

Dynamics of influenza infection in swine populations

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The results of this study showed that:

- There is a great diversity of Influenza A viruses circulating in Canada.
- Infection of one Influenza A virus does not guarantee protection from other viruses of the same sub-lineage.

Why was this study done?

The influenza virus has a major impact on Canadian swine production. Significant genetic diversity and the emergence of new variants have complicated the control of this virus. Therefore, to have a big picture of swine influenza A in Canada, researchers analyzed the diversity of these viruses across the country. On a smaller scale, they also studied the circulation of influenza A viruses in some herds and worked on a real-time outbreak detection system.

What was done and what was the outcome?

Diversity of influenza A viruses in swine in Canada

Researchers conducted a comprehensive genomic analysis of 16 influenza A virus samples. These samples were from clinical outbreaks that took place in 2014 within swine herds in Alberta, Manitoba, Ontario, and Saskatchewan. Out of the 16 influenza A virus samples, three were identified as H1N2 and 13 as H3N2. All H3N2 viruses belonged to cluster IV. The diversity of these viruses was greater than expected.

Circulation of influenza A viruses in swine herds

Results have shown that even in herds where new animals are rarely introduced, such as closed farrow-to-finish herds, growing pigs continuously circulate the influenza A virus. Also, some nursery pigs repeatedly tested positive for the same virus. Therefore, if pigs are infected with one Influenza A virus, it does not guarantee the future protection of an animal against that specific virus and even one from the same sub-lineage.

Real-time outbreak detection system

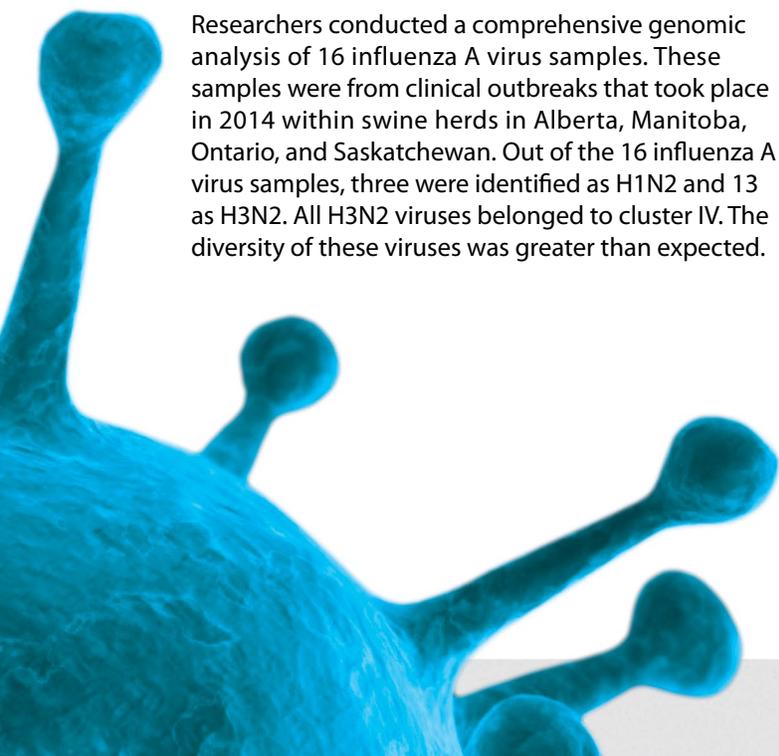
Part of this research also focused on processing and summarizing laboratory swine influenza information in a user-friendly report for producers, swine veterinarians, and regulatory experts. These reports display trends regarding periods where more samples were submitted to laboratories and/or when there were more samples that tested positive for swine influenza. This data may then be processed using a specific statistical model to forecast influenza outbreaks.

Collaborators

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Additional project information

Click on the links below for further information on this project

R&D Featured Articles—by Geoff Geddes for Swine Innovation Porc

Articles may be found at: <http://www.swineinnovationporc.ca/resources-e-newsletters.php>

- [Analyzing Influenza a Shot in the Arm for Industry](#).
- March 2018 (Vol. 2, No. 8.)

Farmscape Interviews:

- [Scientists Examine Dynamics of Influenza Infection in Swine Populations](#)
- November 25, 2014

Peer-reviewed articles:

- Grgić H, Gallant J, Poljak Z. (2017) [Virological Surveillance of Influenza A Subtypes Isolated in 2014 from Clinical Outbreaks in Canadian Swine](#). Full article. *Viruses* 2017, 9(3): p. 55
DOI: <https://doi.org/10.3390/v9030055>

Additional resources:

2016

- Poljak, Z., Arruda, A. (2016) [Managing the Health Status of the Sow](#). Conference proceedings. *Proceedings of the London swine conference*, pp. 37-42.
Retrieved from: <https://www.londonswineconference.ca/resources>
- Poljak, Z. (2016) [Swine Influenza Series 1c. Dr. Zvonimir Poljak - A Review of Swine Influenza Research Currently Being Conducted at the Ontario Veterinary College \(OVC\) and by Other Researchers](#). Podcast. *Ontario Animal Health Network Veterinary Podcasts*, January 22, 2016. Retrieved from: <https://oahn.podbean.com/page/5/>

2015

- Ferreira, J., Grgić H., Friendship, R., Wideman, G., Nagy È., Poljak, Z. (2015) [Dynamics of influenza virus transmission in a swine herd and analysis of risk factors for recurrent infections](#). Conference proceedings. *The 12th Mike Wilson Swine Research Day*, p. 2.
Retrieved from: <https://www.uoguelph.ca/osrn/swine-research-day/proceedings-archives>

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2014

- Poljak, Z. (2014) [Spread and control of influenza in swine populations: insight from analysis of infectious disease data](#). Conference proceedings. *The 11th Mike Wilson Swine Research Day Proceedings*, p. 1. Retrieved from: <https://www.uoguelph.ca/osrn/swine-research-day/proceedings-archives>
- Poljak, Z. (2014) [Influenza virus in swine: Transmissibility within and between populations](#). Conference proceedings. *Proceedings of the 23rd International Pig Veterinary Society (IPVS) Congress, Volume 1*, pp. 67-74. Retrieved from: <http://www.theipvs.com/links/>

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