

BARN SANITATION WITH ARE / RWA / ABF

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Disease Control



Biosecurity
ARE

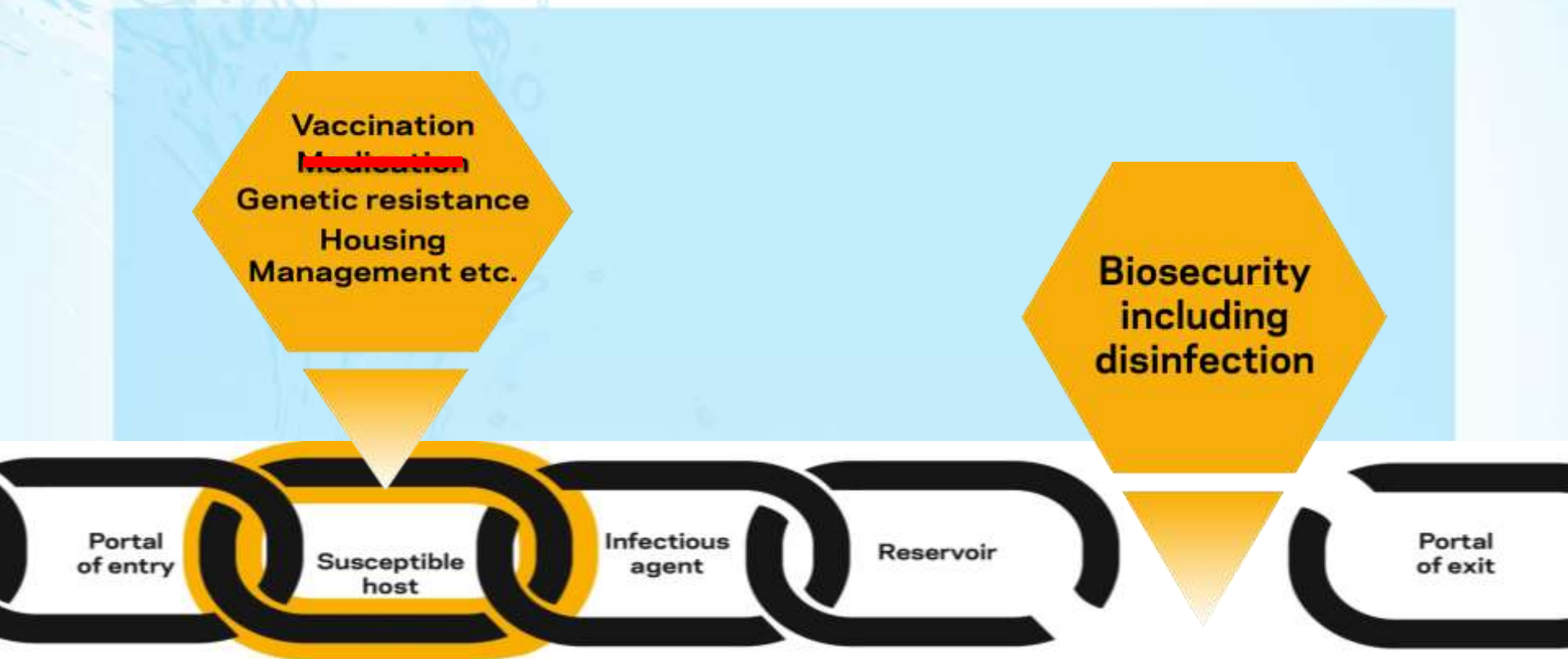
Disease Control



RWA/ABF



Only Chemistry can break the chain of transmission



J-P Vaillancourt, 2000

 **Vétoquinol**
*the biosecurity
specialist!*

BIOSECURITY

- Physical
 - Caz, Raz ,C&D, rodent, Insect....
- Personal
 - PPE, Zoonosis...
- Material
- Transport
- Auditing
- Programs

Living Science



Biosecurity Program

**Biosecurity Should be in the
operating budget**

Biosecurity is not an additional expense!!!

- **Terminal Disinfection**

- Without birds in the room or barn

- **Continuous Protection**

- With birds in the room, barn, or adjacent pens



VETOQUINOL PRODUCTS / PROGRAMS

The screenshot shows a web browser window displaying the Vetoquinol website. The browser's address bar shows the URL <https://biosecurity.vetoquinol.ca/eng>. The website header features the Vetoquinol logo with the tagline "ACHIEVE MORE TOGETHER", a search bar, and a language selector set to "ENG / ER". A "CONTACT US" button with a world map icon is also present. The main navigation bar includes links for "HOME", "PRODUCTS", and "PROGRAMS". The main content area has a background image of a farm with chickens and a red water dispenser. A black text box overlays the image with the URL <http://biosecurity.vetoquinol.ca/eng>. Below this, a white box titled "Swine & poultry" contains the text: "A step by step cleaning, disinfecting & pest control protocol to ensure your animals and buildings are healthy." and a link ">Read more". The Windows taskbar at the bottom shows the time as 9:53 AM on 26/09/2018.

Vetoquinol | Achieve more together

<https://biosecurity.vetoquinol.ca/eng>

Search products, ingredients, categories, uses

ENG / ER

CONTACT US

HOME PRODUCTS PROGRAMS

<http://biosecurity.vetoquinol.ca/eng>

Swine & poultry

A step by step cleaning, disinfecting & pest control protocol to ensure your animals and buildings are healthy.

[>Read more](#)

100% 9:53 AM 26/09/2018

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specialist!*

TERMINAL DISINFECTION

– IN ABSENCE OF ANIMALS

1. Initial Insect Control
 - Space spray
2. Organic Matter Removal
3. Water Line Cleaning and Disinfection
4. Detergent Application
 - Spraying / foaming
5. Washing and Rinsing
 - High pressure water



TERMINAL DISINFECTION

– IN ABSENCE OF ANIMALS...

