

Cleaning and Disinfection

Why Clean and Disinfect?

Disease agents such as viruses, bacteria, and parasite eggs can be carried on the surface of equipment. When these diseases are unknowingly carried onto your property, your flock can become sick. When setting up your coop for the first time or when adding new equipment such as feeders or waterers, it is important that each piece be thoroughly cleaned and disinfected before coming in contact with your poultry. Disease agents can also survive on your property and equipment even if you no longer have birds living there. In these situations, it is important that all housing and equipment be cleaned and allowed to sit empty for at least 6 weeks before re-introducing new birds to the site.

Cleaning and Disinfection Protocol
Remove all grossly visible debris. The presence of gross contamination or organic material, especially feces, will inactivate most disinfectants.
Wash the area or item with water and detergent.
Thoroughly rinse the cleaned area to remove any detergent residue. Some disinfectants may be inactivated by detergents; therefore, it is very important to rinse well after washing the area or item.
Allow the area to dry completely.
Select and apply an appropriate, effective disinfectant.
Allow the proper contact time! This is one of the most overlooked steps!! Contact time may vary depending on the disinfectant selected, but is usually at least 10 minutes. Consult the product label.
Thoroughly rinse away any residual disinfectant and allow the area or item to dry.

http://www.cfsph.iastate.edu/Maddies_Textbook/Resources/CleaningDisinfection/SignCleaningDisinfectProtocol.pdf

Disinfectant Options

Class	Mycoplasma	Bacteria (Gram +&-) (eg: Staph, Salmonella)	Fungi (eg: Aspergillus)	Enveloped viruses (eg: Mareks, Influenza)	Non-enveloped viruses (eg: parvo)	Coccidia	Example Product	Instructions for use
Acid	X	X	X	X			Vinegar (5% Acetic acid)	Submerge or flush drinkers with undiluted vinegar for 30 minutes
Alcohol	X	X	X	X			Isopropyl alcohol (70%)	Contact time 10 mins
Alkalis	X	X	X	X	X	X	Calcium oxide (quicklime)	Spread 25lb/yd ³ (prevention) to 250lb/yd ³ (treatment) on litter. Moisten mixture and extinguish self-ignitions with water
Biguanides	X	X	X	X			Nolvasan® (chlorhexidine diacetate 2 percent)	Mix 3 fluid oz of Nolvasan per gallon of water
Halogen	X	X	X	X	X		Bleach (sodium hypochlorite 6 percent)	Mix ¼ cup of household bleach per gallon of water. 15 min contact time. Use bottle open < 3months
Oxidizing	X	X	X	X	X		Hydrogen peroxide	Thoroughly wet surface. Remain wet for 3 min, then wipe.
Phenolic	X	X	X	X		X	Lysol, TekTrol	Spray until covered with mist. Surfaces must remain wet for 3 minutes then allow to air dry.
Quaternary Ammonium	X	X	X	X			Synergize	Mix 1/2 oz per gallon water. Wet surface thoroughly. Allow to remain wet for 10 min.

Characteristics of Selected Disinfectants

This table provides general information for each disinfectant chemical classes. Antimicrobial activity may vary with formulation and concentration. Always read and follow the product label for proper preparation and application directions.

Disinfectant Category	Alcohols	Alkalis	Aldehydes	Oxidizing Agents			Phenols	Quaternary Ammonium Compounds
				Halogens: Chlorine	Halogens: Iodine	Peroxygen Compounds		
Common Active Ingredients	ethanol, isopropanol	calcium hydroxide, sodium carbonate, calcium oxide	formaldehyde, glutaraldehyde, ortho-phthalaldehyde,	sodium hypochlorite (bleach), calcium hypochlorite, chlorine dioxide	povidone-iodine	hydrogen peroxide/accelerated HP, peracetic acid, potassium peroxymonosulfate	ortho-phenylphenol, orthobenzylpara-chlorophenol	benzalkonium chloride, alkyldimethyl ammonium chloride
Sample Trade Names*			Synergize®	Clorox®, Wysiwash®		Rescue®, Oxy-Sept 333®, Virkon-S®	One-Stroke Environ®, Pheno-Tek II®, Tek-Trol®, Lysol®	Roccal-D®, DiQuat®, D-256®
Mechanism of Action	Precipitates proteins; denatures lipids	Alters pH through hydroxyl ions; fat saponification	Denatures proteins; alkylates nucleic acids	Denatures proteins	Denatures proteins	Denature proteins and lipids	Denatures proteins; disrupts cell wall	Denatures proteins; binds phospholipids of cell membrane
Characteristics	<ul style="list-style-type: none"> Fast acting Rapid evaporation Leaves no residue Can swell or harden rubber and plastics 	<ul style="list-style-type: none"> Slow acting Affected by pH Best at high temps Corrosive to metals Severe skin burns; mucous membrane irritation Environmental hazard 	<ul style="list-style-type: none"> Slow acting Affected by pH and temperature Irritation of skin/mucous membrane Only use in well ventilated areas Pungent odor Noncorrosive 	<ul style="list-style-type: none"> Fast acting Affected by pH Frequent application Inactivated by UV radiation Corrodes metals, rubber, fabrics, Mucous membrane irritation 	<ul style="list-style-type: none"> Stable in storage Affected by pH Requires frequent application Corrosive Stains clothes and treated surfaces 	<ul style="list-style-type: none"> Fast acting May damage some metals (e.g., lead, copper, brass, zinc) Powdered form may cause mucous membrane irritation Low toxicity at lower concentrations Environmentally friendly 	<ul style="list-style-type: none"> Can leave residual film on surfaces Can damage rubber, plastic; non-corrosive Stable in storage Irritation to skin and eyes 	<ul style="list-style-type: none"> Stable in storage Best at neutral or alkaline pH Effective at high temps High concentrations corrosive to metals Irritation to skin, eyes, and respiratory tract
Precautions	Flammable	Very caustic	Carcinogenic	Toxic gas released if mixed with strong acids or ammonia			May be toxic to animals, especially cats and pigs	
Bactericidal	+	+	+	+	+	+	+	+
Virucidal	± ^a	+	±	+	+	+	+	+ Enveloped
Fungicidal	+	+	+	+	+	±	+	+
Tuberculocidal	+	±	+	+	+	±	+	-
Sporicidal	-	+	+	+	±	+	-	+
Factors Affecting Effectiveness	Inactivated by organic matter	Variable	Inactivated by organic matter, hard water, soaps and detergents	Rapidly inactivated by organic matter	Rapidly inactivated by organic matter	Effective in presence of organic matter, hard water, soaps, and detergents	Effective in presence of organic matter, hard water, soaps, and detergents	Inactivated by organic matter, hard water, soaps and anionic detergents

