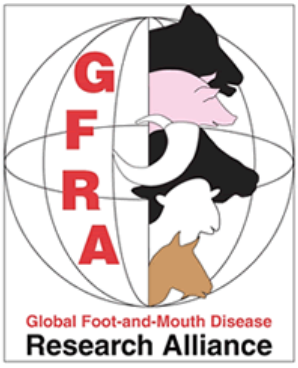
2013

ANNEX 2 of EuFMD- FAR: REVIEW OF GFRA FMD GLOBAL RESEARCH DIGEST



eufmd
european commission for the control of foot-and-mouth disease

Annex 2

REVIEW OF GFRA FMD GLOBAL RESEARCH DIGEST - PRIORITIES FOR FMD RESEARCH FOR EUROPE TO PRESENT TO DG-SANCO AND DG-RESEARCH

During the Open Session of the EuFMD in Jerez (Spain) in 2012, the highlights on research regarding Diagnostics, Epidemiology and Vaccines were presented. The Special Committee on Research at a Closed meeting evaluated the GFRA Review and made the following recommendations on R&D priorities, with (+++) indicating the highest priorities. This list is not formally endorsed by the EuFMD for the EuFMD-FAR as it was prepared for the guidance of EC institutions involved in decisions on Research Funding.

Recommendations on diagnostics and testing

Background

- The EuFMD special committee on research should produce a guideline on sending samples in compliance with UN dangerous goods guidelines;
- The WRL should give recommendations on optimal SOP and optimal primers of real-time RT-PCR for laboratories that do not have their own technique;
- Countries/organisations buying kits to detect antibodies against NSP should request the results of the WRL reference panel and/or the Panaftosa reference panel as evidence that the test provides a good result;
- The EuFMD Special Committee on Research should evaluate the outcome of the post-vaccination monitoring working group before it is finalised;
- The WRL has a list of viruses representative of the existing virus pools, NRLs have use these sequences and viruses to validate/improve in-house virus detection assays;
- The WRL has FMD reference panels available upon request. These panels should be used for the internal verification and validation of FMD antibody and virus detection techniques and for in-house developments.

Research

- Research funding bodies should support research on type-specific RT-PCR techniques for virus pools or virus serotypes, or topotypes, or sub-regions as in some samples the concentration is not sufficient for ELISA and virus amplification in cell culture is not always available in some countries (++);
- Companies should develop ready-to-use kits and easily transportable sample storage kits for molecular diagnosis of FMD infection (issue for companies but involves issues on costs and return, volume of market) (++);
- Research bodies should support the continuous improvement and updating and validation of existing ELISAs (in house and ready to use kits) for SP and NSP serology and for antigen detection and serotyping (+++);
- Research funding bodies should support the development of new ELISA kits for SATs Abs and SAT3 Ag, to complete the portfolio of new generation ELISAs for serological and virological diagnosis (+++);

- Research funding bodies should support the development of isotype-specific ELISAs (IgM, IgG, IgA) in kit formats (+);
- Research funding bodies should support the development of simplified diagnostic tools, such as penside test for virus detection and serotyping based on LFC and PCR (++);
- Research funding bodies should support next Generation Sequencing, with potential implication also for diagnosis (i.e. characterize/identify new viruses, or mixed population?, or recombinations, etc.) (++);
- Research funding bodies should support multiplex testing technologies for Ag, Abs, genomes (++);

