

Establishment Name	Boehringer Ingelheim Animal Health USA Inc.
USDA Vet Biologics Establishment Number	124
Product Code	2668.06
True Name	Leptospira Canicola-Grippotyphosa-Icterohaemorrhagiae- Pomona Bacterial Extract
Tradename(s) / Distributor or Subsidiary (if different from manufacturer)	
Date of Compilation Summary	September 01, 2020

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	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/ μ 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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Leptospira canicola Clinical Signs Observed Post Challenge	SC Vaccinates	8DPC												3.0-103.9 ⁴ F)	4.0-104.9 ⁴ F)	5.0-105.9 ¹ F)			nical signs of	
ola Clinical	SCI	7DPC									9			N1 - Fever (103.0-103.9 ¹ F)	N2 - Fever (104.0-104.9 ¹ F)	N3 - Fever (105.0-105.9 ¹ F)	N4 - <99.6 ⁵ F	P - Death	Blank - no clinical signs observed	
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 |
 | 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,R G G A A,N1 A,G,N2 G A,D,G,K,L A,D,G,K,L A,D,G,K,L A,D,G,K,L A,D,G,K,L A,R G G A,N1 A,G,N2 G A,D,G,K,L A,D,G,K,L A,D,G,K,L A,R G,K G,K G,K A,N1 A,G,N2 A,D,G,K,L A,D,G,K,L A,D,G,K,L A,R G,K G,K G,K A,N1 A,G,G,L,N1 A,D,G,K,L A,D,G,K,L A,R G,K G,K G,K A,N1 A,D,G,L,N1 A,D,G,K,L A,D,G,K,L A,D,G,K,L A,R G,K G,K A,N1 A,D,G,L,N1 A,D,G,K,L A,D,G,K,L A,R G,K G,K A,N1 A,G,K A,D,G,K,L A,D,G,K,L A,D,G,K,L A,R G,K G,K | N1 G G,L D,K,L A,D,G,K,L,M,N4 P G,N2 A,G,N1 A,G A,B,J A,D,G,K,L A,D,G,K,L A,R G G C P A,N1 A,G 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,D,G,K,L A,D,G,K,L A,D,G,K,L A,C G G A A,N1 A,G,N2 G A,D,G,K,L A,D,G,K,L A,D,G,K,L A,D,G,K,L A,D,G,K,L A,D,G,K,L A,D,G,K,L A,D,G,K,L A,D,G,K,L A G G G A A A,D,G,K,L A A G G G G G G G G G G A G G A G G G G G G G G G G G G <td>N2 G,K B,D,K,L D,G,K,L,N4 P N1 G G,L D,K,L A,D,G,K,L,M,M4 P P P 6,N2 G,L D,K,L A,D,G,K,L A,D,G,K,L</td> <td>N2 G,K G,K Å,D,G,K G,G G,K M G
 G G</td> <td>D/N2 J/K A,B,D,G,L,L,M, A,D,E,J,K,L,M,M A,D,E,J,K,L,M,M A,D,E,J,K,L,M,M A,D,G,K,L,M,M A,D,G,K,L,M A,D,G,K,L,M</td> <td>ZDPC 3DPC 4DPC 5DPC 5DPC 3DPC <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>.0-104.9°F)</td><td>N2 - Fever (104</td><td></td><td>charge Serous</td><td>H - Nasal Disc</td><td></td><td></td><td>-</td><td></td></th<></td> | N2 G,K B,D,K,L D,G,K,L,N4 P N1 G G,L D,K,L A,D,G,K,L,M,M4 P P P 6,N2 G,L D,K,L A,D,G,K,L | N2 G,K G,K Å,D,G,K G,G G,K M G | D/N2 J/K A,B,D,G,L,L,M, A,D,E,J,K,L,M,M A,D,E,J,K,L,M,M A,D,E,J,K,L,M,M A,D,G,K,L,M,M A,D,G,K,L,M | ZDPC 3DPC 4DPC 5DPC 5DPC 3DPC 3DPC <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>.0-104.9°F)</td><td>N2 - Fever (104</td><td></td><td>charge Serous</td><td>H - Nasal Disc</td><td></td><td></td><td>-</td><td></td></th<> | |
 | | | | | | .0-104.9°F) | N2 - Fever (104 | | charge Serous | H - Nasal Disc | | | - | |
| H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ⁺ F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 ⁺ F) Irgy J - Diarrhea Mild (loose stool) Id/Moderate K - Diarrhea Severe (bloody stool) | H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ⁺ F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 ⁺ F) I - Diarrhea Mild (loose stool) N4 - <99.6 ⁺ F
 | H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ⁺ F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 ⁺ F)
 | H - Nasal Discharge Serous N2 - Fever (104.0-104.9°F)
 | 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 G G,L A,G
A,N1 A,G,N2 G A,D,G,K,L A,D,G,K,N1 A,D,G,K,L A,K G,K G,K G,K G,K G,K - | N1 G G,L D/K,L A,D,G,K,L,M,N4 G,N2 A,G,N1 A,G A,B,J A,D,G,K,L
 | N2 G,K B,D,KL D,G,K,L,M4 N1 G G,L D,K,L A,D,G,K,L,M,M4 6,N2 A,G,N1 A,G A,B,J A,D,G,K,L A,D,G,K,L A,K G G G,L B,L A,D,G,K,L A,D,G,K,L A,K G G G,L A,G A,G A,B,L A,D,G,K,L A,D,G,K,L A,K G G,L A,G | N2 G/K G/K A,D/G,K G G/K C | D/N2 J,K A,B,D,G,L D,G,K,L,M,A A,D,E,K,L,M,N4 C C F F F F F F F F F F F F F F
 F | ZDPC 3DPC 4DPC 5DPC 5DPC 3DPC 3DPC <t< td=""><td>ay post-challenge</td><td>DPC = D</td><td></td><td></td><td></td><td></td><td></td><td>.0-103.9°F)</td><td>N1 - Fever (103</td><td></td><td>charge Mucoid</td><td>G - Ocular Dis</td><td></td><td></td><td>ance</td><td></td></t<> | ay post-challenge | DPC = D | | | | | | .0-103.9°F) | N1 - Fever (103 | | charge Mucoid | G - Ocular Dis | | | ance | |
| G - Ocular Discharge Mucoid N1 - Fever (103.0-103.9 ⁺ F) H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ⁺ F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 ⁺ F) rgy J - Diarrhea Mild (loose stool) rdy - O95.6 ⁺ F | G - Ocular Discharge Mucoid N1 - Fever (103.0-103.9 ⁺ F) H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ⁺ F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 ⁺ F) Irgy J - Diarthea Mild (loose stool)
 | G - Ocular Discharge Mucoid N1 - Fever (103.0-103.9 ^c F) H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ^c F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 ^c F)
 | G - Ocular Discharge Mucoid N1 - Fever (103.0-103.9 ^r F)
H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ^r F)
 | 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 G,L A,G
A,N1 A,G,N2 G A,D,G,K,L A,D,G,K,LN1 A,D,G,K,L A,K G,K G,K G,K A | N1 G G,L D/K,L A,D,G,K,L,M,N4 6,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,C G,L G,L A,G A,N1 A,G,N2 G,G A,D,G,K,L A,D,G,K,L A,D,G,K,L A,K G G G,L A,G A,N1 A,G,N2 G,G A,D,G,K,L A,D,G,K,L A,D,G,K,L A,R G G G,L A,G
 | N2 G,K B,D,K,L D,G,K,LM4 N1 G G,L D,K,L A,D,G,K,LM14 6,N2 A,G,N1 A,G A,D,G,K,L A,C G G,L A,G | N2 G/K B/D/KL G/K A/D/G/K G G/K C
 | | ZDPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC 9DPC N2 A,D,K,M,M4 A,D,G, A,D,K A,D,K A,D,K A,D,K 9DPC 9DPC 9DPC N2 B G A,D,G A,D,K A,D,K A,G,K A,D,K A,D N2 B G D A,J A,K A,G A,D A,D N1 A A,A A,A A,A A,D,G,K,L,M,M A,G,K A,D,G A,D,G A,D,G A,D,G A,D,G A,D A,D N1 A A,G,L A,D,G,K,L,M,M A,D,G,K,L,M,M A,D,G,K A,D | | | | | | | | | | | | | | | | 1 |
| G - Ocular Discharge Mucoid N1 - Fever (103.0-103.9 ⁺ F) H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ⁺ F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 ⁺ F) rgy J - Diarthea Mild (loose stool) rd/Moderate K - Diarthea Severe (bloody stool) | G - Ocular Discharge Mucoid N1 - Fever (103.0-103.9 [*] F) H - Nasal Discharge Serous N2 - Fever (104.0-104.9 [*] F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 [*] F) Irgy J - Diarthea Mild (loose stool)
