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National Poultry
Improvement Plan

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Best Management Practices Handbook



**A Guide to the Mitigation of
Salmonella Contamination
at Poultry Hatcheries**

Best Management Practices Handbook: A Guide to the Mitigation of *Salmonella* at Poultry Hatcheries

United States Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services
National Poultry Improvement Plan

Contact

USDA-APHIS-VS
National Poultry Improvement Plan
1506 Klondike Rd. Suite 101
Conyers, GA 30094
(770)922-3496

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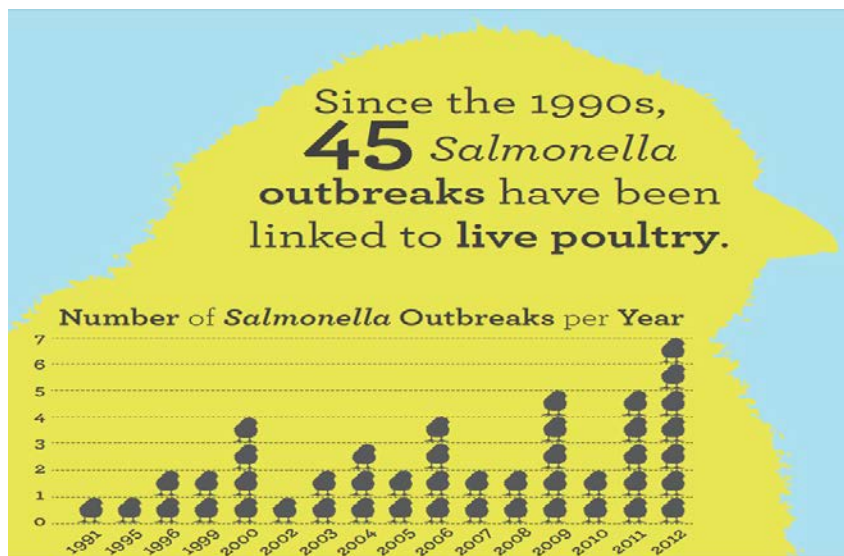
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About This Handbook

This handbook was developed to assist hatchery operators in mitigating *Salmonella* contamination of birds to be sold through the mail, feed stores, or other retail outlets. Reducing *Salmonella* contamination at the hatchery, along with proper handling of live poultry by those purchasing birds, will help reduce the number of people becoming ill. The biosecurity, sanitation, and quality assurance recommendations made in this handbook are very basic approaches to improving the quality of the birds produced at a hatchery and reducing the risk of *Salmonella* transmission. A *Salmonella* control program specifically designed for an individual hatchery should be developed in collaboration with a professional poultry health consultant such as a poultry veterinarian.

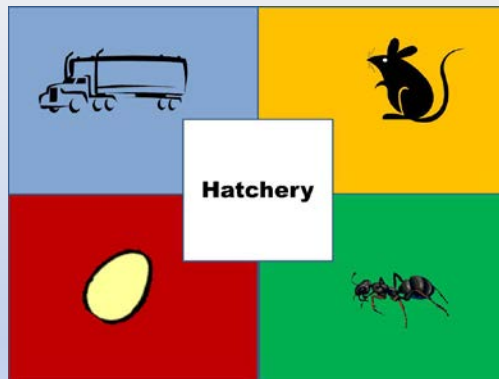
Introduction



CDC Graphic

Salmonella bacteria cause an estimated 1.2 million human illnesses, 19,000 hospitalizations, and 370 deaths annually in the United States. The United States Department of Agriculture's (USDA) Economic Research Service estimates that *Salmonella* costs the U.S. economy approximately \$2.5 billion annually. An estimated 11% of human *Salmonella*

infections are attributed to animal exposure annually, making it important for producers, public health and agriculture officials, health care providers, pertinent industries, and consumers to be aware of this zoonotic disease. Live poultry, reptiles, amphibians, cattle, sheep, pigs, horses, dogs, cats, and many other animals have been identified as sources for human *Salmonella* infection. Infections are caused by direct or indirect contact with animals. Indirect transmission can occur through contact with anything in areas where animals live and roam or consumption of food/drink prepared in contaminated environments. Live poultry infected with *Salmonella* typically appear healthy, but can intermittently shed bacteria. Infections have occurred in a variety of public and private settings such as farms, feed stores, county fairs, child care facilities, schools, veterinary clinics, and homes.

