Report of the WOAH Scientific Commission for Animal Diseases

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Paris

World Organisation for Animal Health

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A meeting of the WOAH Scientific Commission for Animal Diseases (the Commission) was held from 9 to 13 September 2024.

1. Welcome

Dr Montserrat Arroyo, WOAH DDG ISS met with the Commission on 9 September 2024 and thanked new and re-elected members for their ongoing contributions to the work of the Commission, acknowledging their busy agenda. Dr Arroyo extended these thanks to the members' employing institutions and national governments.

2. Meeting with the Director General

On 9 September, Dr Emmanuelle Soubeyran, the newly elected WOAH Director General, and Dr Montserrat Arroyo, met with the members of the Biological Standards Commission, the Scientific Commission for Animal Diseases, and Terrestrial Animal Health Standards Commission to offer a formal welcome for the new term of Specialist Commissions, following the elections at the 91st General Session in May 2024.

Dr Soubeyran congratulated the members on their election and extended her appreciation to the members' employing institutions and national governments for their support. Dr Soubeyran outlined her vision for innovation, strategic development, and increased visibility for WOAH, emphasising collaboration, digitalisation, and global program enhancements. Dr Soubeyran informed Commission members that WOAH will continue with the ongoing process to revise the Basic Texts of the Organisation, with a focus to review its governance, to ensure WOAH's credibility among Members and stakeholders.

Dr Soubeyran highlighted the critical role played by the Specialist Commissions, as leaders of the Organisations technical governance and stressed the importance of Commission expertise for WOAH's reputation and recognition. She also emphasised the importance of collaboration among Specialist Commissions. Dr Soubeyran reiterated her commitment to promote inclusivity and transparency and noted that it was of utmost importance not only to promote the active engagement of all Members in the process for the elaboration of standards, but also to ensure that WOAH standards address the needs of all Members and that they are implementable worldwide.

Dr Soubeyran stressed WOAH's activities to improve transparency through the publication of Members comments. Further, she reminded the Commission about the digitisation of the WOAH standards in the form of the WOAH Standards Online Navigation Tool to provide users with streamlined access and navigation. Inclusion and member involvement were also highlighted as essential elements of WOAH's governance. Dr Soubeyran shared plans to increase Member participation in the standard-setting processes and shared that upcoming Regional Commission Conferences will include dedicated sessions for Members to share priorities for standard setting work items. In closing, Dr Soubeyran reaffirmed WOAH's commitment to transparency, credibility and inclusivity in all its operations.

Dr Arroyo highlighted the significance of a new term, noting the addition of new members, geographic balance, and improved workload management. She also stressed the importance of inclusivity, transparency, and continuity in each of the Commissions' work. In closing, Dr Arroyo highlighted the main points of the Specialist Commissions Performance Management Framework and emphasised its value to ensure the continuous improvement of the Commission's work.

3. Commission members expressed appreciation for these updates and wished Dr Soubeyran success in her term as Director General. Adoption of the agenda

The draft agenda was adopted by the Commission. The meeting was chaired by Dr Cristóbal Zepeda and the WOAH Secretariat acted as rapporteur. The agenda and list of participants are attached as Annexes 1 and 2, respectively. Dr Zepeda welcomed the new members of the Commission to their first Commission meeting.

4. *Terrestrial Animal Health Code*

4.1. Member comments received for Commission consideration

In February 2018, the Commission confirmed the need to harmonise and update the requirements for recognition and maintenance of status. In February 2019, the Commission and Code Commission acknowledged the proposed work programme for the harmonisation of the provisions for the official recognition of disease-free status and their maintenance for AHS, CSF, CBPP, FMD and PPR, and for the endorsement of official control programmes for CBPP, FMD and PPR.

Out of the six diseases that are included in the WOAH procedure for official status recognition (AHS, BSE, CSF, CBPP, FMD and PPR), the harmonisation work has been completed and the revised *Terrestrial Code* chapters have been adopted for CSF and PPR in May 2021, BSE[1] in May 2023 and FMD in May 2024.

The harmonisation work for the remaining Chapters 11.5. (CBPP), and 12.1. (AHS) has been already undertaken, and the revised chapters were last circulated to Members in the Code Commission September 2023 meeting report.

The Commission reviewed the latest versions of the draft revised Chapters 11.5. and 12.1. and agreed on the requirements for recognition and maintenance of status under Articles 11.5.3. and 12.1.2. and related surveillance provisions. In addition, the Commission also noted other points in relation to these two chapters as in the respective sections below.

4.1.1. Chapter 11.5. Infection with *Mycoplasma mycoides* subsp. *mycoides* SC (Contagious bovine pleuropneumonia)

The Commission considered the available scientific evidence[2,3,4,5,6] on the role of small ruminants in the epidemiology of CBPP and concluded that for the moment there is not enough evidence to support the inclusion of small **ruminants** in the case definition. While goats and sheep may occasionally become infected with *M. mycoides subsp. mycoides*[7], there is lack of sufficient evidence that these species can sustain the infection or serve as permanent reservoirs for the pathogen, hence they are not considered to play a significant epidemiological role[8,9,10]. Additionally, eradication of the disease has been achieved without considering the important small ruminant population in some countries[11]. Further molecular studies and pathogenicity and transmission experiments would be needed to provide evidence on the role of small ruminants in the transmission and spread of CBPP pathogen.

4.1.2. Chapter 12.1. Infection with African horse sickness virus

In relation to the inclusion of 'sterile filtered horse serum' in the list of safe commodities, the Commission was of the opinion that the methods of sterilisation and filtration (e.g. variation in pore size) need to be specified as they are not standardised processes; thus, cannot be defined as a safe commodity.

4.1.3. Chapter 12.3. Infection with Trypanosoma equiperdum (dourine)

At the September 2023 meeting, the Commission reviewed the *ad hoc* Group report and the draft Chapter 12.3. Infection with *Trypanosoma equiperdum* (dourine) and forwarded it to the Code Commission. In February 2024, the Code Commission reviewed and circulated the draft text to Members for comments.

The Commission was requested to further justify the inclusion of equids other than horses (*Equus caballus*), donkeys (*Equus asinus*) and their crosses in the case definition. The Commission consulted subject-matter experts and noted that despite the scientific literature citing dourine as a disease that affects equids, there are no reports of dourine in wild equids such as zebras (*Equus quagga*, *Equus zebra* or *Equus grevyi*). The

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1 Whilst BSE was not included in this harmonisation work due to its disease specificities, the overall aim of ensuring that the requirements – to declare a country or a zone free from 'infection with pathogenic agent X' or as having a controlled or negligible BSE risk status – to be clearly captured in the disease-specific chapter itself was maintained during the revision of both Chapters 11.4. and 1.8., which had been adopted in May 2023.

2 Di Teodoro G, Marruchella G, Di Provvido A, et al. Contagious Bovine Pleuropneumonia: A Comprehensive Overview. Veterinary Pathology. 2020;57(4):476-489. doi:10.1177/0300985820921818

3 Jores, J., Baldwin, C., Blanchard, A. *et al.* Contagious Bovine and Caprine Pleuropneumonia: a research community's recommendations for the development of better vaccines. *npj Vaccines*, 2020 **5** (66). https://doi.org/10.1038/s41541-020-00214-2

4 Egwu G. O.1 , Adamu M.2 *, Mshelia G. D.3 and Bukar-Kolo Y. M. Isolates of Mycoplasma mycoides subspecies mycoides (SC) in small ruminants in Sahel zone of Nigeria and its implications on disease control. African Journal of Biotechnology. 2012 ; 11(23) : 6396-6401

5 Akwuobu, C.A., Ayling, R.D., Chah, K.F. *et al.* Studies into the prevalence of *Mycoplasma* species in small ruminants in Benue State, North-central Nigeria. *Trop Anim Health Prod* **46**, 1087–1092 (2014). https://doi.org/10.1007/s11250-014-0613-6

6 Gap analysis (Discontools project), accessed on 16/09/2024.

7 Brandao, E., 1995: Isolation and identification of Mycoplasma mycoides subspecies mycoides SC strains in sheep and goats. Vet Rec, 136, 98-99.

8 Thomson, G. R., 2005: Bovine pleuropneumonia and poverty: A strategy for addressing the effects of the disease in sub-Sahan Africa. Research report, DFID Animal Health Programme. Centre for Tropical Medicine, University of Edinburgh., Edinburgh.

9 Brandao, E., 1995: Isolation and identification of Mycoplasma mycoides subspecies mycoides SC strains in sheep and goats. Vet Rec, 136, 98-99.

10 Kusiluka, L. J. M., Semuguruka, W.D., Kazwala, R.R., Ojenyiyi, B. and Friis, N.F., 2000: Demonstration of Mycoplasma capricolum subsp. capripneumoniae and Mycoplasma mycoides subsp. mycoides small colony type in outbreaks of caprine pneumonia in eastern Tanzania. Acta Vet SCand, 41, 311-319.

11 Gap analysis (Discontools project), accessed on 16/09/2024. (can be removed and replaced by ref 6 in the text)

Commission recommended referring to dourine as a disease of horses (*Equus caballus*), donkeys (*Equus asinus*) and their crosses (whether domestic or wild).

The opinion of the Commission was forwarded to the Code Commission.

4.2. Other considerations

4.2.1. Chapter 1.6. Procedures for official recognition of animal health status, endorsement of an official control programme, and publication of a self-declaration of animal health status, by WOAH

At the meeting of the Bureaus of the Code Commission and the Scientific Commission in September 2019, both Commissions agreed on a plan and timeframe for the removal of the questionnaires for official recognition of animal health status and endorsement of official control programmes (Chapters 1.7. to 1.12.) from the *Terrestrial Code* and to maintain them on the WOAH website.

The Commissions highlighted the following points in support of the removal of the questionnaires from the *Terrestrial Code*:

- the requirements that form the basis of the questionnaires – to declare a country or a zone free from infection, or as having a controlled or negligible BSE risk status – are clearly captured in the respective new disease-specific chapters;

- the mandatory use of questionnaires when applying for official recognition of animal health status or for endorsement of official control programmes are clearly referenced in Chapter 1.6.; and

- any changes to the questionnaires will be proposed to and endorsed by the Commission and will be reported to Members through the meeting reports of the Commission.

The detailed rationale for this proposal is attached as Annex 3. The Commission would welcome Members' consideration and any comments to be sent to the WOAH Status Department (disease.status@woah.org) prior to the adoption of draft Chapter 1.6.

4.2.2. New World screwworm (*Cochliomyia hominivorax*) and Old World screwworm (*Chrysomya bezziana*)

At its September 2023 meeting, the Commission reviewed the case definitions provided by the expert group and recommended to include birds in the case definitions of infection with *Cochliomyia hominivorax* and *Chrysomya bezziana*.

The Code Commission reviewed the Commission's opinion and requested further clarification on the role of birds in the epidemiology of both diseases and whether they should be featured in two separate disease-specific chapters of the *Terrestrial Code* or should remain combined as current *Terrestrial Code* chapter 8.1.3.

The Commission reiterated its previous opinion and stressed that birds, like mammals, host stages of the life cycle of screwworms and contribute to the amplification and spread of the infestation. The Commission made reference to the current outbreak of New World screwworm in Central America where Members are reporting cases in birds[12]. In addition, they noted the importance of including birds in the early detection surveillance systems.

The Commission was of the opinion that both diseases should remain combined in one single chapter.

The opinion of the Commission was forwarded to the Code Commission.

4.2.3. Epizootic haemorrhagic disease virus

The Commission was informed that at its February 2024 meeting, the Code Commission had noted an evolution in the epidemiology of epizootic haemorrhagic disease (EHD), including emergence and spread in Europe, and included a comprehensive review of Chapter 8.7. Infection with epizootic haemorrhagic disease virus in its work programme. The Commission was also informed of the case study of the spread of EHD based on a technical item that was presented at the 91st General Session.

[12] Regional epidemiological bulletin of screw worms published by Organismo internacional regional de sanidad agropecuaria (OIRSA), #34/2024, week 18 – 24 August 2024

Considering the information provided, the Commission noted that the provisions in Chapter 8.7. are still relevant, but the description of the geographical spread in *Terrestrial Manual* Chapter 3.1.7. Epizootic haemorrhagic disease would need to be updated.

The opinion of the Commission was forwarded to the Code Commission and Biological Standard Commission.

5. *Ad hoc* and Working Groups

5.1. Meeting reports for consideration

5.1.1. *Ad hoc* Group on equine encephalitides

The Commission was informed that the first meeting of the *ad hoc* Group on the revision of chapters on Equine Encephalitides of the *Terrestrial Code* was held in-person in June 2024. The Commission reviewed the report of the meeting and the proposed draft chapter.

The Commission acknowledged the value of having a dedicated chapter on eastern equine encephalomyelitis and western equine encephalomyelitis to have clear guidelines on the notification of these diseases and avoid unjustified trade barriers. In addition, the Commission highlighted the importance of prompt mitigation of the animal and public health risks posed by these diseases in the affected and neighbouring areas.

The Commission noted that the rationale of the Group for including an article on 'Recommendations for importation of horses' was to avoid potential disruption of trade flows and welfare issues. Considering that live horses are safe commodities, the Commission suggested the deletion of such article, as welfare recommendations are included in Section 7 of the *Terrestrial Code*.

The Commission noted that, as a next step, two *ad hoc* Groups would convene, one on the revision of Chapter 8.10 on Japanese encephalitis in November 2024 and one on the revision of Chapter 12.11. on Venezuelan equine encephalomyelitis tentatively in April 2025. The Commission agreed with the proposed composition of these Groups.

The opinion of the Commission was forwarded to the Code Commission.

5.1.2. *Ad hoc* Group on biosecurity

The Commission received an update of the meeting of the *ad hoc* Group on biosecurity for terrestrial animals which met for the third time in March 2024. The Group had proposed amendments to new draft Chapter 4.X. and glossary definitions in response to Member comments and the recommendations of the Code Commission. The Group had also provided its initial views on areas to consider in a future revision of Chapter 4.14. 'General recommendations on disinfection and disinsection, as requested by the Code Commission.

The Commission acknowledged and supported the recommendations of the Group. The opinion of the Commission was forwarded to the Code Commission.

5.1.3. *Ad hoc* Group on scrapie

The Commission was informed that the first *ad hoc* Group meeting on scrapie was convened in-person in April 2024 to undertake a comprehensive review of *Terrestrial Code* Chapter 14.8. Scrapie, including to review the criteria and concept of freedom for scrapie and to provide recommendations on genetic susceptibility, surveillance and the safe trade of at-risk commodities raised by Members. The Commission was also informed that the recommendations of the Group on genetic resistance and the need to have further guidance on ante-mortem surveillance and testing were presented to the Biological Standards Commission at its September 2024 meeting.

Both Commissions noted the recommendations of the Group on genotypic resistance and requested the Secretariat to seek further clarification from subject-matter experts on the methods for genotyping and whether there is consensus in the scientific community on the resistant genotypes. The Commission also considered that the draft recommendations on surveillance would have to be adapted to the distribution of genotypes in the population and fitness of purpose and use of existing test methods for scrapie that could support surveillance programmes. The Commission will review the expert opinion at the February 2025 meeting.

The opinion of the Commission was forwarded to the Code Commission.

5.2. Planned *ad hoc* Groups and confirmation of proposed agendas

With regard to the *ad hoc* Groups on the evaluation of animal health status and official control programmes for WOAH endorsement, the Commission was briefed on the proposed agendas including information on the applications submitted to the WOAH so far.

5.2.1. *Ad hoc* Group on the evaluation of BSE risk status: 1–4 October 2024

5.2.2. *Ad hoc* Group on the evaluation of official control programmes for dog-mediated rabies: 8 & 10 October 2024

5.2.3. *Ad hoc* Group on the evaluation of AHS status: 9 & 11 October 2024

5.2.4. *Ad hoc* Group on the evaluation of CBPP status: 29–31 October 2024 (cancelled)

5.2.5. *Ad hoc* Group on the evaluation of FMD status: 4–7 November 2024

5.2.6. *Ad hoc* Group on the evaluation of PPR status: 12–14 November 2024 (tbc)

5.2.7. *Ad hoc Group on the evaluation of CSF status: 19 &21 November 2024*

5.2.8. *Ad hoc Group on sheep pox and goat pox: 26-28 November*

At its February 2024 meeting, the Commission noted the incursion of sheep and goat pox into new areas, the apparent under-reporting and purported difficulties in diagnosis owing to recombination between lumpy skin disease virus and sheep and goat pox virus. The Commission had recommended revision of the Chapter 14.9. Infection with sheep pox and goat pox to include up-to-date recommendations on disease prevention, control, surveillance and case definition which would benefit Members in controlling the disease.

