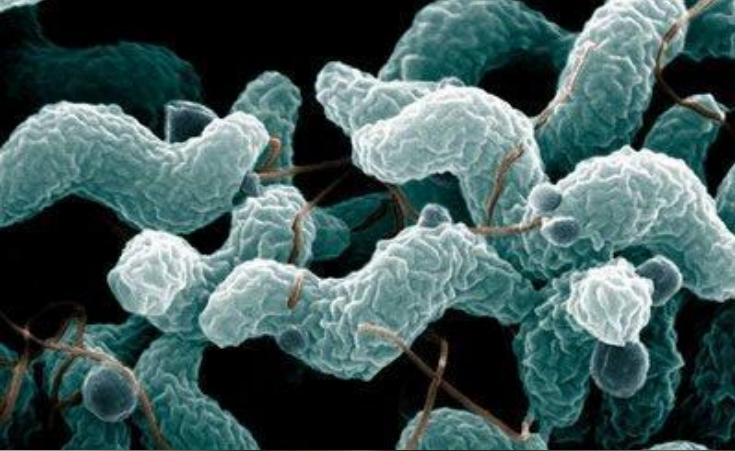




# How to control and prevent Salmonella in the field?

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Disease description

Transmission

Prevention and control

Salmonella sanitation program

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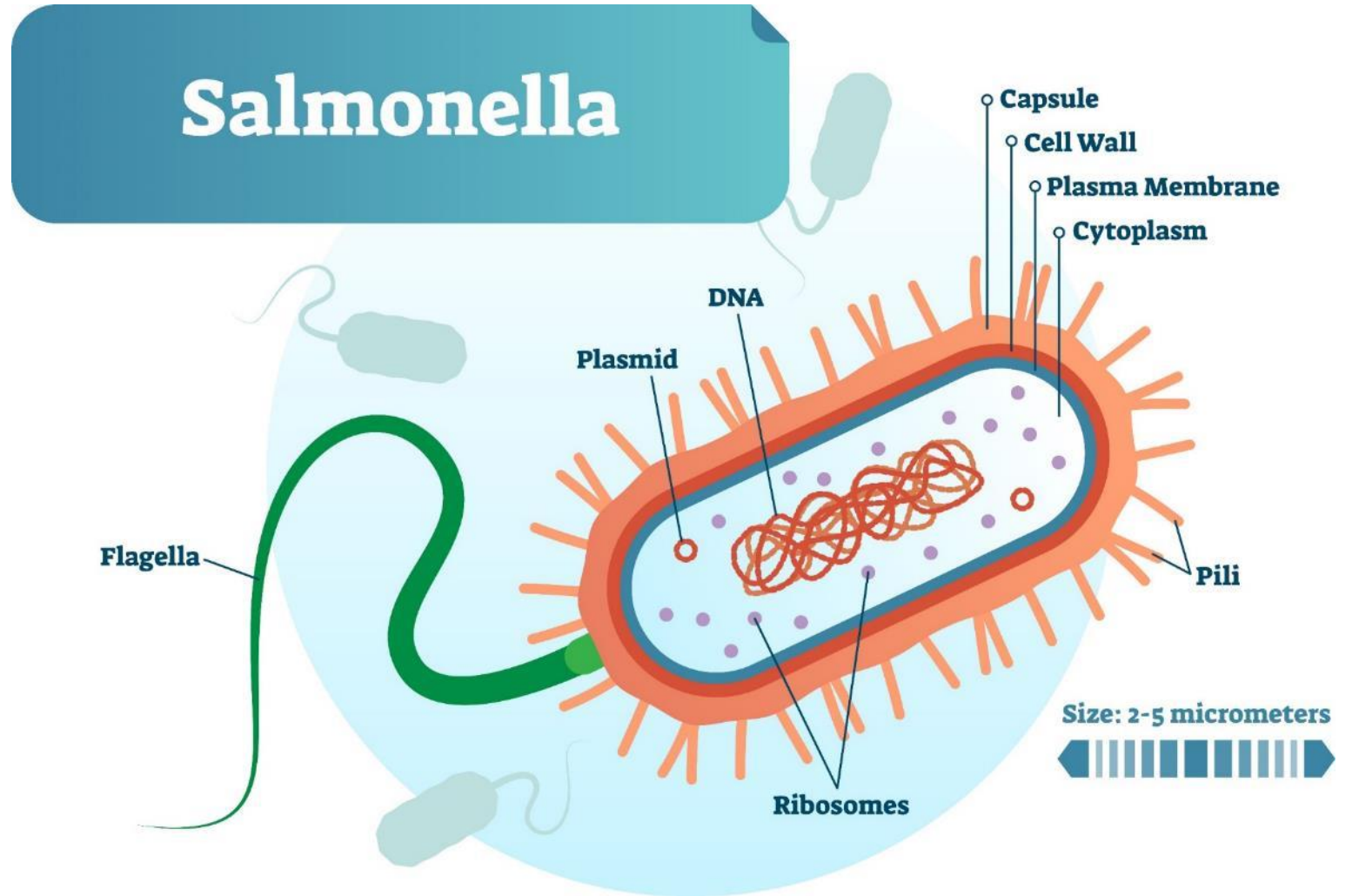
# Disease description

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

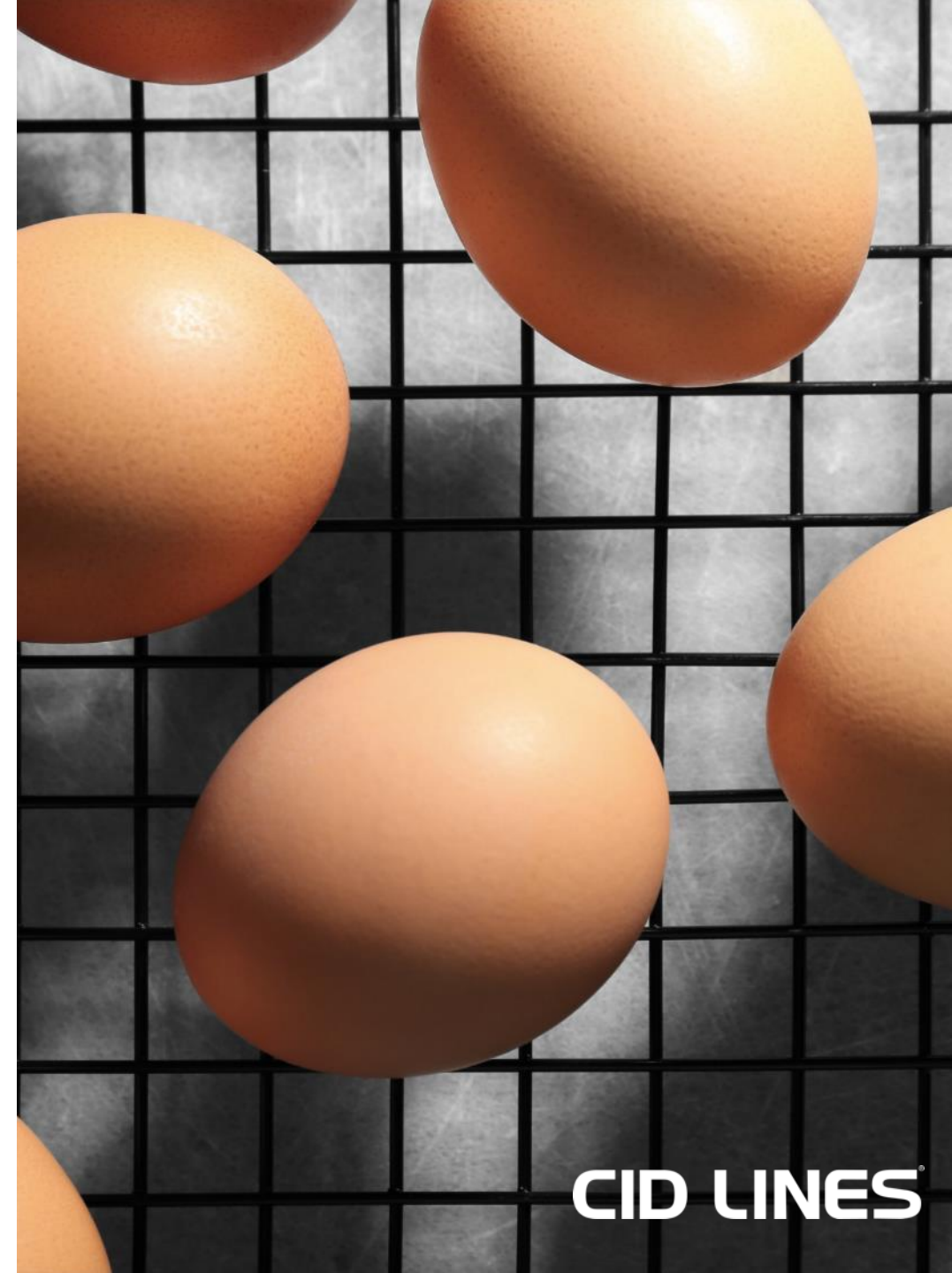
Raw poultry meat

Undercooked poultry meat products

Eggs and products containing raw eggs

!! YOPI !!

