



# Vaccine perspectives

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## IABS Background

- A scientific society established in 1955
- Recognized as a non-profit organization in Switzerland, France and the United States
- Independent interface between stakeholders
- Working relationships with WOAHP and WHO



## IABS MISSION

To contribute to the scientific and medical advancement of Biologicals by **facilitating the communication** among those who develop, produce and regulate **biological products** for human and animal health.



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# HIGH PATHOGENICITY AVIAN INFLUENZA VACCINATION STRATEGIES TO PREVENT AND CONTROL HPAI : REMOVING UNNECESSARY BARRIERS FOR USAGE

## Paris, France - An IABS Hybrid Meeting

### October 25 - 26, 2022



## Outline / Questions

- a. What are the primary reasons for limited availability of high quality, potent vaccines for use against HPAI in chickens, turkeys, ducks and other poultry species?
- b. Do we encourage revision of regulatory processes to reduce time to update avian influenza vaccine seed strains or hemagglutinin gene inserts of registered vaccines. How can we reduce the time for vaccine registration?





## Outline / Questions

- c. Are new vaccine technologies needed and/or are under development to improve immunization of diverse poultry species or specialized species, different ages and in different production types of poultry?
- d. Where is financial support coming for vaccine development, vaccine registration processes and development of vaccine banks or initial production of HPAI?
- e. Where do we need innovation in poultry influenza vaccines?



# Outline

- **What vaccines are available ? For which purpose ? For which species ?**
- **Can we register them quickly ? Strain adaptation ?**
- **Is research and money available ?**
- **What more can we do ?**



# Vaccination purposes

- **What for ?**
  - Protect the life, health and economic value of the birds (endemic countries)
  - Prevent the spread of the virus (Countries that want to eradicate)
    - Preventative
    - Emergency
- **Which species ?**
  - *Gallus* data mostly
    - Some turkey data
    - Some duck/goose data
- **What type of birds ?** ong lived or broiler
- Vaccine choice function of your strategy





# Vaccine parameters

## Clinical and Paraclinical parameters

- Control of morbidity and mortality
- Shedding of infection virus / Transmission to naive birds /  $R_0$
- Onset of immunity
- Duration of immunity
- Cross protection

## Other factors

- DIVA
- Compatibility with maternal antibodies / Age of administration
- Route of administration
- Booster or not

## Cost



# Type of vaccines (1)

## Inactivated (killed) vaccines

- Full virus totally inactivated
- Registered in many countries, widely used

## Vector vaccines

- A non-pathogenic reproducing virus (HVT, FP, ND) with a Hemagglutinin gene inserted by genomic techniques
- Most common vector HVT (Marek)
- Registered and used in many countries

## Subunit vaccines

- Contains specific viral proteins (H, N or structural)
- Some contain complete viral external structure (VLP)
- Can be produced in cellular systems from baculoviruses
- Registered in some countries, used



# Type of vaccines (2)

## RNA vaccines

- mRNA or self-amplifying mRNA
- Broad immune response (cellular)
- Duck trial in France
- In development

## DNA vaccines

- DNA plasmid including H5 gene
- Broad immune response
- Authorized and used in some countries

## Live attenuated vaccines

- Risk of recombination



# Vaccine availability

- **Broad range of technologies available, either registered or in late development**
  - Very favorable situation in comparison to human vaccines
  - Cost
  - But all "needle"
- **Able to respond to different requirements, productions type**
  - Need more "species" data
- **Industrial capacity is there (but not instantly)**



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# Registration

- In the past, industry has refrained to put forward registration dossiers for lack of a prospective market
  - This is changing
  - Some agencies propose platforms by which strain adaptation is possible
  - Minor species will always be a challenge for industry
- Regulatory emergency procedures available
- Reliance on other agencies possible
- Are regulatory requirements adapted to the purpose ?
  - Life/ health vs shedding / transmission
- Industrial capacity is there
- **It is a matter of political will, industry ready**





# Beyond registration

1. **Vaccine development:** trials + approvals processes (emergency/accelerated)
2. **Vaccination strategy in country:** season, species, type of birds, type of vaccine(s), zone, type of vaccination (emergency/preventive), etc.... and cost/benefit analysis
3. **Diagnostics development:** trials, harmonization, approvals, etc.
4. **Development/set up of surveillance systems:** in country, agreement between private and public sectors on who does what, etc.
5. **Agreement on finances of vaccination:** (compensation/ help to farmers?)
6. **Political agreement:** between trading countries on which diagnostics, surveillance systems, vaccinations, etc. are acceptable for allowing trade

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## Financial means

- Industry can invest in developing vaccines if vaccination is allowed
- Financial problem is around increased surveillance and compensation



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# What more can we do ?

- "*Vaccination is dangerous because it will select for mutants*"
  - Yes, but vaccination also reduces chances of recombination
  - Example of Infectious Bronchitis (1)
- "*We need a vaccine that does not allow any shedding*"
  - Shedding and transmission are not the same thing
- "*Vaccination will hide circulation of the virus*"
  - Efficient vaccination strategy and adapted surveillance can take care of this

# What more can we do ?

- Immense challenge
  - Pandemic risk increasing
  - Biodiversity losses
  - Food prices
- It will be very hard to explain that we do not vaccinate solely for economical (trade) reasons
- IGOs should focus on standards and training
- Industry should work on development (i.e. routes) and registrations
- Regulatory authorities should speed up reviews of industry applications
- Countries should make more use of WOAHP standards





Thank you so much for  
your attention !

Muchas gracias !