Cleaning & Disinfection of Poultry Farm

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Objectives

By the end of this session, participants will be able to:

- Define farm decontamination - cleaning and disinfection and explain what each accomplishes
- Describe different groups of disinfectants
- Describe the safe use of disinfectants and explain the importance of PPE during cleaning and disinfection
- Review the information on a disinfectant

  by reading and interpretation of a products' label

Cleaning and Disinfection = Decontamination

- Cleaning and disinfection are key components of routine biosecurity in poultry farming

- Decontamination kills any disease organisms like:

  virus

  bacteria

  parasite

  mold

  that might be present on a farm at the end of a production cycle or after disease outbreak

- Decontamination allows for safe re-population of a farm

Exercise:

- The questions!

1. What is a poultry farm cleaning and how its done ?
2. What is a poultry farm disinfection and how its done?
3. How do you choose a disinfectant?
4. What are risks involved in using disinfectants and how to avoid them?

- In your group discuss what do you know about the question
- Record your key points on the flipchart
- Be prepared to present your answer to the group
- Take about 10 minutes to complete this task

Survival of disease causing agents in the environment

Disease agent	Survival time
• Avian influenza	Days to months
• IBD (Gumboro)	Months
• Coccidiosis	Months
• Fowl Cholera	Weeks
• Coryza	Hours to days
• Marek's Disease	Months to years
• Newcastle Disease	Days to months
• Mycoplasma	Hours to days
• Salmonellosis (Pullorum)	Weeks

What can kill disease agents?

- Detergents / soap
- Disinfectants
- Sunlight
- Heat (direct flame or steam)

Cleaning

The physical removal of foreign materials like:

- dust
- soil
- organic material such as: droppings, blood, secretions

which protect disease agents

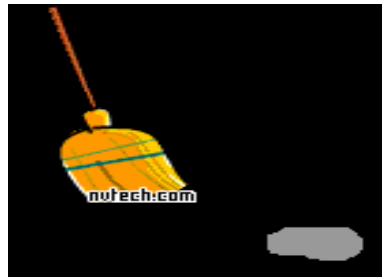
Remember!

A good cleaning job will remove 80% of disease agents

Cleaning - is a two-step process

step 1. Dry cleaning

- Using a broom, brush, shovel, rag or compressed air to remove dust, soil and dry organic material



Remember!

Dry cleaning should not be used for cleaning poultry houses infected with air-born diseases such as: Avian Influenza or Newcastle it may cause aerosolization of the virus and increase the risk of spreading the disease

step 2. Wet cleaning

- Using detergent/soap and water

  soak the area and scrub to remove remaining organic material as well as dirt and grease

- For washing you can use common detergent powder sold for cloth laundering – is cheap and effective

Wet cleaning reduces the risk of aerosolization of virus

Cleaning is improved with:

- Detergents / Soaps
- Warm water
- Scrubbing
- Brushing
- Power washers
- Steamers

Remember!

- Disinfectants lose effectiveness during contact with disease agents
- Organic materials such as manure, blood, dust or dirt absorb disinfectants and makes them less effective
- Organic materials protect disease agents

You must CLEAN properly before you disinfect!

Disinfection

- Disinfection might kill the remaining disease agents left after cleaning

- Disinfection is the least reliable step of biosecurity, depends on many factors such as:
  - the quality of cleaning
  - the hardness of water
  - quality and suitability of disinfectant
  - correct dilution and application

What are Disinfectants?

Disinfectants are chemicals that

- Slow disease agents activity, multiplication and their growth

or

- Kill disease agents

Common types of disinfectants

- Disinfectants are divided into several groups based on their chemical structure

Like:

- Halogens (iodophors and chlorines, halamid®, dettol®)
- Alcohols
- Oxidizing agents (hydrogen-peroxide, hyperox®, virkon®)
- Phenols (fenix®, Prophyl 75®)
- Aldehydes (glutheraldhyde – TH4®, formalin)
- Quaternary ammonium compound (Timsen® Medisep®)

Choosing the Right Disinfectant

The choice of disinfectant will depend on the following:

- Cost
- Type of disease agent/s to be destroyed
- Amount of contamination by organic matters such as: droppings, blood and manure left in the poultry house
- Active ingredient
  the chemical compound and concentration that its contained

