MINISTÈRE
DE L'AGRICULTURE
ET DE LA SOUVERAINETÉ
ALIMENTAIRE

Liberté
Égalité
Fraternité

anses

Highly pathogenic avian influenza vaccination campaign in ducks in France: review and outlook

Béatrice Grasland , E. Niqueux, A. Schmitz, M. Salines, A. Scoizec, S. Le Bouquin, N. Eterradossi & AI NRL – ANSES

Karen Bucher, Andrea Jimenez-Pellicer, Olivier Debaere – DGAl

22/10/2024

IABS
International Alliance for Biological Standardization

World Organisation for Animal Health
Founded as OIE

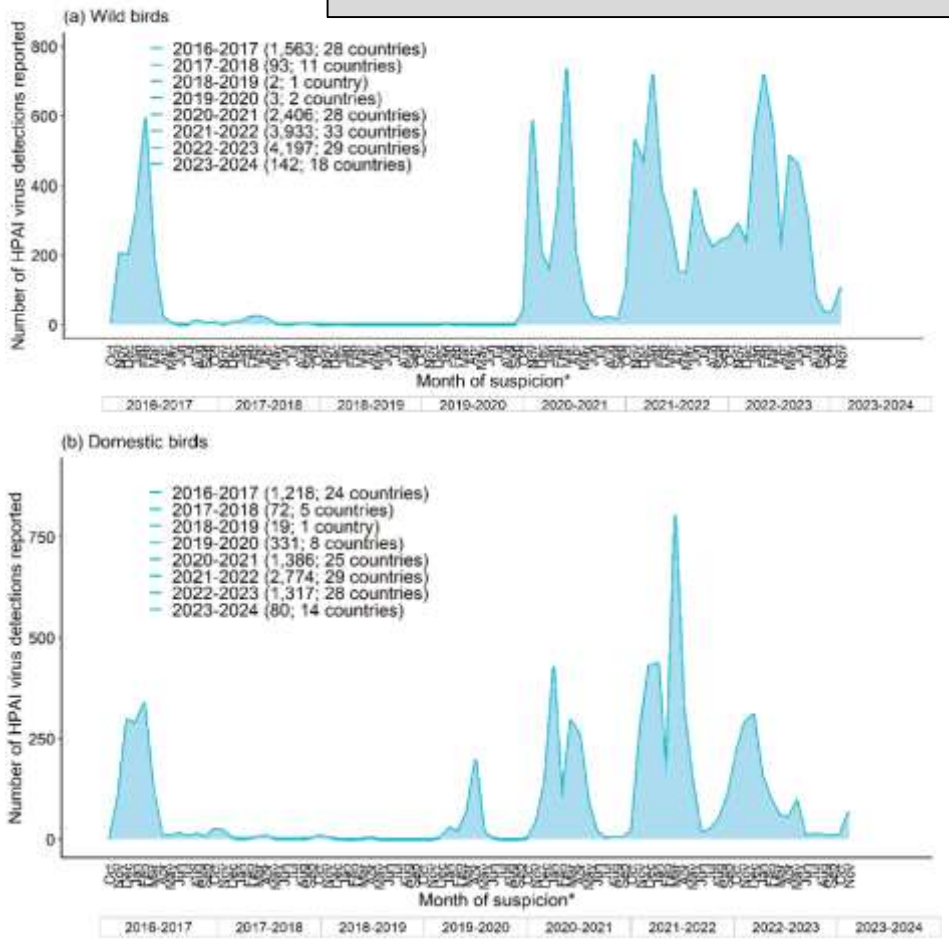
Vaccination and Surveillance for High Pathogenicity Avian Influenza in poultry: Current Situation and Perspectives – October 22-23, 2024 – WOAH, Paris

MINISTÈRE
DE L'AGRICULTURE
ET DE LA SOUVERAINETÉ
ALIMENTAIRE

anses

CONTEXT

Increase of **successive epizootics of HPAI H5** of clade 2.3.4.4b since **2016** as well of the number of affected wild birds and poultry



In France:

2016-2017 : HPAI H5N8

488 flocks affected mainly ducks in south-west of France- 4.5 millions of poultry culled

2020-2021 : H5N8

492 flocks affected mainly ducks in south-west of France - 3.3 millions of poultry culled

2021-2022 : H5N1

1377 flocks affected mainly duck production areas - 22 millions of poultry culled

2022-2023 : H5N1

402 flocks affected - 10 millions of poultry culled

https://doi.org/10.2903/j.efsa.2023.8539

MINISTÈRE
DE L'AGRICULTURE
ET DE LA SOUVERAINETÉ
ALIMENTAIRE

anses

A regulatory framework for HPAI vaccination

Ministerial order of September 25, 2023

Strategy	• Preventive vaccination
Species	• Ducks (Muscovy, Mule and Pekin)
Zone	• All mainland France (except Corsica)
Period	• Year-round, from October 2023

Species	Production flocks	Reproduction flocks
Ducks	Mandatory vaccination	Vaccination prohibited for breeding ducks whose products (hatching eggs and day-old ducklings) are exported to other Member States and third countries.
Gallus	Vaccination prohibited	Vaccination prohibited
Other species	Vaccination prohibited	Vaccination prohibited

MINISTÈRE
DE L'AGRICULTURE
ET DE LA SOUVERAINETÉ
ALIMENTAIRE

anses

VACCINES

- **The vaccine used must :**
  - Effective on HPAI strain clade 2.3.4.4.b
  - DIVA strategy capability using NP ELISA serology
  - Authorized for use by ANMV https://www.anses.fr/fr/content/médicaments
- **A 1st order: 80 million doses == > VOLVAC BEST vaccine**
- **A 2nd order: 61 million doses == > VOLVAC BEST and CEVA Respons H5 vaccines**

