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## Technical meeting on HPAI Vaccination: Approach, tools, knowledge and experience for the Americas

**Experience from Hong Kong SAR**

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### Background of Implementing HPAI Vaccination in Hong Kong

- ◆ Currently, there are **28 active chicken farms** in Hong Kong
  - Holding capacity varying from 10,000 to 162,300 chickens for each farm
  - Total maximum holding capacity: about 1,300,000 chickens
- ◆ Sporadic **H5 HPAI outbreaks** have occurred at the farm level since 1997
  - **Culling** of the live chickens on farm had been conducted as the major control measure for these outbreaks
- ◆ The **compulsory preventive HPAI vaccination campaign** fully implemented in 2003
  - Since then, only one H5 HPAI outbreak was reported in 2008, which was also the latest outbreak at the farm level

HPAI Outbreak at Farm Level (Month/Year)	Estimated No. of Chickens Culled
12/1997	1,300,000
5/2001	1,200,000
2/2002	900,000
12/2002	16,000
1/2003	10,000
12/2008	90,000

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## HPAI Vaccines Used in Hong Kong

Year of introduction	Vaccine introduced	Strains of seed viruses (clades)
2003	H5 Intervet Nobilis; monovalent	A/duck/Potsdam/1402-6/1986 (H5N2, European LPAIV)
2012	*H5 Re-5 / H5 Re-6; monovalent	H5 Re-5: A/duck/Anhui/1/2006 (H5N1, clade 2.3.4) H5 Re-6: A/duck/Guangdong/S1322/10 (H5N1, clade 2.3.2.1)
2016	*H5 Re-6 + Re-8; bivalent	H5 Re-6: A/duck/Guangdong/S1322/10 (H5N1, clade 2.3.2.1) H5 Re-8: A/chicken/Guizhou/4/2013 (H5N1, clade 2.3.4.g)
2018	*H5 Re-8 + H7 Re-1; bivalent	H5 Re-8: A/chicken/Guizhou/4/2013 (H5N1, clade 2.3.4.g) H7 Re-1: A/pigeon/Shanghai/S1069/2013 (H7N9)
2019	*H5 Re-11 + H7 Re-2; bivalent	H5 Re-11: A/duck/Guizhou/S4184/2017 (H5N6, clade 2.3.4.4h) H7 Re-2: A/chicken/Guangxi/SD098/2017 (H7N9)
2022	*H5 Re-13 + H5 Re-14 + H7 Re-4; trivalent	H5 Re-13: A/duck/Fujian/S1424/2020 (H5N6, clade 2.3.4.4h) H5 Re-14: A/whooper swan/Shanxi/4-1/2020 (H5N8, clade 2.3.4.4b) H7 Re-4: A/chicken/Yunnan/SD024/2021 (H7N9)

\*Developed by the National Avian Influenza Reference Laboratory of Harbin Veterinary Research Institute



2003



2012



2022

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## General HPAI Vaccination Strategy for Chicken Farm

- ◆ Compulsory H5/H7 vaccination for all chickens in each flock
  - **First dose** of H5/H7 vaccination at 8 – 10 days old
  - **Second dose** of H5/H7 vaccination 4 weeks after the first dose (i.e. at around 36 – 40 days old)
  - For chickens aged 120 days old or more (e.g. breeders), a **booster dose** of H5/H7 vaccine is required, followed by further booster shots once every 6 months or whenever the antibody titre of vaccinated chickens in the same batch failed in routine serosurveillance



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## Surveillance Approach for Vaccinated Flocks in Chicken Farms

- ◆ Random sampling of **oropharyngeal and cloacal swabs from vaccinated chickens** (n = 30) of pre-sale chicken batch for **H5 & H7 AI PCR test**
- ◆ Random sampling of **blood samples from vaccinated chickens** (n = 30) for **AI vaccination efficacy evaluation (by H5 & H7 serological HI test)** on each chicken batch 4 weeks after second AI vaccination
- ◆ Random sampling of **blood samples from vaccinated breeders** (n = 30) batch for **H5 & H7 serological HI test** on a regular basis
- ◆ **Environmental sampling** on a regular basis for **AI virological testing**
- ◆ Routine **AI surveillance on dead chickens** found on farm during regular inspections

Market sale of the chickens will only be approved if –

- **≥ 70%** of blood samples from vaccinated chickens show **H5 and H7 HI titers ≥ 1:16** (revaccination would be required for the concerned batch of chickens if failed); and
- **Negative PCR results** for subtypes H5 and H7 AI viruses



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## Other AI Surveillance Activities in Hong Kong

**AI Testing Statistics (2020-2022)**

	2020	2021	2022
	Number of samples	Number of samples	Number of samples
Local Poultry Farms	15521	15166	14006
Import Poultry	0	0	0
Poultry Markets	4485	5074	5211
Wild birds	9778	10828	12198
Pet birds	3060	3216	3267
Park birds	2553	2467	1718
Other locations	601	577	520
<b>Total</b>	<b>35998</b>	<b>33601</b>	<b>36920</b>



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## Major Concerns on Feasibility and Applicability in Other Places

- ◆ Frequent **official farm visits** are being conducted which may not be acceptable in other places with a higher number of farms
- ◆ The Hong Kong government **fully covers the cost** of the AI surveillance activities which may not be affordable in other places with a much larger poultry production scale
- ◆ The chickens produced from chicken farms in Hong Kong are **solely supplied for local consumption**
  - **International trade** is not a concern for HPAI vaccination in Hong Kong compared to other countries



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## Latest Review on Sentinel Surveillance Approach in Hong Kong

- ◆ The AI surveillance and monitoring mechanism using **unvaccinated sentinel chicken** has been in place in local chicken farms since compulsory HPAI vaccination implemented
  - Primarily for the **detection of sustained silent infection** in vaccinated flocks if it were to occur
- ◆ The mechanism was adopted when vaccination was first introduced to Hong Kong, where there were **limited cost-effective options** available for surveillance and monitoring (esp. DIVA not applicable)
  - More surveillance options are available nowadays with **technology advancement**
  - Equivalent AI surveillance information could be obtained by **alternative AI surveillance approaches**



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## Latest Review on Sentinel Surveillance Approach in Hong Kong

- ◆ With 20 years' experience of implementing AI vaccination in Hong Kong, it is considered that **silent infection is unlikely to occur in well vaccinated flocks**, with good antibody response against a well-matched vaccine antigen to the circulating field strains
  - The **limited shedding** in vaccinated chickens is very unlikely to result in sustained transmission
  - The presence of unvaccinated sentinel chickens on farm may on the contrary pose a **higher introduction and transmission risk** of HPAI
  - Experience learnt from the HPAI outbreak at the farm level in 2008



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## Latest Review on Sentinel Surveillance Approach in Hong Kong

- ◆ Sentinel chickens were tested positive serologically in multiple occasions every year, leading to **suspension of farms** for thorough disease investigation of the flocks
  - **None** of the them has been detected as being **HPAI virus-positive** over the years
  - Likely by mixing up of vaccinated chicken with sentinel chicken, or mis-vaccination of sentinel chicken due to **farm management issues**
  - Possibly **cross reactivity on serology** due to coincidental presence of other viruses (e.g. H9 AI)



**Cessation of the sentinel surveillance approach for vaccinated flocks in local chicken farms since October 2022**

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