Cont

Characteristics of Selected Disinfectants

Disinfectant Category	Alcohols	Aldehydes	Biguanides	Halogens: Hypochlorites	Halogens: Iodine Compounds	Oxidizing Agents	Phenols	Quaternary Ammonium Compounds (QAC)
Sample Trade Names	Ethyl alcohol Isopropyl alcohol	Formaldehyde Glutaraldehyde	Chlorhexidine Nolvasan® Virosan®	Bleach	Betadyne® Providone®	Hydrogen peroxide Peracetic acid Virkon S® Oxy-Sept 333®	One-Stroke Environ® Pheno-Tek II® Tek-Trol®	Roccal® DiQuat® D-256®
Mechanism of Action	•Precipitates proteins •Denatures lipids	•Denatures proteins •Alkylates nucleic acids	•Alters membrane permeability	•Denatures proteins	•Denatures proteins	•Denature proteins and lipids	• Denatures proteins • Alters cell wall permeability	• Denatures proteins • Binds phospholipids of cell membrane
Advantages	•Fast acting •Leaves no residue	•Broad spectrum	•Broad spectrum	•Broad spectrum •Short contact time •Inexpensive	•Stable in storage •Relatively safe	•Broad spectrum	• Good efficacy with organic material • Non-corrosive • Stable in storage	• Stable in storage • Non-irritating to skin • Effective at high temperatures and high pH (9-10)
Disadvantages	•Rapid evaporation •Flammable	•Carcinogenic •Mucous membranes and tissue irritation •Only use in well ventilated areas	•Only functions in limited pH range (5–7) •Toxic to fish (environmental concern)	•Inactivated by sunlight •Requires frequent application •Corrodes metals •Mucous membrane and tissue irritation	•Inactivated by QACs •Requires frequent application •Corrosive •Stains clothes and treated surfaces	•Damaging to some metals	• Can cause skin and eye irritation	
Precautions	Flammable	Carcinogenic		Never mix with acids; toxic chlorine gas will be released			May be toxic to animals, especially cats and pigs	
Vegetative Bacteria	Effective	Effective	Effective	Effective	Effective	Effective	Effective	YES—Gram Positive Limited—Gram Negative
Mycobacteria	Effective	Effective	Variable	Effective	Limited	Effective	Variable	Variable
Enveloped Viruses	Effective	Effective	Limited	Effective	Effective	Effective	Effective	Variable
Non-enveloped Viruses	Variable	Effective	Limited	Effective	Limited	Effective	Variable	Not Effective
Spores	Not Effective	Effective	Not Effective	Variable	Limited	Variable	Not Effective	Not Effective
Fungi	Effective	Effective	Limited	Effective	Effective	Variable	Variable	Variable
Efficacy with Organic Matter	Reduced	Reduced	?	Rapidly reduced	Rapidly reduced	Variable	Effective	Inactivated
Efficacy with Hard Water	?	Reduced	?	Effective	?	?	Effective	Inactivated
Efficacy with Soap/ Detergents	?	Reduced	Inactivated	Inactivated	Effective	?	Effective	Inactivated

Reading the label of disinfectants

- Before using any disinfectant the label MUST be red and understood.

- The label gives you valuable information.

POISON

KEEP OUT OF REACH OF CHILDREN

READ SAFETY DIRECTIONS BEFORE OPENING OR USING

CHEMETALL PARAFORMALDEHYDE

DISINFECTANT

ACTIVE CONSTITUENT: 900 g/kg FORMALDEHYDE

For disinfecting poultry houses.

DIRECTIONS FOR USE:

This product should be only used by licensed Pest Control Operators (PCO), technicians or other persons who are appropriately trained or experienced in the use and handling of formaldehyde based preparations for fumigation purposes within the poultry and egg related industries. All users must be aware of, and fully understand the Australian Chicken Meat Federation, Formaldehyde Guidelines for Safe Working Practices (1995).