At this meeting, the Commission reviewed and agreed with the Terms of Reference of the *ad hoc* Group proposed by the Secretariat and noted the plans to convene a meeting of the Group from 26 to 28 November 2024. The report of the meeting and the draft revised chapter will be presented to the Commission at its February 2025 meeting.

5.2.9. *Ad hoc Group on Terrestrial Code standards on zoning*

The Commission was presented a draft Terms of Reference for an *ad hoc* Group on zoning that was proposed to be convened to revise Chapter 4.4. 'Zoning and compartmentalisation' and develop new Chapter 4.Y. 'Application of zoning'. The Commission discussed concerns from Members that had arisen in the course of status recognition work, including the implementation of containment zones (such as limitations on number), ability to ship animals from a containment zone to a free zone for slaughter and implementation of protection zones. The Commission in-principle supported the proposed Terms of Reference for the Group and discussed the need for the Group to collectively possess technical expertise across different diseases covering different transmission mechanisms, such as vector borne diseases, to ensure that the horizontal updates to the zoning chapter would be relevant for the implementation of zoning for specific diseases.

In coordination with the Code Commission, prior to convening a meeting of the *ad hoc* Group, the Commission agreed to convene a taskforce comprising members of both Commissions to conduct a deep dive into the practical issues faced with zoning and how the standards should address these. In addition, the Commission also noted that the taskforce could provide guidance to the organisation of the Zoning Forum (see Item 10.8.).

5.3. Meeting reports for information

5.3.1. WOAH Working Group on Wildlife

The Commission received an update from the meeting of the Working Group on Wildlife (WGW) completed that was organised in April 2024. The Commission was informed about the various activities of the WGW, including the ongoing wildlife health program (Wildlife Health - WOAH - World Organisation for Animal Health), publishing of new guidelines in particular the Guidelines for addressing disease risks in wildlife trade and the WGW's activities of providing support on wildlife health topic to the of Code Commission.

The Commission expressed its appreciation for the WGW's efforts and recommended continued coordination with global disease-specific strategies and networks, such as OFFLU, African swine fever, Peste des Petits Ruminants etc. The Commission welcomed the WGW's plans to consider simulation exercises for managing wildlife emergencies in collaboration with wildlife focal points. It further recommended incorporating public

health, animal health, and wildlife sectors to enhance coordination and data sharing in the simulation exercises. Additionally, the Commission suggested WGW to consider inclusion of animals of high conservation value in the preparedness plans for these simulation exercises due to various challenges encountered for reaching such animals such as sample collection, testing etc.

5.3.2. *Ad hoc* Group on Alternative Strategies for the Control and Elimination of *Mycobacterium tuberculosis* complex Infection (MTBC) in Livestock

At its September 2023 and February 2024 meeting, the Commission was updated on the WOAH consultancy project and the WOAH *ad hoc* Group discussion on developing guidelines for control strategies to assist endemic Members in reducing the burden of TB in livestock through strategies other than test and slaughter. The *ad hoc* Group noted the need to provide guidance to Members on monitoring reduction of within-herd prevalence which could assist them in monitoring the progression of control strategies.

At this meeting, the Commission reviewed *Terrestrial Code* Chapter 8.12. and noted that recommendations on surveillance were in the context of freedom demonstration. While the Commission agreed with the importance of providing Members with some guidance on measuring the success of their control measures, it also considered that such guidance would need to be tailored to different epidemiological scenarios, and the level of detail required might not be appropriate to be included in Chapter 8.12. Therefore, the Commission instead proposed some additional clarification text in the guidelines.

6. Official animal health status

6.1. Annual reconfirmations for maintenance of status

6.1.1. Selection of status items for comprehensive review of 2024 annual reconfirmations

The Commission selected the list of Members' 2024 annual reconfirmations to be comprehensively reviewed during its forthcoming meeting in February 2025. The selection was based on a set of criteria described in the Annual Reconfirmation SOPs. The Commission will comprehensively review a total of 48 annual reconfirmations during its February 2025 meeting. The Members selected for comprehensive review of their annual reconfirmations will be notified officially by letter from WOAH in October 2024.

6.2. Specific update on official animal health status

6.2.1. Update on situation of countries/zone with suspended status

6.2.1.1. Reinstatement of a suspended status

The Commission noted the following reinstatements of official status since its last February 2024 meeting:

GUYANA – FMD-free country where vaccination is not practised

Guyana has been officially recognised as free from FMD since May 2001 but following the failure to submit the annual reconfirmation and the adequate documented evidence by the end of January 2024, the "FMD-free country where vaccination is not practised" status of Guyana, as recognised by the WOAH World Assembly of Delegates in terms of Resolution No. 11 in May 2023, was suspended on 20 February 2024.

In March 2024, the Commission reviewed the updated report for the reinstatement of its official status submitted by the Delegate of Guyana and concluded to reinstate the "FMD-free country where vaccination is not practised" status of Guyana with effect from 22 March 2024.

BOTSWANA (Zone 6b) – FMD-free zone where vaccination is not practised

Following an immediate notification received from the Delegate of Botswana on an outbreak of FMD in Butale crush, Masungu, the "FMD-free zone where vaccination is not practised" status of Zone 6b of Botswana consisting of part of Francistown as recognised by the World Assembly of Delegates in terms of Resolution No. 11 in May 2022 was suspended with effect from 18 August 2022.

A containment zone was established within Zone 6b in Bisoli North, as described in the documentation submitted by the Delegate to WOAH on 28 November 2022 and 10 February 2023, and the "FMD-free zone where vaccination is not practised" status was re-instated in Zone 6b with effect from 03 March 2023, with the exception of the containment zone.

The Delegate of Botswana submitted an application for the reinstatement of the FMD-free status of the containment zone. Having considered this application, the Commission approved the reinstatement of the FMD-free status of the containment zone within Zone 6b with effect from 10 April 2024.

KAZAKHSTAN – CSF free country status

The "CSF free status" of Kazakhstan as recognised by the World Assembly of Delegates in terms of Resolution No. 18 in May 2022, was suspended with effect from 14 June 2022, due to lack of adequate documented evidence that was followed up in the 2021 annual reconfirmation dossier. In June 2024, the Delegate of Kazakhstan submitted an application for the reinstatement of the CSF-free status of the country. Having considered this application, the Commission approved the reinstatement of the CSF-free status of Kazakhstan with effect from 13 September 2024.

6.2.1.2. Suspension of an official status

The Commission noted the following suspension of official status since its last February 2024 meeting:

GREECE – PPR-free country status

Following an immediate notification received from the Delegate of Greece on an outbreak of PPR in Kastraki, Kalambaka, Thessaly, the "PPR-free country" status was suspended with effect from 8 July 2024.

ROMANIA – PPR-free country status

Following an immediate notification received from the Delegate of Romania on an outbreak of PPR in Baia, Ceamurlia De Jos, Tulcea, the "PPR-free country" status was suspended with effect from 15 July 2024.

6.2.2. Updates on official BSE risk status

6.2.2.1. Risk assessments for maintenance of official status

The Commission noted that China and India had submitted updated risk assessments following the provisions of the new BSE standards. These risk assessments have been forwarded to the *ad hoc* Group on BSE risk status evaluation of Members for evaluation at its upcoming meeting, and prior to further consideration by the Commission in February 2025.

6.2.2.2. United Kingdom (Zone of Scotland) – Controlled BSE risk status

A case of classical BSE was confirmed in Scotland on 9 May 2024. An immediate notification report was submitted by the UK through the World Animal Health Information System (WAHIS) on 10 May 2024. As per Article 11.4.8. of the *Terrestrial Code* and the Standard Operating Procedures on suspension, recovery or withdrawal of officially recognised animal health status, the UK submitted to WOAH an epidemiological report within 90 days of the confirmation date.

The Commission commended the UK for the thorough epidemiological report and concluded that the risk of recycling of the BSE agent had remained negligible. Thus, the Commission agreed to maintain the official controlled BSE risk status of the Zone of Scotland.

6.3. State of play and prioritisation of expert mission to Members requested by the Commission

6.3.1. Follow-up of field missions

The Commission considered and endorsed the detailed report of a mission conducted in April 2024 to assess compliance by a Member with the relevant provisions of the WOAH *Terrestrial Code* for official recognition of its AHS-free status. The Commission commended the mission team for the thorough assessment undertaken in the limited time of the mission. Whilst the Commission decided not to recommend the official recognition of the AHS-free status of the Member, the Commission appreciated the actions taken, and the continuous efforts being made by the Member in response to the recommendations of the WOAH mission team.

6.3.2. State of play and prioritisation

The Commission reviewed and prioritised the missions for the maintenance of disease status and the endorsement of official control programmes to be undertaken, considering the priority issues identified by the Commission when reviewing the annual reconfirmations submitted in November 2023 as well as recent changes in the epidemiological situation in certain regions. The prioritised list of missions will be confirmed following consultation with the Director General of WOAH.

6.4. Standards and procedures related to official status recognition

6.4.1. Streamlining the procedure for annual reconfirmations for maintenance of official status

In response to a comment raised by Members that the procedure for annual reconfirmations for the maintenance of official animal health status has created an administrative burden, the Commission and WOAH committed to streamlining the process while still respecting the relevant requirements of the *Terrestrial Code* and without compromising the credibility of the WOAH procedure.

To launch this work, the Commission endorsed the following three-step plan to be implemented during the 2024 annual reconfirmation campaign and the 2024/2025 evaluation cycle of animal health status:

i) Standardisation of the process: A guidance document will be developed in the format of an annual reconfirmation form presented as an algorithm/deduction tree. The goal is to provide Members with a sequence of sub-questions and description of documented evidence needed based on the answer chosen.

ii) Seeking disease expert opinion: The opinion of each of the seven *ad hoc* Groups on status evaluation will be sought on the minimum supportive information they would expect Members to provide for each disease when reconfirming their animal health status annually, demonstrating compliance with the relevant requirements of the *Terrestrial Code* for maintenance of official status.

iii) Data collection from Members annual reconfirmations: WOAH will compile and categorise data on the information submitted by Members during the 2024 annual reconfirmation campaign, which starts on 1st November 2024. The data will be used to provide an overview on the different ways of presentation of information for the Commission to agree and propose an acceptable/preferrable way of reporting as well as to identify problem areas to propose a more targeted approach for the 2025 annual reconfirmation campaign.

6.4.2. Development of the Official Status Management Platform

The Commission received an update on the development of the online platform dedicated to disease status management, which commenced in 2023 in line with the strategic objectives of the WOAH 7th Strategic Plan for optimising data governance through digital transformation. The Commission was reminded that this platform is aimed to serve as a secure centralised system to archive, track, search, and submit all relevant dossiers related to the official recognition and maintenance of animal health status, and self-declarations of disease freedom.

The Commission took note that the first component of the platform dedicated to annual reconfirmations for maintenance of status was launched for the 2023 annual reconfirmation campaign. The Commission was further informed that WOAH was now working on improvements of the annual reconfirmation component, on the development of the new BSE annual reconfirmation form to accommodate the recently adopted changes to the BSE standards in May 2023. The development of the second component of the platform dedicated to 'Applications' is also ongoing.

7. Global control and eradication strategies

7.1. African swine fever. Global Control Initiative

The Commission was updated on the activities conducted under the Global Initiative (GI) for the Control of African swine fever (ASF), noting that the GI is managed by the FAO and WOAH under the GF-TADs. The responsibility for chairing the GF-TADs ASF Working Group alternates annually between FAO and WOAH, with WOAH holding this position for the upcoming year (July 2024 to June 2025). The Commission was informed that a crucial activity for the upcoming year is for WOAH, FAO and partners to review the progress of the current Global Initiative that spanned from 2020 to 2025 and to develop the approach to designing the next strategy.

A key activity was the second meeting of the Global Coordination Committee for ASF organised at the margins of the 91st General Session in May 2024, aimed at strengthening inter-regional cooperation and dialogue on ASF prevention

and control, sharing of good practices and lessons learnt and provide advice to the ASF Working Group to guide its activities. Prior to the meeting, future ASF scenarios were projected for 2030 to support countries in identifying their plausible outlook for ASF in the near-term, so as to identify realistic and actionable areas that they, international organisations and partners can take now to improve the situation. Potential priorities as raised collectively across the region include: development of the quality requirements for ASF vaccines that are acceptable to all regions, control of ASF in wild pigs, communication and awareness raising and contingency planning.

In the four regions of Americas, Africa, Asia-Pacific and Europe, Standing Group of Experts (SGE) were in place to bring together experts and policymakers within each region to strengthen regional cooperation and efforts against ASF. Since the start of the year to date, SGE meetings have been organised for the Europe and Asia-Pacific regions. In April 2024, the 22nd meeting of the SGE-ASF for Europe was organised in Germany, and focused on the control of ASF in wild boars. In June 2024, the 9th meeting of the SGE-ASF for Asia took place in the Philippines, and the theme was on risk communication and community engagement. The 23rd meeting of the SGE-ASF for Europe will take place in North Macedonia on 18-19 September 2024 with a focus on cross border cooperation. There are plans to conduct a virtual SGE-ASF meeting for the Africa region at the end of the year and for the Americas region.

The Commission was also informed that standards on ASF vaccines for the *Terrestrial Manual* had been circulated twice in the report of the Biological Standards Commission, but were withdrawn from adoption at the General Session in May 2024 due to significant Member comments, notably concerning safety in non-target groups due to horizontal transmission and risk of recombination with field strains. The Biological Standards Commission reviewed Member comments at its September 2024 meeting together with comments received from the experts from the ASF Reference Laboratory Network.

Separately, the Commission was informed that WOAH has launched two consultancy projects for ASF. The first project is to elaborate guidelines on vaccine evaluation and post-vaccination monitoring, aimed at providing Members with guidance and tools on undertaking their own independent quality evaluations and post-vaccination monitoring to detect any evolution of circulating strains or generation of recombination strains to inform surveillance, vaccination strategy and other risk mitigation measures. The second project is to provide recommendations to its Members on effectively managing risks at the domestic-wild animal interface according to international standards for disease control purposes while preserving animal health status of domestic subpopulations for business continuity, and this will feature case studies on specific transboundary animal diseases including ASF.

7.2. Peste des Petits Ruminants. Global Control and Eradication Strategy

The Commission was updated on the recent activities to support the PPR Global Eradication Programme (GEP) as it progresses into the 2nd and 3rd phases of PPR eradication, following the publication of the PPR Blueprint in late 2022:

- The PPR Global Research and Expert Network (PPR GREN) held its sixth meeting in Bengaluru, India, addressing important research innovations for the implementation of the PPR Blueprint in the next phases of PPR eradication. Key topics included the PPR episystem approach, One Health integration, PPR diagnostics and support from WOAH PPR Reference Laboratories, gender and community participation in livestock vaccination and vaccine quality control of thermolabile, thermotolerant, and DIVA vaccines;

- To support the PPR episystem approach, a guideline was developed in January 2024, followed by a regional workshop in Cameroon organised by FAO to help countries identify and coordinate episystem activities. WOAH is leading the planning and organisation of similar workshops planned for 2025;

- A cross-border harmonisation workshop was held in Côte d'Ivoire, bringing together countries in the Mano River basin to engage in action-oriented discussions on managing risks and advancing PPR eradication effort;

- A Blueprint sensitisation workshop was organised in Nigeria, focusing on informing participants about the key activities of the Blueprint and identifying priority steps and approaches to enhance PPR disease control coordination, knowledge exchange, and resource mobilisation at the Economic Community of West African States (ECOWAS) sub-regional level;

- A regional workshop in China supported information sharing and capacity building in the Asia-Pacific region;

- The PPR Advisory Committee met in Rome, Italy, to review recommendations from the 6th PPR GREN, assess the current status of the PPR GEP, and provide strategic guidance for 2025-2026. The Committee also discussed resource mobilisation for the GEP Blueprint and validated the PPR GEP mainstreaming guideline;

- Regional Advisory Group meetings were organised for different regions to assess progress along the PPR stepwise approach;

- The WOAH PPR Reference Laboratory Network discussed at its annual workshop the effectiveness of the "ARRIAH" vaccine strain against PPR, proficiency testing for PPR in camels, and the establishment of minimum criteria for developing WOAH-approved reference reagents;

Additionally, a proposal for the Panafrican PPR eradication Programme was developed and submitted to EU DG INTPA in January 2024, with funding expected in the second half of the year. The project, led by AU-IBAR and implemented by AU-IBAR, WOAH, and FAO, will begin with an initial funding phase of 8 million euros.

