

**LEPTOSPIROSIS**

<b>ANIMAL GROUP AFFECTED</b>	<b>TRANSMISSION</b>	<b>CLINICAL SIGNS</b>	<b>FATAL DISEASE ?</b>	<b>TREATMENT</b>	<b>PREVENTION &amp; CONTROL</b>
All mammal species	Per wounds or via intact mucous membranes	Often asymptomatic, in fatal cases fever, jaundice, weakness, lethargy, icterus, anaemia, abortions	Yes	Tetracycline, Doxycycline	<i>In houses</i> Control of wild rodents  <i>in zoos</i> vaccination programs

<b>Fact sheet compiled by</b> Martin Straube, Wilhelma Zoological-Botanical Garden, Stuttgart / Germany	<b>Last update</b> December 2003
<b>Fact sheet reviewed by</b> Chris W. Furley, Howletts Zoo, Bekesbourne, United Kingdom	
<b>Susceptible animal groups</b> All mammal species, reptiles, (birds only serological )	
<b>Causative organism</b> <i>Leptospira interrogans</i> subspecies	
<b>Zoonotic potential</b> Yes.	
<b>Distribution</b> World - wide.	
<b>Transmission</b> The bacteria is dispersed by urine of rodents, especially rats. The germ can survive many weeks in a slightly alkaline moisture environment. The infection is percutaneously via wounds or through intact mucous membranes	
<b>Incubation period</b> 3 – 30 days.	
<b>Clinical symptoms</b> In many cases the infection is asymptomatic. In fatal cases anaemia, icterus, haemorrhagia of mucous membranes, haemoglobinuria, weakness, jaundice, fever, lethargy were observed. In chronic infected animals, abortions may be the only symptom.	
<b>Post mortem findings</b> Icterus, haemorrhages (skin, lymph nodes, viscera, heart, mucous membranes), liver necrosis, fatty degeneration and necrosis of renal tubules.	
<b>Diagnosis</b> Serological (Micro Agglutination Test MAT, ELISA), PCR, dark field microscopy, silver impregnation.	
<b>Material required for laboratory analysis</b> Urine, tissues (kidneys, urinary bladder), serum	
<b>OIE Reference Laboratories</b>	
<ul style="list-style-type: none"> <li>• <b>Dr R.A. Hartskeerl</b> Royal Tropical Institute, N.H. Swellengrebel Laboratory of Tropical Hygiene, Division of Health, Department of Biomedical Research Meibergdreef 39, 1105 AZ Amsterdam THE NETHERLANDS Tel: (31.20) 566.54.38 Fax: (31.20) 697.18.41 Email: <a href="mailto:r.hartskeerl@kit.nl">r.hartskeerl@kit.nl</a></li> <li>• <b>Dr W.A. Ellis</b> Department of Agriculture, Veterinary Sciences Division Stoney Road, Stormont, Belfast BT4 3SD, Northern Ireland UNITED KINGDOM</li> </ul>	



Tel: (44.2890) 51.94.41 Fax: (44.2890) 52.57.55  
Email: [bill.ellis@afbini.gov.uk](mailto:bill.ellis@afbini.gov.uk)

• **Dr L. Samartino (1)**

Instituto de Bacteriología, Centro de Investigaciones en Ciencias Veterinarias (CICV), Instituto Nacional de Tecnología Agropecuaria (INTA)  
Castelar, Casilla de Correo 77, 1708 Morón, Pcia. de Buenos Aires  
ARGENTINA  
Tel: (54.11) 46.21.12.89 Fax: (54.11) 46.21.17.12  
Email: [lsanma@correo.inta.gov.ar](mailto:lsanma@correo.inta.gov.ar)

• **Dr Gleyre T.D. de Mazzonelli (2)**

Gerencia de Laboratorios (GELAB), Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA)  
Av. Alexander Fleming 1653, 1640 Martínez, Pcia. de Buenos Aires  
ARGENTINA  
Tel: (54.11) 48.36.19.92 Fax: (54.11) 48.36.19.92  
Email: [dilab@senasa.gov.ar](mailto:dilab@senasa.gov.ar)/[gmazzone@senasa.gov.ar](mailto:gmazzone@senasa.gov.ar)

