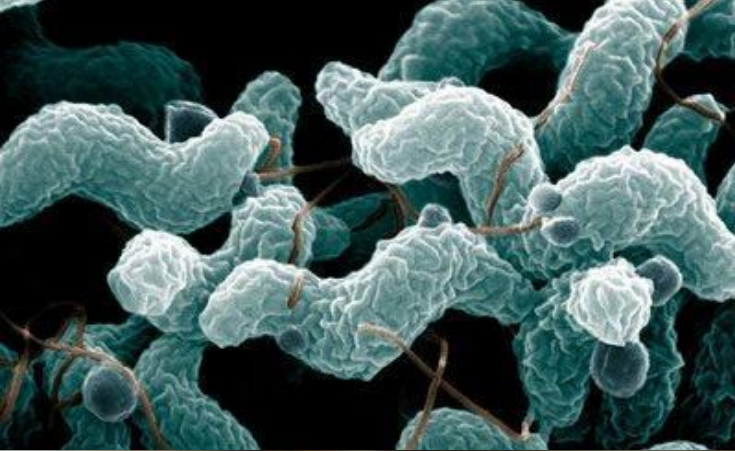


# How to control and prevent Salmonella in the field?

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Disease description

Transmission

Prevention and control

Salmonella sanitation program

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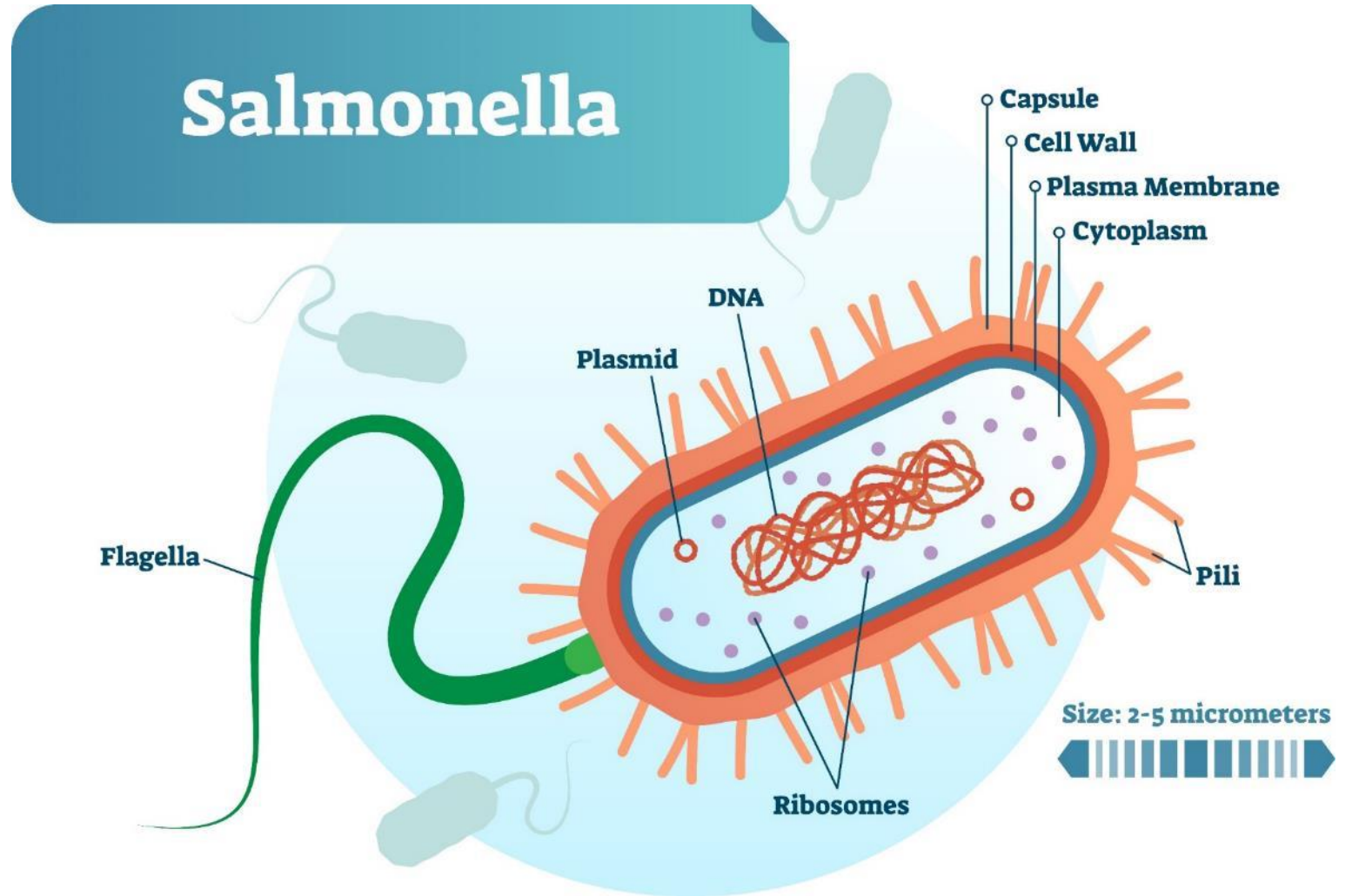
# Disease description

Enterobacteriaceae

Facultative anaerobic

Gram –

Rod-shaped bacteria



# Salmonellosis

## Optimal growth temperature

35 – 37 °C (growth between 5 - 45°C)

can survive in freezing temperatures

## Optimal growth pH

pH 6.5 – 7.5 (growth between pH 4 – 9)

## Resistant in the environment

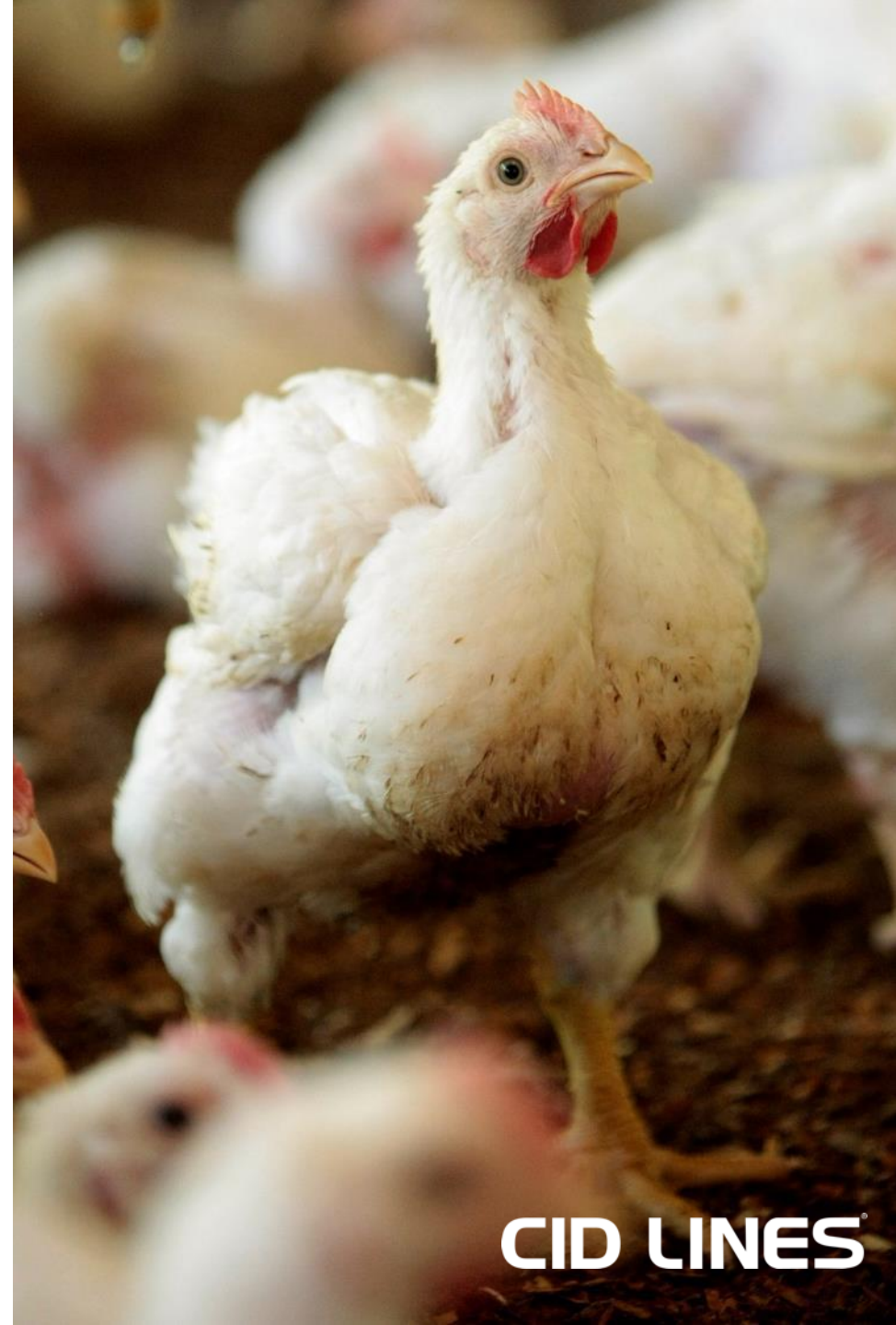
# Zoonosis

## Public health concern

Enteric disease both in **human** and **animals**

Salmonella can adapt easily to different hosts

One of the most common causes of food poisoning in humans



# Zoonosis

## Greatest hazards

Raw poultry meat

Undercooked poultry meat products

Eggs and products containing raw eggs

**!! YOPI !!**

*young, old, pregnant and immunodeficient*





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## Host-specific salmonella

*S. Pullorum* - *S. Gallinarum* - ...

**Clinical** symptoms in one particular species

Rarely transmission to humans

## Non host-specific salmonella

*S. Typhimurium* - *S. Enteritidis* - ...

