



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

Using Vaccines for Foreign Animal Disease

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Canada 

Official vs non official status



- FMD is considered by WOAHA to be one of 6 diseases having **official status** and therefore Countries must provide **documented proof**, to be reviewed by WOAHA for decision before the creation of any zone or the declaration of **country freedom**.
- If WOAHA accepts the **documented proof** they will re-instate the status of the country or zone lost during an outbreak, by publishing on their website.
- Once WOAHA has reinstated a country's free status, **negotiations with trading partners** can begin so that trade can resume.
- AI and ASF are **not WOAHA official status** diseases and so countries can **self-declare** country or zone freedom during an outbreak and as long as **trading partners agree**, trade can resume.

Approach to vaccination



- **Vaccination** for AI , ASF and FMD have very different approaches.
- Standard **inactivated vaccines** are (3 PD 50) and require a primer dose and a booster dose while for FMD we use **high potency vaccines** (at least 6 PD 50) which may provide some **cross protection** if the vaccine is not perfectly matched to the virus.
- Generally only one dose is needed for **FMD emergency vaccination** which provides up to 6 months protection.
- For AI and ASF the purpose of using vaccines is to to **protect the animals** from infection.
- For FMD the purpose of using vaccines is to **reduce the virus in the environment** and because we may be vaccinating exposed animals we likely will end up having to dispose of them in order to comply with WOAHP requirements.
- Having a **DIVA test** and the revised **emergency zoning** procedure may allow us to pursue a vaccinate to live strategy

Vaccination for Avian Influenza



- WOAHA specifically says in the Chapter on Infection with high pathogenicity avian influenza viruses that vaccination will **not affect the high pathogenicity avian influenza status** of a free country or zone **if surveillance supports the absence of infection**, in accordance with Article 10.4.28., in particular point 2.
- This requires that testing must be conducted in **all vaccinated flocks** to ensure the **absence of virus** circulation.
- The tests need to be **repeated** at a frequency that is proportionate to the risk in the country, zone or compartment.
- The testing requirements come at a **huge cost** to countries wanting to vaccinate and continue to **trade internationally**.

Avian Influenza Vaccination Issues



- Vaccination for AI as well needs to be targeted and **matched to the specific strain**, much like the yearly vaccination for flu.
- CFIA is still exploring our **approach** to vaccination.
- Most **outbreaks in 2022-2023**, except for some in the Fraser valley, were **point source** introductions and without vaccinating all birds in Canada, it would be **difficult to protect** against these kinds of introductions.
- Some of the questions currently being examined by CFIA are, do you **vaccinate all birds** or **only high value birds** or even just **specific segments** of the industry, who **pays** for the vaccine, what are the **trade impacts** and what if a **different strain** emerges that the vaccine does not protect against.

ASF Vaccination



- WOAHA does not mention **vaccination** in the **ASF chapter**, likely due to the fact that there have been **no vaccines for ASF** available, although there are a few **promising** candidates particularly those being **licensed** in Vietnam.
- None of these vaccines have **DIVA capability**, and therefore it is unlikely that they will be used in **ASF free countries** due to potential **trade** impacts.
- At this point no way to **differentiate** the vaccinated from infected animals

Foot and Mouth Disease Vaccination



- Due to the **persistent** nature of FMD virus in Cattle, WOAHA currently requires that **documented proof of freedom** cannot be submitted for review by WOAHA until **three months** after the disposal of the last animal killed or the slaughter of all vaccinated animals, whichever **occurred last**, where a **stamping-out policy**, and **emergency vaccination** have been employed.
- This period increases to **six months** after the disposal of the **last animal killed** or the **last vaccination** whichever occurred last, where a **stamping-out policy**, **emergency vaccination not followed by the slaughtering** of all vaccinated animals.
- This also requires a **serological survey** based on the detection of antibodies to non-structural proteins of FMDV in **all vaccinated animals** and their **offspring**, to demonstrate no **evidence of infection** in the remaining vaccinated population.



