RESOLUTION No. 26

Amendments to the WOAH *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*

CONSIDERING THAT

1. The *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* (*Terrestrial Manual*), like the *Terrestrial Animal Health Code*, is an important contribution to the international harmonisation of sanitary standards related to terrestrial animals and animal products,

2. Members were asked for the comments of their specialists for each new or revised chapter of the *Terrestrial Manual* before it was finalised by the Biological Standards Commission,

THE ASSEMBLY

RESOLVES

1. To adopt the following texts for the *Terrestrial Manual*:

   1.1.3. ‘Transport of biological materials’

   1.1.7. ‘Standards for high throughput sequencing, bioinformatics and computational genomics’

   1.1.9. ‘Tests for sterility and freedom from contamination of biological materials intended for veterinary use’

   With the amendments approved by the Assembly:

   In Section D. ‘Living bacterial vaccines’ replace “antibiotics” with “antimicrobials” four times in point 2

   2.1.1. ‘Laboratory methodologies for bacterial antimicrobial susceptibility testing’

   With the amendments approved by the Assembly:

   In Section A. ‘Introduction’, add “Variable levels of” before “resistance has been observed” and “despite that there is still a high level of susceptibility present” after “animals”

   2.2.1. ‘Development and optimisation of antibody detection assays’

   With the amendments approved by the Assembly:

   In Section A.1.b. ‘Purpose 1b: Contribute to the demonstration of freedom from infection in a defined population: re-establishment of freedom after outbreaks’ add “This shift in prevalence affects the positive predictive value (PPV) and negative predictive value (NPV) of a given test (Figure 1); therefore, test selection should be made accordingly.” after the first sentence

   In Section A.2.1.3. ‘Positive and negative reference panel’ add “In cases where such population-specific samples are unavailable, such as during the validation of an assay intended for use in a disease-free population, sera from experimentally sensitised animals may be used as an alternative. However, test performance parameters must

be interpreted with caution due to potential differences in antibody profiles elicited by natural infection versus sensitisation." after the third sentence

In Section B.2.2.1. 'Animals of known infection status' move "Heuer & Stevenson (2021) describe procedures for diagnostic test validation studies when there is a perfect reference standard available for either positive or negative animals or both." from point v) and add it to the end of point i)

Add the following reference to the list: "GARDNER I.A., STRYHN H., LIND P. & COLLINS M.T. (2000). Conditional dependence between tests affects the diagnosis and surveillance of animal diseases. *Prev. Vet. Med*., **45**, 107–122. doi: 10.1016/s0167-5877(00)00119-7."

2.2.2. 'Development and optimisation of antigen detection assays'

2.2.3. 'Development and optimisation of nucleic acid detection assays'

2.2.5. 'Statistical approaches to validation'

2.2.8. 'Comparability of assays after minor changes in a validated test method'

3.1.2. 'Aujeszky's disease (infection with suid alphaherpesvirus 1 [SuAHV1])'

With the amendments approved by the Assembly:

In the Summary section on 'Requirements for vaccines' to add "Generally, pigs are vaccinated at the beginning of the growing period, i.e. when they are between 9 and 12 weeks old. Some vaccines can also be used in pregnant sows to protect young piglets against central nervous disorders and mortality through passive immunity (follow the manufacturer's recommendations)." after the first sentence

3.1.8. 'Foot and mouth disease (infection with foot and mouth disease virus)'

With the amendments approved by the Assembly:

In the Summary text on vaccine challenge tests, to replace "reduce the number of animals being used" with "replace potency tests"

In Section B.1.3.6. 'Molecular epidemiology' add "Sequencing 1D, the genomic region encoding" before "VP1" and delete "sequencing" after "VP1"

3.1.9. 'Heartwater'

3.1.21. 'Rinderpest (infection with rinderpest virus)'

3.2.4. 'Infestation of honey bees with *Aethina tumida* (small hive beetle)'

3.2.5. 'Infestation of honey bees with *Tropilaelaps* spp'

3.3.1. 'Avian chlamydiosis'

3.3.2. 'Avian infectious bronchitis'

3.3.4. 'Avian influenza (including infection with high pathogenicity avian influenza viruses)'

With the amendments approved by the Assembly:

In Section B.1.4 'Assessment of pathogenicity' to add the following reference to support the recommended virus haemagglutinin titre of >16 to be used for the intravenous pathogenicity index: Terregino C. & Capua I. (2009). Conventional Diagnosis of Avian

Influenza. *In:* Avian Influenza and Newcastle Disease, Capua I. & Alexander D.J., eds, Springer, Milano. https://doi.org/10.1007/978-88-470-0826-7_7.