Mainly **subclinical** in several species

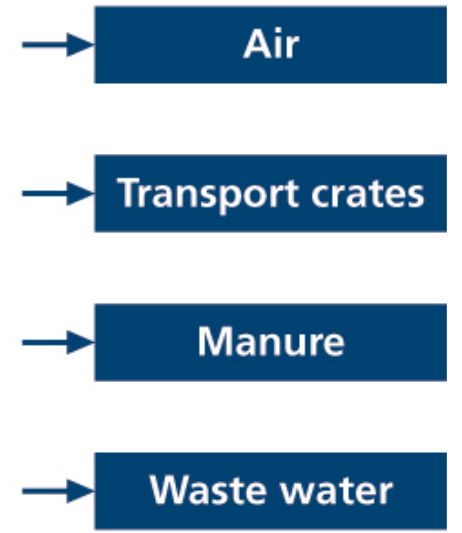
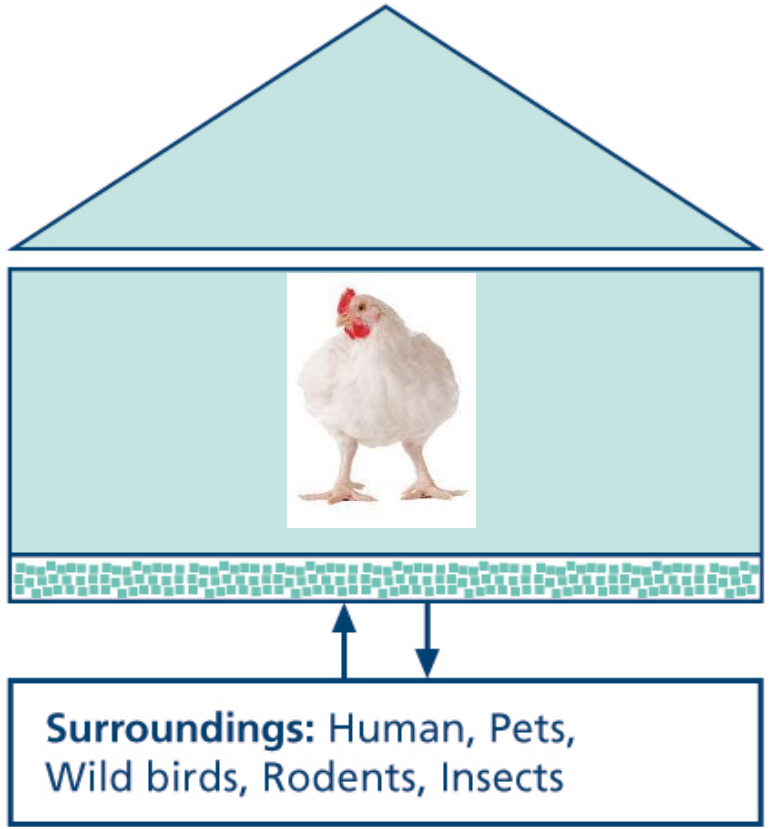
Food poisoning in humans

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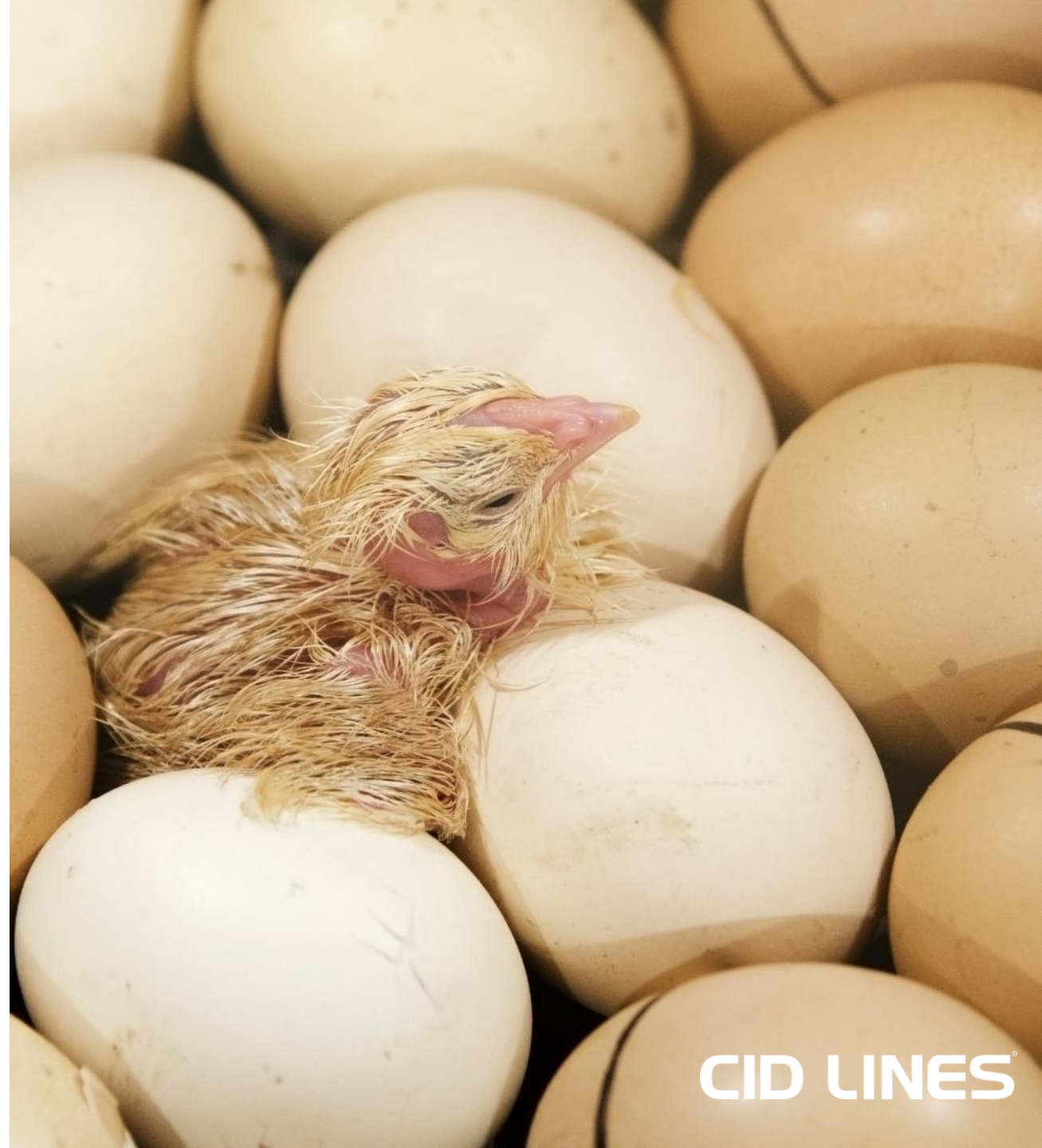
# Transmission



# Main vector

Contaminated birds themselves

via contaminated egg-shells



# Most of the salmonella

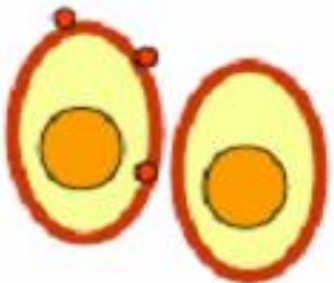
Limitation to the oral/fecal cycle

Multiplication in the digestive tract and shedding

Environmental and faecal contaminations

Contamination of egg limited to surface of the shell

HORIZONTAL TRANSMISSION



# Salmonella enteritidis



Invasion of internal organs

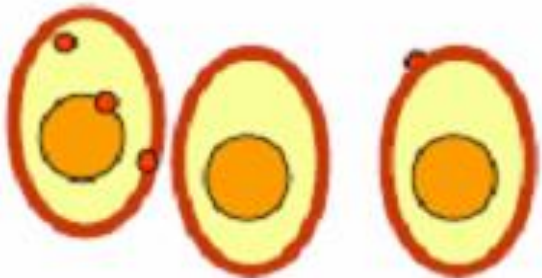
Multiplication in the digestive tract and shedding

Environmental and faecal contaminations

Contamination of eggs

**Transmission to next generation**

VERTICAL TRANSMISSION

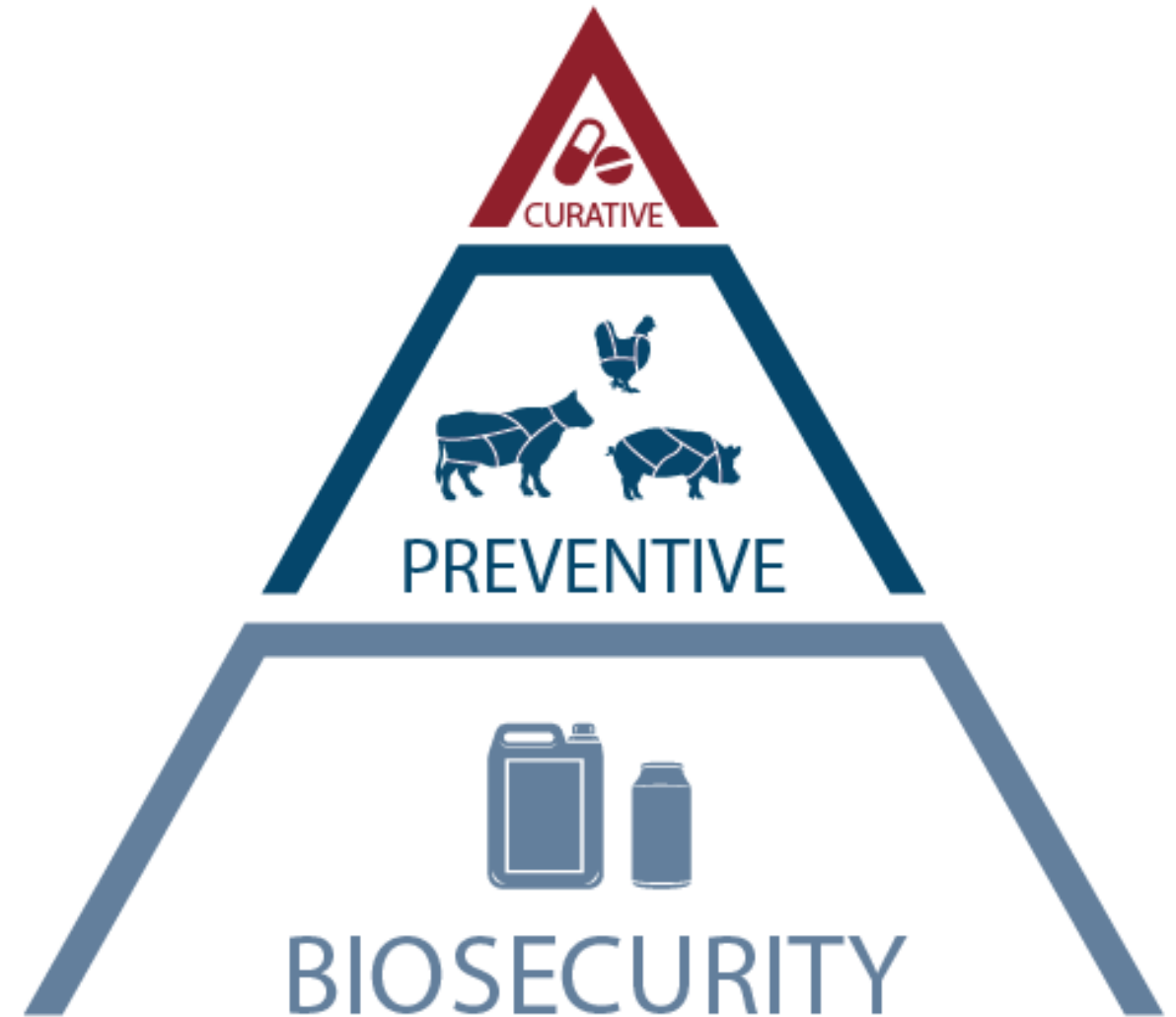




# Prevention and control

# Biosecurity

Biosecurity is **(should be)** the basis of any disease control program



# 5 basic principles

Salmonella free **one-day-old chicks**

Rearing chicks in a Salmonella free **environment**

Salmonella free **water and feed**

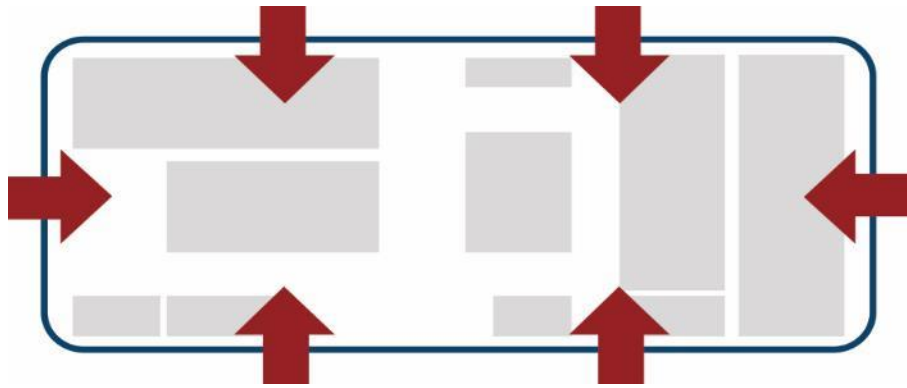
Regular **monitoring** of the total production chain

