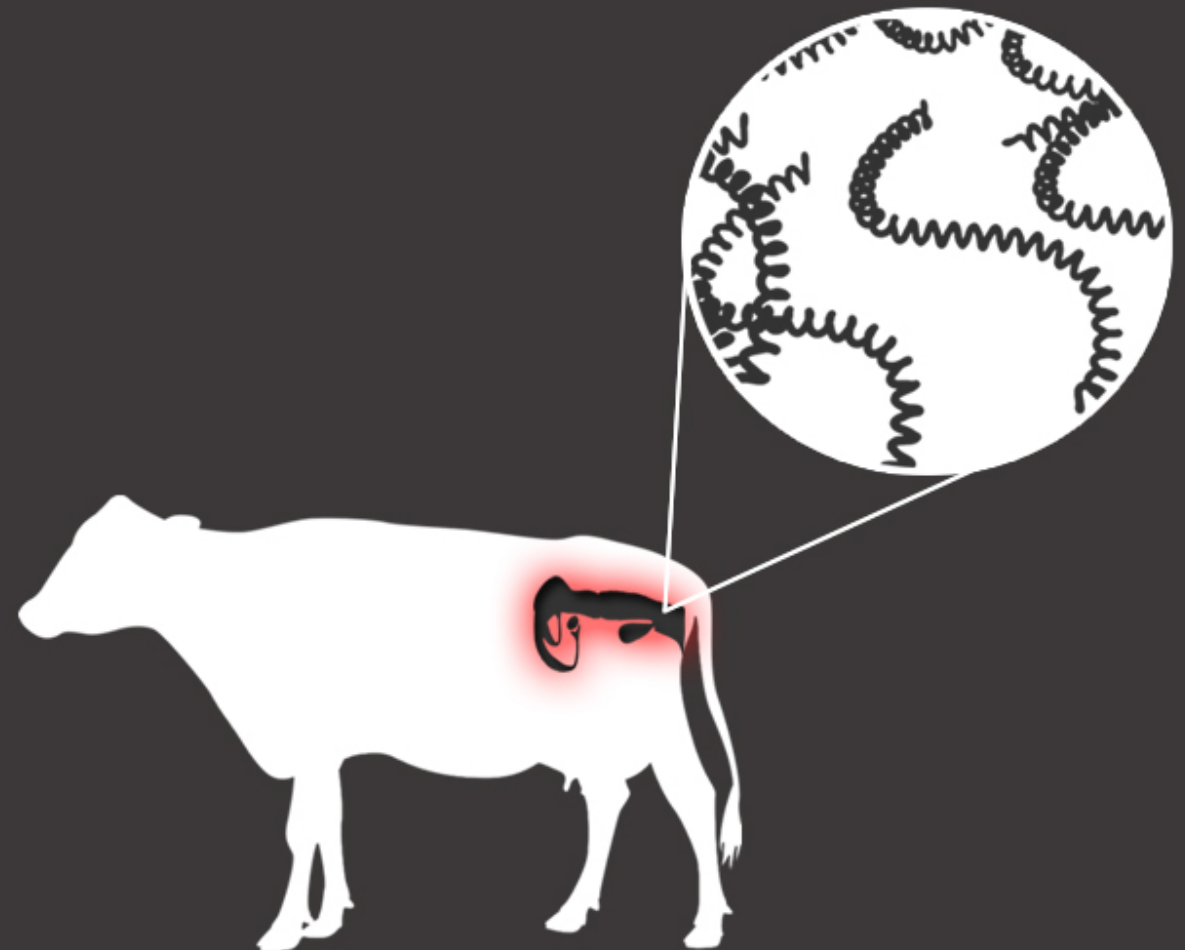


BOVINE GENITAL LEPTOSPIROSIS: A NEW LOOK FOR AN OLD DISEASE

Prof. Dr. Walter Lilenbaum

Laboratory of Veterinary Bacteriology

Federal Fluminense University





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Theriogenology

journal homepage: www.theriojournal.com



Genital bovine leptospirosis: A new look for an old disease

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Animal Leptospirosis

Host interaction x strain : different clinical aspects

```
graph TD; A[Host interaction x strain : different clinical aspects] --> B[Incidental infection]; A --> C[Adapted infection]; B --> D[Systemic acute and severe form]; C --> E[Little clinical effect; silent and chronic];
```