 | G - Ocular Discharge Mucoid N1 - Fever (103.0-103.9 [*] F) H - Nasal Discharge Serous N2 - Fever (104.0-104.9 [*] F) I - Nasal Discharge Mucoid N3 - Fever (105.0-105.9 [*] F)
 | G - Ocular Discharge Mucoid N1 - Fever (103.0-103.9 ^r F)
H - Nasal Discharge Serous N2 - Fever (104.0-104.9 ^r F)
 | 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,K G G G GL A,G | NI G G,L D,K,L A,D,G,K,LM.N4
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,C G G G,L A,G
 | N2 G,K B,D,K,L D,G,K,LN4 N1 G G,L D,K,L A,D,G,K,L,M,N4 P 6,N2 A,G,N1 A,G A,B,J A,D,G,K,L | N2 G,K A,D,G,K G G,K A,D,G,K G
 | D _N 2 J,K A,B,D,G,L D,G,K,LM4 A,D,E,I,K,LM,N4 N2 C,K B,D,K,L C,K A,D,G,K C C,K C | ZDPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC 9DPC $AD,KM,N4$ $AD,KM,N4$ $AD,KM,N4$ $AD,KM,N4$ AD,K AD,K BD,C $BDPC$ | | | | G,K | G,K | A,K | A,D,G,K,L | A,D,G,L,N1 | | A,D,G,K,L | U | | A,G,N2 | A,N1 | | |
| 11 A,G,N2 G A,D,G,K,L A,D,G,K,L A,K G,K | 11 A,G,N2 G A,D,G,K,L A,D,G,K,L A,K G,K
 | vi1 A,G,N2 G A,D,G,K,L A,D,G,K,L A,D,G,K,L A,K G,K G,K G,K G,K G,K L L L L Nasal Discharge Serous N1 - Fever (103.0-103.9 ⁴ F) A,D,G,K,L A,K G,K G,K G,K G,K G,K C,K L L Nasal Discharge Serous N2 - Fever (104.0-104.9 ⁴ F) N N L Nasal Discharge Mucoid N3 - Fever (105.0-105.9 ⁴ F) N N L N N L N
 | A,N1 A,G,N2 G A,D,G,K,L A,D,G,L,N1 A,D,G,K,L A,K G,K G,K G,K G,K G,K M Ferrer G Ocular Discharge Mucoid N1-Fever (103.0-103.9 ⁴ F) A,D,G,K,L |
 | G G,L D,K,L A,D,G,K,L,M,1N4
 | G,K B,D,K,L D,G,K,L,M4 P G G,L D,K,L A,D,G,K,L,M,N4 | N2 G,K B,D,K,L G,K A,D,G,K,L,M,H G G G G G G G G G G G G G G G D G < | D,N2 J,K A,B,D,G,L D,G,K,LM4 A,D,E1,K,LM,M4 P N2 C G,K A,D,G,K G G,K A,D,G,K G G G G G A N2 G,K B,D,K,L D,G,K,LM4 G G,K G G G G G G A G G A G A G A
 | ZDPC 3DPC 4DPC 5DPC 5DPC 3DPC 3DPC <th< td=""><td></td><td>C,L</td><td></td><td>S</td><td>g</td><td>A,K</td><td>A,D,G,K,L</td><td>A,D,G,K,L</td><td></td><td>A,D,G,K,L</td><td>A,B,J</td><td>A,G</td><td>A,G,N1</td><td>G,N2</td><td>9</td><td></td></th<> | | C,L | | S | g | A,K | A,D,G,K,L | A,D,G,K,L | | A,D,G,K,L | A,B,J | A,G | A,G,N1 | G,N2 | 9 | |
| Image: Constraint of the state of | Image: 2 A
 | GN2 A A,G,L A,D,G,L,M,W4 A,D,E2,M,M4 A,D,G,M,L4 A
 | GN2 A A,G,L A,D,G,L,M,W A,D,E2,M,M4 A,D,E2,M,M4 A,D,E2,M,M4 A,D,E2,M,M4 A,D,E2,M,M4 A,D,E2,M,M4 A,D,E2,M,M4 A,D,E2,M,M4 A,D,E1,M,M4 P | GN2 A A,G,L A,D,G,K,L,M,N4 A,D,E2,M,M4 A,D,E2,M,M4 A,D,E2,M,M4 P <t< td=""><td>GN2 A A,G,L A,D,G,K,L,M,V4 A,D,E2,M,V4 A,D,D,E2,M,V4<</td><td>GN2 A A,G,L A,D,G,K,L,M,N4 A,D,E2,M,N4
D,N2 J,K A,B,D,G,L D,G,K,L,N4 A,D,E1,K,L,M,N4</td><td>GN2 A A,G,L A,D,G,K,L,M,N4 A,D,E2,M,N4 GN2</td><td></td><td>2DPC 3DPC 4DPC 5DPC 5DPC 3DPC <th< td=""><td>A,G</td><td>A</td><td></td><td></td><td></td><td></td><td></td><td></td><td>A,D,G</td><td>A,K</td><td>A,N1</td><td>A</td><td>A</td><td>N1</td><td></td><td></td></th<></td></t<>
 | GN2 A A,G,L A,D,G,K,L,M,V4 A,D,E2,M,V4 A,D,D,E2,M,V4< | GN2 A A,G,L A,D,G,K,L,M,N4 A,D,E2,M,N4
D,N2 J,K A,B,D,G,L D,G,K,L,N4 A,D,E1,K,L,M,N4
 | GN2 A A,G,L A,D,G,K,L,M,N4 A,D,E2,M,N4 GN2 | | 2DPC 3DPC 4DPC 5DPC 5DPC 3DPC 3DPC <th< td=""><td>A,G</td><td>A</td><td></td><td></td><td></td><td></td><td></td><td></td><td>A,D,G</td><td>A,K</td><td>A,N1</td><td>A</td><td>A</td><td>N1</td><td></td><td></td></th<> | A,G | A | | | | | | | A,D,G
 | A,K | A,N1 | A | A | N1 | | |
| 1 A | 1AA <th< td=""><td>I A A,N1 A,K A,D,G,K,L,M,M A,D,G,K,L B,D,K B,D,K</td></th<> <td>NI A A/N1 A/K A/D,G,K,L,M,M A/D,G,K,L,M A/D,G,K</td> <td>N1 A A,N1 A,K A,D,G A,D,G<td>N1 A A A,N1 A,K A,D,G A,D,G A</td><td>N1 A A A,N1 A,K A,D,G A A,D A <</td><td>N1 A A A,N1 A,K A,D,G A A GN2 A A,G,L A,D,G,K,L,M,N4 A,D,K,L,M,N4 A,D,G,K,L,M,N4</td><td>A A A,N1 A,K A,D,G A</td><td>2DPC 3DPC 4DPC 5DPC 5DPC 9DPC <th< td=""><td>8</td><td></td><td></td><td>D,G</td><td>9</td><td></td><td>A,D</td><td>A,D,K</td><td>A,G,K</td><td>A,D,J</td><td>0</td><td>G</td><td>D,G,N1</td><td></td><td></td><td></td></th<></td></td> | I A A,N1 A,K A,D,G,K,L,M,M A,D,G,K,L B,D,K | NI A A/N1 A/K A/D,G,K,L,M,M A/D,G,K,L,M A/D,G,K | N1 A A,N1 A,K A,D,G A,D,G <td>N1 A A A,N1 A,K A,D,G A,D,G A</td> <td>N1 A A A,N1 A,K A,D,G A A,D A <</td> <td>N1 A A A,N1 A,K A,D,G A A GN2 A A,G,L A,D,G,K,L,M,N4 A,D,K,L,M,N4 A,D,G,K,L,M,N4</td> <td>A A A,N1 A,K A,D,G A</td> <td>2DPC 3DPC 4DPC 5DPC 5DPC 9DPC <th< td=""><td>8</td><td></td><td></td><td>D,G</td><td>9</td><td></td><td>A,D</td><td>A,D,K</td><td>A,G,K</td><td>A,D,J</td><td>0</td><td>G</td><td>D,G,N1</td><td></td><td></td><td></td></th<></td> | N1 A A A,N1 A,K A,D,G A,D,G A | N1 A A A,N1 A,K A,D,G A A,D A < | N1 A A A,N1 A,K A,D,G A A GN2 A A,G,L A,D,G,K,L,M,N4 A,D,K,L,M,N4 A,D,G,K,L,M,N4 | A A A,N1 A,K A,D,G A | 2DPC 3DPC 4DPC 5DPC 5DPC 9DPC 9DPC <th< td=""><td>8</td><td></td><td></td><td>D,G</td><td>9</td><td></td><td>A,D</td><td>A,D,K</td><td>A,G,K</td><td>A,D,J</td><td>0</td><td>G</td><td>D,G,N1</td><td></td><td></td><td></td></th<> | 8 | | | D,G | 9 | | A,D | A,D,K | A,G,K | A,D,J | 0 | G | D,G,N1 | | | |
| MID,G,MIGDA,DA,D,GA,D,G,KA,D,G,KA,D,GCCCD,GC1AA,G,LA,D,G,K,L,M/HA,D,E,Z,M,H4A,D,E,Z,M,H4A,D,E,Z,M,H4A,D,E,Z,M,H4A,D,E,Z,M,H4A,D,E,Z,M,H4A,D,E,Z,M,H4A,D,E,Z,K,L,M,H4A,D,E,Z,K,L,M,H4A,D,E,Z,K,L,M,H4A,D,E,Z,K,L,M,H4A,D,E,Z,K,L,M,H4A,D,E,Z,K,L,M,H4A,D,E,Z,K,L,M,H4A,D,G,K,L,M,H4A,D,G,K,L,M,H4A,D,G,K,L,M,H4A,D,G,K,L,M,H4A,D,G,K,LA,D,G,K,LA,D,C,K,LA,D,G,K,L <td>MIDG,MIGDAD<!--</td--><td>MIDG,MIGDADJA,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,G,G,KA,D,G,KA,G,G,</td><td>DGMIDGMIGDADJADJAGKADKADKADKADADAADAAA<t< td=""><td>DGMI DGMI G D ADJ A,G,K A,D,K A,D G D,G D <thd< th=""> D <thd< th=""> <thd< thd=""></thd<></thd<></thd<></td><td>D,G,N1 D,G,N1 G D A,D,L A,G,L A,D,C A,D,C</td><td>D,G,N1 D,G,N1 G D A,D A,G,K A,D,K A,D G D,G G D,G G D,G D,G<td>D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D<</td><td>D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D A,D A,G,K A,D,K A,D G D,G D A,G D A,D,K A,D,K A,D G D,G D A,G D A,G D A,G D</td><td>ZDPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC A,D,K,M,N4 A,D,K,M,N4 A,D,K C,D,G,L,M4 A,D,K A,D,K,M4</td><td></td><td>U</td><td></td><td></td><td>A,D,N1</td><td></td><td>D</td><td>A</td><td>A,G</td><td>A,K</td><td></td><td>G</td><td>8</td><td>N2</td><td></td><td></td></td></t<></td></td> | MIDG,MIGDAD </td <td>MIDG,MIGDADJA,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,G,G,KA,D,G,KA,G,G,</td> <td>DGMIDGMIGDADJADJAGKADKADKADKADADAADAAA<t< td=""><td>DGMI DGMI G D ADJ A,G,K A,D,K A,D G D,G D <thd< th=""> D <thd< th=""> <thd< thd=""></thd<></thd<></thd<></td><td>D,G,N1 D,G,N1 G D A,D,L A,G,L A,D,C A,D,C</td><td>D,G,N1 D,G,N1 G D A,D A,G,K A,D,K A,D G D,G G D,G G D,G D,G<td>D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D
