

ARE YOUR EQUINE PATIENTS AT RISK FOR LEPTOSPIROSIS?

This risk assessment can help you determine if your patients may need additional protection from leptospirosis. If you answer yes to any of these questions, your patients may be at risk for leptospirosis.

- | YES | NO | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Do your patients have access to standing water or ponds? |
| <input type="checkbox"/> | <input type="checkbox"/> | Has this year been wetter than years past? |
| <input type="checkbox"/> | <input type="checkbox"/> | Have any of your clients' horse pastures flooded this year? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are there skunks, white-tailed deer, raccoons, opossums or other wildlife sharing pastures with your patients? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is there wildlife in your clients' horse barns? Do your clients keep feed/hay in open containers? Do they feed on the ground? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do your clients own Appaloosas or Warmblood breeds? |
| <input type="checkbox"/> | <input type="checkbox"/> | Have any of your patients or horses they are housed with lost their eyesight or been diagnosed with ERU? |
| <input type="checkbox"/> | <input type="checkbox"/> | Have any of your patients or horses they are housed with experienced recent abortions, stillbirths or neonatal deaths? |
| <input type="checkbox"/> | <input type="checkbox"/> | Have there been signs of renal disease in any of your patients? |

Lepto EQ
Innovator®

LEPTOSPIROSIS IS HARD TO DETECT.
NOW HELPING PREVENT IT CAN BE EASY.



Lepto EQ
Innovator®

TO LEARN MORE ABOUT HOW LEPTO EQ INNOVATOR® CAN HELP PROTECT YOUR EQUINE PATIENTS, TALK TO YOUR ZOETIS REPRESENTATIVE, VISIT LEPTOEQINNOVATOR.COM OR CALL VETERINARY MEDICAL INFORMATION AND PRODUCT SUPPORT AT **800-366-5288**.

WE'RE COMMITTED TO YOU.

Zoetis supports you with unmatched product support, technical training and customer education materials. We continue to invest in research and development to bring you advanced vaccine solutions, such as LEPTO EQ INNOVATOR, the newest addition to the trusted INNOVATOR line of equine vaccines from Zoetis.

References:

- ¹ Carter CN, Cohen N, Steinman MN, Smith JL, Erol E, Brown S. Seroepidemiology of equine leptospirosis utilizing diagnostic laboratory specimens from 29 states (US) and one Canadian province, in *Proceedings, 55th Annu AAVLD Meet* 2012:51.
- ² Data on file, Study Report No. Restricted Grant-FITLEPT013 (v1.0) TI-0366, Zoetis Inc.
- ³ Divers TJ, Chang Y-F. Leptospirosis. In: Robinson NE, Sprayberry KA, eds. *Current Therapy in Equine Medicine*. Vol 6. 6th ed. St. Louis, MO: Saunders Elsevier;2009:145-147.
- ⁴ Polle F, Storey E, Eades S, et al. Role of intraocular *Leptospira* infections in the pathogenesis of equine recurrent uveitis in the southern United States. *J Equine Vet Sci*. 2014;34(11-12):1300-1306.
- ⁵ Borstel MV, Oey L, Strutzberg-Minder K, Boeve MH, Ohnesorge B. Direkter und indirekter Nachweis von Leptospiren aus Glaskörperproben von Pferden mit ERU. *Pferdeheilkunde*. 2010;22(März/April):219-225.
- ⁶ Erol E, Jackson CB, Steinman M, et al. A diagnostic evaluation of real-time PCR, fluorescent antibody and microscopic agglutination tests in cases of equine leptospiral abortion. *Equine Vet J*. 2015;47(2):171-174.
- ⁷ Thomas H. Leptospirosis in horses. *Equine Chronicle*. January/February 2015. Available at: <http://www.equinechronicle.com/leptospirosis-in-horses>. Accessed June 23, 2015.
- ⁸ Levett PN. Leptospirosis. *Clin Microbiol Rev*. 2001;14(2):296-326.
- ⁹ Spickler AR, Leedom Larson KR. Leptospirosis. Available at: <http://www.cfsph.iastate.edu/DiseasesInfo/factsheets.php>. Updated August 2013. Accessed September 28, 2015.
- ¹⁰ Faine S, Adler B, Bolin C, et al. Physiology, growth and survival. In: *Leptospira and Leptospirosis*. 2nd ed. Melbourne: MedSci, 1999:29-36.
- ¹¹ Gerding JC, Gilger BC. Prognosis and impact of equine recurrent uveitis. *Equine Vet J*. In press. doi:10.1111/evj.12451.
- ¹² Dwyer AE, Crockett RS, Kalsow CM. Association of leptospiral seroreactivity and breed with uveitis and blindness in horses: 372 cases (1986-1993). *J Am Vet Med Assoc*. 1995;207(10):1327-1331.
- ¹³ Kinde H, Hietala SK, Bolin CA, Dowe JT. Leptospiral abortion in horses following a flooding incident. *Equine Vet J*. 1996;28(4):327-330.
- ¹⁴ University of Guelph, Animal Health Laboratory. Equine abortion, 2006/2007. *AHL Newsletter*. March 2008. Available at: <http://guelphahlabservices.com/files/AHL/AHL%20Newsletters/2008/AHLNewsletter%20March%202008.pdf>. Accessed August 3, 2015.
- ¹⁵ Tengelsen LA, Yamini B, Mullaney TP, et al. A 12-year retrospective study of equine abortion in Michigan. *J Vet Diagn Invest*. 1997;9(3):303-306.
- ¹⁶ Thalheimer R. The depth of the disaster: The economic impact of MRLS on harness horse breeding in Kentucky 2001 and beyond. Available at: www.harnesstracks.com/2002annualmeeting/thalheimer.pdf. Accessed August 3, 2015.
- ¹⁷ Neibergs S. Economics of Broodmare Reproduction. *Equine Disease Quarterly*. 2006;15(4):4-5. Available at: http://www2.ca.uky.edu/gluck/cv_oct06.asp#repro. Accessed August 3, 2015.
- ¹⁸ Bosh KA, Powell D, Neibergs JS, et al. Impact of reproductive efficiency over time and mare financial value on economic returns among Thoroughbred mares in central Kentucky. *Equine Vet J*. 2009;41(9):889-894.
- ¹⁹ The Jockey Club. *Fact Book*. Available at: <http://www.jockeyclub.com/default.asp?section=Resources&area=1>. Updated 2015. Accessed August 3, 2015.
- ²⁰ Holland L. Leptospirosis: What is it? *The Horse*. March 1, 2008. Available at: <http://www.thehorse.com/articles/17522/leptospirosis-what-is-it>. Accessed September 28, 2015.
- ²¹ Freilstedt L. Equine recurrent uveitis: A clinical manifestation of leptospirosis. *Equine Vet Educ*. 2009;21(10):546-552.
- ²² Verma A, Stevenson B, Adler B. Leptospirosis in horses. *Vet Microbiol*. 2013;1(2):167-61-66.
- ²³ Davis EG, Zhang Y, Tuttle J, Hankins S, Wilkerson M. Investigation of antigen specific lymphocyte responses in healthy horses vaccinated with an inactivated West Nile virus vaccine. *Vet Immunol Immunopathol*. 2008;126(3-4):293-301.
- ²⁴ Data on file, Study Report No. B950R-US-12-01, Zoetis Inc.
- ²⁵ Data on file, Study Report No. B951R-US-13-043, Zoetis Inc.
- ²⁶ Data on file, Study Report No. B951R-US-13-046, Zoetis Inc.

zoetis

All trademarks are the property of Zoetis Inc., its affiliates and/or its licensors. ©2015 Zoetis Inc. All rights reserved. LEI-00001

