

Food-Borne Pathogens

Salmonella and other food-borne pathogens are 100 percent preventable.

As backyard chicken owners, many of us enjoy eating the eggs that we get from our own chickens. After all, how much more local can you get than your own backyard? Aside from the convenience and satisfaction of having our own little farm and producing our own food, we need to make sure that the eggs we consume from these chickens are produced in a manner that ensures the least amount of risk from dangerous bacteria such as salmonella.

Food safety begins at farms and ends at our tables — even when the farms are our backyards. The food chain includes the steps that food undergoes from production, processing,

storage and transportation, until it is prepared and consumed. Because we usually can't tell if our eggs or our chickens are carrying pathogenic bacteria that are harmful to us (e.g., we can't detect pathogenic bacteria by candling our eggs), the safety of our food is best assured when all links in the food chain are interconnected, taking preventive measures at each step.

Food safety is serious business for everyone that prepares food in some form or fashion, including backyard chicken-keepers who consume eggs from their chickens. According to the Centers for Disease Control and Prevention, in 2007, more than 200,000 people in the United



Harmful food-borne pathogens can be prevented through good sanitation and storage practices.

Store eggs in the refrigerator for 3 to 5 weeks, or mix the yolk and white and freeze. You can also freeze the whites and yolks separately. Freeze the mix or separate in ice-cube trays. Once frozen, pop them out and put in freezer-safe plastic bags.

States were sickened with *Salmonella enteritidis*, one of the most common food-borne types of salmonella, with the vast majority having been sickened from eggs. While most cases of SE are relatively mild (with symptoms such as diarrhea and fever), severe cases can lead to hospitalization and death. The good news is that food-borne infections of salmonella and other pathogenic bacteria are 100 percent preventable.

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Most harmful pathogens associated with raw eggs are bacterial pathogens. Therefore, for purposes of this article, we will focus on bacterial food-borne pathogens, such as those from the genus *Salmonella*. *Salmonella* is a type of bacteria primarily associated with mammals, birds, reptiles and insects. Because it is often shed in the feces of these animals, bacteria such as salmonella are considered ubiquitous in the environment.

Interestingly, there are more than 2,600 types or serotypes of salmonella, most of which are not pathogenic to humans. Of those 2,600 types, only about a dozen serotypes of salmonella, including SE, are considered harmful to humans. This same phenomena (e.g., some types being pathogenic and some types being harmless) is true for most types of bacteria, including *E. coli*.

Practicing Good Food Safety

Pathogenic bacteria do not just appear out of thin air within a small flock of chickens. The bacteria need to be introduced. Pathogenic bacteria can be introduced multiple ways, including the purchase of infected hatching eggs or chicks from an infected breeder flock. Other routes of introduction include contaminated feed, infected rodents that come into contact with your chickens and contaminated equipment, including egg cartons or even people. Once introduced to the farm or backyard, the bacteria can contaminate the egg via contact with eggs in the environment, or in some cases, the bacteria can move from the infected reproductive tract of a laying hen to the developing egg. It is also possible for eggs to become infected by bacteria via fecal contamination through the pores of the shells after the egg is laid.

Bacteria can be on the outside and inside of eggs that appear normal. That's because the egg



