Hatchery Talks

Formaldehyde-free hatching egg disinfection

Before we start …

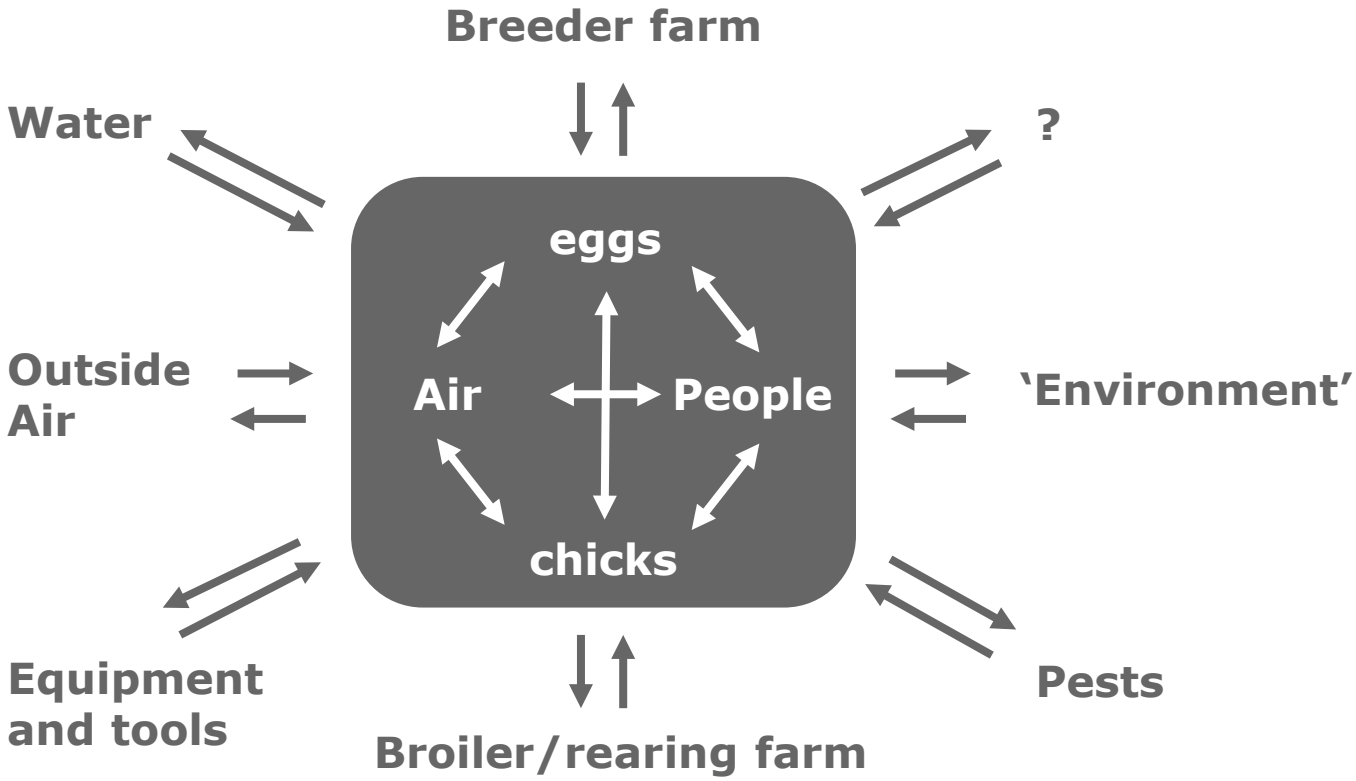
- Polls
- Questions in chat
- Webinar-replay + hand-out

Contents

Hatchery Talks

Introduction

Vector control for hatchery hygiene



Bacteria on egg shell

- **At time of laying: 300 – 500**
- **One hour later: 20,000 – 30,000**
- **Dirty egg: upto 80,000**
- **Typical contaminants:**
  - Micrococcus, Salmonella, Pseudomonas, E.coli
  - but also various types of moulds