The Commission was further informed that the revised PPR Monitoring and Assessment Tool (PMAT) had been piloted in workshops in Georgia and Algeria and was currently being edited. Efforts to digitise the tool and develop e-learning modules are also close to completion. As a next step, PMAT will be translated into other WOAH and FAO official languages. In addition, two templates for National Strategic Plans (one for Africa and one for Asia) have been developed and are being adopted by countries to align their strategies with the PPR Blueprint.

The Commission took note of the current state of PPR eradication worldwide (Figure 1). As of the report, 58 countries are officially recognised as free from PPR by WOAH, and one country (Namibia) has an officially recognised PPR-free zone. Two countries, Greece and Romania, had their official statuses suspended in July 2024 following outbreaks of PPR. National PMAT assessments are available from 79 countries, revealing that one country remains below stage 1, 25 are at stage 1, 29 at stage 2, 20 at stage 3, and four countries at stage 4. For comparison, in 2022, PMAT assessments were available from 80 countries, one of which was below stage 1, 25 at stage 1, 37 at stage 2, 13 at stage 3, and four countries at stage 4. During this period, one country (Azerbaijan) progressed from PMAT stage 1 to being officially recognised as free from PPR by WOAH, and 12 countries changed their PMAT stage. Nine of these countries progressed positively by either one or two stages, while three countries dropped from stage 2 to stage 1. Between 2023-2024, 29 countries submitted updated PMAT, with six of these advancing at least one stage along the PPR stepwise approach.

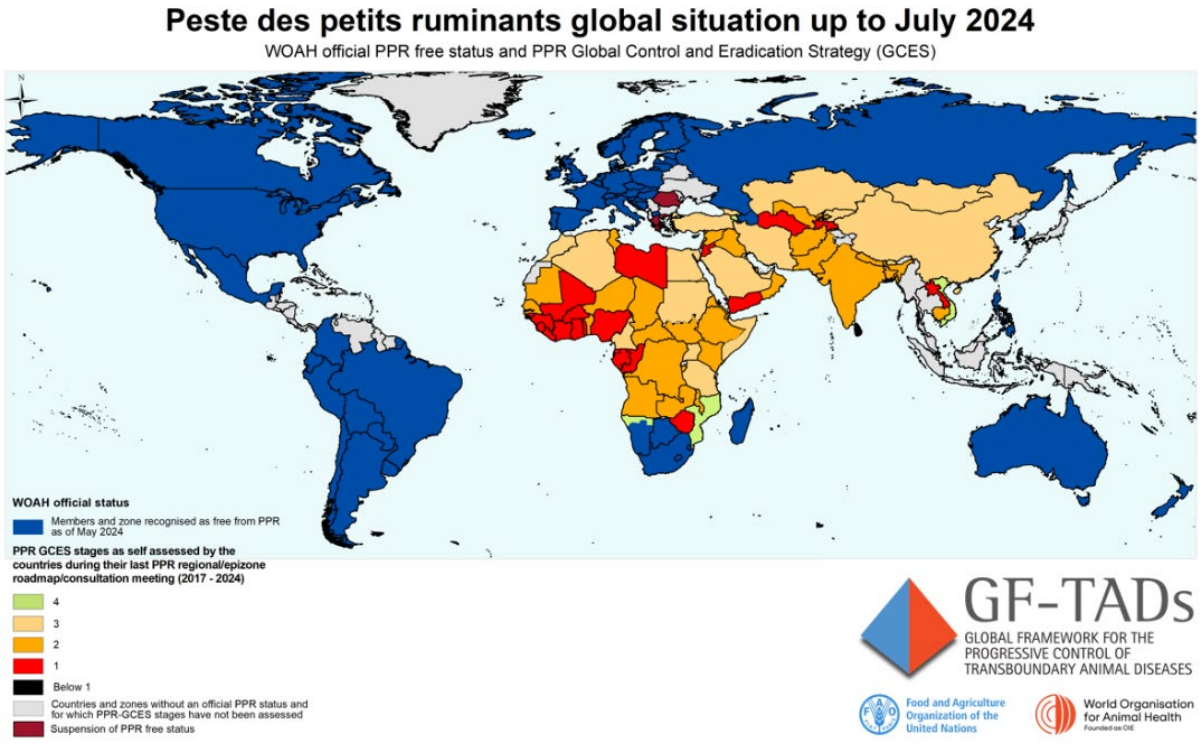

Figure 1. Map of the PPR global situation with respect to the GCES stepwise approach, as reported by countries in their PPR assessments until July 2024

The Commission raised concerns about the limited progress achieved in PPR eradication so far, emphasising that no country has successfully transitioned from a state of endemic infection to fully eradicating the disease and receiving official recognition of PPR-free status by WOAH. The Commission reiterated its concerns about countries implementing vaccination strategies without adequate knowledge of e.g. viral circulation and population distribution. The Commission urged WOAH to continue supporting its Members to address this issue, as this lack of understanding could hinder the effectiveness of vaccination campaigns, particularly when countries fail to perform proper post-vaccination evaluations.

7.3. Avian Influenza. Global Control Strategy. Animal health forum. OFFLU

The Commission was briefed on WOAH and OFFLU's (Joint WOAH-FAO Network of Expertise on Animal Influenza) activities on avian influenza. Following the incursion of HPAI outbreaks in South America and Antarctica, the disease has not only reached new and unusual territories but has also affected new uncommon species. In March 2024, H5N1 clade 2.3.4.4b was detected in dairy cows in the USA.

WOAH published a statement on April 2024 and continues to pay close attention to the situation of HPAI in dairy cows. WOAH recommended to include H5 influenza virus as a differential diagnosis in non-avian species, including cattle and other livestock populations, with high risk of exposure to A(H5) viruses. Members were advised to report promptly HPAI events in all animal species, including unusual hosts to WOAH. The Tripartite FAO/WHO/WOAH published a joint assessment of the recent A(H5N1) virus events in animals and people and assessed the global public health risk to be low while the risk of infection for occupationally exposed persons is low to moderate depending on the risk of mitigation measures in place.

The Commission was briefed on the WOAH implementation framework to address the recommendations adopted in the Resolution No. 28 at the 90th General Session in 2023. As a follow-up of the recommendations, a project to develop guidelines for avian influenza surveillance in small holders (backyard poultry) was initiated and drafting of the concept note is underway for approval. The Biological Standards Commission, with the support of WOAH Reference Laboratories' avian influenza experts continue reviewing and updating Terrestrial Manual Chapter 3.3.4. on avian influenza with the goal of being adopted in May 2025.

The Commission was updated on the activities of the OFFLU network which continued to actively exchange epidemiological and virological data and published scientific statements addressing emerging animal influenza threats. The OFFLU network compiled the virological update of the virus circulating in dairy cows and the diagnostic guidance for sample collection and testing. The network contributed animal influenza data to the February 2024 WHO Vaccine Composition Meeting. The network held its Global Technical Meeting at FAO headquarters in July 2024, where the operational methods and terms of reference of various technical activities (avian, swine, equine, wildlife, epidemiology, human-animal interface, socio-economic) of the network were discussed and updated. The network organised a webinar on the Avian Influenza Matching (AIM) for Poultry Vaccines in July 2024 to share the second technical report of the project. These reports assist decision-makers and FAO and WOAH Members in developing evidence-based guidelines and policies for effective vaccination strategies.

The Commission was informed of the launch of the GF-TADs HPAI Strategy for 2024–2033 in the margin of the at the 91st General Session. A brief version of the strategy was presented to Members and stakeholders. The updated global strategy adopts a systems approach, integrating HPAI with other broader global issues, and aims for long-term improvements in the poultry sector. Emphasising the One Health approach, it advocates for collaboration across public health, wildlife, and environmental sectors to protect and transform poultry value chains. The strategy encourages the use of established and innovative methods to reduce infections and losses and provides a blueprint for countries to formulate effective national plans based on the latest scientific advances and the specific needs of their regions.

8. Liaison with other Commissions and Departments

8.1. Terrestrial Animal Health Standards Commission (Code Commission)

The Commission was updated on relevant ongoing activities of the Code Commission through the Secretariat. At this meeting, the Commission agreed with the Code Commission to convene a taskforce to undertake a deep dive into zoning issues for the revision of Chapter 4.4. 'Zoning and compartmentalisation' and new Chapter 4.Y. 'Implementation of zoning' (see Item 5.2.9.). In addition, in discussion with the Code Commission and with the agreement of DDG ISS, the Commission will undertake an assessment of SARS-CoV-2 and reassessment of paratuberculosis against the listing criteria of Chapter 1.2. of the *Terrestrial Code* intersession and present its conclusion at its upcoming meeting in February 2025 (see Items 9.1.1. and 9.3.1.). The recommendation of the Commission on the evaluation of Nairobi sheep disease against the listing criteria will also be discussed with the Code Commission in February 2025 (see Item 9.2.1.).

8.2. Biological Standards Commission

The Commission considered the Biological Standards Commission's opinion on recommendations from the *ad hoc* Group on scrapie, taskforce on animal hosts, two proposed case definitions and one listing assessment (see Items 5.1.3., 8.3., 9.2.1., 9.3.1. and 9.3.2.).

8.3. Taskforce on animal hosts

At its February 2024 meeting, the Commission was informed of the discussion of the Code Commission at its September 2023 meeting to develop a clear and consistent approach to defining how animal hosts for a listed disease, infection or infestation would be included in the *Terrestrial Code* and the *Terrestrial Manual*, and considered a

proposal from the Secretariat of both Commissions to approach this work through a joint taskforce, given that this dovetailed with the Commission's work on case definitions.

At this meeting, the Commission was presented with the recommendations of the taskforce, which also comprised members from the Biological Standards Commission and Code Commission, that met on four occasions to rationalise the coverage of animal hosts for listed diseases in WOAH Terrestrial Standards. The recommendations had also been forwarded to the Chair of the Working Group on Wildlife for opinion.

The Commission agreed with the recommendations of the taskforce that the selection of animal hosts to be included in a *Terrestrial Code* chapter should be based on the value that any concrete actions taken on that animal species would have for the objective of reducing the risks or impact of the disease on animal or human health. Nonetheless, the Commission emphasised the importance of ensuring that the notification requirements do not impose an additional burden on Members to conduct surveillance and that the approach to including animal hosts for notification should be a balanced one that considers potential trade implications to Members.

The Commission agreed to pilot the proposed recommendations of the taskforce for upcoming case definitions and will provide feedback to the taskforce.

9. Disease control: specific issues

9.1. Emerging diseases

9.1.1. Annual re-assessment of emerging disease: infection with SARS-CoV-2

At this meeting, the Commission considered the update from the Secretariat on the global situation for SARS-CoV-2 and the intervention from the European Union at the 91st General Session on requesting the listing assessment of SARS-CoV-2. The Commission noted that infection with SARS-CoV-2 was considered an emerging disease according to the *Terrestrial Code* Glossary definition since 2020. Since the onset of the pandemic in 2019, multiple animal species were reported to be naturally infected with SARS-CoV-2. Evidence for efficient transmission of SARS-CoV2 between animals has only been reported in mink and white tail deer, while conclusive evidence for animal - human transmission was only reported from mink to human and cat to human. The Commission also noted that the number of reports of SARS-CoV-2 infection in animals to WAHIS, including farmed mink has sharply declined in 2023 and 2024.

In accordance with point 5.1. of the Standard Operating Procedure for determining whether a disease should be considered as emerging, the Commission considered that sufficient evidence exists on the epidemiology of SARS-CoV-2 in animals and recommended subjecting it to an assessment against the listing criteria of *Terrestrial Code* Chapter 1.2. The Commission agreed to take the responsibility to conduct the assessment intersession as per point 3.1 of the Standard Operating Procedure for listing decisions for pathogenic agents of terrestrial animals and to present the result of the assessment at its meeting in February 2025.

9.2. Evaluation of pathogenic agent against the listing criteria of Terrestrial Code Chapter 1.2.

9.2.1. Nairobi sheep disease virus

At its September 2023 and February 2024 meetings, the Commission reviewed the initial expert opinions on Nairobi sheep disease virus (NSDV). They noted that infection with NSDV had not been reported to WAHIS in the last ten years and there was an apparent lack of impact in animals even if it was known to be circulating in ticks in certain geographical areas. Based on the above evidence, in February 2024, it was agreed to assess NSDV against the criteria of Chapter 1.2. 'Criteria for the inclusion of diseases, infections and infestations in the WOAH list' of the *Terrestrial Code*.

At this meeting, the Commission reviewed the assessments conducted by three subject-matter experts and noted that the experts differed in their assessments on the continued listing of NSDV. Two experts agreed that NSDV met the criteria for listing, whereas one did not agree that criteria 1 and 2 were met.

One expert considered that criterion 1 was not met given that reports of NSDV from East Africa, India, and China that were detected in ticks were of isolated events, each involving distinct variants of NSDV circulating exclusively within their respective regions. There has been no evidence of geographical spread of these local variants let alone any evidence of spread via the movement of animals, animal products, vectors, or fomites. Although the other two experts considered criterion 1 was met, they acknowledged there was no direct evidence linking virus transmission between regions through movements of animals or through vectors. One noted the hypothesis that inter-regional spread may have occurred via bird-borne ticks or transportation of animals during the 18th and 19th centuries, while the other expert suggested a possible introduction of African strain into China through similarities in viral RNA detected in ticks. The Commission assessed the information

provided and considered that since there has not been any recent nor definitive evidence of international spread of NSDV via live animals, their products, vectors or fomites, criterion 1 was not met.

On criterion 2, the Commission agreed with the assessments of the two experts that regions such as Europe, the Americas, parts of Asia, and Australia, have never reported any cases and could be considered free from NSDV or have the potential to meet with the requirements for freedom in accordance with the surveillance principles outlined in Chapter 1.4. 'Animal health surveillance'. However, the Commission noted that one expert disagreed that criterion 2 was met as the guidance also required there to be at least one country with official programmes in place to control or prevent the spread of NSDV and the expert was not aware of any country which had one.

The Commission, in consultation with the Biological Standards Commission, agreed with the experts that criterion 3 was met as there are reliable means of detecting and diagnosing NSDV.

For criterion 4, the Commission noted that all three experts agreed NSDV could cause high mortalities in susceptible animal populations and therefore considered criterion 4b as met (all experts considered 4a and 4c were not met). However, the Commission noted that these assessments were based on evidence of mortalities and/ or morbidities of animals in the initial outbreaks that occurred decades ago. The Commission understood from the experts that there was no recent evidence of NSDV having a significant impact on the health of domestic animals, causing any mortality, morbidity, or production losses. In fact, the Commission noted that recent reports of NSDV are of detection in ticks, without any corresponding impact to (or detection in) animals. Therefore, the Commission, considered criterion 4 was not met.

The Commission noted that the primary objective of listing a pathogenic agent in the *Terrestrial Code* is to support Members by providing the information needed to take appropriate action to prevent the transboundary spread of important diseases of terrestrial animals, achieved through transparent, timely and consistent notification *(i.e. Terrestrial Code* Article 1.2.1.). However, this would not be satisfied with NSD, given that over the past decade, no Member has notified its occurrence to WAHIS. This, together with its assessment that NSD does not meet criterion 1 and 4, the Commission recommended that NSDV be delisted. The opinion of the Commission was forwarded to the Code Commission and to the Biological Standard Commission.

The experts' report is provided as Annex 4.

9.3. Development of case definitions

9.3.1. Infection with *Mycobacterium avium* subsp. *paratuberculosis* (paratuberculosis)

At this meeting, the Commission was presented the draft case definition for infection with *Mycobacterium avium* subsp. *paratuberculosis* (paratuberculosis) prepared by the experts, along with the accompanying technical report and the Biological Standards Commission's opinion on the case definition.

