



# Salmonella:

## What you and your chickens need to know

By Maurice Pitesky, DVM, MPVM, ACPVM

**S**almonella and the resulting infection from Salmonella—Salmonellosis—is one of the more confusing diseases in poultry. Some types of *Salmonella* don't make poultry sick but make humans sick. Some types of *Salmonella* make poultry sick but typically don't make us sick. Finally there are some types of *Salmonella* that are merely "*Salmonella* in name only" meaning they don't typically cause sickness in poultry or humans. This article is meant to provide an overview of what you and your chicken need to know about *Salmonella*.









## The gestalt of *Salmonella*

Scientists have identified over 2500 different types or serotypes of *Salmonella*. The majority of them are harmless to humans and poultry alike. However, there are two groups of *Salmonella* that we should be aware of that either affect our poultry or ourselves.

### **Paratyphoid *Salmonella*: Affects us, not them**

The paratyphoid serotypes of *Salmonella* are generally the *Salmonella* that make us sick but typically do not make our chickens sick. Examples of paratyphoid *Salmonella* include *Salmonella* Enteritidis (SE), *Salmonella* Heidelberg (SH), and *Salmonella* Typhimurium (ST).

Interestingly, chickens rarely get sick from paratyphoid *Salmonella*. However, mortality can occur in chicks exposed to paratyphoid *Salmonella*, most likely due to the lower infectious dose (i.e. you need fewer organisms to cause an infection) needed to cause disease



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in chicks versus older pullets and chickens. There are fewer beneficial and commensal (i.e. there is no benefit for the animal) bacteria in the chicken's intestinal tract to displace or prevent pathogenic bacteria from gaining a "foothold" in the chick's intestine. Consequently, protecting chicks from exposure to all diseases is extremely important since they are often more susceptible due to their developing immune system and for enteric (i.e. bacteria in the intestines) organisms like *Salmonella* the lack of beneficial bacteria.

Because poultry rarely get sick from paratyphoid *Salmonella*, identifying birds that are carriers of paratyphoid *Salmonella* such as SE, SH, and ST is challenging and requires testing in flocks that appear healthy. Therefore, the comment that "my chickens can't have *Salmonella* because they appear healthy" is not accurate.

For testing the most common and practical ways to test for paratyphoid *Salmonella* is via the environmental testing of the environment where the chickens defecate. Specifically, sterile gauze pads are dipped in canned evaporated milk and attached to a clip which is attached to a pole. The pole is then "dragged" around the environment where the birds defecate. This swab is then submitted to a diagnostic laboratory for testing. This method is better than collecting individual poop samples from chickens because *Salmonella* is intermittently shed meaning that if you had a negative test from a direct fecal sample you could not accurately say your chicken is *Salmonella*-free. In addition, by using the drag swab method in the environment you are getting a representative





sample of your flock over several days/weeks and hence are more likely to identify paratyphoid *Salmonella* if it is present in your flock. For more information on how to do a drag swab in your backyard please visit: <http://ucanr.edu/sites/poultry/files/243638.pdf>

**Host-Adapted *Salmonella*: Affects them, not us**

Host-adapted *Salmonella* very rarely make humans sick but are associated with significant morbidity and mortality in poultry. The two most common serotypes of host-adapted *Salmonella* are *Salmonella* Pullorum (SP) and *Salmonella* Gallinarium (SG) or fowl typhoid. The following is a brief summary of SP and SG.

SP is highly contagious and can be spread vertically or horizontally. This means it can be spread either from the hen to the developing embryo (i.e. vertically) or horizontally, from one bird to another or (via contact with fecal material or other contaminated sources such as contaminated feed, rodents and other wildlife). SP results in reduced hatchability in hens and high mortality in young chicks. Specifically, mortality can occur from the day of hatch to 21 days—with

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approximately five days post-hatch being the most common age of mortality, although you may not see any clinical signs for up to 10 days. Affected chickens are depressed, anorexic, have white diarrhea and tend to huddle under brooders. The most common diagnostic test requires a small blood sample and can be relatively easily performed by qualified individuals.

SG (i.e. fowl-typhoid) is also spread vertically or horizontally. SG is more commonly associated with adult chickens as opposed to SP. However, SG can cause mortality in both hens and chicks. Common clinical signs include a drop in egg production, diarrhea, and depression.

While antibiotics such as aminoglycosides and tetracyclines have been shown to be effective treating infected chickens with host adapted *Salmonella*, it should be noted that eggs should not be consumed during treatment and the subsequent withdrawal period. Consultation with the Food Animal Residue Avoidance Databank or FARAD should be done in order to determine the optimal withdrawal period.

It should be noted that no combination of drugs has been found to completely eliminate infection from a treated flock. Because of this and the time and expense related to treatment which requires approximately two weeks of antibiotics in the feed in addition to the fact that new birds brought to your premise could also become exposed to older birds leads to the reality that depopulation of affected flocks is the best with respect to short and long-term control.

