



FMD and CSF Coordination Action



International Network of FMD Vaccine Banks, and Antigen Testing Protocols

FMD and CSF Coordination Action - Workpackage 4,
Vaccine Reserves
Institute for Animal Health, Pirbright Laboratory,
Pirbright, Surrey
United Kingdom



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Coordination Action

Work Package 4 FMD Vaccine Reserves

Notes from the teleconference meeting 15 May 2008, 20.00 (GMT)

Participants:

Paul Barnett (Chairperson) – IAH, Pirbright
John Bashiruddin (Rapporteur) – IAH, Pirbright
Karin Ahring – AHA, Australia
Hernando Duque– NAVB, USA
Richard Drummond– Derfa, UK
Alf Fussel– DG SANCO, EU, Brussels
Andre van Halderen – MAF, New Zealand
Jill Mortier– (Observer) – Australian Government

Paul Barnett warmly welcomed all participants and especially those for whom times were out of work hours.

Three documents as follows were circulated before the meeting:

Annex 1 –The Memorandum of Understanding for an International Network of Vaccine Banks for Foot-and-mouth Disease Vaccine.

Annex 2 – Consideration of the Standards/protocols that should be followed by the banks.

Annex 3 – Methods and format for reporting these key standards and protocols to the network.

It was agreed that the Agenda should follow this sequence.

Summaries of Discussions

1. The Memorandum of Understanding (MOU) for an International Network of Vaccine Banks for foot-and-mouth disease vaccine.

Elements in the MOU (Annex 1) pertained to the manufacturer and some concern was expressed as to their involvement. The chairperson emphasised that it was always the intention within Work package 4 of the FMD-CSF Coordinated Action to involve manufacturers once the network of reserves and their owners was established. Having then established the Network, this would

present recommendations for the storage and testing of vaccine/antigen from a unified front to the manufacturers and regulators and would also facilitate science based changes when and if required to international executive organisations such as the OIE. As the source of the vaccine/antigen was the same manufacturer for all the current participants, the present group was well placed to work as a team.

Principle aims of the Network were to facilitate the sharing of information between banks leading toward a more harmonised approach in the execution and running of emergency FMD reserves. In the long term it was hoped that the liaison between reserves, following harmonised and complimentary procedures within this network, would widen the amounts and type/strains of vaccine available to each other as well as reduce expense to the individual banks.

The coordinaton of the Network was explained in the MOU. Briefly, by agreement the secretariat shifted in rotation among the members, one contact point would be assigned to act as the hub, mainly for information and as a conduit for the arrangement of bilateral agreements between banks. It was noted that the EU FMD functioned in a similar way and this worked well.

It became apparent that signatories on the MOU would not necessarily be the vaccine bank managers i.e. the participant of this meeting or those assigned in the draft document. However, they would be the main contact points for each bank and the signatories would be the vaccine bank owners who vary from bank to bank, from Governments, executive agencies of Governments, or private companies providing to the Government. For example for the EU it would be the Deputy Director General after approval from all CVOs, for Australia it would be the Director of Animal Health Australia, for the UK it would be the CVO and for New Zealand it would be the CVO after approval of the Director General.

Action: It was agreed that all participants would provide names and details of appropriate signatories to John Bashiruddin for inclusion into the MOU.

2. Consideration of the Standards/protocols that should be followed by the banks

The chairperson opened this part of the agenda by stating that much of the standards/protocols that were suggested as the basis of Annex 2 were directly taken from the new OIE chapter on Vaccine Reserves to which he had been the principal author. The aim of this document was to suggest that, by agreement, the most appropriate test (or a minimum set of tests) be performed periodically to check the integrity of stored antigens. This stability check should verify storage, good housekeeping and QA for the antigen bank. Data on integrity of antigens accumulated over time would also provide a basis for further studies on stability, providing recommendations for antigen shelf life and renewal that is currently arbitrarily and ambiguously set at 5 years.

It was agreed that this would have wide repercussions for vaccine banks world wide. Following agreed protocols would also allow for assurance of quality and security of shared antigens.