Incidental infection

Systemic acute and severe form

Adapted infection

Little clinical effect; silent and chronic

Bovine Leptospirosis

Clinical aspects of bovine leptospirosis clearly indicate that it is a reproductive disease independent of the infecting strain

Paradoxically, research in the area most often focuses on the detection of renal carriers and urine testing

Genital carriers are frequently neglected

Despite the relevance of genital tract colonization by leptospires, few studies focused on detection of this bacterium in the reproductive tract


Reproductive Bovine Leptospirosis - History

1982

The Veterinary record

Volume 110, Issue 7, 13 Feb 1982, Pages 147-150

Bovine leptospirosis: microbiological and serological findings in aborted fetuses. (Article)

Ellis, W.A., O'Brien, J.J., Neill, S.D., Ferguson, H.W., Hanna, J. 

1985

Research in Veterinary Science 1985, 39, 292-295

Dihydrostreptomycin treatment of bovine carriers of *Leptospira interrogans* serovar *hardjo*

W. A. ELLIS, J. MONTGOMERY, J. A. CASSELLS, *Veterinary Research Laboratories, Stoney Road, Stormont, Belfast BT4 3SD*

1996

Research in Veterinary Science 1996, 60, 163-167

Presence of antigen and antibodies in serum and genital discharges of cows from dairy herds naturally infected with *Leptospira interrogans* serovar *hardjo*


G. S. DHALIWAL, R. D. MURRAY, H. DOBSON, *Department of Veterinary Clinical Science and Animal Husbandry, University of Liverpool, Leahurst, Neston, South Wirral L64 7TE*, J. MONTGOMERY, W. A. ELLIS, *Veterinary Science Division, Stoney Road, Stormont, Belfast BT4 3SD*

1986

American journal of veterinary research

Volume 47, Issue 8, August 1986, Pages 1694-1696

Isolation of leptospire from the genital tracts of Iowa cows. (Article)


Ellis, W.A., Thiermann, A.B. 

1996

Research in Veterinary Science

Volume 60, Issue 2, March 1996, Pages 157-162


Presence of antigen and antibodies in serum and genital discharges of heifers after experimental intrauterine inoculation with *Leptospira interrogans* serovar hardjo (Article)

Dhaliwal, G.S.^{a,d}, Murray, R.D.^a, Dobson, H.^a, Montgomery, J.^b, Ellis, W.A.^b, Baker, J.R.^c 

^aDept. Vet. Clin. Sci. Anim. Husb., University of Liverpool, Neston, South Wirral L64 7TE, United Kingdom

^bVeterinary Science Division, Stoney Road, Stormont, Belfast, BT4 3SD, United Kingdom

^cDepartment of Veterinary Pathology, University of Liverpool, Neston, South Wirral L64 7TE, United Kingdom


[View additional affiliations](#) 

1997

Canadian Journal of Veterinary Research

Volume 61, Issue 1, 1997, Pages 15-20

A Polymerase Chain Reaction Assay for the Detection of *Leptospira* spp. in Bovine Semen (Article)

Masri, S.A.^a, Nguyen, P.T.^a, Gale, S.P.^a, Howard, C.J.^a, Jung, S.-C.^b 

^aAnimal Diseases Research Institute, Agriculture and Agri-Food Canada, P.O. Box 640, Lethbridge, Alta. T1J 3Z4, Canada

^bVeterinary Research Institute, Rural Development Administration, Anyang, South Korea

1998



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Animal Reproduction Science 54 (1998) 65–73

ANIMAL
REPRODUCTION
SCIENCE

Sanitary status of oocytes and embryos collected from heifers experimentally exposed to *Leptospira borgpetersenii* serovar *hardjobovis*

