

SALMONELLA PREVENTION MEASURES FOR SMALL BACKYARD FLOCK OWNERS

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Abstract

Salmonella Enteritidis is a potential food safety issue in eggs, egg products, and poultry in all operations, including noncommercial and small operations. A thorough understanding of the disease is critical for effective control and preventative measures. Developing written farm-specific programs such as an Egg Quality Assurance Plan for a poultry flock incorporates both preventing introduction of *Salmonella* Enteritidis onto the premises and monitoring for this organism to reduce contamination in the shell egg. Such farm-specific programs are required for certain poultry producers depending on animal products sold from that facility. Program requirements, example programs, and some general recommendations for developing Egg Quality Assurance Plan programs are presented in this article. Copyright 2015 Elsevier Inc. All rights reserved.

Key words: *Salmonella* Enteritidis; Egg Quality Assurance Plan; food safety; public health; egg; poultry

The purpose of this article is to introduce the reader to the issue of *Salmonella* Enteritidis (SE) as a food safety problem in eggs, egg products, and poultry, and its correlation to the small flock owner or urban farmer. In addition, the author will describe how to implement a written program that will be farm specific in an attempt to address the SE issue in shell eggs and how to prevent the introduction of this bacterium onto the facility. As important is monitoring the program and its effectiveness in reducing possible SE contamination into the shell egg itself.

Salmonella spp., in particular SE, does not just appear out of thin air onto a large poultry facility or into a small flock of chickens in someone's backyard or urban setting. The SE bacterium is introduced onto the farm through a number of methods, all of which need to be addressed, no matter how small or large the operation. SE can be introduced through the purchase of hatching eggs from an infected breeder flock or SE-infected chicks, rodents (e.g., mice), fomites (e.g., production equipment, egg cartons, and pallets) that came from another premise which was contaminated with SE, feed (a low possibility), and, in many cases, people (e.g., employees, visitors, and owner). It is this author's goal to help

small/urban producers develop an "on farm egg quality assurance plan" as the best solution to prevent SE from being introduced into a flock.

WHAT IS SALMONELLA?

Salmonella is a rod-shaped Gram negative bacterium belonging to the family Enterobacteriaceae (intestinal bacteria).¹ *Salmonella* has a long history of being responsible for causing significant related health issues in poultry. *Salmonella* can be divided into 2 basic groups: host-specific *Salmonella*, which infects only avian species (*Salmonella* Pullorum and *Salmonella* Gallinarum), and non-host-specific *Salmonella* spp., also called

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paratyphoid *Salmonella*. Paratyphoid *Salmonella* is ubiquitous in the environment and is primarily associated with intestinal tract flora of mammals, birds, reptiles, and insects. There are more than 2500 serotypes of *Salmonella* (paratyphoid), most of which are not pathogenic to humans.¹

Paratyphoid *Salmonella* can be vertically transmitted, through the hatching egg to the chick, as well as horizontally, from fecal droppings, bird to bird contact, dead birds, litter, rodent droppings, direct contact with contaminated clothing, shoes, and other inanimate objects.^{2,3} Infected birds become "carriers" of the *Salmonella* bacteria, shedding the microorganism intermittently over the life of the animal, thereby contaminating eggs, eggshells, and the surrounding environment. More importantly, paratyphoid infections can be subclinical infections in poultry.¹

Salmonella is one of the leading causes of foodborne illness in the United States. The 2 most common serotypes of *Salmonella* are associated with food-type illness in humans are SE and *Salmonella* Typhimurium. SE has been associated with contaminated egg contents, egg products, and poultry that have not been properly cooked.

U.S. FOOD SAFETY AND SALMONELLA PREVENTION POLICIES AND REGULATIONS FOR THE POULTRY EGG INDUSTRY (FOOD AND DRUG ADMINISTRATION EGG SAFETY RULE OF JULY 9, 2010)

Beginning July 9, 2010, all shell egg producers who produced shell eggs for the table egg market and had 50,000 or more laying chickens were required to register with Food and Drug Administration (FDA) and be in compliance with the "Prevention of SE in Shell Eggs During Production, Transportation, and Storage" 74 FR 33030.⁴ From this point forward, "Prevention of *Salmonella* Enteritidis in Shell Eggs During Production, Transportation, and Storage" 74 FR 33030 will be referred to as FDA's "Egg Safety Rule." Shell egg producers with flocks less than 50,000 but more than 3000 laying chickens had time until July 9, 2012, to register with FDA and comply with the Egg Safety Rule. The Egg Safety Rule required shell egg producers to implement written protocols to prevent SE from contaminating eggs on the farm and from further bacterial growth during storage and transportation of the eggs. The Egg Safety Rule also requires the producers to maintain records concerning their written SE prevention plan.

The Egg Safety Rule required shell egg producers to have a written SE prevention plan which

included the following items:

1. Chicks and/or pullets must be raised under SE-monitored conditions
 - (a) Chicks come from SE-monitored breeder flocks that meet National Poultry Improvement Plan (NPIP) standards for "U.S. SE Clean" status or equivalent.
2. A written biosecurity program is in place.
 - (a) Limit visitors on the farm and in the poultry barn.
 - (b) Prevent stray animals from entering the barn.
 - (c) Maintain practices that will protect from cross contamination between barns.
3. Rodent/pest control measures.
 - (a) A written monitoring program for rodents and flies.
 - (b) Remove rodent/pest harborage in and around the barns.
4. Cleaning and disinfecting measures
 - (a) A written cleaning and disinfecting program required at depopulation if the barn had an SE positive environmental or egg test during the life of the flock before depopulation.
5. Adequate refrigeration of shell eggs.
 - (a) Hold and transport eggs at or below 45F ambient temperature beginning 36 hours after time of lay (after the last gathering of eggs).
6. A written environmental and egg sampling testing protocol
 - (a) Pullets at 14 to 16 weeks of age (preproduction).
 - (b) Laying hens at 40 to 45 weeks of age (mid-production).
 - (c) Laying hens 4 to 6 weeks after molting (begins when flock reaches 50% egg production after molting).
 - (d) If environment tests positive for SE, must have an egg diversion plan.
 - (i) Put flock down.
 - (ii) Send eggs to breaker plant.
 - (iii) Test eggs for SE.
 - (iv) Test 1000 eggs every 2 weeks for a total of 4 tests.
7. Required records
 - (a) A written SE Prevention Plan.
 - (b) Documentation showing that chicks come from SE monitored breeders/pullets were raised under "SE-monitored" conditions.
 - (c) Records documenting compliance with SE prevention measures.

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