6. Disinfection

- Spraying / foaming

7. Misting / fumigating

8. Second Insect Control

- Wall spray

9. Rodent Control

1. INITIAL INSECT CONTROL – SPACE SPRAY

- Insects also are **great vectors** for many diseases – Leaves spots every 4-5 minutes
- ❖ **It is ideal to treat while the barn is empty, as soon as birds have been taken out !**



Terminal Disinfection

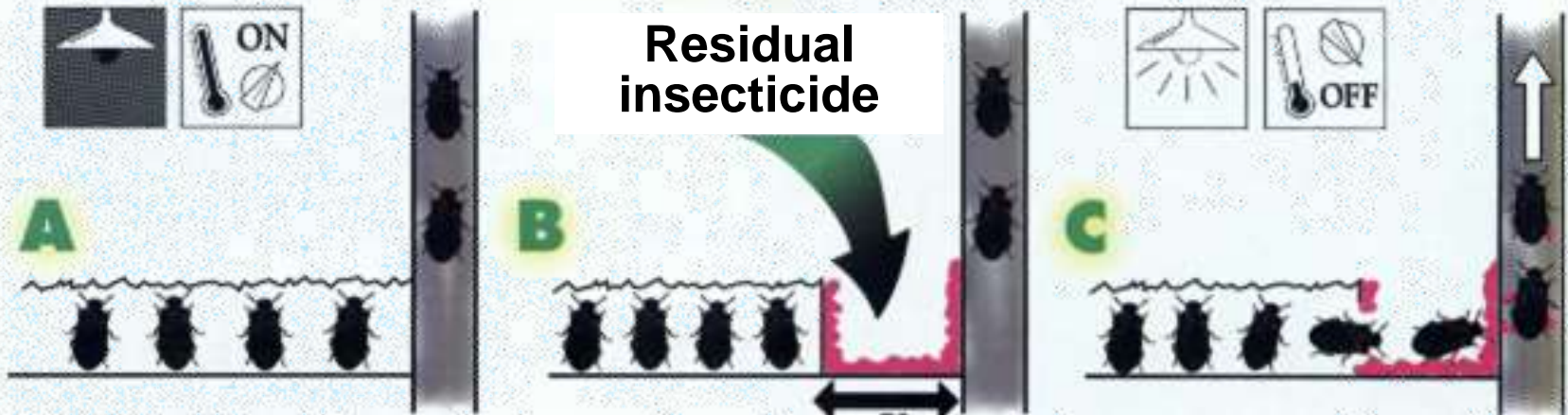


1. INITIAL INSECT CONTROL

Darkling Beetles: a special application!

STEP 1

Residual
insecticide



Terminal Disinfection



3. WATER LINE CLEANING AND DISINFECTION...

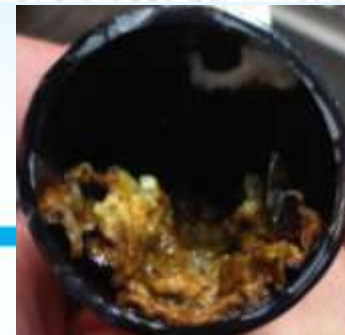
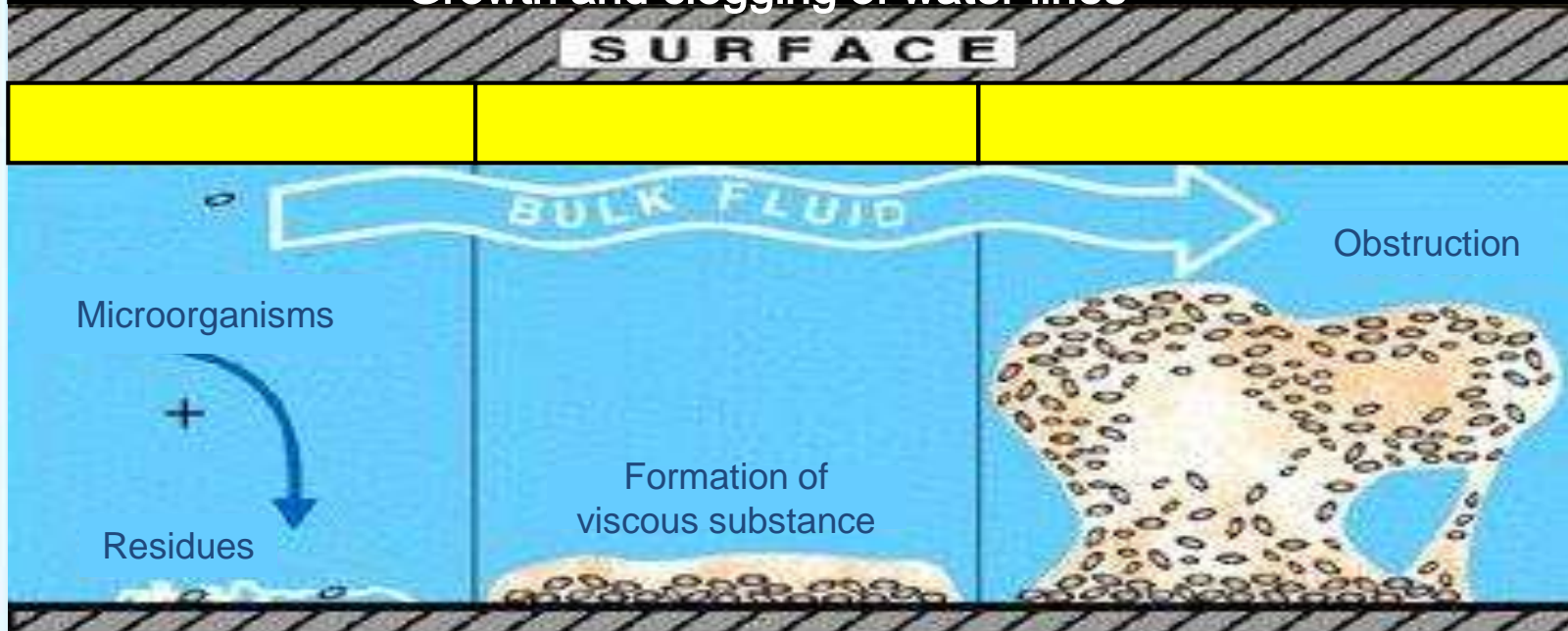
- Why?
 - Birds drink approximately 2X what they eat
- Improperly cleaned waterlines may harbor
 - Biofilms containing a variety of microbes
 - Left over medications from previous batches
 - Excess minerals
 - Probiotics, Prebiotics, Vitamins ..