*young, old, pregnant and immunodefficient*





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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

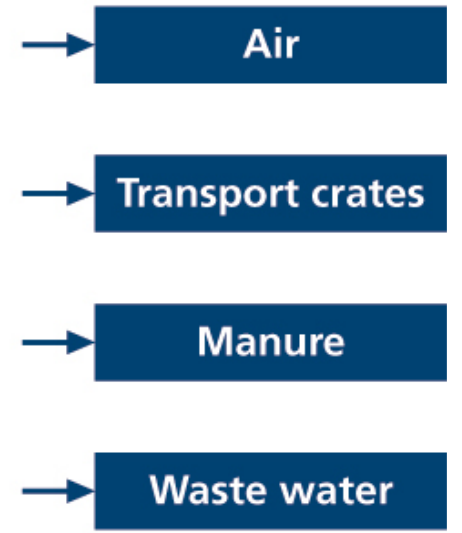
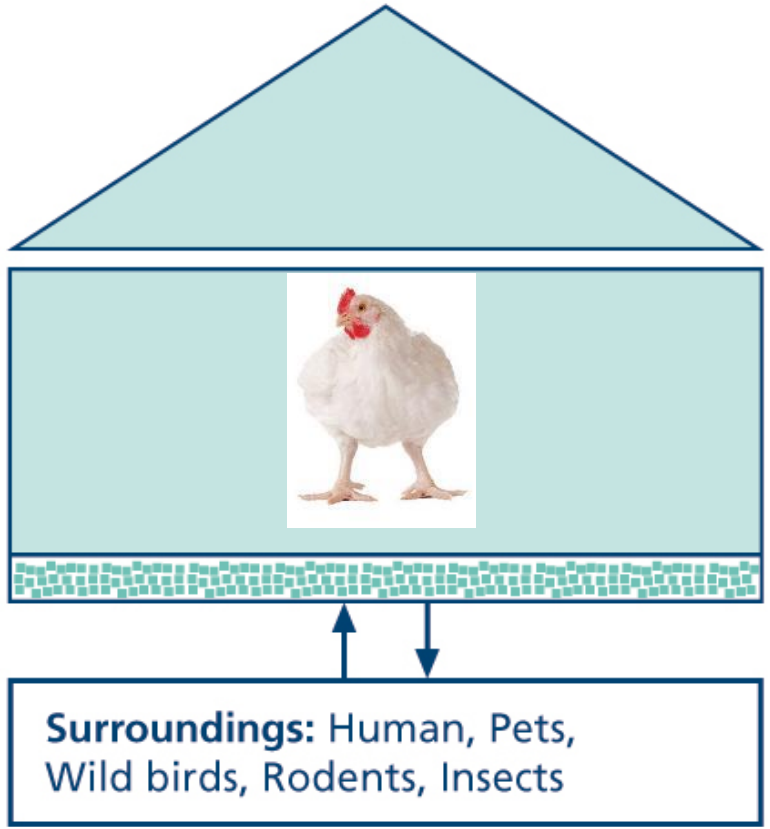
Food poisoning in humans

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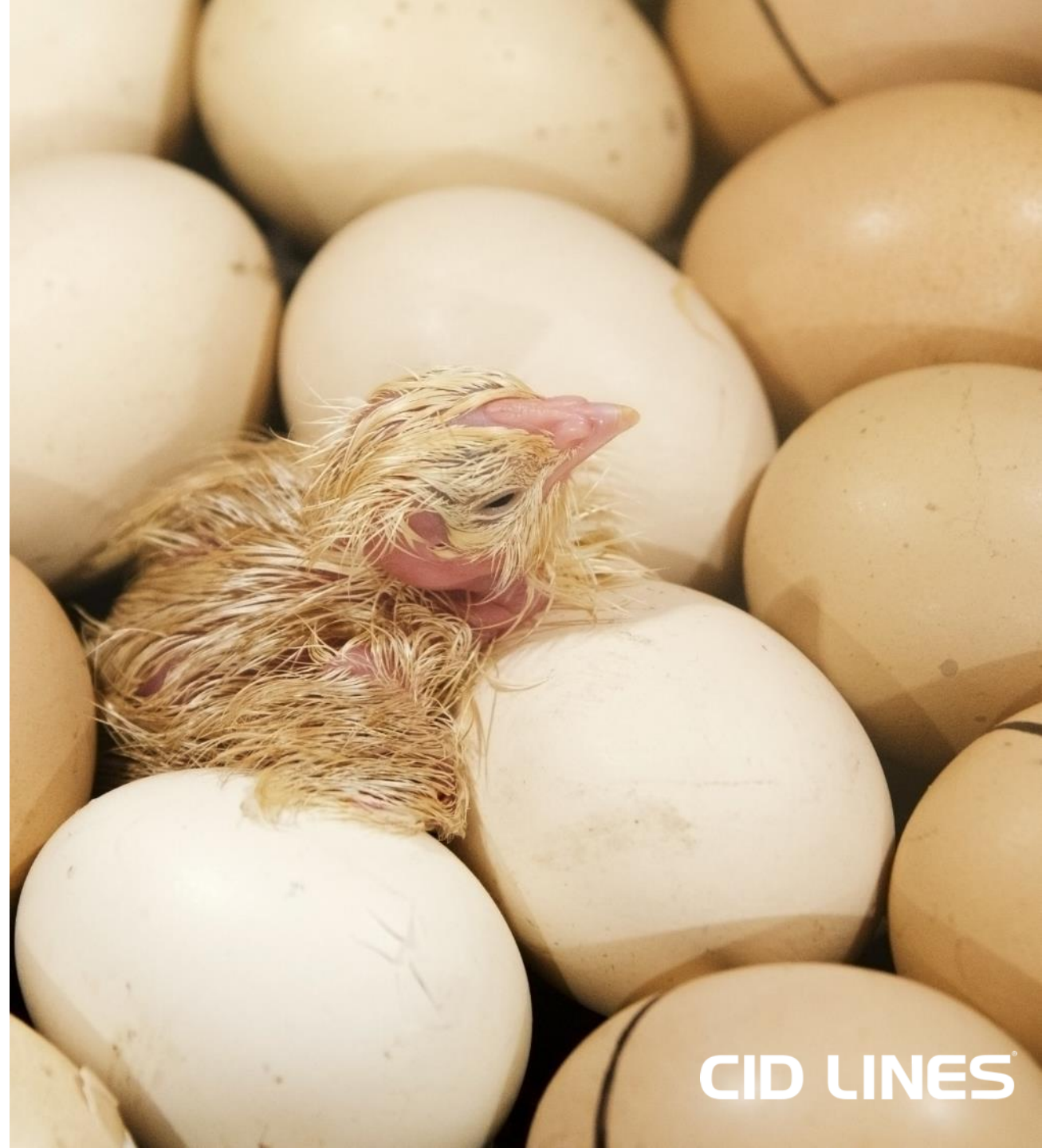
# Transmission



# Main vector

Contaminated birds themselves

via contaminated egg-shells



# Most of the salmonella

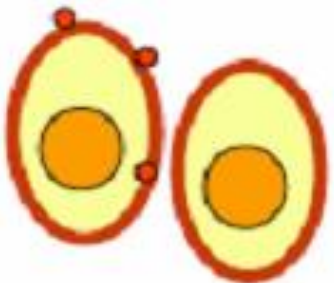
Limitation to the oral/fecal cycle

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

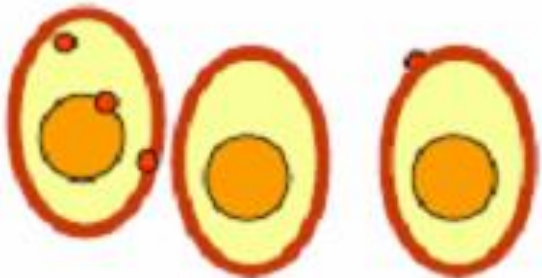
Multiplication in the digestive tract and shedding

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**

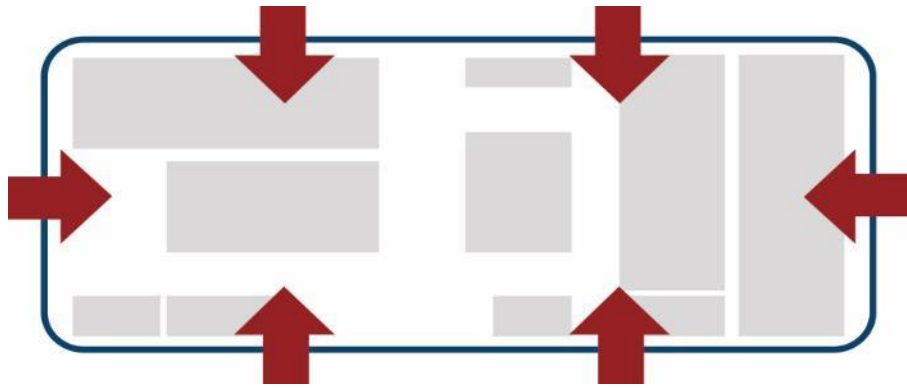
Regular **monitoring** of the total production chain

