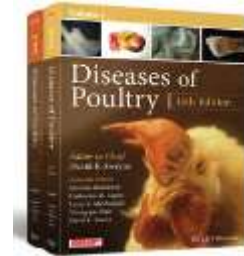


Conclusions and Recommendations from October 2022 IABS Meeting



David E Swayne

Chair of the Scientific Committee



International Alliance for
Biological Standardization

**Vaccination Strategies to prevent and control HPAI:
Removing unnecessary barriers for usage**

Venue: WOHQ Headquarter, Paris
Date : October 25-26, 2022

Disclaimer: This presentation is based on current scientific data and is not an endorsement of any specific product or company

HPAI 2022: Setting the Stage

1. 1959: Scotland, H5N1	22. 2004: USA, H5N2
2. 1961: S. Africa, H5N3	23. 2004: Canada, H7N3
3. 1963: England, H7N3	24. 2004: S. Africa, H5N2 (ostriches)
4. 1966: Canada, H5N9	25. 2006: S. Africa, H5N2 (ostriches)
5. 1975: Australia, H7N7	§ 26. 2005: N. Korea, H7N7
6. 1979: Germany, H7N7	27. 2007: Canada, H7N3
7. 1979: England, H7N7	28. 2008: England, H7N7
8. 1983-84: USA, H5N2	29. 2009: Spain, H7N7
9. 1983: Ireland, H5N8	30. 2011-3: S. Africa, H5N2 (Ostriches)
10. 1985: Australia, H7N7	31. 2012: Chinese Taipei, H5N2
11. 1991: England, H5N1	§ 32. 2012-present: Mexico, H7N3
12. 1992: Australia, H7N3	33. 2012: Australia, H7N7
13. 1994: Australia, H7N3	34. 2013: Italy, H7N7
§ 14. 1994-95: Mexico, H5N2	35. 2013: Australia, H7N2
§ 15. 1995 & 2004: Pakistan, H7N3	36. 2015: England, H7N7
16. 1997: Australia, H7N4	37. 2015: Germany, H7N7
17. 1997: Italy, H5N2	38. 2015: France, H5Nx
§ 18. 1996-present: Eurasia/Afr./N. America, H5Nx (including N1, N2, N3, N5, N6, N8 reassortants) –	39. 2016: USA (Indiana), H7N8
19. 1999-2000: Italy, H7N1	40. 2016: Italy, H7N7
20. 2002: Chile, H7N3	41. 2017: China, H7N9
21. 2003: Netherlands (BLGM, GRM), H7N7	42. 2017: USA (Tennessee), H7N9
	43. 2020: USA (S. Carolina), H7N3
	44. 2020: Australia (Victoria), H7N7

§ Vaccine used in the control strategy

- H5/H7 LP → HPAIV
- 44 HPAI events based on distinct lineages of virus hemagglutinin:

- 41 Emergent (41 eliminated)

