



INTERNATIONAL

The key to your profit!



Vaccination Techniques in alternative production systems

Vaccines

Live attenuated vaccines

- Mass or individual administration
- Storage condition are critical (temperature)



Inactivated vaccines

- Only individual administration (injection)
- Storage condition should be respected



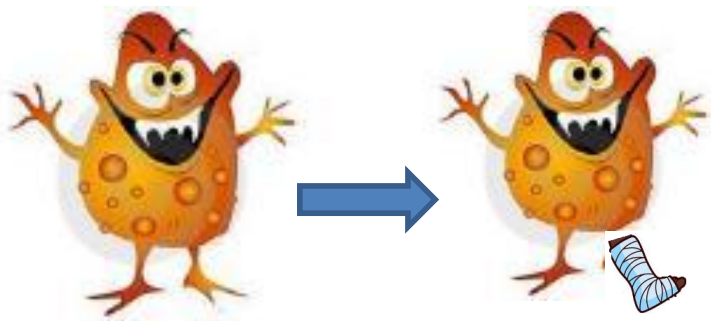
Vectored vaccines

- Only individual administration
- Storage condition are critical (temperature)



Others

Live vaccines



A weakened living pathogen that retains all of its antigenic properties, but can no longer cause a pathological condition

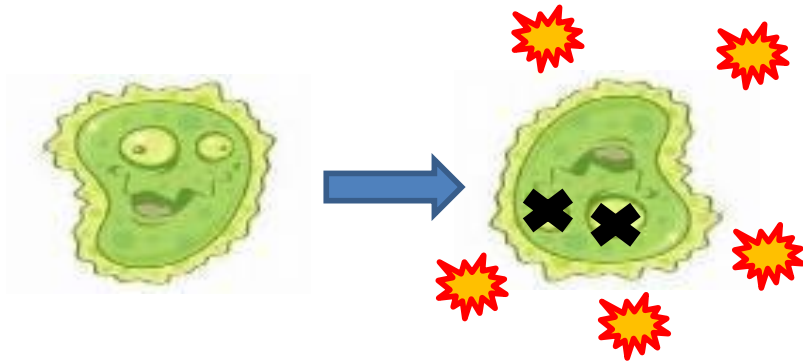
Advantages

- humoral + cell-mediated immunity
- Rapid onset of protection
- Easy mass application
- No adjuvants needed

Disadvantages

- Vaccine agent is present in poultry population
- Possibility of shedding of the vaccine agent
- Post vaccinal reactions are more likely

Inactivated vaccines



A killed pathogen so it cannot replicate at all but remains immunogenic. It requires an adjuvant to induce immune response

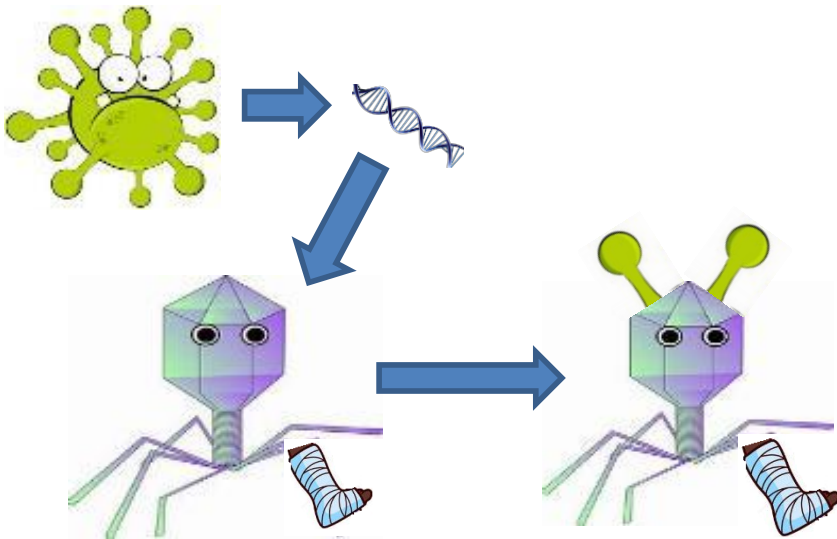
Advantages

- No introduction of a “new living agent”
- No vaccine reactions
- Accurate individual vaccination