A. Bielanski ^{a,*}, O. Surujballi ^a, E. Golsteyn Thomas ^b, E. Tanaka ^b

Bovine Leptospirosis

For many years, genital tract infection has been considered a secondary effect of renal infection. In contrast to this hypothesis, there is some evidence suggesting that genital leptospirosis should be considered a specific syndrome:

1

A relevant vaginal immune response has been recognized, usually with low systemic titers

2

Infection by uterine inoculation has been demonstrated experimentally

3

The possibility of sexual transmission of leptospire in both directions has been raised

4

Some strains, mainly members of the Sejroe serogroup, preferentially colonize the genital tract and have been more closely associated with reproductive syndromes

Bovine Genital Leptospirosis

The agent

Serogroup	Serovar	Species	Genotype	Type of strain	Distribution	Association with BGL
Sejroe	Hardjo	<i>L. interrogans</i>	Hardjoprajitno	Adapted	Worldwide* ¹	High
Sejroe	Hardjo	<i>L. borgpetersenii</i>	Hardjobovis	Adapted	Worldwide* ²	High
Sejroe	Guaricura	<i>L. santarosai</i>	Unknow	Unclear	Americas	Probable
Pomona	Pomona	<i>L. interrogans</i>	Unknow	Incidental	Worldwide	Low
Icterohaemorrhagiae	Icterohaemorrhagiae	<i>L. interrogans</i>	Unknow	Incidental	Worldwide	Low

