

Duck vaccination against bird flu in France

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France is the only country in the world to require all farmed ducks to be vaccinated against avian flu, and the authorities are very proud of this. Of the two products on offer, CEVA with self-amplifying mRNA is the first product of this type to be injected into birds in the marketing phase. Another self-amplifying mRNA is marketed for pigs by MSD: Sequivity. The USDA includes a mandatory weaning period before consumption of meat from vaccinated animals, to exclude any contamination through meat consumption: tests determine how long it takes before any trace of the vaccine can be identified in any part of the animal. Also in the USA, legislation is underway to require labelling of vaccines received by meat animals¹. It has been impossible to find any evidence of such precautions being taken in France with regard to meat from vaccinated ducks.

In France, since autumn 2023, vaccination of ducks against avian flu has been compulsory for farms with more than 250 ducks (Muscovy, Mulard and Peking) whose products (meat and foie gras) are intended for sale². Only farms with more than 250 ducks are concerned³. Vaccination of ducks on farms with fewer than 250 individuals remains prohibited⁴.

According to the French Ministry of Agriculture, “This initiative is the first of its kind in Europe, positioning France as the first major poultry exporting country to deploy a large-scale vaccination strategy to protect its farms. During this first vaccination campaign, between October 1, 2023 and September 30, 2024, 61 million ducks were vaccinated against HPAI. On October 1, 2024, this

¹ Messenger RNA Vaccines in Meat Animals - How are mRNA vaccines different and are they safe? June 16, 2023

<https://www.tsln.com/news/messenger-rna-vaccines-in-meat-animals-how-are-mrna-vaccines-different-and-are-they-safe/> It has been impossible to find any evidence of such precautions being taken in France with regard to vaccinated duck meat.

² Highly pathogenic avian influenza: start of the first duck vaccination campaign, a first in France and worldwide, October 2, 2023, French Ministry of Agriculture
<https://agriculture.gouv.fr/influenza-aviaire-demarrage-de-la-premiere-campagne-de-vaccination-des-canards>

³ <https://agriculture.gouv.fr/influenza-aviaire-hautement-pathogene-lancement-de-la-deuxieme-campagne-de-vaccination-obligatoire>

⁴ <https://www.lafranceagricole.fr/grippe-aviaire/article/872559/la-deuxieme-campagne-de-vaccination-contre-la-grippe-aviaire-est-lancee>

campaign was renewed using the same strategy, in addition to the biosecurity and reinforced surveillance measures already in place in mainland France.⁵

“For the record, 1,378 HPAI outbreaks were identified on farms during the 2021-2022 epizootic in France, leading to the slaughter of 22 million poultry. During the 2022-2023 epizootic, 402 outbreaks on farms were recorded, for a total of 10 million poultry slaughtered.” (note 1)

However, health authorities are aware that vaccination is not effective and is commercially harmful, since foreign countries refuse to import vaccinated poultry. A conference was held in 2022 at the Dordogne Chamber of Agriculture (south-west France, a traditional duck-breeding region), here's a brief summary⁶:

« Avian influenza (caused by the highly pathogenic HPAI H5N1 virus) is present in 24 countries, with no off-season (the alert is permanent), in wildlife and on farms. The risk is heightened during periods of wild bird migration. The virus (clade H5 2.3.4.4b) circulates worldwide, having appeared in Southeast Asia 8 to 10 years ago, and travels on migratory birds. The spread of H5NX viruses dates back to 1996. Poorly performing vaccinations, which led to the multiplication of more pathogenic variants, led to international pressure against vaccination. The response to the virus has been to slaughter infected farms and confine livestock. In the USA, all animals are confined and the virus still spreads. The bird that contaminated the farm is never found, so it is assumed that the virus is permanently present in the environment. The only solution proposed [in France] is vaccination, since confinement is not enough to prevent contagion. A laying duck farmer present at the conference described his own case. His 13,000 birds were no longer laying eggs; a positive test for Avian Influenza was carried out; after three weeks, they were laying again, not a single animal died, and after three months, slaughter was still imposed. These were vaccinated ducks. »

The information gathered at this conference is in line with what is known about animal vaccination The use of vaccines in birds can encourage the emergence of mutants.

