**What is this research about?**

*Salmonella* is the second most commonly identified bacterial cause of foodborne illness in humans in North America. In Ontario, many of the total reported cases of salmonellosis are thought to be associated with the consumption of chicken and eggs. Chicks are distributed to commercial farms from the hatchery so control of *Salmonella* at this level is important. Yet there have been no studies in Canada on the temporal (time-related) occurrence of *Salmonella* in poultry hatcheries. This study looked at the occurrence of *Salmonella* types in Ontario hatcheries between 1998 and 2008. Fluff samples were taken from the incubators for breeder flocks of broiler (for meat production), layer (for egg production), turkey, and other birds (includes ducks, geese, quail, partridges, and pheasants).

**What did the researchers do?**

Michele Guerin, a Professor with the University of Guelph’s Ontario Veterinary College, used surveillance data from the Ontario Hatchery and Supply Flock Policy, a government monitoring program to detect certain bacteria in Ontario poultry hatcheries, to determine *Salmonella* occurrence, including the major types found, trends, and seasonal patterns. The data from over 28,000 samples submitted through the monitoring program between 1998 and 2008 underwent various statistical analyses.

**How can you use this research?**

**Industry** can use this research to understand the need to implement control measures at the hatchery level to help reduce the occurrence and spread of *Salmonella*. **Government** can use this research to understand the need to further develop monitoring programs and provide guidance to reduce the risk of *Salmonella* in the poultry production chain.

**What you need to know:**

Prevention steps at the hatchery level would likely reduce the spread of *Salmonella*. 

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Project supported by: A program of the OMAFRA-U of G Partnership.
What did the researchers find?

Michele Guerin found the overall occurrence of *Salmonella* in fluff samples to be 8.7% in broiler-breeders, 3.1% in layer-breeders, 13.2% in turkey breeders, and 11.9% in other-breeder birds. Over the time period, occurrence of *Salmonella* increased for broiler-breeders and other-breeder birds while layer-breeders saw a decline. Seasonal effects varied from year to year but the highest chance of finding *Salmonella* was during the summer then fall seasons. The four most common types of *Salmonella* found were:

- Kentucky, Heidelberg, Enteritidis, and Senftenberg in broiler-breeder hatcheries
- Heidelberg, Senftenberg, Brandenburg, and Typhimurium in layer-breeder hatcheries
- Senftenberg, Heidelberg, Saintpaul, and Montevideo in turkey-breeder hatcheries
- Enteritidis, Thompson, Typhimurium, and Heidelberg in other-breeder bird hatcheries

Michele Guerin and her team found that often an increase in occurrence of *Salmonella* matched an event that had occurred. For example, an increase in one type of *Salmonella* in hatcheries was also seen in human monitoring programs over the similar time frame. Another time an increase in occurrence of one type of *Salmonella* was linked back to a single parent flock.

The results of this research support the further development of monitoring programs and indicate that interventions at the hatchery level might help reduce the occurrence of *Salmonella* to lower levels of the poultry production chain and the human food chain.

About the University of Guelph researcher:

Dr. Michele Guerin, is an Assistant Professor with Population Medicine, Ontario Veterinary College at the University of Guelph. Email: mguerin@uoguelph.ca

Dr. Theva Sivaramalingam was a graduate student on Dr. Guerin’s research team.

Article citation:


Cite this work:


Keywords:

*Salmonella* Enteritidis, period occurrence, temporal clusters

This summary is a project of the Institute for Community Engaged Scholarship (ICES) at the University of Guelph, with project partners: the Catalyst Centre, SPARK Program at the University of Guelph, and the Knowledge Mobilization Unit at York University. This project is part of the Pan-Canadian Research Impact Network.

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