zoetis

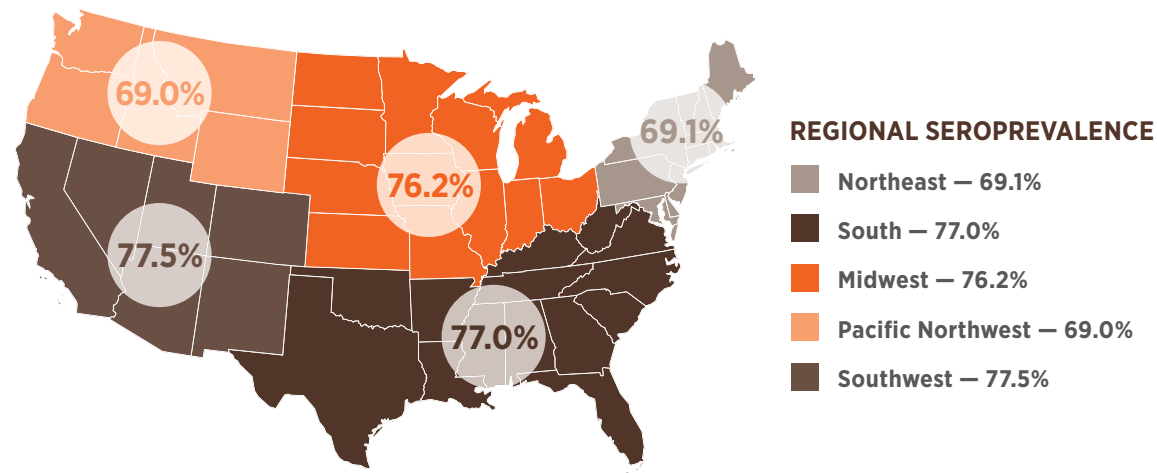
WHAT IS LEPTOSPIROSIS?

It's a bacterial infection caused by spirochetes belonging to *Leptospira* spp.

HORSES ACROSS THE COUNTRY MAY BE AT RISK.

Serologic evidence indicates that exposure is common in many states nationwide:

- A 45% seroprevalence was revealed in a 2012 analysis of diagnostic laboratory samples from 29 states and one Canadian province.¹
- 75% of 5,261 healthy horses tested positive for at least one leptospiral serovar in a 2014 study involving 53 clinics in 18 states.²

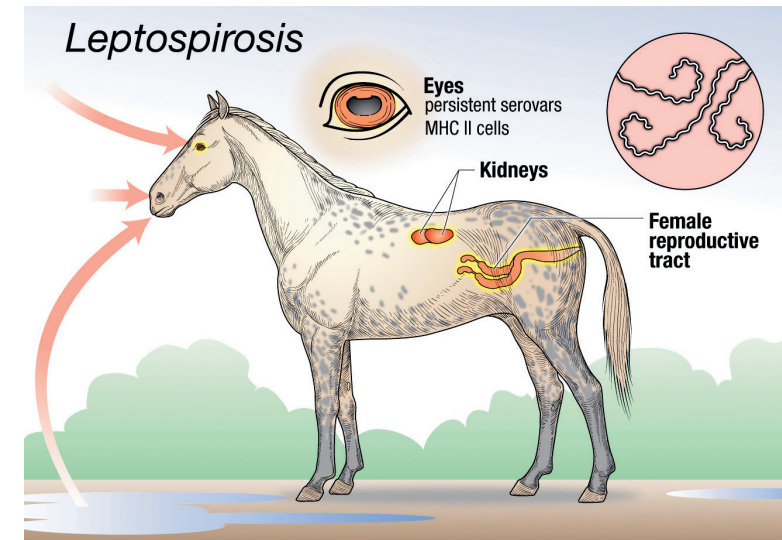


LEPTOSPIROSIS CAN BE A COSTLY DISEASE.

- In horses, *Leptospira interrogans* serovar Pomona, or *L. pomona*, is the primary pathogen in North America most commonly associated with disease.³
- Leptospirosis is a leading cause of equine recurrent uveitis (ERU).³
- It's been estimated that up to 70% of all uveitis cases are associated with leptospires.^{4,5}
- The pathogen can colonize in the kidneys and the horse can become septicemic, potentially leading to abortion and acute renal failure.
- Dr. Craig Carter of the University of Kentucky conservatively estimates losses of more than \$100 million over a 20-year period with 541 confirmed cases of leptospiral abortion in Kentucky.¹
- Horses may be 3.7 times more likely to abort due to leptospires during seasons with heavy rainfall.^{1,6}
- Acute renal failure, especially in yearlings, can occur with renal infection associated with leptospires.^{2,3,7}

HOW DO HORSES BECOME INFECTED?