Disadvantages

- Slow onset of protection
- Humoral immunity only
- High labour costs for application
- Bacterins may cause local reactions

Vectored vaccines



A weakened living virus (the vector) that is used to express, by insertion of the genes for protection against a second virus (the donor), antibodies also against this donor virus by multiplication

Advantages

- No shedding of the donor virus
- No vaccine reactions for the donor virus
- It is possible to administer at hatchery

Disadvantages

- No specific local immunity for the donor virus
- Accurate individual vaccination is essential
- Only one vaccine for vector virus can be applied

An universal vaccination program ?

Vaccination Program for Commercial Layers ^a			
Age	Vaccine	Route	Type
1 day	Marek's disease	SC	Turkey herpesvirus and SB-1
14 -21 days	Newcastle/infectious bronchitis	Water	B1/Mass
14-21 days	Infectious bursal disease	Water	Intermediate
5 wk	Newcastle/infectious bronchitis	Water or coarse spray	B1/Mass
8-10 wk	Newcastle/infectious bronchitis	Water or coarse spray	B1 or LaSota/Mass
10-12 wk	Encephalomyelitis	Wing web	Live, chick-embryo origin
10-12 wk	Fowlpox	Wing web	Modified live
10-12 wk	Laryngotracheitis	Intraocular	Modified live
10-14 wk	<i>Mycoplasma gallisepticum</i> ^b	Intraocular or spray	Mild live strain
or 18 wk		Parenteral	Inactivated
12-14 wk	Newcastle/infectious bronchitis	Water or aerosol	B1 or LaSota/Mass
16-18 wk	Newcastle/infectious bronchitis	Water or aerosol	B1 or LaSota/Mass
Every 60-90 days or 18 wk	Newcastle/infectious bronchitis	Parenteral	Inactivated



Merck veterinary manual

Vaccination program should be tailor-made



Key points in vaccines administration

1. Respect the timing according the vaccine program

2. Keep records on each vaccine administration

3. Administer vaccines only to healthy flocks

S. No.	Age	Vaccine	Route of administration
1	First day	Marek's disease	Under skin
2	5 th day	Raniket disease (F/B)	I/O or I/N
3	7 th day	Marek's disease booster	Under skin
4	10 th day	Debeaking	-
5	12-14 th day	Marek's disease - Intermediate	Eye
6	20-22 nd day	IBD Plus	I/O / water
7	27 th day	LaSota	water
8	30 th day	Infectious Bronchitis(IB)	water
9	42 nd day	Fowl Pox	wing
10	47 th day	Deworming	water
11	52 nd day	LaSota	water
12	64 th day	R ₂ B	I/M
14	86 th day	Coryza / Fowl Cholera	Under skin
15	93 rd day	IB	water
16	100 day	Debeaking (second time)	-
17	110 th day	Deworming	water
18	112 th day	LaSota	water
19	126 th day	RD - Killed	Under skin
20	280 th day	Deworming / LaSota	water



- Age of birds
- Date of vaccination
- Route of administration
- Withdraw period
- Prescription order no
- Vaccine type
- Batch number
- Expiration date
- Person administering the vaccine

Key points in vaccines administration

4. NEVER CUT DOSES !!!

10^8

$10^8?$

$10^8?$

$10^8?$

$10^8?$

$10^8?$

$10^7?$

$10^6?$

$10^4?$

10^4

CUTTING VACCINE DOSES CONSEQUENCES:

1. NO SCIENTIFIC EVIDENCE THAT VACCINE
WILL PROVIDE PROTECTION

2. NO SAFETY MARGIN IN THE VACCINATION
PROCEDURE

Key points in vaccines administration

5. Transport & store vaccines correctly

Follow strictly the manufacturers recommendations

LIVE & LYOPHIZED VACCINES

- ⑩ Temperature strictly 2-8 °C
- ⑩ Protect from direct sunlight
- ⑩ Do not freeze