Potency and challenge tests are important but collaborative work within this Network could be undertaken, not necessarily with all batches, but with some, to work within serological testing models to refine such an approach in order to make an assessment of vaccine efficacy by in vitro methods. Potency testing, involving challenge, is costly but recent revision of the monograph now includes guidance for an in vitro approach, providing the necessary validation has taken place.

Work in the UK is currently being carried out to develop better computational models that assess potency, using data from tests such as VNT and ELISA, and the Network could act as a source for additional data to further develop and improve such an approach.

It was recognised that harmonisation of testing regimes, common manufacturing source and manufacturing standards were a good basis for the possibility of an International exchange of antigens.

3. Standards and Protocols

The reporting system exemplified by the Annex 3 document was supported by all, given that these tests were already being done regularly by all. The need for each partner to seek approval for information exchange was noted and these are more fully described in the MOU. The chair person added that the reporting system could also offer a further means of establishing the global picture on the epidemiological situation regarding FMD and the effectiveness of certain vaccines strains to network members as well as an up to the minute source on developments in FMD vaccine research. A secure web based data entry and repository could be established.

4. Any other business

The need for a face-to-face meeting was deemed useful, but more so if combined with another meeting such as that which occurs annually at OIE in May. It was felt that this could be arranged after the signing of the MOU. This could take some time, but it was agreed that efforts should be made by all to start the accumulation of data on antigen stocks.

Annex 1



DRAFT

**Memorandum of Understanding for an
International Network of Vaccine Banks for
Foot-and-mouth Disease Vaccine**

Memorandum of Understanding for an International Network of Foot-and-Mouth Disease Vaccine Banks

International Network of Foot-and-mouth Disease Vaccine Banks involving Owners, Managers, Technical Representatives and other Authorised Parties responsible for such antigen/vaccine reserves.

Purpose:

Several countries and groups of countries have established foot-and-mouth disease (FMD) vaccine banks or reserves, which are mainly in the form of concentrated viral antigens stored over liquid nitrogen. Each of these organisations faces a number of similar issues over selection, manufacture, storage and regulation of vaccines, which they currently deal with independently. Therefore practical and economic benefit could be realised from collaboration between those responsible for these vaccine banks or reserves. This will be achieved through mutually acceptable mechanisms for the exchange of information and materials relevant to vaccine banks and their management and ultimately has the potential to contribute significantly to the improved control of FMD worldwide.

The purpose of this document is to provide a framework for facilitating collaborations between FMD Vaccine Bank Managers, Owners, Technical Representatives and Authorised Parties with the following objectives.

Objectives:

The network will:

1. Increase co-operative effort, mutual support and back-up for vaccine bank network members in order to improve international control of FMD by vaccination.
2. With respect to common vaccine bank issues such as vaccine dose requirements, virus strain selection, manufacture, formulation, testing and regulatory control, storage, security, maintenance, monitoring and disposal, ,:
 - a. share information and best practices
 - b. aim to avoid duplication of effort and realise economies
 - c. work to harmonise approaches and define standards where appropriate
 - d. promote rationalisation and sharing of bank reagents
 - e. investigate possibilities for the sharing of banked antigens, working towards a virtual international bank for FMD vaccines
3. Identify routes for independent testing and assessment of FMD antigens/vaccines.
4. Improve the availability of emergency vaccines and access to a wider range of vaccine types and quantities.
5. Monitor progress and technical developments relating to emergency FMD vaccines.
6. Identify and promote areas of research that could lead to improvements in emergency FMD vaccine reserves.

7. Increase the efficiency of vaccine banks and the proficiency of vaccine bank staff.
8. Offer expertise to member countries and to international disease control agencies such as OIE and FAO to assist in the control of FMD by vaccination.
9. Identify and propose solutions to any constraints in the functioning of the network.

Membership:

The following have been invited to join the network in the first instance:

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Other vaccine bank personnel and other experts in relevant associated fields may be invited to join or contribute to the network according to need and progress during the development of coordination procedures. OIE and FAO should be invited to attend meetings as observers.

