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Serology to the rescue for detecting tuberculosis in pigs: the Corsican experience

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Introduction:

Animal tuberculosis (TB) caused by *Mycobacterium bovis* is a chronic, weakening infectious disease, which affects cattle, but also goats, sheep, and numerous wildlife species. Suidae are highly susceptible to *M. bovis* and may act as maintenance hosts in peculiar epidemiological contexts. Tuberculosis in pigs can occur in areas where animals are bred in free-roaming systems and where the density of infected wild boars and/or cattle is high. This is the case in Corsica, where the prevalence in pigs, cattle and wild boars is particularly high. Reliable ante-mortem tests are needed to perform surveillance in domestic swine in order to envisage the control of TB through the classic test-and-cull strategy. Therefore, a study on pigs was launched in Corsica in order to compare the performance of commercial swine-TB ELISA kits to assess their introduction as official tests for the detection of the disease in the breeding context.

Methods:

The study included 135 pork pigs (average age two years), belonging to 19 herds (between 1 and 19 animals per herd) with a history of tuberculosis infection, slaughtered between February-Apr 2021 and February-March 2022. From all these animals, with or without lesions suggestive of tuberculosis, retro-mandibular lymph nodes were taken for PCR, blood samples for serum and blood samples on filter papers (BFP), the latter two samples for serological tests currently approved for wild boars.

Results:

Using the PCR test as a reference, out of 14 animals thus confirmed infected, 11 were positive on blotter and 9 on serum (Se of approximately 79% and 64% respectively). However, since PCR is not a perfect test, we also analyzed serological results based on animals with suspect TB lesions at slaughter. Out of 15 animals with lesions, 13 gave a positive result on BFP serology (10 of which also on serum) (Se 87%), while only 11 were also PCR positive (Se 73%). Thus, we confirm that PCR and serology tests have very similar capacities to detect infected animals (14 animals found positive by PCR, 13 by serology (of which at least 11 with both tests). Although PCR seems to have a better detection capacity on animals probably infected earlier (3 animals without lesion but negative serology), serology would find animals infected for a longer period of time (2 animals with lesion, but negative PCR) which probably managed to contain the proliferation of the bacillus in the lymph nodes. The correlation between the serological tests Vs either PCR or presence of lesions proved to be very good.

Conclusions:

The serological test has a very good capacity to detect real infected pigs. In addition, the test on BFP, an easy way to collect blood samples at the slaughterhouse, gives better sensitivity results than with sera. Therefore, in the framework of the official TB regulation, serological tests for the detection of tuberculosis in swine, can be used as a means to control the disease at the herds level in Corsica, where other zootechnical as well as biosecurity will also be necessary to tackle this multi-factorial disease.