

Infection dynamics of influenza A virus in two Danish sow herds

A longitudinal field study

CPH Pig Seminar 02-02-23

IVH - enzootic and zoonotic virus research

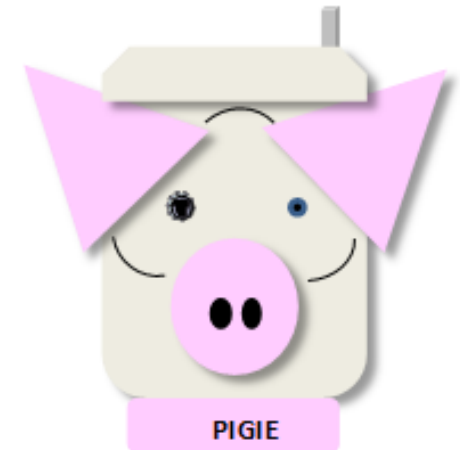
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The project

- PIGIE – Pig Influenza Genetics, Intervention and Epidemiology
- Italy, Spain, Germany, France, GB and Denmark
- Investigating – swIAV dynamics and prevention of clinical signs



SEGES
INNOVATION

Svineavgiftsfonden

Influenza A virus in pigs

Passive surveillance – up to 2/3 submissions are positive

Larger herds – naive pigs keeps infection running

All ages – mostly farrowing and nursery unit

Virus shedding 1 to 3 weeks

High morbidity and low mortality

Cough, sneezing, nasal discharge

Pneumonia

High fever

Reproductive disorders

Part of Porcine Respiratory Disease Complex (PRDC)



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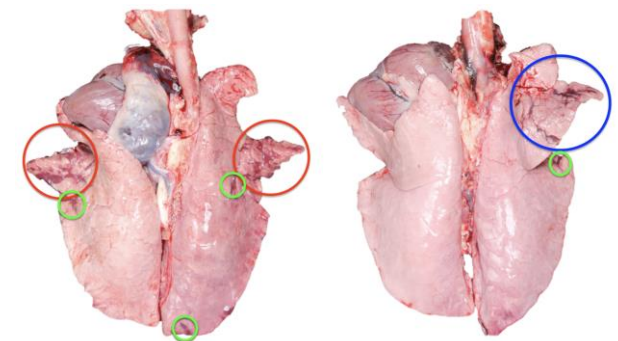