**Immediate action** when Salmonella is detected

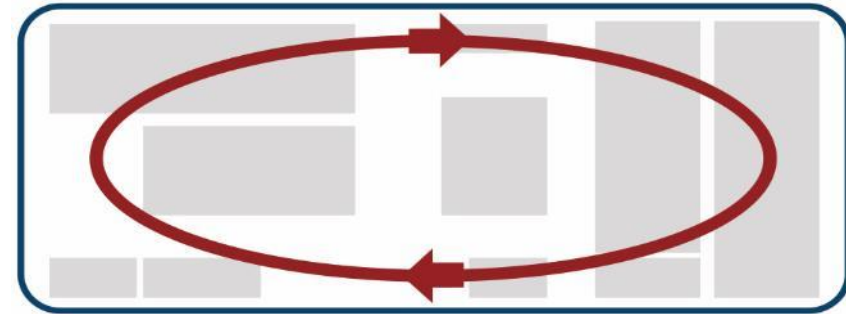




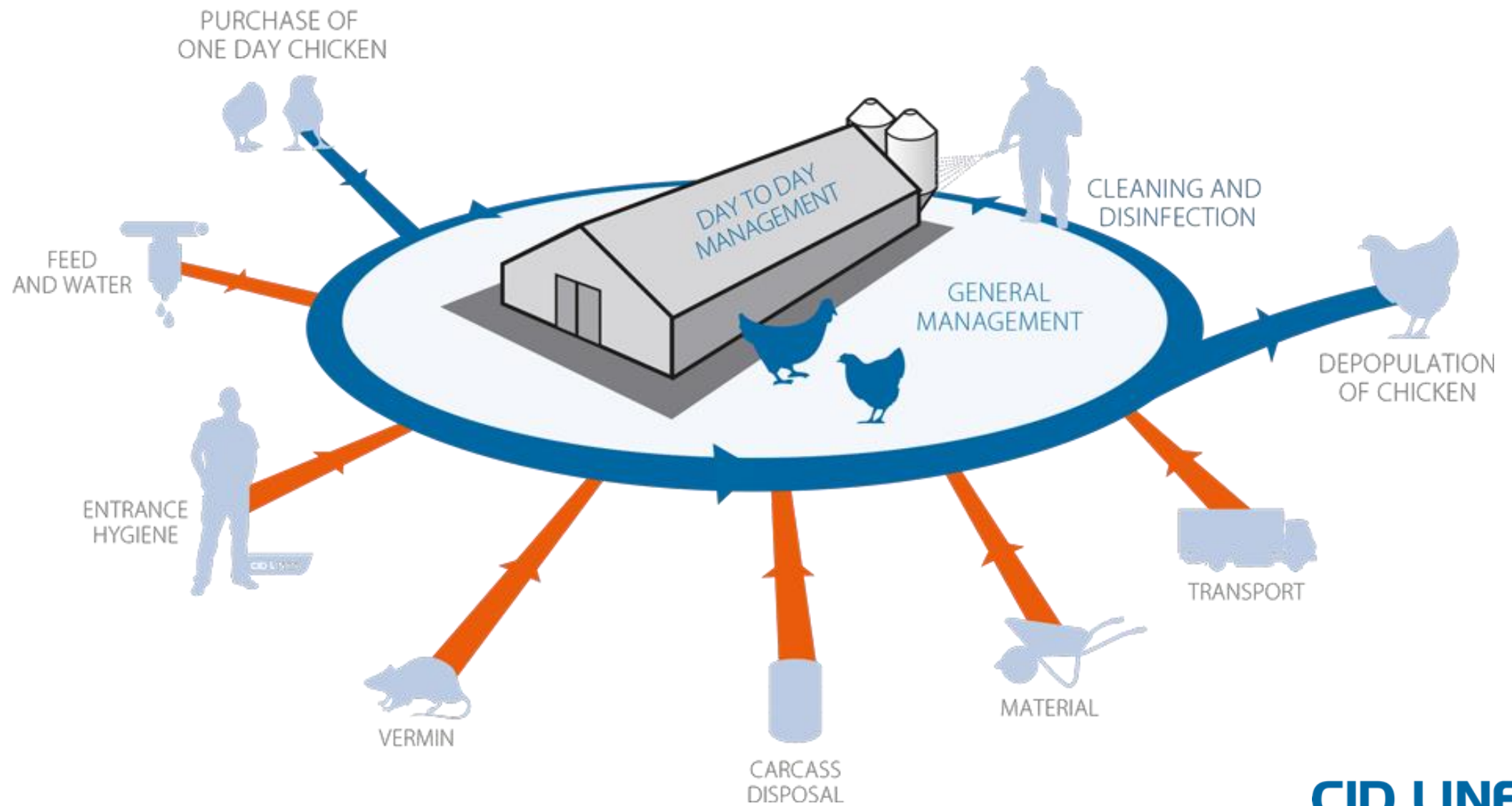
# Biosecurity



EXTERNAL BIOSECURITY



INTERNAL BIOSECURITY



# Purchase of One Day Old Chicks

*Salmonella* is transmitted via the egg from parent to chick,  
thus an obvious starting point for any *Salmonella* control strategy is to ensure **poultry breeding flocks are kept *Salmonella* free**



# Purchase of One Day Old Chicks

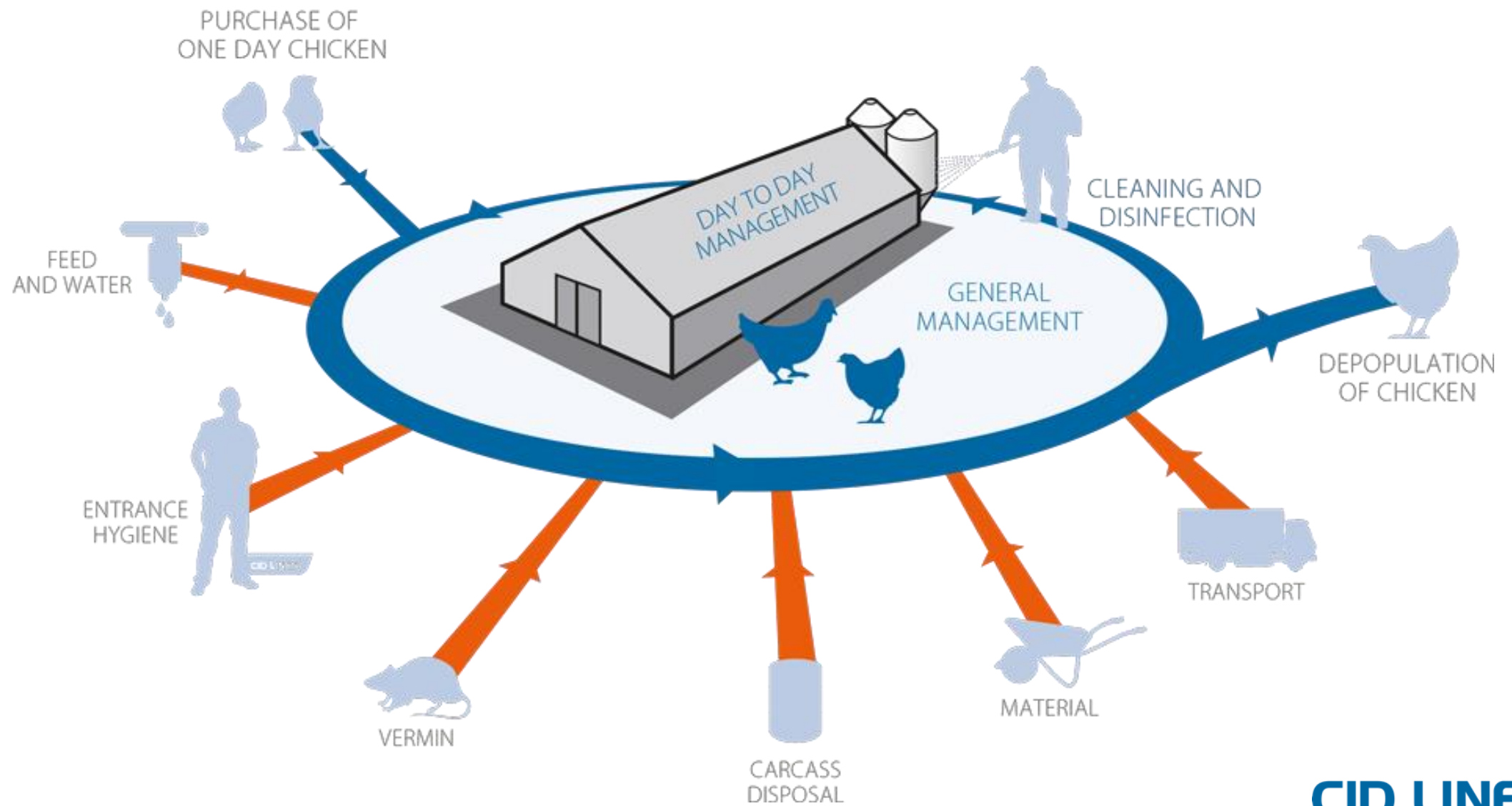
ODC come from **same supplier**

**first delivered** on your farm

truck has to be **cleaned and disinfected** before loading the chicks at the hatchery

**as few deliveries** as possible







# Feed supply

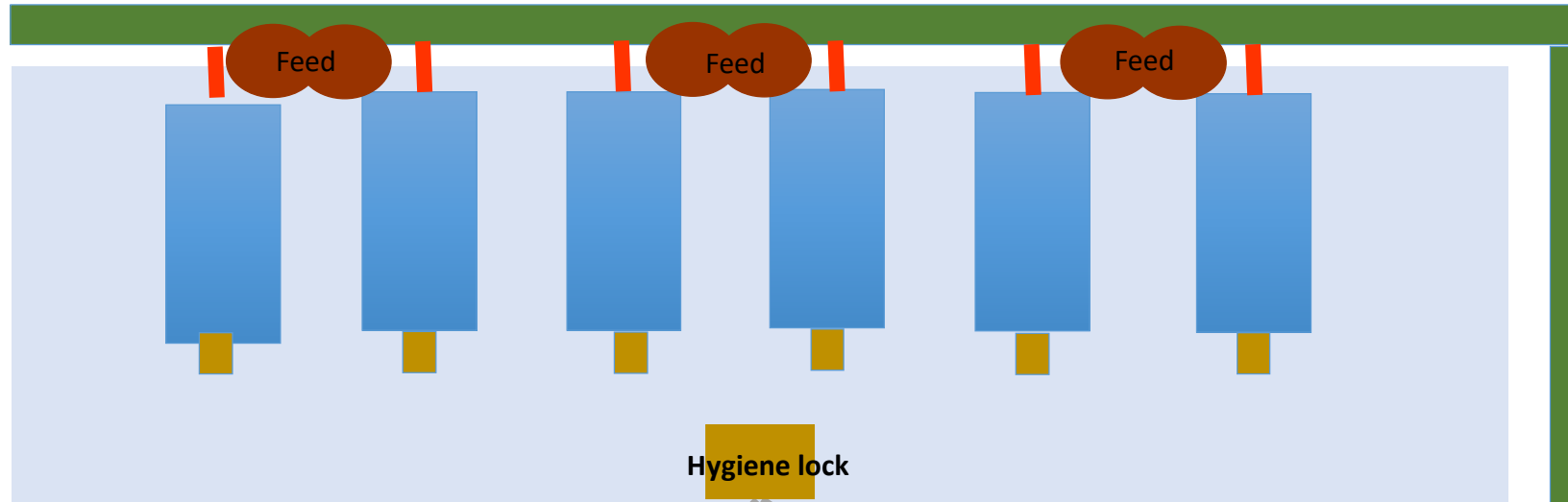
feed delivery along the **'dirty road'**