Strategic activities of the Network

The Network has no budget and will act through its members each of whom will be financially independent and supported by their own resources

The network will:

1. Meet at least annually to appoint a secretariat, review progress, identify priorities and agree plans for the network.
2. Produce an annual network report.
3. Operate initially for a limited period of between 3-5 years, with a review of the value of continued interaction thereafter.
4. Agree a memorandum of understanding to identify objectives and strategic activities as well as to facilitate the exchange of materials and information.
5. Develop processes based on best practice to achieve equivalence in FMD vaccine bank standards. In this regard, the network will aim to hold and use antigens/vaccines produced in compliance to OIE recommendations and will evaluate the applicability of guidelines from the EU Committee on Veterinary Medicinal Products.
6. Concertedly address, by application of risk analyses, the appropriateness of types and the optimal amounts of antigens/vaccines required in reserves.
7. Promote the development of *in vitro* tests that provide improved correlation with protection against challenge and ultimately reduce reliance on animal testing.
8. Consider practical uses of emergency antigens/vaccines no longer required in banks or that have or are about to have exceeded their holding period.
9. Identify research requirements and where appropriate develop joint research projects.
10. Develop guidelines for successful implementation of emergency vaccination.
11. Develop a web-based tool for the network to share and make available laboratory information such as vaccine strain matching results, as close to real time as possible.
12. Maintain a database of FMD vaccine bank managers and their field of expertise.

Coordination:

A secretariat will be required to organise the annual meeting and disseminate minutes or reports, to establish and maintain the web-based network tool and to facilitate the implementation of the agreed plan of work. The secretariat will be provided by one of the network representatives to coordinate network activities. The decision on who will act in the capacity of the secretariat and for what period of time will be taken at the network meetings.

Code of Practice

In order to realise the above objectives and strategic actions, the participating members agree to the following code of practice for exchange of information and materials between originators and recipients within the network.

It is perceived that there may be a threat of deliberate introduction of FMDV into certain countries and that the potential perpetrators of such acts should not gain access to information on the strains and doses of vaccine antigen held in relevant vaccine banks. Therefore, many vaccine banks do not divulge information of this nature. However, the level of confidentiality that is maintained varies between vaccine banks. In some cases, the information is not published or otherwise made public but is available to trusted government advisors and civil servants. For these organisations, sharing of such information within a small network of like-minded authorised persons might be conceivable, subject to confidentiality agreement. In contrast, other countries maintain a much more stringent confidentiality and are currently unlikely to agree to share this information within this network. It is therefore proposed that initially, there is no point in trying to include the sharing of this information. However, it must be recognised that this will considerably constrain the value of the network and the issue should be revisited once the network has established its participants and its modus operandi.

1. Exchange of information

- 1.1. This includes, but is not limited to, methods of analysis to decide on optimal quantities and types of vaccine, methods of selecting vaccine strains, infrastructure required to support an efficient vaccination campaign, recommendations for improving vaccine efficacy, methods for increasing shelf-life of antigens/vaccines including assessment on the long-term stability of antigens under ultra low temperature storage, improvements to potency testing and alternatives to challenge, development of alternative methods to detect infected animals following vaccination, methods for post-vaccination serosurveillance and means of safe disposal for vaccines.
- 1.2. The annual report of the network and the minutes of its meetings should be agreed by all the participants prior to finalisation. A decision will be needed on whether these documents (in whole or part) can be disclosed more widely and such disclosure shall require the agreement of all of the participants.
- 1.3. Information may be passed from originator to recipient verbally or in writing. Information produced by one vaccine/antigen bank remains the intellectual property of that bank until such time as it is released by the originator into public access by publication in print or via the internet. Until then, it may be utilised by other

vaccine/antigen banks in the network upon request or via a shared access website, provided that any publications that arise from using the information are agreed by the originator, including appropriate acknowledgement of or co-authorship with the originator. Whilst the information remains the intellectual property of the originator, it shall not be passed on to third parties by the recipient without the express consent of the originator.