SITUATION	RATE
Disinfection of incubators at hatcheries, on-farm egg fumigation. Setters, when eggs placed in hatchers or when eggs transferred. Trickle fumigation in hatchers	Heat Paraformaldehyde prills. Incubators: use 10g Paraformaldehyde / m^3air space. Buildings: use 360g Paraformaldehyde / $100m^3$ air space.
Terminal Disinfection of poultry housing including broiler, rearing and breeder sheds.	Paraformaldehyde prills: apply 10grams per nest box every 1–2 weeks.

CRITICAL USE COMMENTS: Use only heat resistant polyethylene pans.

In the fumigation of egg hatcheries the technician must calculate the correct dose of the product to achieve a concentration within the range of 10-15g formaldehyde/m^3

NOT TO BE USED FOR ANY PURPOSE, OR IN ANY MANNER, CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION.

RE-ENTRY: Wear cotton overalls buttoned to the neck and wrist, elbow length PVC gloves, goggles and a half facepiece respirator with canister specified formaldehyde when entering the fumigated sheds prior to and during ventilation.

PRECAUTION: Close shed doors and ventilation shutters during fumigation. Sheds should be ventilated only when formaldehyde concentration in the air (in sheds) falls below 1 ppm, as measured with a suitable detector tube.

PROTECTION OF LIVESTOCK

Before use: Remove animals, remove or cover all feed troughs, and any other equipment.

After use: Wait until formaldehyde concentration falls below 1 ppm, then thoroughly ventilate treated area. Clean up thoroughly before allowing re-entry of animals.

STORAGE AND DISPOSAL

Store below 30°C (room temperature). Keep containers well sealed when not in use. Store in well ventilated areas out of direct sunlight where temperatures do not fluctuate. Preferably store between 20 - 25°C. DO NOT store below 5°C.

Shake bag contents onto pan until the bag is empty. Do not dispose of chemical on site. Puncture or shred and bury empty bags in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty bags and product should not be burnt.

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FIRST AID

If poisoning occurs, contact a doctor or Poisons Information Centre (phone 13 1126). If swallowed, do NOT induce vomiting. Give water or milk, then raw egg. If skin contact occurs remove contaminated clothing and wash skin thoroughly. If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor.

MSDS

Additional information is listed in the Material Safety Data Sheet which can be obtained from the supplier.

SHIPPING NAME: **PARAFORMALDEHYDE**

CLASS: 4.1 UN No. 2213 PG III HAZCHEM 1Z

In a Transport Emergency contact Police or Fire Brigade DIAL 000

For Specialist advice telephone 03 9625 0722 (24 Hours)

Chemetall

Chemetall (Australasia) Pty Ltd

17 Turbo Drive, Bayswater North, VIC 3153 Australia

Telephone: 03 9729 6253 Fax: 03 9720 1711

Contents 25 Kg

BATCH No.

D.O.M. Expiry

APVMA APPROVAL NUMBER: 61655/25kg/0307

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CAUTION or WARNING - Slightly toxic = S5

POISON - Highly toxic = S6

DANGEROUS POISON - Extremely toxic = S7

Active Ingredient

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SITUATION	RATE
Disinfection of incubators at hatcheries, on-farm egg fumigation. Setters, when eggs placed in hatchers or when eggs transferred. Trickle fumigation in hatchers	Heat Paraformaldehyde prills. Incubators: use 10g Paraformaldehyde / m^3 air space. Buildings: use 360g Paraformaldehyde / 100m^3 air space.
Terminal Disinfection of poultry housing including broiler, rearing and breeder sheds.	Paraformaldehyde prills: apply 10grams per nest box every 1–3 weeks.

CRITICAL USE COMMENTS: Use only heat resistant polyethylene pans.
In the fumigation of egg hatcheries the technician must calculate the correct dose of the product to achieve a concentration within the range of 10-15g formaldehyde/m^3.
NOT TO BE USED FOR ANY PURPOSE, OR IN ANY MANNER, CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION.

RE-ENTRY: Wear cotton overalls buttoned to the neck and wrist, elbow length PVC gloves, goggles and a half facepiece respirator with canister specified formaldehyde when entering the fumigated sheds prior to and during ventilation.

PRECAUTION: Close shed doors and ventilation shutters during fumigation. Sheds should be ventilated only when formaldehyde concentration in the air (in sheds) falls below 1 ppm, as measured with a suitable detector tube.