NEVER BREAK
THE COLD CHAIN

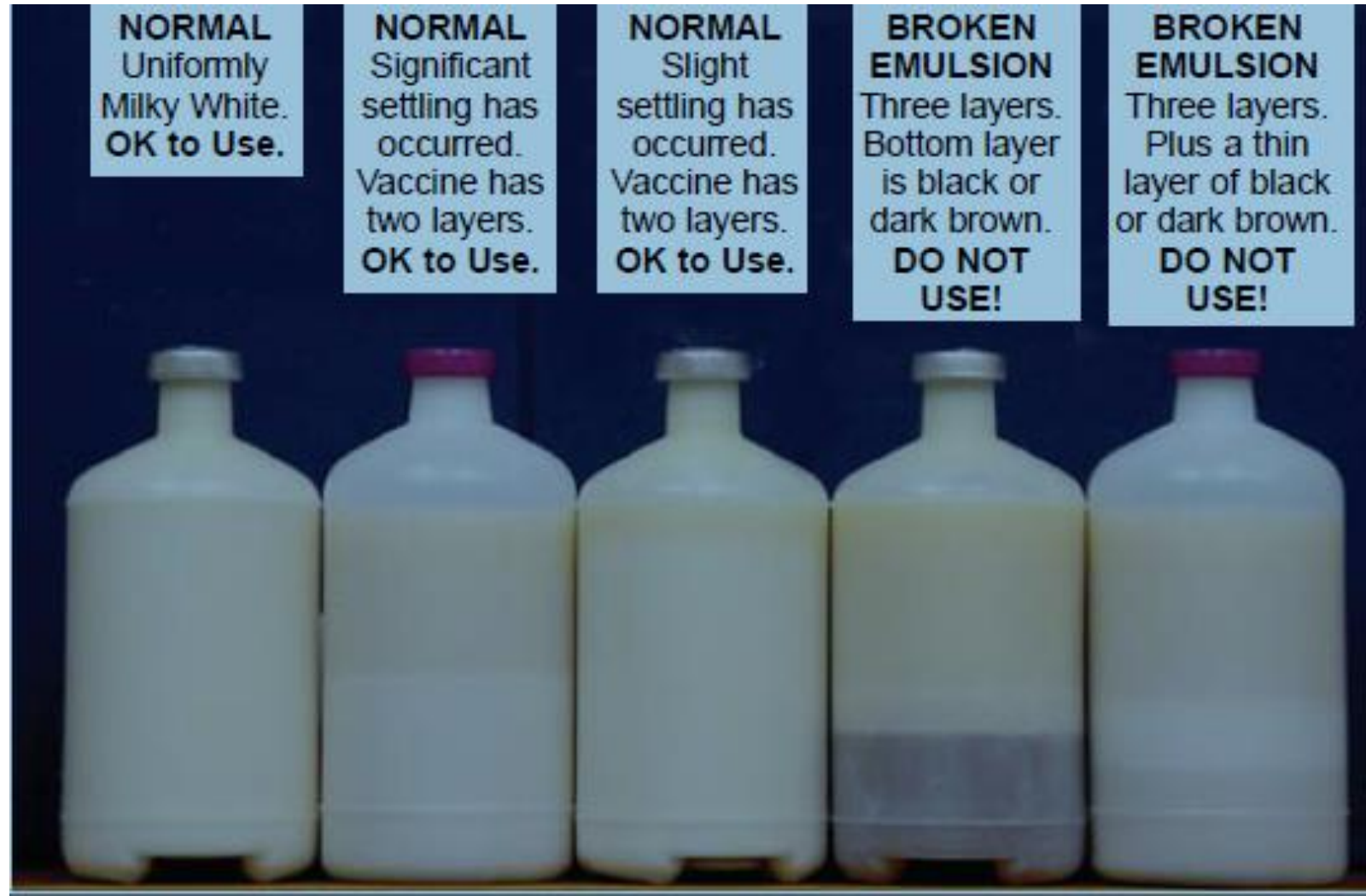
INACTIVATED & EMULSIONATED VACCINES

- ⑩ Recommended temperature 2-8 °C
- ⑩ Protect from direct sunlight
- ⑩ Do not freeze

DO NOT BREAK THE
EMULSION



Inactivated vaccines storage



NORMAL
Uniformly
Milky White.
OK to Use.