Formation of Biofilms

© 1995 CENTER FOR BIOFILM ENGINEERING MSU-BOZEMAN

Settling and attachment;
Colonization and biofilm formation;
Growth and clogging of water lines



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3. WATER LINE CLEANING AND DISINFECTION...

➤ Maintenance vs. Cleaning

➤ **Maintenance** – Restricting / Maintaining (CP)

- Chlorine
- Hypochlorous acid
- Acidified sodium chlorites
- Chlorine dioxide
- Hydrogen peroxide
- Hydrogen peroxide and peracetic acid
- Iodine or iodophors
- UV light
- Acidification



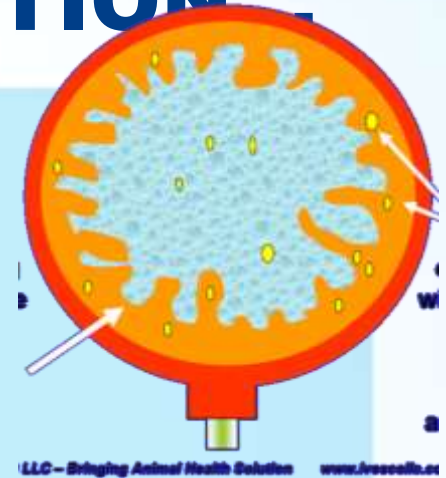
3. WATER LINE CLEANING AND DISINFECTION...

- Maintenance vs. Cleaning.
 - **Cleaning** – Without birds present or not allowed to consume water **(TD)**
 - Biofilms, Microbes, Medications..
 - Choose an appropriate **detergent** depending on issues: **organic** matter or **mineral** deposits
- ** Ensure treated waterline is not supplying water to birds in another room / building!**

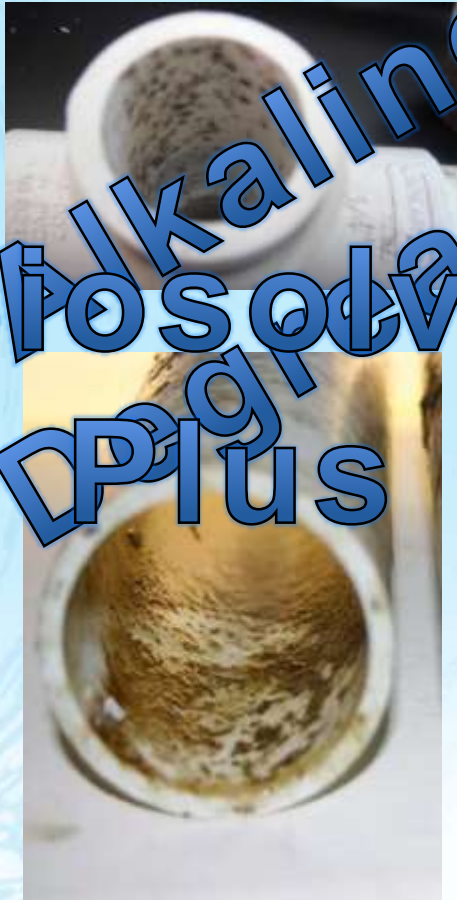


3. WATER LINE CLEANING AND DISINFECTION

- Testing
 - Splitting lines –look or feel
 - Water samples – levels of loads
 - Swab samples – growing media
 - Active chemical testing – specifying agents



Organic and Mineral Deposits



Alkaline
Bio-solvent
Degreaser
Plus



Acidic
Bio-solvent
Degreaser
AFC

Water Lines



<http://biosecurite.vetoquinol.ca/eng>

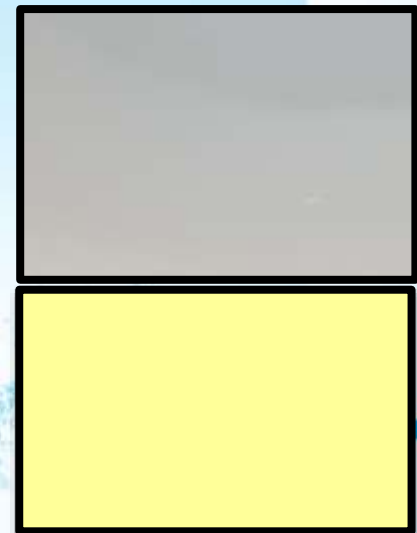


3. WATER LINE CLEANING AND DISINFECTION...

- Prepare stock solution to ensure proper dilution rate and volume, depending on delivery system
- Inject solution in waterline
- Ensure product is **present everywhere**



Biosolve Plus
Biosolve AFC



3. WATER LINE CLEANING AND DISINFECTION...

- **Let stand** (soaking time depends on condition of the waterline)
 - Soak while surface washing!
- **Rinse / flush** the line
- Preferably repeat steps using an appropriate **disinfectant**



4. DETERGENT APPLICATION

– SPRAYING / FOAMING

- Thorough washing with a **detergent** is essential to:
 - ✓ **Reduce time and water** required for the cleaning process
 - ✓ **Help remove biofilms and minerals**
 - ✓ **Help maximize the efficacy** of disinfectants