**no access for the feed supplier** to the animal houses

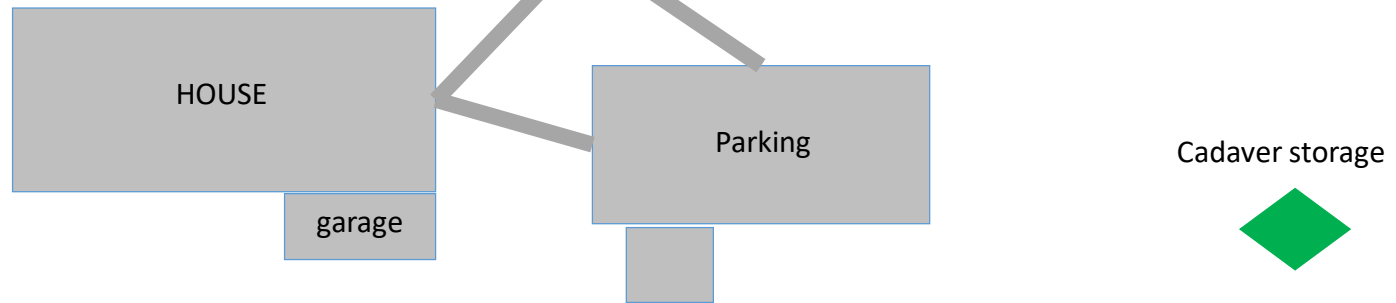
feed **silos well sealed** against water birds and vermin

**as few deliveries** as possible

DIRTY ROAD



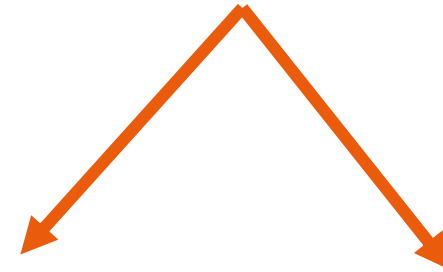
CLEAN ROAD





# Water supply

Drinking water hygiene



**Cleaning at  
sanitary stop**

**Treatment during  
production cycle**



# Water supply

Regular **quality and safety checks** of the drinking water

At the source

At the last nipple or last drinking cup





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# Application at sanitary stop

PRODUCT	DOSAGE	CONTACT TIME
Cid 2000	2 %	4 tot 6 uur



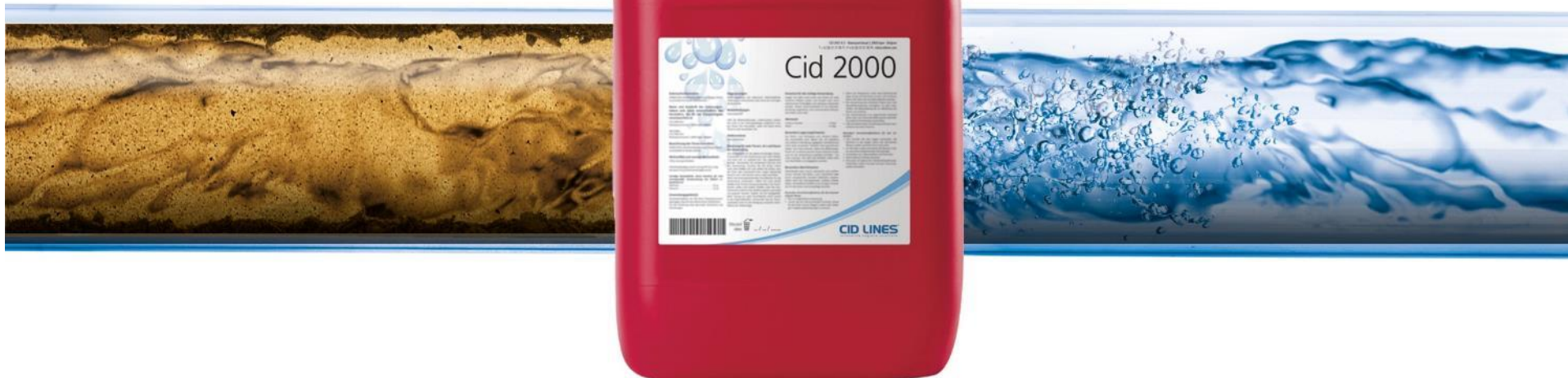
# Application at sanitary stop

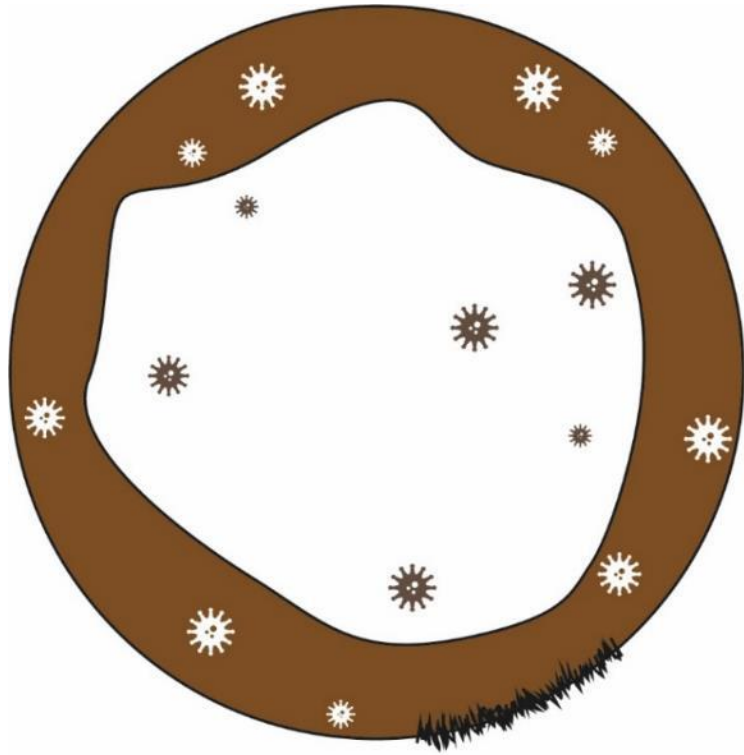
<b>1</b>	Empty the drinking water lines
<b>2</b>	Close all the lines off (except one)
<b>3</b>	Add CID 2000 2% until you're sure that the product is at the end of the line: reaction smell test strips
<b>4</b>	Trigger the nipples, so you can be sure that the product is also there
<b>5</b>	Close the line and let the product work for 4 – 6 hours
<b>6</b>	Repeat step 2 to 5 for all the drinking water lines
<b>7</b>	After 4 – 6 hours: flush and rinse with clean water






