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Technical Note

Suggestions for a More Updated Diagnostic of Leptospirosis

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INTRODUCTION

Leptospirosis is the most widespread zoonosis today. Every year 500 000 severe cases of leptospirosis are reported in the world, a figure that still falls short from the actual incidence (Samir *et al*., 2015). Its impacts on animals is full of uncertainties, though there is consensus in terms of economic losses (Shafighi *et al*., 2010). There is a wide range of domesticated animals that suffer the disease, and act as reservoirs. Such is the case in bovines, swine, equines (Lunn, 2015a), and canines (Samir *et al*, 2015), with a preponderant behavior in Camaguey, in comparison to ovine-caprine (Rodríguez *et al*., 2017), whose control must not be neglected for several reasons.

In the Provincial Laboratories of Animal Health throughout the country, leptospira antibodies are identified by microagglutination tests (MAT), according to the Regional Standard for Veterinary Diagnostic No. 673, from 1982, issued by the Ministry of Agriculture. Serotypes Icterohaemorrhagiae, Canicola, Ballum, Australis, Pomona and Tarassovi are used for equines, swine, and canines; whereas, Icterohaemorrhagiae, Canicola, Ballum, Pomona, Hebdomadis and Sejroe (Puentes *et al*., 2009) are still utilized for screening tests in bovines and ovine-caprine, despite the many years they have been in place.

DEVELOPMENT

According to Bolin (2005), the most important cattle serotypes are Hardjo and Pomona, for North America, South America, Australia, and New Zealand; whereas Hardjo is the only one used in Europe. The cattle areas of Mexico have a similar behavior (Luna *et al*., 2015). However, Hardjo is not used in Cuba for bovine serum screening, though Puentes *et al* (2009) considered it a universal serotype.

Recent sources considered Hardjo, Wolffi, Grippotyphosa, Canicola, Icterohaemorrhagiae, Copenhageni, Australis, Bratislava, and Pomona as the most frequently used serotypes in ovine-caprine (Topazio *et al.,* 2015). The underlined serotypes are not included in the national proposal, though Copenhageni was one of the most frequently used in these species.

Leptospira interrogans (serotypes Pomona, Icterohaemorrhagiae, Canicola, Hardjo, and Bratislava); *Leptospira borgpetersenii* (serotypes Sejroe and Tarassovi); and *Leptospira kirschneri* (serotypes Grippotyphosa), infect pigs. Pomona and Bratislava are exclusively adapted to this species, the others could be found in other reservoirs, and can infect pigs occasionally (Divers, 2015a).

Although the national Cuban standard includes serotype Australis, not included in Divers´s (2015a) proposal, it lacks Hardjo, Bratislava, Sejroe, and Grippotyphosa. Their inclusion would be an important decision in favor of provinces like Camaguey, with a swine population of 148 779, of which 77 673 (66.06%) are grown by private breeders, especially in backyards (CENCOP, 2015a). They pose risks to humans, since most people engaged in this activity have poor training, and their facilities do not meet the minimum requirements (Morales *et al*., 2014).

Dogs act as maintenance hosts for *Leptospira interrogans*, serotype Canicola, and Icteriohaemorrhagiae was the most commonly found serotype before the implementation of vaccination programs. As a result of selective pressure, others have emerged, particularly Grippotyphosa, Pomona and Bratislava (Lunn, 2015). Results like these had already been reported in Colombia (Álvarez *et al*., 2011).

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The Cuban standards exclude serotypes Grippotyphosa, Bratislava, and Sejroe, which are commercially available in other countries. Apart from protecting against the disease, they reduce removal of the etiological agent through urine (Lunn, 2015), a phenomenon that may last three years, thus becoming a significant source of infection to people and other animals.

The prevalence of leptospirosis in equines is unknown; however, the serological evidence points to higher incidence than the one recorded in the clinical reports. In the U.S. and Canada, Pomona and Grippotyphosa are the major causes of infection in these animals (Divers, 2015b), whereas in Brazil Copenhageni (Hammond *et al*., 2013) stands out. Only the former is considered for screening in Cuba.

Based on the previous, the inclusion of the serotypes shown in the Table, should be part of the MAT standards for Leptospira antibody detection in domesticated species in Cuba. If any of them is not available in the country, proper adjustments should be made with the existing ones. These alternatives might contribute to the reduction of the difference between the actual number of infected individuals and the diagnosed cases (Samir, *et al*., 2015).

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Table. Serotypes to be added to the current MAT kits

Domesticated species to be screened	Current kits	Serotypes to be added
Bovine-ovine-caprine	Icterohaemorrhagiae, Canicola, Ballum, Pomona, Hebdomadis, and Sejroe	Harjo, Wolffi, Grippotyphosa, Copenhageni, Australis, and Bratislava
Swine-canine-equine	Icterohaemorrhagiae, Canicola, Ballum, Australis, Pomona, and Tarassovi	Harjo, Bratislava, Sejroe, Copenhageni, and Grippotyphosa