

Outbreaks of *Salmonella* Linked to Backyard Flocks

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Inside this issue:

<i>Outbreaks of Salmonella Linked to Backyard Flocks</i>	1
<i>Outbreaks of Salmonella Linked to Backyard Flocks</i>	2
<i>The Female Avian Reproductive System</i>	3
<i>The Female Avian Reproductive System</i>	4
<i>Contact Information</i>	4

While many people associate *Salmonella* infections with the consumption of poultry meat or eggs, there is also the possibility of contracting this bacterium from live poultry. As of this writing there have been eight outbreaks of *Salmonella* associated with live poultry and backyard flocks in the United States during 2016. These outbreaks have affected a total of 45 states and Florida is included. While many of the 611 cases have been in the Northeast and Eastern Seaboard regions of the country, Florida has had nine cases. Below is the current information about the outbreaks as reported by the Centers for Disease Control. This information can also be found at <http://www.cdc.gov/salmonella/live-poultry-05-16/index.html>.

- The CDC, USDA-APHIS, and multiple states are investigating eight outbreaks of human *Salmonella* infections linked to contact with live poultry in backyard flocks.
- At this time, there have been 611 cases associated with the outbreaks in 45 states.
- Illnesses started on dates ranging from January 4, 2016 to June 25, 2016
- At this time, 138 people have been hospitalized due to the outbreaks. There has been one death of an infected person; however, *Salmonella* infection was not considered to be the cause of death.
- Of the 611 cases, 195 of these (32%) have been reported in children aged 5 years or younger.
- There has been considerable effort put forth in epidemiological studies and traceback for these outbreaks and the findings have concluded that the outbreaks are sourced from live poultry such as chicks or ducklings originating from multiple hatcheries.
- It is important to remember that all live poultry have the potential to carry *Salmonella* bacteria, regardless of where they were purchased and whether they appear to be clean and healthy.
 - Note that many serotypes of *Salmonella* are considered to be commensal with poultry species, and therefore, will not present any disease-like symptoms even though they are present.
- These outbreaks are expected to continue for the next several months since many flock owners might not be aware of the risk of *Salmonella* infection by live poultry, or by participating in behaviors and practices that can result in infection.

Continued on page 2

Information from the CDC about the current *Salmonella* outbreak linked to live poultry can be found [here](#).

Information from the CDC about live poultry and the associated risks with young poultry can be found [here](#).

Information from the CDC about zoonotic disease can be found [here](#).

Outbreaks of *Salmonella*

Continued from page 1

It is important to remember that contact with live poultry and their environment has the potential to cause illness, including illness from *Salmonella* bacteria. The items listed below are steps for backyard flock owners to follow to protect themselves and others from potential disease.

