

The Dirt on "Cleaning and disinfecting"

Dave Van Walleghem b.s.a

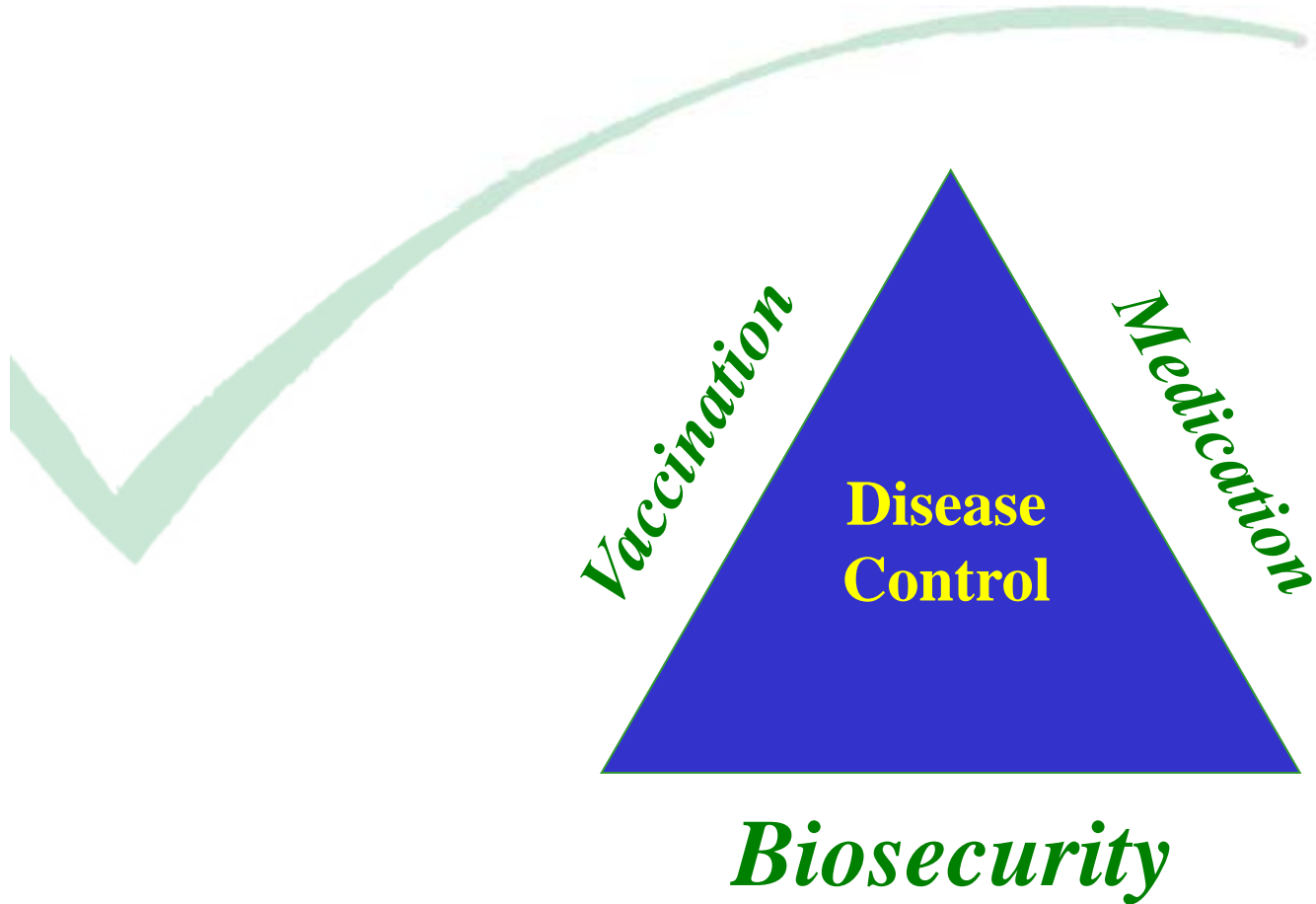
Biosecurity Specialist

Vetoquinol



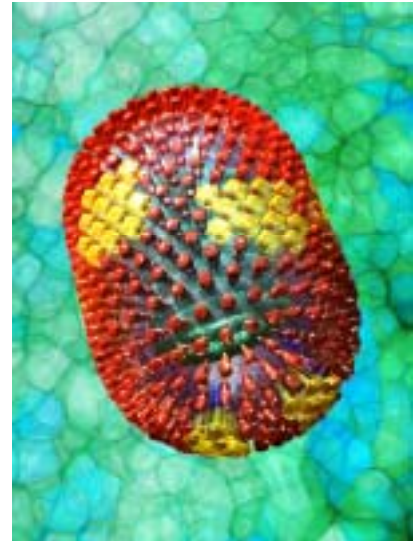
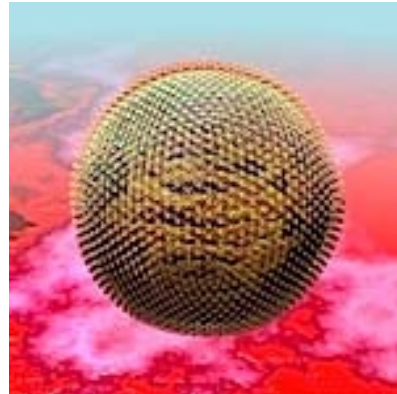
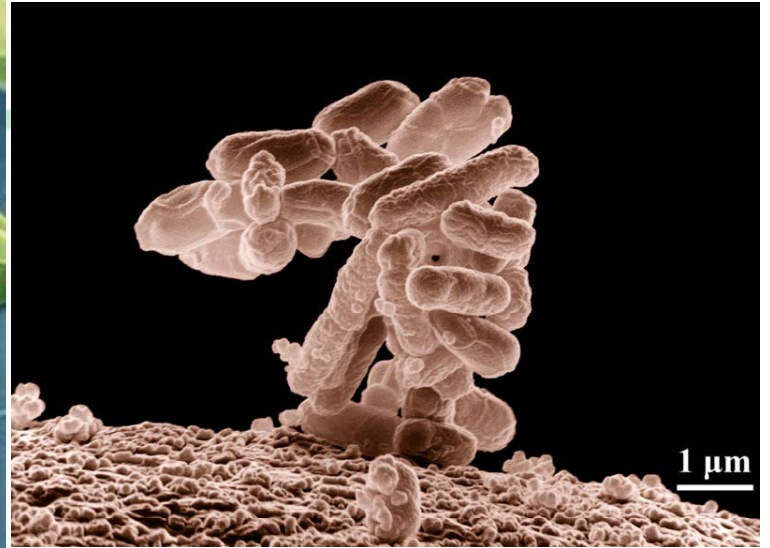
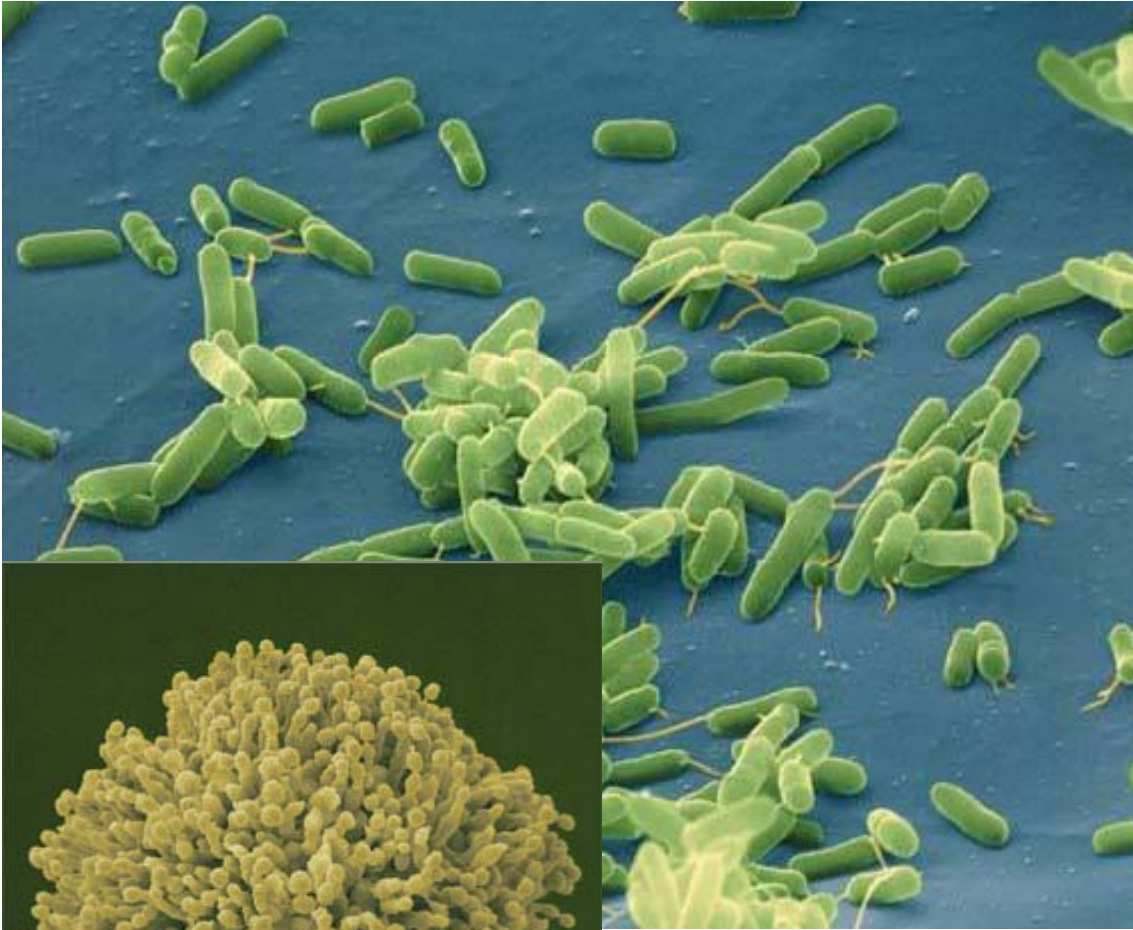
 Vetoquinol
a Sign of Passion

Disease Control



Disease

a disordered or incorrectly functioning organ, part, structure, or system of the body resulting from the effect of genetic or developmental errors, **infection**, poisons, nutritional deficiency or imbalance, toxicity, or **unfavorable environmental factors**; illness; sickness; ailment.



a sign of passion

Bacteria and Viruses

Mortality, disease
expression

**Damage to
the Animals**

Morbidity,
Decreased
performance
(unseen)

Cleaning and Disinfecting

- 1. Gross dirt removal
- 2. Cleaning – removal of Biofilm
- 3. Disinfecting – controlling Bacteria and viruses
- 4. Fogging
- 5. Drying

1. Dirt Removal

- Removal of all organic matter is essential.
- Organic matter contains high levels of contamination
- **High levels of soil reduce the efficacy** of cleaning and disinfecting processes



Surface Contamination...