How does a hatchery become contaminated with *Salmonella*?

- Contaminated hatching eggs from an infected breeder flock
- Rodents or other animals/wild birds carrying the *Salmonella* bacterium
- Insects mechanically spreading the organism
- Contamination from equipment, incoming and outgoing trucks, feed, workers or caretakers, visitors, or water sources

How *Salmonella* can spread within a flock

The *Salmonella* bacterium can spread from bird to bird in a flock through direct contact, indirect contact (environmental contamination and/or ingestion of feces or fecal contaminated feed, soil, dander, feathers, etc.), or from an infected hen to her offspring through or on her eggs.

Live poultry play a particularly important role in transmitting salmonellosis to humans. More people are raising chickens and other poultry in their backyards for meat and egg production, or for hobby. The risk of human salmonellosis after contact with live poultry such as chicks, ducklings and other live poultry, including those in backyard flocks, has been well documented through numerous large outbreaks. According to the Centers for Disease Control and Prevention (CDC), 45 outbreaks of human *Salmonella* infections linked to live poultry have been documented from 1996-2012, resulting in >1,581 illnesses, 221 hospitalizations, and 5 deaths. Because only a portion of *Salmonella* infections are diagnosed and reported, many more infections likely occurred in association with these outbreaks. A thorough summary of these outbreaks was recently published.

Approximately 20 core U.S. hatcheries produce over 50 million chicks annually, which are sold online, through feed stores, and by mail order. In most documented outbreaks of human salmonellosis linked to live poultry contact, infection can be traced back to a single hatchery or hatcheries, highlighting the importance of reducing *Salmonella* bacteria at the hatchery level.

***Salmonella* in Poultry**

More than 2,500 serotypes of *Salmonella* species of bacteria have been identified. Some serotypes have frequently been associated with foodborne illnesses and some inhabit the

intestinal tract of chickens and other poultry. Typically, poultry carrying *Salmonella* bacteria appear healthy and clean despite shedding many different *Salmonella* serotypes that can cause illness in people; additionally, shedding can be intermittent. Past research has shown that as many as 30 *Salmonella* serotypes have been identified being carried by poultry.

Eggs can be infected during formation in an infected hen's reproductive tract (called transovarial transmission) or horizontal transmission after the egg is laid and is contaminated by fecal material from an infected bird. The bacterium can penetrate the shell and vitelline membrane. Once inside the egg, the *Salmonella* bacterium rapidly replicates to an infective dose level.

How is *Salmonella* infection spread from live poultry to humans?



Live poultry (including day-old chicks, ducklings, goslings and poults) may have *Salmonella* bacteria in their droppings and on their bodies (feathers, feet, and beaks) even when they appear healthy and clean. The bacteria can also contaminate cages, coops, chick/poult boxes, bedding, plants, and soil in the area where the birds live and roam.

Additionally, *Salmonella* bacteria can be found on the hands, shoes, and clothing of those who handle the birds or work or play near the birds. People can become infected with *Salmonella* when they put their hands in or around their mouth after touching or coming into contact with fecal material, inhaling contaminated dust, or touching contaminated objects.

Biosecurity

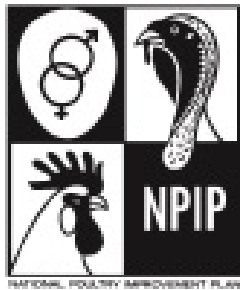


Biosecurity is the development and implementation of the practices, procedures, and programs to protect poultry production systems from unwanted microbes.

The major sources of *Salmonella* entering a hatchery are: incoming eggs (contaminated with feces, feather, and litter), people, rodents, insect vectors, and equipment.