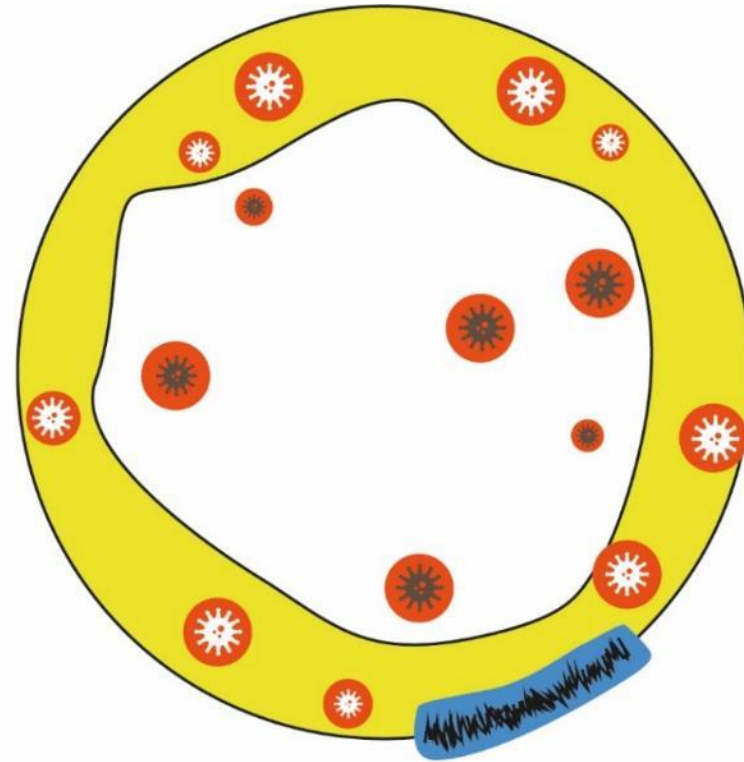
# Application during production cycle




PRODUCT	DOSAGE	CONTACT TIME
Cid 2000 Cid Clean	100 – 500 ml / 1000 L	continue





-  BACTERIA
-  BIOFILM
-  MINERAL DEPOSITS



-  H<sub>2</sub>O<sub>2</sub>
-  ACETIC ACID
-  PERACETIC ACID

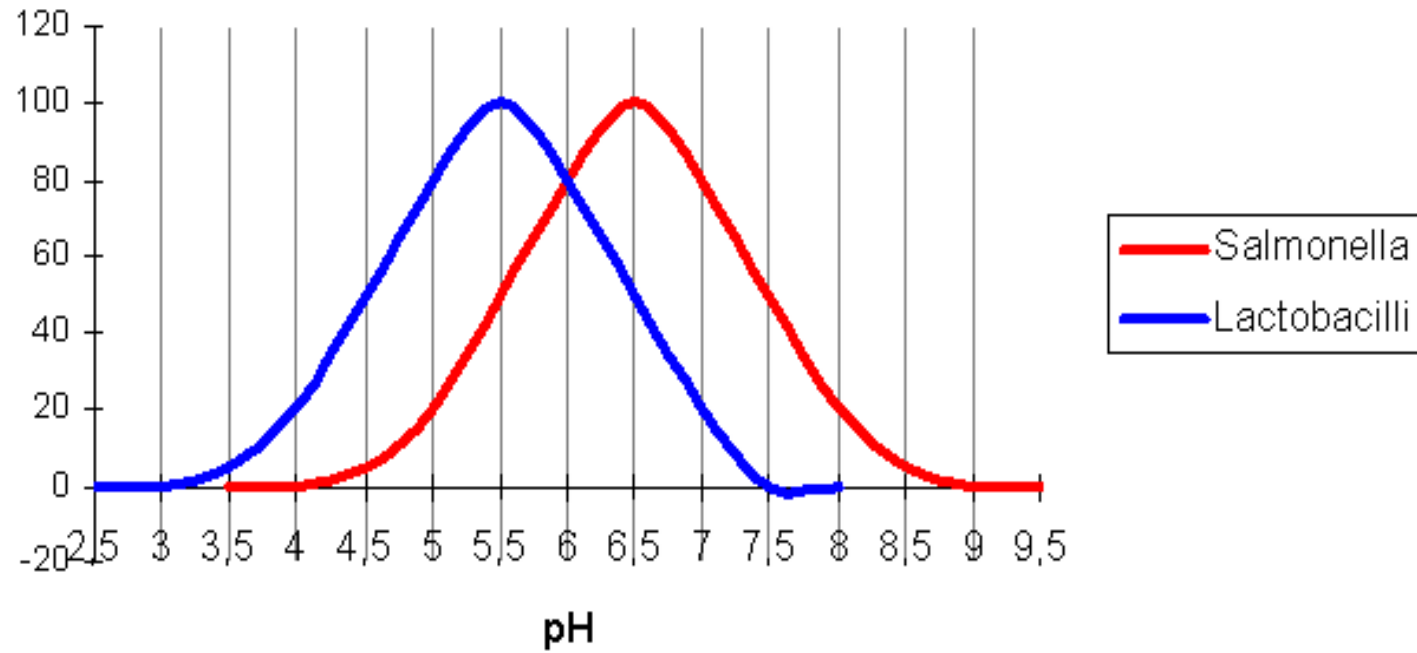
# Application during production cycle

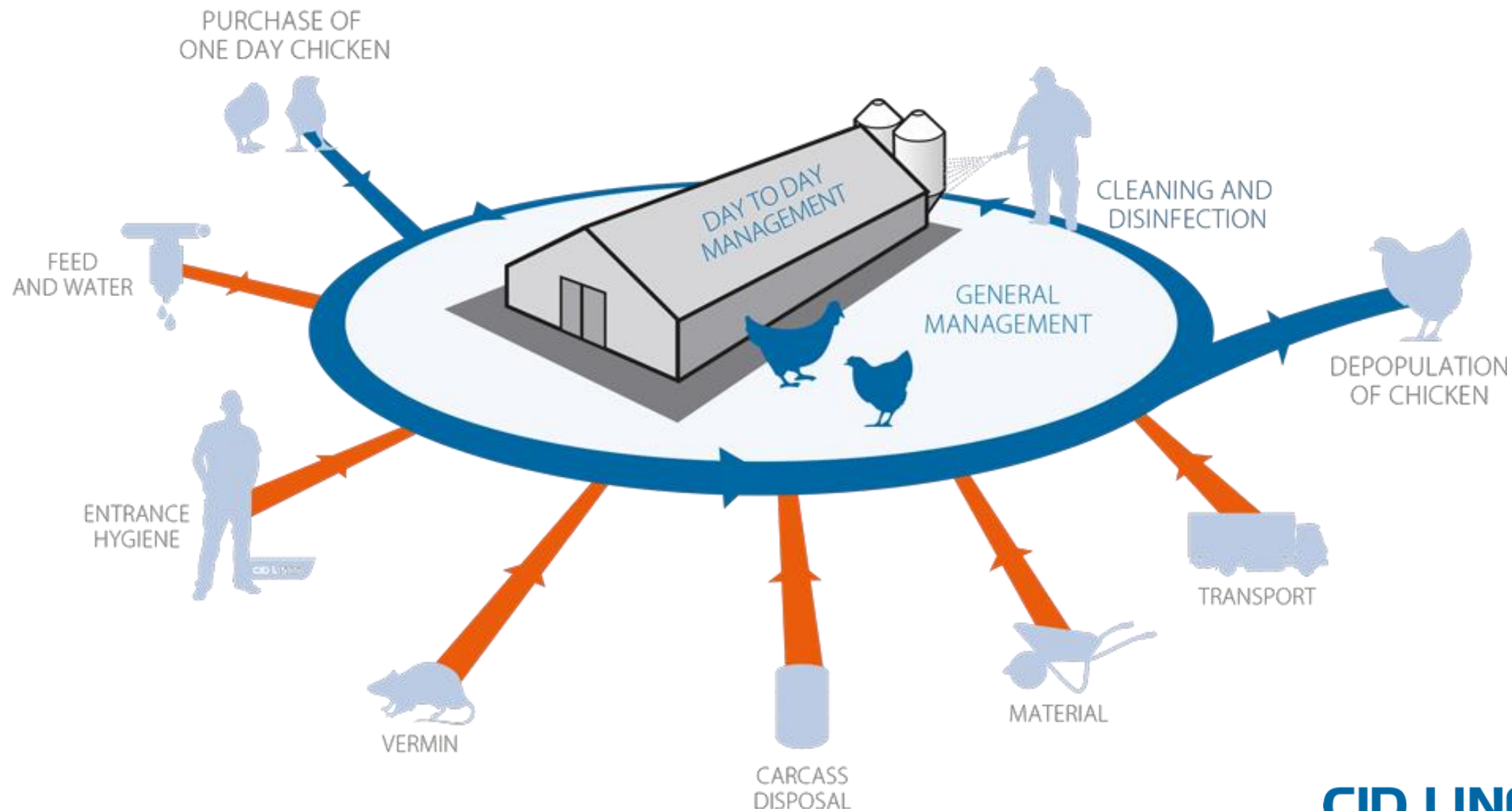
PRODUCT	DOSAGE	CONTACT TIME
Agrocid Super™ Oligo	300 – 500 ml / 1000 L	continue





**Growth curve Salmonella and Lactobacilli vs. pH**





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# Entrance hygiene

keep the **number of people** with access to farm and animal facilities to a **minimum**

**check-in** for visitors

farm specific **clothing and shoes**



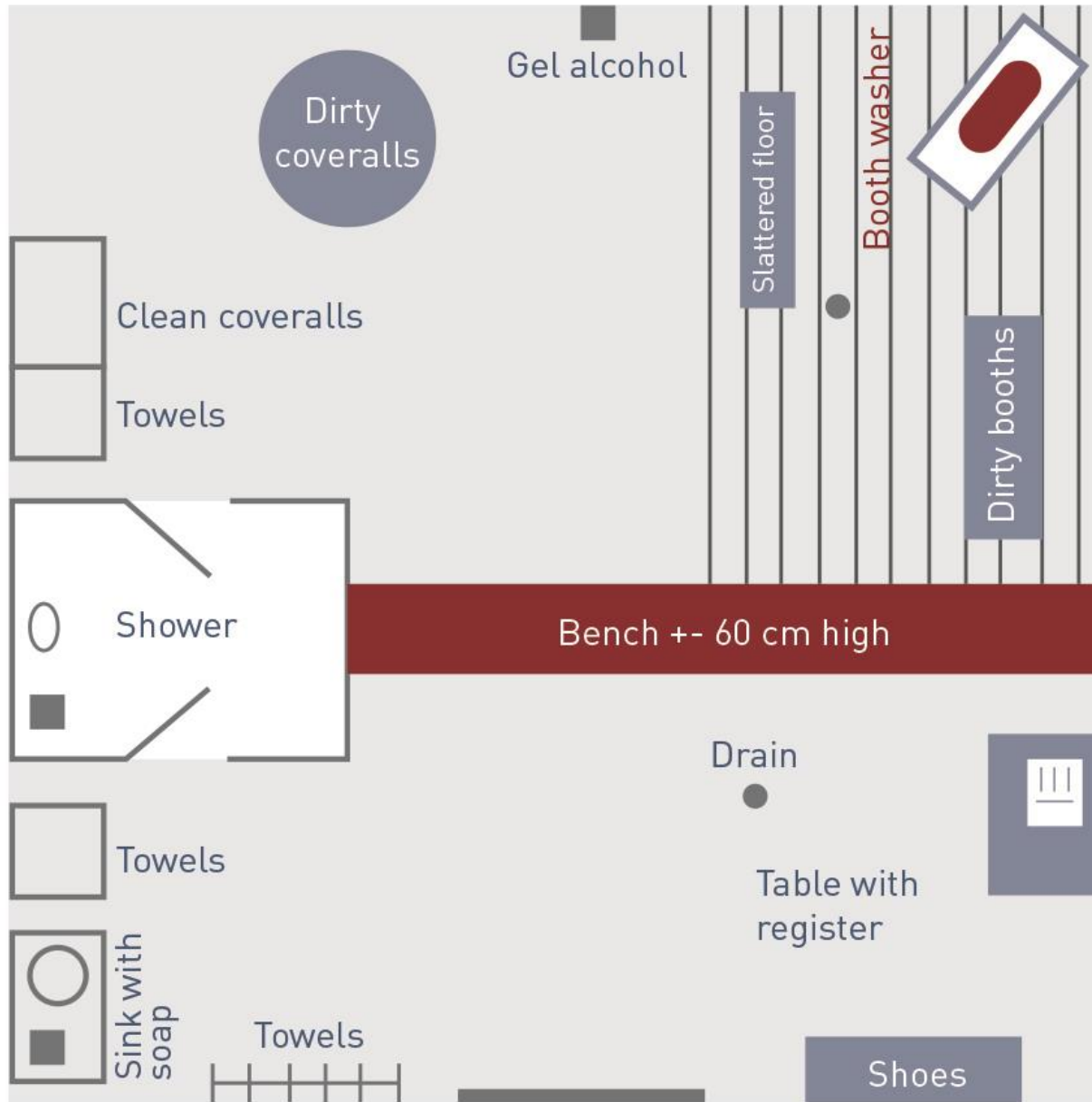
# Entrance hygiene

hand hygiene

hygiene lock with footbath or booth washer

employees should **not work at other poultry farms**







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# BOOT HYGIENE

STEP 1



Dry cleaning (brush)  
Take away all rests of manure.