Source: review by S. Cadirci, 2009

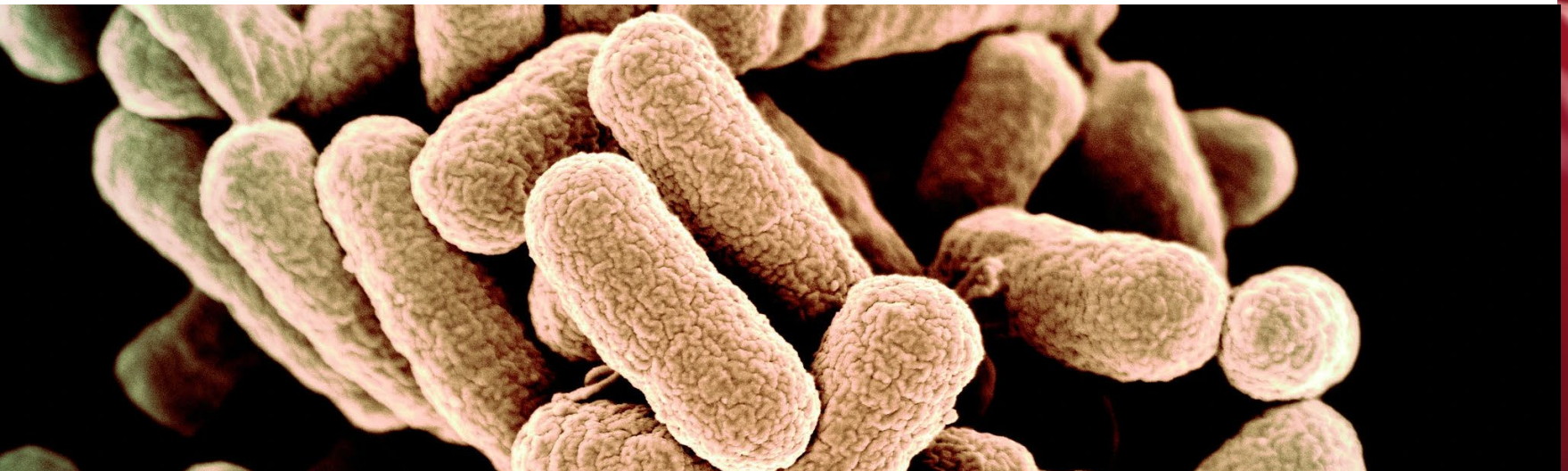
Hatching eggs

Hatching eggs → main source of pathogens

- Are you setting floor eggs?
- Do you accept dirty eggs?
- Do you check for hair line cracks?
- Are you preventing ‘egg sweating’?

Poll

Are you disinfecting hatching eggs prior to setting? When/Where?



Hatchery Talks

Hatching egg disinfection with formaldehyde

When/frequency?

- **Directly after egg collection**
- **At reception in the hatchery**
- **Just before placement in the setter**

- Avoid recontamination
- Never during first 4 days of incubation in case of formaldehyde!
- Too frequent within short time span affects hatchability