2. Exchange of materials.

Such an exchange of materials will principally involve small scale vaccines/antigens or anti-serum representing vaccine strains held in strategic reserves. FMD vaccines or inactivated FMD virus antigen held by one vaccine/antigen bank may be passed to another vaccine/antigen bank if there is a requirement for either independent testing, confirmatory testing, or for experimental analyses or the production of reference materials such as bovine vaccinal sera for improved vaccine strain selection.

Equally, antisera derived from animals that have been immunised with vaccines that are representative of a component of an antigen reserve, and that either have, or have not, been subjected to challenge/protection testing can be used by a network. Such reagents can be used for serological assessment of the suitability of vaccine strains for use to control particular field isolates or for input into other research studies such as the statistical validation of alternative routes for in-vitro potency estimation. In addition, antisera may also be passed to another vaccine/antigen bank if there is a requirement for either independent testing, confirmatory testing, or for other experimental analyses.

Such an exchange of materials may be in the capacity also of a collaborative research project, or because such experiments cannot be completed by the originator themselves.

In such cases, the recipient shall agree not to pass the material on to any third party, nor to exploit it commercially without the express written consent of the originator. Furthermore, the recipient will provide the originator with the results of all the testing and/or experiments carried out using such materials or the reference materials derived from them including any novel analysis that is undertaken. The Recipient may utilise the results of their own studies using the originator's material without the originator's consent, except in the context of refereed publications resulting from such analysis which must be agreed with the originator and with appropriate acknowledgement of,

or co-authorship with, the originator. Presentations or reports made by the recipient that utilise the results of any analysis of the originator's material, should also acknowledge the originator as the source of the material.

3. Shared access to antigens and vaccines for more comprehensive global cover

Whilst a prerequisite to any antigen bank or vaccine reserve is to have the most comprehensive stock-pile of vaccine strains available that are pertinent to any given outbreak situation, realistically this is neither logistical nor economically plausible. Therefore, antigen/vaccine reserves are established on the basis of the likeliest perceived risk and on the minimum amounts of each vaccine strain that should be stock-piled. Thus antigens/vaccines are obtained/incorporated into antigen/vaccine reserves on a prioritised basis. However, there is recognition that FMD is a global disease with a global risk of incursion that could occur from any source such that there may well be instances where a national, or international reserve, does not have any, or enough, of the most appropriate vaccine strain to assist in control of a particular disease incursion. This could be counteracted by an agreed access to supplies from other antigen reserves which hold a more relevant vaccine strain. In part this is already addressed by some national authorities who hold their own reserves but also have access to the European Union antigen bank.

In order to maintain confidentiality of the stockpiles held by any given bank within the network, any request by another network member for supply of a specific vaccine strain will be made through a single key contact, such as the network secretariat, who on the requestor's behalf will seek potential supply from any other member of the network. Should another network member be willing to support such a request then, in the first instance, this will be mediated through the key contact to the requestor. However, since the issue of confidentiality is principally based over bioterrorism, its value is only in respect of the vaccine strains that are not held by the reserves and is thus amenable to bilateral communication between both requestor and supplier over the final arrangements for access.

Under such arrangements, the requestor shall bear the full costs of the formulation, bottling, shipment and replacement of this antigen stock, including any necessary testing, on implementation and shall agree not to pass the vaccine on to any third party, nor to exploit it commercially without the express consent of the supplier. Furthermore, the requestor will provide the supplier with any results if it is subsequently used for control purpose in the field and following thereafter any serological surveillance that is undertaken.

The requestor may not utilise the results following implementation of an immunisation campaign using vaccine provided by the supplier without the supplier's consent, including the context of refereed publications resulting from such analysis which must be agreed with the supplier and with appropriate acknowledgement of or co-authorship with the supplier. Presentations or reports made by the requestor that utilise the results of any analysis of the supplier's vaccine, should only acknowledge the source of the material with the expressed permission of the supplier.

4. General provisions.

Use of biological samples and reagents by the recipient should be limited to the specific purpose for which they were submitted/requested, unless additional, written authorisation is obtained.

