

HATCHERY HYGIENE

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CONTENT

I. Introduction

Hatchery sanitation as part of a chain :

BREAK THE CHAIN OF INFECTION !

Breeders: A hatchery relies on breeder farm management to receive quality hatching eggs.

Hygienic transport

Hatchery: incubates eggs and produces quality chicks, largely depending on the quality and management of the eggs.

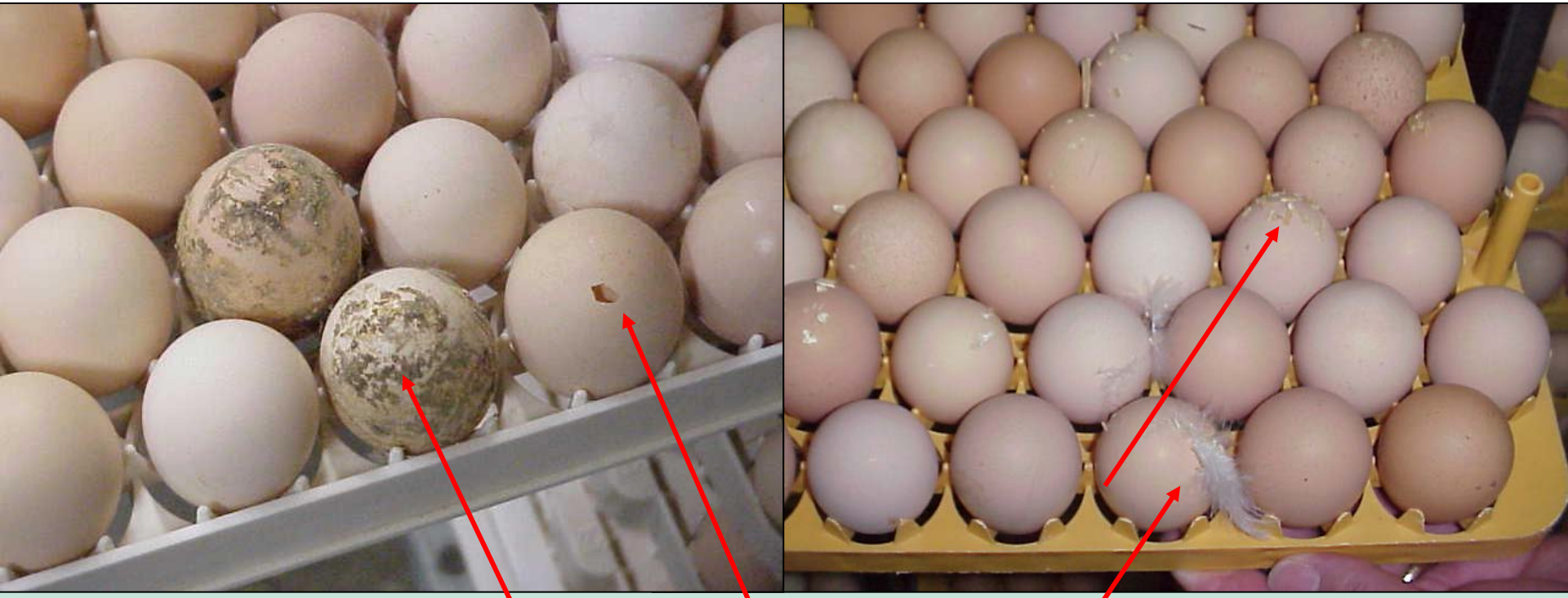
Hygienic transport

farm: House has been cleaned, sanitized, pre-heated, good ventilation, feed, water = chicks take off for a good start.

➡ A happy customer!!