Biofilm



Stainless



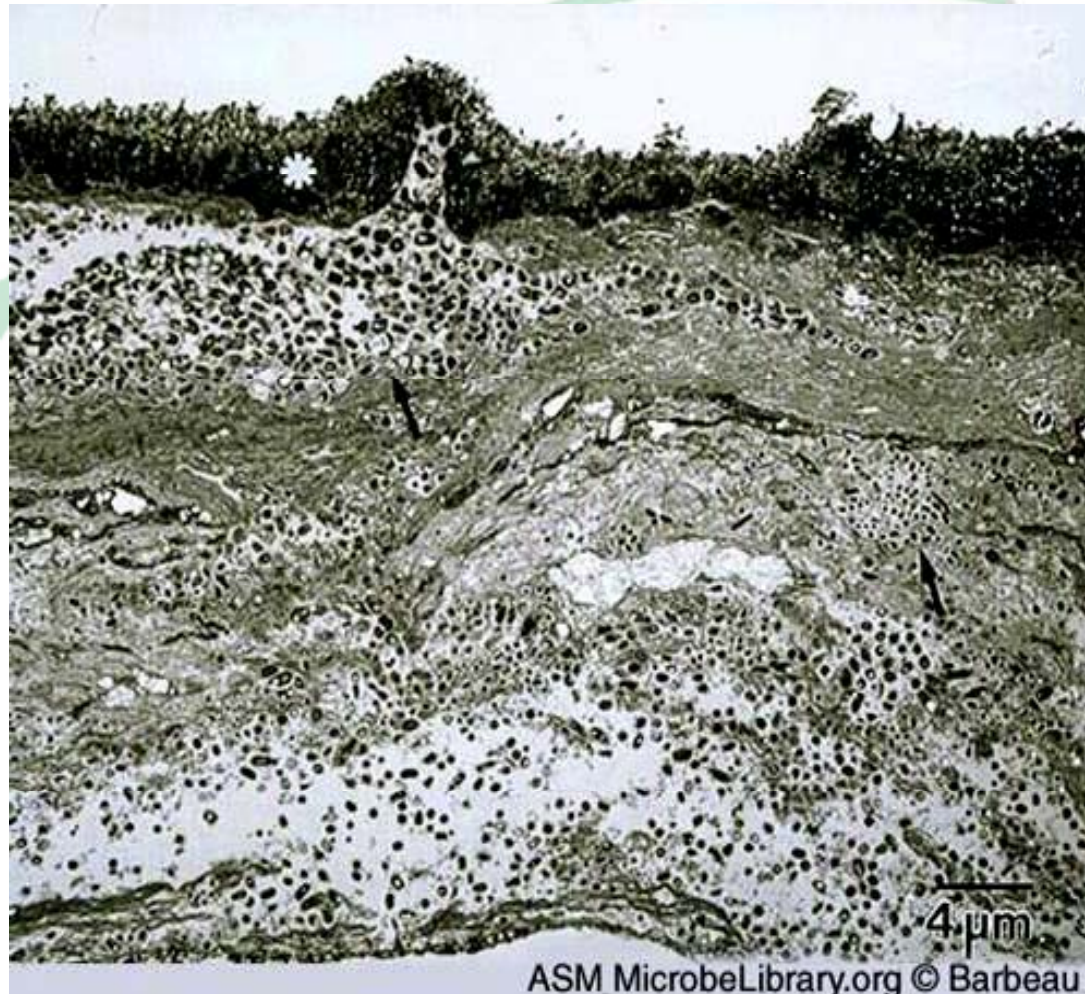
Stainless



Wood, cement

- 1) Même des surfaces visuellement lisses présentent de nombreux interstices, ici observés au microscope à balayage.
- 2) Bactéries en forme de bâtonnets adhérentes sur de l'inco.
- 3) Le béton, le bois, présentent de véritables cavernes dans lesquelles des colonies bactériennes s'implantent à l'abri de la pompe haute pression.
- 4) Film bactérien se développant sur une surface lisse.
- 5) « L'ennemi », ici des bactéries à découvert sur une surface en inox.

Biofilms!?!?



Arrows = microcolonies
of bacteria

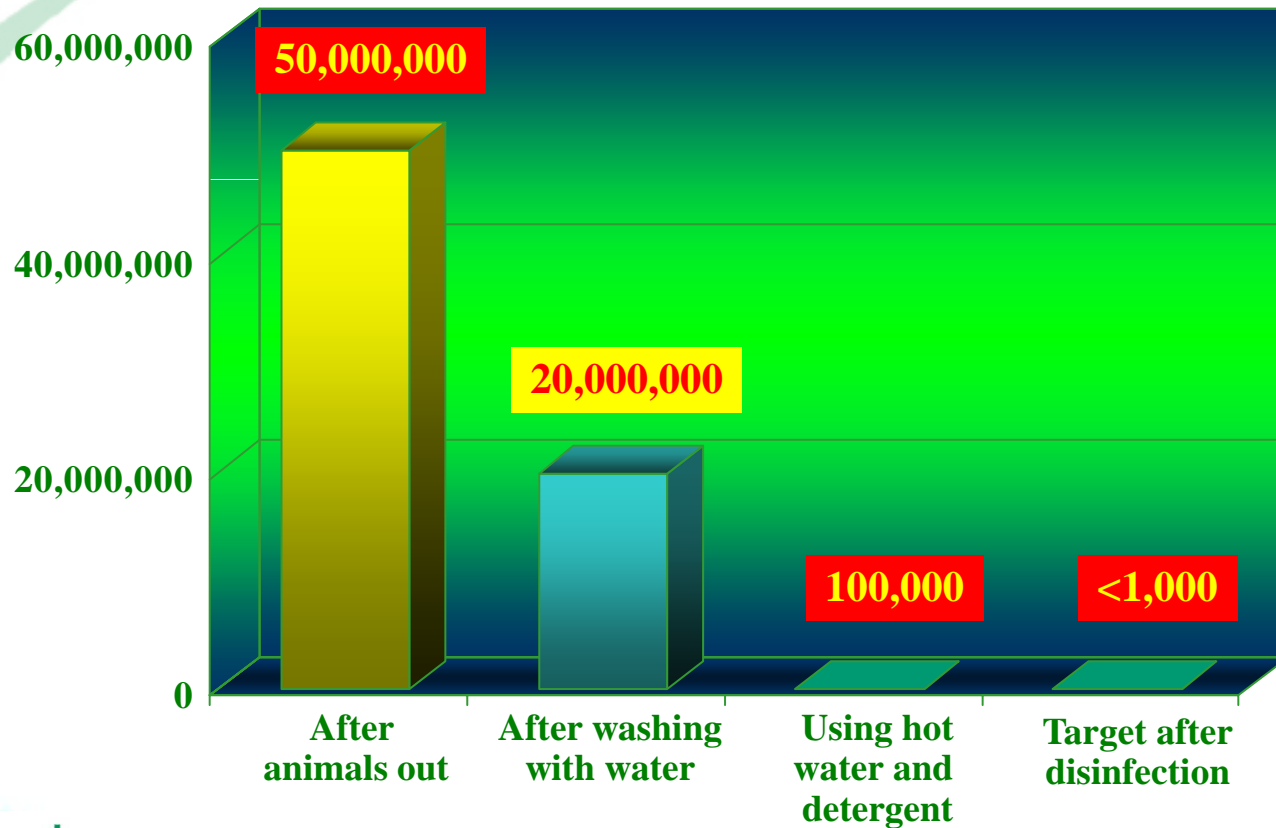
* = microcolonies
on inner wall

ASM MicrobeLibrary.org © Barbeau

Water Alone Is Not Enough!...