MARIA KOMAR/SHUTTERSTOCK

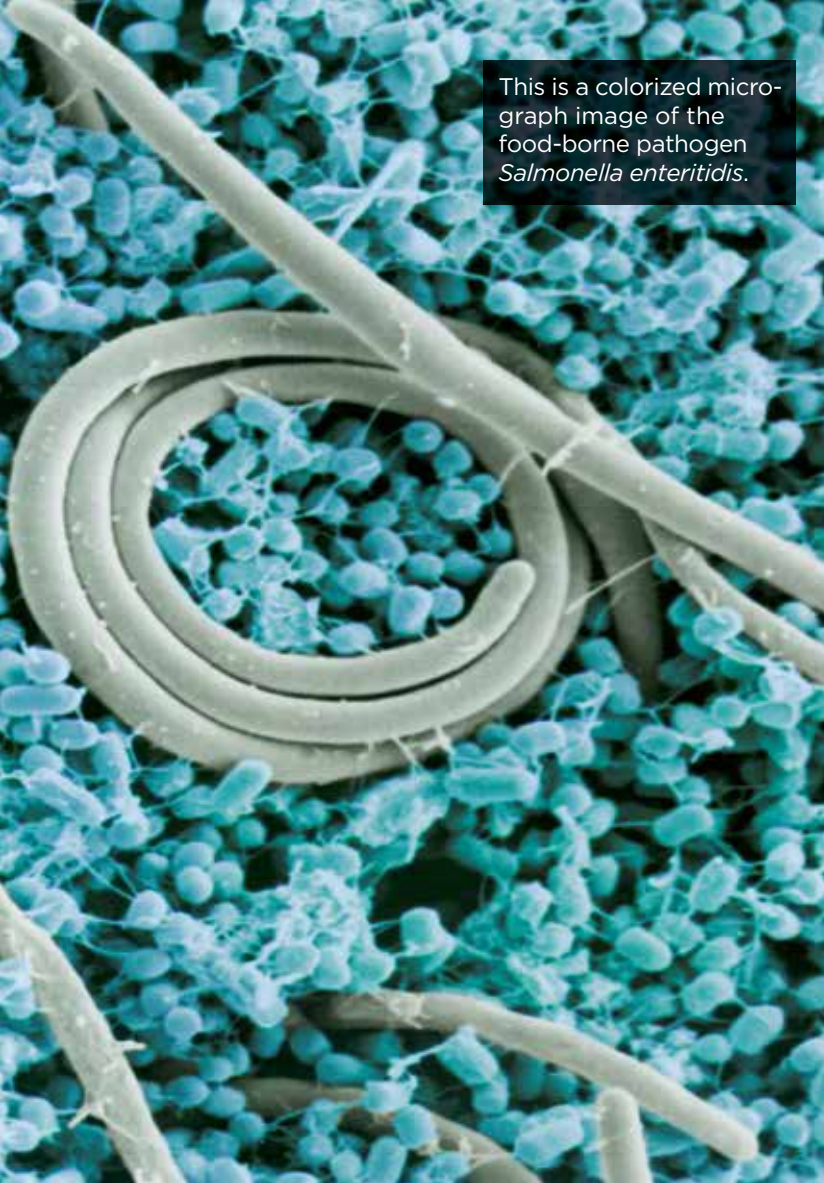
In the Kitchen

Raw eggs in their shells can safely stay in the refrigerator for three to five weeks. If you have too many eggs, you can beat the raw yolks and whites together and then freeze. Do not freeze the entire egg in the shell by itself.

If eggs are eaten raw and pathogenic bacteria are present in the eggs, salmonella can cause illness. Therefore, it is important to only consume cooked eggs, especially for the young, elderly and persons with weakened immune systems. Cooking reduces the number of bacteria present in an egg; however, a lightly cooked egg (with a runny white or yolk) still poses a greater risk than a thoroughly cooked egg (with firm white and yolk).

- When you scramble eggs, cook until the eggs are firm and not runny.
- When you fry, poach or boil eggs, cook them until the white and the yolk are both firm.
- For egg mixtures such as casseroles, homemade ice cream and eggnog, cook until the center of the mixture reaches at least 160 degrees Fahrenheit when measured with a food thermometer.

If your recipe calls for uncooked eggs, make it safe by heating the eggs in one of the recipe's other liquid ingredients over low heat, stirring constantly, until the mixture reaches 160 degrees. Then, combine it with the other ingredients and complete the recipe, or use pasteurized eggs or egg products.