This is known for Marek's disease in poultry⁷. Vaccination can also increase the spread of the H5N1 virus, and incomplete protection in birds can lead to a silent spread of the virus. Vaccines can exert immunological selection pressure on circulating strains: strains not targeted by the vaccine are favored, and among them may emerge a variant with increased pathogenicity potential in humans. In China, despite a compulsory vaccination program for all poultry starting in September 2005, the H5N1 influenza virus caused poultry epidemics in 12 provinces between October 2005 and August 2006. Genetic analysis revealed that an H5N1 mutant, a previously uncharacterized sub-lineage of the H5N1 virus, had emerged and subsequently become the predominant variant, replacing the

⁵ Everything you need to know about France's avian influenza vaccination plan available on line, accessed, January 3, 2025 <https://agriculture.gouv.fr/influenza-aviaire-le-plan-daction-vaccination-de-la-france>

⁶ Excerpts from a talk given by Pr Jean-Luc Guerin, professor at the Toulouse Veterinary School, at the Dordogne Chamber of Agriculture on November 10, 2022, aimed at farmers (transcribed by Fred Boutet). Speech by Catherine CARRÈRE-FAMOSE, Director of the Prefecture's Veterinary Services Department <https://dordogne.chambre-agriculture.fr/actualites/detail-de-lactualite/actualites/assemblees-generales-asseldor-copeldor/>

⁷ Read AF, Baigent SJ, Powers C, Kgosana LB, Blackwell L, Smith LP, Kennedy DA, Walkden-Brown SW, Nair VK. Imperfect Vaccination Can Enhance the Transmission of Highly Virulent Pathogens. *PLoS Biol.* 2015 Jul 27;13(7):e1002198. doi: 10.1371/journal.pbio.1002198. PMID: 26214839; PMCID: PMC4516275. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4516275/>

multiple sub-lineages previously established in southern China⁸. According to a Chinese publication from 2023, an adjuvanted H5N1 vaccine for birds, based on VLP technology (virus-like particle from insect baculovirus: baculovirus recombined with avian virus genes is grown on insect cells) protects chickens. But vaccinated chickens still excrete the virus when infected (in smaller quantities than unvaccinated chickens). Since these chickens will have fewer symptoms than unvaccinated chickens, they will not be detected and can continue to excrete and spread the virus⁹.

Vaccines available to duck breeders in France

In September 2023, only the Boehringer Ingelheim¹⁰ vaccine was selected by ANSES (the French national agency for food, environmental and occupational health and safety) to combat avian flu, although 2 vaccines had been tested: the mRNA vaccine from France's CEVA was ruled out for logistical reasons (storage required at very low temperatures). 80 million doses will be supplied, and the vaccine has been tested in France on mulard ducks. It is an inactivated H5 subunit vaccine (the H5 subtype is the strain prevalent in autumn 2023 in France), and has been on the market for over 10 years.

In March 2024, however, the authorities changed their minds and ordered 27 million doses of Ceva mRNA vaccine and 34 million doses of Boehringer conventional vaccine for compulsory vaccination of ducks from October 2023 (in 2023, Boehringer had been awarded the 80 million doses). Ceva is said to have modified storage conditions, alleviating thermal constraints¹¹. Vaccination includes 3 doses of vaccine. HEALTH Influenza vaccine: Boehringer and Ceva share the doses¹².

The CEVA vaccine is a self-amplifying mRNA encoding H5 of H5N8 coated in ferric nanoparticles, and contains squalene (suspected of toxicity in humans). Accidental (self)-injection may cause severe pain and swelling, particularly in the case of (self)-injection into a joint or finger of the hand, and in rare cases may lead to the loss of the finger if a medical examination is not carried out promptly¹³.

