

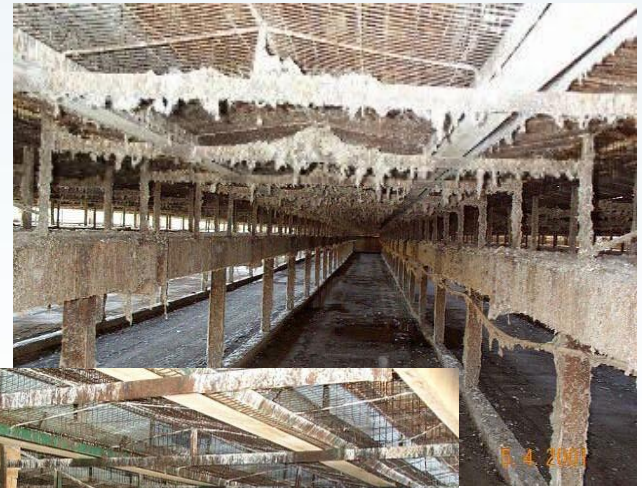


On-Farm *Salmonella* Control Measures for
Layers

Cleaning and Disinfection

Elements Of Cleaning

- Cleaning is key to pathogen reduction
- Clean, then disinfect
- Remove all organic material (feed, feces, feathers, etc.) prior to disinfection
- Surfaces must be clean for disinfection to be effective



Elements Of Cleaning

Pressure

- Brushes
- Brooms
- Blowers
- Water

Heat

- Burning of feathers and other debris aids cleaning
- Hot water makes soap more effective

Caution: Use appropriate equipment and follow proper procedures.



Elements Of Cleaning – Drying

- Thoroughly dry equipment before applying disinfectant
- *Salmonella* replicate outside of a host in damp environments
- In environments with high humidity and/or low temperatures, dry cleaning is a reasonable alternative to wet cleaning
 - Conditions may not allow for adequate drying after wet cleaning

Elements Of Cleaning – Drying Cleaning

- May be acceptable in houses with low rodent populations and low *Salmonella* spp. contamination
- Labor intensive
- May require longer downtime
- Blowing and light sweeping will dislodge organic material that is loosely attached to equipment
- Firmly attached organic material requires more scrubbing
- Protocol for Dry Cleaning

What Are Sanitizers?

- Sanitizers are cleaning reagents that may also disinfect
- Sanitizers may interact with disinfectants
 - Incompatible products can inactivate one another
- Some commercial disinfectants contain a compatible sanitizer
- If using a separate sanitizer and disinfectant, pick two with similar pH
 - Use acids with acids and bases with bases

What Are Disinfectants?

- Can kill disease-causing microorganisms
- Each class has unique characteristics that impact its suitability for on-farm *Salmonella* control
 - Chlorines
 - Iodines
 - Phenols
 - Quaternary Ammonias (Quats)
 - Chlorhexidine
 - Peroxygens
- Disinfection 101

Choosing The Right Disinfectant

- Will it be in contact with organic material?
- Does it need to have residual activity?
- Will it be used on metal or motors?
- Will it be used in wet or dry conditions?
- Is it compatible with soaps you use?

Choosing The Right Disinfectant

- Will birds be exposed to it?
- How will it be applied?
- Are there any safety concerns?
- How important is cost?

Characteristics Of Common Disinfectant Classes

	Chlorines	Iodines	Phenols	Quats	Chlorhexidine*	Peroxygens
Toxicity	Fumes are toxic	No	No	No	No	No
Corrosive	Yes	No	No	No	No	Highly
Spectrum	Bacteria, Viruses	Bacteria, Fungi	Bacteria, Fungi, Viruses	Bacteria, Fungi, Viruses	Fungi, Viruses	Bacteria, Fungi, Viruses
Organic Material	No	No	Yes	Some	--	Yes
Residual Activity	No	No	Yes	Yes	--	Yes

*Not effective against *Salmonella* spp.

Disinfectants For Clean-out

- Necessary characteristics
 - Need residual activity
 - Some activity with organic material
 - Broad spectrum of activity for bacteria and viruses
 - Low toxicity
 - Inexpensive
- Good choices
 - Phenols
 - Quaternary Ammonias
 - Peroxygens
- Infrequent clean-out allows use of disinfectants that are too corrosive for daily disinfection of equipment



Disinfectants For Clean-out

As wood is organic, use disinfectants that retain activity in organic material. Poor choices for *Salmonella* spp. Include:

Chlorine:

- Little residual activity
- Toxic fumes
- Inactivated by organic material

Iodines:

- Little residual activity
- Inactivated by organic material

Chlorhexidine

- Not effective against bacteria

Equipment Disinfection



- Necessary characteristics
 - Residual activity
 - Broad spectrum of activity
 - Noncorrosive
- Good choices
 - Phenols
 - Quaternary Ammonias
- Manure trucks should be cleaned and disinfected between farms

Equipment Disinfection



- Poor choices
 - Peroxygens
 - Highly corrosive
 - Chlorines
 - Corrosive
- Metal trailer will corrode with frequent exposure to peroxygens and chlorines
 - Plastic crates won't be damaged

Disinfectants – Label Claims

- Use disinfectants that are active against *Salmonella* spp., Newcastle Disease and Avian Influenza
- Organisms killed by disinfectant are listed on label
- Conditions disinfectant faces in poultry houses are different than requirements for label claim
 - Label efficacy testing is performed on clean, dry stainless steel surface

What Disinfectant Would Be Effective Here?



You can't disinfect manure!

Getting The Best Effect From Disinfectants

- All disinfectants work best on clean surfaces
 - Remove all organic material before application
 - Excess organic material neutralizes disinfectant activity
- Label use – dilution assumes disinfectant is applied to dry surface
 - If surface is wet, apply at a higher concentration
- Disinfectants work best on nonporous surfaces
- Disinfectants take time to work
 - Should be left on surface for maximum contact time

Complements To Disinfectants

- Sunlight in conjunction with drying and downtime helps kill viruses and bacteria
- Downtime is not equal to time between birds leaving building and new birds being placed
 - Downtime starts when all surfaces in the environment are clean, dry, disinfected and then dried again
- Disinfectants need contact time on clean, dry surface in order to help kill viruses and bacteria

Nonwetting Disinfectants

- Fogging products penetrate hard-to-reach areas
- Some fogging products are extremely effective against *Salmonella* spp.
- Formaldehyde is a powerful disinfectant, but subject to regulations and permits – check with regulatory officials in your area
- Manufacturers are developing dry disinfectants in a variety of classes
- Since dry and fogged disinfectants are not in solution, they do not require drying time and work well in a dry-cleaning program

Using Disinfectants Safely

- Avoid runoff
- Properly dispose of concentrates and containers
- Minimize use
 - Use proper dilutions
 - Use only on clean surfaces
 - Use personal protective equipment (PPE) if required
 - Use alternatives to disinfectants
 - Use equipment that measures out set amount of sanitizers and disinfectants
 - Using the right amount is best for the environment and budget



Disinfectants Are An Important Part Of *Salmonella* Control Programs

- Are not effective when used alone or improperly
- Proper disposal of mortalities will help reinforce success of cleaning and disinfection program