The Commission queried the continued listing of paratuberculosis and referred to its discussions on the listing assessment of paratuberculosis conducted at its February and September 2022 meetings. At that time, the Commission had noted that experts had difficulty providing a clear conclusion on whether criterion 2 ('at least one country has demonstrated freedom or impending freedom from the disease infection or infestation in populations of susceptible animals, based on the provision of Chapter 1.4') was met.

According to this criterion, at least one country should have documented evidence such as peer reviewed publications, official reports, or self-declarations on freedom or impending freedom. The Commission noted that although there is evidence suggesting that there is one country that may be free from paratuberculosis, there are doubts about this claim[13] [14]. The Commission therefore considers criterion 2 to not be met.

Similarly, during the February and September 2022 meetings, the Commission noted that although subject-matter experts and the Biological Standards Commission agreed that paratuberculosis satisfied criterion 3 ('reliable means of detection and diagnosis exist, a precise case definition is available to clearly identify cases and allow them to be distinguished from other diseases, infections or infestations'), the Commission. considered that the recommended diagnostic test for individual animals prior to movement and referred to table 1 of the *Terrestrial Manual* chapter 3.1.17. PCR and ELISA were the recommended tests but have

[13] Frössling J., Wahlström H., Ågren E.C.C., Cameron A., Lindberg A. & Sternberg Lewerin S. (2013). – Surveillance system sensitivities and probability of freedom from Mycobacterium avium subsp. paratuberculosis infection in Swedish cattle. Preventive Veterinary Medicine, 108 (1), 47–62. doi:10.1016/j.prevetmed.2012.07.010

[14] EFSA Panel on Animal Health and Welfare (AHAW), More S., Bøtner A., Butterworth A., Calistri P., Depner K., Edwards S., Garin-Bastuji B., Good M., Gortázar Schmidt C., Michel V., Miranda M.A., Nielsen S.S., Raj M., Sihvonen L., Spoolder H., Stegeman J.A., Thulke H.H., Velarde A., Willeberg P., Winckler C., Baldinelli F., Broglia A., Zancanaro G., BeltránBeck B., Kohnle L., Morgado J. & Bicout D. (2017). – Assessment of listing and categorisation of animal diseases within the framework of the Animal Health Law (Regulation (EU) No 2016/429): paratuberculosis. EFSA Journal, 15 (7), e04960. doi:10.2903/j.efsa.2017.4960

insufficient sensitivity for cattle and as such were insufficient for use in preventing the transboundary spread of paratuberculosis through the movement of individual animals.

Based on its discussions, the Commission decided to reassess as described in point 3.1 of the Standard Operating Procedure for listing decisions for pathogenic agents of terrestrial animals. The Commission will conduct the assessment and discuss the result of the assessment at its meeting in February 2025.

9.3.2. Infection with small ruminant lentiviruses (maedi visna and caprine arthritis encephalitis)

The Commission reviewed the draft case definition for infection with small ruminant lentiviruses (maedi visna and caprine arthritis encephalitis) prepared by the experts, along with the accompanying technical report and the Biological Standards Commission's opinion on the case definition. This report summarises their combined position.

In terms of the pathogenic agent, both Commissions agreed with the experts' opinion that it would be recommended to refer to the pathogenic agent collectively as 'small ruminant lentiviruses' as referenced in the *Terrestrial Manual*.

The Commission also agreed with the experts' view that domestic sheep and goat species, i.e. *Ovis aries* and *Capra hircus* are epidemiologically relevant and important to be considered as the animal host species for notification for infection with small ruminant lentiviruses (both maedi visna and caprine arthritis encephalitis). The Commission agreed with the experts' opinion that as the infections (maedi visna and caprine arthritis encephalitis) can transmit across species, the occurrence of either in both domestic sheep and goats should be notified. The Commission concurred with the experts that wild small ruminants do not play a role in the epidemiology of the disease.

Both Commissions noted that the experts had recommended three options (isolation, nucleic acid detection, and antibody detection) as part of the diagnostic criteria to confirm a case of infection with small ruminant lentiviruses (maedi visna and caprine arthritis encephalitis). Regarding the detection of nucleic acid in samples from an animal host, both Commissions agreed with the experts' opinion to add the option 'parts of proviral genome of the same SRLVs have been amplified and sequenced in samples from the animal host'. The detection of proviral genome after integration of the lentivirus into the host cell increases the specificity of detecting viral nucleic acid, but considering the potential for non-specific signals detected by the PCR, it is important to ensure that the proviral genome amplified matches the viral nucleic acid detected.

With regard to the disease-specific chapters in the *Terrestrial Code*, the Commission recommended to combine both Chapter 14.1. and Chapter 14.5. in a single chapter covering small ruminant lentiviruses, given that the risk management measures are sufficiently similar. The opinion of the Commission was forwarded to the Code Commission. The experts' report is provided as Annex 5.

10. For Commission information

10.1. Update on the STAR IDAZ International Research Consortium

The Commission was updated on STAR IDAZ International Research Consortium (IRC), focussing on coordinating global research efforts to enhance animal health. Its goal is to accelerate delivery of disease control tools and strategies for controlling priority diseases with key deliverables including vaccines, diagnostics, and therapeutics, contributing to risk analysis and disease control.

STAR IDAZ has successfully built a network involving research organisations from over 55 countries, with 35 partners from 23 countries moving over $2.5 billion in research funding. It also fosters regional cooperation through networks in Africa & Middle East, the Americas, Asia & Australasia, and Europe, enhancing collaboration and resource-sharing. Recent milestones include expanding the IRC network with new partners from Switzerland, Kenya, Uganda, Morocco and Canada. WOAH actively participates in STAR IDAZ through its Executive Committee and co-hosts its Secretariat. In particular, WOAH is leading advocacy activities within the STAR IDAZ Secretariat. Any organisation managing or funding animal health research wishing to join the STAR IDAZ IRC is welcomed to contact Dr Valeria Mariano (v.mariano@woah.org).

In 2023-2024, several key meetings and workshops advanced research collaboration in priority areas, ensuring alignment and coordinated efforts across countries. Several experts' working groups progressed in the identification critical gaps on African Swine Fever (ASF), antimicrobial resistance and alternative to antimicrobials (AMR & ATA), bovine tuberculosis (bTB), coronaviruses, influenza, FMD, mastitis, vector transmission control and one health. In addition, a workshop to identify the highest research priorities for aquaculture, in line with WOAH Aquatic Animal Health Strategy 2021-2025, is expected to be held in collaboration with WOAH Reference and Collaborating Centres in February 2025. Critical gaps continue to be disseminated to funders within the STAR IDAZ Executive Committee and beyond to activate research programmes were most needed. More information on these activities and IRC

Members can be found in the recently released STAR IDAZ Newsletter, Report on Global funding landscape for One Health and the forthcoming State of the Art Report 2024 that will be soon available here.

10.2. WOAH Science System

The Commission was informed that WOAH embarked on an initiative to document and describe the functioning of the WOAH science system (WSS) as a basis for evaluating its performance against WOAH's strategic priorities as part of the 7th Strategic plan. The objective was to illustrate the mechanisms by which WOAH leverages science and uses its scientific networks to ensure that its recommendations and technical outputs are based on the latest best available science, aligned with best practices and optimised the support WOAH's mandate. The work also sought to improve awareness by internal and external stakeholders of the WSS, and identify strengths, weaknesses and opportunities to better enhance WOAH's scientific credibility and transparency with it's stakeholders.

As part of the process, information was collated on the structure and functioning of equivalent systems (or knowledge management systems) in other institutions in order to draw parallels. Consultations were also conducted with WOAH staff and the wider networks, including members of Specialist Commissions to capture information about the system in action and fitness for purpose. A framework that bests describes existing mechanisms was then developed, with examples of how this is exemplified in WOAH core functions, such as in standard-setting and the provision of scientific guidance.

The Commission was informed that the document was published on the WOAH website.

10.3. WOAH activities on Substandard and falsified veterinary products programme

The Commission was informed about WOAH activities and plans for the Substandard and Falsified Veterinary Products Programme, as per the recommendations of the 2nd Global OIE Conference on AMR in 2018 on building a reporting system of falsified or substandard veterinary products in the animal sectors illegally circulating within and between countries.

Whilst there are some Members that voluntarily contribute this information, the Commission was informed that some Members had also requested the need to have a dedicated reporting system for these falsified or substandard veterinary products. The Commission noted that all the Specialist Commissions were being consulted on whether there was a need for the inclusion of definitions for substandard and falsified veterinary products in International Standards as well as if there is a need for including further specification in the *Terrestrial Manual, Terrestrial Code* and *Aquatic Code* to clarify what Members were required to report and the modalities for doing so.

The Commission commended this initiative on developing such a system and agreed that clear definitions could be included in the *Terrestrial Code* Chapters on anti-microbial resistance given that this terminology has been used in the chapters.

10.4. WOAH Incident Management System

The Commission was updated on the initiative of developing WOAH Incident Management System (IMS) to enhance the organisation's technical response to incidents. An IMS encompasses policies, procedures, and resources (including personnel) to effectively manage incidents, facilitating communication, control, and decision-making during emergencies. This system will enable WOAH to respond more efficiently to international and regional emergencies, supporting its Members within WOAH's scope and mandate. The initiative follows recommendations from the COVID-19 After Action Review and adoption of Resolution No. 28 from the 89th General Session in 2022. The development will proceed in phases, starting with scoping and design, followed by development, training, and concluding with testing through a simulation exercise and refinement through external experts. The IMS is scheduled for completion by May 2025 to be reported back to the Membership during the 2025 General Session.

The Commission commended this initiative and highlighted the importance of biosecurity risk management during disasters and crises and suggested engaging the support from aid agencies to ensure that biosecurity is implemented even whilst responding to non-animal health-related emergencies (e.g. natural disasters and civil conflicts).

10.5. WOAH Standards Online Navigation Tool

The Commission was updated on the WOAH Standards Online Navigation Tool project which aimed at providing users with streamlined access and navigation of WOAH Standards. This tool is a platform designed to simplify access to WOAH standards and aligns with the WOAH Digitalisation Strategy, which aimed to improve efficiency and support informed decision-making.

The Commission was informed that the public interface was presented at the 91st General Session and had received positive feedback. The standards have been fully digitalised, verified, and are being updated and the tool is expected to go live by end of 202

The Commission commended the utility of this tool and suggested that the tool should further evaluate on possible interconnectivity with other databases.

10.6. WOAH actions for mpox

The Commission was updated on WOAH activities on the current mpox outbreak which included the publication of a statement. The Commission was informed that WOAH is currently monitoring the evolution of the event and assessing the role of animals in current transmission and has mobilised the WOAH *ad hoc* Group on emerging diseases and drivers of disease emergence in animals to provide its opinion. WOAH is also in close communication with the World Health Organisation. WOAH is working with experts to update the document on risk guidance on reducing spillback of mpox from humans to wildlife, pet animals and other animals. The Commission suggested that WOAH should encourage leveraging on expertise from the veterinary sector which has experience in the management of sheep and goat pox, namely with the use of vaccines. The Commission appreciated the update and requested to be informed should mpox be detected in animals.

10.7. Updates on WAHIAD and WAHIS platform

The Commission was provided a demo of WAHIS platform and was encouraged to use the system when needed and to contact the WAHIS Support desk in case of any question or request. The session also clarified the way countries report their data and animal data visualisations on WAHIS maps. The Commission was informed about the launch of the optimised six-monthly report and new annual report modules in June 2024 and feedback from reporting countries and territories, progress on WAHIS-ADIS interconnectivity, evolution of dashboards, mapping functionalities in WAHIS and the preparation of annual updates of reference tables to reflect all the changes adopted in WOAH standards at the 91st General Session.

The Commission appreciated the hands-on demonstration and noted the progress made in visualising and downloading data. Furthermore, they provided suggestions for improving WAHIS user experience, including considering integrating data on WOAH Members official disease status onto the WAHIS maps and providing greater clarity in the legends provided.

10.8. Update on the WOAH Observatory

The Commission was updated on the activities of the WOAH Observatory and results from phase 1 of the Thematic Study on zoning. In exploring factors influencing the acceptance of zoning by trading partners, the following major factors were identified to have a positive impact:

- Demonstrated transparency of exporting countries;
- Trust in the implementation of certification, biosecurity, surveillance and information systems, movement control, animal identification and traceability, zoning practices, ability to conduct risk analysis;
- Stability of the epidemiological situation and trade in exporting countries;
- Bilateral relations between exporting and importing countries;
- Technical independence of Veterinary Services in exporting countries;
- Use of WOAH processes by exporting countries, including reporting through WAHIS and other WOAH processes including official status recognition, self-declaration of freedom, PVS evaluation and implementation of WOAH standards in national legislation;
- Relations between exporting countries and other trade partners

The Commission was informed that the report for phase 2 of the Thematic Study on zoning was being prepared and will be published in 2025. The Commission was also informed that a Zoning Forum will be organised in response to the recommendations from phase 1 of the study, for Members to exchange their success and learning lessons from implementing zoning. The Commission raised the importance of better understanding potential negative impacts on communities caused by implementation of zoning, as certain zonal status may have restrictions on the local communities and stakeholders and their animal keeping practices or movements. The Commission also noted that the findings from the Forum would be useful for the planned revisions to Chapter 4.4. 'Zoning and compartmentalisation' and new Chapter 4.Y. 'Application of zoning' (see Item 5.2.9.). The Commission also requested to receive updates of the Thematic Study on compartmentalisation for avian influenza that was planned for 2025.

11. Programme and priorities

11.1. Update and prioritisation of the work plan

The Commission updated its work programme, identified the priorities, and scheduled the dates for the various *ad hoc* Group meetings, which will be accessible to Members through the WOAH website. The updated work programme is attached as Annex 6.

12. Adoption of the meeting report

The Commission adopted the report that was circulated electronically after the meeting.

13. Date of the next meeting

The next meeting of the Commission is scheduled to take place between 10 and 14 February 2025.

14. Meeting Review

A meeting review was conducted in accordance with the Commission Performance Management Framework.