*¹ Highest prevalence in Europe

*² Highest prevalence in USA and Oceania

Bovine Genital Leptospirosis

Transmission

Urine and/or
contaminated water



Sexual



Artificial insemination*



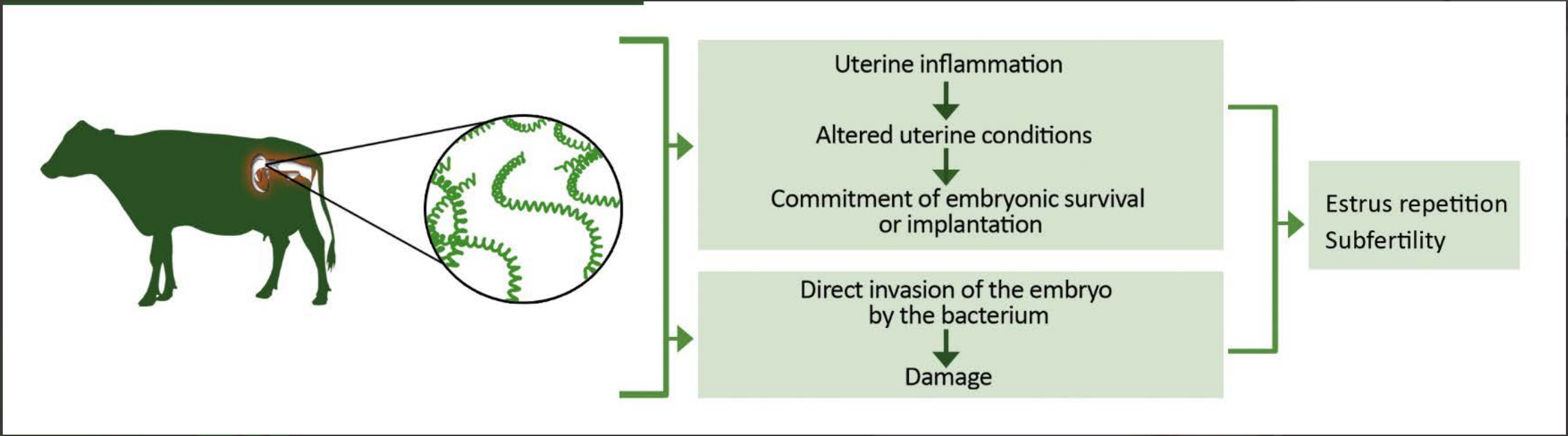
Embryo transfer*



* when antibiotics are not used in processing

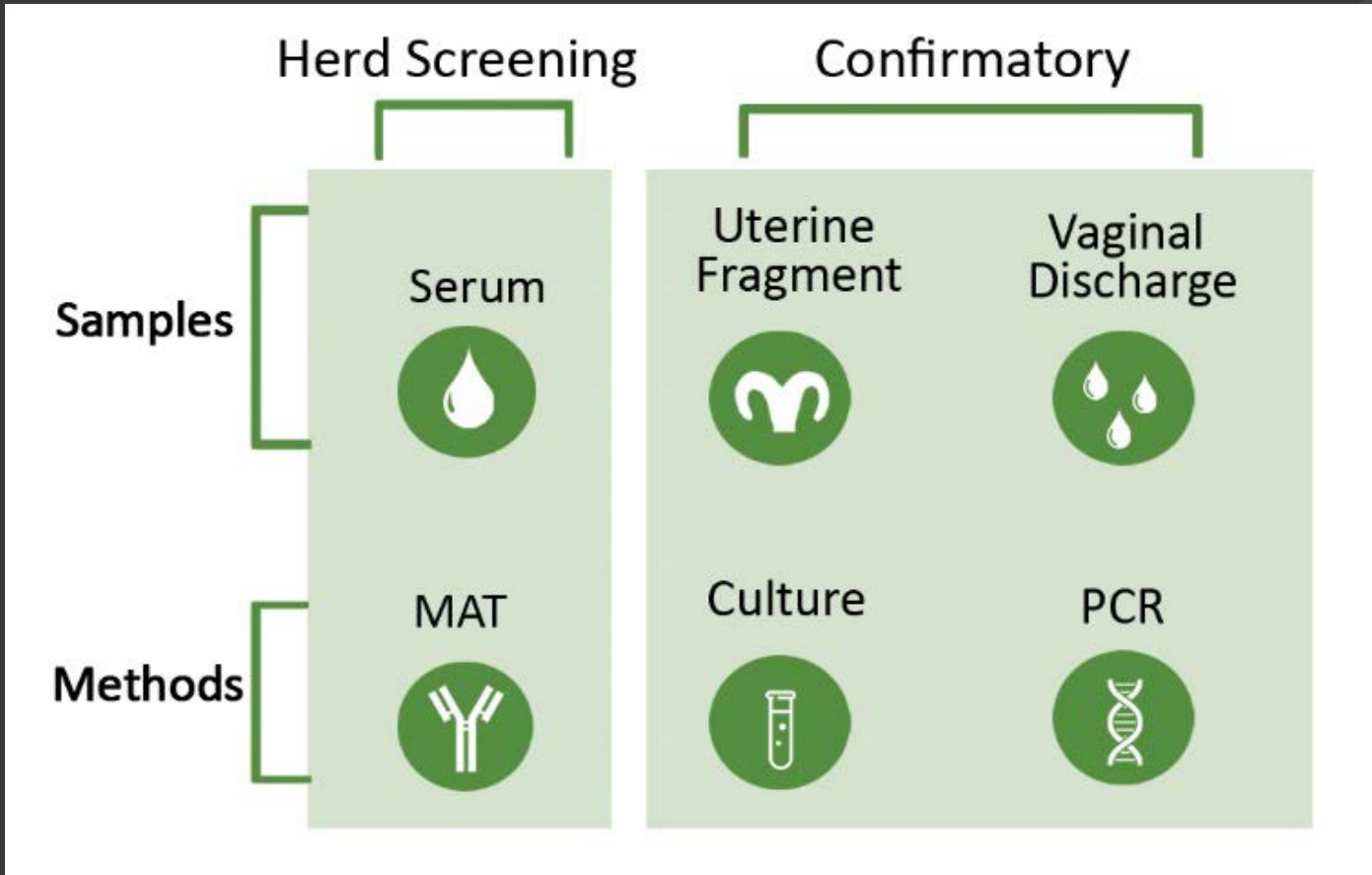
Bovine Genital Leptospirosis

Symptoms and effects