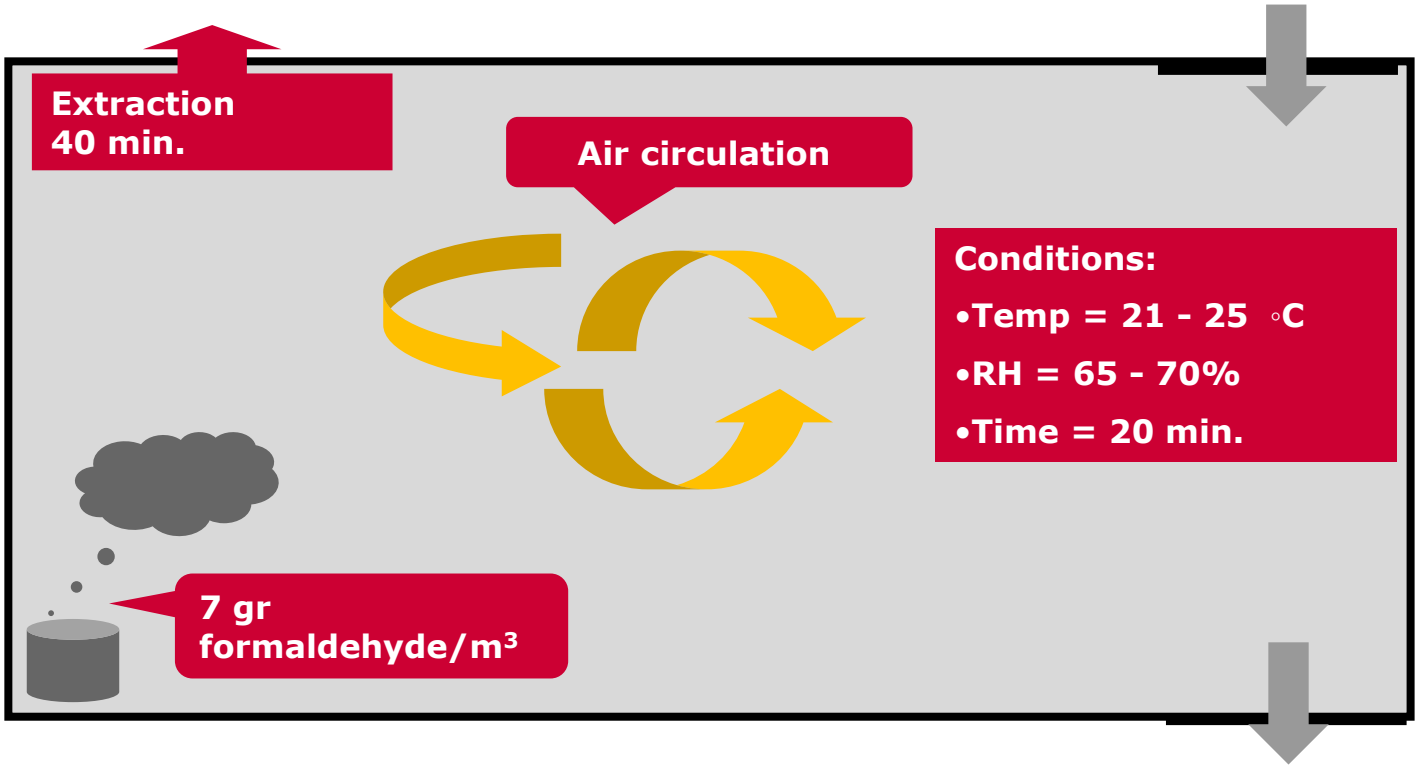
Desinfectant?

- **Paraformaldehyde commonly used**
- **Paraformaldehyde + H_2O = formalin (37 – 40 %)**
- **Application method:**
  - Per m^3: 7 gram formaldehyde in electric pan
  - Per m^3: 30 cc formalin poured on top of 20 gram $KMnO_4$

Hatching egg disinfection with formaldehyde

Fumigation procedure

Egg traying room



Setter room

Paraformaldehyde

Advantages	Disadvantages
Effective and no resistance	Unhealthy (carcinogenic)
Easy to apply	Unpleasant labour conditions
Not corrosive	Environmental hazard
Cheap	Legislation?

Formalin Neutralisation Unit

- For better labour conditions
- Per m^3: 15 ml ammonia (25%)
- Formalin +ammonia → Hexa Methylen Tetramine

Poll

Are you using paraformaldehyde for hatching egg disinfection?

If not, please let us know in the chat what else you are using

Hatchery Talks

Formaldehyde-free hatching egg disinfection

Alternative chemicals

Requirements

- Safe to use (people, material, environment)
- No negative effect on hatchability and chick quality
- Good disinfection results
- Easy to apply
- Reach entire surface
- Sufficient capacity
- Price?

Alternative chemicals

Examples (active components)

- Quaternary ammonium (+ glutaraldehyde)
- Peracetic acid + hydrogen peroxide (PAA + H_2O_2)
- Products based on organic fruit acids
- Electrolyzed Oxidizing Water (H_20+NaCl+electricity)
- (Ozon)
- (UV-light)
- (Novel products)
- …

Application method

How to get the liquid chemical on the egg?

- Unlike formaldehyde cannot be applied as gas
- Other options available:
  - Spraying
  - Fogging
  - (dipping/washing)
- Requires:
  - Good technology
  - Correct dosing

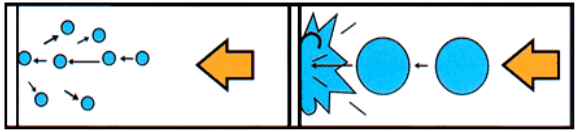
Spraying

Big droplets: tray-by-tray or trolley-by-trolley?