I. Introduction

The main source of hatchery contamination



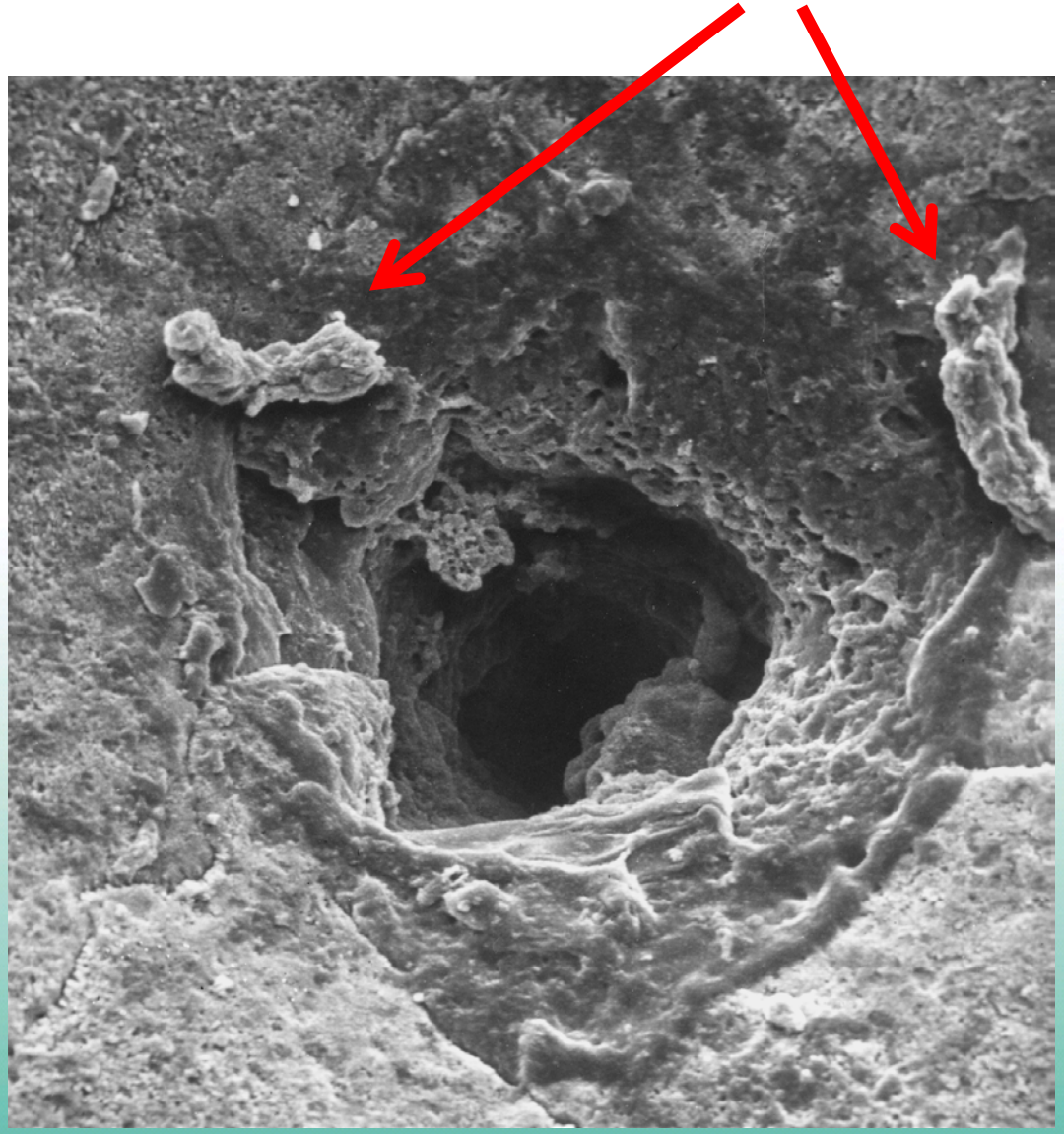
Dirty eggs are main source of contamination

Bacterial contamination

Egg type	Bacterial count
Freshly laid	300+
Clean	3,000+
Soiled	26,000+
Very Dirty	400,000+