Vaccine and manufacturer	Duck species	Administration route	Storage	DIVA Strategy using NP serology	Vaccination at 1 day of age	Vaccination scheme
Volvac BEST AI+ND BOERHINGER INGELHEIM	Pekin Duck, Mule duck,	Sub-cutaneous	**+5°C**	**Yes**	Yes	2 injections: D1 or D10
	Muscovy duck				No	and D28
Ceva Respons H5 CEVA	Mule duck, Pekin Duck, Muscovy duck	Intramuscular	**72h +2-8°C** **28d ≤ -20°C** **24 months at ≤ -60°C**	**Yes**	Yes	2 injections: 1 day and 3-4 weeks later

Financial support for the campaign 2023-2024:

85% for government 15% farmers

ENHANCED POST-VACCINATION MONITORING

According EU regulation 2023/361

Terms and conditions	Enhanced passive surveillance	Active monitoring	Serological survey to assess campaign effectiveness
Where?	Epidemiology Unit	Epidemiology Unit	Batch
Who?	Breeder or Technician	Appointed sanitary veterinarian	Appointed sanitary veterinarian
Frequency?	Weekly	Every 30 days: Clinical examination and virological analysis	At the end of the batch : serological analysis
How?	Swabs on 5 dead ducks	Swabs (ET/EOP) from 60 animals	Blood sample from 20 animals
Analysis?	Virology by real-time RT-PCR M gene. (If positive ➔ screening H5/H7)	Virology by real-time RT-PCR M gene (If positive ➔ screening H5/H7)	ELISA NP serology
Type of laboratory?	Recognized laboratory	Approved laboratory	Approved laboratory

French network of AI/ND laboratories

AI/ND French NRL

Network of laboratories
for AI and ND surveillance in main poultry production areas:

- Approved for molecular detection of AIV, virology and serology : 18
- Recognized for molecular detection of AIV : 36 (including approved)

Egg isolation:
2 approved laboratories

Data logging system

CALYPSO

- To collect data on **vaccinations** and interventions carried out by the **veterinarian** or under his supervision: **vaccination and monthly visit.**

SIGAL

- To collect surveillance data: **laboratory analysis results**

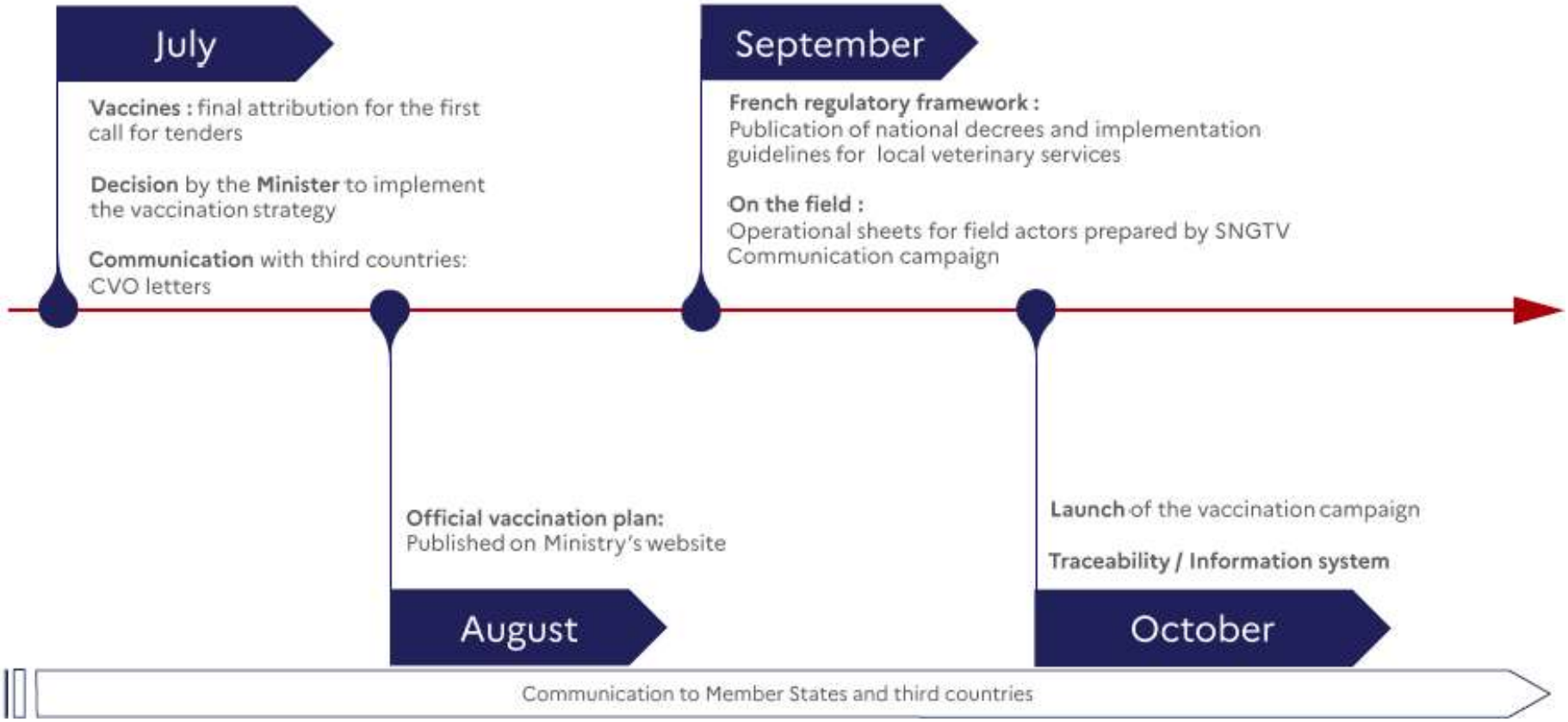
CARTOGIP

- To combine movement data declared by the operator and vaccination data from Calypso, and thus ensure **traceability of vaccinated animals**.