D D<</td><td>D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D A,D A,G,K A,D,K A,D G D,G D A,G D A,D,K A,D,K A,D G D,G D A,G D A,G D A,G D</td><td>ZDPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC A,D,K,M,N4 A,D,K,M,N4 A,D,K C,D,G,L,M4 A,D,K A,D,K,M4</td><td></td><td>U</td><td></td><td></td><td>A,D,N1</td><td></td><td>D</td><td>A</td><td>A,G</td><td>A,K</td><td></td><td>G</td><td>8</td><td>N2</td><td></td><td></td></td></t<></td> | MIDG,MIGDADJA,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,D,G,KA,G,G,KA,D,G,KA,G,G,
 | DGMIDGMIGDADJADJAGKADKADKADKADADAADAAA <t< td=""><td>DGMI DGMI G D ADJ A,G,K A,D,K A,D G D,G D <thd< th=""> D <thd< th=""> <thd< thd=""></thd<></thd<></thd<></td><td>D,G,N1 D,G,N1 G D A,D,L A,G,L A,D,C A,D,C</td><td>D,G,N1 D,G,N1 G D A,D A,G,K A,D,K A,D G D,G G D,G G D,G D,G<td>D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D<</td><td>D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D A,D A,G,K A,D,K A,D G D,G D A,G D A,D,K A,D,K A,D G D,G D A,G D A,G D A,G D</td><td>ZDPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC A,D,K,M,N4 A,D,K,M,N4 A,D,K C,D,G,L,M4 A,D,K A,D,K,M4</td><td></td><td>U</td><td></td><td></td><td>A,D,N1</td><td></td><td>D</td><td>A</td><td>A,G</td><td>A,K</td><td></td><td>G</td><td>8</td><td>N2</td><td></td><td></td></td></t<> | DGMI DGMI G D ADJ A,G,K A,D,K A,D G D,G D <thd< th=""> D <thd< th=""> <thd< thd=""></thd<></thd<></thd<>
 | D,G,N1 D,G,N1 G D A,D,L A,G,L A,D,C | D,G,N1 D,G,N1 G D A,D A,G,K A,D,K A,D G D,G G D,G G D,G D,G <td>D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D<</td> <td>D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D A,D A,G,K A,D,K A,D G D,G D A,G D A,D,K A,D,K A,D G D,G D A,G D A,G D A,G D</td> <td>ZDPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC A,D,K,M,N4 A,D,K,M,N4 A,D,K C,D,G,L,M4 A,D,K A,D,K,M4</td> <td></td> <td>U</td> <td></td> <td></td> <td>A,D,N1</td> <td></td> <td>D</td> <td>A</td> <td>A,G</td> <td>A,K</td> <td></td> <td>G</td> <td>8</td> <td>N2</td> <td></td> <td></td> | D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D D D D D D D D D D D D D
 D D< | D,G,N1 D,G,N1 G D A,D,J A,G,K A,D,K A,D G D,G D A,D A,G,K A,D,K A,D G D,G D A,G D A,D,K A,D,K A,D G D,G D A,G D A,G D A,G D | ZDPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC A,D,K,M,N4 A,D,K,M,N4 A,D,K C,D,G,L,M4 A,D,K A,D,K,M4 | | U | | | A,D,N1 | | D | A | A,G
 | A,K | | G | 8 | N2 | | |
| | $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$
 |
 | N2 B G A,K A,K A,G A D D G
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 | N2 B G A,K A,G A,G A,G A,D D,G,N1 D G C <thc< th=""> <thc< th=""> <thc< th=""></thc<></thc<></thc<> | N2 B G A,K A,G A,G A D A,D,NI D G G D G D G D G D G D G D G D G D G D G D G D G D G D G D G D D G D A,D G D G D <thd< th=""> <thd< th=""> <thd< th=""> <!--</td--><td>N2 B G A/K A/G A D A/D/I D G D
 D <thd< th=""> D D D</thd<></td><td>2DPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC A,D,K,M,N4 A,D,K,M,N4 A<td></td><td>Р</td><td></td><td></td><td></td><td></td><td></td><td></td><td>C,D,G,L,N4</td><td>A,D,K</td><td>A,D,G</td><td>A,D,G,J</td><td></td><td>D,G,N3</td><td></td><td></td></td></thd<></thd<></thd<> | N2 B G A/K A/G A D A/D/I D G D <thd< th=""> D D D</thd<> | 2DPC 3DPC 4DPC 5DPC 6DPC 7DPC 8DPC 9DPC A,D,K,M,N4 A,D,K,M,N4 A <td></td> <td>Р</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>C,D,G,L,N4</td> <td>A,D,K</td> <td>A,D,G</td> <td>A,D,G,J</td> <td></td> <td>D,G,N3</td> <td></td> <td></td> | | Р | | | | | | | C,D,G,L,N4 | A,D,K | A,D,G | A,D,G,J |
 | D,G,N3 | | |
| N3 AD,GJ A,D,G A,D,G A,D,G A,D,G A,D,G A,D,M D A,D,M | M3ADIGJA,D,GA,
 | M3ADGJADGJADGADGADGADGADGADGADADAD2BGNAXAGADADADGDCDDDD1AAADADAGAD </td <td>DG(N3)A,D(G,A,D(G,A,D(K)C,O(G)(L)(MADA,D(M)DGGNN12BGNA,CA,GA,GA,D<td< td=""><td>DG/N3 A,D/G,J A,D/G A,D/K C,D/G,L/M4 A D D</td><td>DG/N3 A,D/G A,D/K C,D/G,L/M4 N2 B G A,D/K A,G A A D A,D/M1 D G D D D D D D G D</td><td>D,G,N3 A,D,G,J A,D,G A,D,X C,D,G,L,M4 A D A,D,N1 D G G G G G G G G G G
 G G</td><td>D,G,N3 A,D,G,J A,D,G A,D,K C,D,G,L,M4 N2 B G A,D A,C A,G A A B G A A A A B G B G A A,G A,G A B B G B G A B A B B G D A,G A,G A,G A,G A,D,G A,D,M D G D G D A A,G A,G A,G A,D,G A,D G D,G D A A,G <</td><td>D,G,N3 A,D,G_J A,D,G A,D,K C,D,G,L,M4 N2 B G A,D A,G A D A,D,N1 D G P D,G,N1 D,G,N1 G D A,D,K A,D A,D G D,G P A,D,N1 D G P<!--</td--><td>20PC 30PC 40PC 50PC 60PC 70PC 80PC 90PC</td><td></td><td></td><td></td><td></td><td>а</td><td></td><td></td><td></td><td></td><td></td><td></td><td>A,D,K,M,N4</td><td></td><td></td><td></td><td></td></td></td<></td> | DG(N3)A,D(G,A,D(G,A,D(K)C,O(G)(L)(MADA,D(M)DGGNN12BGNA,CA,GA,GA,D <td< td=""><td>DG/N3 A,D/G,J A,D/G A,D/K C,D/G,L/M4 A D D</td><td>DG/N3 A,D/G A,D/K C,D/G,L/M4 N2 B G A,D/K A,G A A D A,D/M1 D G D D D D D D G D</td><td>D,G,N3 A,D,G,J A,D,G A,D,X C,D,G,L,M4 A D A,D,N1 D G</td><td>D,G,N3 A,D,G,J A,D,G A,D,K C,D,G,L,M4 N2 B G A,D A,C A,G A A B G A A A A B G B G A A,G A,G A B B G B G A B A B B G D A,G A,G A,G A,G A,D,G A,D,M D G D G D A A,G A,G A,G A,D,G A,D G D,G D A A,G <</td><td>D,G,N3 A,D,G_J A,D,G A,D,K C,D,G,L,M4 N2 B G A,D A,G A D A,D,N1 D G P D,G,N1 D,G,N1 G D A,D,K A,D A,D G D,G P A,D,N1 D G P<!--</td--><td>20PC 30PC 40PC 50PC 60PC 70PC 80PC 90PC</td><td></td><td></td><td></td><td></td><td>а</td><td></td><td></td><td></td><td></td><td></td><td></td><td>A,D,K,M,N4</td><td></td><td></td><td></td><td></td></td></td<> | DG/N3 A,D/G,J A,D/G A,D/K C,D/G,L/M4 A D A
 D A D A D A D A D A D | DG/N3 A,D/G A,D/K C,D/G,L/M4 N2 B G A,D/K A,G A A D A,D/M1 D G D D D D D D G D
 | D,G,N3 A,D,G,J A,D,G A,D,X C,D,G,L,M4 A D A,D,N1 D G | D,G,N3 A,D,G,J A,D,G A,D,K C,D,G,L,M4 N2 B G A,D A,C A,G A A B G A A A A B G B G A A,G A,G A B B G B G A B A B B G D A,G A,G A,G A,G A,D,G A,D,M D G D G D A A,G A,G A,G A,D,G A,D G D,G D A A,G < | D,G,N3 A,D,G_J A,D,G A,D,K C,D,G,L,M4 N2 B G A,D A,G A D A,D,N1 D G P D,G,N1 D,G,N1 G D A,D,K A,D A,D G D,G P A,D,N1 D G P
 P P </td <td>20PC 30PC 40PC 50PC 60PC 70PC 80PC 90PC</td> <td></td> <td></td> <td></td> <td></td> <td>а</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A,D,K,M,N4</td> <td></td> <td></td> <td></td> <td></td> | 20PC 30PC 40PC 50PC 60PC 70PC 80PC 90PC | | | | | а | | | | | | | A,D,K,M,N4 | | | | |