Proper biosecurity measures can:

- Prevent the entry of disease-causing organisms into a facility or area
- Control the spread of disease-causing organisms within a facility or area
- Eliminate the disease-causing organisms in the facility or area



Hatcheries participating in the National Poultry Improvement Plan (NPIP) *Salmonella* control programs can minimize the risk of importing *Salmonella*-contaminated eggs into the hatchery. Participating breeder flocks must demonstrate that they are *U.S. Pullorum-Typhoid Clean*, *U.S. S. Enteritidis Clean*, *U.S. Salmonella Monitored*, and *U.S. Sanitation Monitored*. This status may apply to the following types of breeding flocks and products (9 CFR Part 145):

- Multiplier egg-type chicken
- Multiplier meat-type chicken
- Breeding turkeys
- Breeding hobbyist and exhibition waterfowl, poultry, and game birds
- Primary egg-type chickens
- Primary meat-type chickens
- Breeding meat-type waterfowl

NPIP in 2010 ratified a new voluntary monitoring program for mail-order hatcheries, which proposes monthly environmental sampling of the hatchery for *Salmonella*. Once this NPIP classification becomes official, mail-order hatcheries may voluntarily choose to participate and enhance control of all *Salmonella* serotypes.



Biosecurity for the hatchery must begin at the breeder farms producing the hatching eggs. The production of top grade and healthy chicks/poults from the hatchery depends on careful attention to detail, starting with the arrival of the breeding stock from NPIP participating hatcheries on the farm, testing arriving chick/poults papers for *Salmonella*, to the collection and dispatch of hatching eggs, to the delivery of the chicks to their final destination.

Handling Hatching Eggs

- 🥚 Collect hatching eggs from nests frequently to prevent contamination with disease-causing organisms.
- 🥚 Use cleaned and disinfected containers, such as egg flats, to collect eggs for hatching. Egg handlers should wear clean outer garments and thoroughly wash hands with soap and water prior to and after egg collection.
- 🥚 Do not use dirty eggs for hatching purposes. Collect dirty eggs in a separate container. Gently remove organic debris by hand.
- 🥚 Store hatching eggs in a designated room in conditions that minimize egg sweating. Clean and disinfect egg room walls, ceiling, floor, door, heater, and humidifier after every egg pickup. Clean and disinfect the egg processing area daily. Cleaning and disinfection procedures are outlined in 9 CFR, Part 147.
- 🥚 Clean and disinfect all vehicles used for transporting eggs or chicks/poults after use.
- 🥚 Implement effective rodent and insect control programs.
- 🥚 Ensure that egg processing building or area is designed, located, and constructed of materials that allow for proper egg sanitation procedures and easy, effective, and routine sanitation of the building itself.

Egg Sanitation Procedures

Sanitize eggs before cooling to 60-68° F. overnight and before transferring to the hatchery. Sanitation options include:

- 🥚 **Fumigation with formaldehyde gas.** Mix 60 gms of potassium permanganate with 120 cc 37 percent formaldehyde solution for each 100 cubic feet of space; circulate for 20 minutes with fans. It is important to wear the appropriate personal protective equipment during fumigation and follow understand all safety requirements included on the Material Safety data sheets.

Eggs that have been disinfected on the breeder farm may be moved immediately to the setter trays for storage. For eggs from different sources or of an unknown hygiene status, disinfect by disinfectant spray or fog before setting using an appropriate warm (70- 80° F.) solution. Shipping containers from other egg sources should be disposed if single use or cleaned and disinfected thoroughly if multiple use.

Vehicles and Equipment



- ✓ Clean and disinfect vehicles transporting hatching eggs from breeder farm to hatchery or live poultry from other sources, inside and out. This is particularly important if the vehicle is delivering eggs from more than one breeder farm to the hatchery. Cleaning and disinfection procedures are outlined in 9 CFR, Part 147.
- ✓ Provide wheel dips or wheel spraying facilities at farm entrance and allow only necessary vehicles onto the property. Use an appropriately strong disinfectant solution. Replace the wheel dip regularly to avoid dilution or contamination.
- ✓ Ensure that all new and used equipment is thoroughly cleaned and disinfected before entering hatchery. Mobile equipment brought onto the site from other hatcheries or units must be washed, disinfected, and dried before entering.

