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Main topic : Surveillance and control of emerging diseases

The history of a successful diagnostic tool for bovine tuberculosis detection and control in France: the ifn- γ test

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Introduction:

Since 2004, just three years after having obtained the disease-free status, the number of bovine tuberculosis (bTB) breakdowns disclosed at the slaughterhouse started to increase in extensive cattle rearing regions in France, indicating that the current skin testing-cull strategy was no longer a useful means not only to eradicate residual infection but even to control the disease.

Methods:

The use of the interferon gamma release assay (IGRA) was introduced at first in an experimental manner in the most affected regions –Camargue, Dordogne and Côte d'Or- allowing us to adapt the test as best as possible to their inherent variable epidemiological situation for result interpretation but also introducing technical changes to render it as robust and specific as possible. Among these adaptations was the introduction of an interpretation formula including the positive control value in a ratio, which allows a decreasing variability of result and inter-comparability, the systematic use of a mitogen for controlling false negative animals/samples and also the use of *Mycobacterium tuberculosis* complex specific antigens for increasing specificity, the use of adapted cut-off values taking into consideration the degree of animal stress and a result-interpretation chart to adapt the test to the epidemiological context of the herd.

Results:

Once the test was settled, a network of authorised laboratories, trained and evaluated by the national reference laboratory was set up at a national level to make its use wider and to reinforce surveillance. Nowadays, the test is used in parallel with or in serial after the skin test to increase detection of positive predictive value depending on the regional epidemiological situation.

After almost 20 years, the test proved its usefulness as the disease was almost completely eliminated from Camargue, showed a spectacular prevalence decrease in Côte d'Or. However, besides helping the authorities to realise the real difficult epidemiological situation on south west France, the reinforced control programme which includes the use of this test does not seem to improve the difficult context in this region, explained by several present risk factors, including human borne- noncompliance with regulatory recommendations regarding the skin test or sanitary management-, that can explain its failure.

Conclusions:

As any current bTB ante-mortem test, this test is not perfect, but from our point of view it is the closest to provide results as reliable as possible both at the individual and at the herd level. Improvements can still be introduced to improve technical specificity. Thus, we consider that IGRA is a valuable tool for a bTB eradication programme provided that a good communication between committed stakeholders exists and that the employed screening tests are adapted to the local epidemiological context.