PROTECTION OF LIVESTOCK
Before use: Remove animals, remove or cover all feed troughs, and any other equipment.
After use: Wait until formaldehyde concentration falls below 1 ppm, then thoroughly ventilate treated area. Clean up thoroughly before allowing re-entry of animals.

STORAGE AND DISPOSAL
Store below 30°C (room temperature). Keep containers well sealed when not in use. Store in well ventilated areas out of direct sunlight where temperatures do not fluctuate. Preferably store between 20 - 25°C. DO NOT store below 5°C.
Shake bag contents onto pan until the bag is empty. Do not dispose of chemical on site. Puncture or shred and bury empty bags in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty bags and product should not be burnt.

SAFETY DIRECTIONS
Poisonous if absorbed by skin contact, inhaled or swallowed. Attacks the eyes. The fumes first cause smarting, then watering of the eyes. This should be taken as a warning sign. Will irritate the nose and throat and skin. Repeated exposure may cause allergic disorders. Sensitive workers should use protective clothing. Avoid contact with the eyes and skin and clothing. Do not inhale vapour or spray mist. When opening the container and using the product wear cotton overalls buttoned to the neck and wrist and a washable hat, elbow-length PVC gloves, goggles and half facepiece respirator with canister specified for formaldehyde. If product on skin, immediately wash area with soap and water. If product in eyes, wash it out immediately with water. Wash hands after use. After each day's use, wash gloves, goggles, contaminated clothing and respirator and if rubber, wash with detergent and warm water.

FIRST AID
If poisoning occurs, contact a doctor or Poisons Information Centre (phone 13 1126). If swallowed, do NOT induce vomiting. Give water or milk, then raw egg. If skin contact occurs remove contaminated clothing and wash skin thoroughly. If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor.

MSDS
Additional information is listed in the Material Safety Data Sheet which can be obtained from the supplier.

SHIPPING NAME: PARAFORMALDEHYDE
CLASS: 4.1 UN No. 2213 PG III HAZCHEM 1Z
In a Transport Emergency contact Police or Fire Brigade DIAL 000
For Specialist advice telephone 03 9625 0722 (24 Hours)

Chemetall

Chemetall (Australasia) Pty Ltd
17 Turbo Drive, Bayswater North, VIC 3153 Australia
Telephone: 03 9729 6253 Fax: 03 9720 1711

Contents 25 Kg
BATCH No.
D.O.M. Expiry
APVMA APPROVAL NUMBER: 61655/25kg/0307

First Aid

For additional information look at – www.MSDS.com

Reading the Label

- Look at the labels provided
  Complete the questions

Product Name	Active ingredient	Rate of Mixing	Toxicity Level
1			
2			
3			

Disinfectants are Dangerous !

- Disinfectants are dangerous chemicals = poisons

- We have to be careful when we use disinfectants

Disinfectants might cause poisoning:

  - Acute (fast) toxicity with certain disinfectants may cause: dizziness, nausea and itchy eyes or skin

  - Chronic (slow) toxicity may occur gradually over many years, may cause: permanent disability because the body has become very sensitive

How dangerous a disinfectant is?

Depends on:

- The type of substance and what it is made of
- The speed and the way it enters the body
- The amount of substance that enters the body

Absorption rate

Scalp = 3.7

Forehead = 4.2

Ear = 5.4

Eyes = 12

Nose = 6

Palm = 1.3

Arm = 1

Abdomen = 2

Feet = 2

Groin = 11

A splash in the eyes is absorbed **12 times** faster than a splash on the arm

Poisoning

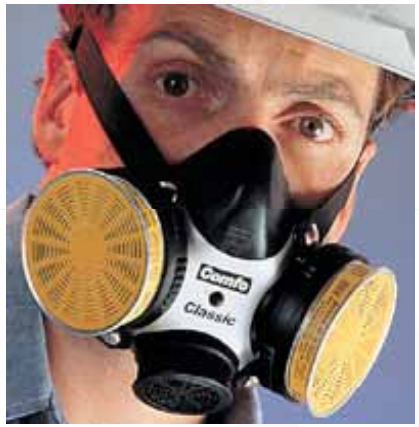
Chemicals can enter your body through 3 ways:

1. through the lungs when breathing or smoking
2. through the mouth when eating and drinking
3. through the skin and eyes

Remember!