Where will vaccination be used in Canada

- **Delays to depopulation** lead to large outbreaks, usually due to the resource constraints needed to depopulate within **24-48** hours.
- Delays allow animals to **continue to produce virus** that spreads via aerosol.
- The three most relevant factors in large outbreaks are
 - 1. a **high density** of susceptible species;
 - 2. **large geographic spread** in the first 7-10 days and;
 - 3. **large number of infected premises** in the first 7 – 10 days.



What vaccination does is **buy us time**, as it **flattens the curve** of the outbreak.

The **decision to vaccinate** will be made around **Day 7 – 10** when the epi investigation indicates we do not have sufficient resources to successfully depopulate in the **24-48 hour window**.

Proposed Changes to Recovery of Status Article 8.8.7.



Current

- a) **six months** after the disposal of the last animal killed or the last vaccination whichever occurred last, where a stamping-out policy, emergency vaccination not followed by the slaughtering of all vaccinated animals, and surveillance in accordance with Articles 8.8.40. to 8.8.42. are applied. However, this requires a serological survey based on the detection of antibodies to **nonstructural** proteins of FMDV to demonstrate **no evidence of infection** in the remaining vaccinated population.

Proposed

- c) **six months** after the disposal of the last animal killed or the last *vaccination*, whichever occurred last, where a *stamping-out policy*, emergency *vaccination* not followed by the slaughtering of all vaccinated animals, and *surveillance* in accordance with Articles 8.8.40. to 8.8.42. are applied. However, this requires a serological survey based on the detection of antibodies to **NSP** of FMDV to **demonstrate no transmission of FMDV** in the vaccinated *population*. This period can be reduced to a minimum of three months if a country can submit sufficient evidence demonstrating absence of infection in the non-vaccinated population, and absence of transmission in the emergency vaccinated population based on the provisions of point 7 of Article 8.8.40.

Claim of recovery of freedom



- This may be achieved when answering the **relevant questionnaire** in Chapter 1.11. by demonstrating compliance with **either** (a) **or** (b) and (c) below, in the area(s) where **emergency vaccination** has been applied.
 - (a) requires **all vaccinates** to be tested **as well as their offspring** (Only useful in where very small numbers were vaccinated).
 - OR**
 - (b) **random (can be risk based stratified) serological surveillance** in vaccinated herds while in non-vaccinated herds, surveillance of 1% at herd level and 5% within herd prevalence.
 - and**
 - (c) **Vaccine efficacy** and vaccination **effectiveness** of the **emergency vaccination** (at least **6PD50** or equivalent) deployed have been demonstrated.



*“You been
farming
long?”*

Questions?

Proposed Changes to Recovery of Status Article 8.8.7.



Actuel

- c) **six mois** après l'élimination du dernier animal abattu ou après la dernière vaccination (selon l'événement se produisant en dernier) lorsqu'est pratiqué un abattage sanitaire complété par une vaccination d'urgence non suivie de l'abattage de tous les animaux vaccinés, ainsi que par la mise en place d'une surveillance conformément aux articles 8.8.40. à 8.8.42. Toutefois, cela nécessite la réalisation d'enquêtes sérologiques reposant sur la détection d'anticorps dirigés contre les protéines non structurales du virus de la fièvre aphteuse afin de démontrer l'absence **de mise en évidence d'une infection** dans la population vaccinée restante.

Proposé

- c) **six mois** après l'élimination du dernier animal mis à mort ou après la dernière *vaccination*, selon l'événement se produisant en dernier, lorsqu'est pratiqué un *abattage sanitaire* complété par la mise en place d'une *vaccination* d'urgence non suivie de l'*abattage* de tous les animaux vaccinés, ainsi que par la mise en place d'une *surveillance* comme prévu aux articles 8.8.40. à 8.8.42. Toutefois, cela nécessite la réalisation d'enquêtes sérologiques reposant sur la détection d'anticorps dirigés contre les **NSP** du virus de la fièvre aphteuse, afin de **démontrer l'absence de transmission du virus de la fièvre aphteuse** dans la *population* vaccinée. Cette période peut être ramenée à un minimum de trois mois si un pays peut présenter des éléments probants, suffisants pour démontrer l'absence d'infection dans la population non vaccinée, et l'absence de transmission dans la population vaccinée en urgence, en s'appuyant sur les dispositions énoncées au point 7 de l'article 8.8.40.