E-Ocula
		Dog	11	12	13	14	15	16	17	18	19	90					

DPC = Day post-challenge

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		OPC												П						
		100PC 110PC 120PC 130PC 140PC 150PC 150PC 170PC 180PC 190PC 200PC 210PC												Н	+					
		3DPC 20		ш	ш									Н	+					
		8DPC 19			ш						0		0	80						
		7DPC 1			ш									Н	7					
		16DPC 1			ш								ш	П	\exists					
		15DPC					Г		0					П						
		14DPC																		
		13DPC																		
		12DPC			ш				E											
enge		11DPC								×		×	w	Ц						
t Chall		10DPC																		
rved Pos		9DPC		8															served	
igns Obse	Controls	8DPC							A							Je Je	J°F		ical Sign ob	
ro Clinical S	0	7DPC							1							K - Bloody Urine	L - Fever >103.0°F	M · Death	Blank - no clinical Sign observed	
Leptospira Ictero Clinical Signs Observed Post Challenge		9DPC	A										A	E						
Lep							\vdash	\vdash						Н	_	S	pio	stool)	atery stool)	dy stool
		SDPC							ш		0					harge Sero	charge Muc	ild (loose	oderate (W	evere (bloo
		3MQ4	u.	4					Q	A,C,D,J		A,E				F - Nasal Discharge Serous	G - Nasal Discharge Mucoid	H- Diarrhea Mild (loose stool)	I- Diarrhea Moderate (W.	J - Diarrhea Severe (bloody stool)
		3DPC			1	7			0	×		L,D	u							
		2DPC			1	7			_	L,E	7		_	П	T			thargy	ge Serous	ge Mucoi
																ance	0.0	sion/Le	Dischar	Dischar
		3d01 3d00														A-inappetance	B-Vomiting	C - Depression/Lethargy	D- Ocular Discharge Serous	E - Ocular Discharge Mucoid
		Dog	21	22	23	24	25	36	77	28	29	30	31	32						

DPC = Day post-challenge

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				_								_
		14DPC	6.4	12.3	8.4	9.1	10.9	8.3	7.3	6.4	6.7	8.9
		13DPC	7.2	9.1	7.8	12.8	7.5	8.3	7.5	7.8	8.8	8.1
		120PC	9.6	6	7.8	10	11.1	10	10.2	6.5	7	7.6
		11DPC	9.7	10.2	6.7	8.6	7.7	9.5	7.1	8.1	7.8	12.6
		10DPC	8.9	7.7	10.6	13.2	10.4	8.7	11.7	6	7.7	12.5
Leptospira ictero White Blood Cell Count Post Challenge		9DPC	8.5	8.6	8.3	80	7.5	7.7	7.6	80	8.2	8.7
		SDPC	6.4	11.1	9.6	11.8	60	10.1	11.4	7.4	7.5	9.1
	inates	7DPC	6.4	8.2	9.2	7.3	10.2	8.4	9.4	8.4	10.5	6.4
	SC Vaccinates	6DPC	6.4	15.2	89.09	9.3	11.2	9.4	10.5	7.1	6.7	14.4
		SDPC	10.1	12.4	14.2	11.3	8.3	9.1	7.2	7.3	8.7	14.8
		4DPC	6.8	9.1	9.1	12.6	80	8.1	7.5	9.9	11.7	11.9
		3DPC	7.9	8.9	13.2	8.2	6	6.8	8.1	9.1	11.7	9.1
		2DPC	12.4	10.4	9.6	12.6	9.8	9.5	7.8	10.5	8.4	5.3
		1DPC	7.3	13.9	15.4	7.6	11.4	8.8	7.1	7.7	13.8.	6.6
		Baseline (Avg -2DPC, -1DPC, 0DPC)	7.2	10	7.6	13.4	8.6	9.1	9.1	7.2	9.5	13.1
		Dog	11	12	13	14	15	16	17	18	19	20

DPC = Day post-challenge. Values reported as $k/\mu L$.

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allenge		9DPC 10DPC 12DPC 13DPC 14DPC	8.1 10.4 6.4 8.5 6.5 6.2	8.2 13.4 10.1 7.7 7.6 9.4	7.1 11.9 7 9.6 11 11.8	13.7 19.2 24.9 13.3 24.4 12.3	10 13.9 9.4 8.3 9 7.1	9 10.2 13.3 8.6 8.9 10.5	12.1 8.6 8.3 11.4 7.4 9.5	11.6 11.7 14 8.3 7.8 7.7	Q	8 10.3 10.1 9.9 9.4 9.6	D	9.6 14.1 9.9 10 10.1 9.3	
Leptospira ictero White Blood Cell Count Post Challenge	s	7DPC 8DPC	6.7 6.5	9.4 7.2	7 6.5	19.8 16	12.8 9.6	11.3 11.8	7.5 8.6	14.7 10		6.2 9.9		13.5 14.5	
Vhite Blood (Controls	6DPC 7	8.6	13.4	10	16.7	10.9	15.4	8.6	8.8		7.8		10.6	
a ictero V		SDPC	6.2	7.3	6	15.3	7	12.2	10.7	7.3		7.5		12.6	
Leptospir		4DPC	8.2	6.5	7.1	11.8	9.1	11.8	14.6	7.3	26.4	7.8	19	10.7	
		3DPC	6.7	8.2	11.6	7.8	6.9	3.9	15.8	4.5	4.1	7.2	4.2	5	
		2DPC	9.6	9.3	9.4	10.6	8.5	6	9.4	6.7	5.8	5	8.3	6.2	
		1DPC	9.9	8.5	12.2	19.6	13.9	9.8	7.5	8.8	6.7	9.2	8.1	9.3	
		Baseline (Avg -2DPC, -1DPC, 0DPC)	7.4	7.4	9.3	13.7	10	8.4	7.8	7.8	7.8	8.8	11	8.3	
		Dog	21	22	23	24	25	26	27	28	29	30	31	32	D-dood

DPC = Day post-challenge. Values reported as $k/\mu L$.