**Immediate action** when Salmonella is detected

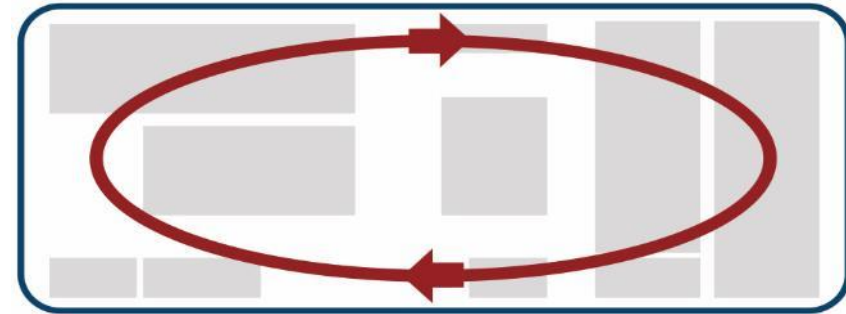




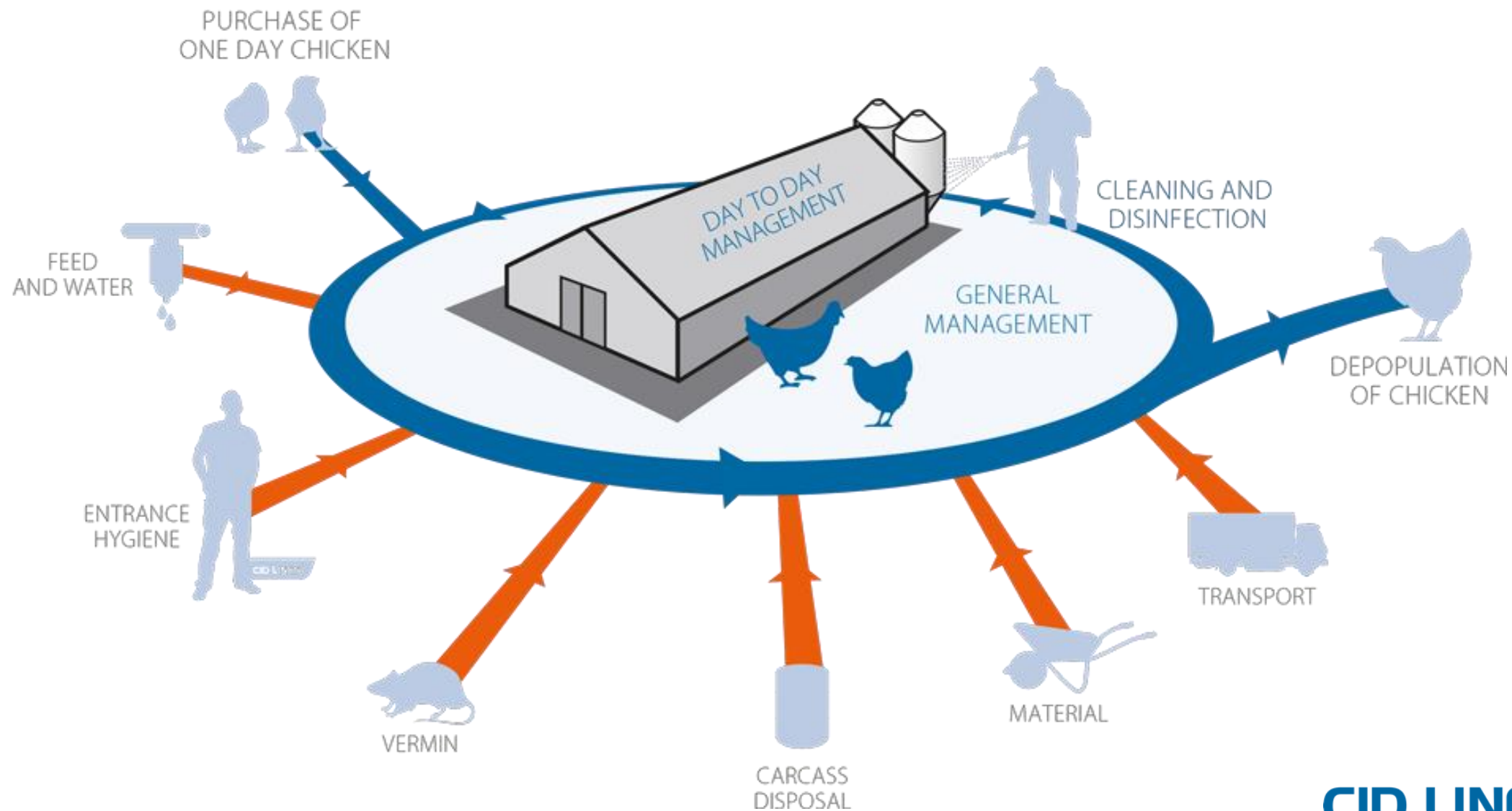
# Biosecurity



EXTERNAL BIOSECURITY



INTERNAL BIOSECURITY



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# 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

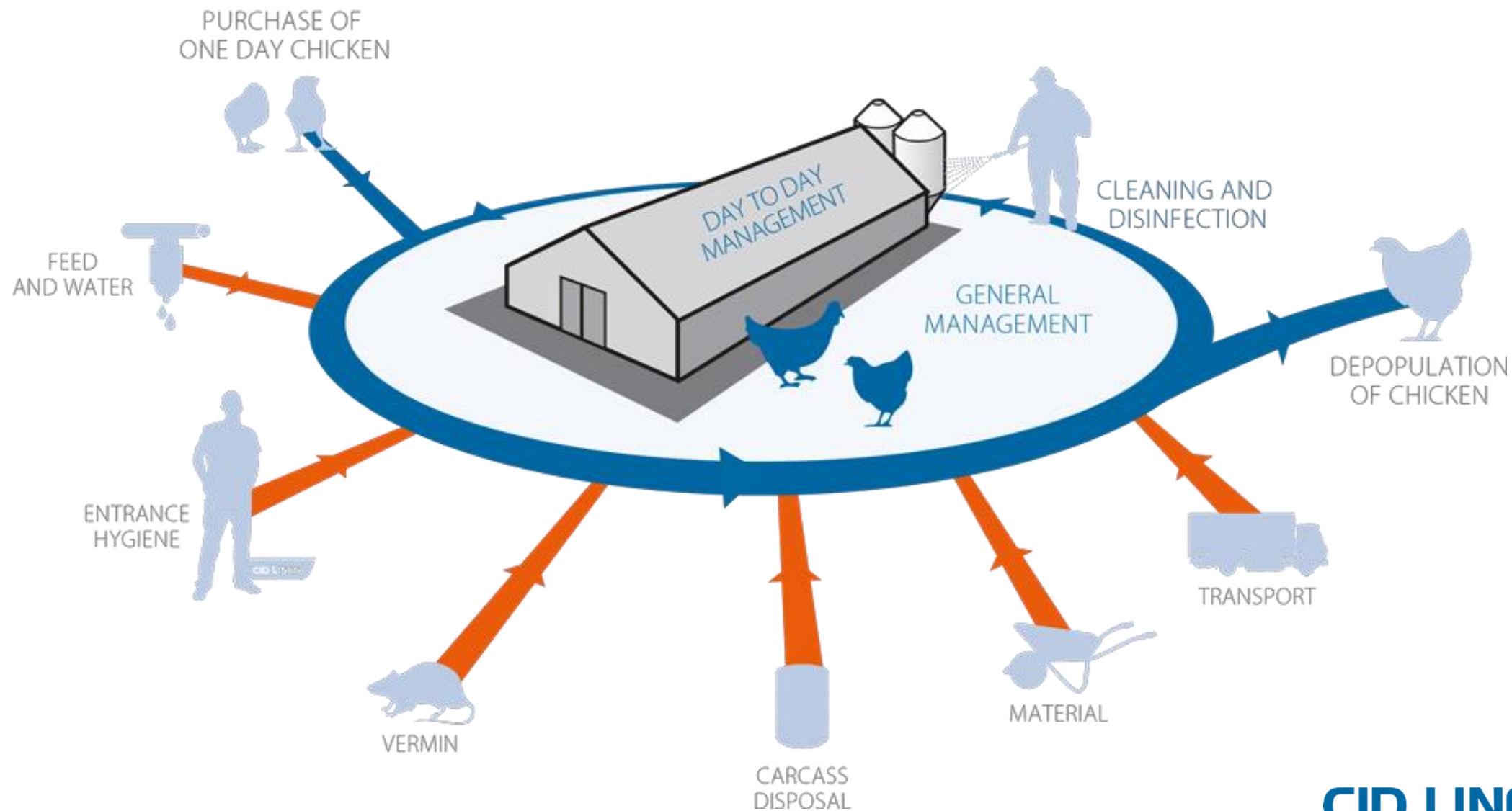
ODC come from **same supplier**

**first delivered** on your farm

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

**as few deliveries** as possible





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# Feed supply

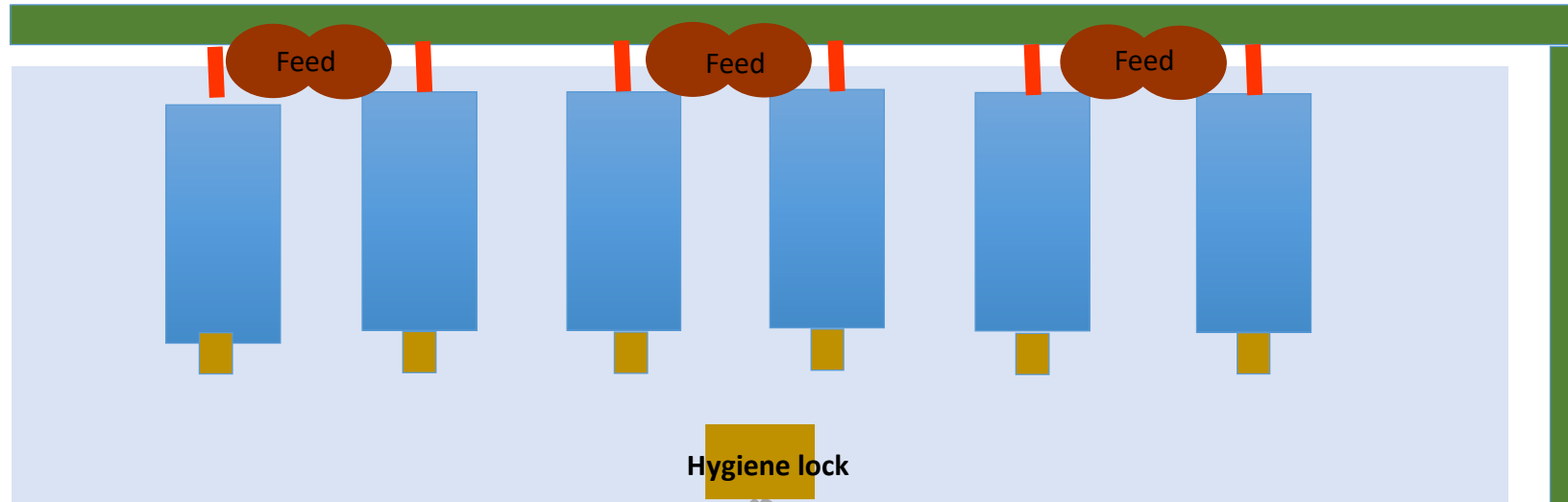
feed delivery along the **'dirty road'**

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

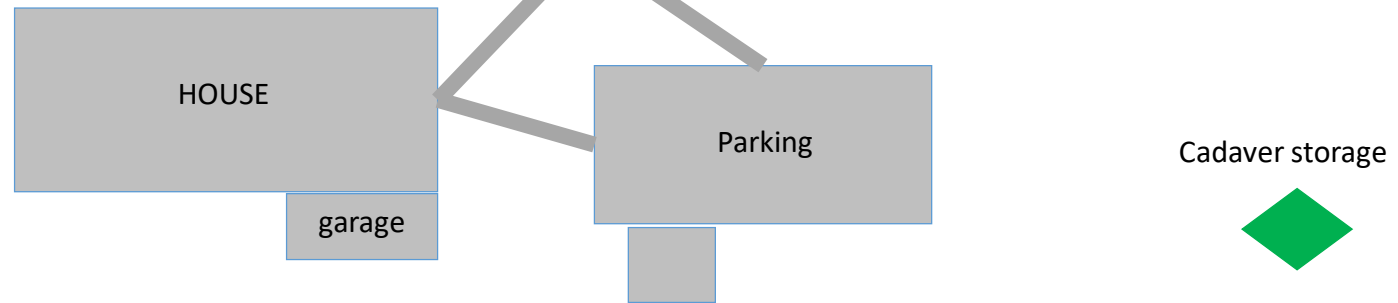
feed **silos well sealed** against water birds and vermin