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…/Annexes

Annex 1. Adopted Agenda

MEETING OF THE WOAH SCIENTIFIC COMMISSION FOR ANIMAL DISEASES

Paris, 9 to 13 September 2024

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1. Welcome

2. Meeting with the Director General

3. Adoption of the agenda

4. *Terrestrial Animal Health Code*

4.1. Member comments received for Commission consideration

4.1.1. Chapter 11.5. Infection with *Mycoplasma mycoides* subsp. *mycoides* SC (Contagious bovine pleuropneumonia)

4.1.2. Chapter 12.1. Infection with African horse sickness virus

4.1.3. Chapter 12.3. Infection with *Trypanosoma equiperdum* (dourine)

4.2. Other considerations

4.2.1. Chapter 1.6. Procedures for official recognition of animal health status, endorsement of an official control programme, and publication of a self-declaration of animal health status, by WOAH

4.2.2. New World screwworm (*Cochliomyia hominivorax*) and Old World screwworm (*Chrysomya bezziana*)

4.2.3. Epizootic haemorrhagic disease virus

5. *Ad hoc* and Working Groups

5.1. Meeting reports for consideration

5.1.1. *Ad hoc* Group on equine encephalitides

5.1.2. *Ad hoc* Group on biosecurity

5.1.3. *Ad hoc* Group on scrapie

5.2. Planned *ad hoc* Groups and confirmation of proposed agendas

5.2.1. *Ad hoc* Group on the evaluation of BSE risk status: 1–4 October 2024

5.2.2. *Ad hoc* Group on the evaluation of official control programmes for dog-mediated rabies: 8 & 10 October 2024

5.2.3. *Ad hoc* Group on the evaluation of AHS status: 9 & 11 October 2024

5.2.4. *Ad hoc* Group on the evaluation of CBPP status: 29–31 October 2024 (cancelled)

5.2.5. *Ad hoc* Group on the evaluation of FMD status: 4–7 November 2024

5.2.6. *Ad hoc* Group on the evaluation of PPR status: 12–14 November 2024 (tbc)

5.2.7. *Ad hoc* Group on the evaluation of CSF status: 19–21 November 2024 (tbc)

5.2.8. *Ad hoc* Group on sheep pox and goat pox: 26-28 November (tbc)

5.2.9. *Ad hoc* Group on Terrestrial Code standards on zoning

5.3. Meeting reports for information

5.3.1. WOAH Working Group on Wildlife

5.3.2. *Ad hoc* Group on Alternative Strategies for the Control and Elimination of *Mycobacterium tuberculosis* complex Infection (MTBC) in Livestock

6. Official animal health status

6.1. Annual reconfirmations for maintenance of status

6.1.1. Selection of status items for comprehensive review of 2024 annual reconfirmations

6.2. Specific update on official animal health status

6.2.1. Update on situation of countries/zone with suspended status

6.2.2. Updates on official BSE risk status

6.3. State of play and prioritisation of expert mission to Members requested by the Commission

6.3.1. Follow-up of field missions

6.3.2. State of play and prioritisation

6.4. Standards and procedures related to official status recognition

6.4.1. Streamlining the procedure for annual reconfirmations for maintenance of official status

6.4.2. Development of the Official Status Management Platform

7. Global control and eradication strategies

7.1. African swine fever. Global Control Initiative

7.2. Peste des Petits Ruminants. Global Control and Eradication Strategy

7.3. Avian Influenza. Global Control Strategy. Animal health forum. OFFLU

8. Liaison with other Commissions and Departments

8.1. Terrestrial Animal Health Standards Commission (Code Commission)

8.2. Biological Standards Commission

8.3. Taskforce on animal hosts

9. Disease control: specific issues

9.1. Emerging diseases

9.1.1. Annual re-assessment of emerging disease: infection with SARS-CoV-2

9.2. Evaluation of pathogenic agent against the listing criteria of Terrestrial Code Chapter 1.2.

9.2.1. Nairobi sheep disease virus

9.3. Development of case definitions

9.3.1. Infection with *Mycobacterium avium* subsp. *paratuberculosis* (paratuberculosis)

9.3.2. Infection with small ruminant lentiviruses (maedi visna and caprine arthritis encephalitis)

10. For Commission information

10.1. Update on the STAR IDAZ International Research Consortium

10.2. WOAH Science System

10.3. WOAH activities on Substandard and falsified veterinary products programme

10.4. WOAH Incident Management System

10.5. WOAH Standards Online Navigation Tool

10.6. WOAH actions for mpox

10.7. Updates on WAHIAD and WAHIS platform

10.8. Update on the WOAH Observatory

11. Programme and priorities

11.1. Update and prioritisation of the work plan

12. Adoption of the meeting report

13. Date of the next meeting

14. Meeting Review

Annex 2. List of Participants

MEETING OF THE WOAH SCIENTIFIC COMMISSION FOR ANIMAL DISEASES

Paris, 9 to 13 September 2024

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MEMBERS OF THE COMMISSION

Dr Cristóbal Zepeda
(President)
UNITED STATES OF AMERICA

Prof Naomi Cogger
(Vice-President)
NEW ZEALAND

Dr Misheck Mulumba
(member)
ZAMBIA

Dr Silvia Bellini
(Vice-President)
ITALY

Prof Baptise Kimbenga Dungu
(member)
SOUTH AFRICA AND
CONGO (DEMO.REP.OF)

Prof Jan Arend Stegeman
(member)
NETHERLANDS

WOAH HEADQUARTERS

Dr Gregorio Torres
Head
Science Department

Dr Monal Daptardar
Scientific Coordinator
Science Department

Dr Min Kyung Park
Head
Status Department

Dr Charmaine Chng
Deputy Head
Science Department

Dr Yuka Moribe
Young Professional Officer
Science Department

Dr Anna-Maria Baka
Senior Disease Status Officer
Status Department

Dr Natalie Moyen
Disease Status Officer
Status Department

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Annex 3. Publication of questionnaires related to official recognition of disease status and the endorsement of official control programmes on the WOAH website and removal from the *Terrestrial Animal Health Code*

MEETING OF THE WOAH SCIENTIFIC COMMISSION FOR ANIMAL DISEASES

Paris, 9 to 13 September 2024

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Objective

The purpose of this paper is to provide the background and rationale for the proposal to remove the questionnaires (Chapters 1.7. to 1.12) used when applying for official recognition of disease status and for the endorsement of official control programmes from the *Terrestrial Animal Health Code (Terrestrial Code)* and maintain them on the WOAH website.

Background

At the General Session in May 2019, the revised Chapter 8.14. Infection with Rabies virus was adopted by the World Assembly of Delegates. One of the amendments in the adopted chapter was the inclusion of a new article on WOAH endorsed official control programme for dog-mediated rabies, similar to existing provisions on WOAH endorsed official control programmes that are included in disease-specific chapters for FMD, CBPP and PPR. Upon agreement by the WOAH Committee Direction meeting on 6 May 2019, the questionnaire for the endorsement of official control programme for dog-mediated rabies was published on the WOAH website, i.e. outside of the *Terrestrial Code*.

Requirements for WOAH recognition of official status and endorsement of official control programmes and the role of questionnaires

Requirements for WOAH official recognition

For all diseases that are included in the WOAH procedure for official status recognition (AHS, BSE, CSF, CBPP, FMD and PPR; endorsement of official control programmes for CBPP, FMD and PPR), the requirements to declare a country or a zone free from 'infection with pathogenic agent X' are clearly described in Article 1.4.6. and the disease-specific chapters of the *Terrestrial Code*. For example, the requirements to be considered as a country or zone free from PPR are described in Article 14.7.3. Likewise, to obtain WOAH endorsement of a country's official control programme for PPR, a Member Country should comply with Article 14.7.34.

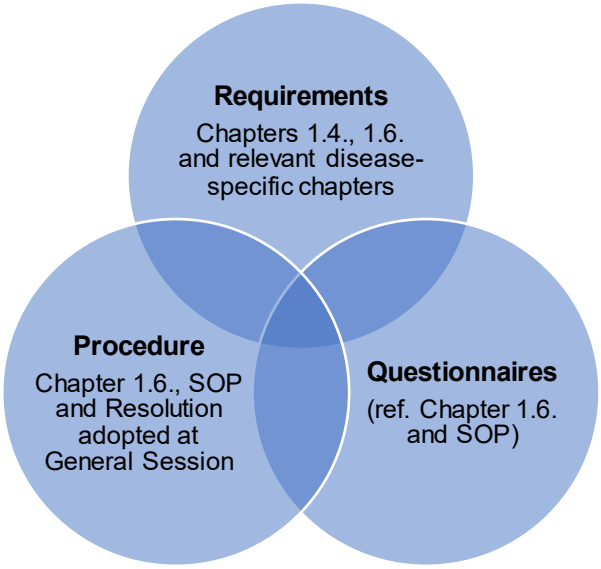
Furthermore, Chapter 1.6. Procedures for official recognition of animal health status, endorsement of an official control programme, and publication of a self-declaration of animal health status, by WOAH (currently undergoing revision), describes the procedures and general provisions to be followed should a Member wish to apply for official recognition of disease status for one of the six diseases (i.e. AHS, BSE, CBPP, CSF, FMD or PPR) or for endorsement of their national official control programme for FMD, CBPP, PPR and dog-mediated rabies.

The Standard Operating Procedure (SOP) for official recognition of disease status and for the endorsement of national official control programmes of Members provides detailed guidelines on the entire application process.

Role of the questionnaires

The main role of the questionnaires is to provide guidance to Members on how to collect and compile documented evidence that supports demonstration of compliance with the requirements described in the *Terrestrial Code*. The questionnaire is not the requirement *per se*, but a tool used by – Members to develop their dossier and evaluating experts to assess the dossier – thereby providing a standardised and transparent format for the submission and evaluation process.

Questions in the questionnaires were developed by a group of relevant disease experts to ensure that information provided by Members adequately describes the animal health situation with regard to a particular disease. The questionnaires aim to ensure that all necessary information is provided by Members to demonstrate their compliance with the provisions of the *Terrestrial Code* for that particular disease. In parallel, it allows experts to evaluate all necessary information to make a final recommendation on whether or not a Member Country successfully demonstrates compliance with the provisions of the *Terrestrial Code* for official recognition of its disease status for a particular disease.



The mandatory provision of information requested in the questionnaires when submitting an application for the aforementioned purposes is in accordance with: i) the Standard Operating Procedures for official recognition of disease status; ii) the relevant Resolutions adopted at previous General Sessions; and iii) the requirements of the *Terrestrial Code*

Proposal

It is proposed that the questionnaires currently published in the *Terrestrial Code* to be removed and published outside of the *Terrestrial Code*. The change is proposed in parallel to the completion and adoption of the 'harmonisation work': the systematic review and standardisation of the articles describing country and zone freedom requirements in the relevant disease-specific chapters of the *Terrestrial Code* for all diseases that are included in the WOAH procedure for official status recognition (AHS, BSE, CSF, CBPP, FMD and PPR; endorsement of official control programmes for CBPP, FMD and PPR). This change recognises the nature of the questionnaires as guidance (i.e. procedures and templates) for implementation of the standards. Retaining the questionnaires outside the *Terrestrial Code* will allow re-examination and amendments when necessary to ensure they are up-to-date and fit for purpose as a tool for compilation and evaluation of applications by Members and experts, without the effort and timelines associated with the adoption process for amendments to texts of the *Terrestrial Code*. Such effort is more efficiently and effectively directed to maintaining the relevant disease-specific chapters themselves, with consequential review or incremental improvement to the questionnaires overseen by Specialist Commissions and implemented by the WOAH Headquarters directly.

All questionnaires will remain available on the WOAH website (e.g. official disease status webpage) and on the WOAH Delegates' website.

Any amendments to the questionnaires will be reviewed by the Scientific Commission for Animal Diseases and will be tracked in its report. Members will continue to have the possibility to make recommendations to improve the clarity of the questionnaires for their use.

Annex 4. Listing Assessment for Nairobi Sheep Disease

MEETING OF THE WOAH SCIENTIFIC COMMISSION FOR ANIMAL DISEASES

Paris, 9 to 13 September 2024

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SUMMARY OF THE EXPERT ASSESSMENT OF NAIROBI SHEEP DISEASE AGAINST THE LISTING CRITERIA OF *TERRESTRIAL CODE* CHAPTER 1.2.

Three experts participated in this consultation:

1. Dr Martin Groschup, Head of the Institute of Novel and Emerging Infectious Diseases, Friedrich-Loeffler-Institut, Germany
2. Dr Pragya Yadav, Scientist F, Indian Council of Medical Research, India
3. Dr Lidia Dykes, Senior Postdoctoral Scientist, Pirbright institute, United Kingdom

Summary

Criterion	1	2	3
Criterion 1: International spread of the pathogenic agent (via live animals or their products, vectors or fomites) has been proven.	NO	YES	YES
Criterion 2: At least one country has demonstrated freedom or impending freedom from the disease, infection or infestation in populations of susceptible animals, based on the provisions of Chapter 1.4.	NO	YES	YES
Criterion 3: Reliable means of detection and diagnosis exist, and a precise case definition is available to clearly identify cases and allow them to be distinguished from other diseases, infections or infestations.	YES	YES	YES
Criterion 4a: Natural transmission to humans has been proven, and human infection is associated with severe consequences.	NO	YES	YES
Criterion 4b: The disease has been shown to have a significant impact on the health of domestic animals at the level of a country or a zone taking into account the occurrence and severity of the clinical signs, including direct production losses and mortality.	YES	YES	YES
Criterion 4c: The disease has been shown to, or scientific evidence indicates that it would, have a significant impact on the health of wildlife taking into account the occurrence and severity of the clinical signs, including direct economic losses and mortality, and any threat to the viability of a wildlife population.	NO	NO	NO
CONCLUSION: Does infection with Nairobi sheep disease virus match the listing criteria that are described in the Terrestrial Animal Health Code Chapter 1.2?	**NO**	**YES**	**YES**

Assessment for Nairobi sheep disease virus by Dr Martin Groschup

The criteria for the inclusion of a disease, infection or infestation in the WOAH list are as follows:

1) International spread of the pathogenic agent (via live animals or their products, vectors or fomites) has been proven. **No**

Scientific rationale:
Different variants of the virus are known to circulate in East Africa (NSDV) and India (here, so-called Ganjam virus) (Marczinke et al., 2002; PMID: 12482666). Recently, molecular evidence for the presence of NSDV in China has been reported (Gong et al., 2015; PMID: 25811222; Zhang et al., 2022; PMID:36090082). All those variants are closely related but not identical and there is no recent report or evidence for the international spread of a certain NSDV variant. However, it is widely discussed that the introduction of the virus into new areas, e.g. through its tick vector and international animal trade, could lead to severe disease courses in naive sheep populations while in endemic regions, the presence of maternal antibodies is thought to provide sufficient protection (Krasteva et al., 2020; PMID: 32793646).

AND

2) At least one country has demonstrated freedom or impending freedom from the disease, infection or infestation in populations of susceptible animals, based on the provisions of Chapter 1.4. **No**

Scientific rationale:
To date, the virus is endemic in East Africa and Asia. From an international perspective, to the best of my knowledge there is no official program in place to control or prevent the spread of the virus in any of the affected countries.

AND

3) Reliable means of detection and diagnosis exist and a precise case definition is available to clearly identify cases and allow them to be distinguished from other diseases, infections or infestations. **Yes**

Scientific rationale:
Means of detection and diagnosis exist locally and on an international level (bin Tarif et al., 2012; PMID: 23083136; Hartlaub et al., 2021; PMID: 34199054). Moreover, clinical symptoms of infection have been consistently and well described since its first discovery in Kenya in 1910 (Montgomery 1917, "On a tick-borne gastro-enteritis of sheep and goats occurring in British East Africa). However, to distinguish the disease from other highly pathogenic diseases in sheep, laboratory testing is required as the diagnosis based on clinical symptoms only may be misleading.

AND

4a) Natural transmission to humans has been proven, and human infection is associated with severe consequences. **No**

Scientific rationale:
A few natural NSDV transmissions to humans have been reported, but the human infections were without really severe consequences. In India, a 12-year-old European boy showed high fever and nausea and – as his father was a surgeon this case was further investigated (Dandawate et al., 1969, PMID: 5823182). Ganjam virus, one NSDV variant from India, was successfully isolated and a specific antibody response was detected. Furthermore, a laboratory technician was infected handling this patient's samples in the laboratory. Similarly, the other reported human infections were laboratory-acquired (Rao et al.,1981; PMID: 6797936; Banerjee et al., 1979). Reported symptoms included nausea, vomiting and headache. There is serological evidence for human exposure to NSDV reported from India (Dandawate et al., 1969, PMID: 5823182), Uganda (Weinbren et al., 1958; PMID: 13525464), Kenya (Morrill et al., 1991; PMID: 2051522) and Sri Lanka (Perera et al., 1996; PMID: 8729633). However, published reports of severe human disease related to NSDV infection in these countries are currently lacking.

OR

4b) The disease has been shown to have a significant impact on the health of domestic animals at the level of a country or a zone taking into account the occurrence and severity of the clinical signs, including direct production losses and mortality. **Yes**

Scientific rationale:
An infection of naive sheep with NSDV can cause over 90% mortality, causing significant economic losses for production systems (Terpstra, 1969; Nairobi Sheep Disease. Studies on Virus Properties, Epizootiology and Vaccination in Uganda). If the NSDV is introduced through trade into new countries with favourable environmental conditions (e.g. vector-competent ticks, suitable climate), it has the potential to have a devastating impact on small ruminant producers due to its high pathogenicity. So far, it is unclear whether the virus would be only spreading in Africa and southern parts of Asia or whether such an expansion would also possible to countries outside (especially considering global warming). Awareness and

surveillance should thus be increased, especially in countries whose economies depend on small ruminants and their products.

OR

4c) The disease has been shown to, or scientific evidence indicates that it would, have a significant impact on the health of wildlife taking into account the occurrence and severity of the clinical signs, including direct economic losses and mortality, and any threat to the viability of a wildlife population. **No**

Scientific rationale:
There is currently no scientific evidence indicating that the health of the wildlife population is jeopardised by this virus.

