

Enhancing Egg Quality & Safety in Small Flocks

► Whether you are raising one or a thousand laying hens, maintaining the best possible cleanliness and safety of the eggs produced leads to improved egg quality and shelf life as well as reduced risk of illness from consuming the eggs.

In a typical flock environment, eggshells have some level of bacteria present. Much of these bacteria are harmless or even beneficial; however, laying hens live and lay eggs in the same environment where they eat, sleep, and defecate. This increases the potential for the eggs to be contaminated with pathogens, such as *Salmonella* and *Campylobacter*, that cause human illness or bacteria that cause egg spoilage.

The key to egg safety is proper management of the chicken coop environment and care of the eggs to minimize overall eggshell fecal contamination.

How Eggshells Become Contaminated

The first point of contact between the egg and fecal material is within the hen's cloaca (where the egg exits the hen). As the egg passes through the vent, it can come in contact with feces. When the outer cuticle layer dries, it helps to protect the egg from additional bacterial invasion. After the egg is laid, the egg comes in contact with bacteria within the nest box or chicken coop environment.

How to Minimize Eggshell Bacteria

Biosecurity

A very important strategy for enhancing the quality and safety of eggs is through managing the environment within your chicken coop. Good biosecurity is the first step to minimize eggshell bacteria. Biosecurity includes keeping the birds protected from potential sources of contamination. Here are some strategies to help you maintain good biosecurity:

- Maintain a clean environment.
- Discourage pests through rodent and insect control.
- Do not allow wild birds to come in contact with the flock.



- Avoid cross-contamination from other poultry (animal swaps).
- Quarantine any new birds you add to your flock in a separate area for a minimum of 30 days to ensure that they do not bring in any illnesses.
- Thoroughly clean and sanitize new equipment before introducing it into the coop and range area.
- Use dedicated clothing and footwear when entering the coop and range area to help protect the flock from outside contamination.
- Wash your hands or use hand sanitizer both before and after entering the coop and working with your birds.
- Visit younger birds prior to older birds if you have separate coops with flocks of differing ages.



Nesting Box Placement and Design

One of the most important ways you can minimize eggshell bacteria is to provide the cleanest possible nesting environment for your birds. First, there should be an adequate number of nests. You will need only one nest box for every four hens. Each of these nests should be in a location that is not brightly lit and is out of the way of foot traffic.



To keep nest boxes clean, it is important to provide attractive perches that allow hens to roost away from where they are nesting. Minimizing perching in or on the nest boxes keeps fecal contamination away from the nests. Perches also should be placed higher than the nest boxes, and the tops of the boxes should be designed to discourage roosting. For example, a steep incline or slippery surface can help your hens decide that the top of the nest boxes is not a great place to take a nap.

Each nest should be easy to clean and cleaned regularly. Nest boxes constructed of plastic or metal can be easier to clean than wooden boxes, which can harbor insects and bacteria and retain moisture. With proper care and maintenance, however, plastic, metal, and wood boxes are all acceptable. One tip for using wooden nest boxes is to give them a good coat of paint to help seal them.

The bedding inside the nest box also needs to be properly maintained. Pine shavings, straw, and hay are all good bedding materials that are relatively inexpensive and lend well to frequent replacement when soiled. Another option is to use nest box liners, which can be removed, cleaned, and sanitized regularly.

In addition to routine cleaning and maintenance of nest boxes and nests, the henhouse or chicken coop also needs regular maintenance. Manure must be removed daily and fresh bedding added several times a week. Areas with the greatest amount of manure will be under the perches and around the feeders and waterers. These areas can be spot cleaned daily by removing soiled litter and fecal material. This allows for longer time intervals between full coop clean-outs.

Both waterers and feeders should be properly maintained through frequent cleaning with soap and water. How often you do this depends on the type of waterers and feeders used. Open-access waterers should be cleaned daily while nipple drinkers can be cleaned less often. A good idea is to set up a regular cleaning schedule for this equipment. If equipment looks dirty, however, then it is dirty and needs to be cleaned immediately. Do not allow your birds to drink dirty water or eat feed mixed with manure or litter. This is how they may become sick or come into contact with pathogens that can make you sick.

Techniques for Washing Eggs

Eggs should be collected at least once per day and preferably twice per day. Multiple hens will use the same nest boxes over the course of the day. Each time a bird enters the nest box there is potential for feces from its feet or feathers to contaminate the eggs. Rollout nest boxes help to prevent this by allowing the eggs to roll away from the nest. Regularly collecting eggs will discourage your hens from becoming broody and wanting to sit on a clutch of eggs.

When eggs are collected, they should be placed in a clean container. Traditional egg baskets work well because they allow dirt and debris to fall from the basket, and the baskets themselves are easily cleaned and sanitized.

When collecting eggs, keep clean eggs separate from dirty eggs. Separate eggs that have been laid somewhere other than a clean nest box, such as the floor. Dirty eggs and floor eggs can contaminate the clean eggs if collected in the same container.



Once the eggs have been collected, they should be stored at refrigerated temperatures (33 to 40 degrees F). Refrigerated storage not only minimizes bacterial growth, but it extends the shelf life of your eggs.

Whether or not to wash your eggs is often a matter of debate. When eggs are washed, dirt and bacteria are washed off, but the egg's natural antimicrobial coating (cuticle) is also removed. Properly washed and refrigerated eggs are just as safe as clean eggs with the cuticle remaining. Whether or not you wash your eggs will depend on your preference and sometimes your market, if washing eggs is required.

If you choose not to wash your eggs, they can be spot cleaned with a clean towel or a lightly abrasive material such as fine grade sandpaper. Another spot-cleaning alternative is to use a clean, disposable towel wetted with 200 ppm bleach (3 teaspoons per gallon) or commercially available wipes produced for cleaning eggs.

If you decide that you want to use water to wash your eggs, do it with water that is at least 20°F warmer than your eggs. Submerging warm eggs in cold water can cause bacteria to be pulled into the egg through the pores in the eggshell. This reduces egg shelf life and potentially allows the internalization of pathogens.

The best way to wash with water is to use running hot water directly from your faucet. The water should be hot enough to wash the egg but not hot enough to scald your hands. Submerging eggs in water can lead to bacterial spread over the entire surface of an egg and from egg to egg. If the egg is so dirty that water from the tap is not adequate for washing, then the egg is likely too dirty to enter the food chain. Do not wash very dirty eggs since this can spread fecal contamination. Very dirty eggs should not be consumed and should be disposed of properly.

It is always best practice to minimize the occurrence of dirty eggs through optimal coop organization, cleaning, and maintenance. Always make sure the eggs are fully dry prior to packing in a clean egg carton.

Resources

If you are planning to sell your eggs, be sure to investigate the regulations that are specific to your individual state. Alabama resources include the following:

- The Alabama Shell Egg Law: www.fma.alabama.gov/PDFs_NEW/Shell_Eggs.pdf
- Information on selling eggs: Kristin Woods, (251) 275-3121 or woodskl@aces.edu
- Information on flock biosecurity: www.aces.edu/blog/topics/poultry/biosecurity-for-backyard-poultry-flocks/



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For more information, contact your county Extension office.
Visit www.aces.edu/directory.

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