Rodents, Wild Birds, Other Animals, and Insects

- ✓ The hatchery's construction should be as vermin-proof as possible - including protection against rodents, wild birds, or insects that are destructive, annoying, or injurious to health.
- ✓ Maintain a vermin control plan that includes frequent monitoring of rodent, bird, or insect activity. Install adequate rodent bait and traps when there is evidence of rodent activity. Rotate bait brands frequently to prevent resistance.
- ✓ Use insecticides as necessary.
- ✓ Keep the area around the hatchery free from vegetation, debris, and unused equipment.



Hatchery Facility



- ✓ A perimeter fence, preferably woven wire topped by barbed wire, can be put in place around the hatchery. Post "Prohibited Entry" or similar signs at regular intervals along perimeter fence. Post signs labeled "Restricted Entry," "Official Business Only," "Sign in at Front Desk," or similar, at entrance gate. Keep doors and gates locked at all times during off hours to prevent unauthorized entry. Absolutely no other poultry or domestic animals can be kept on the hatchery property.
- ✓ The hatchery water source must be potable, preferably from a chlorinated municipal water source or filtered/chlorinated well water. Ponds, backyard poultry, or livestock production operations should not be contiguous to property.

- ✓ The hatchery should have sealed concrete floors and moisture-impermeable (non-porous) walls to withstand frequent pressure washing and disinfection.
- ✓ Ideally, maintain separate areas and ventilation systems for egg receiving, storage rooms, incubation rooms (setters and hatcher), and chick/poult processing rooms.
- ✓ Inside traffic should always flow from “clean” areas (i.e., egg rooms and incubators) to increasingly “dirtier” areas (hatchery room, chick/poult servicing, and hatch debris). Optimally, ventilate each area of the hatchery separately. If this is not possible, keep the incubation room under positive pressure (pushing air out of the room) to minimize potentially contaminated air from the dirty side of hatchery.
- ✓ Positive air flow minimizes the risk of transfer of contamination from the hatcher back to the setters and to the egg storage room. Use air vents, positive pressure fans (i.e., fans blowing into the building), and exhaust fans (i.e., fans blowing out of the building). Monitor the air pressure with a manometer that measures either inches of water column or mm or inches of mercury. Keep incubator room under positive pressure. Hatcher and dirty side may be under negative or positive pressure (negative pressure if attached directly to incubation area.)

Employees and Visitors

- ✓ Install foot baths at hatchery entrance and at strategic sites within the hatchery. Foot baths should contain a strong disinfectant. Employees and visitors should clean footwear to remove organic material, which could inactivate the disinfectant, before using footbaths. Replenish foot bath daily or when visibly contaminated.
- ✓ Place hand-sanitizing stations in the hatchery’s locker room entrance, at the entrance to each room, and at the exit. All employees must wash or sanitize their hands before work, after breaks, and when moving between activities (e.g., traying



up, setting, transferring, candling, sexing, vaccinating and packing).

- ✓ Place a shower at the entrance to the working area of the hatchery, furnished with bactericidal soap. Employees and visitors should shower in for a minimum of 5 minutes (including cleansing/brushing under nails) and shampooing hair. After showering, visitors and employees must don freshly laundered coveralls, nitrile or latex gloves, hair net, and

rubber boots. This must be located in a dedicated locker room. Coveralls and work clothing should be color-coded to help distinguish between employees and visitors and to facilitate personnel movement within the different rooms in the hatchery.

- ✓ Employees may not maintain poultry or pet birds at their residences and must avoid contact with non-hatchery poultry, particularly backyard flocks.
- ✓ Limit non-essential visitors. Require all to register before entry and list dates of all previous poultry visits. Prohibit those who have visited another poultry operation or experienced vomiting and/or diarrhea within the previous 72 hours.

Sanitation Program



A rigorous sanitation program integrated into the hatchery operation prevents the accumulation of microorganisms in the environment. Regulatory requirements for hatchery sanitation, cleaning, and disinfection are in place for hatcheries participating in the NPIP.

Hatcher, Hatcher Room, and Take-Off Area



Frank T. Jones

The hatcher is the main source of contamination for the entire hatchery. Debris, dead chicks, and chick fluff are ideal replication sites for bacteria and fungi in the warm and humid hatchery environment and this contamination is easily spread by air currents, equipment, and personnel. Attention to cleaning, disinfection, drying, and handling procedures is of utmost importance.