⁸ Iwami S, Suzuki T, Takeuchi Y. Paradox of vaccination: is vaccination really effective against avian flu epidemics? PLoS One. 2009;4(3):e4915. doi: 10.1371/journal.pone.0004915. Epub 2009 Mar 18. PMID: 19295921; PMCID: PMC2657368. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2657368/>

⁹ Kong D, He Y, Wang J, Chi L, Ao X, Ye H, Qiu W, Zhu X, Liao M, Fan H. A single immunization with H5N1 virus-like particle vaccine protects chickens against divergent H5N1 influenza viruses and vaccine efficacy is determined by adjuvant and dosage. Emerg Microbes Infect. 2024 Dec;13(1):2287682. doi: 10.1080/22221751.2023.2287682. Epub 2023 Dec 30. PMID: 37994795; PMCID: PMC10763850. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10763850/>

¹⁰ <https://www.boehringer-ingelheim.com/fr/presse/press-releases/boehringer-ingelheim-partenaire-privilegie-pour-lutter-contre-linfluenza>

¹¹ <https://www.reussir.fr/volailles/vaccination-grippe-aviaire-quel-vaccin-sera-retenu-au-second-appel-doffres>

¹² APASEC, April 4 2024, <https://apasec.net/articles/04/04/2024/Vaccin-influenza-Boehringer-et-Ceva-se-partagent-les-doses-91144/>

¹³ Summary of product characteristics CEVA Respons AI H5 February 2, 2024 ANSES <https://www.anses.fr/fr/content/ceva-respons-ai-h5-suspension-congelee-et-diluant-pour-injection>
https://www.anses.fr/fr/system/files/ANNEXE_90053_ATU_M_06.pdf

Boehringer and Ceva vaccines were evaluated in 2022 by the Toulouse Veterinary School. The vaccination schedule included 2 doses for each vaccine (at 1 day and 28 days of life for the CEVA mRNA vaccine, and at 10 days and 28 days of life for the Boehringer recombinant vaccine). The official conclusion of the trial was that the 2 vaccines reduced the level and duration of viral excretion by the respiratory and faecal routes, and reduced transmission between poultry (no transmission was observed by indirect contact, i.e. airborne). However, cloacal excretion in vaccinated and unvaccinated birds lasts for 14 days, and is only slightly reduced in vaccinated birds compared with controls.

Fig. 13.1/

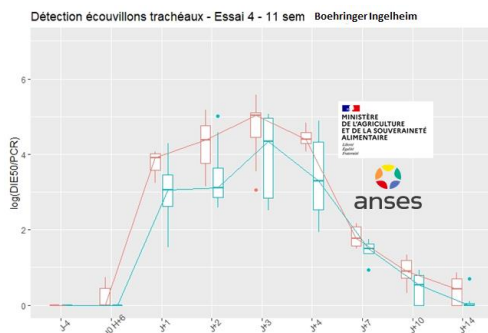


Fig. 13.2/

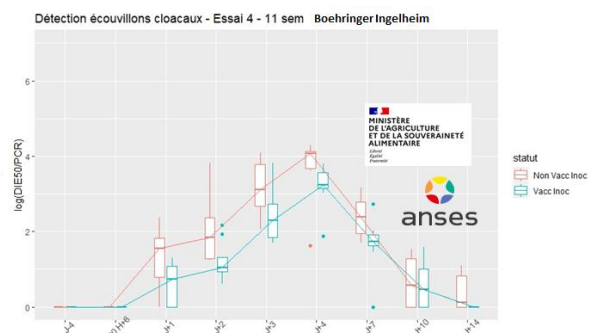


Figure 13: Excrétion virale oro-pharyngée (Fig. 13.1) et cloacale (Fig 13.2) chez les canards mulards vaccinés ou non avec le vaccin B et éprouvés à 11 semaines d'âge avec le virus IAHP A/chicken/France/D2107428/2021 (H5N1). Le niveau d'excrétion virale est exprimé en titre infectieux estimé (\log_{10} EID₅₀/PCR).