NORMAL
Significant
settling has
occurred.
Vaccine has
two layers.
OK to Use.

NORMAL
Slight
settling has
occurred.
Vaccine has
two layers.
OK to Use.

**BROKEN
EMULSION**
Three layers.
Bottom layer
is black or
dark brown.
**DO NOT
USE!**

**BROKEN
EMULSION**
Three layers.
Plus a thin
layer of black
or dark brown.
**DO NOT
USE!**

Administration routes

Mass administration



Drinking water



Spray

Administration route is a
essential part of the
veterinarian prescription



RESPECT IT STRICLY !!

Individual administration



Eye Drop

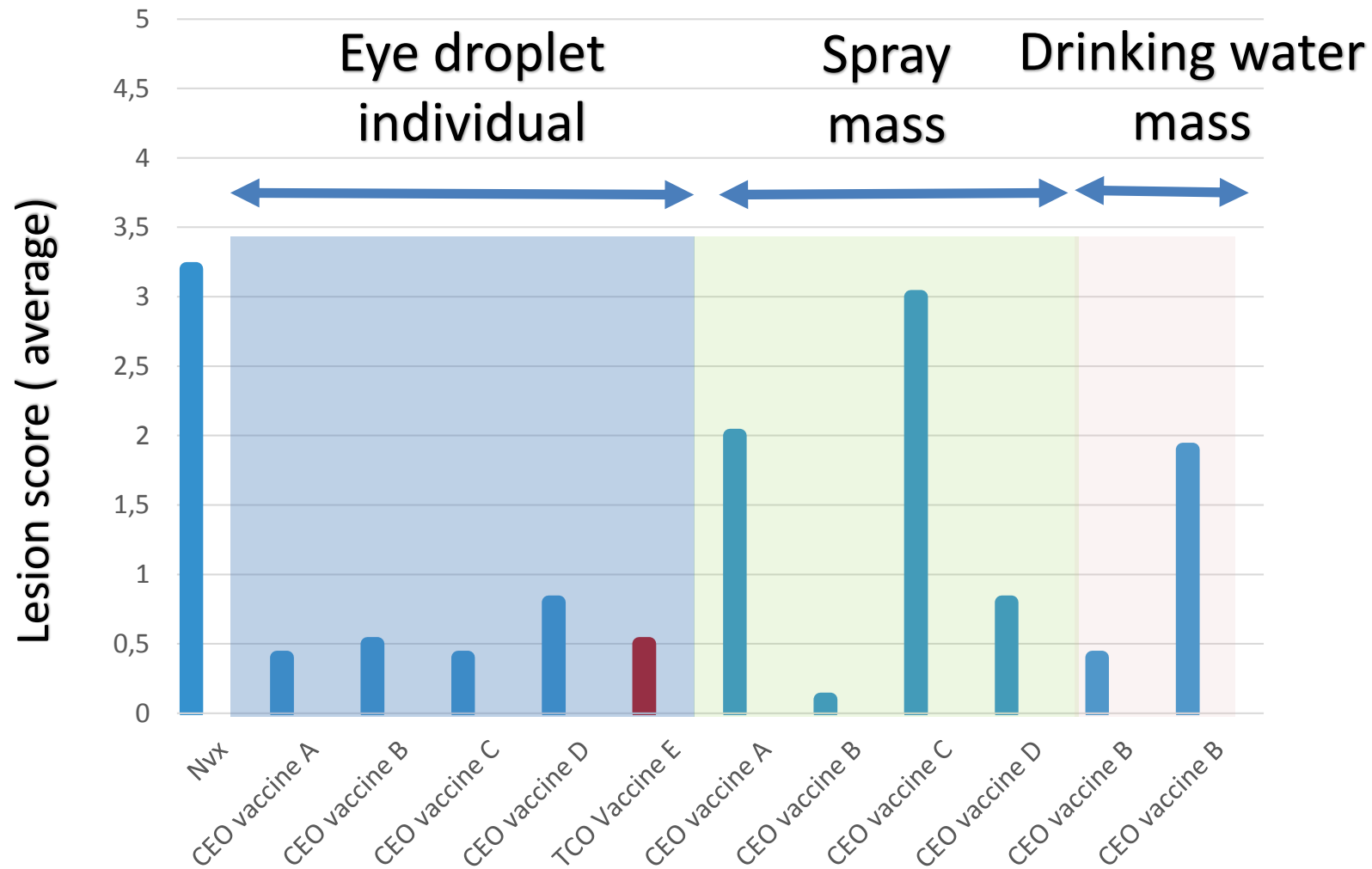


Injection



Wing inoculation

Live ILT Vaccine administration



Source: R. Fulton



DRINKING WATER VACCINATION

Available vaccines against:

- IB
- ND
- ILT
- AE
- SE
- IBD

- Local protection
 - Digestive tract
 - (Respiratory tract)
- Mass application
- Appropriate method of administration for most live vaccines



DRINKING WATER VACCINATION

VACCINATION PROCEDURES



Vaccine storage

Water privation

Vaccine reconstitution

Vaccine distribution

Vaccine consumption

1. Cold chain break

1. Disinfectant in material

1. Disinfectant in water

1. Poor coverage



Water privation

Objective: make the whole flock to get thirsty

- All the birds feels attired by water and will use the drinker as soon as water will be available again
- Water consumption is augmented during vaccination

- Too thirsty: bird will contest for water and drink in excess.
- Not enough thirsty: bird will be not specially attired by water