Foto: Christoffer Flyger

Study design



Herd 1

Danish SPF Blue and declared positive for M. hyo, App6 and App12

820 sows

Respiporc FLU3 once a year

2 weeks between each batch

Weaned litter wise

AI/AO in the farrowing unit

Data collection Nov 2021 to Feb 2022



Herd 2

Danish SPF Blue and declared positive for M. hyo, App6 and App12

820 sows

Respiporc FLU3 three times a year

1 weeks between each batch

Mixed at weaning

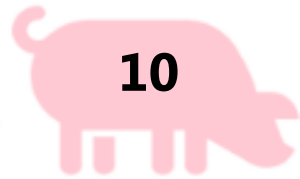
Continuous input of piglets and sows

Data collection Feb to Jun 2022

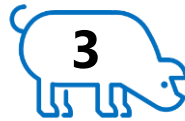
Two consecutive batches included

Batch 1

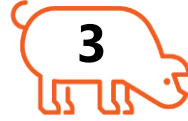
Sow



Own

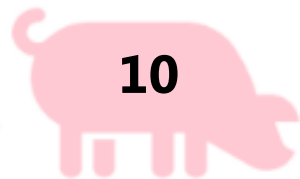


Cross

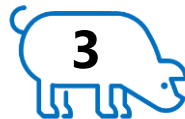


Batch 2

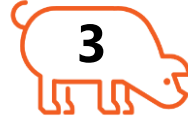
Sow



Own



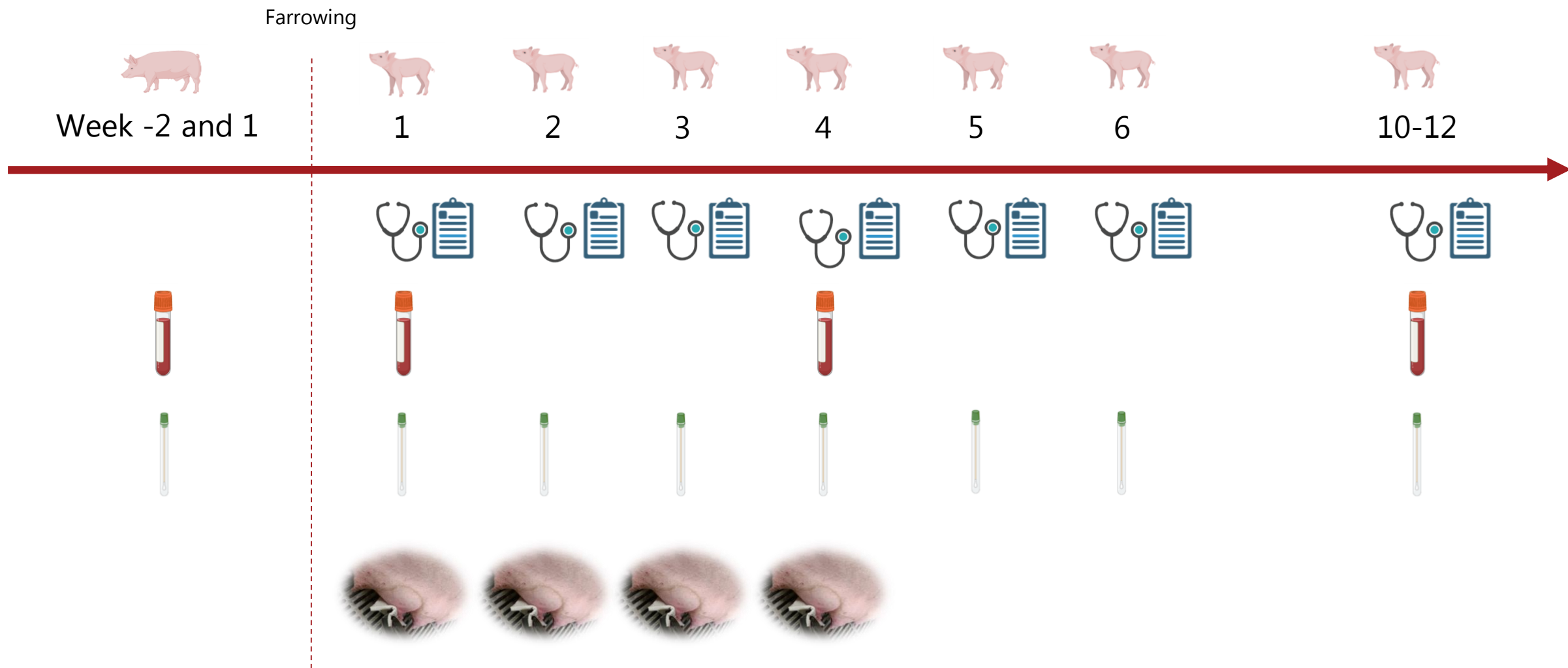
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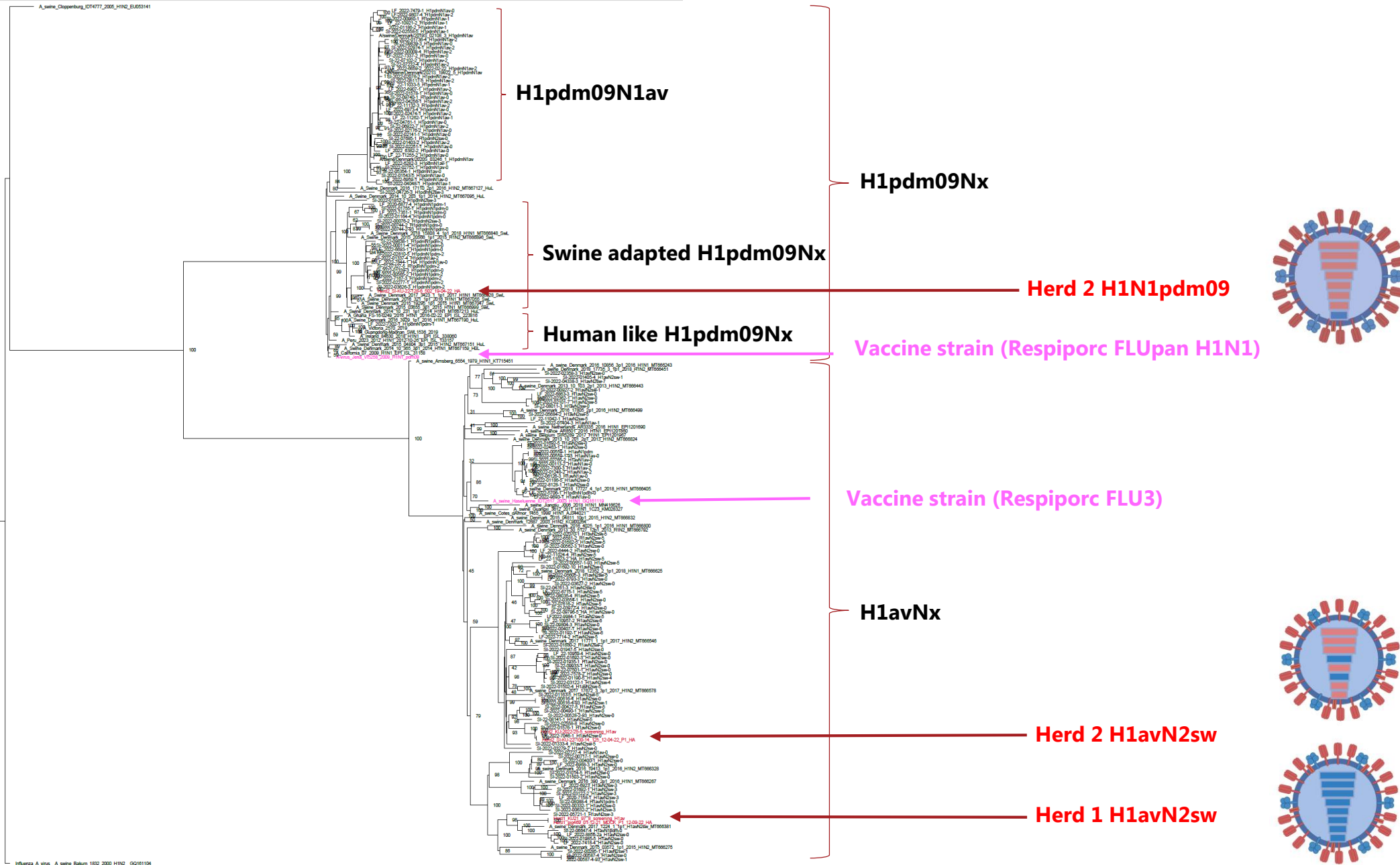
In total