The biological materials supplied by a vaccine/antigen bank may have characteristics which are unknown or difficult to determine and which may pose potential hazards and risks either in their handling, delivery, use, disposal and overall treatment and possession. The Recipient(s) hereby assumes all liability with respect to any risk arising from these materials and in no event shall the Originator be liable to the Recipient(s) or third parties for claims arising there from, even in the event of negligence. It is the responsibility of the recipient to get authorisation from their national authority to be able to import biological materials.

Additional constraints on the use by recipient(s) of materials and information provided by the originator may be imposed by third parties that have given the materials or information to the originator in the first place.

This memorandum of understanding does not preclude the participating vaccine/antigen banks from entering into more specific agreements to govern particular exchanges of materials or information.

The participating vaccine bank Owners, Managers, Technical Representatives and other Authorised Parties responsible for such antigen/vaccine reserves agree to join the Network of FMD Vaccine Banks, to promote its purpose and objectives and to uphold this memorandum of understanding. This memorandum of understanding is hereby executed by the duly authorized representatives of the participating reference laboratories and/or vaccine/antigen banks.

Agreement Holders

For: Institute for Animal Health
By: **Paul Barnett**
Signature:
Date:

For: North American Foot-and-Mouth Disease Vaccine Bank
By: **Hernando Duque**
Signature:
Date:

For: EC Commission, DG SANCO/E2
By: **Alf Füssel**
Signature:
Date:

For: Ministry of Agriculture & Forestry, New Zealand
By: **Andre van Halderen**
Signature:
Date:

For : Department for Environment, Food and Rural Affairs (Defra), UK
By: **Richard Drummond**
Signature:
Date:

For: Animal Health Australia
By: **Karin Ahrling**
Signature:
Date:

Annex 2.

Standards/protocols that should be followed by the banks within a network

Collaboration between vaccine banks provides a number of advantages including an economic way of increasing the amount of emergency vaccine that could be accessible to those in a network. However, there would be a necessity to ensure that collaborating banks operate to similar standards particularly in confirmation of the safety and efficacy of the vaccines. Issues related to regulatory compliance would also need to be addressed at an early stage to ensure that vaccine produced from the bank would be authorised for use in any of the participating countries.

Current practices for each bank may, or may not, vary widely but it is essential to know that banks, which are incorporated into a network, perform similar and acceptable levels of testing and monitoring to ensure that the antigens/vaccine are stored appropriately and will be fit for purpose in an emergency, particularly in terms of their efficacy. At the first WP4 Vaccine Reserve Workshop there was general agreement that all antigens/vaccines produced or used by the members of the network should be manufactured in compliance with OIE recommendations, taking into account the EU Committee on Veterinary Medicinal Product guidelines. Therefore it is important to identify and agree these key standards and protocols which should be attained by the network of vaccine banks.

Identification of key standards and protocols

In order to identify key standards and protocols for a bank network we must first recognise the importance they play on both vaccine components and the final product particularly in terms quality, safety and efficacy.

Final Product

Regulatory requirements for the final veterinary medicinal product must be considered by any country wishing to have the necessary authorisation to use emergency vaccine in an outbreak situation. For example, all veterinary medicinal products that are placed on the market in the European Union (EU) must hold a marketing authorisation, and the EU lays down the requirements for such authorisations. However, a more recent EU Directive 2003/85/EC on current and future policy on control of FMD places more emphasis on the use of vaccines as part of a vaccinate-to-live policy. This makes the issue of an authorised product even more essential, particularly where vaccinated animals are intended for the food chain and require the support of agencies responsible for human health.

FMD vaccines are covered in the European Pharmacopoeia, under Monograph 63 where standards for Safety, Efficacy, Sterility and Quality are laid down though this is not an obligation for all the countries who may wish to participate in a network of banks. For the other case where an immunological comes under the Pharmacopoeia general section on Vaccines for Veterinary Use, then the minimum standards prescribed by the Pharmacopoeia should perhaps apply, and disease control authorities may wish to add other individual requirements to these minimum standards. These standards might include antigen strain identity, freedom from adventitious agents, innocuity, absence of toxicity, quantity of antigen payload per dose, safety, potency and sterility, and manufacture in officially approved quality assured (QA) good manufacturing practice (GMP) premises. Any adjuvant or pharmacologically active ingredient used in a formulation must also conform to the necessary guideline requirements including residues in food-producing species.