A pore in the egg shell

A pore and bacteria

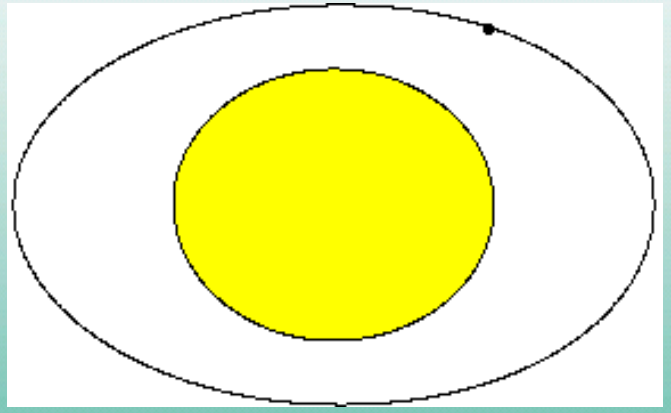


I. Introduction

Way of contamination

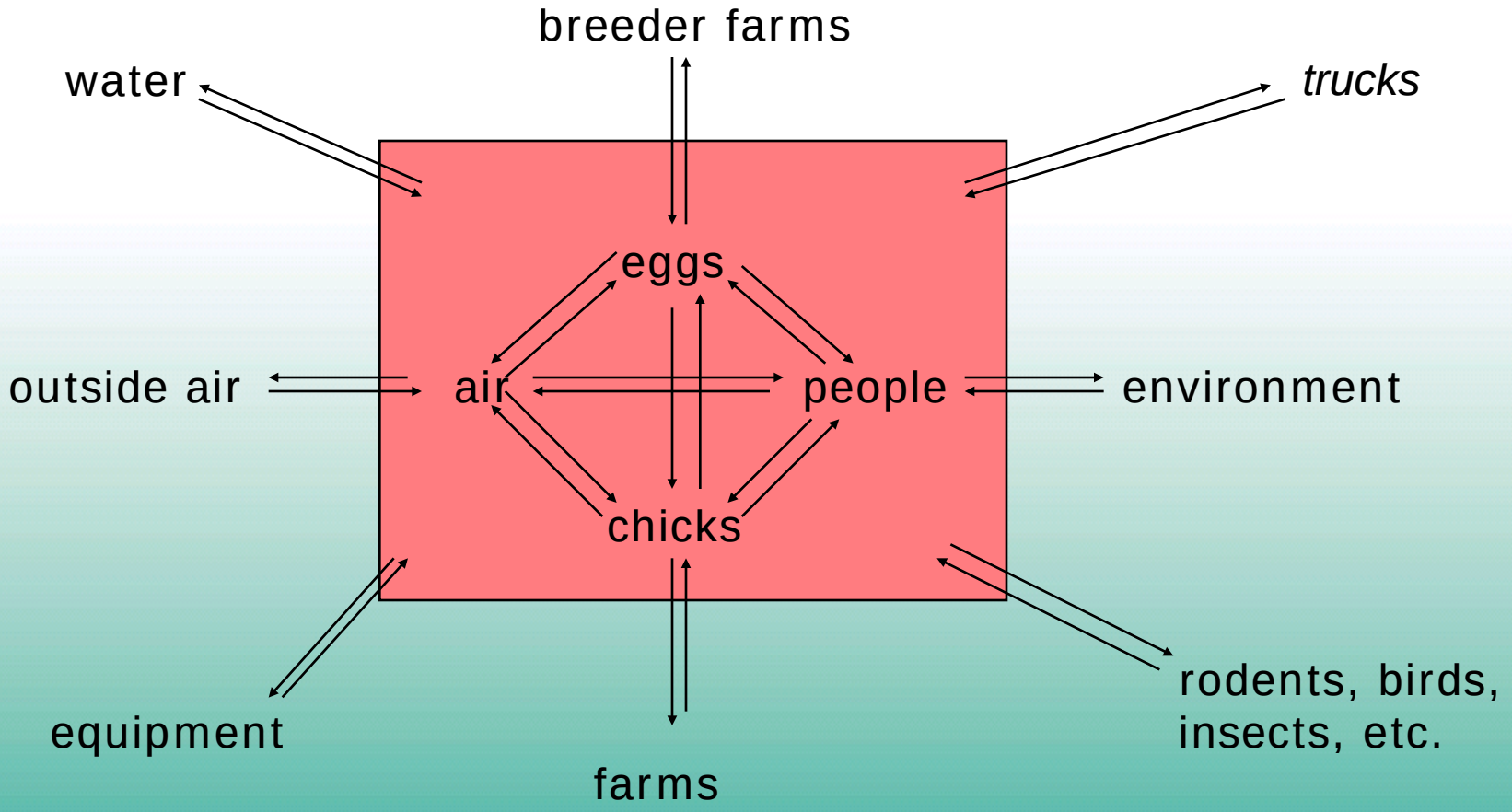
- External contamination through the pores and hairline cracks in the shell
- Vertical transmission (from infected flocks)
- Internal contamination (of yolk and albumen)

