Calculations & Application of disinfectants

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Objectives

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

- Calculate correctly: - the area to be disinfected,
  - the amount of water required
  - the amount of disinfectant required
- Describe the steps for poultry house cleaning and disinfection

Effective Disinfection

Concentration & Contact time

Therefore the correct calculation of the amount of disinfectant and water required for the spraying solution is extremely important

Calculations

- How much disinfectant do I need?

You need to calculate:

1. Area to be disinfected - in square meter (m^2)
2. Quantity of mixed solution required
   (based on average of 300ml (0.3 liters) per $1m^2$
3. The correct dilution rate (%), according to manufacturer recommendations
   (how much disinfectant and how much water)

Calculations

How much disinfectant do I need?

using Virkon® powder as an example

1. Calculating the area to be disinfected (in square meter)

What is the total area to be sprayed?
including all walls, floor and ceiling

- **Step 1** calculate the floor area
  How long (m) X How wide (m) = floor area in m^2

- **Step 2** calculate the room area (including all walls, floor and ceiling)
  Floor area x 2.5 = total area to be sprayed in m^2

Please calculate

- If a room is 4 metre long and 3 metre wide
- What is the total room area to be sprayed?

- 4m x 3m x 2.5 = 30m²

2. Calculating the quantity of mixed solution required (how much water + disinfectant)

- If we need to apply 300mls (0.3 liters) of mixed solution for every square meter (m^2) of surface

See product label →

Application
Using a pressure washer or other mechanical sprayer, apply Virkon® S solution at an application rate of 300ml/m^2
Spray all equipment with Virkon® S solution at an application rate of 300ml/m^2

Room area x 300mls (0.3 liters) = Quantity of mixed solution required

Please calculate

- If a room is 4 metres long and 3 metres wide
- What is the total room area to spray?
- How much mixed solution (in litres) is required to spray the room?

$4m \times 3m \times 2.5 = 30m^2 \times 0.3L = 9L$

3. Calculating disinfectant dilution rate

- Look at Virkon® label for the recommended dilution rate

INSTRUCTIONS FOR USE

Use	Dilution Rate	Application
Routine disinfection for all surfaces, earth, wood and concrete	1:100 (1%)	Using a pressure washer or other mechanical sprayer, apply Virkon® S solution at an application rate of 300ml/m²
Routine cleaning and disinfection of movable equipment	1:100 (1%)	Spray all equipment with Virkon® S solution at an application rate of 300ml/m²

1% dilution = add 1 gr of Virkon® in every 100ml of water

OR

10 grams Virkon® in every liter of water

Dilution Rate

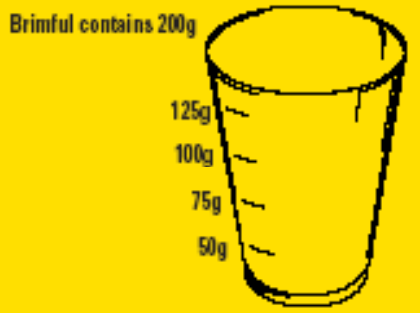
- If we are to spray 10 liters of solution how many grams of Virkon® are required?

- If we are to spray 100 liters of solution, how many grams are now required?

VIRKON® S DILUTION CHART

Surface area to be disinfected	Dilution Rate			
	1:100 (1%)	1:2[illegible] (0.5%)	UK DEFRA Diseases of Poultry Orders 1:280	UK DEFRA General Orders 1:120
	Quantity Virkon® S to be added			
10 litres	100g	50g	36g	83g
20 litres	200g	100g	72g	166g
50 litres	500g	250g	180g	417g
100 litres	1kg	500g	360g	833g
200 litres	2kg	1kg	720g	1.66kg

1. Decide on the volume of disinfectant solution required at the appropriated dilution rate.
2. Measure out the appropriate quantity of Virkon® S powder to achieve the desired dilution rate using the measuring pot provided.
3. Add the Virkon® S powder to the water and stir thoroughly to dissolve.



Please calculate

- If a room is 4 metres long and 3 metres wide
- What is the total room area to spray?
- How much mixed solution (in litres) is required to spray the room?
- How many grams of Virkon® are required?