**as few deliveries** as possible

DIRTY ROAD



CLEAN ROAD

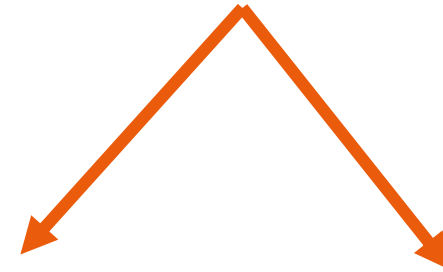


Public road



# 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



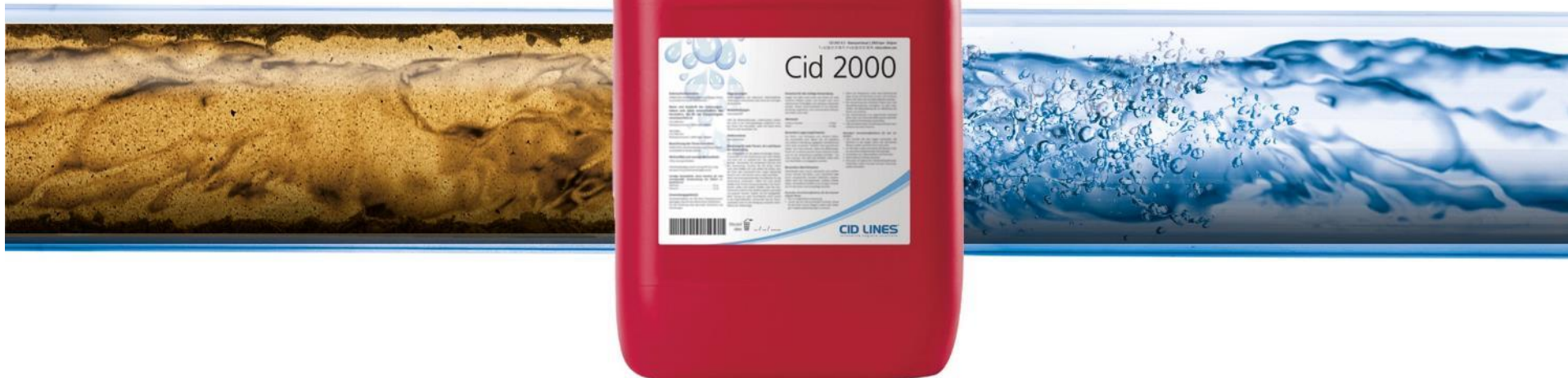
# Application at sanitary stop

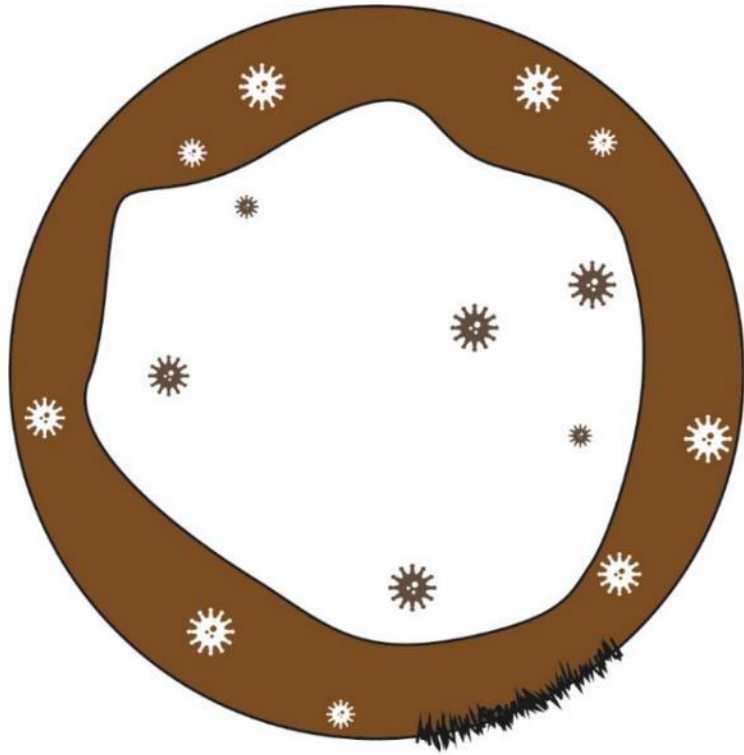
<b>1</b>	Empty the drinking water lines
<b>2</b>	Close all the lines off (except one)
<b>3</b>	Add CID 2000 2% until you're sure that the product is at the end of the line: reaction smell test strips
<b>4</b>	Trigger the nipples, so you can be sure that the product is also there
<b>5</b>	Close the line 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