• **Dr Mark Wilson**

National Veterinary Services Laboratories  
P.O. Box 844, Ames, IA 50010  
UNITED STATES OF AMERICA  
Tel: (1.515) 663.73.42 Fax: (1.515) 663.76.73  
Email: [mark.a.wilson@aphis.usda.gov](mailto:mark.a.wilson@aphis.usda.gov)

• **Dr L.D. Smythe**

WHO/FAO/OIE Collaborating Centre for Reference and Research on Leptospirosis, Western Pacific Region, Queensland Health Scientific Services  
39 Kessels Road, Coopers Plains, P.O. Box 594, Archerfield, Queensland 4108  
AUSTRALIA  
Tel: (61.7) 32.74.90.64 Fax: (61.7) 32.74.91.75  
Email: [lee\\_smythe@health.qld.gov.au](mailto:lee_smythe@health.qld.gov.au)

**Relevant diagnostic laboratories**

1. Local veterinary or medical laboratories
2. Institut für Veterinär-Bakteriologie der Universität Zürich, Winterthurerstrasse 270, CH-8057 Zürich, Switzerland

**Treatment**

Tetraccline, Doxycycline

**Prevention and control in zoos**

Control of wild rodents especially rats, disinfection, avoidance of wet floors in the animal enclosures

**Suggested disinfectant for housing facilities**

Most disinfectants are effective

**Notification**

**Guarantees required under EU Legislation**

**Guarantees required by EAZA Zoos**

**Measures required under the Animal Disease Surveillance Plan**

**Measures required for introducing animals from non-approved sources**

**Measures to be taken in case of disease outbreak or positive laboratory findings**

**Conditions for restoring disease-free status after an outbreak**

**Experts who may be consulted**

**References**

1. Faine, S., B. Adler, C. Bolin, P. Perolat ( 2000): Leptospira and Leptospirosis Second Edition, MediSci,

- Melbourne, Australia
2. Fear, F.A.; Pinkerton, M.E.; Cline, J.A.; Krienwaldt, F. and Kalter, S.S. : A Leptospirosis outbreak in a baboon (*Papio spec.*) colony. *Lab. Anim. Care* 18 (1968), 22-28
  3. Johnson, P. Jr. and Morter, R.: A natural outbreak of Leptospirosis in a Monkey colony. *Verh.ber. Erkg. Zootiere* 11 (1969), 69-72
  4. Kadlec, V. ; : Antibodies to leptospirae in zoo animals in German Democratic Republic *Fol. Parasit. (Praha)* 30 (1983), 9-13
  5. Levett, P.: Leptospirosis. *Clin. Microbiol. Rev.* 14 (2001), 296-326
  6. McNamara, T. ; Linn, M.; Calle, P.; Cook, R.; Karesh, W. And Raphael, B.. : Leptospirosis : an under-reported disease in zoo animals? *Verh.ber. Erkg. Zootiere* 39 (1999), 185-188
  7. Neiffer, D.L.; Klein, E.C.; Wallace-Switalski, C. : Leptospira infection in two black rhinoceros (*Diceros bicornis*, Michaeli) *J. Zoo. Wildl. Med.* 32 (4) (2001), 476-486
  8. Planc; R.; Dean, D.: Overview of the epidemiology, microbiology and pathogenesis of Leptospira in humans. *Microbes and infection* 2 (2000); 1265-1276
  9. Sebek, Z.; Rosicky, B.: Distribution and biotic structure of leptospirosis foci in some European countries *Zbl. Bakt. Hyg., I. Abt. Orig. A* 233 (1975), 380-399
  10. Shotts, E.; Andrews, C.L.; Harvey, T.W.: Leptospirosis in selected wild mammals of the Florida Panhandle and Southwestern Georgia. *J. Am. Med. Assoc.* 167 (1975), 587-589
  11. Sunbul, M.; Esen, S.; Leblebicioglu, H.; Hokelek, M.; Pekbay, A., Eroglu, C.: *Rattus norvegicus* acting as reservoir of leptospira interrogans in the Middle Black Sea region of Turkey, as evidenced by PCR and presence of serum antibodies to Leptospira strain. *Scand J Infect Dis*; 33 (12) (2001) : 896-8
  12. Twigg, G.I.; Cuerden, C.M.; Hughes, D.M. and Medhurst, P.: The Leptospirosis reservoir in British wild mammals. *The Vet. Rec.* (1969), 424-426
  13. White, F.H.: Leptospiral agglutinins in snake serums. *Am. J. Vet. Res.* 24 (1963), 179-182