A study involving bacterial counts at various stages of cleaning has shown the benefits of using a detergent

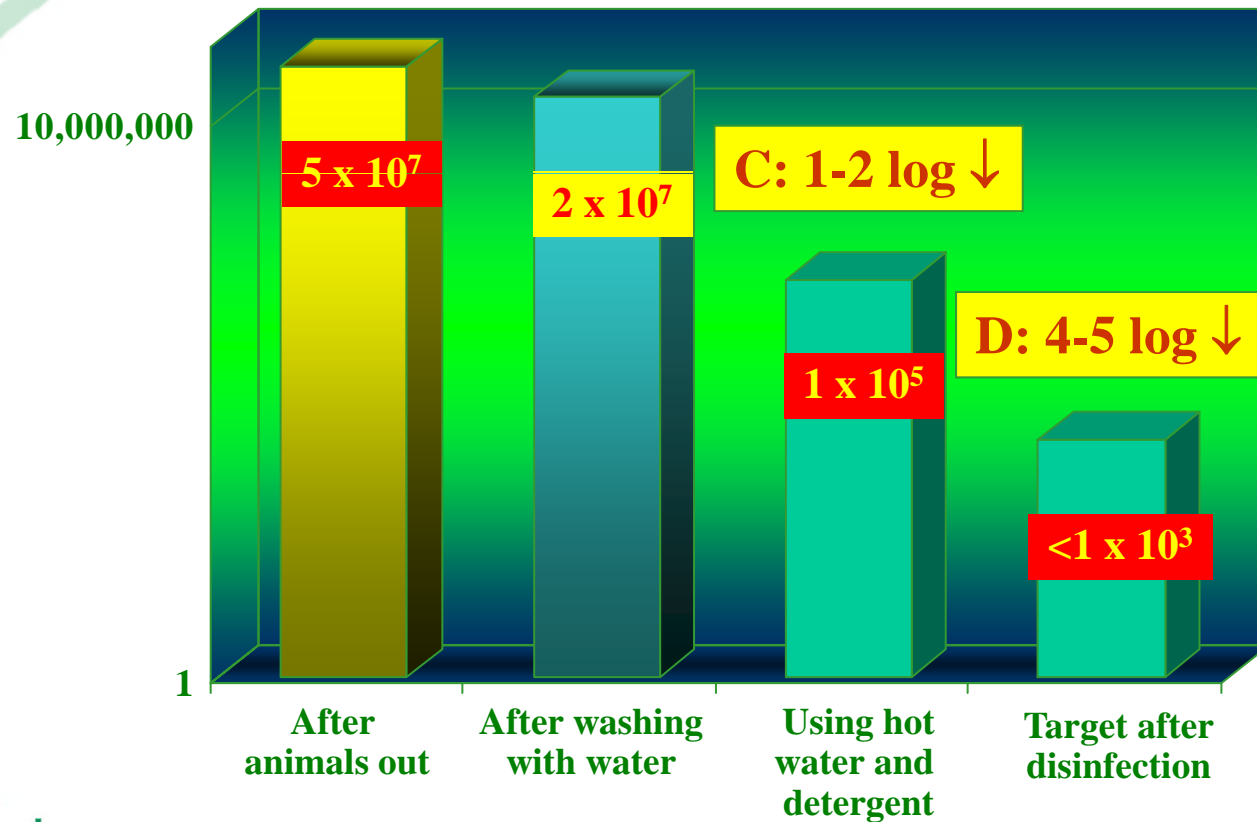
**Viabile
bacteria
(/cm²)**



Water Alone Is Not Enough!...

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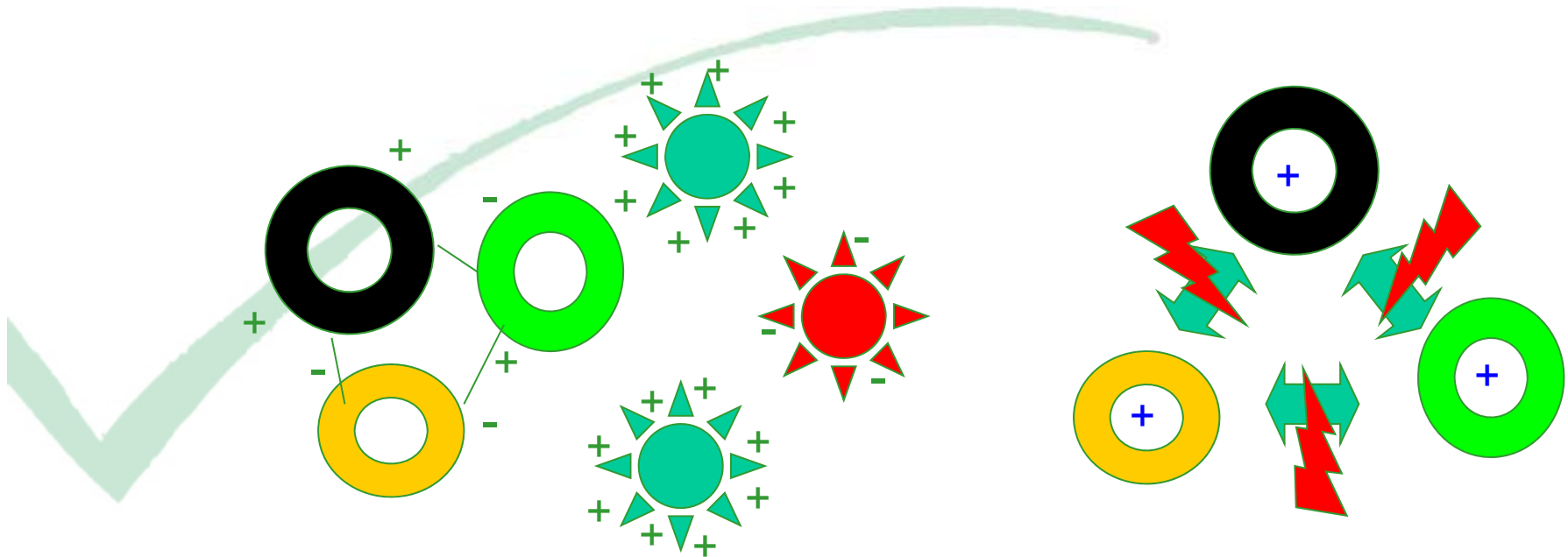
Viable
bacteria
(/cm²)