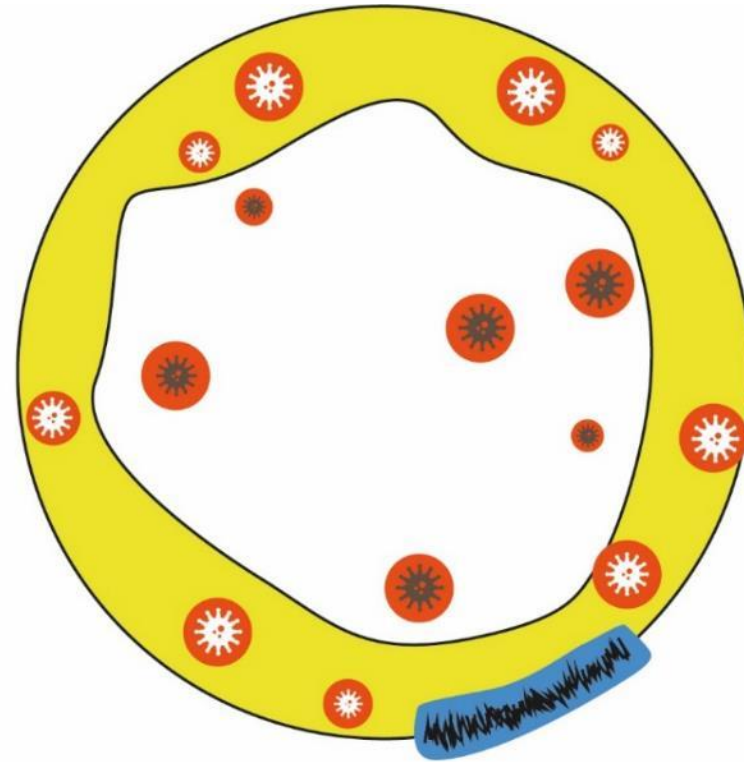
# Application during production cycle




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

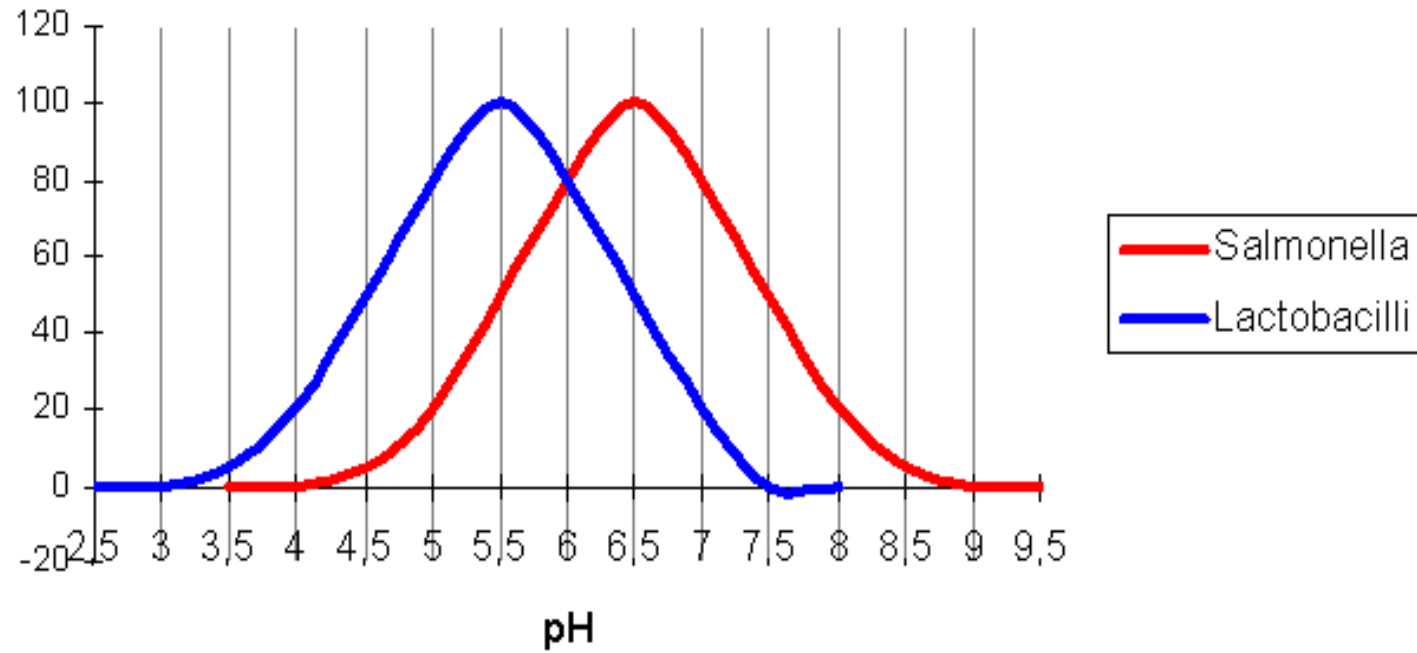
# Application during production cycle

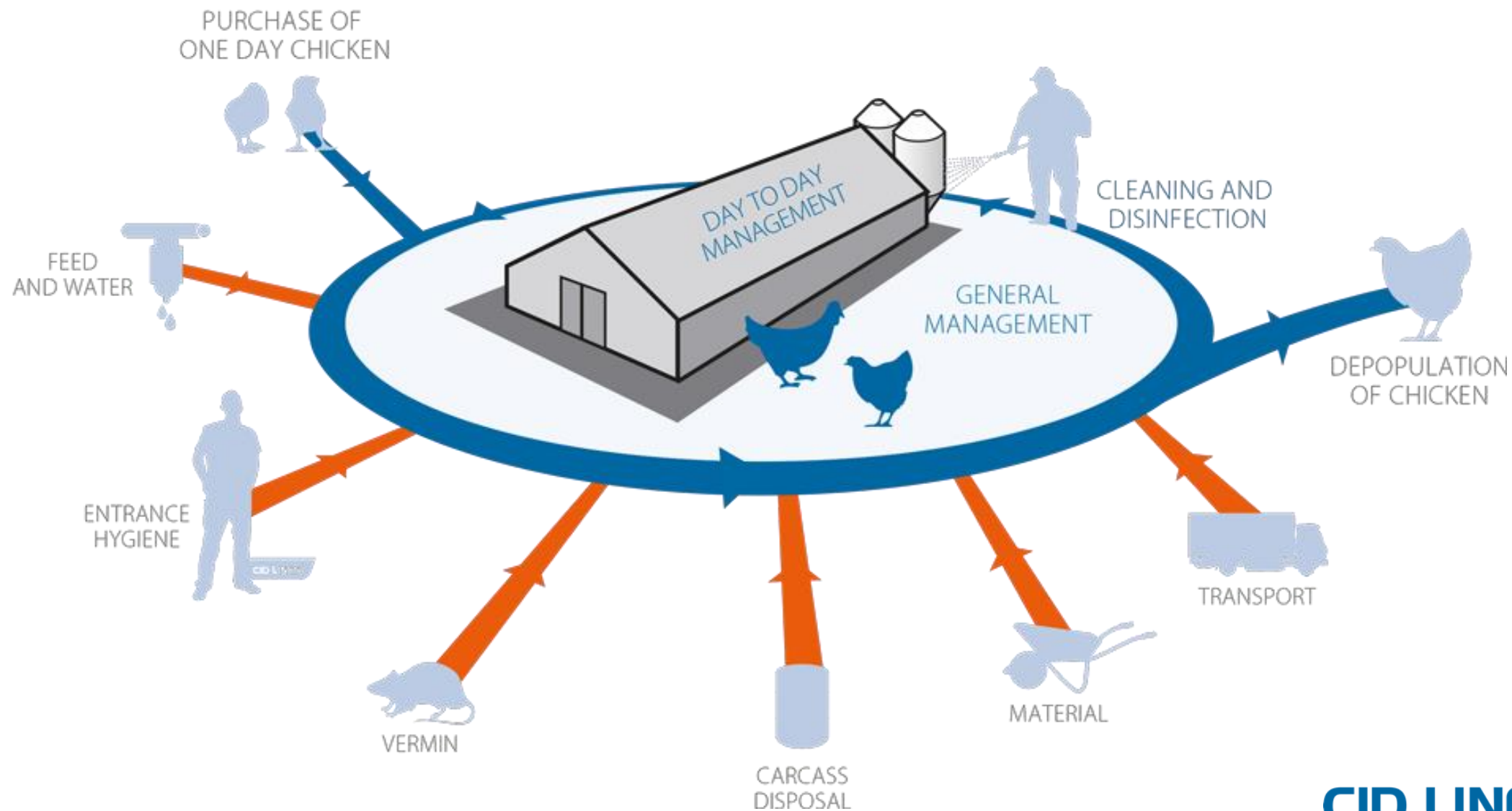
PRODUCT	DOSAGE	CONTACT TIME
Agrocid Super™ Oligo	300 – 500 ml / 1000 L	continue





**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**



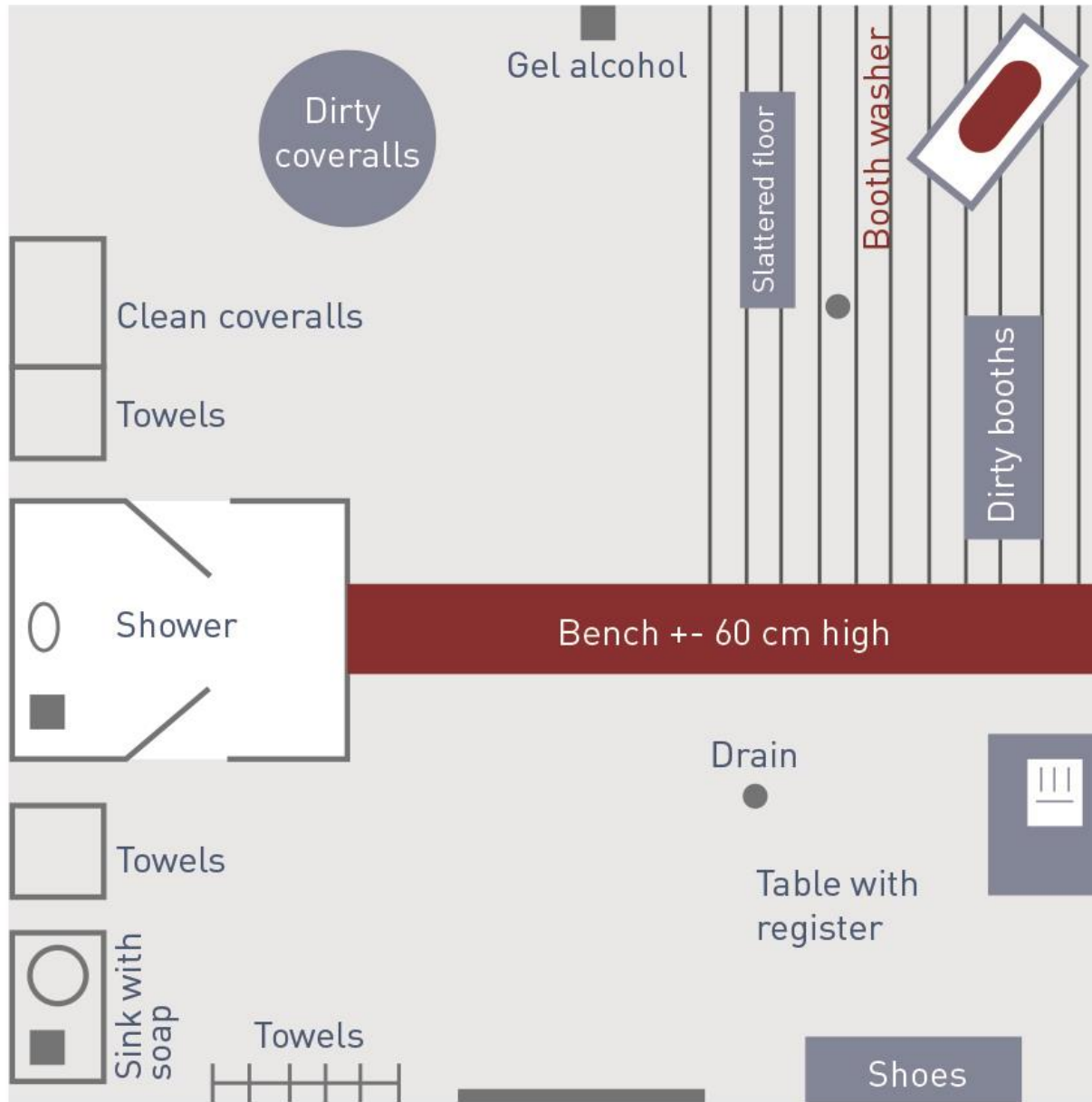
# Entrance hygiene

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**

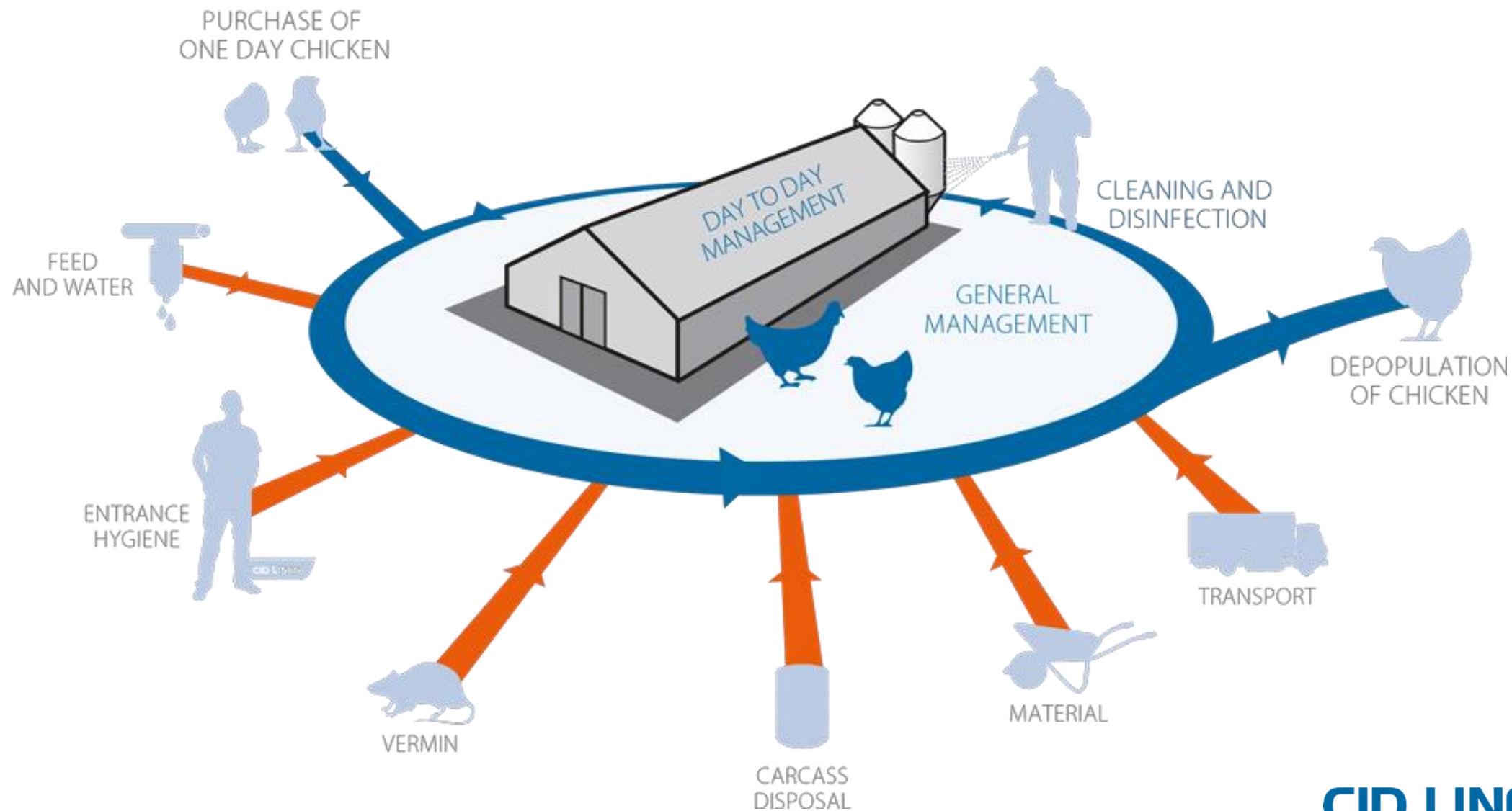


Renew  
Renew the solution regularly: 2-3 times/week



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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**