e.g. *Salmonella Enteritidis*



I. Introduction

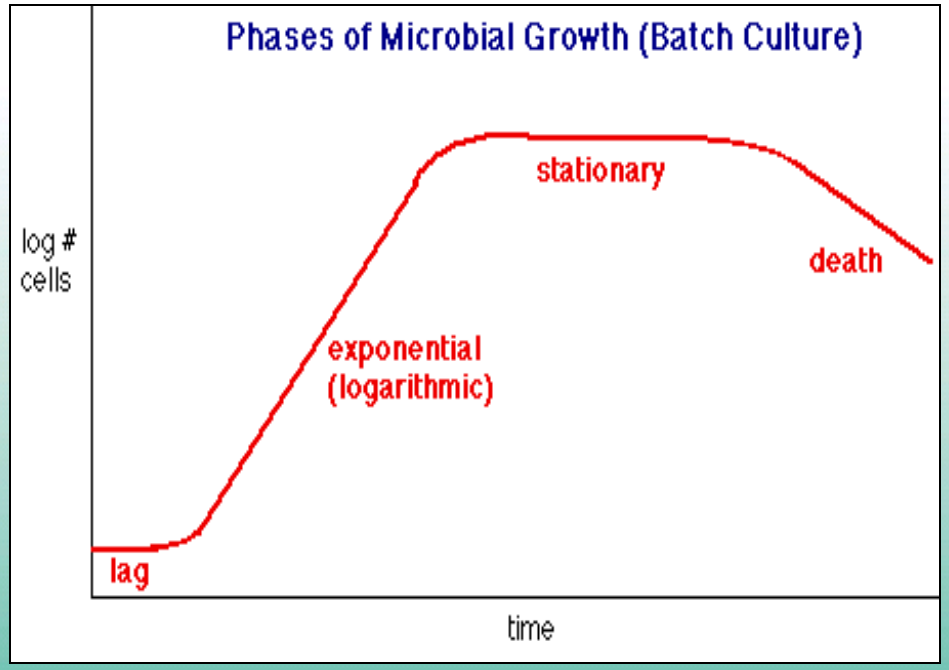
“ a hatchery is a bacterial time bomb” (Brian Hodgetts)

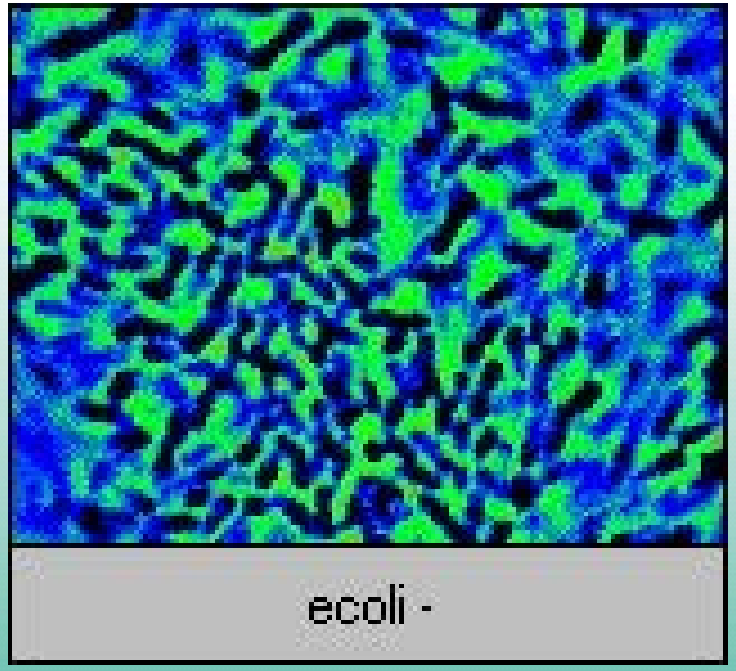


I. Introduction

The invisible enemy

- **Under optimal conditions a bacteria can divide every 20 minutes.**
- **In 24 hours (72 divisions) one bacteria can theoretically become 4,700,000,000,000,000,000,000,000 cells.**
- **The one bacteria goes from being invisible to the naked eye to a readily visible colony of bacteria cells.**





I. Introduction

Typical hatchery bacteria

E. coli

- faecal indicators (Coliforms, Salmonellae...), naturally present in faeces
- eggs with faecal contamination from hens
- faecal material from vermin, insects, wild birds (trolleys standing outside) and PEOPLE (hand hygiene, showers, no birds at home, ...)