$4m \times 3m \times 2.5 = 30m^2 \times 0.3L = 9L \times 1\% = 90gr$

Exercise

A poultry house is 40 m long and 10m wide
Virkon® powder is required for disinfection at 1% dilution

How many grams of Virkon® powder are required?

Answer:

Floor area X 2.5 = Total Area = 400 m^2 X 2.5 = 1000m^2

1000 x 0.3 = 300 liters of mixed solution to spray the room

300 liters at 1% dilution rate = 3000 grams (3KG) Virkon®

Mixing rate at different concentrations

1 : 50	2%	20 gr or ml / Lit
1 :100	1 %	10 gr or ml / Lit
1 :150	0.75 %	7.5 gr or ml / Lit
1 : 200	0.5 %	5 gr or ml / Lit
1 : 250	0.4 %	4 gr or ml / Lit
1 : 300	0.33 %	3.3 gr or ml / Lit
1 : 350	0,28 %	2.8 gr or ml / Lit
1 : 400	0.25%	2.5 gr or ml / Lit

Important message

When preparing a disinfectant solution

mix the required amount of disinfectant solution into a small 10 or 20 liters bucket.

How to prepare:

1. Add water first
2. Then add disinfectant
3. Add contents of bucket into the sprayer

Disinfection is improved with:

Sprayers of high volume output

- Motorized knapsack or pressure sprayer
- Adding small amount of detergent into the disinfectant solution (increases contact time)

Steps in Cleaning and Disinfection of Commercial Poultry House

Steps to take before you start:

1. Check electric power is turned off
2. Check all cleaning and spraying equipment is ready for use
3. Ensure the availability of detergent and disinfectants at the required quantities
4. Ensure correct safety gear (PPE) is available
5. Ensure no poultry, animals or people present in the poultry house area during cleaning and disinfection

Step 1

- Remove and dispose all remained birds from the house

Step 2

- Spray insecticide against darkling beetles, lice and mites

  (darkling beetles are carriers of numerous poultry diseases and should be controlled)

Step 3

- Clean out old feed from bins, hoppers and feeder troughs. (lumpy feed can be high in mould).

Step 4

- Take out all movable equipment such as; drinkers, feeders, hoppers, nest boxes
  - Wash down with detergent and rinse
  - Leave equipment in the sun for at least 24 hours
  - When dry, apply disinfectant

Remember!

Dirty equipment returned to the house, destroys the benefit of cleaning!

Step 5 - Dry cleaning

- Remove cobwebs and dust, from rafters and sills, blinds and fan shafts.
- Use brushes, brooms or high pressure air to allow dirt to fall onto litter.
- Chip of any adhering material from equipment

Note

Don’t use high pressure air if the poultry house is contaminated with avian influenza or other pathogenic viruses to avoid the spread of virus or infect humans

Step 6 – Wet cleaning

- Hose down with detergent to remove organic matter
  use high pressure hose
  starting at the roof
  then walls, close curtains for cleaning

Step 7

- Remove all old manure and litter and safely dispose to ensure no disease spread
- Sweep the floor
- Clean exists and openings, remove spilled feed and litter and all rubbish around poultry houses (including old feathers)

Step 8

Prepare the disinfectant solution, according to manufacturer recommendations

- Start spraying at the ceiling and then spray walls/curtains and finish with the floor.
- Check that ledges, fan boxes, pipes, fogging lines are thoroughly sprayed.

Step 9 - Sanitising water system

- Drain drinkers (bell drinkers pull apart) and scrub to remove scale and dirt (biofilm).
- Drain water points or lines
- Flush out with clean water
- Scrub header tanks to remove scale and algae
- Fill header tanks to normal level and add disinfectant to appropriate strength
- Run mixed water through drinkers and drinker lines then close off tap
- Allow chemical to remain in lines for at least 4 hours then FLUSH with fresh water.

Step 10

- Apply second time insecticide long walls, floor, timbers and base of posts where insect pests hide

Step 11

- Rodent Control

  Place baits and traps in areas that show evidence of rats and mice activity

- Fly control

  Place baits

Step 12

- Prepare the house inside for a new batch of chicks

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