Fig. 12.1/

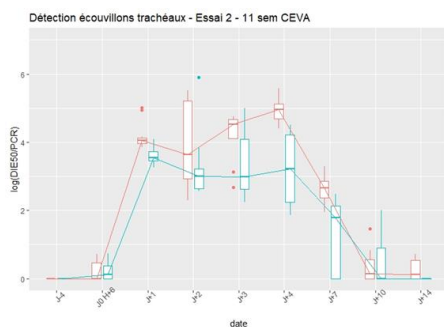


Fig. 12.2/

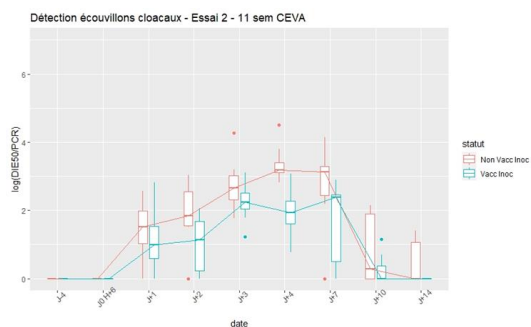


Figure 12: Excrétion virale oro-pharyngée (Fig. 12.1) et cloacale (Fig 12.2) chez les canards mulards vaccinés ou non avec le vaccin A et éprouvés à 11 semaines d'âge avec le virus IAHP A/chicken/France/D2107428/2021 (H5N1). Le niveau d'excrétion virale est exprimé en titre infectieux estimé (\log_{10} EID₅₀/PCR). Aucun lien significatif n'a été établi entre la réponse immunitaire avant épreuve à 11 semaines d'âge et l'excrétion virale pour les animaux vaccinés A.

Figures taken from the Toulouse Veterinary School document <https://agriculture.gouv.fr/experimentation-de-vaccination-des-canards-mulards-en-elevage-contre-un-virus-iahp>
 Vaccine A is mRNA CEVA and vaccine B is subunit Boehringer. Red curves: unvaccinated, blue curves: vaccinated

It is clear that excretion is only slightly reduced in vaccinated animals, in quantity but not in duration.

The scarcity of clinical signs after inoculation with the test strain under the experimental conditions used, including in unvaccinated mulard ducks, provides little evidence of clinical protection. Nevertheless, the only clinical signs observed were in non-vaccinated subjects. Vaccination strongly limits transmission by direct contact and abolishes airborne transmission, according to the conclusions of the authors of this report from the Toulouse Veterinary School. Yet their document reveals that among the vaccinated there may be rare individuals who remain infectious for 3 days and can transmit the virus to other ducks, but that these secondary contacts do not excrete the virus through the intestine¹⁴.

Right from the start of the compulsory vaccination campaign in 2023, the authorities were already doubting the efficacy of the vaccines, as they added a compulsory 3rd dose for one of the 3 target species (mulard ducks): this additional dose was supposed to reduce the risk of excretion and transmission of the virus. But as the ATU for vaccines only provides for 2 doses, this compulsory 3rd dose is applied under the responsibility of the veterinarian!

Does this mean that veterinarians are financially liable for any damage caused by this 3rd dose¹⁵? In July 2024, the French Ministry of Agriculture “proposes” booster doses for breeding ducks: there is talk of 3 additional doses (5 in all) to protect “long-lived” animals (40 weeks - not even a year!)¹⁶.

Reminder for our foreign friends: vaccination of poultry for export is FORBIDDEN.

As expected, cases of avian influenza have been reported in vaccinated farms

An outbreak of highly pathogenic avian influenza was confirmed on November 06, 2024 in a duck farm in the commune of Saint-Étienne d'Orthe in the Landes département (south-west France).

These animals had been vaccinated against HPAI in accordance with regulations¹⁷.