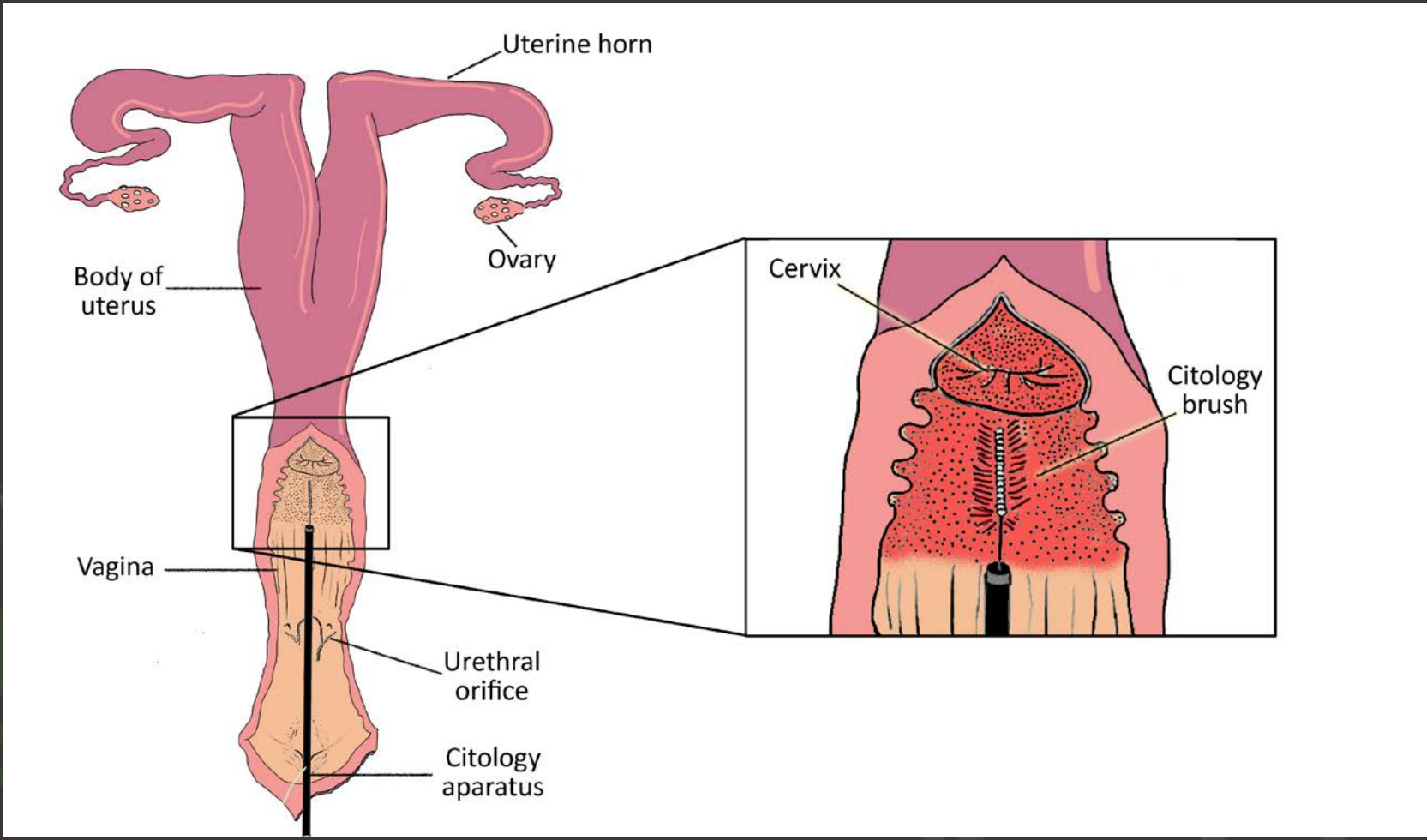
Bovine Genital Leptospirosis

Diagnosis



Bovine Genital Leptospirosis

Diagnosis



Our contribution

2008



Available online at www.sciencedirect.com

ScienceDirect

Theriogenology 69 (2008) 837–842

Theriogenology

www.theriojournal.com

Detection of *Leptospira* spp. in semen and vaginal fluids of goats and sheep by polymerase chain reaction

