

**ANIMAL AND HUMAN HEALTH PREVENTION OPPORTUNITIES**

**Chicks for Sale! Safe or Fowl?**

Spring is a common time for *Salmonella* infections caused by exposure to live poultry. *Salmonella* is a gram-negative rod-shaped bacilli and best known worldwide for being a contaminant of a variety of food products. Non-typhoidal *Salmonella* is a distinction given to species other than *Salmonella typhi* and *S. paratyphi*, which have no known animal reservoirs and cause typhoid fever and paratyphoid fever in humans, respectively. Annually in the United States, non-typhoidal *Salmonella* spp. are responsible for an estimated 1.2 million illnesses, 19,000 hospitalizations, and nearly 380 deaths. Each year, approximately 42,000 (3.5%) cases of salmonellosis are laboratory-confirmed and reported to public health. On average, live poultry exposure causes about 11% of human *Salmonella* infections and has resulted in 45 outbreaks during 1991–2012 (**Figure 1**). Live poultry-associated *Salmonella* outbreaks have been increasing in recent years, making exposure to live poultry a significant public health concern. In Montana, over 100 cases of salmonellosis are typically reported annually; since 2013, about 9% of these cases were associated with live poultry.

In this issue of *Montana One Health*, we discuss the health risks associated with live poultry exposure and preventive measures to aid in controlling the spread of *Salmonella*.

**Animal Health**

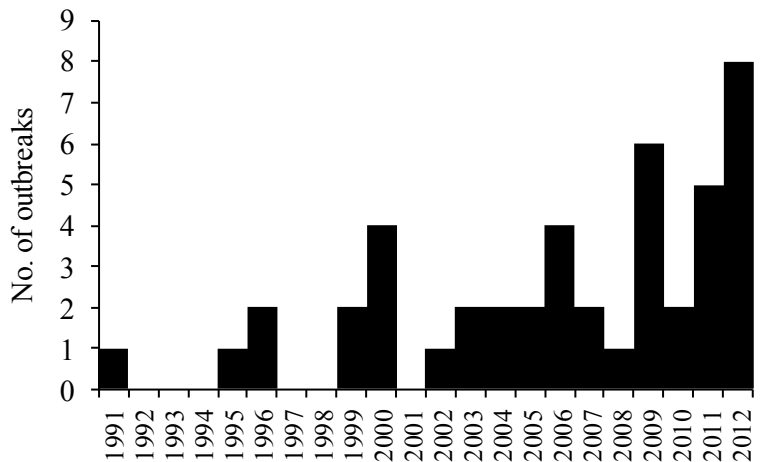
The majority of *Salmonella* infections in poultry result in no clinical signs. Hatchlings appearing healthy are deceiving because they might be harboring and shedding *Salmonella*. If signs are present in young birds, lethargy, anorexia, diarrhea, dehydration, and central nervous system abnormalities are most common. *Salmonella* infections in poultry spread horizontally through fecal-oral transmission and vertically when a hen is infected and passes the bacteria to her eggs before laying. Often, *Salmonella* will harbor in the intestinal tract and pass in the feces. Fecal contamination of food products, live birds, and their environment are the primary causes of human and poultry *Salmonella* infections. *Salmonella* can be diagnosed after isolating the bacteria from fecal samples or blood in systemic infections.

Shedding of *Salmonella* is amplified during times of stress. Shipment from farm to retailer within the first few days of a hatchling’s life is a significant stressor and increases the amount of bacteria in the environment. Human contact with contaminated objects in the birds’ environment is usually sufficient exposure for infection. An increase in reported human salmonellosis cases begins in the Spring, around the Easter holiday, when poultry displays in agriculture retail stores are easily accessible.

Approximately 20 mail-order hatcheries supply U.S. retail agriculture stores. To help eliminate hatchery-disseminated diseases, the United States Department of Agriculture developed the **National Poultry Improvement Plan (NPIP)**, which includes monthly

environmental sampling, rodent control, feed decontamination, enhanced biosecurity, and vaccine usage. Before 2014, supplier’s flocks were only tested for certain *Salmonella enterica* serotypes; the program did not verify the supplier’s flocks were free from other *Salmonella* serotypes capable of causing human illness. Amendments were made to the NPIP in 2014. Currently, a certification program exists for enhanced control of *Salmonella* serotypes that cause human illness. Agriculture retail stores can require their supplier to participate in the certification program.

**Figure 1.** Number of live poultry-associated *Salmonella* outbreaks, United States, 1991–2012



Since the 1990s, **45 *Salmonella* outbreaks** have been linked to **live poultry**.

**1581 illnesses/221 hospitalizations/5 deaths**

## Human Health

The incubation period for *Salmonella* infections is usually 12–36 hours. Signs and symptoms of salmonellosis often include fever, nausea, vomiting, and diarrhea, which can be bloody. Illness duration is typically 4–7 days. Children aged <5 years, the elderly, and those with compromised immune systems are at higher risk for morbidity and mortality. Patients with acute uncomplicated gastroenteritis do not require antimicrobial therapy. For further information on clinical testing and management of patients with acute gastroenteritis, clinicians should consult the Infectious Disease Society of America (IDSA) clinical practice guidelines at <http://IDSociety.org>.

The increasing popularity of backyard flocks is likely contributing to the increase in live poultry-associated *Salmonella* outbreaks over recent years. A survey about chicken ownership in four U.S. cities demonstrated 1% of households owned chickens and 4% planned to obtain chickens within the next 5 years. About 50% of those surveyed thought childhood learning was an important reason for raising chickens but <50% were aware of the risk of *Salmonella* infection when in contact with live poultry.

Considering the popularity of maintaining backyard flocks and giving live poultry as gifts during the Easter

holiday, clinicians should ask their patients about potential exposure to live poultry. Persons exposed to live poultry should be counseled about measures to reduce their risk for *Salmonella* infection (**Figure 2**). Clinicians should order stool cultures for patients with diarrheal illnesses who report live poultry exposure. Clinicians are required to report all suspected cases of salmonellosis immediately to the local health department (**Administrative Rules of Montana [ARM] 37.114.101**).

**Figure 2.** Recommendations for reducing the risk of human *Salmonella* infections associated with live poultry

- Wash hands with soap and water following contact with poultry or objects in their environment
- Supervise children washing hands
- Use hand sanitizer if soap is not readily available
- Assume areas where poultry are housed are contaminated
- Clean equipment associated with the birds outside the house
- Do not let children aged less than 5 years handle poultry; the elderly or persons with compromised immune systems should not handle live poultry
- Do not touch your mouth to live birds or objects in their environment
- Do not eat or drink around poultry
- Do not let poultry into your house, especially in areas where food is stored or prepared

## Live Poultry Key Points

### Animal Health

- Hatchlings without clinical signs can shed *Salmonella* and contaminate their environment
- Animal health professionals involved in poultry production should consult the National Poultry Improvement Plan at <http://www.poultryimprovement.org/>

### Human Health

- Ask patients about their potential exposure to live poultry
- Counsel patients exposed to live poultry about measures to reduce their risk of infection
- Report all suspected cases of salmonellosis immediately to the local health department (ARM 37.114.101)

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