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													r
		14DPC	359	517	349	281	369	294	381	287	352	378	
		13DPC	471	461	337	351	290	284	373	391	406	340	
		12DPC	536	473	347	263	401	286	498	283	331	325	
		11DPC	586	453	415	330	288	258	417	388	383	501	
		10DPC	591	487	522	431	388	316	529	406	356	488	
allenge		9DPC	442	505	508	331	285	253	436	424	489	358	
Post C		8DPC	488	480	416	376	314	281	513	327	378	392	
Leptospira ictero Platelet Counts Post Challenge	nates	7DPC	447	435	517	335	400	268	457	419	200	352	
	SC Vaccinates	6DPC	457	645	445	344	435	308	542	393	459	555	
		SDPC	299	526	580	374	282	278	214	351	417	515	Г
		4DPC	440	428	424	457	275	264	332	397	529	525	
		3DPC	476	447	260	349	286	217	386	392	552	483	
		2DPC	619	456	425	413	297	298	400	569	386	206	
		1DPC	432	475	595	258	380	264	407	482	467	412	
		Baseline (Avg2DPC, -1DPC, 0DPC)	449.7	518.3	489.3	451.7	357.7	369	473.7	206	477	502.3	
		Dog	11	12	13	14	15	16	17	18	19	20	

DPC = Day post-challenge. Values reported as $k/\mu L$.

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				Le	otospira	ictero	Platelet	Leptospira ictero Platelet Counts Post Challenge	Post C	hallenge	•				
H. 3.							Controls	slo							
Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	1DPC	2DPC	3DPC	4DPC	SDPC	90РС	7DPC	8DPC	ЭВРС	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	859	451
25	266	401	220	146	189	288	483	611	458	466	099	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					J	O				
30	421.9	204	80.9	53.9	119	231	379	512	549	516	642	464	411	421	427
31	319.3	163	94.4	36.7	11.9					J	D				
32	267	184	55	7.7	88.8	196	257	347	525	430	529	360	337	287	301
D = Dead	pe														

DPC = Day post-challenge. Values reported as $k/\mu L$.

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Study Type	Efficac	y														
Pertaining to	Leptos	pira	pon	non	a											
Study Purpose	To den	nonst	trat	e ef	fect	iven	iess	aga	inst	Lep	otos	pira	poi	non	a in	6
	week o															
Product Administration	Two do											<u> </u>				apart.
Study Animals	Twenty		/							_		•	_			
	Leptos									_	-	of c	ne g	grou	p of	f 10
	SC vac												11		•	
Challenge Description	Twenty		,		•								all a	nım	als	were
	challen												1		\1	1
Interval observed after	Dogs v					•			•				_			1
challenge	sample							_								
Results	Efficac	•								-	ono	cnei	emi	a in		
	vaccina	nes v	WIIE	en c	omp	are	a to	COL	uroi	S.						
	Leptos	nira	wa	e no	t isc	late	d fr	om	hlo	ad i	กลท	W O	fthe	Va(cin	ates
	receivi	-							UIU	ou n	ıı aıı	iy O.	ı tiic	vac	CIII	ates
	1000171	s			~ j ~	, ,	our									
	Leptos	nira '	was	siso	late	d fr	om	bloo	od c	olle	cted	1 fro	m d	logs	in t	he
	control															
	for Days 0 – 14 (post-challenge):															
	Dog 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14															
	1 + + + +															
	2															
	3 + + +															
	4 + +															
	5 + + + +															
	6			+	+											
	7		+	+	+											
	8			+	+	+										
	9		+	+	+	+										
	10		+		+	+										
	+ is Pos	itive f	or L	epto	spira	a										
USDA Approval Date	January	y 12,	19	99												

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Study Type	Safety								
Pertaining to	All fractions								
Study Purpose	Demonstrate safety	of prod	duct under	typical	use cond	itions			
Product	Two doses were adr	ministe	red subcut	aneous	ly (SC) at	2-3 we	ek intervals	;	
Administration	in dogs 6 weeks of a	age or	older.						
Study Animals	A total of 624 dogs,	, privat	ely owned	and fro	om comme	ercial k	ennels,		
	were enrolled in the	study.	From thes	se dogs	, 341 were	e 6 weel	ks of age or		
	younger, at first vac	cinatio	n.						
Challenge	Not applicable								
Description									
Interval	No challenge. Dogs						each		
observed after	vaccination and dail	ly for t	wo weeks	after ea	ch vaccin	ation.			
challenge									
Results	Frequency of advers	se even	its:						
	Post Vaccination	Reacti	on Occurre	nce by	doses. Tota	al Doses	= 1223		
	ъ .:	≤ 6 V	Veek old	> 6 W	eeks old	Tota	al Doses		
	Reaction	[Dogs	[)ogs	1016	ii Doses		
	Category	#	Percent	#	Percent	#	Percent		
	No adverse events	673	99.26%	538	98.72%	1211	99.02%		
	lethargy	0	0.00%	1	0.18%	1	0.08%		
	Swelling	0	0.00%	3	0.55%	3	0.25%		
	Injection Site pain	5	0.74%	1	0.18%	6	0.49%		
	Pruritus	0	0.00%	2	0.37%	2	0.16%		
	Increased Thirst	0	0.00%	1	0.18%	1	0.08%		
	*25 dogs only recei	ved on	e vaccinati	ion. Eit	her they d	id not r	eturn for		
	follow-up or were re								
	cooperator to be uni					,	•		
USDA Approval	November 2, 1998								
Date									

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