The commercial poultry industry in the United States has completely eliminated SP and SG via various testing and control programs implemented by the National Poultry Improvement Program (NPIP). As part of this voluntary program most commercial

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poultry producers require testing of flocks including breeding flocks. In addition, practices at the breeding facility and grow-out farm are evaluated. Therefore, it is highly recommended that when you order chicks from a hatchery or from a feedstore you should ask not only if they participate in the NPIP program but if chicks were hatched under "NPIP Salmonella Monitored" guidelines and are certified as free of SP. While no testing program is perfect, especially with respect to the Pullorum-Typhoid tests that are used in the NPIP Salmonella Monitored program, the combination of the testing in addition to the inspections is a valuable tool that all chicken owners should consider.

### Minimize exposure

Big picture, focus on biosecurity to mitigate exposure to *Salmonella* in your flocks. If your chicks came from an NPIP Salmonella Monitored flock continue their efforts with respect to biosecurity. Specifically, focus on preventing the *Salmonella* from rodents and other wildlife from infecting your birds.

Remember, *Salmonella* is primarily an enteric organism, meaning it is associated with the GI tract. Therefore, by eliminating or mitigating exposure to wildlife and fomites (infected inanimate objects like equipment and shoes) you can play an important role in protecting your flock from both paratyphoid *Salmonella* and host-adapted *Salmonella*. 🐔

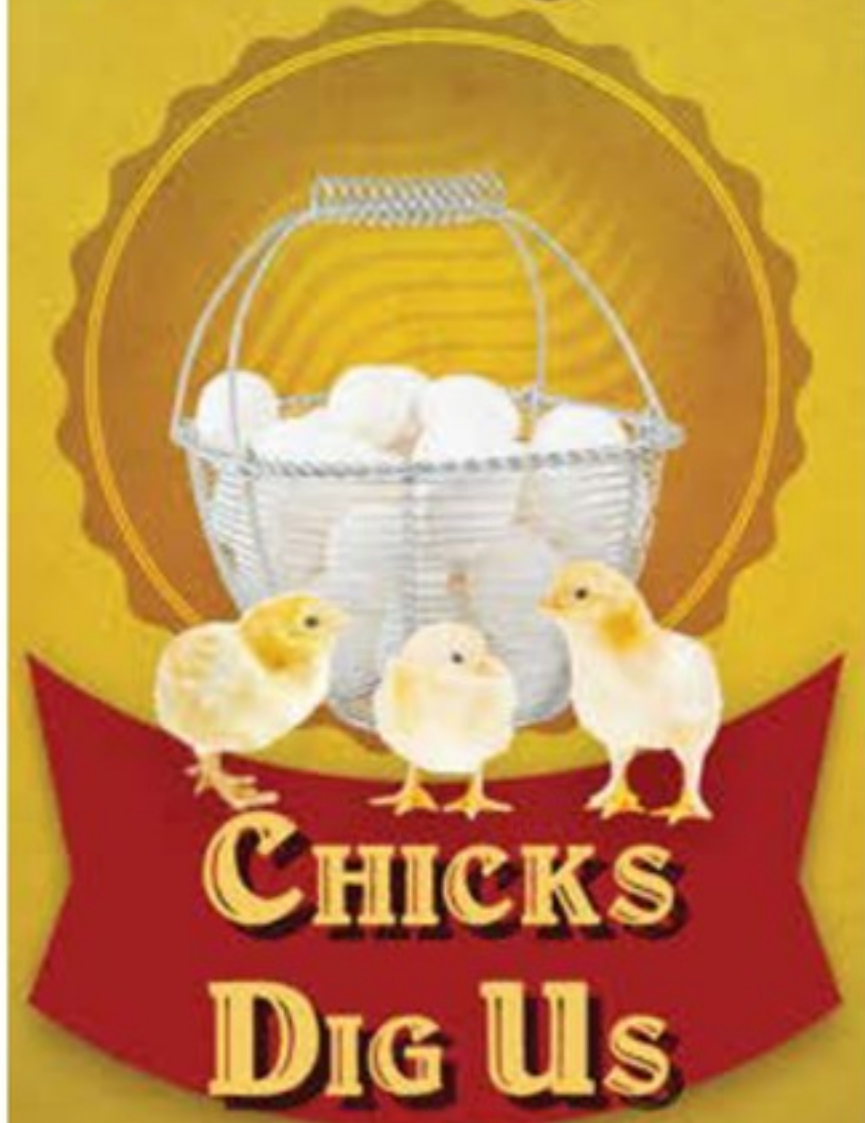
### About the author

**Maurice Pitesky** is a faculty member at University of California Cooperative Extension (UCCE) with an appointment in poultry health and food safety epidemiology. Pitesky earned his BS in biology from UCLA and his DVM and MPVM from UC Davis. Pitesky is also boarded in preventative veterinary medicine (DACVPM).



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