Conclusion regarding Nairobi Sheep Disease virus:
Does Nairobi sheep disease virus match the listing criteria that are described in the *Terrestrial Animal Health Code* Chapter 1.2.? **No**

Summary Conclusion:

NSDV is a probably underestimated tick-borne zoonotic virus. It was long believed to circulate exclusively in East Africa and India. However, recent molecular evidence points towards a broader distribution of the virus as previously anticipated. Given its high pathogenicity, an infection of naive sheep with NSDV can cause over 90% mortality, causing significant economic losses for production systems. If introduced into new areas, e.g. through the observed increase in global trade, NSDV has thus the potential to have devastating impact on small ruminant producers worldwide. Therefore, awareness and surveillance should be increased, especially in countries whose economies depend on small ruminants and their products. However, NSDV does not match the listing criteria described in the Terrestrial Animal Health Code Chapter 1.2.

Assessment for Nairobi sheep disease virus by Dr Pragya Yadav

The criteria for the inclusion of a disease, infection or infestation in the WOAH list are as follows:

1) International spread of the pathogenic agent (via live animals or their products, vectors or fomites) has been proven. **Yes**

Scientific rationale:
The presence of the virus in these geographically distinct regions suggests that there may be other ways than ticks for the virus to spread internationally, but these have not been definitively proven.
AND

2) At least one country has demonstrated freedom or impending freedom from the disease, infection or infestation in populations of susceptible animals, based on the provisions of Chapter 1.4. **Yes**

Scientific rationale:
No evidence for its existence has been found in those parts of Africa where the principle vector tick, Rhipicephalus appendiculatus has a seasonal breeding cycle. Thus countries like Zambia, Zimbabwe and Botswana appear to be free from the disease.

[After-note, provided on 18/04/2024 after clarification by the Secretariat]

Question: Regarding question 2 concerning countries' freedom from disease, could you provide us with literature that has described Zambia, Zimbabwe, and Botswana as being free from the disease?

Reference - Davies FG. Nairobi sheep disease. Parassitologia. 1997 Jun; 39(2):95-8. PMID: 9530691.

AND

3) Reliable means of detection and diagnosis exist and a precise case definition is available to clearly identify cases and allow them to be distinguished from other diseases, infections or infestations. **Yes**

Scientific rationale:
Yes, there are reliable means of detection and diagnosis for Nairobi sheep disease (NSD) along with a well-defined case definition for clear identification.

[After-note, provided on 18/04/2024 after clarification by the Secretariat]

Question: In relation to question 3, where you mentioned the availability of a case definition for NSDV, could you clarify if this case definition is available for animals or humans? Additionally, could you provide us with references supporting this? '

Apparently, there are no standard case definitions available for NSDV for animals and humans.

AND

4a) Natural transmission to humans has been proven, and human infection is associated with severe consequences. **Yes**

Scientific rationale:
The virus is not readily communicable to human, but human infections have been previously documented. Human sera has been shown to contain antibodies in India, Uganda, Kenya, and Sri Lanka. Cases of laboratory-acquired infections have been reported.

OR

4b) The disease has been shown to have a significant impact on the health of domestic animals at the level of a country or a zone taking into account the occurrence and severity of the clinical signs, including direct production losses and mortality. **Yes**

Scientific rationale:
Nairobi sheep disease (NSD) can have a devastating impact on the health of domestic animals, particularly sheep and goats. It causes hemorrhagic gastroenteritis, fever, abortion, and high mortality in small ruminants. Mortality rates in susceptible animals exceed 90%, causing significant economic losses for production systems. This can lead to significant losses of livestock within a short period.

[After-note, provided on 18/04/2024 after clarification by the Secretariat]

Question: Under question 4b, could you kindly provide us with references and scientific literature that have indicated the impact on the health of domestic animals?

References

1. Krasteva S, Jara M, Frias-De-Diego A, Machado G. Nairobi sheep disease virus: a historical and epidemiological perspective. Frontiers in Veterinary Science. 2020 Jul 22;7:419.

2. Davies FG. Nairobi sheep disease. Arboviruses. 2019 Jun 4:191-204.

3. Shime A, Ayele T, Mekuriaw E. Nairobi sheep disease: a review. Journal of Biology, Agriculture and Healthcare. 2016;6(19):7-11.

4. Baron MD, Holzer B. Nairobi sheep disease virus/Ganjam virus. Revue Scientifique et Technique-Office International des Épizooties. 2015;34(2):411-7.

5. CFSPH, Iowa State University, 2009. Nairobi Sheep Disease. Technical Fact Sheet. www.cfsph.iowa.edu. Accessed on April 18, 2024

6. Jatav M, Verma Y, Swamy M, Dubey A. Pathology of Ganjam virus disease in small ruminants. J Entomol Zool Stud. 2018;6(3):738-42.

7. Marczinke BI, Nichol ST. Nairobi sheep disease virus, an important tick-borne pathogen of sheep and goats in Africa, is also present in Asia. Virology. 2002 Nov 10;303(1):146-51.

8. Sudeep AB, Jadi RS, Mishra AC. Ganjam virus. Indian Journal of Medical Research. 2009 Nov 1;130(5):514-9.

9. World Health of Animal Organization. Narobi sheep disease. Chapter 3.7.6. https://www.woah.org/fileadmin/Home/eng/Health_standards/tahm/3.07.06_NAIROBI_SHEEP.pdf. Accessed on April 18, 2024

10. National list of notifiable animal diseases. https://www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/animal/notifiable#national-list-of-notifiable-diseases-of-terrestrial-animals-at-april-2019. Accessed on April 18, 2024

11. Mourya DT, Yadav PD. NairobiSheep Disease virus. Dongyou Liu (Ed.) Molecular detection of animal viral pathogens, CRC Press, May 12, 2016, Chapter 60. ISBN: 9781498700368. eBook ISBN: 9781498700375

OR

4c) The disease has been shown to, or scientific evidence indicates that it would, have a significant impact on the health of wildlife taking into account the occurrence and severity of the clinical signs, including direct economic losses and mortality, and any threat to the viability of a wildlife population. **No**

Scientific rationale:
The impact of Nairobi sheep disease (NSD) on wildlife populations is not known.

Conclusion regarding Nairobi sheep disease virus
Does Nairobi sheep disease virus match the listing criteria that are described in the *Terrestrial Animal Health Code* Chapter 1.2.? **Yes**

Summary Conclusion:
Nairobi sheep disease (NSD) is a serious threat to domestic animals, particularly sheep and goats. While spread primarily by ticks, other potential transmission routes remain under investigation. It causes high fever, internal bleeding, and death in infected animals. The reliable diagnostic tests exist. Though not easily transmitted to humans, some populations have shown antibodies, suggesting potential exposure. The economic impact on livestock herds can be devastating, and the disease's effect on wildlife populations requires further study.

Assessment for Nairobi sheep disease virus by Dr Lidia Dykes

The criteria for the inclusion of a disease, infection or infestation in the WOAH list are as follows:

1) International spread of the pathogenic agent (via live animals or their products, vectors or fomites) has been proven. **Yes**

Scientific rationale:

Nairobi sheep disease virus (NSDV) is endemic in East and Central Africa, Botswana, Mozambique (Davies 1978, Edelsten 1975, Jessett 1978, Weinbren et al. 1958, and reviewed by Baron and Holzer, 2015), and in the Indian subcontinent (NDSV was detected in India and Sri Lanka; Joshi et al. 2005, Marczinke and Nichol 2002, Perera et al. 1996, and reviewed by Baron and Holzer, 2015). Additionally, in 2013 viral RNA was found in the *Haemaphysalis longicornis* ticks in northeastern China (Gong et al. 2013). While there are no recent reports of international spread of NSDV via live animals, their products, vectors or fomites, as suggested by Baron and Holzer (2015) there is evidence that NSDV spread from India to Africa either via bird-borne ticks or on animals shipped from India during 18th and 19th centuries (similarly to how rinderpest was brought into Africa). NSDV rarely causes disease in native sheep and goats in India, however it causes disease in imported to India European breeds, and in local breeds in East and Central Africa (which are often derived from Persian fat-tailed sheep; as reviewed by Spickler 2020, and Baron and Holzer 2015). This suggests that the NSDV is well adapted to its mammalian host in India, but not in East and Central Africa which lacks a native wild sheep and goat species.

Interestingly, Gong et al. 2013 showed that a sequence of the medium (M) genomic segment of NSDV isolated from ticks in China is closely related to the M genomic segment of NSDV isolated from Kenya. Since Yadav et al. 2011 showed that the M genomic segment of NSDVs isolated from India are distinctly related to the M genomic segment of NSDV isolated from Kenya, a possibility that, at some point, an African strain of NSDV was introduced into China cannot be excluded, especially that China is a big importer of ovine meet (Krasteva 2020).

There is a risk that, if in a given area or a country susceptible tick vectors exist, importation of an infected animal could lead to establishment of NSDV in a tick population of that region. Once established in a tick vector population, NSDV is very difficult to eradicate (as commented by Spickler 2020). It should be noted that many of tick vectors susceptible to NSDV (such as *Haemaphysalis longicornis* and *Rhipicephalus appendiculatus*) have a wide geographical distribution. Since sheep and goats become infected only through tick bites, only infected animals or tick vectors can pose a threat for spreading of NSDV.

References:

1. Baron MD, Holzer B. Nairobi sheep disease virus/Ganjam virus. Rev Sci Tech. 2015 Aug;34(2):411-7. doi: 10.20506/rst.34.2.2367. PMID: 26647464.

2. Davies FG. A survey of Nairobi sheep disease antibody in sheep and goats, wild ruminants and rodents within Kenya. J Hyg (Lond). (1978) 81:251– 8. doi: 10.1017/S0022172400025080

3. Edelsten RM. The distribution and prevalence of Nairobi Sheep disease and other tick-borne infections of sheep and goats in northern Somalia. Trop Anim Health Prod. (1975) 7:29–34. doi: 10.1007/BF02383239

4. Gong S, He B, Wang Z, Shang L, Wei F, Liu Q, Tu C. Nairobi sheep disease virus RNA in ixodid ticks, China, 2013. Emerg Infect Dis. 2015 Apr;21(4):718-20. doi: 10.3201/eid2104.141602. PMID: 25811222; PMCID: PMC4378503.

5. Jessett DM. Serological evidence of Nairobi sheep disease in Tanzania. Trop Anim Health Prod. (1978) 10:99–100. doi: 10.1007/BF02235317

6. Joshi MV, Geevarghese G, Joshi GD, Ghodke YS, Mourya DT, Mishra AC. Isolation of Ganjam virus from ticks collected off domestic animals around Pune, Maharashtra, India. J Med Entomol. 2005 Mar;42(2):204-6. doi: 10.1093/jmedent/42.2.204. PMID:

7. Krasteva S, Jara M, Frias-De-Diego A and Machado G (2020) Nairobi Sheep Disease Virus: A Historical and Epidemiological Perspective. Front. Vet. Sci. 7:419. doi:10.3389/fvets.2020.00419

8. Marczinke BI, Nichol ST. Nairobi sheep disease virus, an important tick-borne pathogen of sheep and goats in Africa, is also present in Asia. Virology. 2002 Nov 10;303(1):146-51. doi: 10.1006/viro.2002.1514. PMID: 12482666.

9. Perera LP, Peiris JSM, Weilgama DJ, Calisher CH, Shope RE. Nairobi sheep disease virus isolated from Haemaphysalis intermedia ticks collected in Sri Lanka. Ann Trop Med Parasitol. (1996) 90:91–3. doi: 10.1080/00034983.1996.11813031

10. Spickler, Anna Rovid. 2020. Nairobi Sheep Disease. Retrieved from http://www.cfsph.iastate.edu/DiseaseInfo/factsheets.php.

11. Weinbren MP, Gourlay RN, Lumsden WHR, Weinbren BM. An epizootic of nairobi sheep disease in Uganda. J Comp Pathol Ther. (1958) 68:174– 87. doi: 10.1016/S0368-1742(58)80018-1

12. Yadav PD, Vincent MJ, Khristova M, Kale C, Nichol ST, Mishra AC, Mourya DT. Genomic analysis reveals Nairobi sheep disease virus to be highly diverse and present in both Africa, and in India in the form of the Ganjam virus variant. Infect Genet Evol. 2011 Jul;11(5):1111-20. doi: 10.1016/j.meegid.2011.04.001. Epub 2011 Apr 12. PMID: 21511058.

[After-note, provided on 10/04/2024 after clarification by the Secretariat]

Question - For question 1 on the International spread of the pathogenic agent, could you elaborate on the route of international spread of the diseases, particularly through live infected sheep and goats.

There are only two reports describing inter-regional spread of NSDV. First report was made in 1934 when, after increased rainfall and vegetation changes which increased ecological range of *Rhipicephalus appendiculatus*, NSDV spread from Nairobi, Kenya to Maasai country (Lewis, 1934). In the second report, authors suggest introduction of NSDV in Laikipia region from the Nyeri district and transmission of NSDV from *R. appendiculatus* to native population of *Amblyomma variegatum* (Daubney and Hudson, 1934). Epidemiology of NSDV is poorly studied and there are no other reports on international spread of NSDV. Based on available literature, following assumptions about a potential involvement of sheep and goats in spread of NSDV can be made:

i. In the case of tick control measures being applied in the country in which NSDV is endemic, the most likely route of spread of NSDV to other countries would be through movement of susceptible and viraemic sheep or goats to areas with an established population of NSDV-competent tick vectors, which then can feed on the imported viraemic animals. If the native competent tick vectors become infected, they can potentially spread NSDV to native sheep and goats. Since (at least under the experimental conditions) immune sheep (and probably goats) and cattle do not develop viraemia and are unable to transmit NSDV to competent tick vectors (Hartlaub *et al.,*

2021), movement of NSDV-immune sheep or goats, and movement of cattle should pose little threat if tick control measures are put in place.

ii. In the case of lack of tick control measures in the country in which NSDV is endemic, there is a possibility that NSDV infected ticks feeding on a mammalian host can move to a NSDV-free country upon transportation of that host and, if ecological conditions are favourable, infect native and naïve sheep and goats. As a results, if native competent tick vectors also feed on a native, now NSDV-infected, sheep or goats, NSDV could become established in the native competent tick vector population. This is based on the following findings:

    a. *R. appendiculatus* tend to feed in large numbers on their hosts (even with over thousand ticks found on a single animal) (Spickler, 2022), and infected *R. appendiculatus* tick vectors do not lose their ability to infect a susceptible mammalian host after feeding on an immune or refractory animal (Davies and Mwakima, 1982).

    b. After infectious feed, *R. appendiculatus* can transmit NSDV to the next instar (Daubney and Hudson, 1934) and *R. appendiculatus* ticks can transmit the disease for long periods post an infectious feed: nymphal ticks remain infectious after 359 days, while adult ticks after 871 days (Lewis, 1946). This all contributes towards persistence of Nairobi sheep disease for long periods (even several years with no clinical manifestation of the disease (Davies, 1978a, b)).

References:

1. Daubney R, Hudson JR. Nairobi Sheep Disease: Natural and Experimental Transmission by Ticks other than Rhipicephalus appendiculatus. Parasitology. 1934;26(4):496-509. doi:10.1017/S0031182000023817

2. Davies, F. G. (1978a). A survey of Nairobi sheep disease antibody in sheep, goats and wild ruminants within Kenya. Journal of Hygiene, 81, 251-258.

3. Davies, F. G. (1978b). Nairobi sheep disease in Kenya. The isolation of virus from sheep and goats, ticks, and possible maintenance hosts. Journal of Hygiene, 81, 259-265.

4. Davies FG, Mwakima F. Qualitative studies of the transmission of Nairobi sheep disease virus by Rhipicephalus appendiculatus (Ixodoidea, ixodidae). J Comp Pathol. 1982 Jan;92(1):15-20. doi: 10.1016/0021-9975(82)90039-1. PMID: 7068952.

5. Hartlaub, J.; Gutjahr, B.; Fast, C.; Mirazimi, A.; Keller, M.; Groschup, M.H. Diagnosis and Pathogenesis of Nairobi Sheep Disease Orthonairovirus Infections in Sheep and Cattle. Viruses 2021, 13, 1250. https://doi.org/10.3390/v13071250

6. Lewis, E. A. (1946). Nairobi sheep disease. The survival of the virus in the tick Rhipicephalus appendiculatus. Parasitology, 37, 55-59.