Walls, Floors, Ceilings, Windows, Fans, Ducting, and Machines

- Remove dust and debris from all surfaces and dispose of accordingly. Using a pressure washing system, either spray or foam an appropriate disinfectant detergent solution to all surfaces.
- Where necessary, scrub walls and floors to remove stubborn soiling. Leave to soak for 20-30 minutes before rinsing all surfaces with clean water at high pressure. Remove any excess water from the floors using a squeegee before leaving to dry.
- Switch on setter machine to warm up
 - Apply an appropriate broad-spectrum disinfectant detergent solution to the setter machine, using a pressure washing system on a low setting (300 psi), and leave to dry.

- Employ visual inspection and microbial culture to monitor the sanitation program. Measure using quantitative laboratory tests. Sterilization of the facilities is not realistic, but microbiological monitoring can confirm that non-desired organisms such as *Salmonella* have been eliminated. Most common disinfectants are effective against *Salmonellae*, which are gram-negative bacteria. Disinfectants are even more effective if applied after a thorough washing with a detergent and rinsing has been completed.

Cleanup of Incubators, Hatchers and Hatchery Rooms, and Equipment

Cleaning is the most critical part of the cleaning and disinfecting process. Clean each area

Minimum Sanitation Requirements

- Keep entire hatchery in a neat, orderly condition and clean and disinfect after each hatch.
- Clean and disinfect egg room walls, ceilings, floors, air filters, drains, and humidifiers at least two times per week.
- Clean and disinfect incubator room walls, ceilings, floors, doors, fan grills, vents and ducts after each set or transfer. Do not use incubator rooms for storage.
- Clean and disinfect egg trays and buggies after each transfer.
- Clean and disinfect hatcher walls, ceilings, floors, doors, fans, and vents, and clean plenums after each hatch. Do not use hatcher rooms for storage.
- Clean and disinfect: processing equipment and rooms after each hatch; chick/poult boxes before reusing; and vaccination equipment after each use.
- Properly dispose of hatchery residue, such as chick/poult down, eggshells, infertile eggs, and dead germs, in a manner approved by the official State agency.
- Maintain chicks/poults kept for a period of time after hatching separately from incubation room in a manner satisfactory to the official State agency.
- Ensure that any nutritive material provided to baby poultry is certified free of avian pathogens that are officially represented in the NPIP disease classifications listed in 9CFR 145.10.
- Maintain effective insect and rodent control programs.
- If a person is responsibly connected with more than one hatchery, all such hatcheries must participate in the NPIP. A person is deemed responsibly connected with a hatchery if he or she is a partner, officer, director, holder, owner of 10 percent or more of the voting stock, or an employee in a managerial or executive capacity.



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(MSDS) associated with each product. Wear protective clothing and avoid inhalation and skin and eye contact.

- Be aware that certain cleaners and/or disinfectants should not be used together because they may either neutralize each other or create an undesirable effect. For example, strong bleach in contact with an acid may produce toxic gases, as will mixing bleach with ammonia. Please refer to the Center for Food Security & Public Health Web site for the spectrum of action and characteristics of commonly used disinfectants. (<http://www.cfsph.iastate.edu/Disinfection/index.php>)
- Strictly follow manufacturer's directions for use.
- Keep all MSDS sheets on file and readily available for reference.

thoroughly after every hatch. A buildup of debris and bacterial load tends to occur over time regardless of rigid sanitation procedures. Diligent removal of organic debris is the only way to minimize the microbial load.

Use only agents registered by the U.S. Environmental Protection Agency (EPA). A number of classes of disinfectants are available to choose from including halogens (hypochlorite, iodine), aldehydes (glutaraldehyde, formaldehyde), quaternary ammonium, alcohols, and phenols (see 'Disinfectants in Comparison' table). Check local and State regulations to determine if the intended chemical can be legally used. Read and follow label

directions and understand all precautions listed on the Material Safety Data Sheet