‘Cold’ fogging

Small droplets

Often (part of) droplets too big for good distribution



Formaldehyde-free hatching egg disinfection

Thermal and ultrasonic fogging

Very small droplets

Good distribution, however:

- Maintenance & reliability
- Not suitable for all disinfectants
- Capacity in relation to size fumigation room

Formaldehyde-free hatching egg disinfection

‘Dry’ fogging

Droplets 5 – 10 micron for optimal distribution

- room is filled with a ‘cloud’ → all eggs slightly damp
- works well in existing fumigation rooms

Procedure ‘dry’ fogging

Very small droplets: 5 – 10 micron

- Fogging device on compressed air
- Applicable in existing fumigation rooms
- Procedure max. 1 hour
  - 15 minutes fogging
  - 30 minutes contact time
  - 15 minutes extraction

Correct dosing

- **Water as carrier**
  - Enough to cover all eggs
  - Use more nozzles if it takes too long
- **Concentration depends on application method**
  - Spraying: 0.3 – 0.5 %
  - ‘Dry’ fogging: 5 – 33 %
- **Risk of bad dosage → measure precisely!**
  - Under-dosage: low killing rate
  - Over-dosage: risk for low hatchability
- **Monitor for left-overs and results**

Before calculating 'dry' fogging

Objectives:

1. 2 – 3 (max. 5) ml active ingredient /m^3
2. 15 – max. 30 ml liquid/m^3 (covering all eggs without excessively wetting them)
3. 15 minutes fogging time

Considerations:

- Lower concentration → need more ml liquid/m^3 → risk for overly wet eggs
- In case of quats better to use low concentration (and low dosage) to minimize risk of closing off the pores in eggshell

Calculation for ‘dry’ fogging

Assumption: ➡

30% H_2O_2

Dilute 30% before use ➡

Example:

- 700 ml water
- 300 ml product

Liquid 9% H_2O_2

(ready for ‘dry’ fogging)

Calculation for ‘dry’ fogging

Objective 1. Total liquid (15–30 ml/m^3)

Assume 30 ml

↓

Objective 2. Active ingredient (2–3 ml/3)

30 ml of 9% H_2O_2 = 2.7 ml

↓

Objective 3. Fogging time (15 minutes)

If 1 nozzle = 2.4 liters/hour (= 600 ml/15 minutes)
30 ml/m^3 = 600 ml/20 m^3 → use 1 nozzle/20 m^3

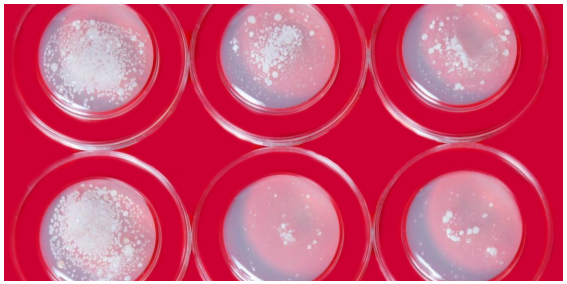
Formaldehyde-free hatching egg disinfection