W. Lilenbaum^{a,*}, R. Varges^a, F.Z. Brandão^a, A. Cortez^b, S.O. de Souza^b,
P.E. Brandão^b, L.J. Richtzenhain^b, S.A. Vasconcellos^b

2014

Animal Reproduction Science 151 (2014) 275–279

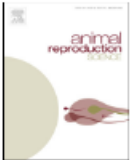


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Contents lists available at ScienceDirect

Animal Reproduction Science

journal homepage: www.elsevier.com/locate/anireprosci



Predominance of *Leptospira interrogans* serovar Bratislava DNA in vaginal fluid of mares suggests sexual transmission of leptospirosis

Camila Hamond^a, Gabriel Martins^a, Sylvie Bremont^c,
Marco Alberto Medeiros^b, Pascale Bourhy^c, Walter Lilenbaum^{a,*}



2014

Isolation of *Leptospira interrogans* Hardjoprajitno from vaginal fluid of a clinically healthy ewe suggests potential for venereal transmission

A. Director,¹ B. Penna,¹ C. Hamond,¹ A. P. Loureiro,¹ G. Martins,¹
M. A. Medeiros² and W. Lilenbaum¹



2015

Veterinary Microbiology 179 (2015) 264–269



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Veterinary Microbiology

journal homepage: www.elsevier.com/locate/vetmic



Presence of leptospires on genital tract of mares with reproductive problems

Camila Hamond^a, Cristiane P. Pestana^b, Cláudio Marcos Rocha-de-Souza^b, Luis Eduardo R. Cunha^c, Felipe Z. Brandão^d, Marco Alberto Medeiros^b, Walter Lilenbaum^{a,*}



2016

Research in Veterinary Science 105 (2016) 249–253



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Contents lists available at ScienceDirect

Research in Veterinary Science

journal homepage: www.elsevier.com/locate/rvsc



Molecular analysis of leptospires from serogroup Sejroe obtained from asymptomatic cattle in Rio de Janeiro – Brazil reveals genetic proximity to serovar Guaricura

A.P. Loureiro^a, C. Hamond^a, P. Pinto^a, S. Bremont^b, P. Bourhy^b, W. Lilenbaum^{a,*}



2017

Animal Reproduction Science 178 (2017) 50–54



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Animal Reproduction Science

journal homepage: www.elsevier.com/locate/anireprosci



High frequency of leptospiral vaginal carriers among slaughtered cows

A.P. Loureiro^a, C. Pestana^b, M.A. Medeiros^b, W. Lilenbaum^{a,*}



^a Laboratório de Bacteriologia Veterinária, Departamento de Microbiologia e Parasitologia, Universidade Federal Fluminense, Niterói, Rio de Janeiro, Brazil

^b Laboratório de Tecnologia Recombinante, Bio-Manguinhos, FIOCRUZ, Rio de Janeiro, Brazil

2018

Tropical Animal Health and Production (2018) 50:883–888

<https://doi.org/10.1007/s11250-018-1512-z>

REGULAR ARTICLES

Detection of bovine carriers of *Leptospira* by serological, bacteriological, and molecular tools

Melissa H. Pinna¹ · Gabriel Martins² · Ana Paula Loureiro² · Walter Lilenbaum²

2018

Tropical Animal Health and Production
<https://doi.org/10.1007/s11250-018-1604-9>

REGULAR ARTICLES

Leptospirosis is strongly associated to estrus repetition on cattle

H. A. Libonati¹ · G. B. Santos² · G. N. Souza³ · F. Z. Brandão² · W. Lilenbaum¹ 

2018

Small Ruminant Research 164 (2018) 28–31



ELSEVIER

Contents lists available at ScienceDirect

Small Ruminant Research

journal homepage: www.elsevier.com/locate/smallrumres



Chronic experimental genital leptospirosis with autochthonous *Leptospira santarosai* strains of serogroup Sejroe