MINISTÈRE
DE L'AGRICULTURE
ET DE LA SOUVERAINETÉ
ALIMENTAIRE

anses

Main steps during first vaccination campaign 2023-2024



Main steps during first vaccination campaign 2023-2024

October

vaccination campaign **launched**

VACCINE: Use of VOLVAC BEST BI vaccine

December - March

VACCINATION: 3-dose risk-targeted vaccination strategy

April

SURVEILLANCE: modification of the passive surveillance protocol

MAY

VACCINES: use of VOLVAC BEST and CEVA RESPONS vaccines

VACCINATION: Pilot phase of vaccination at hatcheries

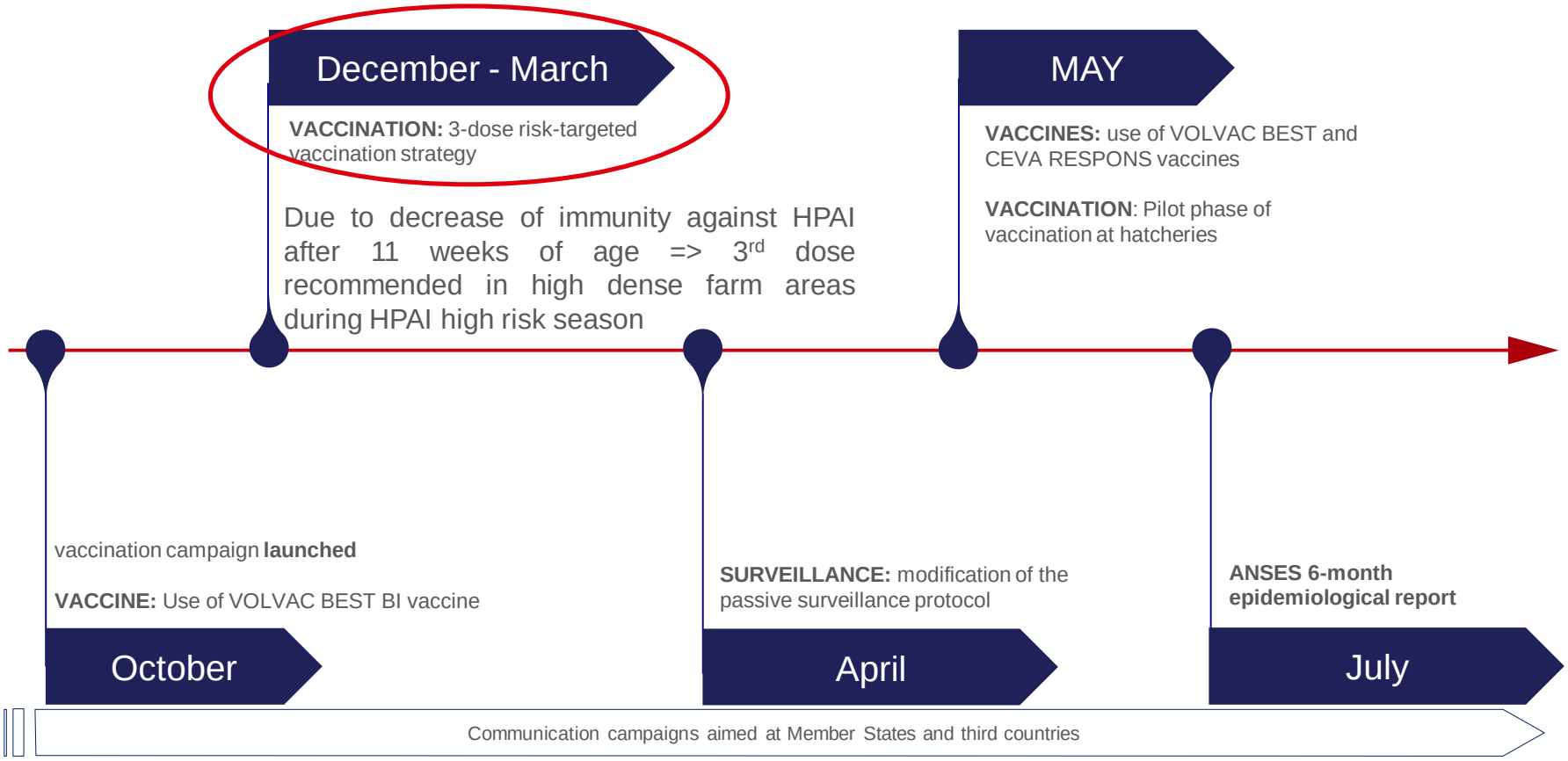
July

ANSES 6-month epidemiological report

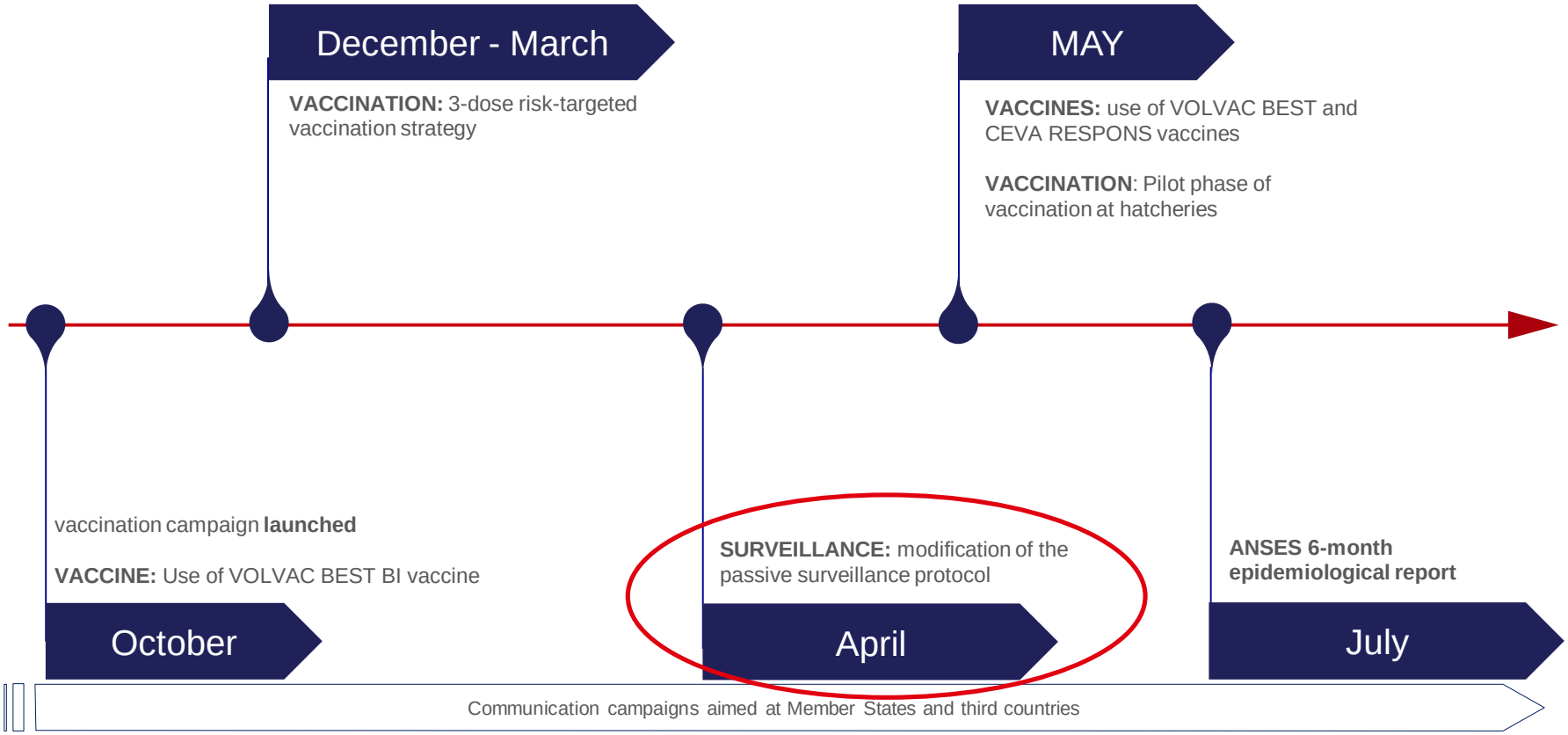
Communication campaigns aimed at Member States and third countries