STEP 2



Rinse with water

STEP 3



Disinfect

STEP 4

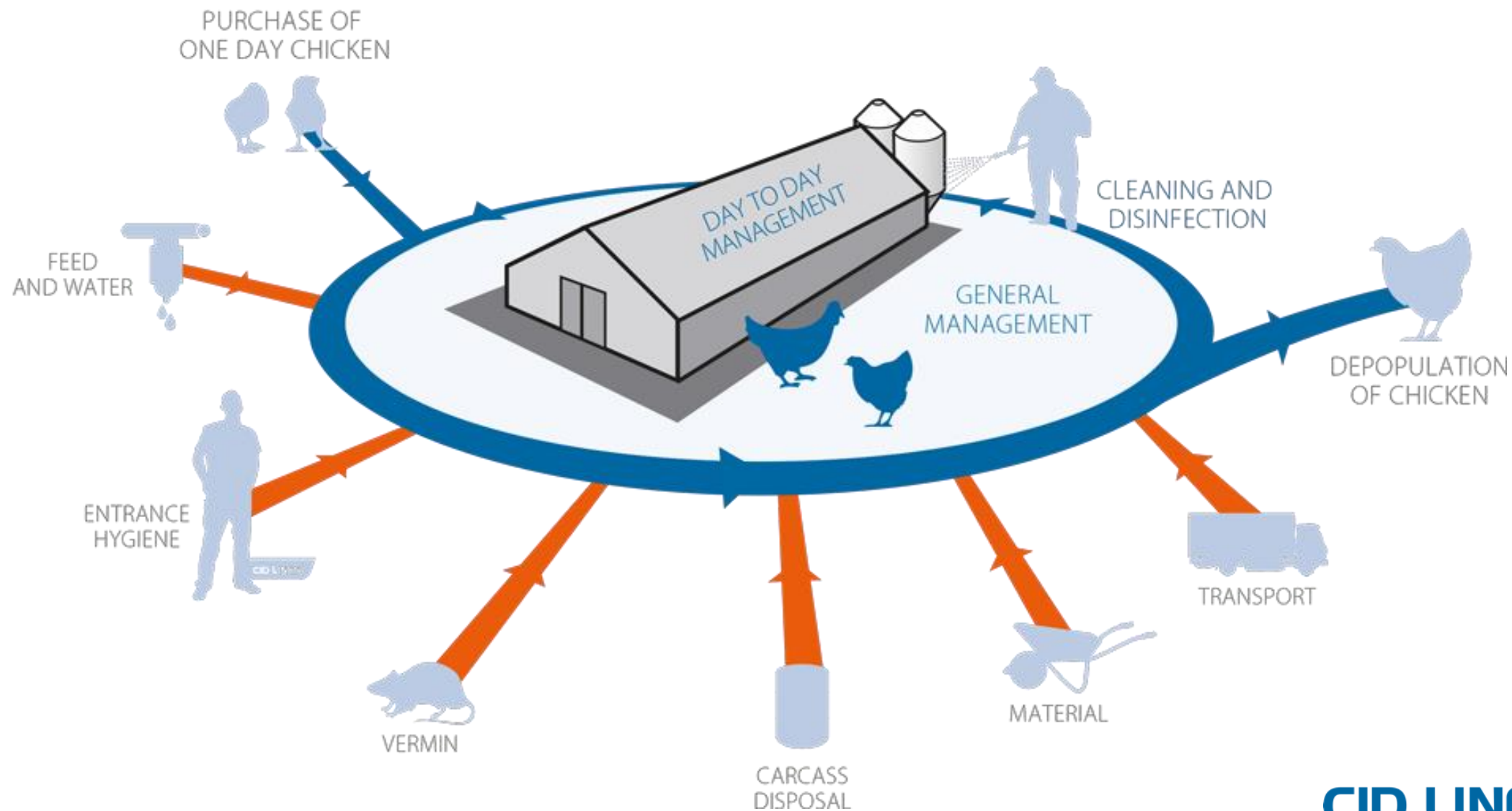


Renew  
Renew the solution regularly: 2-3 times/week



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# Vermin

bird and vermin proof **grids at the air inlets**

outside of the farm (around the walls) **paved and clean**

strict **vermin control program**

**no pets** in the animal houses

**no 'backyard' farming**







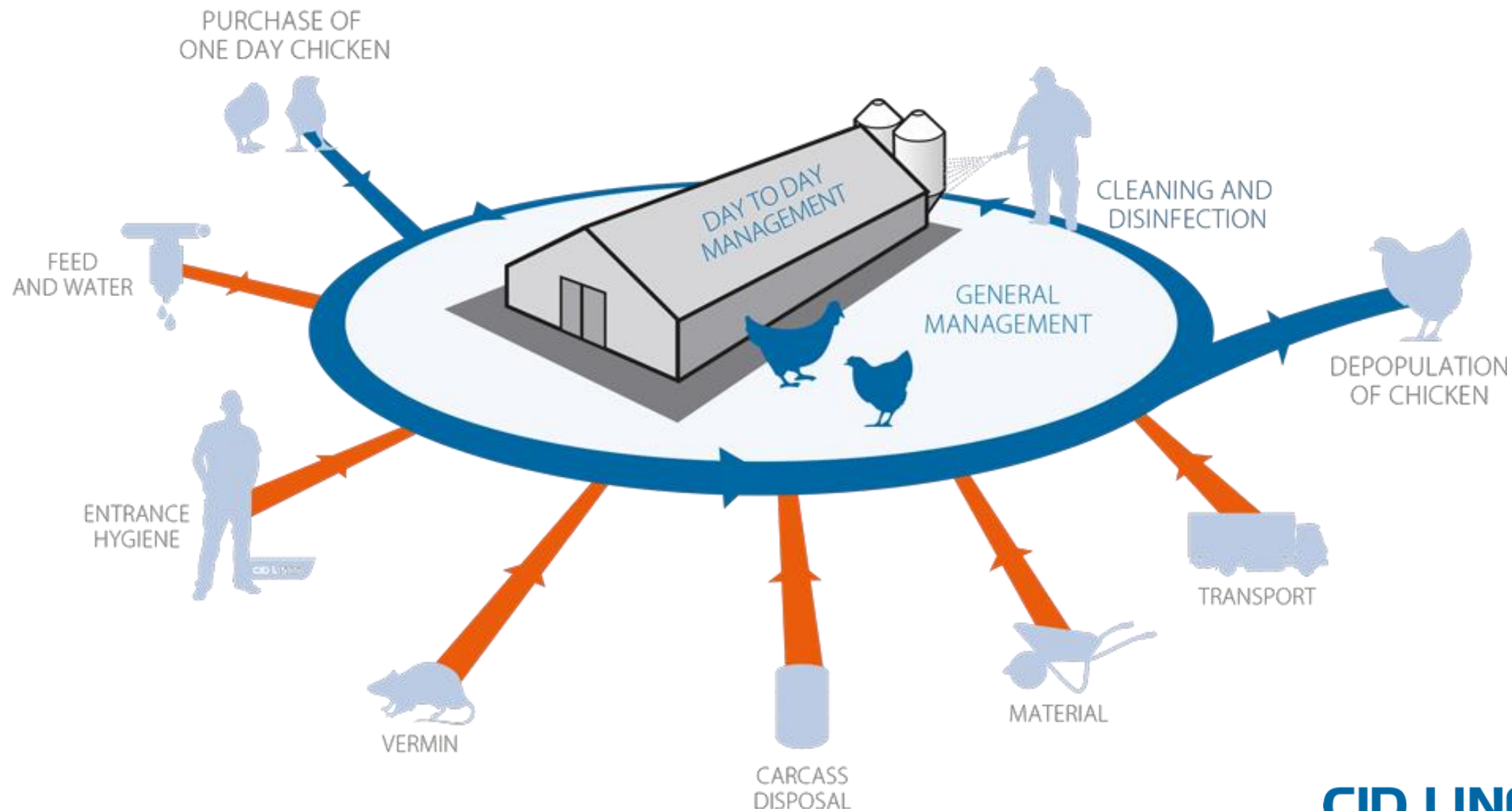




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# Carcass disposal

Dead animals = source of infection

Remove the cadavers **as early as possible**

Remove them along **the dirty road**

Wear **gloves** while manipulating



# Carcass disposal

## Cadaver storage

**physically separated** from the animal facilities

**well closed against vermin and pets**  
**cooled** facility

**regularly cleaned and disinfected**





STEP 1



Dry cleaning

STEP 2



Foaming

STEP 3



Rinse with water

STEP 4

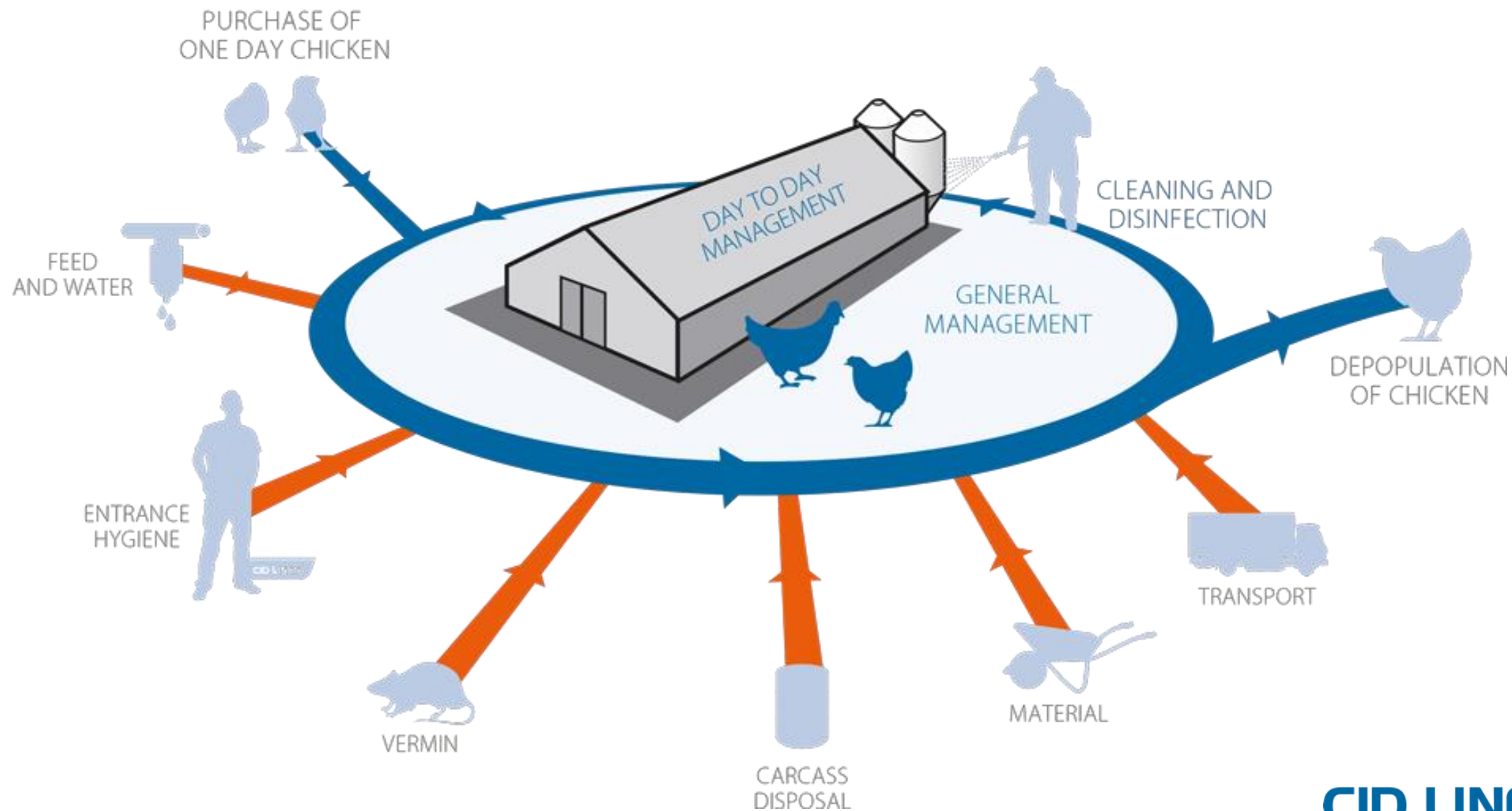


Disinfecting



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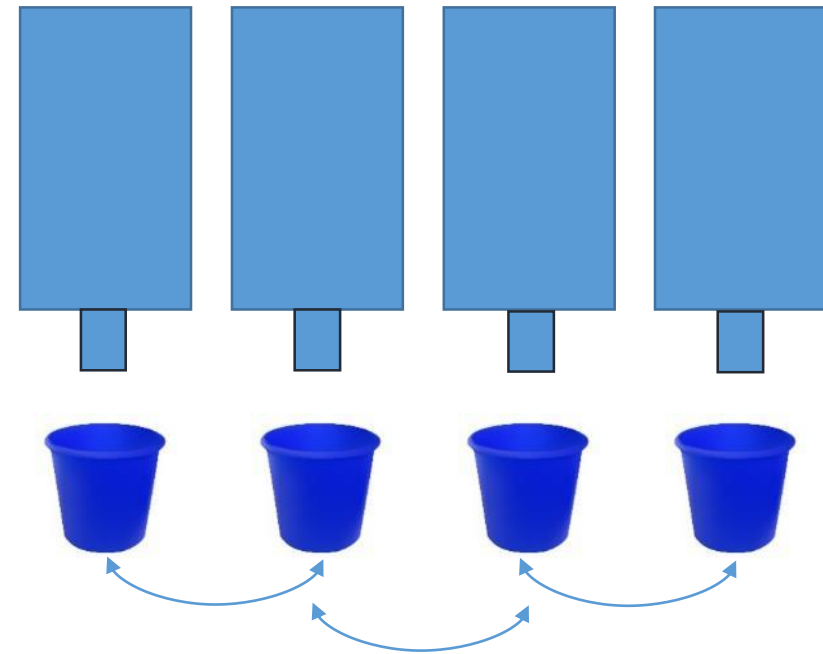
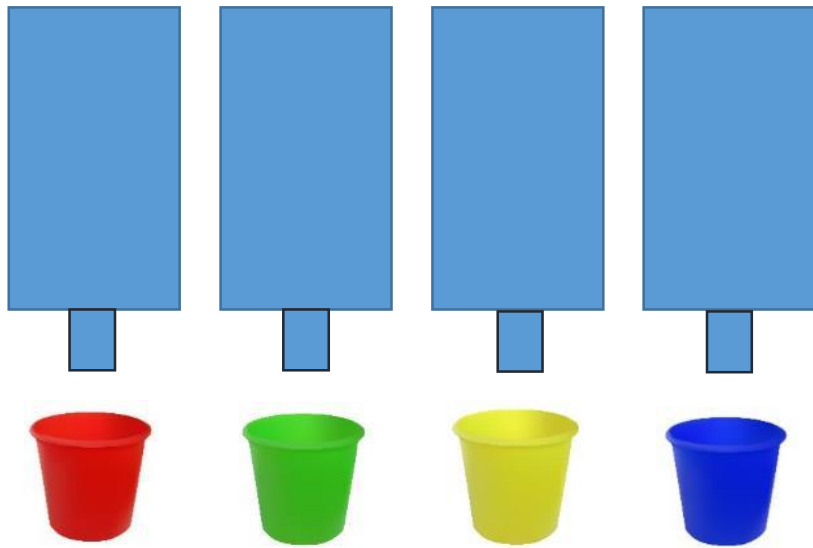
# Material