| N3AD,K,M,W4P28GA,D,GA,D,KC,D,G,L,M4A,D,KA,D,MDA,D,MDA28GDA,D,SA,G,KA,D,KA,D,KA,D,KA,D,MDA,D,MDA1AAA,G,LA,D,G,K,L,M,MA,D,G,K,L,MA, | N3ADX,M,M4N3CADXCOG,LWPPN3CADXADXCOG,LWPPN3CDADXADXADXDCN3DCDADXADXADXDPN3DCDADXADXADXADXADN4CADXADXADXADXADPPN3DADXADXADXADXADPAN4ADADADXADXADPAAN4ADADADXADXADXADPAN4ADG,LADXADXADCAAAN4ADG,LADXADXADCAAAN4ADG,LADXADXADCAAAN4ADXADXAADCAAAN4ADADXADXAAAAAN4ADXADXADXAAAAAN4ADXADXADXADXAAAAN4ADXADXADXAAAAAN4ADXADXADXADXAAAAN4ADXADXADXADXADXAAAN4 <td>N3ADKM/M4PN3CADK/MCOGL/M4PPN3CADGJADKCOGL/M4PPN1DC/MCADAD/MDCPN3DC/MCADAD/MDCPN1DC/MCADAD/MADCPN2CADAD/MAD/AAD/AAD/AAD/AN1DC/MA/AADCCPAN2A/AA/AA/AAD/AAD/AAD/AA/AN3DC/MA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/A<td>NoADK,MM4PP0.6/N3×AD(G)AD(G)AD(KCD(G),MMPP0.6×AD(G)AD(G)AD(KAD(KAD(KPP0.6SAD(G)AD(G)AD(KAD(KAD(KAD(KPP0.6/N1D(G)GD(G)AD(KAD(KAD(KAD(KAD(KAD(K0.6/N1AAD(KAD(KAD(KAD(KAD(KAD(KAD(K0.0JAAD(KAD(K,MMAD(K,MMAD(KAD(KAD(K0.0J/KAB(KAD(KAD(KAD(KAD(KAD(K0.1AAD(KAD(KAD(KAD(KAD(KAC0.1CAD(KAD(KAD(KAD(KAD(KAD(K0.1CAD(KAD(KAD(KAD(KAD(KAD(K0.1CAD(KAD(KAD(KAD(KACA0.1CAD(KAD(KAD(KAD(KAA0.1CAD(KAD(KAD(KAD(KAA0.1CAD(KAD(KAD(KAD(KAA0.1AAAAAAA0.1CAD(KAD(KAD(KAD(KAA0.1AAAAAAA0.1AAAAAAA<td< td=""><td>AD,KM,M4 P D,G,N3 A,D,G, A,D,K C,D,G,L,M4 P,D,K
C,D,G,L,M4 P,D,K P,D,K</td><td>ADX.M.N4 P DG.N3 A.D.K.M.N4 D.G.N3 A.D.K.G. N2 B G A.D.K A.D.K. A.D.K. A.D.K. N2 B G A.D.K A.G.K A.G.K A.D.K A.D</td><td>P AD,K,M,N4 P P D,G,N3 A,D,G,I A,D,G A,D,K C,D,G,M,M P P D,G,N3 B G A,D,G A,D,K C,D,G,M,M A,D,K P P N2 B G D A,D,K A,G,G A,D,K A,D,K P P D,G,N1 D,G,N1 G D,G A,D,K A,G,G A,D,K A,G,G A,D,K A,G,G A,D,K A,D,K A,D,K A,G,G A,D,K A,G,G A,D,K A,G,G A,G,G</td><td>PDG/N3 A,D,K,M,N4 P P D,G,N3 A,D,G, A,D,K C,D,G,L,M4 P P P D,G,N3 B G A,D,G A,D,K C,D,G,L,M4 A D,G P P N2 B G D A,D,K A,G A D A,D,N1 D G D P</td><td>A,D,X,M,N4 P D,G,N3 A,D,G,I A,D,K C,D,G,L,N4 D,G,N3 A,D,G,I A,D,G A,D,K C,D,G,L,N4 N2 B G A,K A,G A D A,D,N1 D G P D,G,N1 D,G,N1 G D A,D,N1 D G P P N1 A A A,D,G A,D,G A,D,G A,D,G A,G A,G P <</td><td></td><td>16DPC 17DPC 18DPC 19DPC 200</td><td>14DPC 15DPC</td><td>13DPC</td><td>12DPC</td><td>11DPC</td><td>10DPC</td><td>9DPC</td><td>8DPC</td><td>7DPC</td><td>6DPC</td><td>SDPC</td><td>4DPC</td><td>3DPC</td><td>2DPC</td><td>1DPC</td><td></td></td<></td></td> | N3ADKM/M4PN3CADK/MCOGL/M4PPN3CADGJADKCOGL/M4PPN1DC/MCADAD/MDCPN3DC/MCADAD/MDCPN1DC/MCADAD/MADCPN2CADAD/MAD/AAD/AAD/AAD/AN1DC/MA/AADCCPAN2A/AA/AA/AAD/AAD/AAD/AA/AN3DC/MA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/AA/AA/AN4A/AA/AA/AA/AA/A <td>NoADK,MM4PP0.6/N3×AD(G)AD(G)AD(KCD(G),MMPP0.6×AD(G)AD(G)AD(KAD(KAD(KPP0.6SAD(G)AD(G)AD(KAD(KAD(KAD(KPP0.6/N1D(G)GD(G)AD(KAD(KAD(KAD(KAD(KAD(K0.6/N1AAD(KAD(KAD(KAD(KAD(KAD(KAD(K0.0JAAD(KAD(K,MMAD(K,MMAD(KAD(KAD(K0.0J/KAB(KAD(KAD(KAD(KAD(KAD(K0.1AAD(KAD(KAD(KAD(KAD(KAC0.1CAD(KAD(KAD(KAD(KAD(KAD(K0.1CAD(KAD(KAD(KAD(KAD(KAD(K0.1CAD(KAD(KAD(KAD(KACA0.1CAD(KAD(KAD(KAD(KAA0.1CAD(KAD(KAD(KAD(KAA0.1CAD(KAD(KAD(KAD(KAA0.1AAAAAAA0.1CAD(KAD(KAD(KAD(KAA0.1AAAAAAA0.1AAAAAAA<td< td=""><td>AD,KM,M4 P D,G,N3 A,D,G, A,D,K C,D,G,L,M4 P,D,K C,D,G,L,M4 P,D,K P,D,K</td><td>ADX.M.N4 P DG.N3 A.D.K.M.N4 D.G.N3 A.D.K.G. N2 B G A.D.K A.D.K. A.D.K. A.D.K. N2 B G A.D.K A.G.K A.G.K A.D.K A.D</td><td>P AD,K,M,N4 P P D,G,N3 A,D,G,I A,D,G A,D,K C,D,G,M,M P P D,G,N3 B G A,D,G A,D,K C,D,G,M,M A,D,K P P N2 B G D A,D,K A,G,G A,D,K A,D,K P P D,G,N1 D,G,N1 G D,G A,D,K A,G,G A,D,K A,G,G A,D,K A,G,G A,D,K A,D,K A,D,K A,G,G A,D,K A,G,G A,D,K A,G,G A,G,G</td><td>PDG/N3 A,D,K,M,N4 P P D,G,N3 A,D,G, A,D,K C,D,G,L,M4 P P P D,G,N3 B G A,D,G A,D,K C,D,G,L,M4 A D,G P P N2 B G D A,D,K A,G A D A,D,N1 D G D P</td><td>A,D,X,M,N4 P D,G,N3 A,D,G,I A,D,K C,D,G,L,N4 D,G,N3 A,D,G,I A,D,G A,D,K C,D,G,L,N4 N2 B G A,K A,G A D A,D,N1 D G P D,G,N1 D,G,N1 G D A,D,N1 D G P P N1 A A A,D,G A,D,G A,D,G A,D,G A,G A,G P <</td><td></td><td>16DPC 17DPC 18DPC 19DPC 200</td><td>14DPC 15DPC</td><td>13DPC</td><td>12DPC</td><td>11DPC</td><td>10DPC</td><td>9DPC</td><td>8DPC</td><td>7DPC</td><td>6DPC</td><td>SDPC</td><td>4DPC</td><td>3DPC</td><td>2DPC</td><td>1DPC</td><td></td></td<></td> |
NoADK,MM4PP0.6/N3×AD(G)AD(G)AD(KCD(G),MMPP0.6×AD(G)AD(G)AD(KAD(KAD(KPP0.6SAD(G)AD(G)AD(KAD(KAD(KAD(KPP0.6/N1D(G)GD(G)AD(KAD(KAD(KAD(KAD(KAD(K0.6/N1AAD(KAD(KAD(KAD(KAD(KAD(KAD(K0.0JAAD(KAD(K,MMAD(K,MMAD(KAD(KAD(K0.0J/KAB(KAD(KAD(KAD(KAD(KAD(K0.1AAD(KAD(KAD(KAD(KAD(KAC0.1CAD(KAD(KAD(KAD(KAD(KAD(K0.1CAD(KAD(KAD(KAD(KAD(KAD(K0.1CAD(KAD(KAD(KAD(KACA0.1CAD(KAD(KAD(KAD(KAA0.1CAD(KAD(KAD(KAD(KAA0.1CAD(KAD(KAD(KAD(KAA0.1AAAAAAA0.1CAD(KAD(KAD(KAD(KAA0.1AAAAAAA0.1AAAAAAA <td< td=""><td>AD,KM,M4 P D,G,N3 A,D,G, A,D,K C,D,G,L,M4 P,D,K C,D,G,L,M4 P,D,K P,D,K</td><td>ADX.M.N4 P DG.N3 A.D.K.M.N4 D.G.N3 A.D.K.G. N2 B G A.D.K A.D.K. A.D.K. A.D.K. N2 B G A.D.K A.G.K A.G.K A.D.K A.D</td><td>P AD,K,M,N4 P P D,G,N3 A,D,G,I A,D,G A,D,K C,D,G,M,M P P D,G,N3 B G A,D,G A,D,K C,D,G,M,M A,D,K P P N2 B G D A,D,K A,G,G A,D,K A,D,K P P D,G,N1 D,G,N1 G D,G A,D,K A,G,G A,D,K A,G,G A,D,K A,G,G A,D,K A,D,K A,D,K A,G,G A,D,K A,G,G A,D,K A,G,G A,G,G</td><td>PDG/N3 A,D,K,M,N4 P P D,G,N3 A,D,G, A,D,K C,D,G,L,M4 P P P D,G,N3 B G A,D,G A,D,K C,D,G,L,M4 A D,G P P N2 B G D A,D,K A,G A D A,D,N1 D G D P</td><td>A,D,X,M,N4 P D,G,N3 A,D,G,I A,D,K C,D,G,L,N4 D,G,N3 A,D,G,I A,D,G A,D,K C,D,G,L,N4 N2 B G A,K A,G A D A,D,N1 D G P D,G,N1 D,G,N1 G D A,D,N1 D G P P N1 A A A,D,G A,D,G A,D,G A,D,G A,G A,G P <</td><td></td><td>16DPC 17DPC 18DPC 19DPC 200</td><td>14DPC 15DPC</td><td>13DPC</td><td>12DPC</td><td>11DPC</td><td>10DPC</td><td>9DPC</td><td>8DPC</td><td>7DPC</td><td>6DPC</td><td>SDPC</td><td>4DPC</td><td>3DPC</td><td>2DPC</td><td>1DPC</td><td></td></td<> | AD,KM,M4 P D,G,N3 A,D,G, A,D,K C,D,G,L,M4 P,D,K C,D,G,L,M4 P,D,K | ADX.M.N4 P DG.N3 A.D.K.M.N4 D.G.N3 A.D.K.G. N2 B G A.D.K A.D.K. A.D.K. A.D.K. N2 B G A.D.K A.G.K A.G.K A.D.K A.D
 | P AD,K,M,N4 P P D,G,N3 A,D,G,I A,D,G A,D,K C,D,G,M,M P P D,G,N3 B G A,D,G A,D,K C,D,G,M,M A,D,K P P N2 B G D A,D,K A,G,G A,D,K A,D,K P P D,G,N1 D,G,N1 G D,G A,D,K A,G,G A,D,K A,G,G A,D,K A,G,G A,D,K A,D,K A,D,K A,G,G A,D,K A,G,G A,D,K A,G,G | PDG/N3 A,D,K,M,N4 P P D,G,N3 A,D,G, A,D,K C,D,G,L,M4 P P P D,G,N3 B G A,D,G A,D,K C,D,G,L,M4 A D,G P P N2 B G D A,D,K A,G A D A,D,N1 D G D P
 | A,D,X,M,N4 P D,G,N3 A,D,G,I A,D,K C,D,G,L,N4 D,G,N3 A,D,G,I A,D,G A,D,K C,D,G,L,N4 N2 B G A,K A,G A D A,D,N1 D G P D,G,N1 D,G,N1 G D A,D,N1 D G P P N1 A A A,D,G A,D,G A,D,G A,D,G A,G A,G P < | | 16DPC 17DPC 18DPC 19DPC 200 | 14DPC 15DPC | 13DPC | 12DPC | 11DPC | 10DPC | 9DPC | 8DPC | 7DPC | 6DPC | SDPC | 4DPC | 3DPC
 | 2DPC | 1DPC | |