Bruno Ribeiro Rocha^a, Mário Balaro^b, Paulo Victor Pereira^a, Gabriel Martins^a,
Walter Lilenbaum^{a,*}



2018

Microbial Pathogenesis 114 (2018) 163–165



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Contents lists available at ScienceDirect

Microbial Pathogenesis

journal homepage: www.elsevier.com/locate/micpath



Occurrence of uterine carriers for *Leptospira interrogans* on slaughtered cows

Bruno Cabral Pires^a, Junia Berzin Grapiglia^a, Lio Moreira^b, Lauren Hubert Jaeger^a,
Filipe Anibal Carvalho-Costa^c, Walter Lilenbaum^{a,*}

^a Laboratory of Veterinary Bacteriology, Department of Microbiology and Parasitology, Universidade Federal Fluminense, Prof. Hernani Melo St., 101, São Domingos, 24210-130 Niterói, RJ, Brazil

^b Laboratory of Pathology, Department of Microbiology and Parasitology, Universidade Federal do Estado do Rio de Janeiro, Frei Caneca, 94, Centro, 20211-010 Rio de Janeiro, RJ, Brazil

^c Laboratory of Epidemiology and Molecular Sistematic, Fundação Oswaldo Cruz, Avenida Brasil, 4365, Manguinhos, 21040-360 Rio de Janeiro, RJ, Brazil



2020

Veterinary Microbiology 250 (2020) 108869



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Contents lists available at ScienceDirect

Veterinary Microbiology

journal homepage: www.elsevier.com/locate/vetmic



Extra-renal bovine leptospirosis: Molecular characterization of the *Leptospira interrogans* Sejroe serogroup on the uterus of non-pregnant cows

Maria Isabel Nogueira Di Azevedo^a, Bruno C. Pires^a, Hugo Libonati^a, Priscila S. Pinto^a, Lucas Figueiredo Cardoso Barbosa^a, Filipe Anibal Carvalho-Costa^b, Walter Lilenbaum^{a,*}

^a Fluminense Federal University, Laboratory of Veterinary Bacteriology, Biomedical Institute, Niterói, Rio de Janeiro, Brazil

^b Laboratory of Epidemiology and Molecular Systematics, Oswaldo Cruz Institute, Oswaldo Cruz Foundation, Rio de Janeiro, Brazil

2020


Received: 20 April 2020 | Revised: 3 December 2020 | Accepted: 26 January 2021

DOI: 10.1002/vetr.143

VetRecord

SHORT COMMUNICATION

Characterization of leptospiral DNA in the follicular fluid of non-pregnant cows

Maria Isabel Nogueira Di Azevedo¹  | Bruno Cabral Pires¹ |
Lucas Figueiredo Cardoso Barbosa¹ | Filipe Anibal Carvalho-Costa² |
Walter Lilenbaum¹

Other groups

2019

Tropical Animal Health and Production (2019) 51:237–241
<https://doi.org/10.1007/s11250-018-1635-2>

SHORT COMMUNICATIONS



Strategies of the control of an outbreak of leptospiral infection in dairy cattle in Northeastern Brazil

Carla Laíse Rodrigues Menezes Pimenta¹ · Diego Figueiredo da Costa¹ · Maria Luana Cristiny Rodrigues Silva¹ · Hélio Domingos Pereira² · João Pessoa Araújo Júnior³ · Camila Dantas Malossi³ · Leila Sabrina Ullmann³ · Clebert José Alves¹ · Sérgio Santos de Azevedo¹

2020

Tropical Animal Health and Production (2020) 52:2055–2061
<https://doi.org/10.1007/s11250-020-02203-y>

REGULAR ARTICLES



High frequency of seropositive and carriers of *Leptospira* spp. in pigs in the semiarid region of northeastern Brazil