Privation time

Flock age

Temperature

Drinking water vaccine preparation



OR



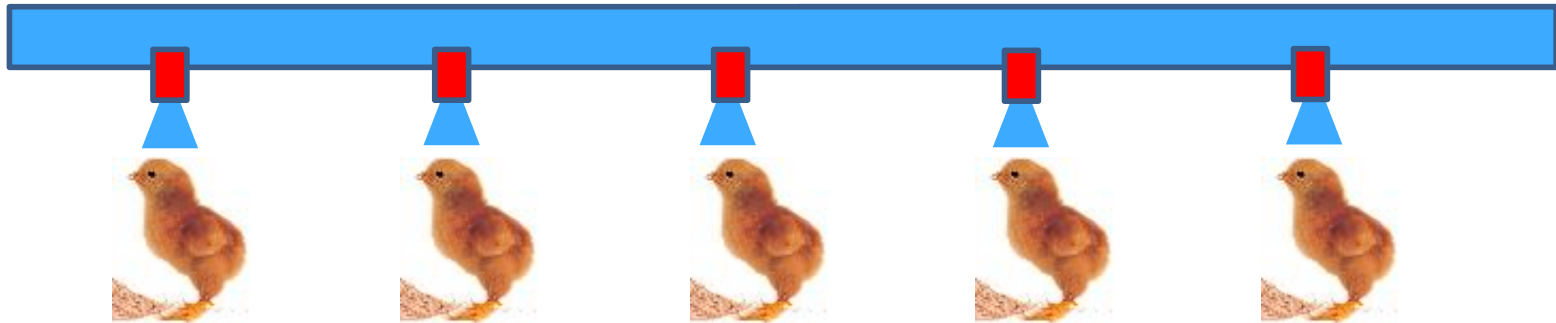
USE DYE FOR BETTER
MONITORING

NO CHLORINE
(OR ANTIBIOTICS) IN
THE WATER

USE WITHIN 2 HOURS

Drinking water vaccination failures

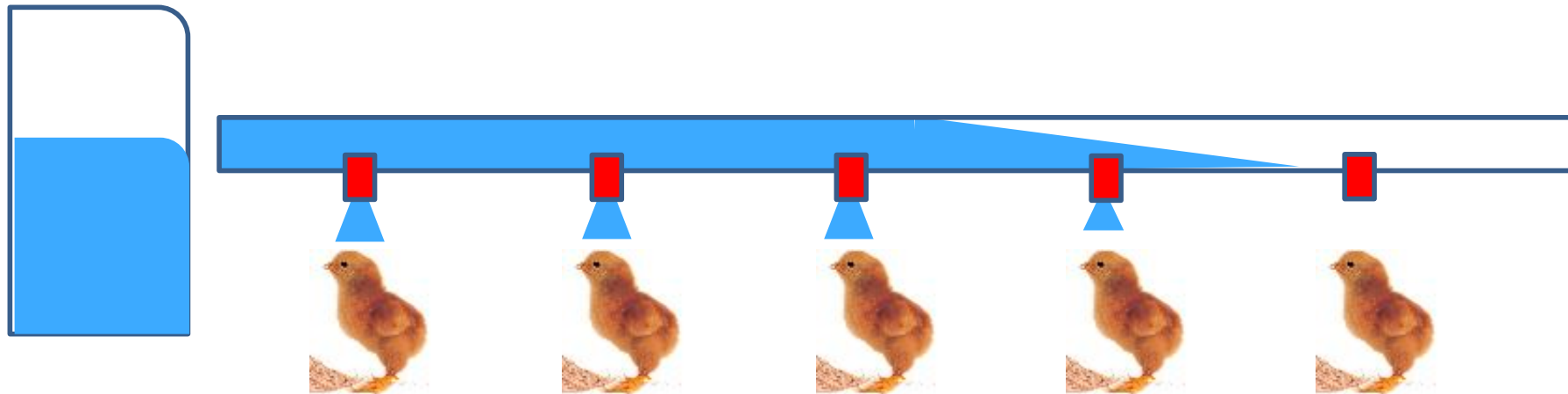
TOO MUCH WATER



CONSEQUENCE	Vaccine is not taken within 2 hours
EXACERBATING FACTORS	Young chicks, short privation time
CORRETIVE MEASURES	Calculate accurately the water volume