				-	eptospira	Leptospira canicola White Blood Cell Count Post Challenge	White Blo	ood Cell Co	ount Post	Challenge					
							SC Vaccinates	cinates							
	Baseline (Avg -2DPC, -1DPC, 0DPC)	1DPC	2DPC	3DPC	4DPC	SDPC	6DPC	7DPC	8DPC	90PC	10DPC	11DPC	12DPC	13DPC	14DPC
	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
	12.3	12.4	9.3	9.6	10.5	6	80	12.5	11.8	10.4	8.8	12.7	10.2	9.7	9.1
	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
	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
	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
	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	123
	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
	8.9	8.4	80	9.1	8.4	6.6	7.2	7.5	6.4	8.2	7	8.8	7.3	12.3	13.4
	11.2	15.8	10.7	9.1	7.6	80	6	9.2	10.5	11.4	7	13	9.3	7.6	12.7
	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
	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
- 1															

		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
		12DPC			26.2	11.5	15			12.69			26.3	15.7
		11DPC			36.7	9.6	13.9			9.2			31.5	10.9
a		10DPC			36.6	16.6	11.3			11.4			20.5	15.3
eptospira canicola White Blood Cell Count Post Challenge		9DPC			28.1	13.8	7.9			8.7			22.8	17.3
ount Post		8DPC			26	11.7	16.2			10.4			22.8	12.6
ood Cell C	Controls	7DPC		20.5	17		21			11.1			13	12
White Blo	Cont	6DPC		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	6.6	4.4	3.8
eptospira		4DPC	21.7	11.5	10	5.7	5.2	7	5	6.1	6	6	5.3	5.6
-		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	27	28	29	30	31	32	33	34