Audits of the vaccination sites by the sanitary veterinarians in charge of the vaccination implementation

Main steps during first vaccination campaign 2023-2024



Main steps during first vaccination campaign 2023-2024



Modification of the passive surveillance protocol according experimental tests of storage and transport performed at French AI NRL: 5 dead or morbid ducks each week sampled (OP swab), storage at +4°C or -20°C if not possible, dispatch to a lab at +4°C

MINISTÈRE
DE L'AGRICULTURE
ET DE LA SOUVERAINETÉ
ALIMENTAIRE

anses

Vaccination follow-up report

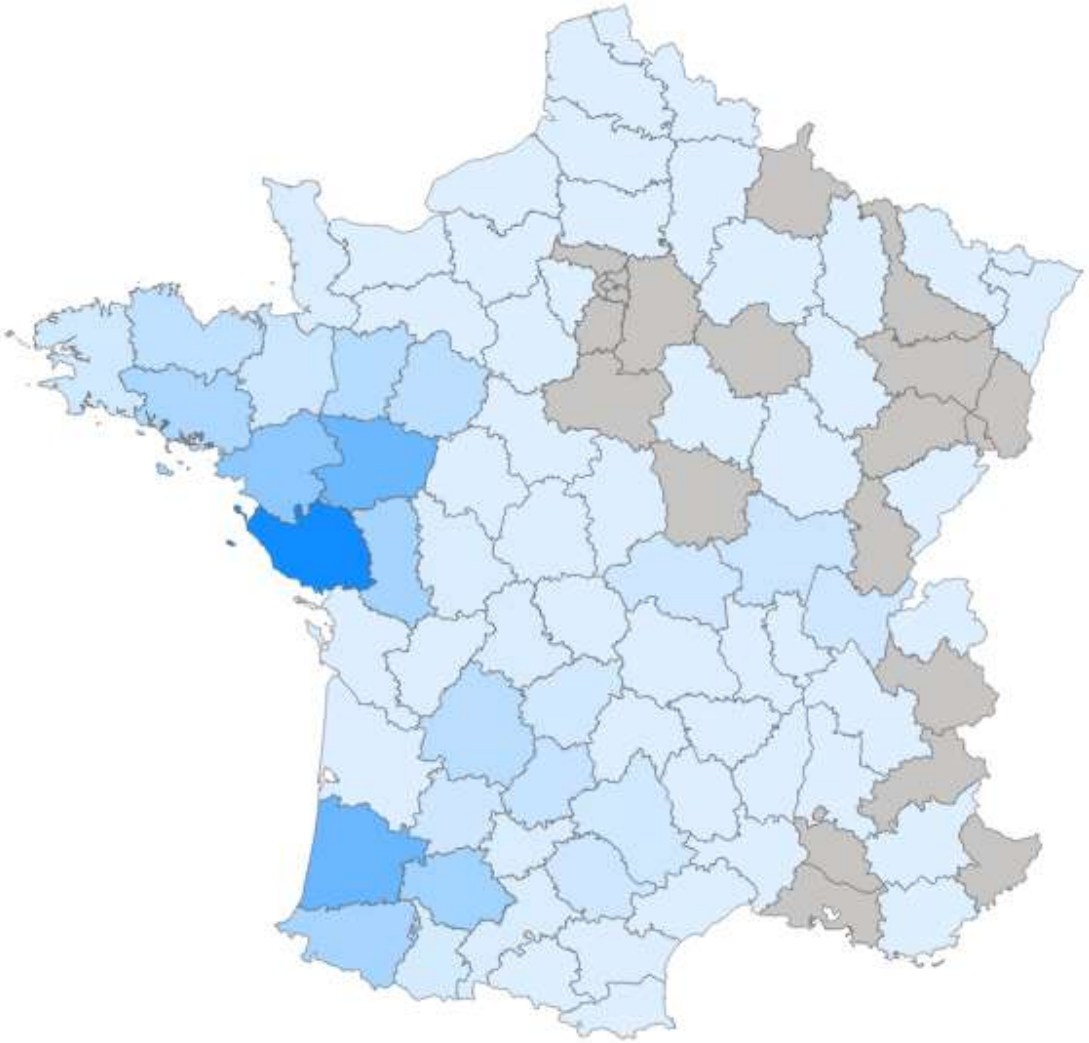
Period: October 1, 2023 to September 26, 2024