20 sows and 120 pigs per herd

Registrations and samples in the herds



Maximum likelihood tree with Danish 2022 H1x sequences (black) + vaccine strains (pink)



Udder wipes as a diagnostic tool in the farrowing unit

Pooled nasal swabs as a reference standard $n = 182$

69 % of the swIAV positive litters will be found positive by the udder wipes (Se=69 %)

2 % of the udder wipes will test positive even though the pooled nasal swabs tested negative (Sp=98%)



Discussion and conclusion

Viral shedding time is herd specific and co-infections with several influenza subtypes occurs.

Correlation to the proportion of seropositive pigs at week 1

The proportion of seropositive pigs is high at week 1 but a fast decline is observed in both herds despite swIAV infections

The pigs will potentially be susceptible to novel influenza infection when leaving the nursery

Clinical signs such as nasal discharge and increased coughing index can be an indicator for influenza A virus in individual batches.

Udder wipes can be used as a less invasive method to diagnostic of influenza A virus in the farrowing unit.

- Pros and cons

Acknowledgment

- Supervisors
 - Pia Ryt-Hansen
 - Lars Erik Larsen
 - Nicolai Rosager Weber
- Helpers
 - Nicole Goecke
 - Christoffer Flyger
 - Sophie George
 - Charlotte Kristensen
 - Karen Martiny
 - Emma Hjørnet
 - Simon Welner
 - Emmy Rønving
 - Line Hansen
 - Kamille Jerris
 - Inge Larsen

- Jana
- PH Rathkjen
- Lab technicians
 - Hue Tran
 - Jonathan Rogersen
 - Nina Grønnegaard
 - Mathias Romar
- Herd personnel
- Practice veterinarians
- Boehringer Ingelheim
- CEVA
- AeroCollect

