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Designing indirect ELISA test for detection of antibodies against serotype A2013 of Foot and Mouth Disease (FMD) virus in cattle

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Foot and Mouth Disease (FMD) virus is a contagious animal disease that causes irreparable damage to the economy of a country, including Iran where the disease is native to. Among the ways to combat FMD is vaccination and slaughter. Because of the specific situation of Iran, it is rather not possible to kill infected animals. Therefore, vaccination seems to be the most important way to fight the disease. The methods used to evaluate the safety and determine the titer of antibody in a serum are mainly Serum Neutralization Test (SNT) and Enzyme Linked Immune-Sorbent Assay (ELISA). In this research, designing an indirect ELISA test based on coating of 140S complete viral particles makes it possible to determine antibody and following the fact that determining serotype and viral type does not require time-consuming and complex molecular tasks, including gene expression. In addition, in the event of a new epidemic, a new epidemic condition can be detected by using serum antibody method. However, coating complete viral particle leads requires virus purification as well as anti-immunoglobulin conjugate antibody testing of the same animal. In this study, SNT test was used as a Gold Test to determine the serum antibody level and its results was compared with indirect ELISA method to determine the sensitivity and specificity of the indirect ELISA test for measuring the anti-virus antibody rate of type (A2013) FMD through ROC analysis, with 100% sensitivity and the specificity of 90% sensitivity, using routine formulas with 100 sensitivity and specificity of 82%. In this study, considering a cut off OD=0.3, there was a significant difference between the vaccinated animals and the unvaccinated animals in terms of antibody level against the A2013 type. This indicates the correctness of the test and the accurate and proportional antibody detection against the under study viral types of FMD.

Biography

Fatemeh Malekdar is a Research Assistant at the Razi Vaccine and Serum Research Institute. Her main research interests are in FMD virus. She is currently working on MSc thesis on the Designing Indirect ELISA Test for Detection of Antibodies against Serotype A2013 and O2010 of Foot and Mouth Disease (FMD) virus in cattle. The research is supervised by Professor Homayoon Mahravani in FMD department.

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