When handling chemicals you need to make sure you wear the right clothes and equipment for your protection

Protect your Mouth and Lungs



Breathing in disinfectant vapors or spray particles

- The main danger exist when:
  - Mixing chemicals
  - Spraying in confined spaces
  - Using fumigants such as formaldehyde or chlorine

- Accidental drinking of chemical by drinking (by children)

Wear respirators

- If the label states a respirator to be worn then **TOXIC** vapors will be released.

- You must use a full face or half face respirator fitted with appropriate filters

Remember!

Dust or biological masks are not designed to filter chemical's spray droplets and vapors

Eye Protection

- Contamination of the eyes can result from:
  - drift, splash or spill of chemicals
  - rubbing eyes with contaminated hands or clothing

- Chemical absorbed through the eye very rapidly

- Always wear eye protection when handling or spraying chemicals

Use: goggles or face shield

Skin Absorption

- Absorption is highest when temperature is hot and skin is perspiring (hot season)

- Longer chemicals are in contact with skin, the more chemical is absorbed

  Don’t wait! wash your skin with soap and plenty of water immediately

- Clothing which has been sprayed must be removed as soon as possible and washed with soap and water

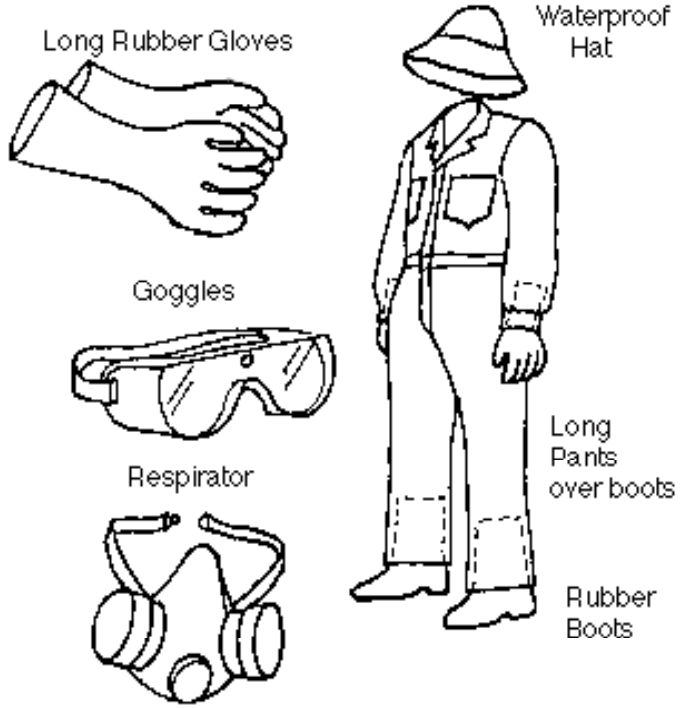
Protect Hands and Arms

- Gloves that cover the forearms are the best
- Make sure they are resistant to chemicals -PVC
- Turn base of glove over when spraying overhead

Body Protection

- Overalls and gloves
- Wide brim hat
- Rubber boots

NO



Aprons for Extra Protection

- PVC or neoprene aprons extending from neck to ground give excellent front protection from spills and splashes
- Easy to put on and wash
- Use when mixing chemicals

Remember!

- Always wash your hands and face with soap after spraying disinfectant
- Never eat or smoke when spraying disinfectant

Exercise

Identifying safety breaches

In a moment, we will show you pictures of disinfection process

- List any chemical handling problems you can see
- How many problems have you identified?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Quiz

1. Organic matter increases the effect of disinfectants

   true or false

2. How would you define Decontamination?

3. Name 3 essential pieces of protective clothing to be used when spraying disinfectant.

4. Under what (3) conditions can chemical vapors, dusts or spray particles be inhaled to cause poisoning?

What do you think ?

1. What are the 3 key points you want to remember from this module?

2. What additional information do you need on this module?

Acknowledgment:
This presentation was developed in collaboration with Mr. A. Almond