This is a colorized micrograph image of the food-borne pathogen *Salmonella enteritidis*.

potential benefits. If there is dirt on the egg, remove it with a dry cloth or some sandpaper.

The larger the number of salmonella bacteria present in the egg, the more likely the egg will cause illness. One way to prevent a few salmonella from growing into a lot of salmonella is to take them away from their optimal growing temperature, which just happens to be room temperature. Therefore, as a backyard producer, collecting eggs every day and keeping the eggs adequately refrigerated is essential for preventing any salmonella present in the eggs from growing. Eggs should be refrigerated until they are needed.

Eggs are a nutritious and economical food. However, you must take special care when handling and preparing fresh eggs and egg products to avoid food poisoning. Food safety and poultry health are linked. You can't have safe food without having healthy poultry and a healthy environment. A future article will focus on the science of biosecurity (i.e., procedures intended to protect animals from disease-causing agents on the farm), with recommendations for reducing the risk of disease on your farm or in your backyard. ☼

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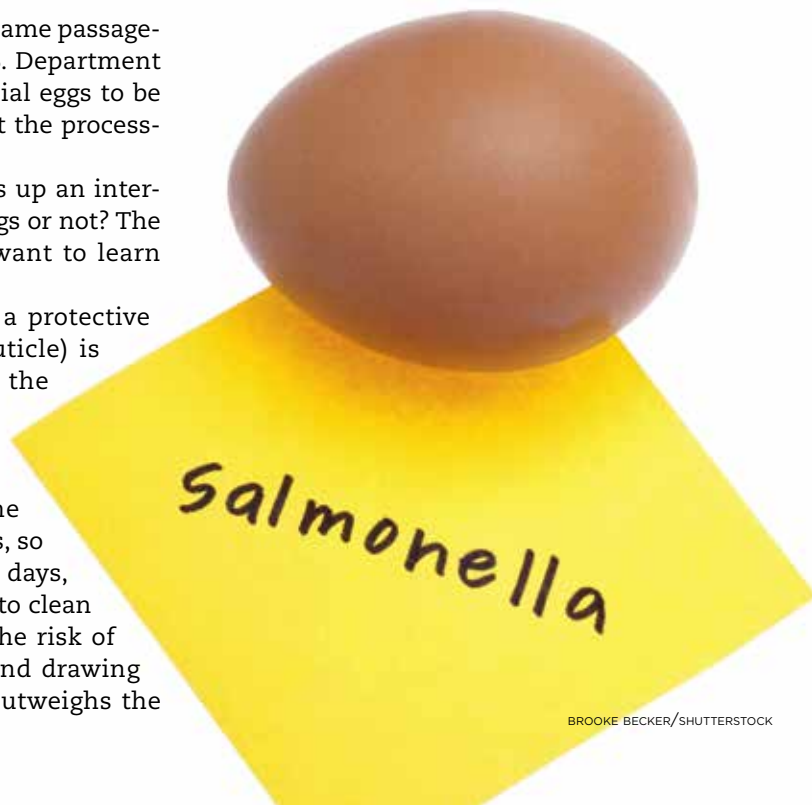
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exits the hen's body through the same passage-way as feces. That's why the U.S. Department of Agriculture requires commercial eggs to be washed with a sanitizing rinse at the processing plant.

This USDA requirement brings up an interesting question: Do I wash my eggs or not? The short answer is no, but if you want to learn more ...

When a chicken lays an egg, a protective coating (called the bloom or cuticle) is also present on the surface of the shell. Among other functions, the bloom is thought to help prevent bacteria from getting inside the egg. The "life span" of the bloom is thought to be a few days, so if you eat your eggs within a few days, you probably don't want or need to clean the outside of the egg. In fact, the risk of incorrectly washing your eggs and drawing bacteria into the egg probably outweighs the

You can't tell if an egg is infected with food-borne pathogens by looking at it, so be sure to only eat thoroughly cooked eggs and egg products.



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