Detergents / Cleaners

Table 6: The Benefits From Better Biosecurity Techniques

Reference	Trial Type, Basic Details	Calculated Value of Finishers (Against Controls or Former Practice)
Cargill & Benhazi (1998)	Cleaning A.I.A.O. buildings before disinfection with a detergent.	+ £3.12/pig
Overton (1995)	Salmonella outbreak controlled.	+ £3.86/pig
Jajubowski <i>et al.</i> (1998)	Using a powdered peroxide disinfectant (Virkon S) instead of NaOH.	+ £8.80/pig
Sala <i>et al.</i> (1998)	Full Antec programme v. iodine.	+ £2.10/pig
Sala <i>et al.</i> (1988)	Full Antec programme batch disinfection v. terminal disinfection only.	+ £5.66/pig
CASHP Denmark (<i>n.d.</i>)	Partial v. total biosecurity programme.	+ £7.77/pig
Antec Trial (G&M, 1999)	Change to A.I.A.O. and full Antec protocol, result after 3rd batch.	+ £7.15/pig
Gadd (1994-1998)	Average of 10 clients uprated to full biosecurity protocols.	+ £5.63/pig
Average : all results		£ 5.51/pig

Assumptions:

- Weights ranged from 6-90 to 30-100 kg.
- Food in last 14-21 days, range 2.2 to 2.25 kg/day.
- Finisher feed price £130/t. KO% standardised at 73%.
- £5.51/pig = C\$12.12 on a selling price per 70 kg dwt hog at 96p/kg dwt of £67.20 hog (C\$148)

The Investment in hygiene measures give a higher return by breaking pathogen cycles.

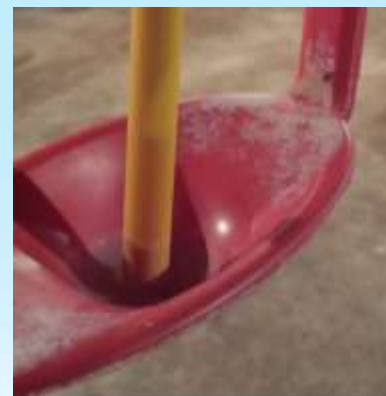
Time, labour and product combined still shows up to 1:13 payback



Picking the right Detergent



Rotation



**Biosolve Plus
Organic
Degreaser**

**Biosolve AFC
Descaler**

Rule 1
Dilute according to label

Cleaner

Deposit
Surface

Different Types of Equipment



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1litre = 1000ml



Labels	%	g or ml/L	oz/gallon
1:100	1	10	1.3
1:128	0.8	8	1
1:256	0.4	4	0.5
1:40	2.5	25	3.2



<http://biosecurity.vetquiniol.ca/eng>



1 : ?

Rule 2
Apply with low pressure

Cleaner

Deposit

Surface

FOAMING VS SPRAYING

- Foaming



- Spraying



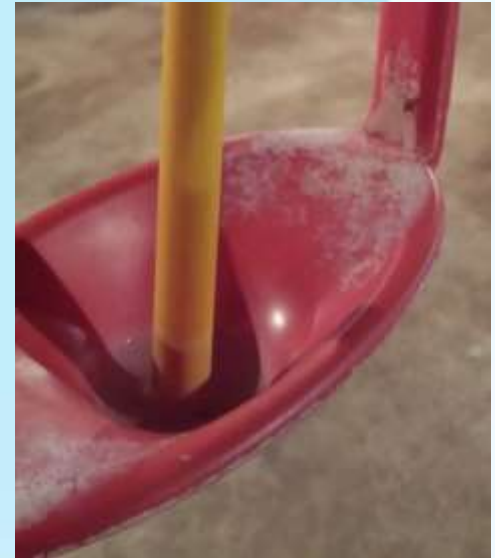
Rule 3
Give it time work

Cleaner

Deposit

Surface

MANUAL SCRUBBING



Rule 4
Rinse off before solution
dries

Cleaner

Deposit

Surface

6. DISINFECTION

- Cleaning With Detergents (Sanitizers) eliminates $> 90\%$ of microbes, what's left is still more than enough to be harmful to livestock
- Live animals and porous surfaces \Rightarrow **high contamination / more viruses**
- ❖ **Using a disinfectant proven efficient against bacteria, fungi and especially viruses is therefore essential!**



6. DISINFECTION

– SPRAYING / FOAMING...

- ❖ Overall result of disinfection depends on:
 - ✓ Type & cleanliness of **surfaces**
 - ✓ Type & resistance of **microbes**
 - ✓ Water and surface **temperature**
 - ✓ Choice & efficacy of **disinfectants**