Juciê Jales Fernandes¹ · João Pessoa Araújo Júnior² · Camila Dantas Malossi² · Leila Sabrina Ullmann² · Diego Figueiredo da Costa¹ · Maria Luana Cristiny Rodrigues Silva¹ · Clebert José Alves¹ · Sergio Santos de Azevedo¹ · Severino Silvano dos Santos Higino¹

2020

Acta Tropica 207 (2020) 105497

Contents lists available at ScienceDirect



ELSEVIER

Acta Tropica

journal homepage: www.elsevier.com/locate/actatropica



Use of serological and molecular techniques for detection of *Leptospira* sp. carrier sheep under semiarid conditions and the importance of genital transmission route



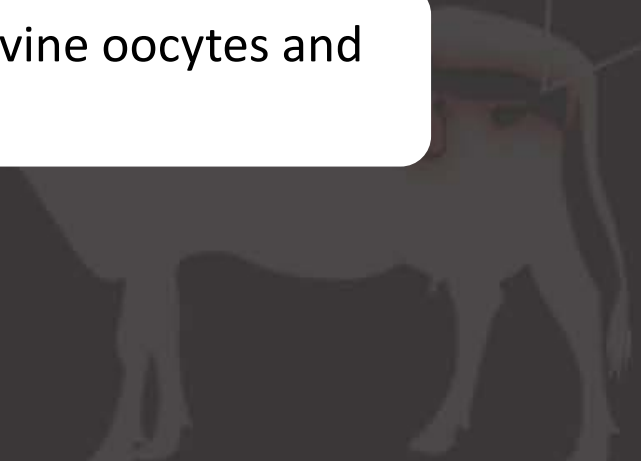
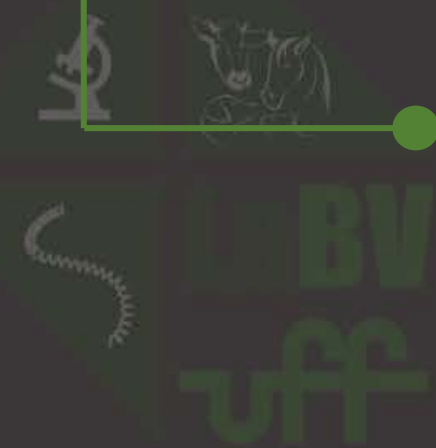
Denise Batista Nogueira^a, Flávia Teresa Ribeiro da Costa^a, Camila de Sousa Bezerra^a, Maria Luana Cristiny Rodrigues Silva^a, Diego Figueiredo da Costa^b, Maira Porto Viana^a, José Dêvede da Silva^a, João Pessoa Araújo Júnior^c, Camila Dantas Malossi^c, Leila Sabrina Ullmann^c, Carolina de Sousa Américo Batista Santos^a, Clebert José Alves^a, Sérgio Santos de Azevedo^{a,*}

Ongoing projects on the theme

Uterine colonization in hamsters

Isolation of *Leptospira* sp. in uterus of cows with reproductive problems in the field

Effect of leptospiric infection on bovine oocytes and embryos



Ongoing projects on the theme

Vaccination efficacy in controlling genital leptospirosis in experimentally infected sheep

Leptospirosis and Early Embryonic Death (EED) on herds with reproductive problems

Treatment with streptomycin in the elimination of the genital carrier state in sheep experimentally infected with leptospire



Bovine Genital Leptospirosis - Conclusions

The adequate recognition of the specificities of this syndrome may help to highlight its occurrence and contribute to a broader understanding of the many obscure points of its manifestation as well as the development of novel approaches for its control



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Bovine Genital Leptospirosis

Perspectives on BGL control should be focused on development of **vaccines** that protects reproductive tract against leptospiral colonization, and better approaches of **antibiotic therapy** to eliminate reproductive tract carriers status



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- Parceiros
- Biotério
- Coleção de Culturas Bacterianas de Interesse Veterinário
- Consensos Brasileiros em Leptospirose Animal 2015
- Banco de Imagens

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Localização e contato


Atendimento:
Segunda a Sexta, das 08:00 às 12:00 e das 13:00 às 16:00 horas

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Thank You!

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