2. Cleaning - detergents

- The detergent removes the Biofilm, an invisible fatty barrier which is secreted by micro-organisms as a means of protection – hence allowing the disinfectant the opportunity to come in contact with the micro-organisms
- With out a detergent, the action of the disinfectant will be greatly reduced
- Economics, saving of 30-50% time and water.

Results of using Degreaser



Following degreaser and rinsing, 85–95% of contaminants will be removed



With out detergent

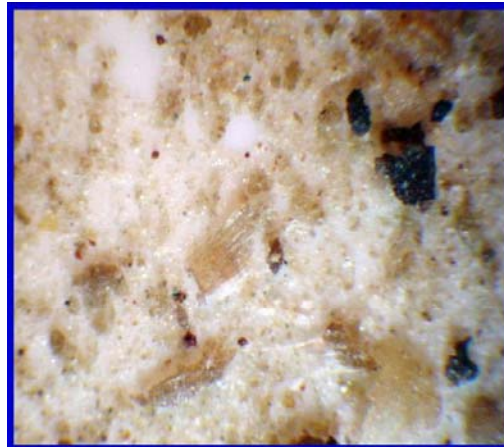


With detergent

Different Biofilms



**Mineral -
Acid**



**Greasy –
Alkaline**

Unwashed

**Pressure Washed
Cold Water**

HOW TO CHOOSE THE CORRECT PRODUCT?

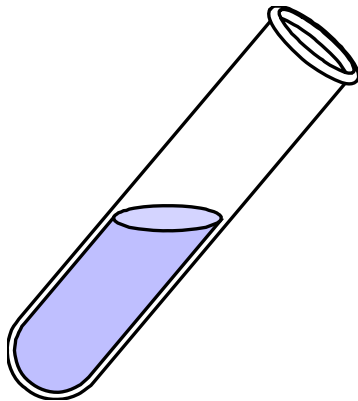
When we know the CONDITIONS...

Match them with the label

WARNING :

The product label sometimes does not provide all the necessary information.

Check the technical data Sheet.



 **Vétoquinol**
a Sign of Passion


Jhvb8y7gfouih ibvbib ugp ig I gff8g9 p9g9 7807 bt8rvf5e65

Jhvb8y7gfouih ibvbib ugp ig I gff8g9 p9g9 7807 bt8rvf5e65 vmj80bvefvjtye4 7807 bt8rvf5e65 vmj80bvefvjtye48y7n bhb6gv5fvbt6gb 7t8bv v t77ddv7drv if 6ro0t8b

vmj80bvefvjtye4 7807 bt8rvf5e65 vmj80bvefvjtye48y7n

bhb6gv5fvbt6gb 7t8bv v t77ddv7drv if 6ro0t8b

Health, safety and the environment.



When using disinfectants, the safety of operators, animals and consumers is paramount.

A number of basic chemicals are highly corrosive, irritant and possibly carcinogenic - higher concentrations of these basic chemicals, often required for adequate activity, exacerbate these problems.

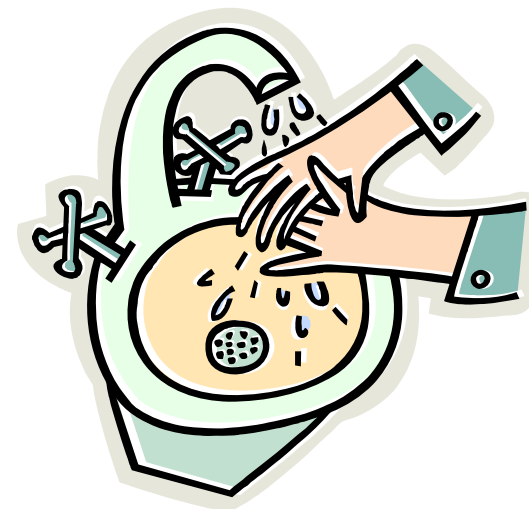
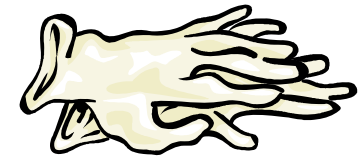


Ref: Blackwell M. International Poultry Production – Volume 10 Number 7

a Sign of Passion



Safety

- All disinfectants are chemicals
- Most soaps are extreme Ph
- Gloves and masks are required
- Washing hands after



2. Cleaning

cleaning and disinfection of barn without animals

product		dilution rate (DR)	application rate (AR)	
	Biosolve	Sprayed	0.5% (5 mL/L)	0.5 L/m ² (or 10 ft ²)
		Sprayed	1% (10 mL/L)	0.5 L/m ² (or 10 ft ²)
		Foamed	2% (20 mL/L)	0.25 L/m ² (or 10 ft ²)
	Biofoam	Sprayed	1% (10 mL/L)	0.5 L/m ² (or 10 ft ²)
		Foamed	2% (20 mL/L)	0.25 L/m ² (or 10 ft ²)