How a Disinfectant works

Viruses

Peplomer : Glycoproteins

Envelope

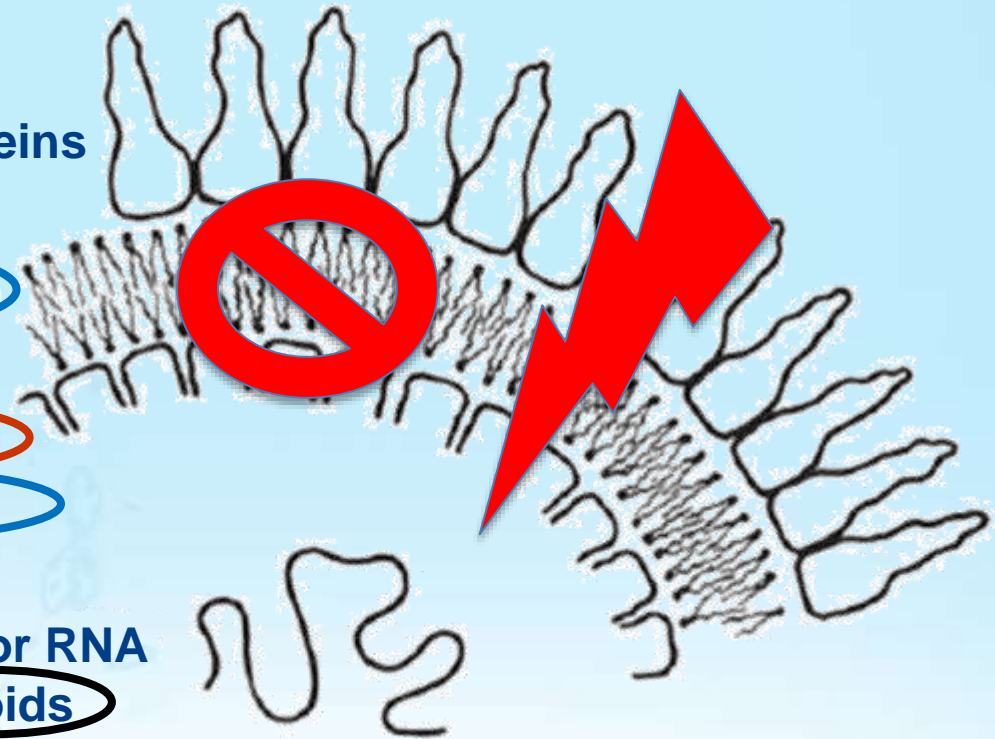
• Phospholipid A
bilayer

Capsid • Proteins **B**

± lipophilic **C**

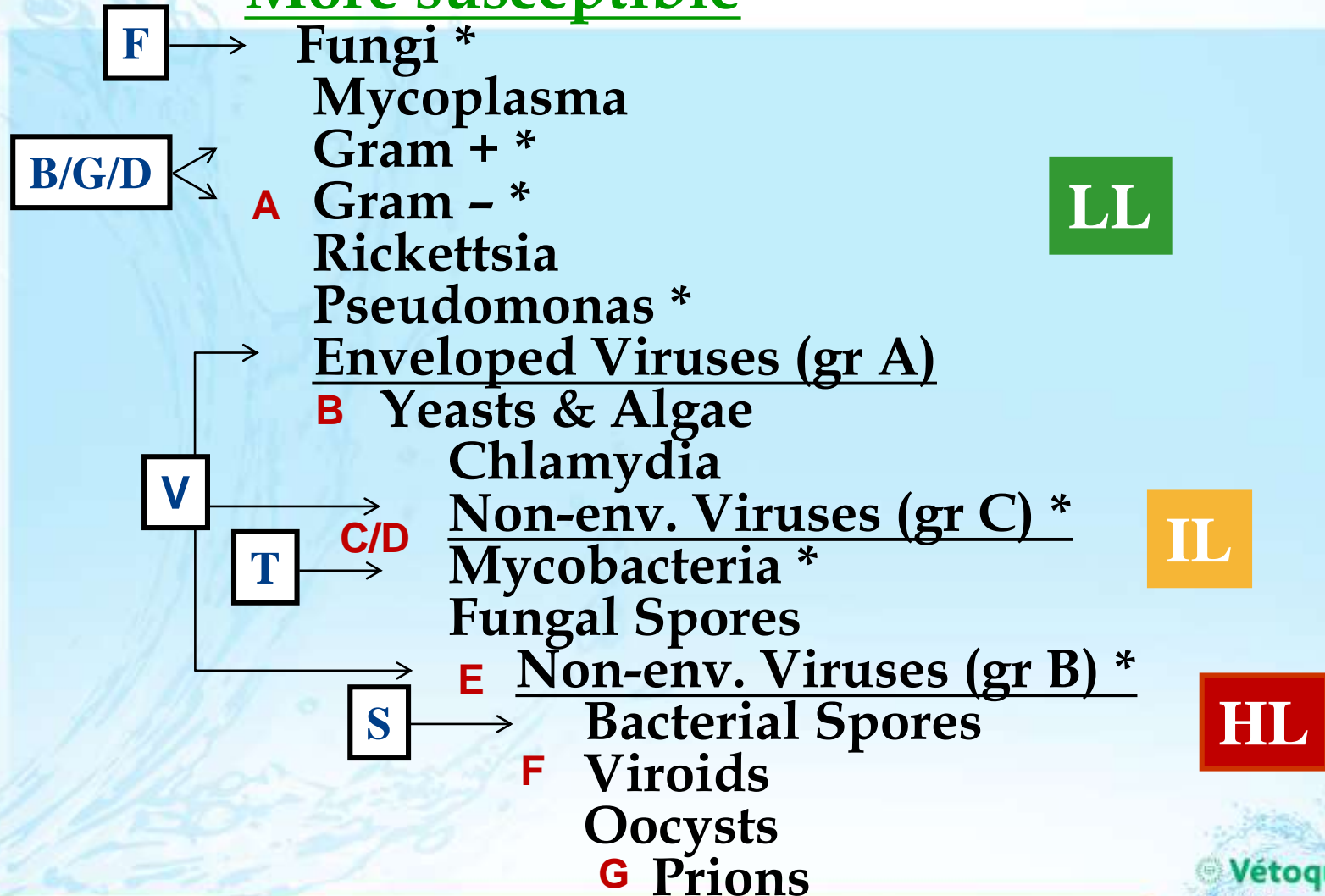
DNA or RNA

Viroids



Spectrum of Disinfectants ...