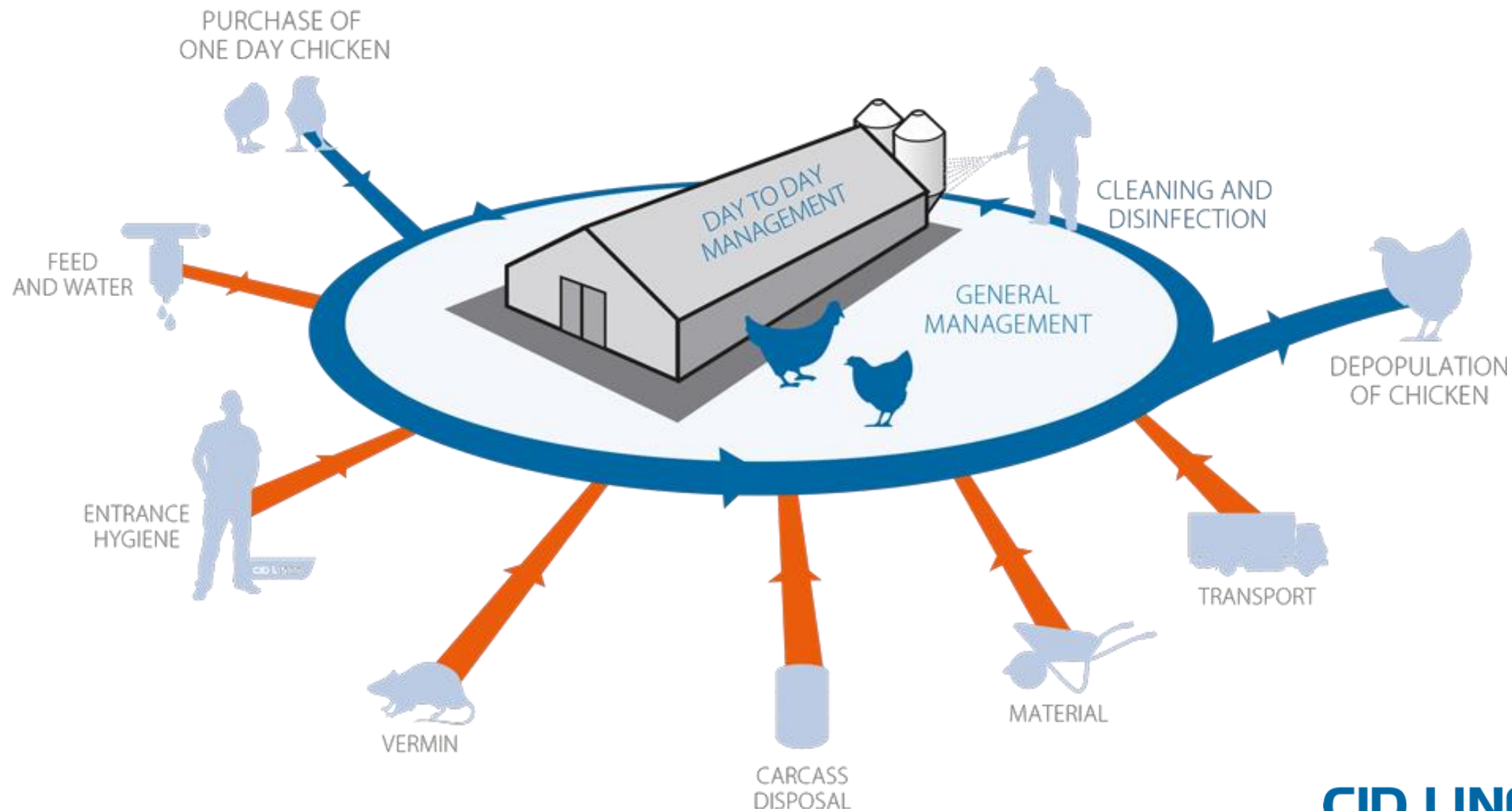
**Farm specific material**

**Preventive measures for new material supply at the farm (disinfection before entering)**

**Cleaning and disinfection protocol**









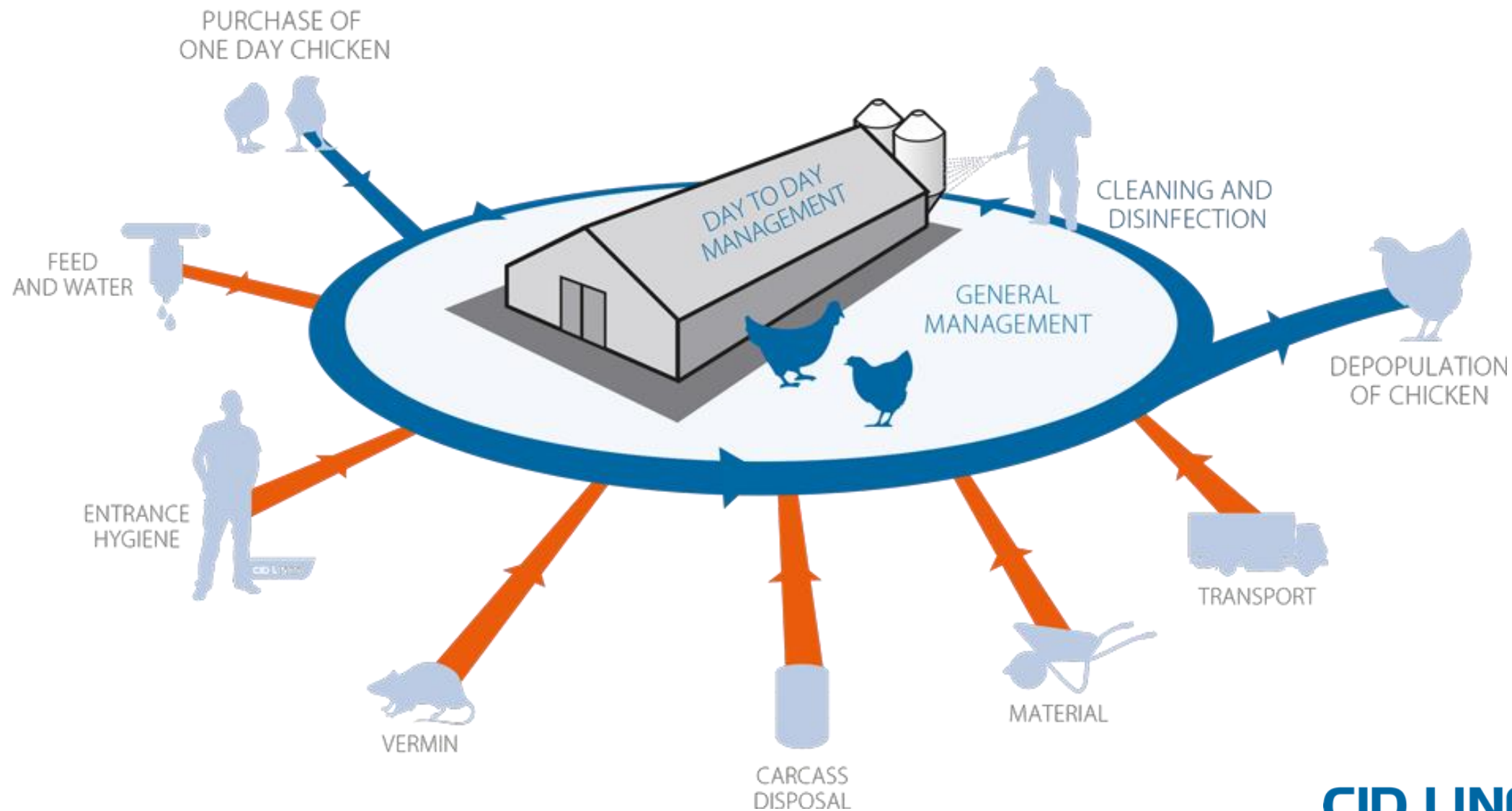
# BREAK THE ROUTES OF TRANSMISSION

Prevent emerging disease outbreaks

African Swine Fever, Avian Influenza, Foot & Mouth Disease

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# Depopulation of broilers

farm specific clothing and shoes for the catching team

transport vehicle **empty** upon arrival at the farm

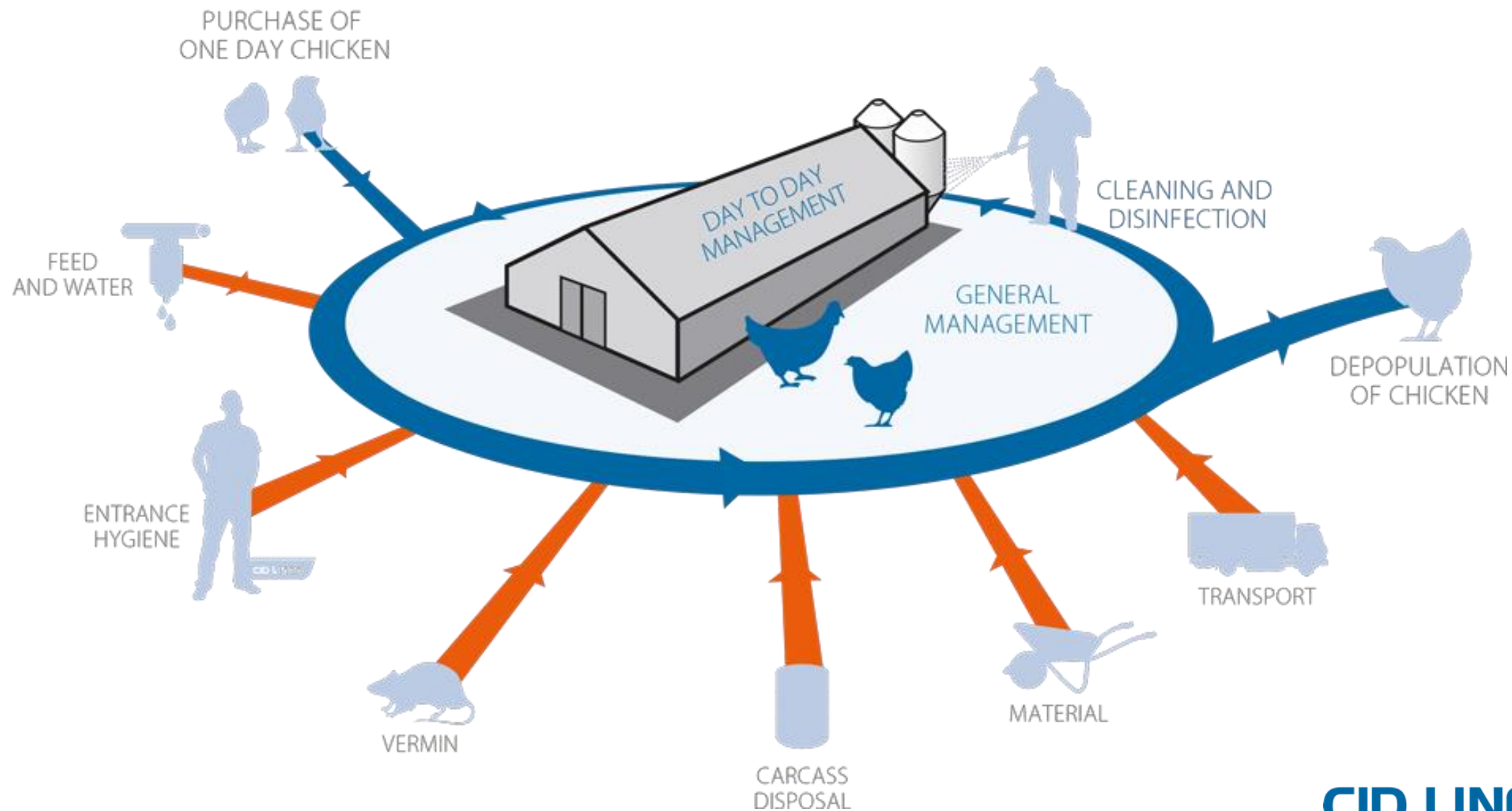
transport vehicle **cleaned and disinfected**

depopulation in 1 step

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# Cleaning and disinfection

Contact time:  
30 – 60 minutes



Let it dry!

Let it dry!



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[www.cidlines.com](http://www.cidlines.com)



# Extra step in case of salmonella

**Dismantle all removable equipment** such as feeders and drinking cups...

Apply an effective cleaning and disinfection protocol for all this equipment with Kenosan and Virocid



# Critical control points



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# Critical control points



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# Critical control points



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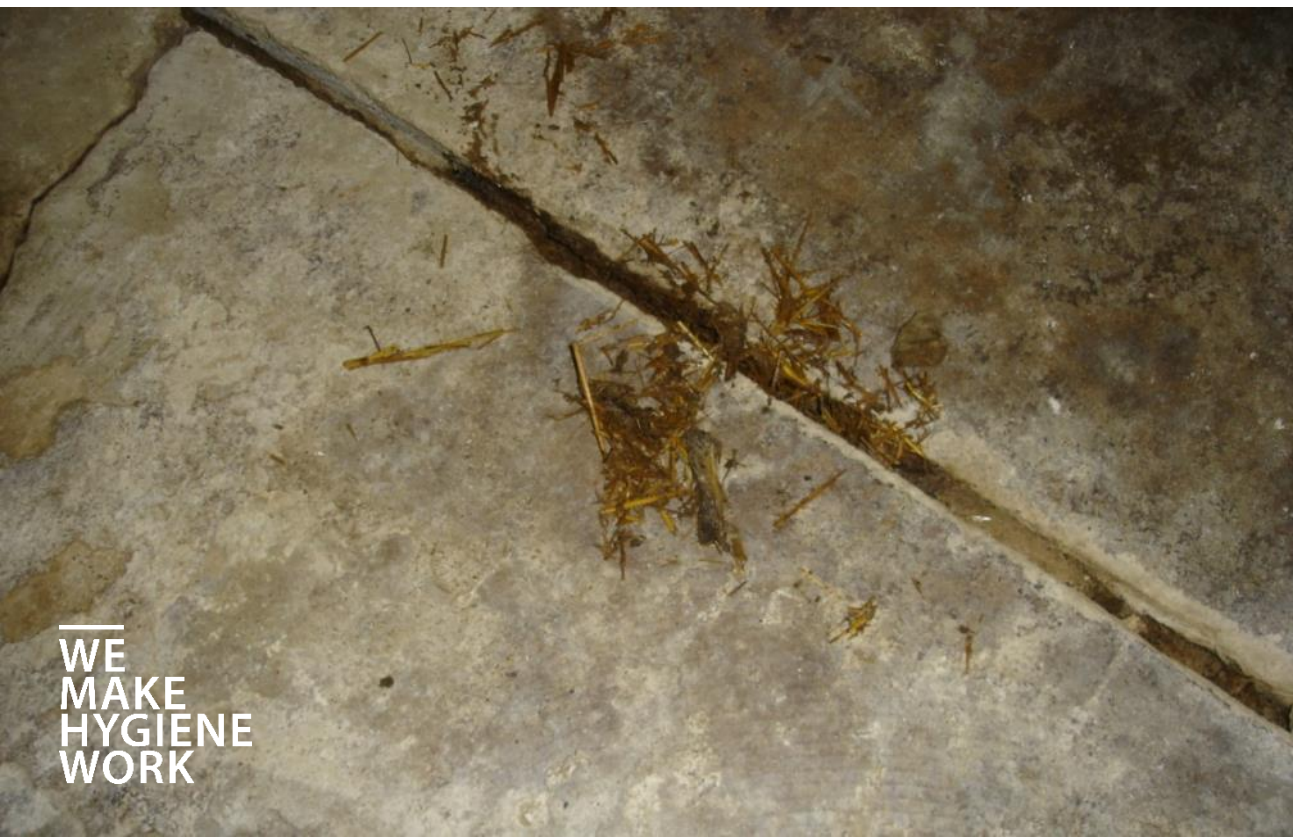
# Critical control points



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# Critical control points

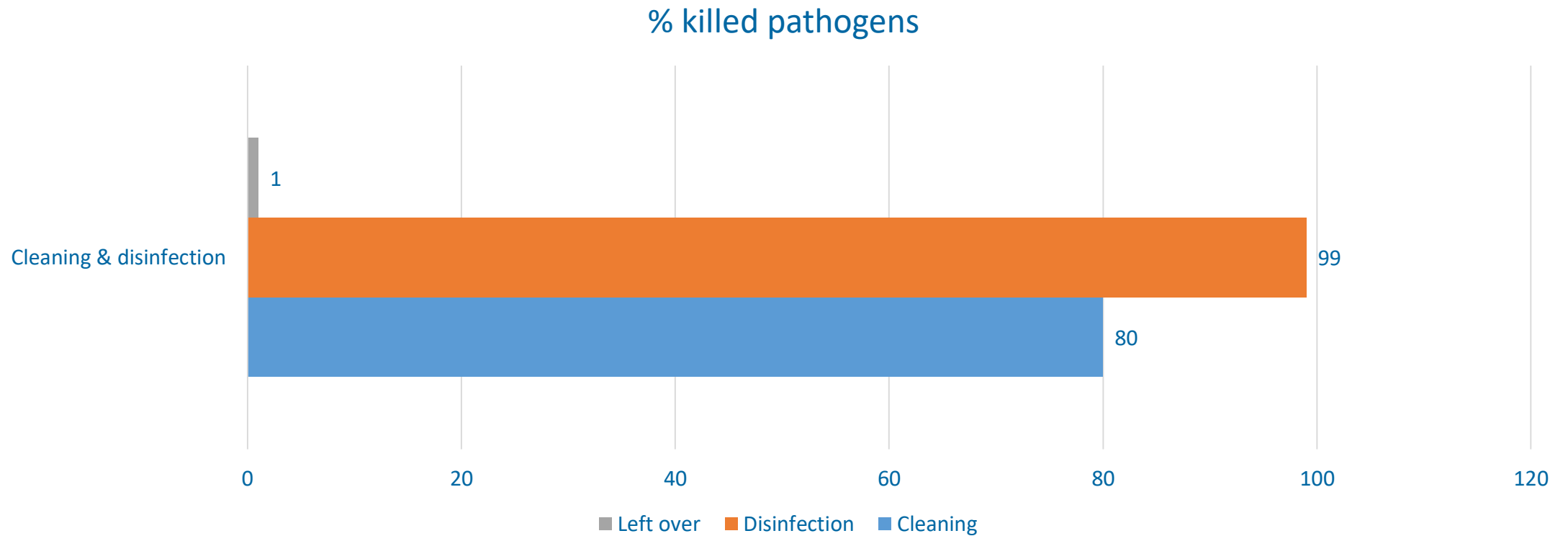


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# Cleaning and disinfection



# Kenosan

Sticky and long-lasting foam

Extreme dirt penetrating capacity

Very economical in use

Non corrosive

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# Organic » MANURE = ACID pH

Fat

Protein

ALKALINE CLEANER

# Inorganic » INORGANIC = ALKALINE pH

Minerals: Ca – Mg - Fe

ACID CLEANER

**Acidic**

**Neutral**

**Alkaline**



# Virocid

Efficient at low concentration (0,25 – 0,5%)

Tested for more than **90 other pathogens**

## Safe for the Material

GLP certified, VDA class A for trucks, Cirlam Corrosivity tested