Disinfectants in Comparison											
Active ingredient	Effective against			Toxicology			No significant protein error	Corrosion No corrosion on surface materials			
	Viruses	Bacteria	Fungi	Non-cytotoxic	Non-mutagenic	Non-carcinogenic					
	enveloped	non enveloped	Gram-positive	Gram-negative	Mycobacteria						
Disifin® - dent	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chloramine-T	-	-	✓	✓	-	-	-	-	-	-	✓
Acridin colouring	-	-	✓	✓	-	-	-	-	-	-	✓
Chloramphenicol	-	-	✓	✓	-	-	-	-	-	-	✓
8-Chinolinsulphane	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
Peracetic acid	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
Phenols	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
Formaldehyde	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
Glutaraldehyde	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
Quats	-	-	✓	-	-	-	✓	✓	✓	✓	✓
4-chloro-m-cresol	✓	✓	✓	✓	-	-	✓	✓	✓	✓	-
4 hexylresorcin	-	-	✓	✓	✓	✓	✓	✓	✓	✓	-
Alcohol 70%	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hydrogen peroxide	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
DCIC	✓	✓	✓	✓	-	-	✓	✓	✓	✓	-
Sodium hypochloride	✓	✓	✓	✓	-	-	✓	✓	✓	✓	-

To the best of our knowledge and belief, all the information given above is according to the current state of research. It is given, however, without liability in respect of existing third party industrial property rights. In particular, no quality warranty in the legal sense is attached to it. We reserve the right to make changes as part of scientific advances and further company development. Reference to other companies' products is not a recommendation and does not exclude the use of similar products. The consumer is not excused from careful quality checking. As we have no control over the correct use of product, we accept no warranty claims whatsoever or any liability arising from improper use of a product or raw material. Information date: January 2000. <http://disifin-me.webs.com/disifindent.htm>

Quality Assurance Program

Producing the highest quality chicks/poults requires regularly monitoring the microbial status of the hatchery. Various methods are used to monitor bacterial and fungal levels.



- A cost-effective method is 10-minute air exposure using trypticase soy agar (or blood agar) and MacConkey agar plates in the incubators and hatchers.
- Drag swabs using 4 in. x 4 in. sterile gauze pads soaked in sterile double strength skim milk are also useful for *Salmonella* monitoring of surfaces.
- Use RODAC plates (Becton, Dickinson) for surface and air enumeration of bacteria
- Culture the surface of cased eggs periodically for fecal contaminating organisms.
- Culture a sample of dead-in-shell eggs periodically from each breeding stock for coliforms and *Salmonella*.
 - Pre-enrichment broths supplemented with 35 mg ferrous sulfate per 1,000 ml pre-enrichment to block iron-binding, *Salmonella*-inhibiting effects of egg conalbumin; and,
 - Tetrathionate selective enrichment broths, competitor-controlling plating media (XLOT4, BGN, etc.) delayed secondary enrichment procedures, and colony lift assays.



Biosecurity and sanitation are the most effective deterrents against an infectious incursion.

Effective practices will help hatchery operators avoid scrutiny and legal litigation, enhance credibility and reputation, and increase profit margins.

Additional keys to success are continuously providing adequate and thorough training to employees, documenting each step, and consistently applying quality sanitation checks.

Education of Consumers

An increasing number of people in the United States are raising backyard flocks, thus making educational messaging about health risks associated with live poultry even more important, particularly in homes with high-risk individuals (children, seniors, and people with weakened immune systems) and inexperienced flock owners. Recommendations on the simple steps that should be followed to prevent *Salmonella* transmission from live poultry to people are available (<http://www.cdc.gov/healthypets/resources/salmonella-baby-poultry.pdf> and

<http://www.cdc.gov/healthypets/resources/backyard-flock-8x11.pdf>). Mail-order hatchery staff should provide educational flyers on safe handling of live poultry to all customers; these posters can be attached to each shipping box and can be linked to on hatchery websites and order forms.

Conclusion

Biosecurity and sanitation are the most effective deterrents against an infectious incursion in most animal agriculture production systems. Mail-order hatcheries are no exception to that rule. Effective practices will help hatchery operators avoid possible scrutiny and even legal litigation, enhance their credibility and reputation for distributing disease-free chicks/poults, and increase profit margins. Additional keys to success are continuously providing adequate and thorough training to employees, documenting each step, and consistently applying quality sanitation checks. Overall, reducing *Salmonella* contamination at the hatchery, along with proper handling of live poultry by those purchasing birds, will result in fewer people becoming ill.