60.5 million

Number of ducks injected 1st dose

2295

No. of facilities vaccinated



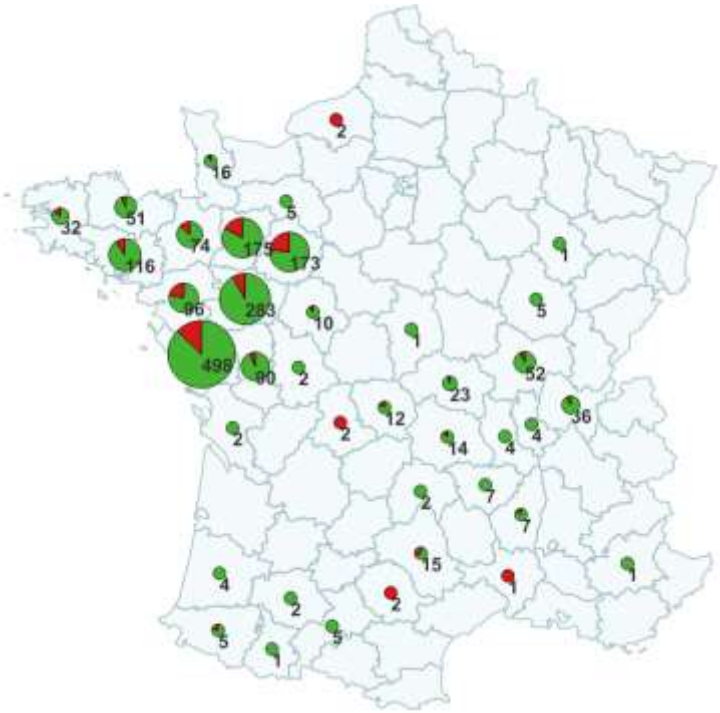
ASSESSMENT OF THE FIRST SIX MONTHS OF THE DUCK VACCINATION CAMPAIGN AGAINST HPAI IN FRANCE (01/10/23 - 31/03/24)

Anses Ploufragan/Plouzané/Niort

Farmers commitment to vaccination

Batches for which at least one vaccination act was reported over the entire period

Meat ducks



Fattening ducks

The numbers shown indicate the total number of batches installed over the period.

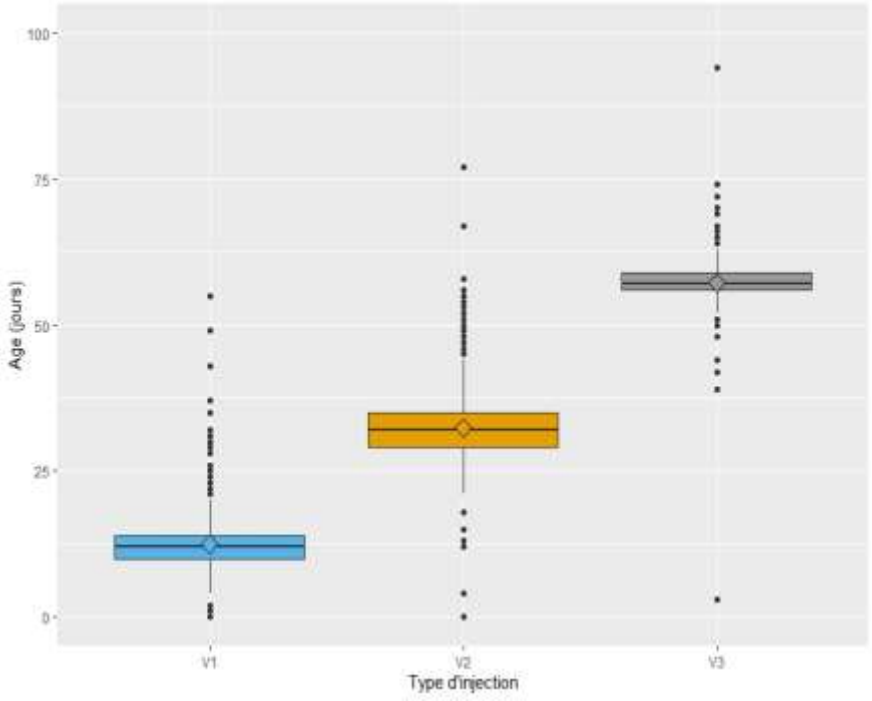
In red: batches reporting no vaccination.

In green: batches reporting at least one vaccination.

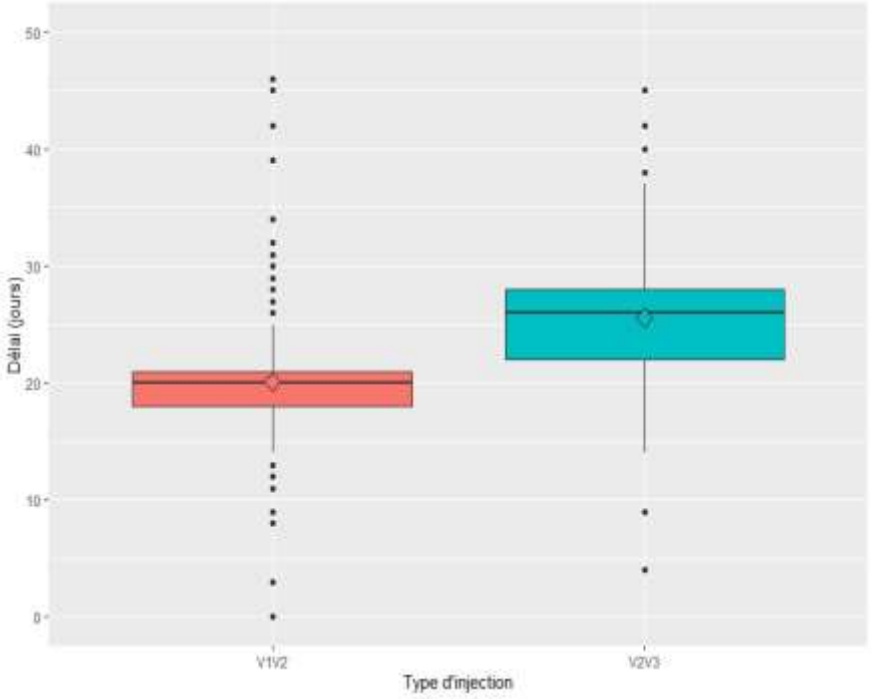
Overall, farmers commitment to vaccination appears satisfactory >95%.