## Safe for the User

Ready to use solution has been proven to be harmless for people (skin, breath, eye)

## Safe for the Environment

Comply with EU regulation of biodegradability

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VIROCID EFFICACY TESTS	
Salmonella choleraesuis	0,25 %
Salmonella enteritidis	0,125 %
Salmonella hadar	0,25 %
Salmonella heidelberg	0,125 %
Salmonella infantis	0,5 %
Salmonella kentucky	1 %
Salmonella paratyphi java	0,10 %
Salmonella pullorum	0,25%
Salmonella typhimurium	0,125 %
Salmonella typhisuis	0,25 %
Salmonella virchow	0,25 %



## BIOCHECK.UGent, prevention is better than cure!

Welkom!

Biocheck.UGent is a risk-based scoring system to evaluate the quality of your on-farm biosecurity in an scientific and independent way.

Fill in the online questionnaire for free and receive valuable feedback about the biosecurity level of your farm. You get a summarizing and personal report with detailed results. These findings can help you to choose your own suitable biosecurity pathway.

Don't hesitate and get started to lift your farm to a higher biosecurity level!

Start the Biocheck.UGent!

How to use Biocheck.UGent?



Free online application: [www.biocheck.ugent.be](http://www.biocheck.ugent.be)



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# Immediate action when salmonella is detected

Determination of the **origin** of the infection

Movement of poultry flocks at the end of the production cycle should only be allowed for **slaughter or destruction**

Poultry litter/faeces and other potentially contaminated farm waste should be **disposed of in a safe manner**

Particular care should be taken in **cleaning and disinfection** of the poultry house and equipment

Before restocking the facility, a **bacteriological examination** should be carried out



A long, brightly lit poultry farm with rows of yellow chicks and red feeders. The chicks are densely packed in the center aisle, and the feeders are arranged in rows on either side. The walls are concrete with small windows, and the ceiling has a grid of lights and pipes.

# How to control and prevent Salmonella in the field?

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