						-	_				_	
	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
	110PC	381	616	568	560	302	261	480	414	601	521	500
	10DPC	512	501	567	482	519	270	405	381	493	501	492
llenge	90PC	631	470	695	497	512	288	483	476	662	581	597
Post Cha	8DPC	478	565	693	576	655	314	463	379	704	650	473
<mark>et Counts</mark> cínates	7DPC	582	636	604	633	558	351	247	375	706	514	469
ola Platelet Cou SC Vaccinates	60PC	531	467	497	612	555	389	542	376	538	441	517
Leptospira canicola Platelet Counts Post Challenge SC Vaccinates	SDPC	512	539	536	503	492	329	453	375	523	469	576
Leptos	4DPC	473	576	444	421	456	324	398	403	483	447	478
	3DPC	452	573	505	543	452	311	381	324	530	476	581
	2DPC	480	559	452	381	409	247	356	353	497	354	455
	1DPC	538	679	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

					Leptos	pira canic	Leptospira canicola Platelet Counts Post Challenge	et Counts	s Post Cha	llenge					
							Controls	rols							
Dog	Baseline (Avg -20PC, -10PC, 00PC)	1DPC	2DPC	3DPC	4DPC	SDPC	6DPC	7DPC	BDPC	9DPC	10DPC	11DPC	12DPC	13DPC	14DPC
23	300	238	148	11	<i>L.</i> T	D	Q	D	D	D	D	D	Q	D	D
24	342	204	161	64.1	40.5	45.3	123	207	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	111	11.3	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
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
32	395.7	329	195	103	33.3	14.2	44.1	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	Data														
D = dead															