- Urine from infected animals serves as the primary source of infection.
- Spirochetes penetrate mucous membranes or abraded skin.
- Bacteria enter the bloodstream, replicate and travel to the kidneys, eyes and reproductive tract.³
- Horses can become septicemic.
- Infected or carrier horses can shed the bacteria in the urine.^{8,9}



Divers TJ. Leptospirosis. In: Sprayberry KA, ed. *Current Therapy in Equine Medicine*. 7th ed. St. Louis, MO: Saunders Elsevier, 2015:379.

WHAT ARE THE RISK FACTORS FOR LEPTOSPIROSIS?

The bacteria can survive for weeks in warm, moist environments.^{8,10} Horses often become infected when exposed to:

- Contaminated soil, bedding, feed and drinking water^{7,9}
- Stagnant or slow-moving water^{3,8}
- Maintenance hosts such as skunks, white-tailed deer, raccoons and opossums
- Aborted or stillborn fetuses or vaginal discharges^{8,9}

Genetics may also play a role in *Leptospira*-associated ERU: Appaloosas and Warmblood breeds are more severely affected than others.^{11,12}

DISEASE OUTBREAKS MAY BE ASSOCIATED WITH RAINFALL.^{8,13}

- In a year with average rainfall, leptospiral abortions can result in overall losses of approximately \$1.4 million.^{11,13-19}
- Heavy rainfall can increase that risk by as much as 3.7 times, with losses as high as \$4.2 million in the Thoroughbred breed alone.^{11,13}
- Reliable abortion data is only available for breeds that represent fewer than 15% of U.S. horses, so the actual number of leptospiral abortions may be five to 10 times higher.²⁰

LEPTOSPIROSIS IS LIKELY UNDERDIAGNOSED.

Clinical signs associated with acute infection are generally nonspecific, such as fever, depression, anorexia and generalized pain.²¹

While the microscopic agglutination test (MAT) is a common diagnostic tool, a single high titer does not differentiate between exposure and infection.²² With no pathognomonic signs of acute infection and difficulties with diagnostic testing, it's likely that leptospirosis is underdiagnosed in horses.



LEPTO EQ INNOVATOR® WAS DEVELOPED SPECIFICALLY FOR HORSES.

Now you can help protect your patients with LEPTO EQ INNOVATOR. Created in collaboration with equine industry leaders, LEPTO EQ INNOVATOR is the first and only equine vaccine to help prevent leptospirosis caused by *L. pomona* in horses 6 months of age or older.

HELPS PROTECT AGAINST THE MOST CLINICALLY RELEVANT SEROVAR.

LEPTO EQ INNOVATOR helps prevent leptospiremia which could, but has not been demonstrated to, help reduce the potential risk of equine recurrent uveitis (ERU) abortion or acute renal failure caused by *L. pomona*.*

METASTIM® ADJUVANT AMPLIFIES THE IMMUNE RESPONSE.

MetaStim, a proprietary adjuvant system designed for safe, enhanced presentation of *L. pomona* antigens to the horse's immune system, features a dual-phase formulation shown to stimulate both cell-mediated and humoral immunity.²³ Only INNOVATOR vaccines are adjuvanted with MetaStim for improved immune response.²³

DEMONSTRATED TO BE SAFE AND EFFECTIVE.

LEPTO EQ INNOVATOR provides a safe immune response, as demonstrated in safety and efficacy trials:

- Vaccinated horses challenged with *Leptospira interrogans* serovar Pomona demonstrated 0% urinary shedding.²⁴
- When the vaccine was administered in field safety studies to 906 horses,

99.8% of the horses were reaction-free. A reaction rate of 0.002% demonstrates the safety of LEPTO EQ INNOVATOR.^{25,26}

- The vaccine was field-tested in hundreds of horses.²⁶
- The vaccine was shown to be safe in healthy mares in the second trimester and foals 3 months of age or older.^{25,26}

VACCINATE PRIOR TO EXPOSURE.

LEPTO EQ INNOVATOR is for vaccination of healthy horses 6 months of age or older:

- It's available in a ready-to-use 10-dose tank.
- Inject a single 1-mL dose intramuscularly.
- Administer a second dose three to four weeks later.
- Annual revaccination with a single dose is recommended.

*Currently, there are no vaccines available with USDA-licensed label claims against equine abortions, uveitis or acute renal failure due to *L. pomona*.