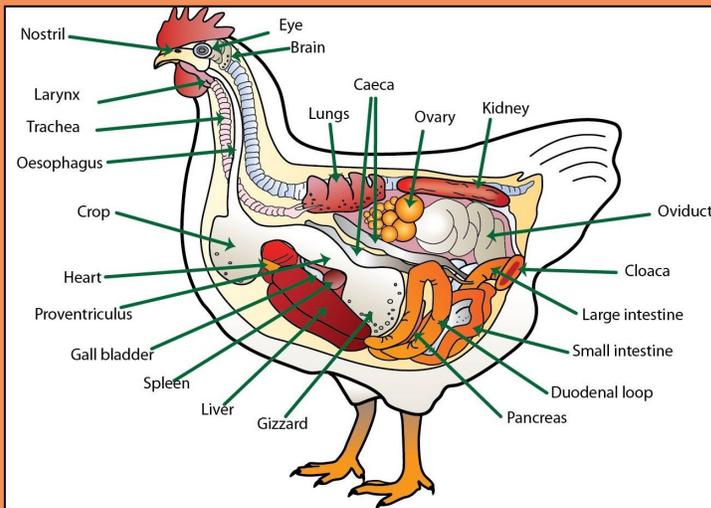


UF/IFAS Photo

- Always wash hands with soap and water immediately after touching live poultry or items in their environment. You should also wash your hands after touching clothes or garments that have come into contact with live poultry or their environment. Adults should always supervise hand washing for young children.
- If soap and water are not available, use sanitizing wipes or hand sanitizer. Wash with soap and water as soon as you are able.
- Do not allow live poultry inside the house, especially in areas where food and/or drink is served and/or prepared. Examples would be kitchens or outdoor patios.
- Children younger than 5 years of age, adults over 65 years of age, and any person that is immunocompromised should not handle or touch live poultry, including chicks and ducklings. People in these groups tend to have more severe symptoms from an infection with *Salmonella*.
- Make sure that no one snuggles or kisses poultry of any age. You should also not touch your mouth, eat, or drink around live poultry.
 - For additional information about live poultry and the associated health risks with young poultry, please visit the following CDC website: <http://www.cdc.gov/Features/SalmonellaBabyBirds/>
- Make sure to stay outside when you are cleaning equipment or materials that have come into contact with live poultry (such as cages, feeders, or waterers),
- Additional information from the CDC about taking care of your backyard flock can be found at: <http://www.cdc.gov/features/salmonellapoultry/>. These guidelines apply to all live poultry, no matter the age of the poultry or where they were purchased.
- When purchasing birds, make sure that the point of sale (hatchery, feed store, etc.) provides information about potential health risks associated with live poultry.
- Additional information about zoonotic diseases (i.e. diseases that can be acquired from animals) can be found on the CDC website at: <http://www.cdc.gov/zoonotic/gi/index.html>.

The Female Avian Reproductive System

Previously in this newsletter, we have talked a lot about eggs, including sizes, grades, and defects. What we haven't touched on is where these eggs come from, i.e., the female avian reproductive system. Avian species, including poultry, have a reproductive system that is designed around the perils of being a bird. Most bird species, apart from raptors and a few others, are the prey animals for many species. Birds have adapted reproductive strategies to help their young survive, but also allow the adult birds to keep the ability to fly.



Location of the reproductive tract in a chicken compared to the other organ systems. Image courtesy of PoultryHub.

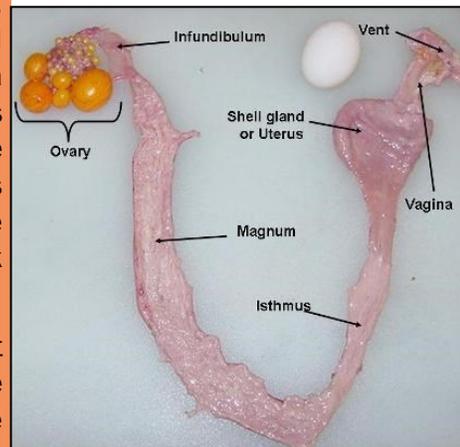
The most important of these is the use of the egg. Laying eggs allows the female bird to have more than a few young at the same time. She lays a group of eggs known as a clutch and they will all hatch within a day or so of each other. Some clutches can be as many as 20 eggs. Can you imagine a bird trying to fly if she had 20 chicks developing inside her? Eggs also allow for all the nutrition for the developing embryo to be deposited inside the shell, thus relieving the mother bird of needing extra nutrition during embryo development. Listed below are the parts of the chicken reproductive tract with explanations of their function in the development of the egg.

THE OVARY—the ovary itself is a cluster of developing ova. These developing ova are what will eventually be referred to as the yolk of the egg. As with many animals, the ovary has all of the potential ova in it when a hen hatches from the egg (it actually contains many more ova than eggs that will actually be laid). However, the ova do not begin to develop until the hen reaches sexual maturity. The ova all start as a single cell and as development continues the yolk is formed to provide nutrients to the developing cells once they have been fertilized by a male. Each ovum is surrounded by an individual sac that has many blood vessels running through it to shuttle nutrients into the developing yolk. At ovulation, the sac splits along the *stigma*, a part of the sac devoid of blood vessels, and releases it toward the infundibulum. Some yolk sacs will split at a different place than the stigma and this split will cross a blood vessel. When this happens, we get a yolk with a blood spot.