Compliance with vaccination protocols

Vaccination age for fattening ducks



Inter-dose times for fattening ducks



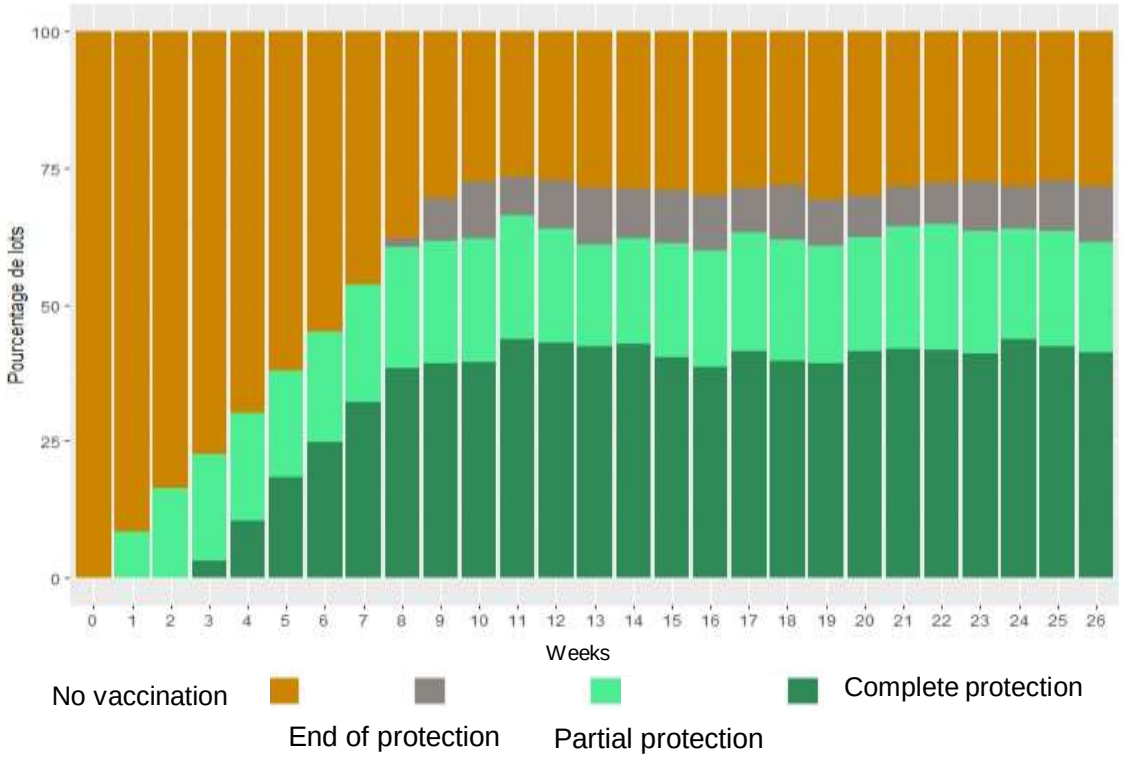
Similar results for meat ducks

In most cases, vaccination ages and inter-dose intervals were respected.

Level of protection for the duck population
Theoretical model

The level of vaccine protection for duck batches depends on :

- Regulatory compliance with the vaccine protocol
- Biological elements:
  - time required for full vaccine protection (7 days after the second dose),
  - the duration of this complete protection (42 days after the second dose in the absence of a third injection, or until slaughter if a third injection has been given).

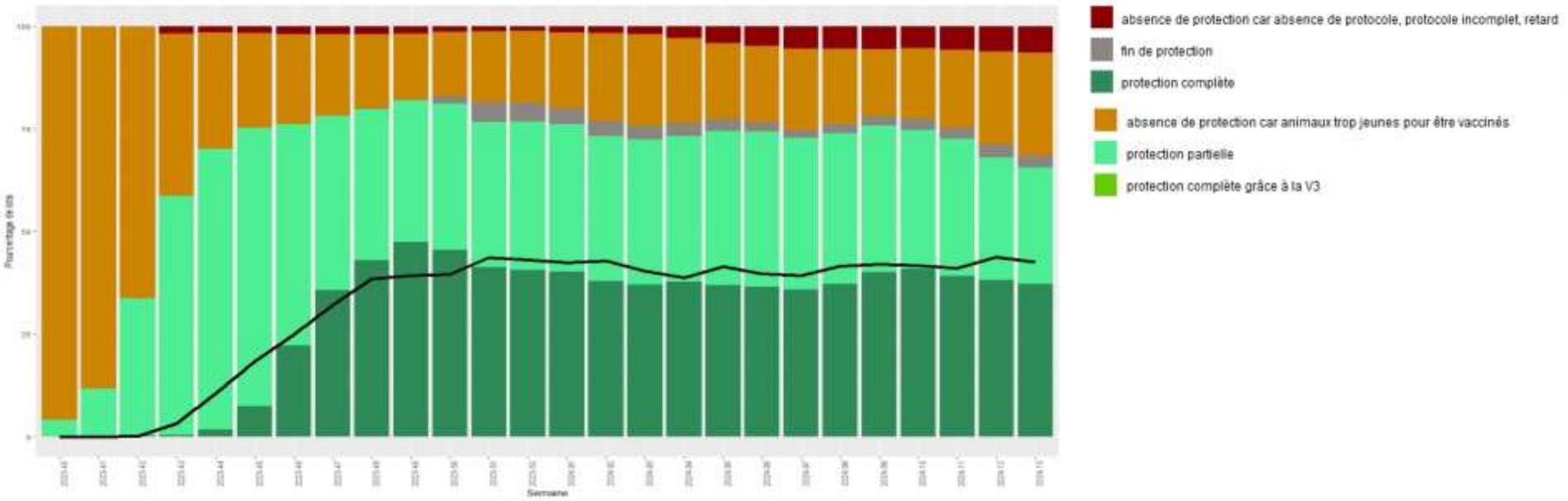


Weekly distribution of the theoretical level of vaccine protection as assessed using simulated data from an individual-centric model

Limits :

- Simplifying population dynamics
- No third injections
- Assumes that all batches are committed to the vaccine protocol and on schedule.