In Section B.1.4 'Assessment of pathogenicity' after "At each" replace "observation, each bird is" with "24-hour interval post-inoculation, birds are observed and"

3.4.9. 'Enzootic bovine leukosis'

3.4.13. 'Theileriosis in cattle (infection with *Theileria annulata, T. orientalis* and *T. parva*)'

3.4.14. 'Trichomonosis'

3.6.1. 'African horse sickness (infection with African horse sickness virus)'

3.6.5. 'Equine infectious anaemia (infection with equine infectious anaemia virus)'

3.8.2. 'Caprine arthritis/encephalitis & maedi-visna (infection with small ruminant lentiviruses)'

3.8.5. 'Enzootic abortion of ewes (ovine chlamydiosis) (infection with *Chlamydia abortus*)'

3.9.2. 'Classical swine fever (infection with classical swine fever virus)'

3.9.7. 'Swine vesicular disease (infection with swine vesicular disease virus)'

3.9.1. 'African swine fever (infection with African swine fever virus)' (vaccine section only)

With the amendments approved by the Assembly:

In Section A. 'Introduction' to add "(Kitamura *et al.,* 2025)" at the end of the sentence: "In addition, there is a risk that vaccine strains might be transmitted to non-vaccinates and/or revert to virulence and/or recombine with circulating strains"

KITAMURA T., MASUJIN K., IKEZAWA M., AMBAGALA A. & KOKUHO T. (2025). Generation of Chimeric African Swine Fever Viruses Through *In Vitro* and *In Vivo* Intergenotypic Gene Complementation. *Vaccines*, **13**(5), 462. doi: 10.3390/vaccines13050462.

In Section C.1 'Background', first point on the characteristics of an optimal ASF modified live virus (MLV) first generation vaccine for the target host add "have no detected impact on the reproductive safety of pregnant sows" and "genetic stability" and delete "genetic and" from the text in the brackets at the end of the point

In Section C.1. 'Background', add a new paragraph after "(Diep *et al.,* 2024).": "There is evidence that first generation MLV vaccines may revert to virulence and negatively affect the reproductive performance of pregnant sows (Nguyen *et al.,* 2025; Van den Born *et al.,* 2025). Additionally, as first generation MLV vaccines are unlikely to cause sterile immunity, immunised pigs are likely to shed the vaccine viruses, which may result in horizontal transmission of the vaccine viruses. This could affect reproductive performance of pregnant sows and may also increase the risk or recombination of the vaccine virus with circulating strains." And add the following references to the list:

NGUYEN T.C., BUI N.T.T., NGUYEN L.T., NGO T.N.T., VAN NGUYEN C., NGUYEN L.M., NOUHIN J., KARLSSON E., PADUNGTOD P., PAMORNCHAINAVAKUL N., KESDANGSAKONWUT S., THANAWONGNUWECH R. & DO D.T. (2025). An African swine fever vaccine-like variant with multiple gene deletions caused reproductive failure in a Vietnamese breeding herd. *Sci. Rep.*, **15**, 14919. https://doi.org/10.1038/s41598-025-95641-3.

VAN DEN BORN E., OLASZ F., MÉSZÁROS I., GÖLTL E., OLÁH B., JOSHI J., VAN KILSDONK E., SEGERS R. & ZÁDORI Z. (2025). African swine fever virus vaccine strain Asfv-G-ΔI177l reverts to virulence and negatively affects reproductive performance. *npj Vaccines*, **10**, 46. https://doi.org/10.1038/s41541-025-01099-9.

In Section C.1. ‘Background’, third last paragraph, add “as suggested by a recent publication (Kitamura *et al.,* 2025)” after “strains”

In Section C.2.3.2. ‘Safety requirements’, iii) ‘Horizontal transmission’, add “through a risk–benefit balance assessment” after “regulators may determine vaccine safety”, delete “No or” before “A low percentage” and add “or ideally no” before “naïve contact pigs”

In Section C.2.3.2. ‘Safety requirements’, iv) Reversion to virulence, delete “No or” before “A low percentage” and add “or ideally no” before “naïve contact pigs”

In Section C.2.3.3. ‘Efficacy requirements’, i) ‘Protective dose’ add to the first point on vaccine compliancy: “It might also be acceptable that a low percentage of vaccinated challenged piglets die or reach the humane endpoint from causes attributable to ASF, depending on the purpose of vaccination, for instance, in cases where the aim is to control the disease rather than eradicate it;”

2. To remove the following chapter from the *Terrestrial Manual:*

   2.3.2. ‘The role of official bodies in the international regulation of veterinary biologicals’

3. To request the Director General to publish the adopted texts in a revised edition in the on-line version of the *Terrestrial Manual*.

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(Adopted by the World Assembly of Delegates on 29 May 2025
in view of an entry into force on 30 May 2025)