

CAE-RAPID – NEW CONCEPT OF RAPID DIAGNOSTICS OF SMALL RUMINANT LENTIVIRUS INFECTION IN GOATS

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Background: Caprine arthritis–encephalitis (CAE) is a widespread viral disease caused by small ruminant lentivirus (SRLV). The disease is responsible for considerable economic losses in goat industry and suffering of apparently affected animals. Diagnosis can be made direct through detection of genetic material of SRLV with PCR or indirectly through detection of humoral immune response to the infection. Currently, field diagnostics of CAE relies on serological immunoenzymatic tests (ELISA), as they are the only commercial diagnostic modalities approved not for research use only. Serological testing of animals requires professional collection of blood samples by a veterinarian and processing them in a veterinary laboratory which takes at least 24 hours. It generates substantial costs relative to financial value of goats and forces farmers to keep tested goats separated from the rest of a herd until results have arrived. These issues discourage farmers from having their goats routinely screened for CAE which contributes to the progressing spread of the disease. Rapid diagnostic test could help overcome these obstacles and improve CAE control as well as goat welfare in general.

Methods: Therefore, the project “CAE-RAPID” was launched last year (2021) to develop a rapid point-of-care serological test based on lateral-flow immunochromatographic technique. The project is financed by the International Coordination of Research on Infectious Animals Disease (ICRAD) program which is a part of the Horizon 2020 – EU’s research and innovation funding programme. Five scientific institutions are involved in the project: Norwegian University of Life Sciences (NMBU) from Norway, University of Bern and Institute of Virology and Immunology (UNIBE-IVI) from Switzerland, University of Veterinary Medicine Budapest (UVMB) from Hungary, Lithuanian University of Health Sciences (LSMU) from Lithuania, and Warsaw

University of Life Sciences (SGGW) from Poland as a coordinator of the entire project. The project aims to find the most optimal set of antigens based on Polish SRLV strains for a rapid lateral-flow immunochromatographic test, develop the rapid test and validate it both in laboratory and in field condition. The test is planned to be intended for using a broad array of biological material such as whole blood, serum, and milk, which will make the test useful not only for veterinarians, but also for farmers, without the need to stress animals with restraining and blood collection. Currently, various types of SRLV antigens are being intensively developed. Validation in laboratory conditions will be based on samples from diseased goats kept in Polish herds of well-known epidemiological status and history, while samples from healthy goats will be collected in Norwegian herds, with official negative status. Field validation will be carried out on Lithuanian and Hungarian goat populations. The additional asset of the CAE-RAPID project is the genetic investigation of SRLV infection in Poland, Lithuania, and Hungary. The project is to be

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