- 3 Entrenched

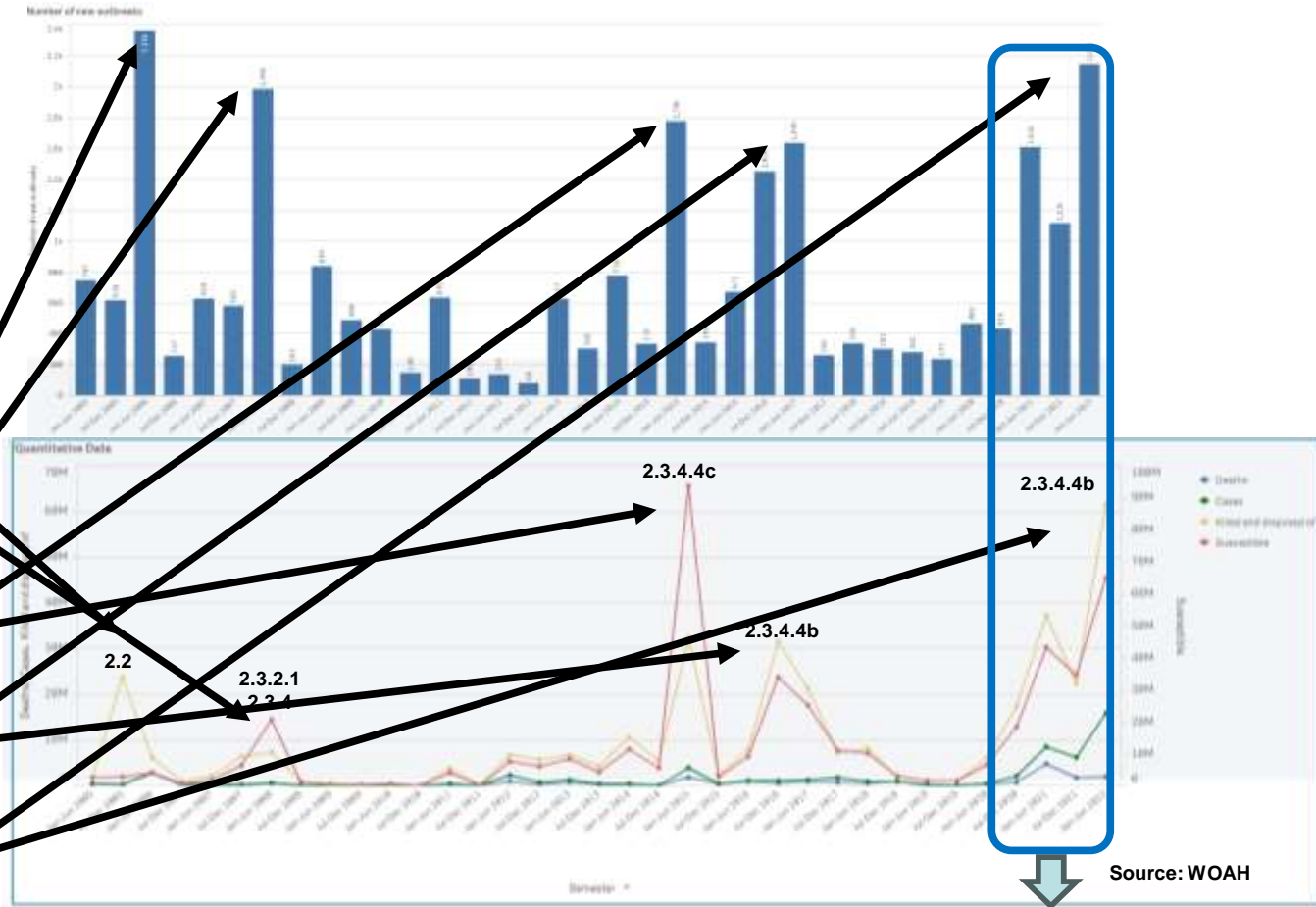
- H5Nx Gs/GD, especially 2344b
- H7N3 N. American
- H7N9 Eurasian

- H5Nx 2344b Gs/GD outbreaks in Africa, Asia, Europe and North America
- >84 countries affected in poultry, wild birds & mammals or humans
- Extensive drift in the hemagglutinin and reassortment of the other 7 gene segments with wild bird LPAI viruses broadening the impact on ecology and epidemiology of the panzootic



Global HPAI: 2005-2022

- HPAI – 5 major waves and these were associated with transcontinental waves of H5 Gs/GD HPAI viruses:
 - 2005: 2.2 clade
 - 2007-08: 2.3.2.1 clade
 - 2014-15: 2.3.4.4c clade
 - 2016-17: 2.3.4.4b clade
 - 2020-22: 2.3.4.4b clade



- 5th wave was a global panzootic: 5771 poultry cases, 154.7 million poultry deaths + culled



Why Did We Have the Meeting?



- **The change in biology, epidemiology and ecology of the H5Nx Gs/GD Eurasian lineage HPAI viruses**
- **The negative effects this is having on production systems (e.g. compulsory housing orders)**
- **The need to explore options to reduce the massive losses of birds and high cost to industry and government from outbreaks**
- **Uptake of vaccination has been slow with reliance solely on biosecurity and response to infections**
- **Recognized that there are several barriers to vaccination that can be overcome**
- **A change is occurring in thinking towards vaccination especially in places that have experienced repeated wild bird introductions and epidemics in poultry**
- **Mounting citizen pressure against mass depopulation**

Major Barriers:



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1. Trade concerns:

- Center on non-acceptance, by importing countries, of any poultry products or birds if vaccines are used (even if limited vaccination is being used or it is only being used in certain sectors, such as vaccination in turkeys but not in broilers).
- Based largely upon concerns that vaccination may mask HPAI infection
- Main barrier to implementing vaccination programs, especially in countries with well-established valuable export markets

2. Appropriate systems for surveillance – linked to trade concerns to demonstrate freedom of HPAI infection in vaccinated flocks

3. Vaccine availability and vaccination:

- Limited number of vaccines are available for use in the EU and USA at present, and will only become available if vaccine producers identify a viable market for their products
- No effective registered vaccine for mass application *on farm* is available
- Inactivated vaccines, which are most doses used globally, are not easily serosurveillance (ie. DIVA) compatible

Concluded:



- **Use of vaccines does not alter avian influenza status from a trade perspective (WOAH Terrestrial Code Article 10.4.1. Provision 6) if an appropriate surveillance system is in place that demonstrates the absence of HPAI infection in poultry**
- **Vaccination of poultry is not a threat to public health**
- **Poultry vaccine and vaccination issues:**
 - **True silent infection (sustained transmission without birds getting sick or dying) in well vaccinated flocks exposed to virus occurs rarely in chickens.**
 - **Transmission of infection following virus incursion is unlikely to occur in flocks with good immunity.**
 - **If transmission does occur, few vaccinated flocks will be 100% immune and a minority of birds with low or no protection will develop disease allowing detection of virus. In domestic ducks, silent infection already occurs in unvaccinated flocks.**
 - **Vaccines that are a poor match to circulating strains should not be used.**
 - **Ongoing surveillance and analysis of circulating HPAI viruses in domestic and wild birds is essential for antigenic updates to vaccines**

Concluded:



- **Poultry vaccine and vaccination issues (cont.):**
 - **Vaccines that induce cellular immunity, such as vector vaccines, help to broaden protection against antigenic variants**
 - **A limited number of vaccines are available for use in the EU and USA at present, and will only become available if vaccine producers identify a viable market for their products**
- **Appropriate systems for surveillance can be developed:**
 - **Must be cost-effective**
 - **Virological surveillance should be the primary method used by demonstrating the absence/presence of virus shedding while serological surveillance can have a role in specific setting such as verifying no virus circulation before major modifications &/or exiting vaccination strategy**
 - **Gaps in knowledge need addressing - especially on relevant sample numbers, methods for targeted surveillance and the role of environmental samples as part of a multi-layered surveillance system**
 - **Need to be adapted to reflect the expected lower prevalence of infection in vaccinated flocks, if it occurs**

Recommended:



- **Conduct additional vaccine trials on farms to assist in developing appropriate surveillance systems for vaccinated poultry populations, with approval of trading partners, to avoid trade barriers:**
 - **Closely monitored to demonstrate response to vaccine, freedom from HPAI infection, and to assess issues such as suitability of different vaccines for different types of birds, costs and issues associated with vaccination**
 - **Assess and develop appropriate surveillance programs, including various alternatives such as greater usage of environmental samples, testing of routine dead birds, and using sufficient vaccinated birds in laboratory challenge studies to mimic the field situation**
- **Support the WOA/FAO Animal Influenza Network (OFFLU) AIM (Avian Influenza Matching) program to assist in matching vaccines to field viruses.**

Recommended:



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- **Continue monitoring for antigenic changes and update vaccine seed strains in countries where HPAI virus infections are endemic**
- **Expand translational research to move advances in vaccine technologies to field**
- **Develop templates for risk assessments of onward spread for HPAI in birds and products from vaccinated and unvaccinated flocks**
- **Formation of a consultative committee on vaccination, involving a range of stakeholders including representation from countries using or considering vaccines, vaccine manufacturers, the poultry sector, trading partners and FAO/WOAH/WHO, to provide support to greater usage of vaccination in association with other control measures**

Summary:



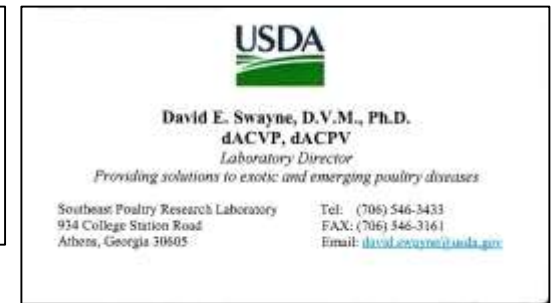
- **The meeting provided information on how vaccines have been and can be used as an additional preventive measure in areas known to be at risk from this disease:**
 - As a preventative response to periods of high risk of introduction,
 - As an emergency response to incursions of virus, and
 - In countries where the virus is endemic.
- **Among the important conclusions from the meeting were that all technical and political barriers to uptake of vaccination can be overcome, with trade considerations and the availability of sufficient quantities of appropriate vaccines likely taking longer to overcome than other barriers.**
- **Key recommendations from the meeting included:**
 - Further vaccine trials on farms that could be used to assist development of appropriate surveillance systems,
 - Support viral genetic and antigenic analysis systems to continually update vaccines and
 - Accelerate translation of advances vaccine technologies to the field

Thank you for your attention!



2023 - present

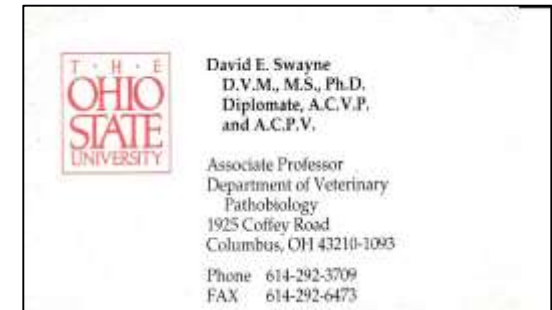
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2024-present



1994 - 2022



2010 – 2011 (Sabbatical)



1987 - 1994