I. Introduction

Typical hatchery bacteria : Pseudomonas

Pseudomonas

- cause bangers (by gas) and rots

  => importance of candling at early stage of incubation (7-10 days)

- can cause yolk sac infection
- are resistant to QAC

I. Introduction

Typical hatchery bacteria : Salmonella

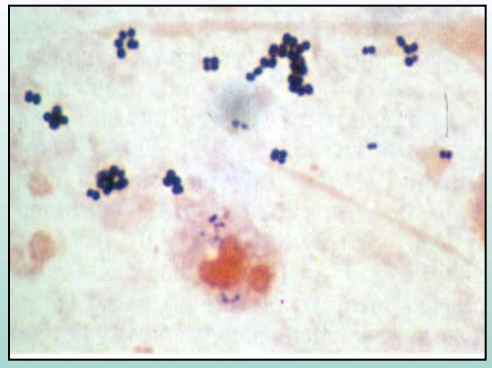
Salmonella

- Vertically transmitted (breeder flock) or by cross contamination (in hatchers, during pulling and chick processing) even through contaminated “exploders” ! Not always the same serotypes as breeders (Bailey, 2002).
- Process positive flocks at the end of hatch !
- Data from post mortem reports of chicks in 1st week of life !
- **Can survive in fluff for >4 years**
- E.U. zero tolerance (*S. enteritidis, S. typhimurium, S. hadar, S. infantis and S. virchow :* EU dir. 2160/2003)

I. Introduction

*Typical hatchery bacteria : **Staph**yloccocus*

Staphylococcus aureus



- Transmitted by the egg OR by the **staff** (eg infected wound, sneezing,not properly covered,…)

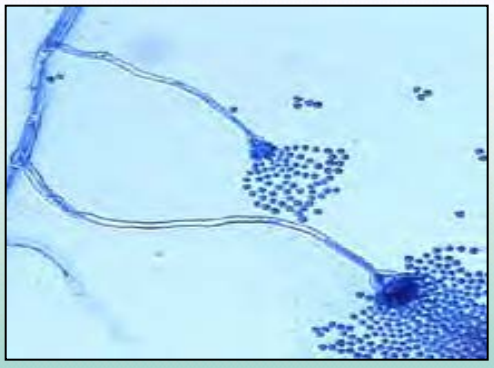
=> importance of **hand hygiene** : washing AND disinfecting with alcoholic liquid or gel that meet EN 1040 and EN 1500 standards

(Check with moisturised swabs on hands !)

I. Introduction

Typical hatchery fungus : Aspergillus

Aspergillus fumigatus



- esp. during hot, dry weather : **sporulation** and when humid : **growth** (*wet-dry-wet* cycles)
- *spore – mould – "bloom"* cycle : 2-3 days
- fungus not eliminated by QAC
- **spores** not affected by formaldehyde fumigation !
- ventilation systems, pad cooling, transfer and in-ovo vaccination equipment, …

I. Introduction

What happens when hatchery sanitation declines?

- Increase in **respiratory** bacterial and fungal diseases: aspergillosis, staphylococcus, pneumonia
- Increase in **navel and yolk sac infections**
- Bacterial conjunctivitis, esp. pseudomonas
- Huge **mortality** possible if vaccines become contaminated, almost 99% death
- First 5 day mortality generally goes back to the hatchery

➡ An unhappy customer!!

CONTENT

II. General Hatchery Hygiene

Employees & visitors

- The company provides:
  - Company clothes (working clothes and towels stay within the hatchery, washing with OMNIWASH)
  - Shoes
  - PPE (rubber gloves, mask, goggle, …)
  - Changing room with showers
- Hand hygiene
  - Wash with KENO® DERM (disinfecting hand soap)
  - Disinfect with KENO® SEPT L or G (liquid or gel alcoholic and CHX solution with glycerine)
  - Boot hygiene
  - Foot dip with 0,5% VIROCID® or KICKSTART

II. General Hatchery Hygiene

Minimizing hatchery contamination

Standing water anywhere in the hatchery is a Bacterial Breeding Ground:

➡ Important to maintain Spray Nozzles, Humidifiers, Foggers

II. General Hatchery Hygiene

Minimizing hatchery contamination

Table 2. Qualitative grading of hatchery fluff by quantitative bacterial count

Grading	*Total bacterial count/g*
Excellent	< 75,000
Good	" 150,000
Fair	" 300,000
Poor	" 500,000
Bad	> 500,000