Study Type	Efficac	у												
Pertaining to	Leptos	pira	grip	opot	yph	osa								
Study Purpose	To den				fecti	iven	ess a	agai	nst	Lepi	tospir	a grip	potyp	<i>hosa</i> in
	6-week													
Product Administration	Two do											,		
Study Animals	Twenty												to one	group
	of 10 S						_		-					
Challenge Description	Fifteen	·	/	•										
	challen	-			-	-	0				-			
Interval observed after	Dogs w	vere	obs	erve	ed d	aily	for	21 c	lays	afte	er cha	llenge		
challenge	T 00		1		1	.1	1				• •		•	
Results	Efficac	-								-	iroche	etemia	1 n	
	vaccina	utes	wne	en co	omp	arec	u to	con	rol	5.				
	Leptos	nira	wa	- n 0	tico	late	d in	anv	of	the 1	vaccir	nates r	eceivi	na
	vaccine	-				face	um	any	01		accii	lates I		ng
	vacenit	JOy	50	IUu	ic.									
	Leptos	oira	was	s iso	late	d fr	om ł	oloo	d co	ollec	ted fr	om do	ogs in	the
	control												-	
	for Day	-	-				•						U	
	Dog	0	3	4	5	6	7	8	9	10	11	12	13	14
	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	amp	le tak	en		1	1
	+ is Posi						-							
				•	•									
USDA Approval Date	January	/ 12	, 19	99										

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 <i>L. icterohaemorrhagiae</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	March 31, 1998

						J	Leptospira Ictero Clinical Signs Observed Post Challenge	tro Clinical	Signs Obse	rved Post	Challe	agu									
								SCI	SC Vaccinates												
Dog	00PC	10PC	20PC	30PC	40PC	SDPC	60PC	70PC	8DPC	9DPC	100PC	100PC 11DPC 12DPC 14DPC 15DPC 15DPC 17DPC 18DPC 19DPC 20DPC 21DPC	2DPC 13	10PC 14	DPC 15D	PC 16DP	C 17DP	C 18DPC	19DPC	200PC	21DPC
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12																					
13				•••		9											•••	•			
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19							E														
8			•	•		٩	٥					•									
	A-inane	A-inappetance			F-Nacal Die	F - Nacal Discharge Service		K - Bloody Line	ą												
	B-Vomiting	ting			G - Nasal Dis	G - Nasal Discharge Mucoid		L-Fever>103.0 ¹ F	95												
	C-Dep	ression	C - Depression/Lethargy		H-Diarrheal	H- Diarrhea Mild (loose stool)		M - Death													
	D-00	ar Disc	D- Ocular Discharge Serous	SILO	I- Diarrhea N	I- Diarrhea Moderate (Watery stool)	(lool)	Blank - no clinical Sign observed	nical Sign obs	served											
	E - Ocul	lar Disc	E - Ocular Discharge Mucoid	coid	J - Diarrhea S	 J - Diarrhea Severe (bloody stool) 	()0														
DPC	= Day	post-	DPC = Day post-challenge	1ge																	
					_																

Leptospira Ictero Clinical Signs Observed Post Challenge Controls	40PC 50PC 60PC 70PC 80PC 90PC 100PC 100PC 120PC 120PC 140PC 150PC 150PC 150PC 170PC 180PC 190PC 200PC 200PC 210PC	The second secon						D E D D	(CD,J		A,E M	A E D		asal Discharge Serous K - Bloody Urine K		H-Diarrhea Mild (loose stool) M - Death	- Diarrhea Moderate (Watery stool) Blank - no clinical Sign observed	J - Diarrhea Severe (bloody stool)
Leptospira Ictero Clini		A						-				A	ш					y stool)
	4DPC 5DPC	u.	-						A,C,D,J	0	A,E			F - Nasal Discharge Serous	G - Nasal Discharge Mucoid	H- Diarrhea Mild (loose s	I- Diarrhea Moderate (Wa	J - Diarrhea Severe (blood
	3DPC			-	1			0	X		L,D	ш						
	2DPC			_	_			_	L,E	_		_				ethargy	arge Serou	arge Muco
	0DPC 1DPC													A-inappetance	8-Vomiting	C - Depression/Lethargy	D- Ocular Discharge Serous	E - Ocular Discharge Mucoid
	Dog	21	22	23	24	25	26	27	28	29	30	31	32					

