

HATCHING-EGG PRODUCTION, STORAGE AND SANITATION

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The most important step in egg sanitation is the production of nest-clean eggs. This requires a carefully planned management system. The following practices have proved useful in producing clean hatching eggs and in keeping the eggs clean until they are set in incubators.

- Maintain birds on wire, plastic, or wooden slatted floors whenever possible. However, some commercial strains of chickens and turkeys do not produce well in this environment and must have litter floors in part or all of the house.
- To keep floor eggs to a minimum, provide one nest for every four hens. Be sure nests are in place before egg production starts.
- Keep nests filled with clean nesting material such as wood shavings, rice hulls or nest pads.
- Collect eggs frequently (at least four times a day).
- Exclude hens from nests at night. This reduces development of broody hens and keeps nests cleaner.
- Maintain dry litter at all times.
- Collect eggs on clean, sanitized, plastic flats or in clean egg baskets.
- Separate cracked, stained, and heavy dirty eggs as you collect them, and don't set them.
- Sanitize clean eggs as soon as possible after collection. This kills microbes on the outside of the shell. It does not kill all of the microbes that have penetrated the shell.
- Always wash hands thoroughly with a disinfectant soap before handling eggs.
- Cool eggs overnight in flats before placing them in cases. If eggs are to be stored, place them in a clean room held at 55°F to 68°F and 75 percent relative humidity (see Table 1).
- Never allow eggs to sweat (form surface moisture from condensation); they may sweat when moved from cold storage into a warmer room. You can prevent this by putting eggs in trays in a temperature-controlled room (see Table 2).

Table 1. Recommended hatching egg storage temperature.

| Duration of Egg Storage (days)* | Recommended Storage Temperature |
|--|--|
| 1 | 68°F |
| 1 to 4 | 65°F |
| 5 or more | 55°F to 60°F |

* Eggs stored more than 7 days will benefit from daily turning and storage in plastic bags.

Table 2. Combinations of temperature and relative humidity in egg-handling rooms causing eggs to sweat when stored at 60°F or 65°F.

| Conditions in Room Where Eggs Will be Handled | | |
|--|---|---|
| Temperature (°F) | Relative Humidity | |
| | Eggs Removed From 60°F Egg Storage | Eggs Removed From 65°F Egg Storage |
| 60 | Eggs won't sweat | Eggs won't sweat |
| 65 | 85% | Eggs won't sweat |
| 70 | 71% | 83% |
| 75 | 60% | 71% |
| 80 | 51% | 60% |
| 85 | 44% | 51% |
| 90 | 37% | 43% |
| 100 | 28% | 32% |

Egg Sanitation

Several methods are available for hatching egg sanitation. The appropriate choice for a particular farm will depend on factors such as the size of the operation, potential use of the chicks, the history of disease problems and costs for alternative equipment and chemicals. Small farms may find that the best alternative is to store hatching eggs in a clean environment and set them as soon as possible without sanitation. Large commercial producers are advised to consult a poultry veterinarian or specialist for advice on the best egg handling and sanitation program for their needs.

Fumigation: Formaldehyde gas fumigation has long been used to reduce contamination on eggs. Label registration for this use was withdrawn for a time due to its potential human toxicity but EPA has again registered several formaldehyde products for incubator and hatching egg fumigation. However, at this time no formaldehyde product is registered in California for this use.

Spray Application: Solutions containing disinfectants can be sprayed onto clean eggs during collection. Any disinfectant registered for use on hatching eggs can be used. Check with local suppliers for registered materials and use them at recommended levels.

UV Light: Eggs can be sanitized with UV light. Commercial sanitizing equipment utilizing UV light is available for commercial producers.

Egg Washing: Some producers prefer to wash hatching eggs. Egg washing effectively sanitizes hatching eggs if proper equipment is available to do the job correctly. However, washing can cause contamination of eggs if the water temperature drops below recommended levels or if contamination exceeds the capacity of the disinfectant (a particular concern in reservoir-type or immersion washers). Wash water must always be hotter than the eggs (recommended range, 110°F to 120°F). The washing solution must contain an appropriate sanitizer. A washer that does not recirculate water is recommended. If an immersion washer is used, the water must be changed frequently; do not wash more than 200 eggs per gallon of solution capacity before changing the washing solution. Immersion time should not exceed 3 minutes and eggs should be thoroughly dry before they are put into cases. To be most effective, reservoir-type washers should be equipped with systems to monitor and control sanitizer levels. This type of washer should have a final sanitizing rinse with a solution that is not recirculated. Several commercial egg washing machines are available that will effectively sanitize hatching eggs when used properly. Only good quality water with less than 2 ppm iron should be used for egg washing.

Disinfectants for Egg Sanitation

Several commercial products are registered for hatching egg sanitation. You can find an extensive list of disinfectants at: <http://www.biosecuritycenter.org/disinfect.htm>. Chlorine-based disinfectants containing a cleaning agent are widely used to wash table eggs and have proved safe for hatching egg sanitation. There are several commercial disinfectant formulas registered for hatching egg washing. University of California research has shown quaternary ammonium to be an excellent sanitizer for hatching eggs. The advantages of quaternary ammonium are that it:

1. Is safe for hatching eggs.
2. Leaves residual protection on eggs.
3. Is safe for equipment and personnel.
4. Is reasonable in cost.

Summary

The key to production of quality chicks is production of clean eggs. Proper egg sanitation will reduce transfer of disease agents from egg shells to chicks.