II. General Hatchery Hygiene

Minimizing hatchery contamination

Table 1. Grading of hatchery equipment and air by total bacterial count (TBC)

Grading	*Bacterial colony count*		*Mould count*
	Machines	*Rooms*	
Excellent	0 - 10	0 - 15	0
Good	11 - 25	16 - 36	01 to 03
Average	26 - 46	37 - 57	04 - 06
Poor	47 - 66	58 - 76	07 - 10
Bad	67 - 86	77 - 96	10 - 12
Miserable	≥87	≥97	≥13

II. General Hatchery Hygiene

pH rotations of detergents

Alkaline cleaners may leave detergent residues on surfaces along with precipitated minerals. Biofilms may also form.

1) Rotate with **acid** tray wash and foamers for one week out of four to eight weeks, to remove residues, scale and mineral deposits and biofilms.

2) This pH shock is highly unfavorable for micro organisms ! (bacteria and virus prefer an alkaline environment)

CONTENT

III. Hatchery lay-out

Basic hatchery planning

- CLEAN ZONE

  Zone with low contamination risico (disinfected eggs)

- NEUTRAL ZONE

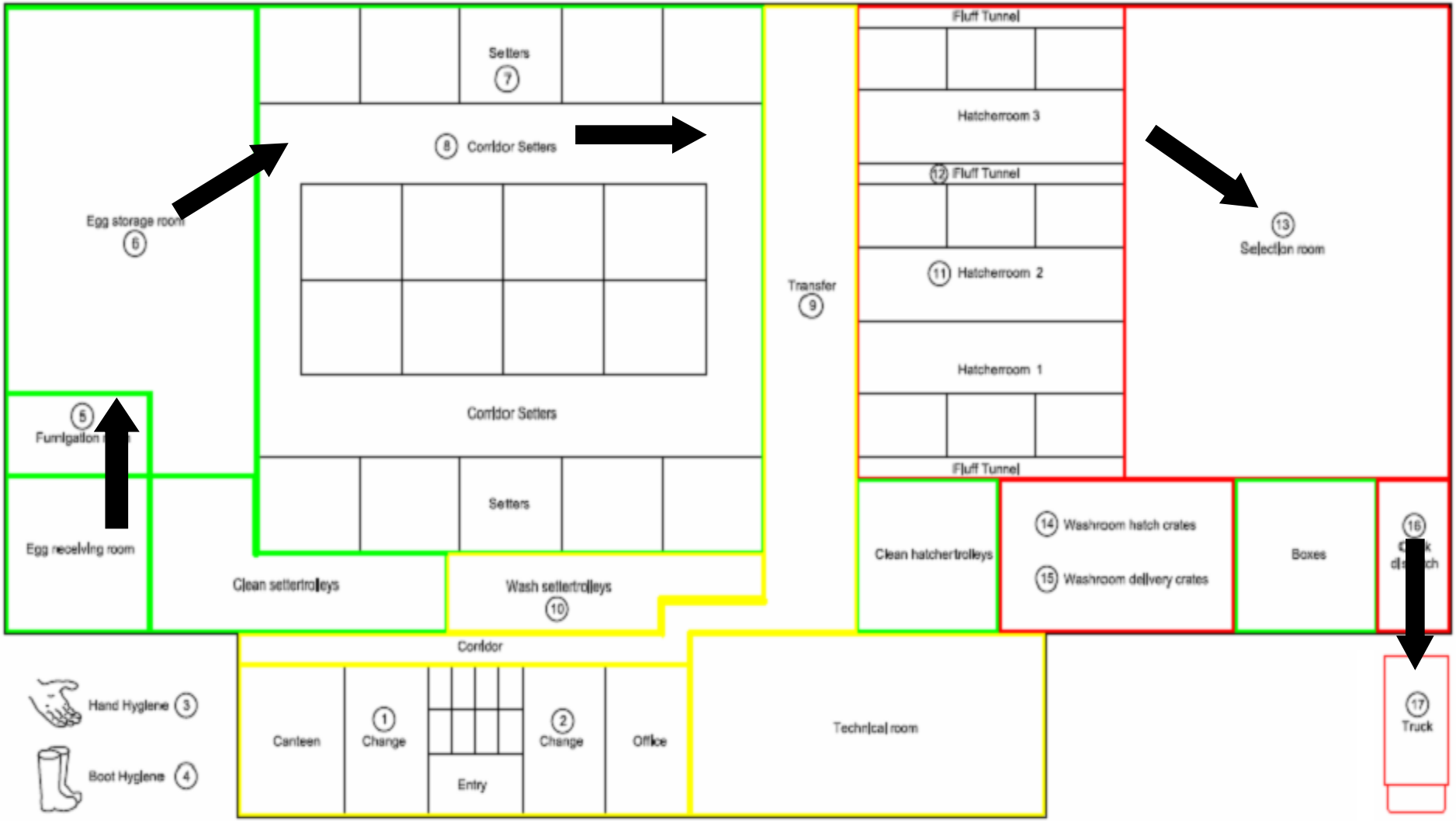
  Zone with intermediate contamination risico