7. Spickler Rovid A. 2022. Rhipicephalus appendiculatus. Retrieved from http://www.cfsph.iastate.edu/DiseaseInfo/factsheets.php.

[After-note, provided on 10/04/2024 after clarification by the Secretariat]

Question: Additionally, about the tick species implicated in disease transmission, since you have specified that Haemaphysalis and Rhipicephalus are susceptible tick species, can you further elaborate on which tick species are responsible for disease transmission to sheep/goats?

Rhipicephalus appendiculatus is the main tick vector in Africa, while *Haemaphysalis intermedia* is the main tick vector in the Indian subcontinent (Montgomery, 1917; Davies, 1978a, b; Joshi *et al.,* 2005). NSDV African strain was also detected in *Amblyomma variegatum* (Johnson *et al.,* 1980) although this tick species appears less effective in transmission of the disease (Daubney and Hudson, 1934). Although *R. bursa* was shown to transmit NSDV to sheep under experimental conditions, the transstadial transmission of NSDV was not observed and *R. bursa* was found to feed on sheep at low frequencies (Daubney and Hudson, 1934). Therefore, further studies are required to verify whether *R. bursa* can contribute to the spread of NSDV. The following tick species were shown to be unlikely vectors of NSDV: *R. pulchellus*, *R. evertsi*, *R. simus* and *Hyalomma aegyptium* (Daubney and Hudson, 1934). Ganjam virus (an Indian NSDV strain) was also isolated from *R. haemaphysaloides* (Joshi *et al.,* 2005) and *H. wellingtoni* (Rajagopalan et al., 1907), however the efficiency of NSDV transmission by these tick vectors remains to be studied. In China, NSDV was detected in *H. longicornis* (Gong *et al.,* 2016), suggesting that they also might play a role in transmission of NSDV, although no clinical disease has been reported.

References:

1. Daubney, R. & Hudson J. R. (1934). Nairobi sheep disease; natural and experimental transmission by ticks other than *Rhipicephalus appendiculatus*. Parasitology 26, 496-509.

2. Davies, F. G. (1978a). A survey of Nairobi sheep disease antibody in sheep, goats and wild ruminants within Kenya. Journal of Hygiene, 81, 251-258.

3. Davies, F. G. (1978b). Nairobi sheep disease in Kenya. The isolation of virus from sheep and goats, ticks, and possible maintenance hosts. Journal of Hygiene, 81, 259-265.

4. Gong S, He B, Wang Z, Shang L, Wei F, Liu Q, Tu C. Nairobi sheep disease virus RNA in ixodid ticks, China, 2013. Emerg Infect Dis. 2015 Apr;21(4):718-20. doi: 10.3201/eid2104.141602. PMID: 25811222; PMCID: PMC4378503.

5. Johnson BK, Chanas AC, Squires EJ, Shockley P, Simpson DI, Parsons J, Smith DH, Casals J. Arbovirus isolations from ixodid ticks infesting livestock, Kano Plain, Kenya. Trans R Soc Trop Med Hyg. 1980;74(6):732-7. doi: 10.1016/0035-9203(80)90188-1. PMID: 7210125.

6. Joshi MV, Geevarghese G, Joshi GD, Ghodke YS, Mourya DT, Mishra AC. Isolation of Ganjam virus from ticks collected off domestic animals around Pune, Maharashtra, India. J Med Entomol. 2005 Mar;42(2):204-6. doi: 10.1093/jmedent/42.2.204. PMID: 15799531.

7. Montgomery, E. On a tick-borne gastroenteritis of sheep and goats occurring in british east africa. J. Comp. Pathol. Ther. 1917,30, 28–57.

8. Rajagopalan PK, Sreenivasan MA, Paul SD. Isolation of Ganjam virus from the bird tick *Haemaphysalis wellingtoni*, Nuttall and Warburton, 1907. Indian J Med Res 1970; 58 : 1195-6.

[After-note, provided on 10/04/2024 after clarification by the Secretariat]

Question: Furthermore, is there any evidence, old or new on the role of birds (bird-borne carriage of ticks) in the epidemiology of disease spread?

There is no direct evidence that NSDV has been spread from one region to another via bird-born carriage of ticks. However, NSDV was detected on two occasions from *Haemaphysalis wellingtoni* ticks, which are primarily ectoparasite on birds (Rajagopalan *et al.,* 1907). One isolation was made from *H. wellingtoni* nymphs collected from ground drags, and another isolation was made from *H. wellingtoni* nymphs collected from red spurfowl (*Galloperdix spadicea*) (Rajagopalan *et al.,* 1907). Recent modelling of potential NSDV spread by bird-borne carriage of ticks identified seven migratory bird species (***cattle*** egret (*Bubulcus ibis*), brown shrike (*Lanius cristatus*), orange-headed thrush (*Geokichla citrina*), Indian pitta (*Pitta brachyura*), black-headed cuckooshrike (*Lalage melanoptera*) and black-faced bunting (*Emberiza spodocephala*)) which were reported to be infested by NSDV-competent tick vectors (*Amblyomma variegatum*, *H. intermedia*, *H. wellingtoni*, and *H. longicornis*). These birds are known to stop in areas where NSDV is endemic (Kim *et al.,* 2023). All predicted potential spread of NSDV was between countries and regions in which NSDV is already endemic (Kim *et al.,* 2023). The highest probability of NSDV spread was predicted for bird-borne transmission of *A. variegatum* by tree pipit (Anthus trivialis) within East Africa, and *H. longicornis* by black-faced bunting (*Emberiza spodocephala*) between India and Eastern China (Kim *et al.,* 2023). Further surveillance and studies are needed to verify probability of NSDV spread by the bird-borne carriage of ticks.

References:

1. Kim K., Wang H, Cha J., Wang X. The Geographical Coexist of the Migratory Birds, Ticks, and Nairobi Sheep Disease Virus May Potentially Contribute to the Passive Spreading of Nairobi Sheep Disease, Transboundary and Emerging Diseases, vol. 2023, Article ID 5598142, 20 pages, 2023. https://doi.org/10.1155/2023/5598142

2. Rajagopalan PK, Sreenivasan MA, Paul SD. Isolation of Ganjam virus from the bird tick *Haemaphysalis wellingtoni*, Nuttall and Warburton, 1907. Indian J Med Res 1970; 58 : 1195-6

AND

2) At least one country has demonstrated freedom or impending freedom from the disease, infection or infestation in populations of susceptible animals, based on the provisions of Chapter 1.4. **Yes**

Scientific rationale:

As mentioned above, NSDV is endemic in East and Central Africa, Botswana, Mozambique, in the Indian subcontinent (India and Sri Lanka) and in northeastern China (see section above for list of references). While distribution of NSDV might be wider to what is currently known, there are many countries which are NSDV-free (NSDV is not endemic in these countries and it has never been reported; for instance Europe, Americas, large part of Asia, Australia). However, to my knowledge, there is no official reports demonstrating that any country is implementing or demonstrated freedom from NSDV in accordance with the surveillance principles outlined in Chapter 1.4**.**

AND

3) Reliable means of detection and diagnosis exist and a precise case definition is available to clearly identify cases and allow them to be distinguished from other diseases, infections or infestations. **Yes**

Scientific rationale:

In susceptible sheep the fever usually lasts for three to seven days, followed by diarrhoea frequently containing blood. Haemorrhagic petechiae can be observed in the nasal mucosa and in the coronary band above the hoofs (Bin Tarif et al. 2012). Upon postmortem examination lower gastric tract shows haemorrhage in the longitudinal folds; haemorrhage can also be found in the caecum and colon (Bin Tarif et al. 2012). No mouth lesions can be found in the NSDV-infected animals, distinguishing them from animals infected with peste des petits ruminants virus (PPRV), which also circulates in the same parts of Africa (Baron and Holzer, 2015). Susceptible goats show similar, but milder clinical signs (reviewed by Baron and Holzer, 2015).

A validated polymerase chain reaction (PCR) assay, which can be used as a gel-based PCR or a real-time PCR assay, was developed to specifically detect NSDV (both African and Asian isolates), but not other nairoviruses (Bin Tarif et al. 2012). This PCR can detect virus in the whole blood also after the febrile period (Bin Tarif et al. 2012). Several immune assays, including enzyme-linked immunosorbent assay (ELISA), were developed for NSDV (Munz et al. 1984, Hartlaub et al. 2021). However, these immune assays should be validated for cross-reaction with antibodies against other nairoviruses (e.g. Dugbe virus) in field samples. Since animals which survive NSDV infection appear immune to subsequent infections or do not develop clinical disease, the current immune assays might be of little use in proving disease free status. It should be noted that neither mentioned here PCR nor immune assays are commercially available.

References:

1. Baron MD, Holzer B. Nairobi sheep disease virus/Ganjam virus. Rev Sci Tech. 2015 Aug;34(2):411-7. doi: 10.20506/rst.34.2.2367. PMID: 26647464.

2. Bin Tarif A, Lasecka L, Holzer B, Baron MD. Ganjam virus/Nairobi sheep disease virus induces a pro-inflammatory response in infected sheep. Vet Res. 2012 Oct 19;43(1):71. doi: 10.1186/1297-9716-43-71. PMID: 23083136; PMCID: PMC3507801.

3. Hartlaub, J.; Gutjahr, B.; Fast, C.; Mirazimi, A.; Keller, M.; Groschup, M.H. Diagnosis and Pathogenesis of Nairobi Sheep Disease Orthonairovirus Infections in Sheep and Cattle. Viruses 2021, 13, 1250. https://doi.org/10.3390/v13071250

4. Munz E, Reimann M, Fritz T, Meier K. An enzyme-linked immunosorbent assay (ELISA) for the detection of antibodies to Nairobi sheep disease virus in comparison with an indirect immunofluorescent- and haemagglutination test. II. Results observed with sera of experimentally infected rabbits and sheep and with African sheep sera. Zentralbl Veterinarmed B. 1984 Aug;31(7):537-49. doi: 10.1111/j.1439-0450.1984.tb01334.x. PMID: 6385572.

5. Spickler, Anna Rovid. 2020. Nairobi Sheep Disease. Retrieved from http://www.cfsph.iastate.edu/DiseaseInfo/factsheets.php.

AND

4a) Natural transmission to humans has been proven, and human infection is associated with severe consequences. **No**

Scientific rationale:

Only a single case of a natural infection in humans has been reported, which resulted in a mild disease (Dandawate et al. 1969).

1. Dandawate CN, Work TH, Webb JK, Shah KV. Isolation of Ganjam virus from a human case of febrile illness: a report of a laboratory infection and serological survey of human sera from three different states of India. Indian J Med Res. 1969 Jun;57(6):975-82. PMID: 5823182.

OR

4b) The disease has been shown to have a significant impact on the health of domestic animals at the level of a country or a zone taking into account the occurrence and severity of the clinical signs, including direct production losses and mortality. **Yes**

Scientific rationale:

NSDV causes mortality ranging from 30 to 90% depending on susceptibility of the sheep and goat population, while pregnant animals often abort. In India, the virus does not appear to cause disease in native breeds, but it causes severe disease in imported European breeds. In Africa, native species which have not been previously infected develop a severe disease upon NSDV infection, while European breeds appear to be more resilient to the disease. Overall, goats show milder disease outcome than sheep. Once recovered from illness, animals tend to be immune to future infections, while offsprings of immune ewes appear to be protected by maternal antibodies. Therefore, NSDV mostly causes outbreaks when naïve animals are imported into NSDV endemic areas, or the geographical range of NSDV transmitting tick vectors expands due to, for instance, a high level of rainfall.

References:

1. Baron MD, Holzer B. Nairobi sheep disease virus/Ganjam virus. Rev Sci Tech. 2015 Aug;34(2):411-7. doi: 10.20506/rst.34.2.2367. PMID: 26647464.
2. Daubney R and Hudson JR. Nairobi sheep disease. 1931 Parasitology 23, 507-24.
3. Davies FG. A survey of Nairobi sheep disease antibody in sheep and goats, wild ruminants and rodents within Kenya. J Hyg (Lond). 1978 Oct;81(2):251-8. doi: 10.1017/s0022172400025080. PMID: 701789; PMCID: PMC2129766.
4. Davies FG. Nairobi sheep disease in Kenya. The isolation of virus from sheep and goats, ticks and possible maintenance hosts. J Hyg (Lond). 1978 Oct;81(2):259-65. doi: 10.1017/s0022172400025092. PMID: 701790; PMCID: PMC2129769.
5. Ghalsasi GR, Rodrigues FM, Dandawate CN, Gupta NP, Khasnis CG, Pinto BD, George S. Investigation of febrile illness in exotic and cross-bred sheep from Sheep Farm, Palamner in Andhra Pradesh. Indian J Med Res. 1981 Sep;74:325-31. PMID: 6797937.
6. Montgomery RE (1917). On a tick borne gastro-enteritis of sheep and goats occurring in East Africa. Journal of Comparative Pathology 30, 28-57.
7. Spickler, Anna Rovid. 2020. Nairobi Sheep Disease. Retrieved from http://www.cfsph.iastate.edu/DiseaseInfo/factsheets.php.
8. Weinbren MP, Gourlay RN, Lumsden WH, Weinbren BM. An epizootic of Nairobi sheep disease in Uganda. J Comp Pathol. 1958 Apr;68(2):174-87. doi: 10.1016/s0368-1742(58)80018-1. PMID: 13525464.

OR

4c) The disease has been shown to, or scientific evidence indicates that it would, have a significant impact on the health of wildlife taking into account the occurrence and severity of the clinical signs, including direct economic losses and mortality, and any threat to the viability of a wildlife population. **No**

Scientific rationale:

While a few fatal cases of Nairobi sheep disease have been reported among blue duikers (Cephalophus monticola) in zoos or in the wild (reviewed by Spickler 2020), there is no current evidence for significant impact of NSDV on wildlife. This could potentially change if distribution of NSDV changes.

Reference – 1- Spickler, Anna Rovid. 2020. Nairobi Sheep Disease. Retrieved from http://www.cfsph.iastate.edu/DiseaseInfo/factsheets.php.

Conclusion regarding Nairobi sheep disease virus :
Does Nairobi sheep disease virus match the listing criteria that are described in the *Terrestrial Animal Health Code* Chapter 1.2.? **Yes**

Summary Conclusion:

Considering the severity of the disease caused by NSDV in susceptible sheep and goat populations, and the potential of NSDV spread due to a wide range of its tick vectors, it is recommended to monitor the prevalence of Nairobi sheep disease. For instance, a recent study (Krasteva et al. 2020) modeled several neighbouring countries of current NSDV endemic areas to be at risk of NSDV incursions.

It should be noted that basic tick control measures can prevent the introduction of NSDV with animals brought from endemic areas (Baron and Holzer 2015).

References:

1. Krasteva S, Jara M, Frias-De-Diego A, Machado G. Nairobi Sheep Disease Virus: A Historical and Epidemiological Perspective. Front Vet Sci. 2020 Jul 22;7:419. doi: 10.3389/fvets.2020.00419. PMID: 32793646; PMCID: PMC7387652.
2. Baron MD, Holzer B. Nairobi sheep disease virus/Ganjam virus. Rev Sci Tech. 2015 Aug;34(2):411-7. doi: 10.20506/rst.34.2.2367. PMID: 26647464.

Annex 5. Report of the Development of the Case Definition for Infection with small ruminant lentiviruses (maedi visna and caprine arthritis encephalitis)
(1 May 2024 to 30 August 2024)

MEETING OF THE WOAH SCIENTIFIC COMMISSION FOR ANIMAL DISEASES

Paris, 9 to 13 September 2024

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The objective of this report is to provide the rationale and scientific justification for elements of the case definition for infection with small ruminant lentiviruses (maedi visna and caprine arthritis encephalitis), which was developed via videoconference and email exchange between 1 May 2024 to 30 August 2024.

Details of the external experts and WOAH staff who contributed to the drafting process are provided in Appendix 1.

1. Background

Maedi visna and caprine arthritis encephalitis are caused by small ruminant lentiviruses (hereinafter 'SRLVs'). Colostrum and milk are known to be the main source of infections in goats. Respiratory and other bio-secretions have also been identified as a major source of horizontal transmission. In sheep especially, respiratory secretions are a source of infection. The disease can be transmitted through either free virus or virus infected cells, as well as proviral DNA. Lentivirus-infected sheep and goats are largely asymptomatic, but remain persistent carriers of virus and are capable of transmitting infection. There is no evidence that humans are susceptible to any SRLVs.