Biosolve & Biofoam

Multipurpose Heavy Duty Cleaners

- Superior cleaning, degreasing & foaming properties
- Non staining, non tainting, biodegradable
- ❖ **Biosolve**
 - ✓ Alkaline (11.5); non-ionic / amphoteric
 - Dilution rates: 0.5 - 2%
- ❖ **Biofoam**
 - ✓ Acidic (2.3); non-ionic / amphoteric
 - ✓ De-scaling
 - Dilution rates: 1 – 5%; 10%; 100%



pH Rotation of Cleaners

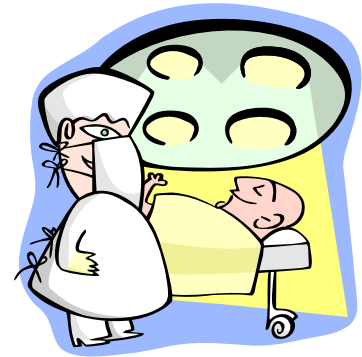


- Presence of **high soiling** implies the regular use of **alkaline** detergents
- Presence of **hard water** implies the periodical use of **acidic** detergents
- **Rotation** between alkaline and acidic detergents **is therefore recommended**
- **7/1** could be ideal for most cases
- **6/2, 5/3, 1/1** could be required for hard water situations

3. Disinfection

- Even though the cleaning will eliminate 90% of the contaminants, what's left is more than enough to be harmful to animals
- Presence of live animals and ± porous surfaces ⇒ **more viruses & contaminated**
- Using a **proven disinfectant** against viruses, bacteria, yeasts and mold is therefore essential

Heart Surgery



Sterilization

- is the use of a physical or chemical procedure to destroy all forms of microbial life.

Sanitization

- The ability to provide disinfectant results (99.99% kill) or at best will simply lower the contamination load, of representative disease microorganisms of public health importance.

Sensitivity to Disinfectants

More susceptible

Fungi

Mycoplasma

Gram +

Gram -

Rickettsia

Enveloped Viruses (gr A)

Yeast & Algae

Pseudomonas

Non-env. Viruses (gr C)

Chlamydia

Mycobacteria

Fungal Spores

Non-env. Viruses (gr B)

Bacterial Spores

Viroids

Coccidia

Prions

Less susceptible

Streptococcus
Staphylococcus

Bordetella
Campylobacter
E coli, Salmonella

Herpes
Paramyxo (KC, Distemper)
Corona (FIP)
Retro (FI, FeL)
Rhabdo (Rabies)

Adeno: ICH

Calici
Circo: PBFD
Parvo: Panleuco



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Microbial Cell Walls...

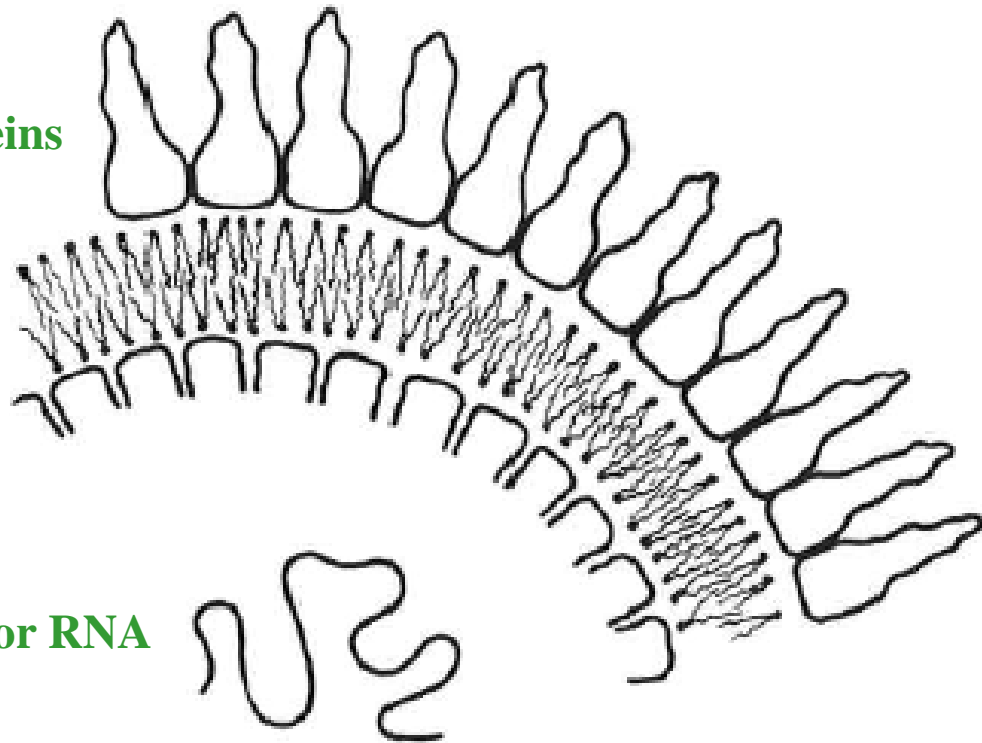
Viruses

Peplomer : Glycoproteins

Envelope : Phospholipids A
bilayer

Capside: Proteins B
± lipophilic C

DNA or RNA



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 <u>Coxsackie B₁</u> <u>Adeno 2</u>	200 ppm ^a 200 ppm ^a	95% active 50% active	50% active 50% active	<u>10% inactive^b</u> <u>70–1,000 ppm</u> active (400 ppm partial)	150 ppm ^a 150 ppm ^a	<u>12% inactive</u> 0.12% ^c	<u>1%^a</u> 0.04% ^a
Gr A <u>Vaccinia</u> <u>Herpes</u> <u>Influenza A</u> <u>HIV-1 (AIDS)</u>	200 ppm ^a 200 ppm ^a 200 ppm ^a 50 ppm ^e	30% active 20% active 30% active 35% active ^e	40% active 30% active 30% active 50% active ^e	100 ppm ^c 100 ppm ^c <u>1,000 ppm^c</u> BTC 2125 dual ^f quat 70–100 ppm (formulation D-125 in 30 sec)	75 ppm ^a 75 ppm ^a 75 ppm ^a 35–75 ppm ^f	0.12% ^c 0.12% ^c 0.12% ^c	0.02% ^a 0.04% ^a 0.02% ^a 0.12% ^f
Gr B <u>Feline^d parvovirus</u>	<u>2,000 ppm</u> ≥4 log reduction	50% inactive in 10 min	50% inactive in 10 min	<u>5,000 ppm</u> inactive 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.

A Comparison of Efficacy...