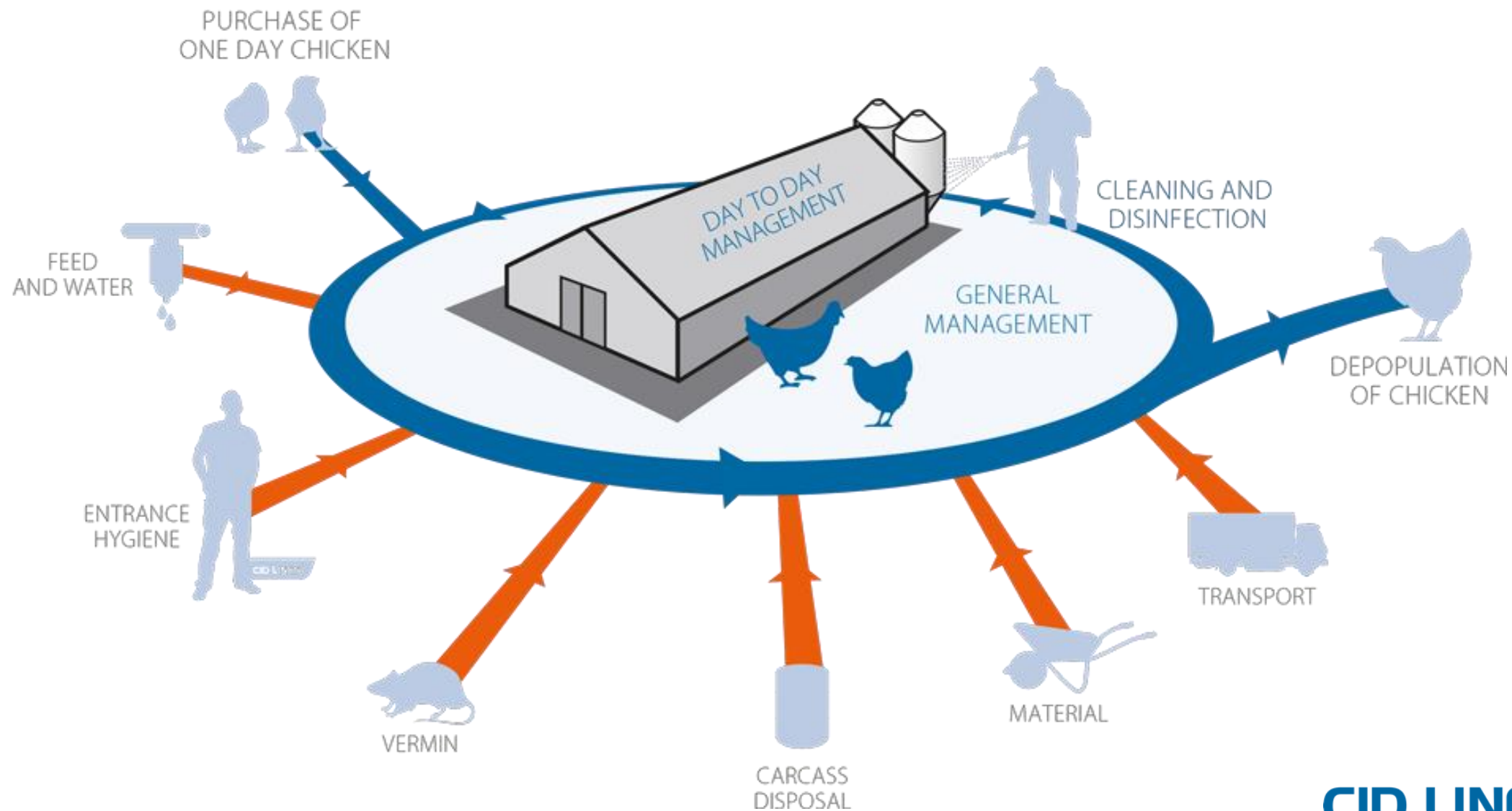




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# Carcass disposal

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

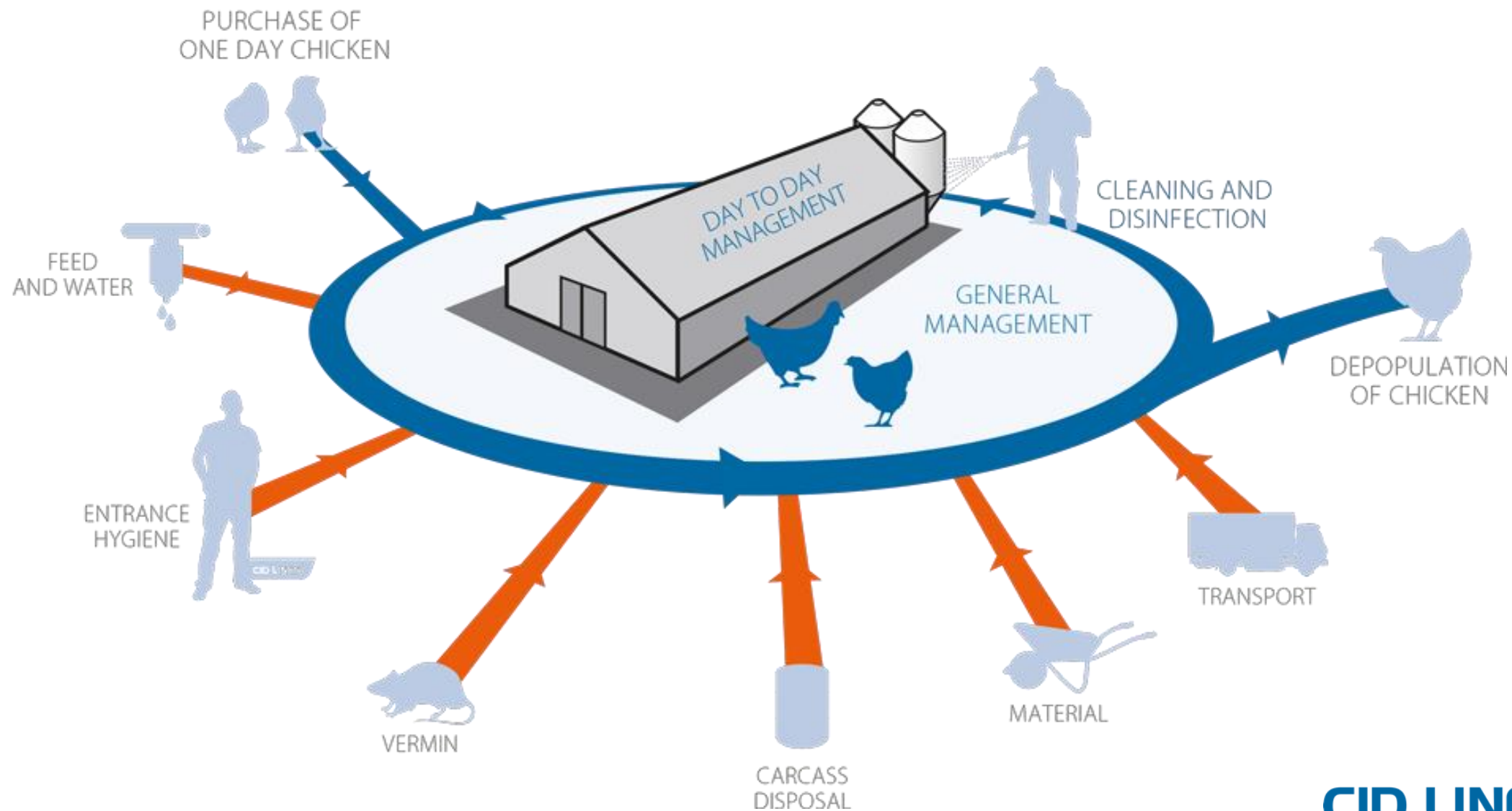


Disinfecting



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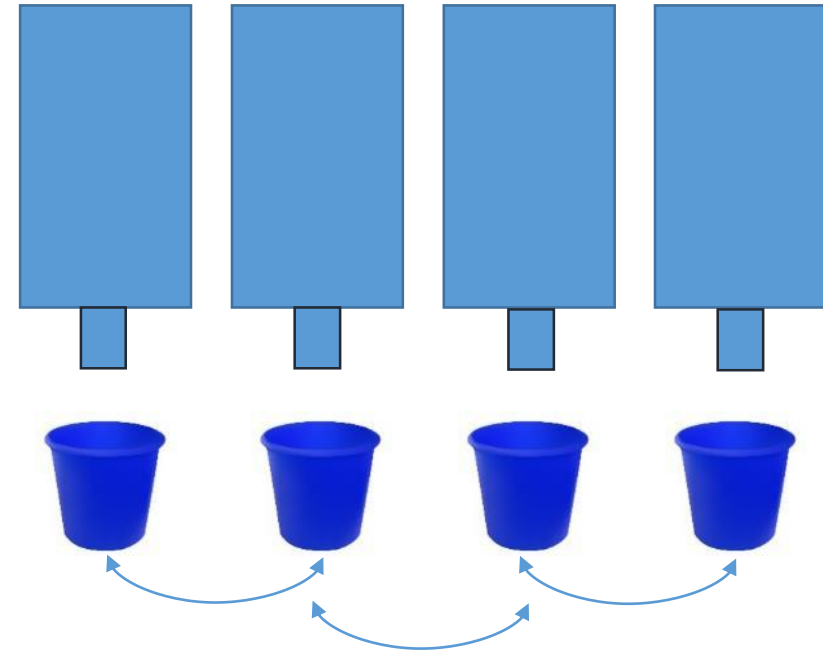