More susceptible



Less susceptible

Sensitivity to Disinfectants : poultry

More susceptible

Fungi *

Mycoplasma

Gram + *

A Gram - *

Rickettsia

Pseudomonas *

Enveloped Viruses (gr A)

B Yeasts & Algae

Chlamydia

C/D Non-env. Viruses (gr C) *

Mycobacteria *

Fungal Spores

E Non-env. Viruses (gr B) *

Bacterial Spores

F Viroids

Oocysts

G Prions

Less susceptible

*Clostridium,
Listeria
Strept., Staph.**

*Enterobacter
E coli,
Pasteurella,
Salmonella**

*Corona: IB
Herpes: Marek, ILT
Orthomyxo: AI
Paramyxo: ND
Toga: WN
Retro: Leucosis*

Aspergillus

*Pox: Fowl pox
Adeno*: EDS, IBH
Reo*: Synovitis*

Clostridium

*Astro: PEMS
Birna: IBD
Circo: CA, PBFD
Aphto*: FMD
Entero, Parvo**

Comparison of Efficacy

TABLE 28.2. Chemical guide to viral inactivation—minimum concentration of virucide inactivation in 10 min

	Virus	Sodium hypochlorite	Isopropanol	Ethanol	Benzalkonium chloride and derivatives	Iodophor as I ₂	Ortho phenylphenol ^g	Glutaraldehyde
Gr B	<u>Polio I</u>	200 ppm ^a	95% active	70% active	<u>10% active^b</u> D-125 inactivates in 30 min	150 ppm ^a	<u>12% inactive^b</u>	<u>2%^a</u>
Gr C	Coxsackie B ₁	200 ppm ^a	95% active	50% active	<u>10% inactive^b</u>	150 ppm ^a	<u>12% inactive</u>	<u>1%^a</u>
	<u>Adeno 2</u>	200 ppm ^a	50% active	50% active	<u>70–1,000 ppm</u> active (400 ppm partial)	150 ppm ^a	0.12% ^c	0.04% ^a
Gr A	Vaccinia	200 ppm ^a	30% active	40% active	100 ppm ^c	75 ppm ^a	0.12% ^c	0.02% ^a
	<u>Herpes</u>	200 ppm ^a	20% active	30% active	100 ppm ^c	75 ppm ^a	0.12% ^c	0.04% ^a
	<u>Influenza A</u>	200 ppm ^a	30% active	30% active	<u>1,000 ppm^c</u>	75 ppm ^a	0.12% ^c	0.02% ^a
	HIV-1 (AIDS)	50 ppm ^e	35% active ^e	50% active ^e	BTC 2125 dual ^f quat 70–100 ppm (formulation D-125 in 30 sec)	35–75 ppm ^f		0.12% ^f
Gr B	Feline ^d <u>parvovirus</u>	<u>2,000 ppm</u> ≥4 log reduction	50% inactive in 10 min	50% inactive in 10 min	<u>5,000 ppm inactive</u> in 10 min	<u>5,000 ppm</u> 1-log reduction	<u>10% inactive</u> in 10 min	<u>1% (2-log reduction)</u>
	Hepatitis B	Limited data of Bond et al. (1983) and Prince, D.L. (unpublished) and Thraenhart, O. suggest the absence of marked resistance.						

^aShows the marked activity of halogens and glutaraldehyde.

^bShows the inactivity of lipophilic substances against hydrophilic viruses in 10 min.

^cShows the activity of lipophilic substances against lipophilic viruses, which generally mimics effects against vegetative bacteria.

^dSome inactivations can occur with high-passage strains and a combination of agents and synergists in the formulation; contact times may have to be extended in presence of minimum protein load of 5% serum. Data from Scott (1980). Customary 10-min contact time ineffective (incomplete to partial inactivation). Similar results are seen with canine parvovirus.

^eSee Martin et al., 1985.

COMPARISON OF EFFICACY...

More susceptible

Fungi *

Mycoplasma

Gram + *

A Gram - *

Rickettsia

Pseudomonas *

Enveloped Viruses (gr A)