- DIRTY ZONE

  Zone with high contamination risico (chicks = fluff, and dirty baskets)

III. Hatchery lay-out

Product flow



CONTENT

IV. C & D : Intro

dirt removing factors

- mechanical energy (broom, high pressure)
- thermical energy (°T)
- chemical energy pH (e.g. acids remove calcium, alkalines remove organic matter) in function of **concentration**, need minimum **contact time** !
- CONTACT TIME

IV. C & D : Intro

steps :

1. Dry clean (hatchers, plenums, trucks, ...)
2. Pre-rinse ?
3. Apply detergent and allow to soak 15-20 min
4. Rinse and LET DRY (1 mm water / m² = 1 litre / m² (40 sq ft = 1 gal) ; we only apply 250 – 300 ml disinfectant / m² ! => 300 % over dilution)
5. Disinfect (do NOT rinse)

CONTENT

V. Sanitation Program : eggs :

different alternatives to formaldehyde fumigation, T independent (formalin needs 20 C or 68 F)

12 ml **CID 2000**
+ 35 ml H2O / m3
20 min contact

CID 2000 @ 20-30 ml conc. / m3, 60 min contact time

Spray 200 ml **VIROCID** @ 1:400 / 100.000 eggs
°T : min 3 ° C > egg content

cold fog **VIROCID** 10 – 20 % saturate room

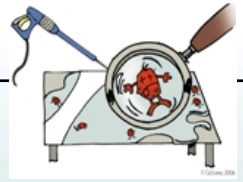
V. Sanitation Program

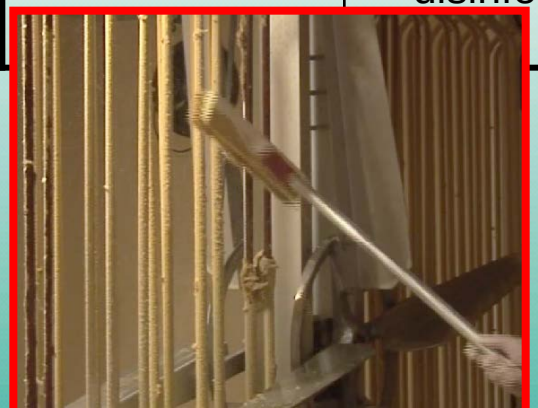
Egg fumigation

Application	Product	Frequency	Dosage	Contact time
	VIROCID® (broad spectrum disinfectant)	After egg delivery	0.2 L VIROCID® + 4 L water for 1000 m³	Minimum 15 minutes with recirculation

V. Sanitation Program

Hatchers

Application	Product	Frequency	Dosage	Contact time
Foaming  	BIOGEL (foaming alkaline detergent) Rotate with acid TORNAX-S	After every use	2-5%	15 - 30 minutes
	VIROCID® (broad spectrum disinfectant)	After every batch	0,5%	Minimum 15 minutes



First dry cleaning !