DPC = Day post-challenge

		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	
		12DPC	9.6	6	7.8	10	111	10	10.2	6.5	7	7.6	
		110PC	9.7	10.2	6.7	9.8	7.7	9.5	7.1	8.1	7.8	12.6	
		100PC	8.9	7.7	10.6	13.2	10.4	8.7	11.7	6	7.7	12.5	
hallenge		9DPC	8.5	8.6	8.3	8	7.5	7.7	7.6	8	8.2	8.7	
int Post C		BDPC	6.4	11.1	9.6	11.8	80	10.1	11.4	7.4	7.5	9.1	
d Cell Cou	inates	7DPC	6.4	8.2	9.2	7.3	10.2	8.4	9.4	8.4	10.5	6.4	
/hite Bloo	SC Vaccinates	6DPC	6.4	15.2	8.8	9.3	11.2	9.4	10.5	7.1	6.7	14.4	
a ictero M		SDPC	10.1	12.4	14.2	11.3	8.3	9.1	7.2	7.3	8.7	14.8	Г
Leptospira ictero White Blood Cell Count Post Challenge		4DPC	6.8	9.1	9.1	12.6	8	8.1	7.5	6.6	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.	9.9	
		Baseline (Avg -2DPC, -1DPC, 0DPC)	7.2	10	7.6	13.4	9.8	9.1	9.1	7.2	9.5	13.1	
		Dog	11	12	13	14	15	16	17	18	19	20	

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					Leptospin	a ictero V	Leptospira ictero White Blood Cell Count Post Challenge	od Cell Co	unt Post (Challenge					
Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	10PC	2DPC	3DPC	4DPC	SDPC	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	6	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	6	7.1
26	8.4	8.6	6	3.9	11.8	12.2	15.4	11.3	11.8	6	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	0				
30	8.8	7.6	5	7.2	7.8	7.5	7.8	6.2	9.9	8	10.3	10.1	6.6	9.4	9.6
31	11	8.1	8.3	4.2	19					D	0				
32	8.3	9.3	6.2	5	10.7	12.6	10.6	13.5	14.5	9.6	14.1	6.6	10	10.1	9.3
D = dead															
						Г									
PC =	DPC = Day post-challenge. Values reported as	hallenge.	Values re		k/μL.	_									

				Le	Leptospira ictero Platelet Counts Post Challenge	ictero	Platelet	Counts	Post Ch	allenge					
							SC Vaccinates	nates							
Dog	Baseline (Avg -2DPC, -1DPC, 0DPC)	1DPC	2DPC	3DPC	4DPC	SDPC	6DPC	7DPC	SDPC	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 =	DPC = Day post-challenge. Values reported as $k/\mu L$.	allenge. V	Values rep	orted as k	/μL.										

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eported	
Values r	
post-challenge.	
Day	
DPC =	

							Controls	ols							
Dog (F	Baseline (Avg -2DPC, -1DPC, 0DPC)	1DPC	2DPC	3DPC	4DPC	SDPC	6DPC	7DPC	SDPC	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						D				
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						D				
32	267	184	55	7.7	88.8	196	257	347	525	430	529	360	337	287	301
D = Dead															

Study Type	Efficac	ey (
Pertaining to	Leptos		por	non	a											
Study Purpose	To den	nons	strat	e ef	fect	iver	ness	aga	inst	Lep	otos	pira	poi	mon	a in	6
	week o	ld d	logs	•				_		_			-			
Product Administration	Two do	oses	we	re a	dmi	niste	ered	sul	ocut	aneo	ousl	y (S	C)	3 we	eeks	apart
Study Animals	Twenty															
	Leptos											ofo	ne g	grou	p of	f 10
	SC vac															
Challenge Description	Twenty												all a	nim	als	were
	challen															
Interval observed after	Dogs v					-			-				_			d
challenge	sample															
Results	Efficac	•								-	oiro	chet	em	a in		
	vaccina	ates	wh	en c	omp	bare	d to	cor	trol	s.						
	Tantaa			~	. :	1.4.	16		1.1 .				6 4 1.		:	
	Leptos receivi								0100	od 11	n an	iy oi	the	e va	ccin	ates
	IECEIVI	ng v	acc	inc	Uy S		out									
	Leptos	nira	wa		late	d fr	om	blo	od c	ماله	cter	1 fro	m	اممد	in t	he
	control group after challenge, as shown in the following table for Days $0 - 14$ (post-challenge):															
				· ur		спа	llen									
	Dog	0	1	2	3	4	5	<u>5</u> C). 6	7	8	9	10	11	12	13	14
	Dog	0	1	2+	3	4	5	Ē ,	7	8	9	10	11	12	13	14
	1	0	1					Ē ,	7	8	9	10	11	12	13	14
	1 2	0	1	+	3 +	4 +	5	Ē ,	7	8	9	10	11	12	13	14
	1 2 3	0	1		3 + + +	4 + +	5	Ē ,	7	8	9	10	11	12	13	14
	1 2 3 4	0	1	+ +	3 + + +	4 + + + +	5 +	Ē ,	7	8	9	10	11	12	13	14
	1 2 3 4 5	0	1	+ + + +	3 + + + +	4 + +	5	Ē ,	7	8	9	10	11	12	13	14
	1 2 3 4			+ + + + +	3 + + + + + +	4 + + + +	5 +	Ē ,	7	8	9	10	11	12	13	14
	1 2 3 4 5		1	+ + + + + +	3 + + + + + + +	4 + + + + +	5 +	Ē ,	7	8	9	10	11	12	13	
	1 2 3 4 5 6			+ + + + +	3 + + + + + + + + +	4 + + + +	5 +	Ē ,	7	8	9	10	11	12	13	
	1 2 3 4 5 6 7			+ + + + + +	3 + + + + + + +	4 + + + + +	5 +	Ē ,	7	8	9	10	11	12	13	
	1 2 3 4 5 6 7 8		+	+ + + + + + + +	3 + + + + + + + + +	4 + + + + + + + +	5 +	Ē ,	7	8	9		11	12	13	
	1 2 3 4 5 6 7 8 9		+++++++++++++++++++++++++++++++++++++++	+ + + + + + + + + +	3 + + + + + + + + + + + + +	4 + + + + + + + + + + + + + + + + + + +	5 +	Ē ,	7	8	9				13	
	1 2 3 4 5 6 7 8 9 10	itive	+ + + for l	+ + + + + + +	3 + + + + + + + + + + + + +	4 + + + + + + + + + + + + + + + + + + +	5 +	Ē ,	7	8	9				13	

Study Type	Safety									
Pertaining to	All fractions									
Study Purpose	Demonstrate safety	of pro	duct under	typical	use cond	itions				
Product	Two doses were adr	niniste	red subcut	aneous	ly (SC) at	2-3 we	ek intervals			
Administration	in dogs 6 weeks of a	age or o	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 wee	ks of age or			
	younger, at first vac	cinatic	on.							
Challenge	Not applicable									
Description										
Interval	No challenge. Dog						g each			
observed after	vaccination and dail	ly for t	wo weeks	after ea	ich vaccin	ation.				
challenge										
Results	Frequency of advers	se even	its:							
	Post Vaccination	Reacti	on Occurre	nce by o	doses. Tota	al Doses	s = 1223			
	Reaction Category≤ 6 Week old Dogs> 6 Weeks old DogsTotal Doses#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 1	eturn for			
	follow-up or were r									
	cooperator to be uni					2	-			
USDA Approval	November 2, 1998									
Date	,									