Maedi visna and caprine arthritis encephalitis are listed in the *Terrestrial Code* Article 1.3.7. Diseases, infections, and infestations listed by the WOAH, in the category of 'caprinae'. While there are corresponding disease-specific chapters in the *Terrestrial Code* (Chapter 14.5. and Chapter 14.1. respectively), there have not been updates since the first adoption in 1992 and do not include case definitions. The *Terrestrial Manual* contains Chapter 3.8.2. on maedi visna and caprine arthritis encephalitis, which was last adopted in 2017.

2. Discussion

2.1. Disease name

The experts recommended to refer to the pathogenic agent, i.e. small ruminant lentiviruses rather than 'maedi visna virus and caprine arthritis encephalitis virus'. To clarify that this continues to refer to the same infection/disease captured in Chapter 1.3., the experts recommended to include in parenthesis that this refers to 'maedi visna and caprine arthritis encephalitis'. Notwithstanding, the Group also noted that in some parts of the world, maedi visna is referred to as ovine progressive pneumonia (OPP).

2.2. Pathogenic agent

As above, the experts agreed that the causal agent for maedi visna and caprine arthritis encephalitis is small ruminant lentiviruses. The experts noted that further differentiation of small ruminant lentiviruses on a molecular basis is at current time not supported and it will therefore be sufficient to refer to the pathogenic agent collectively as 'small ruminant lentiviruses' [1].

2.3. Hosts

The experts identified that domestic sheep and goats, i.e. *Ovis aries* and *Capra hircus* are the primary host species for infection with small ruminant lentiviruses (maedi visna and caprine arthritis encephalitis). The experts recommended reporting maedi visna and caprine arthritis encephalitis in both domestic sheep and goats, i.e. these infections should be reported whether they occur in sheep or goats, based on evidence that the infections can transmit across these two species [2–4].

The experts noted that serological evidence of SRLVs infection has been reported in wild animals [5–10] but the interpretation of this finding with regard to infection status is unclear. Furthermore, descriptions of clinical signs in wild animals are uncommon and there was no evidence of transmission to domestic animals. Also, one expert cited evidence suggesting that SRLVs in wild ruminants may be distinct from maedi visna virus and caprine arthritis encephalitis virus [6]. The experts highlighted that transmission from spillover is rare and there is not enough data to justify the inclusion of wild animals in the case definition.

2.4. Epidemiologic and diagnostic criteria

The experts identified **three options** (either/any one of which is sufficient) for confirming a case of infection with small ruminant lentiviruses for the purposes of notification to WOAH.

2.4.1. Option 1

The experts agreed that virus isolation and identification using molecular methods as described in the *Terrestrial Manual* is a sufficient standalone test.

2.4.2. Option 2

The experts agreed that nucleic acid detection is not sufficient as a standalone to determine a case and should be complemented by other supporting considerations such as an epidemiological link. The experts agreed to include in the supporting diagnosis that partial sequences are amplified and confirmed by sequencing [11–14]. For SRLVs diagnosis, it is usual not only to amplify the genome but also to sequence it in order to classify the strain in the different subtypes. The main reason of this option can be found in the huge genetic variability and difficulty to amplify all the possible strains of these highly heterogeneous viruses.

However, the experts noted that in practice, serological methods are preferred over PCR. There are inherent limitations in PCR methods, and experts noted that there is a lack of standardised or commercial PCR tests. Thus, PCR test is generally done with inhouse standardisation by laboratories. Notwithstanding, the experts noted that quantitative PCR on the samples from blood, bulk milk and spleen is still useful for research [13,15–17].

The experts excluded antigen detection from the diagnostic criteria as there are no available antigen detection methods (not commercially available). One of the experts suggested that immunohistochemistry on necropsy specimens could help identify infection in combination with nucleic acid methods. However, the experts did not agree to include this as a complementary option given that immunohistochemistry is not commonly applied in differential routine diagnosis on live animals due to the high cost, insufficient sensitivity and laboriousness [18,19].

2.4.3. Option 3

The experts noted that serological tests should not be used alone due to the insufficient sensitivity [16,20,21] and the possibility of false positives. Therefore, serological methods should be combined with other evidence or diagnostic methods (e.g. detection of nucleic acid).

Additionally, the experts discussed the presence of maternal antibodies. The life span of antibodies depends on the duration of nursing, type and quality of colostrum. Therefore, the long duration of nursing and the high quality of colostrum would interfere with the test results in young animals. They agreed that the lack of possibility to distinguish between infected and non-infected animals by using ELISA in herds with animals till 6 to 8 months old [22,23]. One of the experts shared that some dairy industries wait until the animals are 1 year old before testing them by ELISA.

There is no need to include DIVA tests since there are no vaccines available.

References

1. WOAH *Terrestrial Manual* Chapter 3.8.2. 'Caprine arthritis/encephalitis and Maedi-visna'
2. Shah C., Böni J., Huder J.B., Vogt H.R., Mühlherr J., Zanoni R., Miserez R., Lutz H. & Schüpbach J. (2004). – Phylogenetic analysis and reclassification of caprine and ovine lentiviruses based on 104 new isolates: evidence for regular sheep-to-goat transmission and worldwide propagation through livestock trade. *Virology*, **319** (1), 12–26. doi:10.1016/j.virol.2003.09.047.
3. Shah C., Huder J.B., Böni J., Schönmann M., Mühlherr J., Lutz H. & Schüpbach J. (2004). – Direct Evidence for Natural Transmission of Small-Ruminant Lentiviruses of Subtype A4 from Goats to Sheep and Vice Versa. *Journal of Virology*, **78** (14), 7518–7522. doi:10.1128/jvi.78.14.7518-7522.2004.
4. Brülisauer F., Vogt H.R., Perler L. & Rüfenacht J. (2005). – Risk factors for the infection of Swiss goat herds with small ruminant lentivirus: a case-control study. *Vet Rec*, **157** (8), 229–233. doi:10.1136/vr.157.8.229.

5. Patton K.M., Bildfell R.J., Anderson M.L., Cebra C.K. & Valentine B.A. (2012). – Fatal Caprine arthritis encephalitis virus–like infection in 4 Rocky Mountain goats (Oreamnos americanus). *J VET Diagn Invest*, **24** (2), 392–396. doi:10.1177/1040638711435503.

6. Peterhans E., Greenland T., Badiola J., Harkiss G., Bertoni G., Amorena B., Eliaszewicz M., Juste R.A., Krassnig R., Lafont J.P., Lenihan P., Pétursson G., Pritchard G., Thorley J., Vitu C., Mornex J.F. & Pépin M. (2004). – Routes of transmission and consequences of small ruminant lentiviruses (SRLVs) infection and eradication schemes. *Vet Res*, **35** (3), 257–274. doi:10.1051/vetres:2004014.

7. Erhouma E., Guiguen F., Chebloune Y., Gauthier D., Lakhal L.M., Greenland T., Mornex J.F., Leroux C. & Alogninouwa T. (2008). – Small ruminant lentivirus proviral sequences from wild ibexes in contact with domestic goats. *Journal of General Virology*, **89** (6), 1478–1484. doi:10.1099/vir.0.2008/000364-0.

8. Minardi da Cruz J.C., Singh D.K., Lamara A. & Chebloune Y. (2013). – Small Ruminant Lentiviruses (SRLVs) Break the Species Barrier to Acquire New Host Range. *Viruses*, **5** (7), 1867–1884. doi:10.3390/v5071867.

9. Olech M., Osiński Z. & Kuźmak J. (2020). – Seroprevalence of small ruminant lentivirus (SRLV) infection in wild cervids in Poland. *Preventive Veterinary Medicine*, **176**, 104905. doi:10.1016/j.prevetmed.2020.104905.

10. Sanjosé L., Crespo H., Blatti-Cardinaux L., Glaria I., Martínez-Carrasco C., Berriatua E., Amorena B., De Andrés D., Bertoni G. & Reina R. (2016). – Post-entry blockade of small ruminant lentiviruses by wild ruminants. *Veterinary Research*, **47** (1), 1. doi:10.1186/s13567-015-0288-7.

11. Minguijón E., Reina R., Pérez M., Polledo L., Villoria M., Ramírez H., Leginagoikoa I., Badiola J.J., García-Marín J.F., Andrés D. de, Luján L., Amorena B. & Juste R.A. (2015). – Small ruminant lentivirus infections and diseases. *Veterinary Microbiology*, **181** (1), 75–89. doi:10.1016/j.vetmic.2015.08.007.

12. Michiels R., Van Mael E., Quinet C., Adjadj N.R., Cay A.B. & De Regge N. (2018). – Comparative Analysis of Different Serological and Molecular Tests for the Detection of Small Ruminant Lentiviruses (SRLVs) in Belgian Sheep and Goats. *Viruses*, **10** (12), 696. doi:10.3390/v10120696.

13. Brinkhof J.M.A., Houwers D.J., Moll L., Dercksen D. & Maanen C. van (2010). – Diagnostic performance of ELISA and PCR in identifying SRLV-infected sheep and goats using serum, plasma and milk samples and in early detection of infection in dairy flocks through bulk milk testing. *Veterinary Microbiology*, **142** (3), 193–198. doi:10.1016/j.vetmic.2009.09.060.

14. Kuhar U., Barlič-Maganja D. & Grom J. (2013). – Development and validation of TaqMan probe based real time PCR assays for the specific detection of genotype A and B small ruminant lentivirus strains. *BMC Vet Res*, **9** (1), 172. doi:10.1186/1746-6148-9-172.

15. Colitti B., Coradduzza E., Puggioni G., Capucchio M.T., Reina R., Bertolotti L. & Rosati S. (2019). – A new approach for Small Ruminant Lentivirus full genome characterization revealed the circulation of divergent strains. *PLOS ONE*, **14** (2), e0212585. doi:10.1371/journal.pone.0212585.

16. Barquero N., Arjona A., Domenech A., Toural C., Heras A. de las, Fernández-Garayzabal J.F., Ruiz-Santa Quiteria J.A. & Gomez-Lucia E. (2011). – Diagnostic performance of PCR and ELISA on blood and milk samples and serological survey for small ruminant lentiviruses in central Spain. *Veterinary Record*, **168** (1), 20–20. doi:10.1136/vr.c4951.

17. Leroux C., Lerondelle C., Chastang J. & Mornex J.F. (1997). – RT-PCR detection of lentiviruses in milk or mammary secretions of sheep or goats from infected flocks. *Veterinary Research*, **28** (2), 115–121.

18. Ramírez H., Reina R., Amorena B., Andrés D. de & Martínez H.A. (2013). – Small Ruminant Lentiviruses: Genetic Variability, Tropism and Diagnosis. *Viruses*, **5** (4), 1175–1207. doi:10.3390/v5041175.

19. Reina R., Berriatua E., Luján L., Juste R., Sánchez A., Andrés D. de & Amorena B. (2009). – Prevention strategies against small ruminant lentiviruses: An update. *The Veterinary Journal*, **182** (1), 31–37. doi:10.1016/j.tvjl.2008.05.008.

20. Andrés D. de, Klein D., Watt N.J., Berriatua E., Torsteinsdottir S., Blacklaws B.A. & Harkiss G.D. (2005). – Diagnostic tests for small ruminant lentiviruses. *Veterinary Microbiology*, **107** (1), 49–62. doi:10.1016/j.vetmic.2005.01.012.

21. Echeverría I., De Miguel R., De Pablo-Maiso L., Glaria I., Benito A.A., De Blas I., De Andrés D., Luján L. & Reina R. (2020). – Multi-Platform Detection of Small Ruminant Lentivirus Antibodies and Provirus as Biomarkers of Production Losses. *Front. Vet. Sci.*, **7**. doi:10.3389/fvets.2020.00182.

22. Czopowicz M., Szaluś-Jordanow O., Mickiewicz M., Moroz A., Witkowski L., Markowska-Daniel I., Reczyńska D., Bagnicka E. & Kaba J. (2018). – Decline of maternal antibodies to small ruminant lentivirus in goat kids. *Animal Science Journal*, **89** (9), 1364–1370. doi:10.1111/asj.13038.

23. Souza T.S.D., Costa J.N., Pinheiro R.R., Melo F.C.C.D., Lima C.C.V.D., Andrioli A., Azevedo D.A.A.D., Santos V.W.S.D., Oliveira E.L.D. & Costa Neto A.D.O. (2014). – Duração da imunidade passiva para lentivírus de pequenos ruminantes em cordeiros. . In *Semina: Ciências Agrárias*. p 845doi:10.5433/1679-0359.2014v35n2p845.

REPORT OF THE DEVELOPMENT OF THE CASE DEFINITION FOR INFECTION WITH SMALL RUMINANT LENTIVIRUSES (MAEDI VISNA AND CAPRINE ARTHRITIS ENCEPHALITIS)

1 May to 30 August 2024

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Annex 6. Work Programme

MEETING OF THE WOAH SCIENTIFIC COMMISSION FOR ANIMAL DISEASES

Paris, 9 to 13 September 2024

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Abbreviations: BSC: Biological Standards Commission; SCAD: Scientific Commission for Animal Diseases; TAHSC: Terrestrial Animal Health Standards Commission (Code Commission).

Priority	Work programme item	Progress
Update of WOAH standards		
	Glossary	
1	Ch. 1.2. Criteria for the inclusion of diseases, infections or infestations in the WOAH list	Not started
1	Ch. 1.3. Diseases, infections and infestations listed by the WOAH	Not on agenda
1	Ch. 1.6. Procedures for official recognition of animal health status, endorsement of an official control programme, and publication of a self-declaration of animal health status, by WOAH	Not on agenda
1	Ch 4.X. New chapter on biosecurity	Ongoing (circulated for comments)
1	Ch 4.4. Zoning and compartmentalisation and Ch 4.Y. Application of zoning	Ongoing
1	Ch. 11.5. Infection with Mycoplasma mycoides subsp. mycoides SC (Contagious bovine pleuropneumonia)	Ongoing (SCAD opinion forwarded to TAHSC at its Sept. meeting)
1	Ch. 12.1. Infection with African horse sickness virus	Ongoing (SCAD opinion forwarded to TAHSC at its Sept. meeting)
1	Ch. 12.3. Dourine	Ongoing (SCAD opinion forwarded to TAHSC at its Sept. meeting)
1	Ch 12.4. Equine encephalomyelitis (Eastern and Western)	Ongoing (SCAD opinion forwarded to TAHSC at its Sept. meeting)
1	Ch 8.10. Japanese encephalitis	Ongoing
1	Ch 12.11. Venezuelan equine encephalomyelitis	Not started
1	Ch. 14.7. Infection with peste des petits ruminants virus	Ongoing
1	Ch.14.8. Scrapie	Ongoing
Official animal health status recognition		
1	Evaluation of Member applications for official recognition of animal health status/endorsement of control programmes	Regular activity
1	Evaluation of annual reconfirmations	Regular activity

Priority	Work programme item	Progress
1	Streamlining the procedure for annual reconfirmations for maintenance of official status	Regular activity
1	Expert missions to Members	Regular activity
1	Evaluation of Members applications for recovery of a suspended official status	Regular activity
Disease control issues		
2	Advise on global strategies and initiatives • FMD • PPR • Rabies • ASF • AI • zTB	SCAD to receive updates on global strategies and initiatives at its Feb 2025 meeting, FMD, Rabies, zTB
2	Assess recent developments in control and eradication of infectious diseases	None as of now
1	Disease prevention and control guidelines • Guidelines on surveillance of AI in smallholder setting • Guidelines on risk management practices at the domestic-wild animal interface	In progress
1	Evaluation of emerging diseases • SARS-CoV-2	In progress
1	Evaluation of pathogenic agents against the listing criteria of Chapter 1.2. • SARS-CoV-2 • Paratuberculosis	In progress
1	Development of case definitions • New World and Old World screwworms • Maedi visna/ caprine arthritis encephalitis • Paratuberculosis	In progress (SCAD reviewed and forwarded its opinion and case definitions to TAHSC; paratuberculosis case definition on hold subject to evaluation against listing criteria)