THE INFUNDIBULUM—the infundibulum is a muscular section of the oviduct around 3 to 4 inches long. At ovulation, it surrounds the yolk and begins the process of moving it down the rest of the oviduct. The yolk only stays in the infundibulum around 15 minutes. If fertilization is going to occur, it happens in the infundibulum.

Did you know?
Even though female chicken embryos have two ovaries, only one develops. The left ovary and left side of the reproductive tract are active in adult hens, while the right side regresses and is not functional.

There have been instances where the left ovary has been defective or otherwise damaged and the right ovary has developed to replace it.



Reproductive tract of a female chicken. Photo courtesy of Jacquie Jacob, University of Kentucky.

Continued on Page 4

The Female Avian Reproductive System Continued from page 3

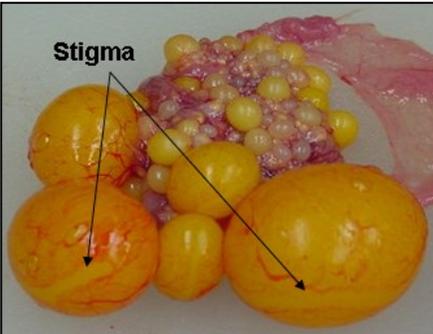
THE MAGNUM—after the yolk passes through the infundibulum, it moves on to the magnum. The magnum is the longest section of the oviduct at around 13 inches long. It is here where the thick albumen (the egg white) is added. At this point there would be no way for a sperm cell to reach the ovum for fertilization, so you can see why fertilization has to take place in the infundibulum. The forming egg stays in the magnum for around 3 hours.

THE ISTHMUS—after its journey through the magnum, the developing egg then moves along to the isthmus. This section of the oviduct is where the inner and outer shell membranes are formed. In general, the egg will stay in the isthmus for about 1 hour and 15 minutes.

THE UTERUS—the uterus is the next stop for the egg on its way down the oviduct. The uterus is around 4 to 5 inches long and is also referred to as the shell gland, as this is the part of the oviduct where the shell is formed. The shell of an egg is made up, mostly, of calcium carbonate. The hen uses the calcium from her diet, along with calcium pulled from her bones to form the egg shell. This is why it is important to make sure that laying hens have the correct amount of calcium in their diet. The egg spends the majority of its development time in the uterus, approximately 20 hours.

THE VAGINA—The final part of the oviduct is called the vagina. It is about 4 to 5 inches long. The last part of the oviduct is where the cuticle of the egg is formed. After the cuticle is deposited, the muscular vagina contracts to push the egg out of the hen's body. The actual laying of the egg is referred to as oviposition. A couple of other notes of interest about egg formation are:

- During egg formation, the egg actually moves down the oviduct small end first. However, while in the vagina and just before oviposition, the egg turns around and is laid large end first.
- I mentioned that fertilization, if it occurs, happens in the infundibulum. So, how are sperm supposed to reach an ova if there is an egg travelling down the oviduct? In the vagina, there are glands called sperm host glands that can store the sperm for long periods of time (up to 2 weeks). It should be noted that rooster sperm can remain viable at body temperature, which is unlike many animals. Once oviposition occurs, the sperm can then move up the oviduct to the infundibulum where fertilization can occur. It is also possible for more than one rooster's sperm to be kept in the sperm host glands for use in fertilization.



A view of developing ova in the chicken ovary. Notice the stigma, which has no blood vessels. This is where the yolk sac splits during ovulation. Photo courtesy of Jacquie Jacob, University of Kentucky.

The total time from ovulation to oviposition is around 26 hours.

Thus, a hen in production will lay an egg around once a day.

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