

Hatchery Biosecurity: Vital for Quality and Healthy Chicks

Vijay Kumar

ICAR-Directorate of Poultry Research, Rajendranagar, Hyderabad- 500030

Corresponding Authors: drvijaykumar.ext@gmail.com

A hatchery is a place used to raise eggs under controlled conditions i.e. incubation of eggs to get quality chicks. Once eggs arrive at a hatchery facility they are moved through a series of process and quality assurance at each stage is must. The eggs are fragile and sensitive to environmental factors. A good embryonic developmental process subsequently achieves optimum growth, production and health in future. In the process of different operations in the hatchery, following biosecurity protocol is must to get healthy and quality chick. It can be done by proper attention and hygiene. There are two classes of diseases which originate from the hatchery. The first includes those diseases which are definitely egg transmittable and the second includes diseases those are transmitted by contact with disease producing microorganism introduced from sources other than eggs after chicks are hatched.

Source of contamination/ threat

- Eggs are collected from different farm and different sources may carry germs
- Eggs may have faecal material/ litter/ any other contamination
- Other transmission sources like air, feather, personal in handling and material in contact
- Climatic condition inside/outside the hatchery specially air
- Other sources are-rodents, visitors and insects
- Clothing and hands of hatchery staff

Hatchery is good place for microbes to flourish like suitable temperature, humidity and organic matter. So, proper preventive measures are important factor for biosecurity. For proper biosecurity, a hatchery can be divided into five zones:

- Egg receiving and storage zone
- Setter zone
- Candling and transfer zone
- Hatching zone
- Chick processing and dispatch zone

Personal working in particular zone should not be allowed to go in another zone. All the working

system should be unidirectional. Different coloured clothing should be used in each zone. After proper disinfectant, material or personnel should be allowed inside the hatchery. Care should be taken to minimal contact of personal working in different zone.

Cleaning and Disinfection

It ensures removal of all unwanted material including biological in origin (pathogen). Basically, there are four elements of cleaning:

- Mechanical action (brushing and high pressure)
- Product (soap, water)
- Temperature (higher temperature is better)
- Time (longer contact time is better)

Cleaning and disinfectant protocol

- Sweep and vacuum areas first
- Soak the surfaces with a foam cleaner
- Allow the room and materials to dry
- Rinse with water
- Allow the room and materials to dry again
- Disinfect

The frequency of cleaning in the hatchery

Area	Frequency
Egg receiving room	1/week
Egg storage	1/week
Setter room	1/week
Setters	After each incubation cycle
Egg transfer room	After every use
Hatchers	After every use
Chick's handling room	After every hatch
Chicks dispatch room	After every use
Racks, trays, baskets, boxes	After every use
Eggs and chick's trucks	After every use/ chick delivery

Some of microbes like *E.Coli*, *Pseudomonas*, *Staphylococcus* and *Aspergillus*, moulds are extremely important in hatchery. These microbes effect hatchability, early survivability and quality of chicks.

Disinfection: The destruction of all vegetative forms of microorganisms. Spores are not destroyed.

Select the right disinfectant: Proper cleaning of facilities removes the vast majority of all organisms and must be used before application of disinfectants. This applies to all areas within the hatchery including floors, walls, setters, hatchers, trays, chick processing equipment, air and personnel. Selection of disinfectant is based on following factors:

- The type of surface being treated
- The cleanliness of the surface
- The type of organisms being treated
- The durability of the equipment/surface material
- Time limitations on treatment duration
- Residual activity requirements

Common disinfectants and uses

1. **Phenol derivatives:** One part of phenols with 4 parts of water, 1 gallon used a spray in 400 sq floor area is very effective for routine purpose.
2. **Iodine Preparations:** Iodine preparations were containing 1.75 % iodine as is used @ 30 ml/2 gallon of water for cleaning the floor and equipment.
3. **Chlorine Preparation:** Chlorinated lime or bleaching powder is a well-known disinfectant. It is prepared by saturating lime with chlorine gas & should contain 30-35 % of available chlorine used as disinfectant of hatchery floor.
4. **Quaternary Ammonium Compounds:** These compounds are cleaning agent and used to scrub and disinfectant premises.
5. **Coal Tar:** These are cresol products which form milky emulsions when mixed with water. 5% is effective for disinfecting purpose of floor space.
6. **Dettol:** Dettol & similar products are expensive but quite effective antiseptics and disinfectants.
7. **Caustic Soda:** It generally used as cleaning agent but 2 % solution is used as disinfectant for most microorganism
8. **Lime:** It is used as white wash

9. **Ultraviolet Rays:** Ultraviolet ray kill bacteria and are used for incubators and another hatchery equipments.

10. **Dry heat and steam cleaning:** Few instruments particularly Incubator trays & metal parts are subjected to pressure steam at boiling point

11. **Formaldehydes:** Under ideal condition formaldehyde is very effective for killing bacteria, fungus and viruses. Formaldehyde is notorious for being a poor penetrator and only works on the surface of the material.

12. **Ethylene oxide:** It has many advantages over formaldehyde as it is effective against many poultry pathogens. Its penetrating properties are excellent so it is valuable for sterilizing the hatchery equipment. Precaution should be taken while using as it is highly inflammable and dangerous.

Fumigation of Incubators

- i. Excessive and improper fumigation may result in higher mortality in developing embryos.
- ii. The killing of bacterial organisms by formaldehyde is based on the concentrations of the gas, exposure time, temperature, and humidity of the incubator.
- iii. The disinfectant potassium permanganate and formalin (40% formaldehyde gas) have proven to be the most effective method of destroying bacterial organisms in the hatchery.
- iv. Fumigation of loaded setters for 30 minutes with 20 grams Potassium permanganate and 40 ml of 40% of Formalin solution for 100 cubic feet of incubator area.

To avoid the spread of diseases from hatchery following precautions may be exercised

- Only nest clean eggs should be collected for hatching in clean filler flats and boxes.
- Hatchery should not be located near poultry farms, poultry processing plants or other hatcheries.
- Incubators should be located in a separate room with "No Admittance" sign at door.
- Each year before the season starts the hatchery building and all the equipment should be thoroughly cleaned and fumigated.

- All eggs entering in incubators must be fumigated.
- The ventilating system in the hatchery should be designed to bring fresh and filtered air in all areas. Ideally no air should be re-circulated in the hatchery.
- The wall, ceilings and floors should be constructed of water-repellent material so that they can be washed easily.

- Keep fans, air conditioner, ventilator etc. free from chick down and dust.
- Hatcher, chick tray etc. should be kept clean.

By applying all the precautions to prevent the entering germs inside the hatchery and adopting proper fumigation and disinfectant procedures a quality and healthy chick can be produced. Healthy chicks are the foundation of any poultry farm and farmers may get better economics with the foundation stock.

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