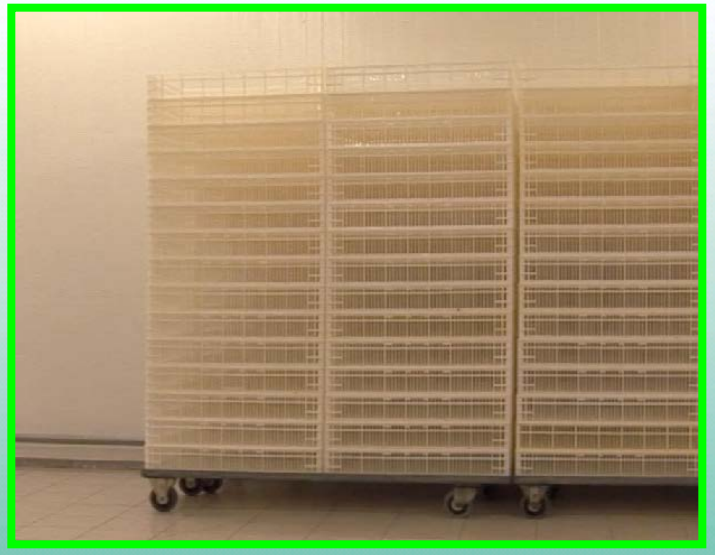
The foam (**gel**) detergent should get 15 - 20 min contact time, then rinse and <u>let dry</u> !

then ***foam*** disinfect : better visualization, longer contact time, less aerosols (MEL)

V. Sanitation Program

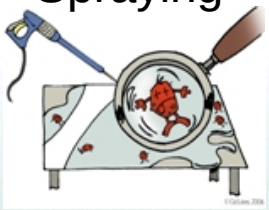
Crate washing

Application	Product	Frequency	Dosage	Temperature
	DM CID (non foaming, alkaline cleaner)	After every hatch	0,5 - 1%	50-60°C (120 – 140° F)
	Rotate with PHOCID (non foaming, acid detergent)	When necessary	0,5 - 1%	50-60°C (120 – 140° F)



V. Sanitation Program

Truck cleaning

Application	Product	Frequency	Dosage	Contact time
Foaming 	BIOSAFE (foaming alkaline detergent)	After every use	2-5%	15 - 30 minutes
Spraying 	VIROCID® (broad spectrum disinfectant)	After every batch	0,5%	Minimum 15 minutes

V. Sanitation Program

Critical control point: broken eggs

V. Sanitation Program

Critical control point: hatcher trays / baskets

V. Sanitation Program

Critical control point: fluff behind profiles

V. Sanitation Program

Critical control point: scale deposits on surfaces

V. Sanitation Program

Critical control point: scale deposits on walls

V. Sanitation Program

Critical control point: fluff in rubber strips from doors

V. Sanitation Program

Critical control point: fluff in ducts, outlets, ...

Conclusion :

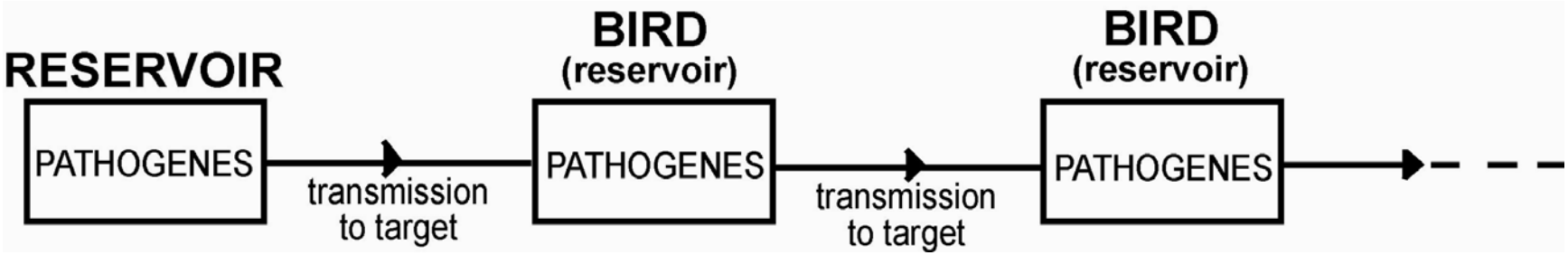
Sanitation Program : product range :

- 1 - 2 foaming (gel forming) alkaline detergents for eqpmt and trucks
- 1 foaming acid detergent for de-scaling incubators, eqpmt
- 1 non foaming alkaline detergent and 1 non foaming acid detergent for tunnel wash of trays and chick boxes
- 1 disinfectants for eggs, surfaces and foot dips
- 1 hand soap and 1 alcoholic hand disinfectant
- 1 shower gel / shampoo
- 1 laundry wash

TOTAL = 6 - 9 products for all sanitation

Take Home Message :

BIOSECURITY = *break the chain of infection* !



So, PREVENT rather than *cure*