Monitoring disinfection results

Before

Formaldehyde

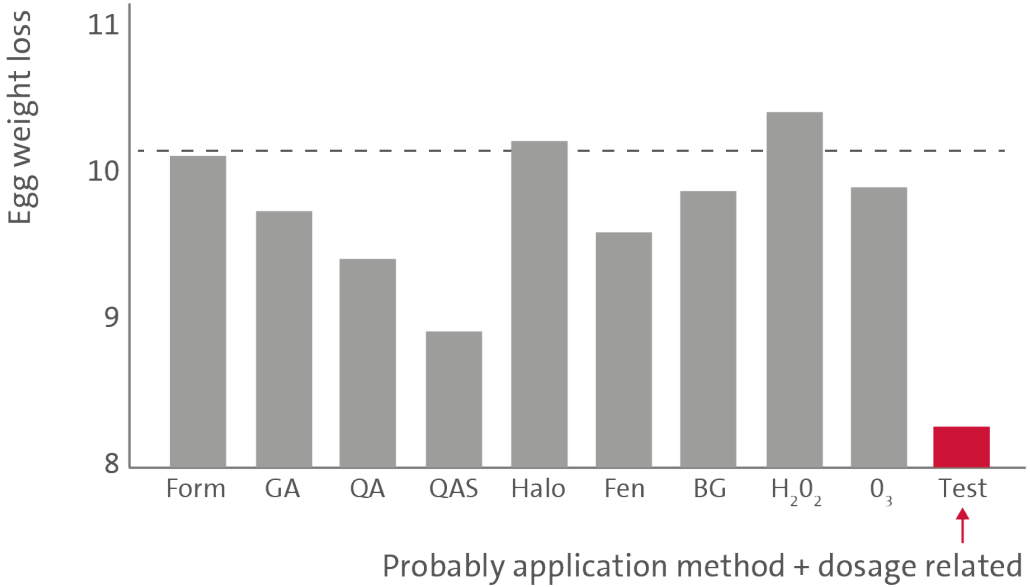
Product X



Monitoring disinfection results

Monitoring other effects

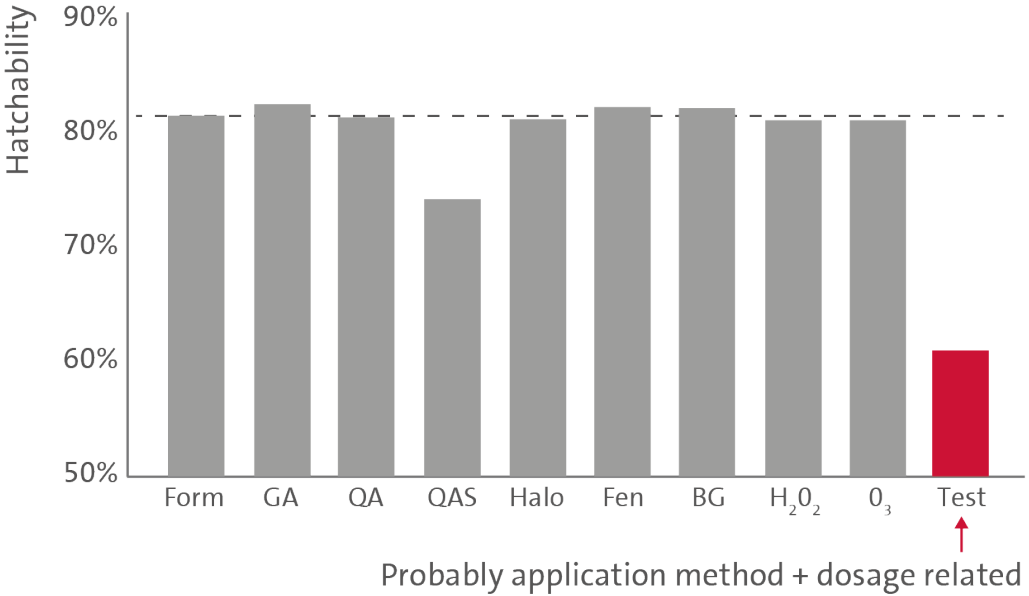
% weight loss 0 – 18 days after disinfection with different active components



Praktijkonderzoek Veehouderij; report 227

Monitoring other effects

Hatchability after disinfection with different active components



Praktijkonderzoek Veehouderij; report 227

Safety first!

- Read the label
- Understand the dangers
- Protect yourself

Hatchery Talks

Summary

Summary

- **Hatching egg disinfection is not the solution for poor egg hygiene!**

Summary

- **Hatching egg disinfection is not the solution for poor egg hygiene!**
- **There are alternatives to formaldehyde for hatching egg disinfection**

Summary

- **Hatching egg disinfection is not the solution for poor egg hygiene!**
- **There are alternatives to formaldehyde for hatching egg disinfection**
- **These need to be applied properly**

Summary

- Hatching egg disinfection is not the solution for poor egg hygiene!
- There are alternatives to formaldehyde for hatching egg disinfection
- These need to be applied properly
- Monitor the effects

Summary

Thanks for watching!

- **Webinar-replay + hand-out**
- **Knowledge section at our website**

See you at our next webinar!

Royal Pas Reform

Pas Reform

@Pasreform

Royal Pas Reform

@Pasreform

Flickr.com/pasreform

Youtube.com/pasreformbv