Differentiating between animals that have been vaccinated and animals that have either recovered from infection or that have acquired sub-clinical infection post-vaccination may also be an important issue, as is the case for FMD. The detection of antibodies to non-structural polyproteins (NSPs) such as 3ABC of FMDV has been shown to be a sensitive and specific method to differentiate between infection and vaccination. This relies on manufacturing methods whereby the NSP component can be reduced to a level that will not cause detectable sero-conversion following vaccination making purity of vaccine an important consideration.

However, most, if not all, of these aspects are likely to have been dealt with the commercial antigen/vaccine supplier.

Antigen Component

It is vitally important that antigen concentrates are optimally maintained and routinely monitored in order to have some assurance that they will be efficacious when needed. Arrangements should be made to monitor antigen concentrates on a routine basis and to include where necessary, and at appropriate time intervals, a testing regime to ensure integrity of the antigen component or acceptable potency of the final product.

Storage of the antigen component in a Bank

It is important that the areas of storage chosen to hold emergency antigens/vaccines are suitable in the context of the required national or internationally accepted standards of GMP and those such standards are acceptable to other members of a network of banks. This will usually be covered when a bank is held in a 'licensed' and routinely inspected vaccine plant. However, if the bank is located outside a nominated vaccine formulation facility, regulatory considerations will be of paramount importance in order to ensure the necessary standards are in place. Banks may wish to seek advice from appropriate licensing authorities on the necessary standards required but there should be visible harmonisation and guidelines in place for a network of banks to follow. Two recommendations made in the first WP4 Vaccine Reserve Workshop were:

1. Vaccine bank managers should consider the possibility of dividing the reserve between two locations for added security. The security clearance of bank staff should also be taken into consideration.
2. Measures to safeguard the physical security of antigen reserves should preferably include the provision of automatic monitoring and alarm capability for the temperature of storage and also back-up systems for electrical power and liquid nitrogen supply. These systems should be regularly tested and also serviced according to a planned, preventive maintenance programme.

Other aspects which should be considered include: health and safety including oxygen monitoring, appropriate floor and wall surfaces, and stock labelling and recording.

If the vaccine bank is associated with a laboratory, or other facility, where pathogens are handled, this should be completely independent of the bank storage facilities, and maintenance and monitoring personnel should obey a quarantine period before entering the bank.

24-hour storage temperature monitoring may normally be undertaken and recorded in FMD vaccine banks, as well as periodic inspection of the bottles containing the antigen for cracks

or leakage. Depending on type, volume and how they are stored there may also be value in weighing antigen deposits annually to ensure they have not lyophilised.

The dose numbers or volumes stored are an important consideration, particularly where a reserve may be shared. It may be advisable to store antigen concentrates in user-friendly units to allow better usage of storage space and capability in producing smaller vaccine batches. One to two litre sized containers can accommodate in excess of 30,000 doses bovine doses. Where the requirement is for a large stockpile of a particular vaccine strain that can only be produced from several separate production runs, Vaccine Bank managers must consider the need to either formulate each lot into a representative final blend for testing purposes or mixing the individual batches, at some convenient point, for ease of formulating and/or testing.

To support monitoring and testing of the antigen integrity depositories should include a large number of small samples that are representative of the larger stock and for such purposes these should be stored alongside the larger component stock under the same conditions. Small aliquots/stocks of FMD antigen have usually consisted of a volume representing approximately one milligram of the antigen.

The type of container used to hold antigen concentrate is important. Under ultra-low temperature conditions it is important to use containers made from materials that do not become brittle and fragile, a good example being fluoropolymer based moulded bottles. Polyfluoro-alkoxy (PFA) based bottles, for example, have a temperature resistance range of between -270°C and $+250^{\circ}\text{C}$.