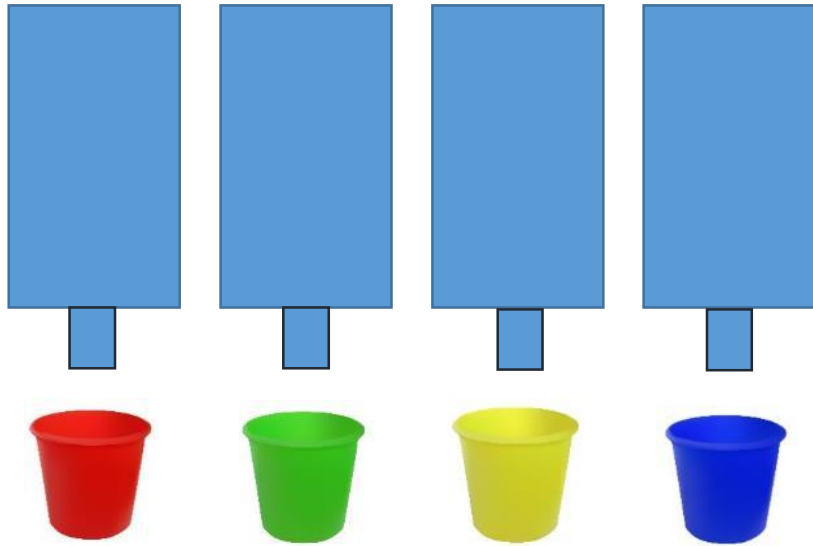
# Material

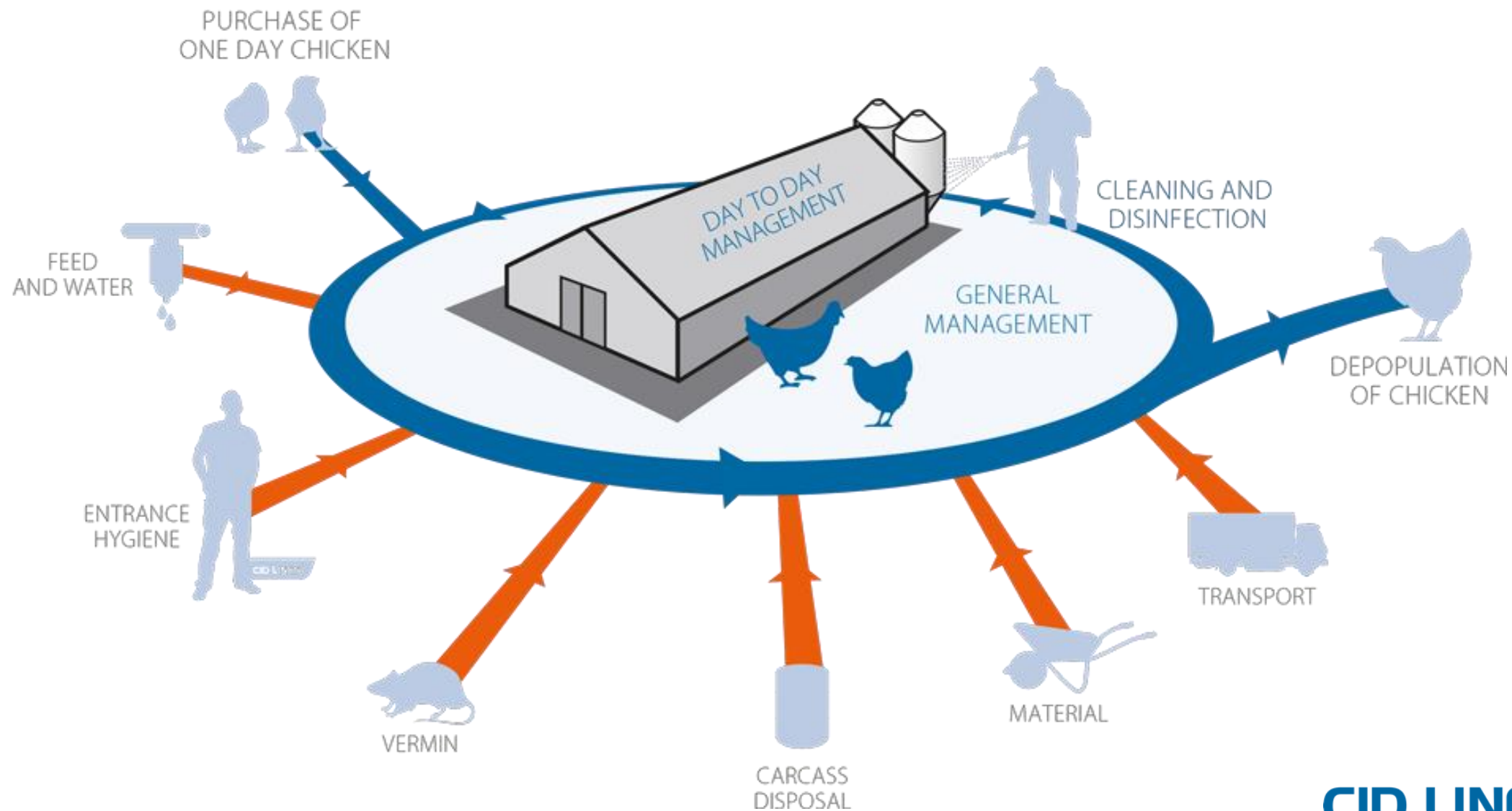
**Farm specific material**

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

**Cleaning and disinfection protocol**







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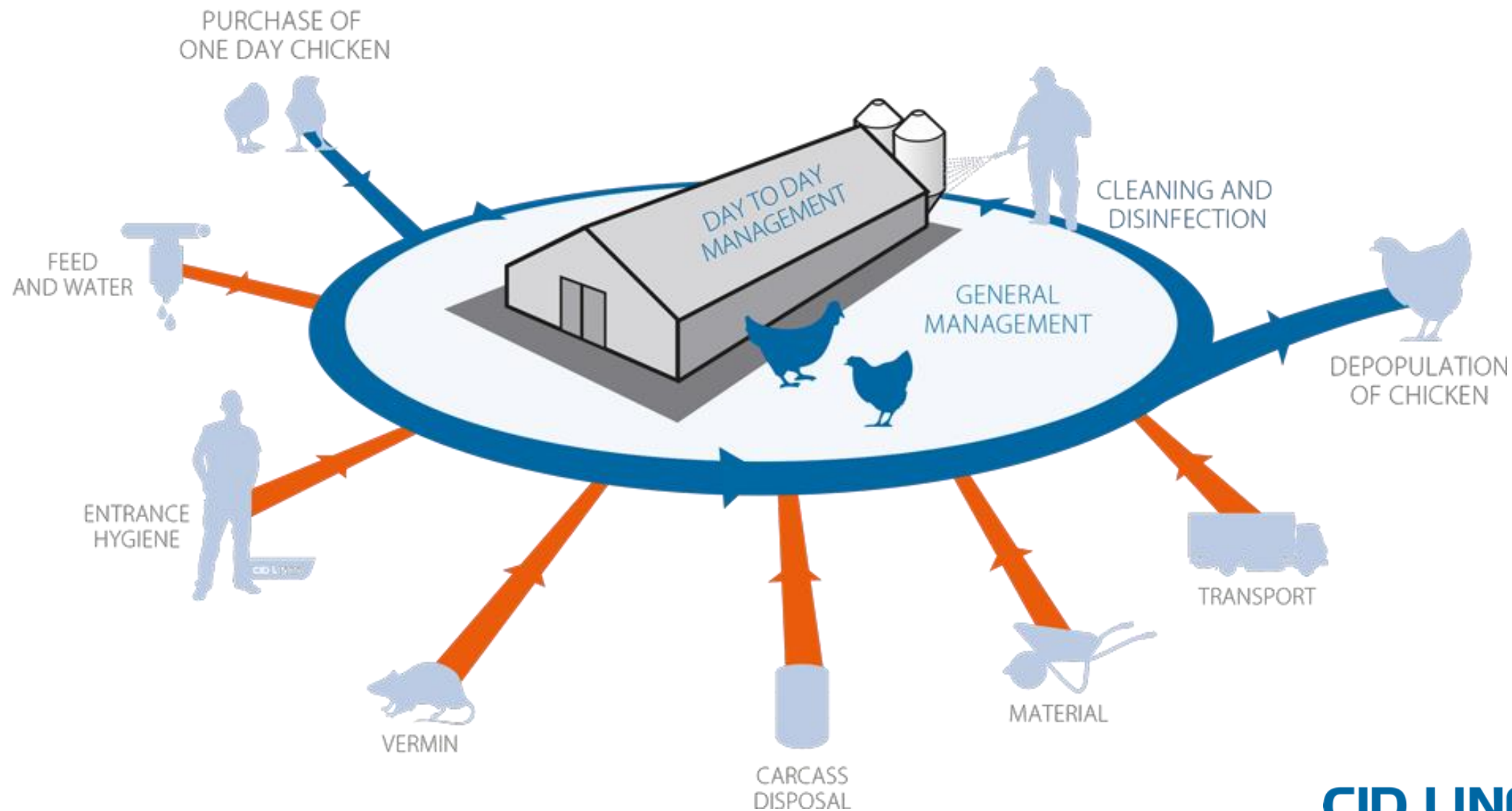
# BREAK THE ROUTES OF TRANSMISSION