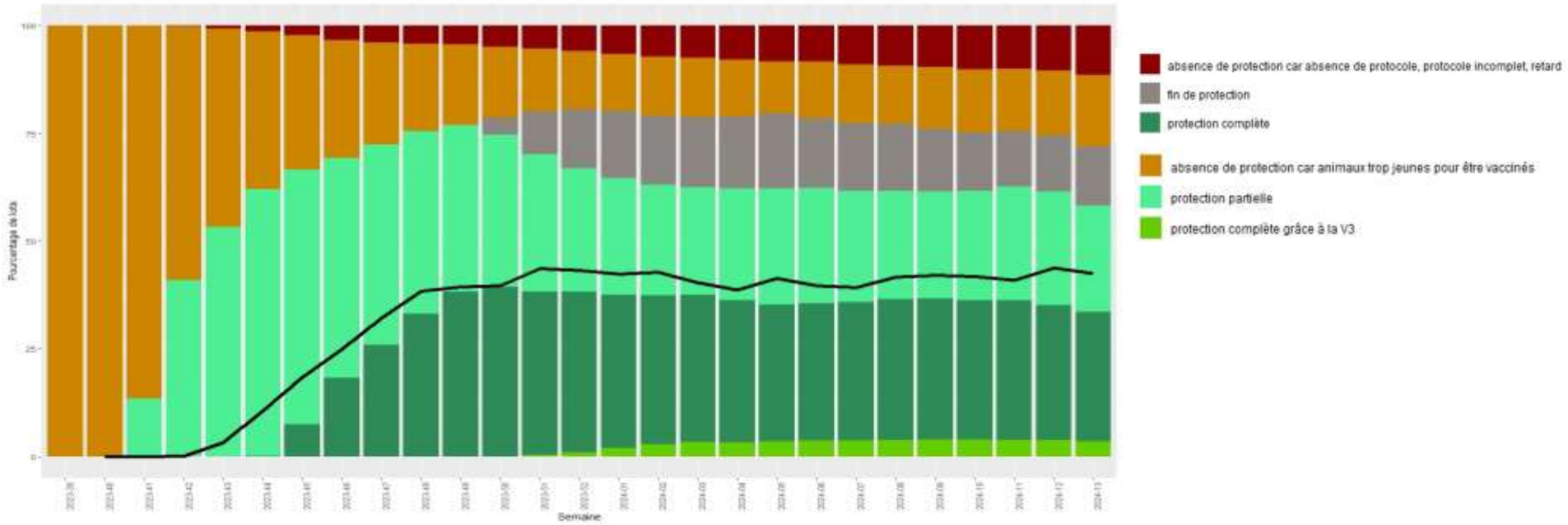
Actual data - meat ducks



Moderate percentage of batches (around 35%) with full protection at a given time t.
Results consistent with theoretical simulations.

The drop observed at the end of the period may be linked to a delay in entering vaccinations into CALYPSO and/or a drop in vaccination compliance.

Actual data - fattening ducks



The maximum percentage of fattened duck batches with complete vaccine protection thanks to third dose is achieved in week 2024-10,
with 3.9% of batches showing complete protection thanks to the third dose.

The drop observed at the end of the period may be linked to a delay in entering vaccinations into CALYPSO and/or a drop in vaccination compliance.

Compliance with active surveillance

Percentage of establishments reporting <u>at least one active surveillance act</u> among those rearing at least one vaccinated batch

Species and production stage	Percentage of sites monitored		
	All types of analysis	Virological analysis	Serological tests
Meat duck farms	90,5 %	90,5 %	83,4 %
Fattening duck farms (PAG + mixed)	90,3 %	89,8 %	81,7 %
Total	90,4 %	90,0 %	82,2 %

The implementation of active surveillance appears to be more in line with requirements.

No H5 or H7
HPAI virus detection

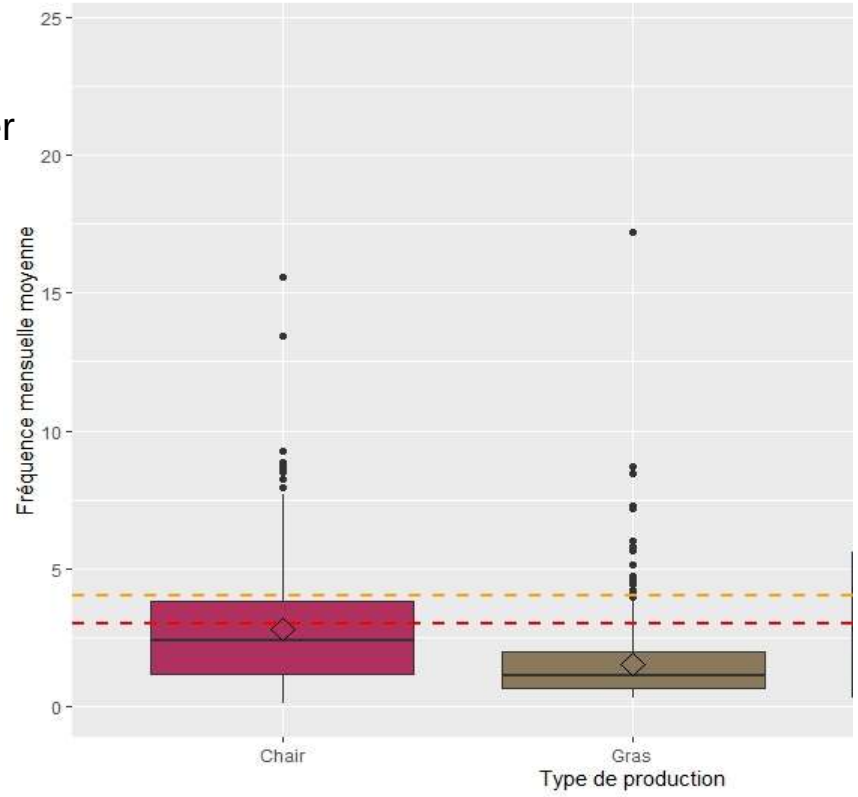
Compliance with reinforced passive surveillance

Calculation of the frequency of enhanced passive surveillance acts performed over the period during which the surveillance was to be carried out, reduced to a monthly frequency.