⊕ = effective; ± = variable or limited activity; ⊖ = not effective

a - slow acting against nonenveloped viruses (e.g., norovirus)

**DISCLAIMER: The use of trade names serves only as examples and does not in any way signify endorsement of a particular product.*

REFERENCES: Fraise AP, Lambert PA et al. (eds). *Russell, Hugo & Ayliffe's Principles and Practice of Disinfection, Preservation and Sterilization*, 5th ed. 2013. Ames, IA: Wiley-Blackwell; McDonnell GE. *Antisepsis, Disinfection, and Sterilization: Types, Action, and Resistance*. 2007. ASM Press, Washington DC. Rutala WA, Weber DJ, Healthcare Infection Control Practices Advisory Committee (HICPAC). 2008. Guideline for disinfection and sterilization in healthcare facilities. Available at: http://www.cdc.gov/hicpac/Disinfection_Sterilization/toc.html; Quinn PJ, Markey FC et al. (eds). *Veterinary Microbiology and Microbial Disease*. 2nd ed. 2011. West Sussex, UK: Wiley-Blackwell, pp 851-889.



IOWA STATE UNIVERSITY*

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The Antimicrobial Spectrum of Disinfectants

This table provides general information for selected disinfectant chemical classes. Antimicrobial activity may vary with formulation and concentration. *The use of trade names does not in any way signify endorsement of a particular product. They are provided as examples.*

Removal of organic material must always precede the use of any disinfectant.

most susceptible

susceptibility of microorganisms to chemical disinfectants

most resistant

	Acids hydrochloric acid, acetic acid, citric acid	Alcohols ethanol, isopropanol	Aldehydes formaldehyde, paraformaldehyde, glutaraldehyde	Alkalis sodium hydroxide, ammonium hydroxide, sodium carbonate	Biguanides chlorhexidine, Nolvasan®, ChlorHex®, Virosan®	Halogens sodium hypochlorite iodine		Peroxygens accelerated hydrogen peroxide (Rescue®), potassium peroxymonosulfate (Virkon-S®), peroxyacetic acid, (Oxy-Sept 333)	Phenolic Compounds (Lysol®, Osyl®, Amphyl®, TekTrol®, Pheno-Tek II®)	Quaternary Ammonium Compounds (Roccal®, Zepharin®, DiQuat®, Parvosol®, D-256®)
mycoplasmas	+	++	++	++	++	++	++	++	++	+
gram-positive bacteria	+	++	++	+	++	+	+	+	++	++
gram-negative bacteria	+	++	++	+	++	+	+	+	++	+
pseudomonads	+	++	++	+	+	+	+	+	++	-
rickettsiae	+	+	+	+	+	+	+	+	+	+
enveloped viruses	+	+	++	+	+	+	+	+	+	+
chlamydiae	+	+	+	+	+	+	+	+	+	-
non-enveloped viruses	-	-	+	+	-	+	+	+	-	-
fungal spores	+	+	+	+	+	+	+	+	+	+
picornaviruses (i.e. FMD)	+	N	+	+	N	N	N	+	N	N
parvoviruses	N	N	+	N	N	+	N	+	N	-
acid-fast bacteria	-	+	+	+	-	+	+	+	+	-
bacterial spores	+	-	+	+	-	+	+	+	-	-
coccidia	-	-	-	+	-	-	-	-	+	-
prions	-	-	-	-	-	-	-	-	-	-

LEGEND
 ++ highly effective
 + effective
 + limited activity
 - no activity
 N information not available

a-varies with composition
 b-peracetic acid is sporicidal
 c-ammonium hydroxide
 d-some have activity against coccidia



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