B Yeasts & Algae

Chlamydia

C/D Non-env. Viruses (gr C) *

Mycobacteria *

Fungal Spores

E Non-env. Viruses (gr B) *

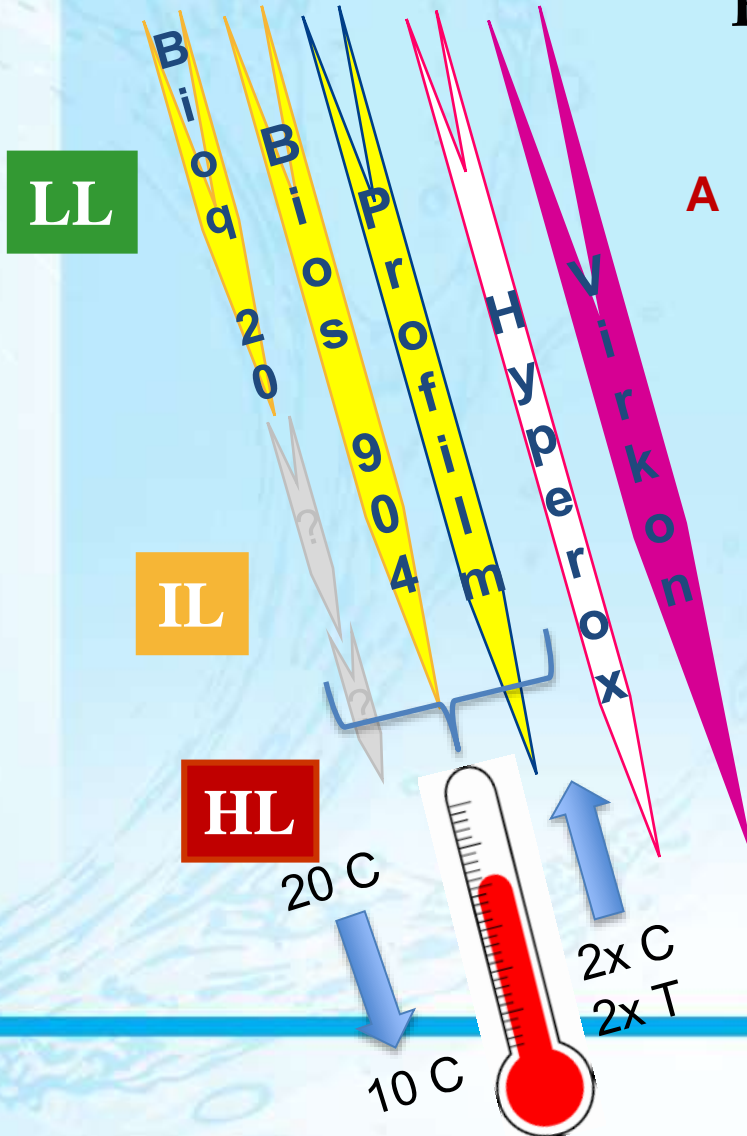
Bacterial Spores

F Viroids

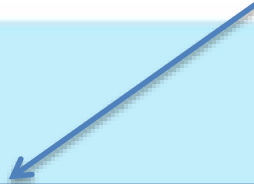
Oocysts

G Prions

Less susceptible



RESIDUAL CHEMISTRIES



Residual = slower
biodegradation

Rehydration = Reactivation

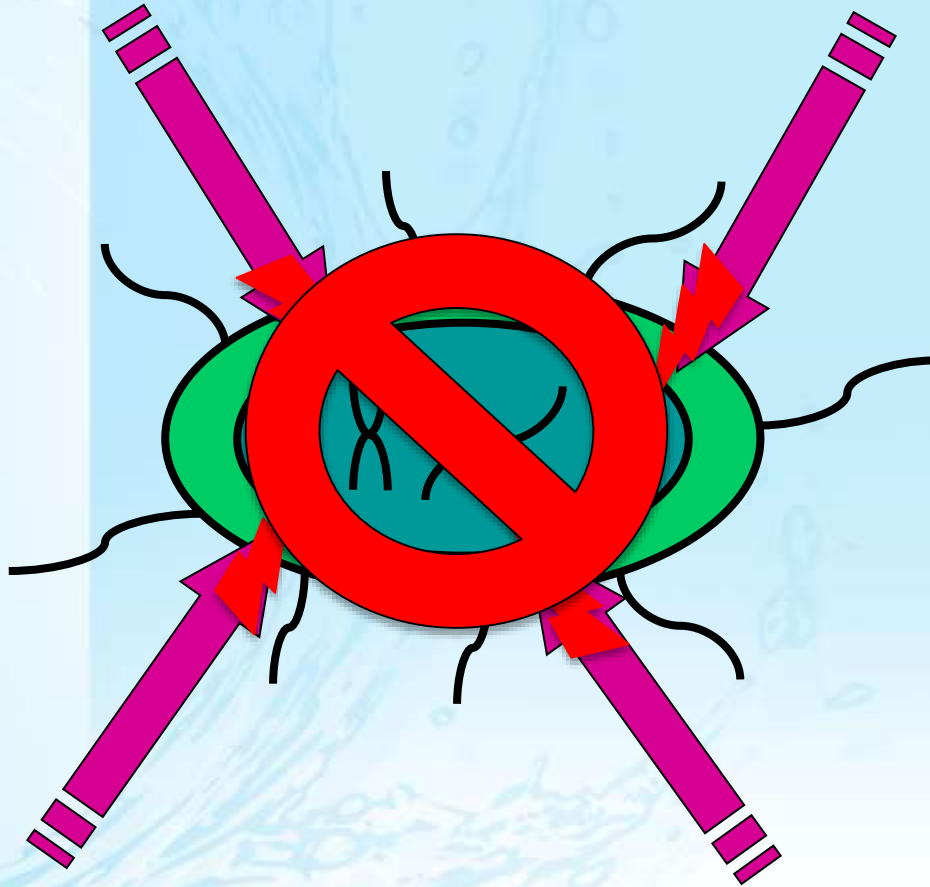
Lower than normal concentration therefore decreased activities
due to less chemical reactive.

Gassing off from the secondary action of the residual chemistry

Irritation to trachea – Morbidity, Opportunistic microbes

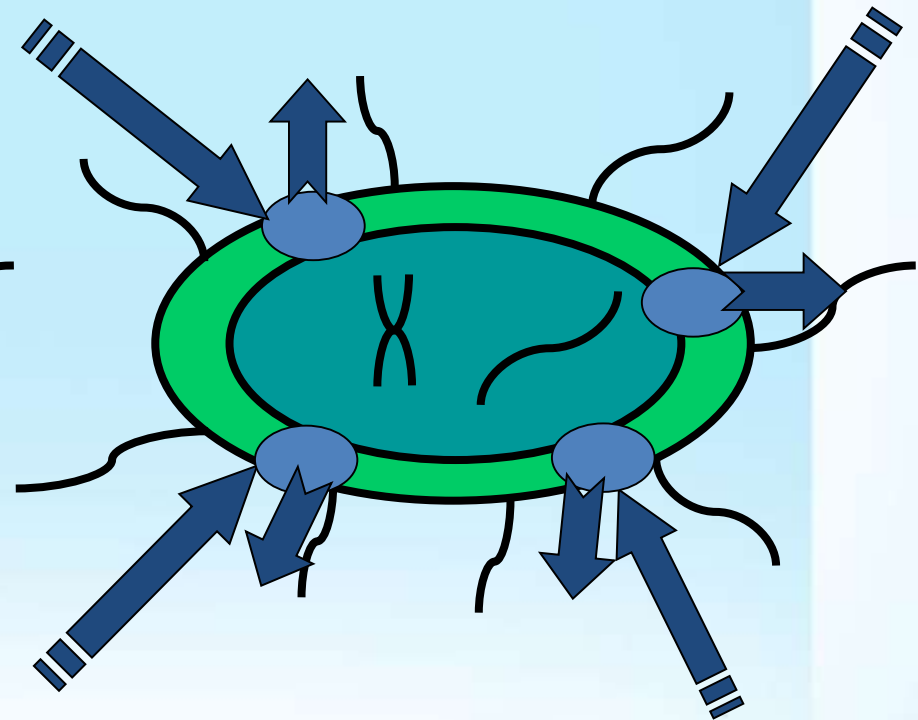
Irritation to feet – Phenols

OXIDATIVE CHEMISTRIES



RESIDUAL CHEMISTRIES

Intrinsic Resistance



6. DISINFECTION

- ❖ Before applying Disinfectants make sure surfaces that are dry as possible:
 - ✓ Prevent **over-dilution**
 - ✓ Prevent chemical **incompatibilities**
 - ✓ Improve **penetration** of the disinfectant

6. DISINFECTION

– SPRAYING / FOAMING...