Although there are national and international guidelines on required labelling of veterinary and medical products, there are no such guidelines currently for emergency stored materials such as the antigen component of a vaccine. Under ultra-low temperature conditions, the method of labelling must be of a durable nature. From experience, wire tagging bottles is the most preferred option using a metal tag sizeable enough to allow the necessary detail. Such detail should include the antigen/vaccine strain, batch number and date received, and should also include an individual container or stock number. This information should be clear to read and marked on the tag using an indelible marker pen. Aluminium metal tags have been used for such purpose and these can be obtained with different colour coatings to allow better identification and accessibility, particularly when different antigen strains are housed in the same container. Metal tags also allow information to be permanently engraved.

Monitoring integrity of antigens in a Bank

Some FMD vaccine banks have incorporated physico-chemical tests like sucrose density gradient analyses to monitor virus integrity and hence stability and some have also carried out in-vivo tests. However, since it has been shown that the shelf-lives of FMD antigen concentrates are likely to be well in excess of 15 years when stored at ultra-low temperature a physico-chemical approach would appear sufficient and for a network of banks there should be agreement on harmonisation of appropriate tests, how it can be accomplished and the interval of testing.

The following timetable of tests might be considered as suitable for validation and revalidation of stored antigens.

Time	Test
On receipt (year 0) and every 5 years thereafter	146S quantification Potency test in cattle which may rely on serological techniques where potency has been adequately correlated with immunogenicity for the antigen concerned or, at the discretion of the bank holder, may be a 'truncated' test** to demonstrate that the minimum potency of the vaccine remains greater than the minimum requirement; however, truncation may underestimate vaccine potency
Years 2 and 4, and immediately before formulation if the need arises	146S quantification
Every 5 years	Evaluation of all data for the preceding 5 years to assess need to replace antigen
** In a truncated test all animals in the next lower volume group are assumed to have not been protected. The test therefore gives an artificially low PD ₅₀ value but reduces the number of animals required.	

Sources of guidelines/protocols

There are few sources available to managers of antigen reserves apart from the recently published chapters in the OIE manual to which much of the above has been drawn. Therefore some agreement will need to be reached on whether this is considered suitable or if some other forms of document should be drawn up and accepted by the network as a guide.

Annex 3

Methods to substantiate key standards and protocols

- Consideration of an annual reporting procedure and model template

Having agreed on the key standards and protocols that should be followed, members of the network may wish to contemplate the need for validation and the mode by which this can be reported. One potential route could be the use of a specific template that could encompass not only annual statutory testing but other associated work related to the use of the emergency vaccines and the strains therein.

However there is need to also recognise that such reporting should not intrude on any confidentiality issues and requirements that members of the network may wish to maintain.

Therefore reports could be flexible enough to accommodate for such a need. For example, a simple form of declaration confirming that samples, representing undisclosed vaccines strains, from a given reserve have undergone the necessary testing and validating in accordance to the standards and protocols agreed by the network.

Another possibility would be the avoidance of specifying actual vaccine strains but instead using a simple coding procedure.

The following is an example of a template previously used by the International FMD Vaccine Bank.

REPORT OF THE XXXXXXXXXXXXX FMD VACCINE BANK

2009-2010

1. General comments

2. Routine stability testing

IN-VIVO TESTS

Cattle potency tests

Vaccine Strain or code#	Year and PD ₅₀ Value				Mean
	2007	2008	2009	2010	

^arunning mean of all existing data

^bsample size

code to maintain confidentiality of actual strains

Guinea pig potency tests

Vaccine Strain or code	Year and PD ₅₀ Value				Mean
	2007	2008	2009	2010	

^arunning mean of all existing data

^bsample size

IN-VITRO TESTS

Sucrose density gradient analyses

Vaccine Strain or code	S Value				Mean
	2007	2008	2009	2010	

^arunning mean of all existing data

^bsample size

3. Maintenance of the Bank

4. Antigenic relationship studies

5. Other related scientific/research work based on the antigen holdings

- Incorporation of this report into the CA web page

Annual reporting using a format similar to that previous could be encompassed into the Coordinated Action Web Page but allowing accessibility to select individuals agreed by the network.