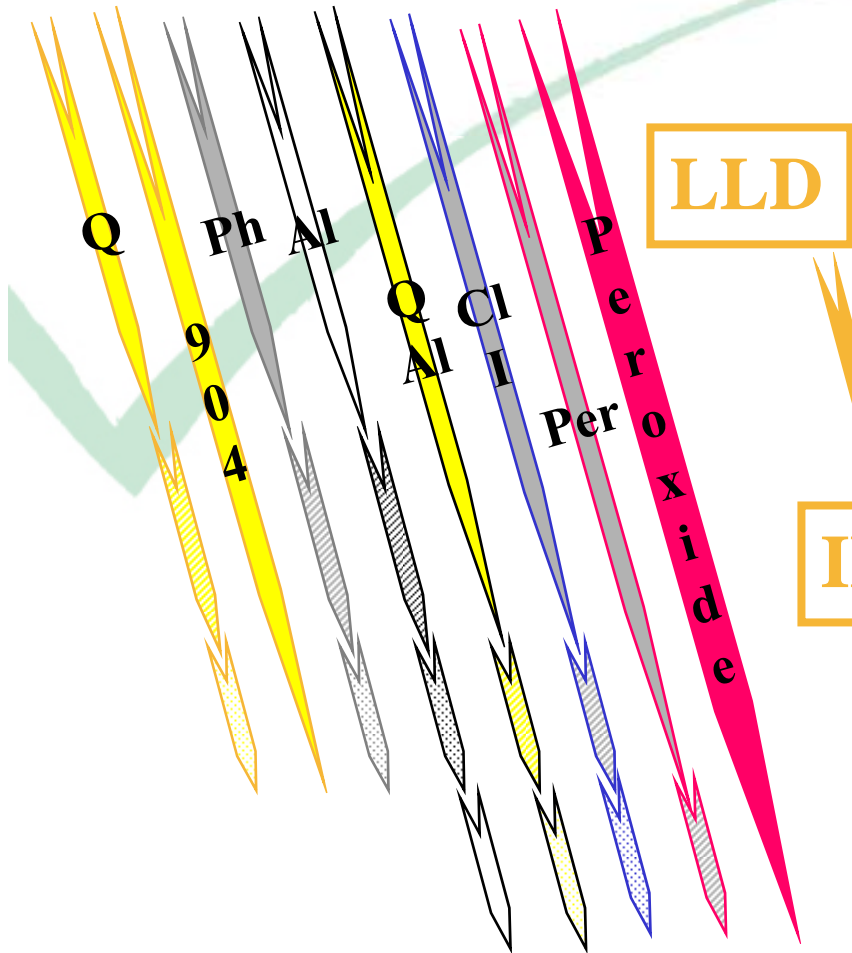
More susceptible

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Chlamydia
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Fungal Spores

Non-env. Viruses (gr B)
Bacterial Spores
 Viroids
 Coccidia
 Prions

Less susceptible



3. Disinfection...

- Normal application rates:
 - 250 – 300 ml/m² (until run-off), or:
 - 125 ml/m² at double strength when foamed
 - Use the correct dilution and amount of product!
- Make sure **surfaces are as dry as possible**
 - ✓ Prevents over dilution
 - ✓ Prevents chemical incompatibilities
 - ✓ Improves penetration
- Never mix disinfectants with anything else

HOW TO MEASURE THE VOLUME OF THE SOLUTION REQUIRED

How to make the calculation?

WE NEED:

- 1- total treatment surfaces; floor, ceiling, wall, equipment
- 2- volume of solution for that quantity of surfaces
- 3- the dilution rate for the Product



Application



**If I give you 1 gallon of paint
when actually 5 gallons are needed?**

- Paint is visual, you can see where it has been applied
- Disinfectants are not easy to see where they have been applied
- For good results, we must apply the quantity and concentration for the conditions we are working with



How to measure

Surface / Area

$$S = L \times W$$

m², ft²



Volume

$$V = L \times W \times H$$

m³, ft³



Holding pen

■ Inside dimensions

- 6 ft wide x 8 ft long x 6 ft high
- $6 \times 6 \times 4 = 144$, $6 \times 8 \times 2 = 96$ total 240 sq ft
- Covert 240 sqft = 22.3 sqm
- 250ml/sqm of product to wet a surface properly
- $22.3 \times 250 = 5,574$ ml or 5.57 liters

Holding pen

- 5.57 liters with 1% or 1:100 = 0.056 liters or 56 ml of detergent @ \$7.00 per liter = \$0.39
- 1% Virkon = \$1.28
- Grand total = \$ 1.68 per Holding area



Bigger area application

- Venturi pump – Work on Ratios
- Example 15:1
- For every 15 liters final water, 1 liter comes from stock and 14 from the water supply.



ad 11

Ratio

- How to check – or measure
- Take a known amount of stock eg. 1 liter or 1 oz. (1 part)
- Measure the out put in a larger container.
- Put together.
- Should test all distribution systems 1X per year.

How to measure

- So if we are doing 10x we would need 57.7 liters
- $57.7 / 15 = 3.85$ liters of stock needed, and in that stock we need 0.577 liters of pure product.
- Remember the final stock volume needs to be 3.85 liters therefore
 - Liquid 0.577 liters of pure product and 3.273 liters of water.
 - A solid will dissolve therefore 0.577 kg and 3.85 liters of water.

Economics

Dilution (rate)	Amount / 100 m2 (liters)	Cost pre litre of detergent
1:100 or 1%	0.25	\$ 7.00
1:50 or 2%	0.5	\$ 3.50
1: 25 or 4%	1	\$1.75
1:20 or 5%	1.25	\$1.40

Amount Review

- 1. Measure surface area's and add together
- 2. Figure out the amount of water needed to wet all the surfaces (250ml/msq)
- 3. Find the working rate of the degreaser.
- 4. Find the amount of product needed.
- 5. If using a distribution system, divide by the ratio.