- **Apply** – right rate according to situation
- **Let stand** at least 10 minutes
 - Minimal contact time for disinfectants in general
- **Dry** as quickly as possible afterward
- ❖ **Too long a contact time is not necessarily preferable nor desirable!**
- ❖ **Some disinfectants need to be rinsed off!**

Residual Chemistries



7. SECOND OPTIONAL DISINFECTION – MISTING / FOGGING

- Misting / fogging is recommended to disinfect **inaccessible areas**, or simply to **complete disinfection**, after mobile equipment and litter are returned
- Sometimes called « **double disinfection** »
- ❖ **Misting / fogging do not replace disinfection by spraying!!!**

7. SECOND OPTIONAL DISINFECTION

– MISTING / FOGGING

- Gas- OPP canisters, Potassium/Formalin
 - Very Fast, gets everywhere quickly
 - Limited products, Long air out, Dangerous
- Thermal Fogging
 - Fast, Gets everywhere
 - Less limited Products, Expensive Machine
- Cold Misting
 - All products, Cheaper to apply
 - Needs assistance, longer to apply



8. SECOND INSECT CONTROL – WALL SPRAY

- Choose an approved wall spray **residual insecticide**, aiming at eliminating **future populations**



Terminal Disinfection



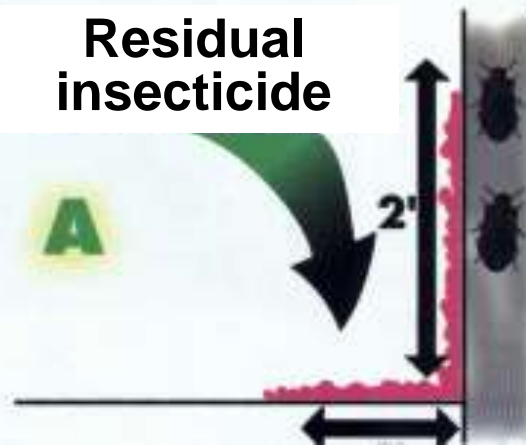
INSECTICIDES FOR WALL SPRAY

Darkling Beetles: a special application!

STEP 2



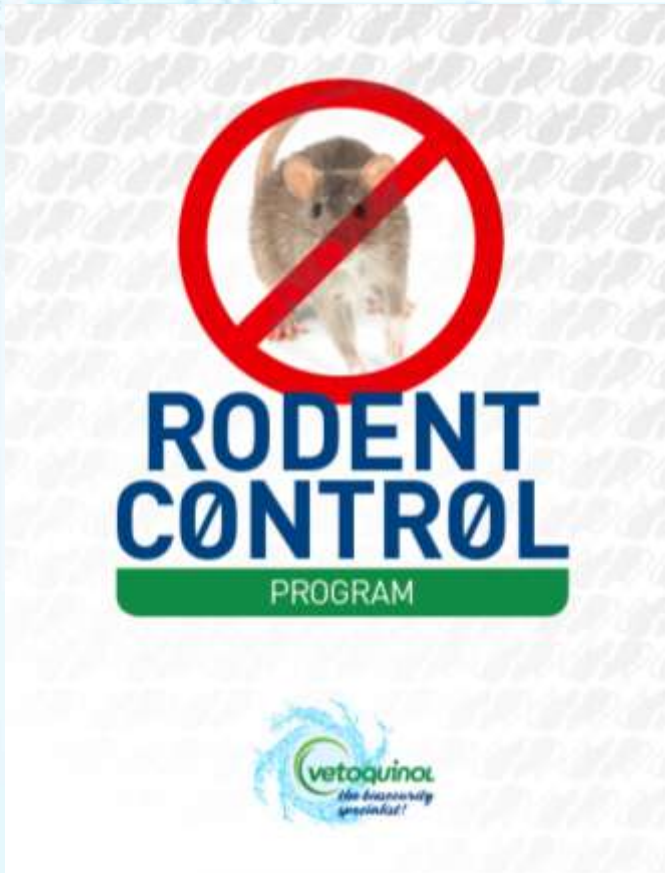
Residual
insecticide



Terminal Disinfection



9. RODENT PROGRAM



- Quality control Programs
- Monitoring
- Assessing
- Readjusting

<http://biosecurity.vetoquinol.ca/eng>



CONTINUOUS PROTECTION – IN PRESENCE OF LIVESTOCK



1. Visitor control

- Access, vehicles, clothing, foot baths

2. Continuous insect control

- Bait, traps, livestock spray, etc.

3. Continuous rodent control

4. Additional routine measures

5. Specific measures



TERMINAL DISINFECTION

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1. Initial Insect Control

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2. Organic Matter Removal

3. Water Line Cleaning and Disinfection

Biosolve Plus

4. Detergent Application

Biosolve AFC

- Spraying / foaming

5. Washing and Rinsing

- High pressure water



TERMINAL DISINFECTION

– IN ABSENCE OF ANIMALS...

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- Wall spray

9. Rodent Control





THANKS!

QUESTIONS?

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