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Appendix A

Sample Questionnaire for Hatchery Manager

Name of Hatchery: _____

Address: _____

Owner: _____

Manager: _____

Signature of manager: _____ Date: _____

Telephone number: _____

FAX number: _____

E-mail address: _____

Website: _____

NPIP number: _____

Parent company affiliation (yes or no)

If yes, company name: _____

Other hatcheries under same ownership or management (yes or no)

If yes, names and addresses of hatcheries: _____

Poultry consultant (yes or no)

Accredited veterinarian(s) (yes or no)

If yes, name(s), address(es), and contact numbers:

Description of business:

- Years in business: _____

- Interstate commerce? (yes or no): If yes, name the states: _____

- International commerce? (yes or no): If yes, name the countries: _____

- Volume of business (# live poultry/year and/or month?) _____

Number of full-time employees: _____

Frequency of training on biosecurity and sanitation administered to employees: _____

Clientele includes (✓ all that apply):

Broiler-Breeder: ____

Commercial Broiler: ____

Commercial Table Egg Producer: ____

Turkey Producer: ____

Mail Order Hobbyists: ____

Fancy/Exhibition Poultry: ____

Game Bird: ____

Domestic Waterfowl: ____

Feed Stores: ____

Broker: ____

Other (specify): _____

Is manager aware of the importance of salmonellosis as a disease of humans?

Yes or No

Is manager aware that hatcheries have been a risk in the transmission of salmonellosis to humans from poultry?

Yes or No

Hatching eggs brought into the hatchery are only from NPIP (circle any or all that apply)

- a) ***U.S. Pullorum-Typhoid Clean***;
- b) ***U.S. S. Enteritidis Clean***; and/or,
- c) ***U.S. Sanitation Monitored*** flocks.

Does this hatchery use other hatcheries for large orders or orders they are unable to fill?

Yes or No

If yes, does hatchery use (circle answer): Trans-shipping Drop shipping Both

On large orders that cannot be filled by this hatchery, are other hatcheries of equal NPIP/Sanitation

Yes or No

General Questions about Hatchery:

1. Is a perimeter fence (preferably woven wire topped by barbed wire) in place around the hatchery?

Yes or No

2. Posted Signs Outside Hatchery:

- o Are "Prohibited Entry" signs, or other similar signs, posted at regular intervals along the perimeter fence?

Yes or No

- Are “Restricted Entry, Official Business Only, Sign-In At Front Desk” (or similar signs) posted at entrance gate? Yes or No
- 3. What is the potable water source for hatchery? ✓ all that apply
 1. Chlorinated municipal water
 2. Filtered/chlorinated well-water
 3. Pond water
 4. Spring
 5. Other (specify)
- 4. Does adjoining property include any of the following? (✓ all that apply)
 1. Pond
 2. Backyard poultry flock
 3. Commercial poultry flock
 4. Cattle or other livestock
 5. None of the above
- 5. Does the hatchery have concrete floors and walls with non-porous surfaces to withstand frequent pressure washing and disinfection? Yes or No
- 6. Is each room (egg receiving and storage, incubation rooms [setters and hatchers] and chick processing) ventilated separately? Yes or No
- 7. In the hatchery, is airflow achieved by using air vents, positive pressure fans (i.e., fans blowing into the building), and exhaust fans (i.e., fans blowing out of the building)? Yes or No
- 8. Is positive pressure air flow out of the incubator rooms (reducing chances of contamination)? Yes or No
- 9. Are doors and gates into the hatchery locked at all times during off-hours to prevent unauthorized entry? Yes or No
- 10. Are other poultry, or domestic animals, kept on the same property as the hatchery? Yes or No
- 11. Are only necessary vehicles granted entry to the property? Yes or No
- 12. For incoming vehicles (delivery and transport), are disinfectant wheel dips or wheel spraying facilities located at the farm entrance? Yes or No
- 13. Is the area outside the hatchery kept free of unclipped vegetation, debris, and unused equipment that could harbor rats, mice, and other animals? Yes or No
- 14. Are foot baths containing a strong disinfectant located at entrance and exits to the hatchery? Yes or No
- 15. Is disinfectant in the footbaths replenished at least twice weekly, or when visibly contaminated? Yes or No
- 16. Are hand-sanitizing stations placed outside hatchery entrance, exit, and at the entrance to each room? Yes or No