Expected frequency of 4 procedures per month

Distribution of the average monthly frequency of enhanced passive surveillance procedures carried out per plant over the period from first vaccination dose to departure for slaughter, among plants having undergone at least one enhanced passive surveillance procedure.

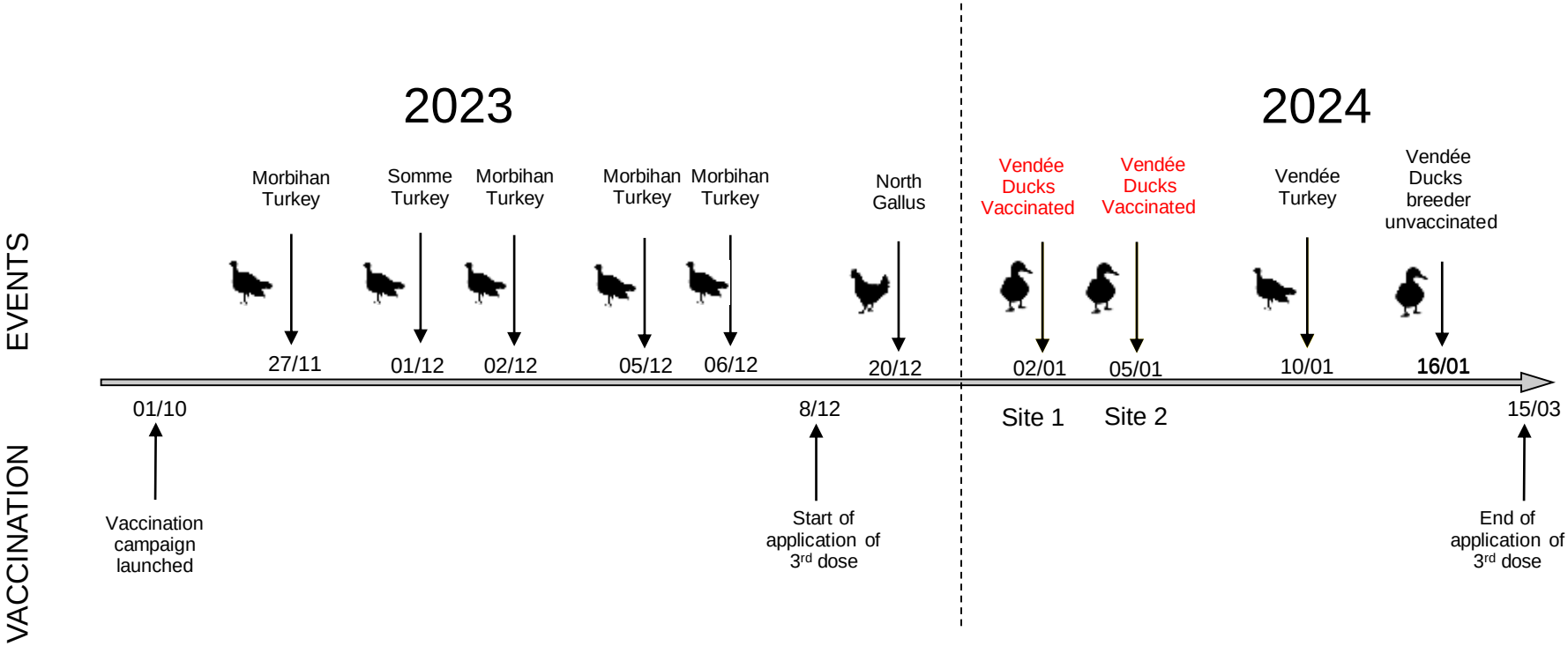
Orange line: theoretical expected threshold (minimum 4 procedures per month), red line: realistic expected threshold (minimum 3 procedures per month).



No H5 or H7
HPAI virus detection

The implementation of enhanced passive surveillance appears to be well below target.

A very positive result for France: only 10 outbreaks reported in poultry



- **Site 1 highly exposed to wild birds at risk of HPAI:** Decrease of vaccine protection on the 10-week-old male duck batch with a **low and heterogeneous level of immunity**

- **Site 2:** Failure of vaccine protection of ducklings detected infected 8 days after 1st injection of vaccine **before complete protective vaccination protocol**

MINISTÈRE
DE L'AGRICULTURE
ET DE LA SOUVERAINETÉ
ALIMENTAIRE

anses

CONCLUSIONS

- Positive result for France: only 10 outbreaks reported in poultry in 2023-2024
- Satisfactory vaccination compliance: > 95% of duck batches with at least one vaccination operation.
- Ages at vaccination and time between doses in line with vaccination protocol.
- Contribution of the 3rd dose to increase complete protection of batches.
- Implementation of active surveillance more in line with requirements but enhanced passive surveillance to improve.
- No detection of HPAI virus with post-vaccination surveillance.
- Circulation of several LPAIV thorugh surveillance in the ducks => attention must be paid to maintaining a good level of biosecurity.
- Complementarity of the three types of analysis: need to combine serological and virological analyses, and improve compliance with reinforced passive surveillance.

MINISTÈRE
DE L'AGRICULTURE
ET DE LA SOUVERAINETÉ
ALIMENTAIRE

Liberté
Égalité
Fraternité

anses

Thanks to farmers, veterinarians, the SNGTV and all those involved in implementing this first HPAI vaccination campaign.

Thank you for your attention