4. Fogging

- Fogging is recommended to **disinfect inaccessible areas**, or simply to **complete your disinfection** program after mobile equipment is returned
- ❖ *“Fogging does not replace disinfection”*



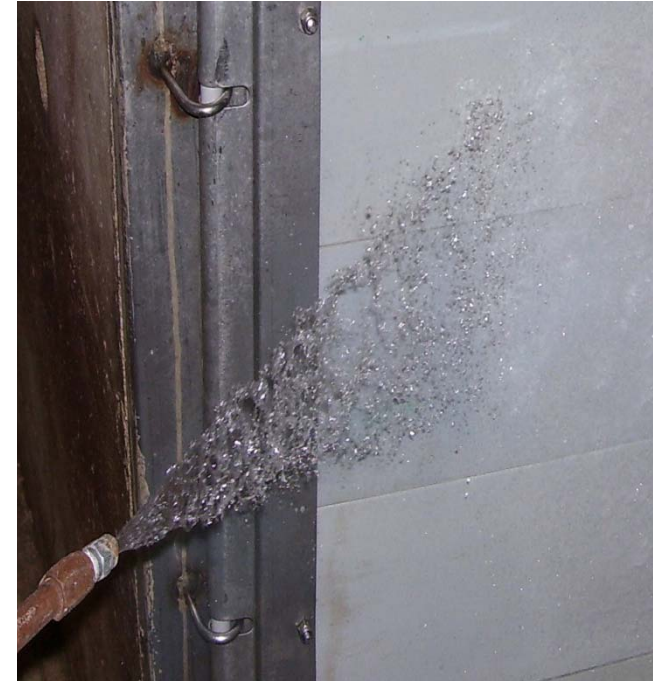
5. Fogging...

- Spray in a very **fine mist** using a mechanical, pulse or thermal fogger
- Dilution and application rates could vary according to the presence of known disease problem or not: from **1 to 4 L per 100 m³**
- Size of droplets and distance they travel depend on the **fogger's flow rate**
- **Room temperature and humidity** may be limiting factors



Rules

- Do not apply on very wet surfaces (possible further dilution of product)
- Evenly and softly
- Wet all surfaces to just before dripping (Normally 250ml/10sqft)
- Let all products sit for a Minimum 10 minutes after application before proceeding to the next step. (let it do it's work!)
- Do not use water temperatures over 140



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a Sign of Passion



5. Drying

- All Disinfectants are required to do their work with in 10 minutes. Label requirement.
- Drying - all cells need moisture to live

Cleaning and Disinfecting

- 1. Gross dirt removal
- 2. Cleaning – removal of Biofilm
- 3. Disinfecting – controlling Bacteria and viruses
- 4. Fogging
- 5. Drying

Continuing Biosecurity

- 1. Visitor control
- 2. Routine/specific Disease Control

1. Visitor Control...

- Use clean or disposable **protective clothing**
 - Coveralls, lab coats, hats, gloves, boots
- Require **hand washing and sanitizing**
 - Kennel / cattery staff
 - AHTs / VETs between each case



2. Routine/Specific Disease Control

- Applications of C&D procedures to rooms, furniture, equipment or personnel have to be achieved on a **regular weekly / daily basis *every one must be on board!!**
- **Procedures vary according to** each item's very own **relative risk** or contamination level:
 - Low / Intermediate / High

2. Routine/Specific Disease Control Low Risk Areas / Items

- **Non-critical** areas / items
 - No known / apparent **disease**
- Routine medical / patient equipment
 - Contact with **intact skin** only
 - ie. Flea comb/stethoscope
- Areas where **no animal** are ever present
 - Reception
 - Pharmacy
 - Warehouse
 - Corridors / service areas



2. Routine/Specific Disease Control... C&D Requirements

■ Non-critical / low risk areas/items

➤ Low or intermediate level disinfection

■ Recommendations

- One step C&D might be satisfactory
- Once a week for floors, walls, desks,...
- After each use for equipment
- Regular hand washing

2. Routine/Specific Disease Control... Intermediate Risk Areas / Items

- **Semi-critical** areas / items
 - No known / apparent **contagious disease**
- Medical / patient equipment, tables...
 - Contact with **intact skin or mucous membranes**
 - ie. Dishes/thermometers
- Spills: urine / feces

Areas where \pm **sick animals** are present

- Waiting rooms
- Consultation / examination rooms
- Treatment / pre-operation rooms
- Kennel / cattery



2. Routine/Specific Disease Control... C&D Requirements...

■ Semi-critical / intermediate risk

- Intermediate or high level disinfection

■ Recommendations

- Two step C&D much more preferable
- Once a day for floors, walls, cabinets,...
- Every spill and surface contamination
- After each use for equipment, tables,...
- Hand washing / sanitizing

after each case

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2. Routine/Specific Disease Control... High Risk Areas / Items

- **Critical** areas / items
 - **Surgery / apparent contagious disease**
- Medical / surgical equipment, tables...
 - Contact with **damaged sk. / m. m. / sterile areas**
 - Anesthetic hoses/dishes/thermometers
- Spills: urine / feces / **body fluids**
- Areas where **sicker animal** are present
 - Contaminated cons. / exam. rooms
 - Contaminated treat. / pre-op. rooms
 - Surgical rooms
 - Isolation rooms



2. Routine/Specific Disease Control... C&D Requirements...

■ Critical / high risk

- High level disinfection or sterilization

■ Recommendations

- Two step C&D mandatory
- Once a day for floors, walls, cabinets,...
- After each surgery / use for equipment, tables,...
- Every spills and surface contamination
- Hand washing / sanitizing after each case
- Clean protective clothing
- Foot baths



2. Routine/Specific Disease Control... Vetoquinol's Recommendations

■ Non-critical / low risk

- ✓ Biosolve / Biofoam
- ✓ Biosentry 904
- ✓ VIRKON always an option

■ Semi-critical / intermediate risk

- ✓ Biosolve / Biofoam
- ✓ Biosentry 904
- ✓ VIRKON

■ Critical / high risk

- ✓ Biosolve / Biofoam
- ✓ VIRKON



Virkon...Easy to Use

■ Virkon Tablets

- No worries of inappropriate mixing
 - 1 tablet per 500ml Virkon labeled spray bottle
- Always have efficacious product
- Safe
- Color indicator to remember to change on a weekly basis
- Proven efficacy all over the globe



VETOQUINOL BIOSECURITY TECHNICAL SERVICES



PLATINUM
BIOSECURITY
PROGRAM



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