A case of avian influenza is detected in the Eure department in December 2024¹⁸. All poultry was confined, the transport of birds was prohibited, as was the sale of live poultry, the removal of eggs from farms (except by dispensation!) and the hunting of birds. The contaminated farm is slaughtered. The Préfet de l'Eure prescribes PCR tests every 15 days on vaccinated poultry: “For poultry recently put into place, which have not yet begun vaccination, vaccination is forbidden.

¹⁴ Evaluation of HPAI vaccines in green-necked ducks, May 2022, France report July 2023 (Toulouse Veterinary School) <https://agriculture.gouv.fr/experimentation-de-vaccination-des-canards-mulards-en-elevage-contre-un-virus-iahp>

¹⁵ Technical Instruction DGAL/SDSBEA/2023-773 of December 8, 2023 <https://info.agriculture.gouv.fr/gedei/site/bo-agri/rectificatif-3b5a1983-9cf0-43d9-a54c-e624932fed18/telechargement>

¹⁶ Technical Instruction DGAL/SDSBEA/2024-386 of July 5, 2024 <https://info.agriculture.gouv.fr/boagri/instruction-2024-386>

¹⁷ <https://www.pyrenees-atlantiques.gouv.fr/Actions-de-l-Etat/Agriculture-foret-et-developpement-rural/Influenza-aviaire-2024-2025>

¹⁸ <https://france3-regions.francetvinfo.fr/normandie/eure/la-grippe-aviaire-detectee-dans-l-eure-plusieurs-commune-sous-surveillance-3083221.html>

Meat and products containing such meat obtained from vaccinated poultry from protection or surveillance zones are subject to specific marking and, if necessary, attenuation treatment”¹⁹.

Poultry vaccination is not recognized as useful anywhere in the world, yet it is imposed in France, even though vaccines are not sterilizing and do not prevent the spread of the virus or the disease, as the 2022 trials and the 2023-2024 campaign have shown.

How dangerous are mRNA vaccines for consumers?

When ducks are vaccinated with CEVA's self-amplifying mRNA product, it must be emphasized that no tests have been carried out on the ability of this gene product to be transmitted to the duck meat consumer. The vaccine mRNA is encapsulated and therefore protected in lipid nanoparticles (LNPs) which are theoretically able to resist gastric juices. So if the duck has been vaccinated with mRNA, we can assume that this product has spread throughout the animal's body (as has been shown in humans, mice, etc.). If the meat is badly cooked (e.g. magret), the mRNA may be intact and still protected in the LNPs: the consumer can therefore theoretically be “vaccinated” by this mRNA destined for the duck. What's more, we know that the vaccine mRNA in Pfizer and Moderna anti-COVID-19 gene products can be naturally included in natural extracellular vesicles or exosomes by the vaccinee's cells; these exosomes are resistant to digestive juices²⁰. This theoretical possibility has not been studied in ducks, since no biodistribution or pharmacokinetic studies were carried out in the 2022 trial. Yet exosomes are known to be able to integrate mRNA replicons and transmit them to other cells²¹. Environmental activists and consumer organizations are very concerned about plant GMOs in food, but not about animals transformed into GMOs by vaccination!

¹⁹ Eure Prefectoral Order, December 27, 2024
<https://www.eure.gouv.fr/contenu/telechargement/56272/414939/file/2024-12-28APZonageIAPHPLaPoterieMathieu-1.pdf>

²⁰ Current state of knowledge on the excretion of mRNA and spike produced by anti-COVID-19 mRNA vaccines; possibility of contamination of the entourage of those vaccinated by these products https://www.tmrjournals.com/article.html?J_num=4&a_id=2402&s_hm=1

²¹ Ishikawa T, Narita K, Matsuyama K, Masuda M. Dissemination of the Flavivirus Subgenomic Replicon Genome and Viral Proteins by Extracellular Vesicles. *Viruses*. 2024 Mar 28;16(4):524. doi: 10.3390/v16040524. PMID: 38675867; PMCID: PMC11054737. <https://pubmed.ncbi.nlm.nih.gov/38675867/>

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