Recommendations regarding epidemiology

Background

- EuFMD should support research assessing the patterns of virus spread and the dynamics of strain circulation in virus pools which pose a risk to Europe through phylogenetic analysis and molecular epidemiology, including analysing viruses circulating in regions and epidemiological groups from which samples are less likely to be submitted currently (+++);
- Research funding bodies should support socioeconomic studies, including value chain analysis, are needed to support and inform effective control measures, characterising the drivers, constraints, social patterns, incentives as well as movement patterns affecting FMD epidemiology, and improve ways of communications to and between stakeholders to improve FMD prevention and/or control (+++);
- Research funding bodies should support investigating the predictors of transmissibility of FMDV, including molecular and antigenic characterisation and relating the findings with field and experimental transmission studies (++);
- Research funding bodies should support research to determine and characterise the drivers of transmission in endemic countries, as well in free countries neighbouring endemic countries, with readily available records, including risk factors, vaccine effectiveness (+++);
- Research funding bodies should support research into the role of African and Asian Buffalo in persistence and spread of different serotypes (++);
- Research funding bodies should support research into the timing of transmission between adult African and Asian Buffalo and their offspring (++);
- Research funding bodies should support research into the potential role of wild boar and wildlife in FMD spread, including ecological studies, non-invasive sampling, transmission studies and modelling (+++);
- Countries using prophylactic vaccinations should support research into the factors influencing vaccine effectiveness in endemic countries, including evaluation and post-vaccination monitoring methods, estimating coverage and disease incidence and determining how to use key indicators to assess vaccination effectiveness (+++);
- Research funding bodies should support the development of decision support tools/models to support the formulation and refinement of vaccination strategies, including methods of harmonising outcomes in different countries where programme elements may differ (++);
- Research funding bodies should support models that estimate the acceptable level protection for countries zones and compartments, by combining different surveillance and control components (+++);

- Application of disease spread models to endemic settings to characterise key transmission parameters and explore the application of model outputs in improving control measures (++);
- Research funding bodies should support research to characterise the mechanisms of spread related to indirect contacts, including fomite-borne viruses (++);
- Research funding bodies should support studies into transmission and pathogenesis to characterise the relationship of pregnancy and parturition to disease susceptibility in ruminants (+);
- Research funding bodies should support research for epidemiological situations where vaccination is carried and outbreaks occur. In those cases the results of diagnostic tests can be complex therefore longitudinal surveys should be carried out and the results of various (serological) tests should be evaluated to understand which results can be expected in such situations. e.g. collect more info on level of cross-reactivity between serotypes in serological ELISA (needed for interpretation of serosurveys) and further evaluate available tests for SP-serology in the context of regions/vaccines/virus pools.

Recommendations to improve vaccines and vaccination programmes

Background

- Countries that use prophylactic vaccination are recommended to do quality control on vaccine that is used;
- Countries that use prophylactic vaccination are recommended to evaluate after how many serial vaccinations response to NSP can be expected;
- Countries that use prophylactic vaccination are recommended to evaluate the quality of their vaccination programmes;
- Guidance is needed on monitoring vaccination programmes (which tests and how to apply them); EuFMD should continue to support the WRL in vaccine matching outbreak strains that occur world-wide;
- The Special Committee on Research should evaluate the WRL report on strains advised for inclusion in antigen banks before it is presented to the EuFMD executive committee and/or the EuFMD General Session;
- Adeno virus vaccines are now licensed in USA – are their implications for possible use in Europe?

Research

- Research funding bodies should support research on development of new vaccines that will induce a stronger and longer lasting immune response (+++);
- Countries that use prophylactic vaccination are recommended to study the duration of immunity (++);
- Research funding bodies should support research into antivirals to be able to cover the immunity gap in case of an emergency vaccination (++);
- Countries that use prophylactic vaccination should do research on the time of first vaccination in face of maternally derived antibodies (++);
- Research funding bodies should fund research into the identification of viral determinants of cross-protection between serotypes (+);
- Research funding bodies should support research on replacing traditional vaccine matching by sequence based determination of antigenicity (++);

- Research funding bodies should support research on evaluating after how many serial vaccinations response to NSP can be expected;
- Research bodies should support research on origins of variation in FMD isolates, is recombination in the field a possibility that could suddenly result in a larger risk for spread and pathogenicity (+)?

Recommendations regarding GFRA report

- The GRFRA report provides useful information on research activities of its members but is not fully comprehensive of the research programs and research advances worldwide. Therefore, it is recommended that the report is supplemented with a review of recent published or internationally presented research globally and to include a gap analysis. It would be useful to have an update of the report in autumn 2013.

Recommendations regarding biosecurity and safe trade

- It is recommended that the minimal standards for laboratories working with FMD virus are updated before the 2013 general session, to better reflect the functions of auxiliary diagnostic laboratories;
- Research bodies should support research into alternatives for formaldehyde fumigation (++);
- Research bodies should support studies of survival of FMDV in commodities and animal products to facilitate trade (++);
- Research bodies should support studies in the amount of bone and lymph nodes in deboned meat and the risk posed by these products in trade (++).