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

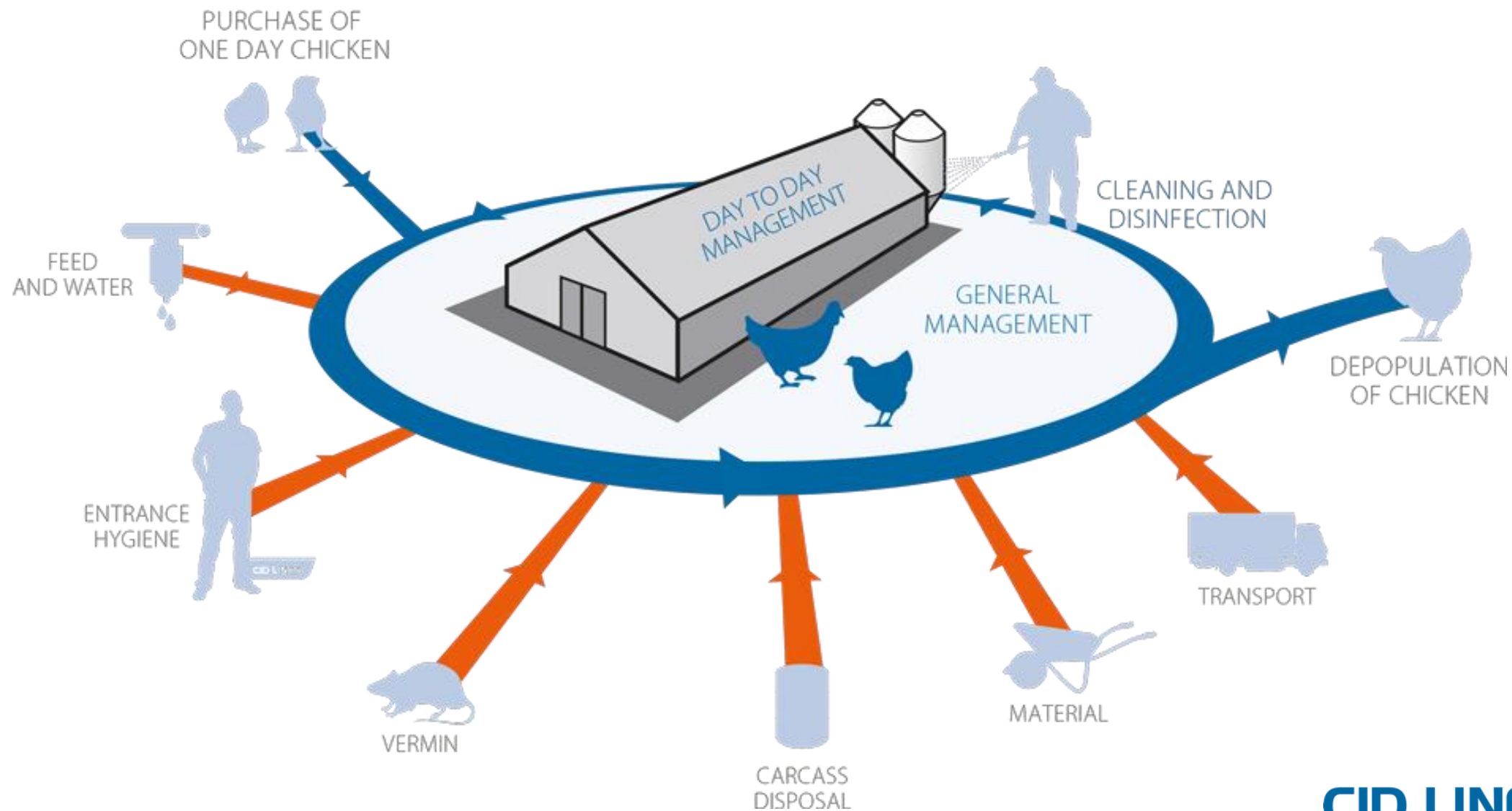
transport vehicle **cleaned and disinfected**

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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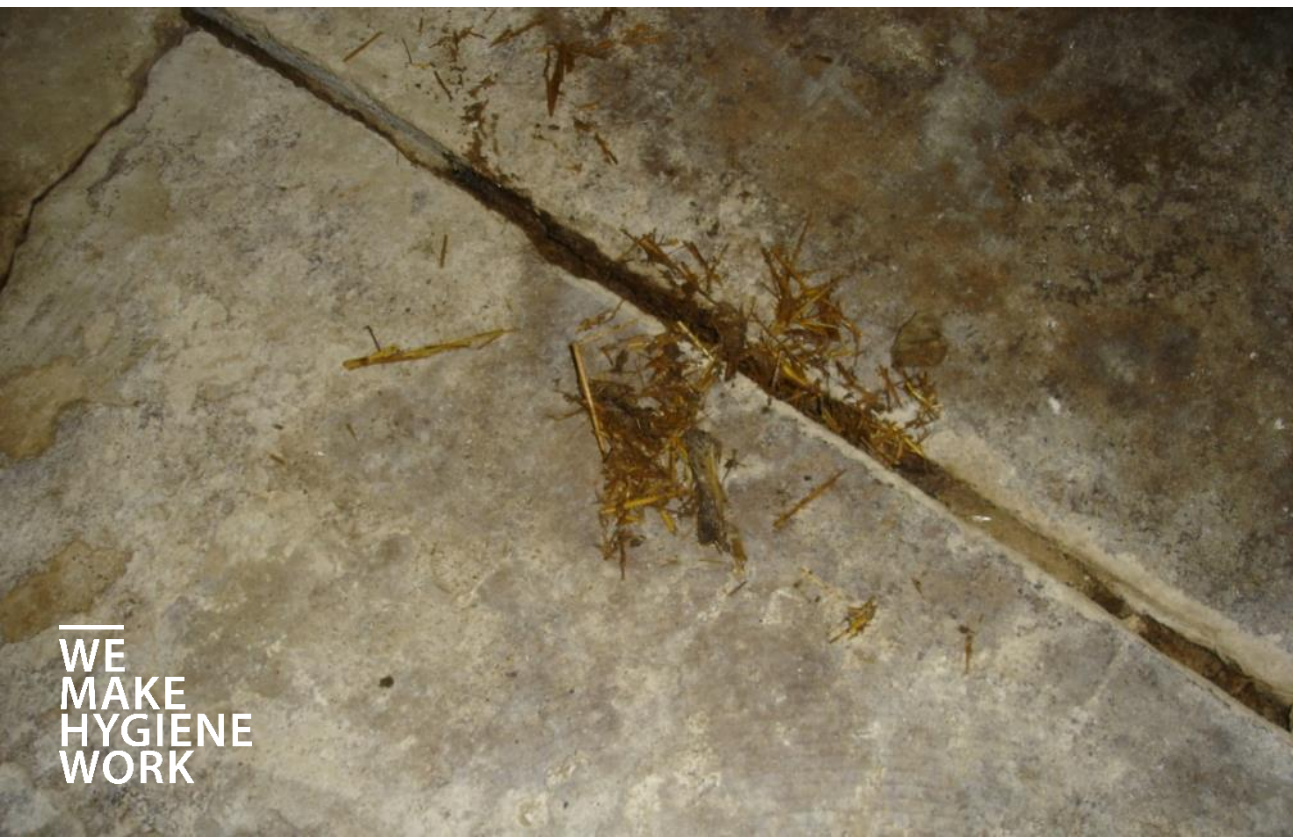
# Critical control points



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# Critical control points

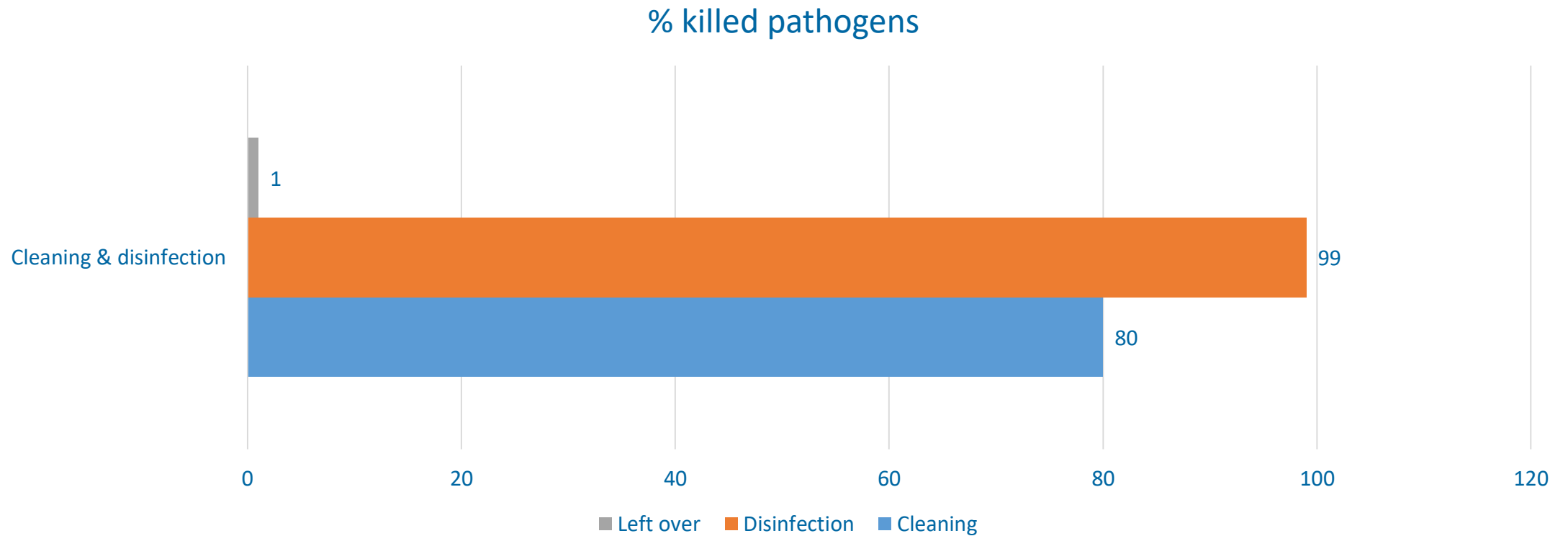


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# Cleaning and disinfection



# 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





# How to control and prevent Salmonella in the field?

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