17. Do all employees wash or sanitize their hands before starting work, after breaks, and when moving between activities (e.g., traying up, setting, transfer, candling, take-off, sexing, vaccinating and packing)?
Yes or No
18. Is a shower furnished with bactericidal soap placed at the entrance into the locker room of the hatchery?
Yes or No
19. Before entering the working area of the hatchery, do employees and visitors shower in for a minimum of 5 minutes (including cleansing/brushing under nails) and shampooing hair?
Yes or No
20. Are freshly laundered coveralls, nitrile or latex gloves, hair nets, and rubber boots located in dedicated locker room for visitors and employees (after showering)?
Yes or No
21. Are employees prohibited from maintaining poultry at their residence and having contact with non-hatchery poultry, particularly backyard flocks?
Yes or No
22. Are non-essential visitors prevented from entry into the hatchery?
Yes or No
23. Are non-essential visitors required to sign a log-in sheet?
Yes or No
24. Are visitors denied entry if they had visited another poultry operation in the previous 72 hours or experienced episodes of vomiting and/or diarrhea?
Yes or No
25. Does hatchery construction/design impede invasion by small animals (rodents, wild birds) and insects?
Yes or No
26. Does hatchery have a vermin (small animals) control plan including frequent monitoring of rodent, bird, or insect activity?
Yes or No
27. Are rodent bait and traps installed when there is evidence of rodent activity?
Yes or No
28. Are brands of bait rotated frequently to prevent development of resistance?
Yes or No
29. Are insecticides/pesticides used as necessary?
Yes or No
30. Is all new and used equipment thoroughly cleaned and disinfected before it is brought into the hatchery?
Yes or No

Sanitation

1. Are egg room walls, ceilings, floors, air filters, drains, and humidifiers cleaned and disinfected at least two times per week?
Yes or No
2. Are incubator room walls, ceilings, floors, doors, fan grills, vents, and ducts cleaned and disinfected after each set or transfer?
Yes or No
3. Are incubator rooms also used for storage?
Yes or No

4. Are egg trays and buggies cleaned and disinfected after each transfer?
Yes or No
5. Are hatcher walls, ceilings, floors, doors, fans, and vents cleaned and disinfected after each hatch?
Yes or No
6. Are chick/poult processing equipment and rooms thoroughly cleaned and disinfected after each hatch?
Yes or No
7. Is vaccination equipment cleaned and disinfected after each use?
Yes or No
8. Is hatchery residue, such as chick/poult down, eggshells, and infertile eggs, disposed of properly in a manner satisfactory to the official State agency?
Yes or No
9. Is the entire hatchery kept in a neat, orderly condition and cleaned and disinfected after each hatch?
Yes or No
10. If chicks/poults are kept for a period after hatching, are they separated from the incubation room in a manner satisfactory to the official State agency?
Yes or No
11. Is feed stuff provided to chicks/poults certified to be free of avian pathogens?
Yes or No
12. Is biosecurity within the hatchery in place ensuring separation of clean and dirty areas?
Yes or No
13. Is an appropriate broad-spectrum disinfectant detergent solution applied monthly, using a pressure washing system on a low pressure setting (300 psi), to all surfaces of the setter and allowed to dry?
Yes or No

Quality Assurance Program

Is a microbial monitoring Quality Assurance Program acceptable to the official State agency in place?
Yes or No

-or-

1. On a quarterly basis, swabs using 4"x4" sterile gauze pads soaked in sterile double strength skim milk or BHI broth are used on surfaces in egg storage, the setter, the hatcher, and chick processing for *Salmonella* monitoring (microbiological culture) at a laboratory acceptable to the official State agency.
Yes or No
2. Incubators and hatchers are periodically monitored by 10-minute air exposure of trypticase soy agar (or blood agar) or MacConkey agar plates.
Yes or No
3. The surface of cased eggs is periodically cultured for fecal *Salmonella* organisms.
Yes or No
4. Dead-in-shell eggs are periodically cultured from each breeding stock for coliforms and *Salmonella*.
Yes or No