WARNING LOG	Vaccine intake time

Drinking water vaccination failures

TOO FEW WATER

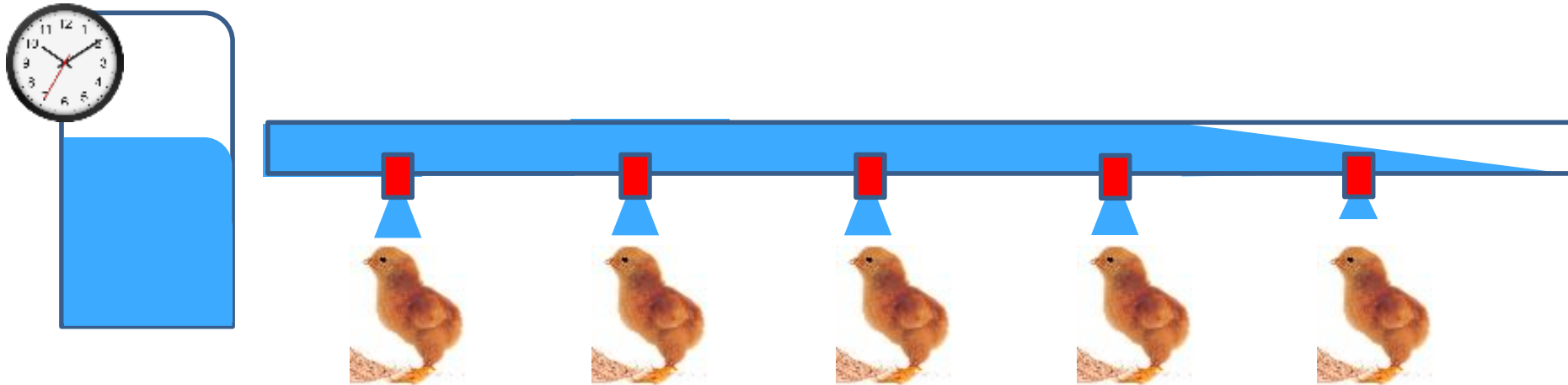


CONSEQUENCE	Poor coverage
EXACERBATING FACTORS	Old chicks, Long privation period, High temperatures, High stock density
CORRECTIVE MEASURES	Calculate accurately the water volume, Shorten privation period, Temperature
WARNING LOG	Dye control



Drinking water vaccination failures

NOT ENOUGH PRESSURE IN THE PIPELINES

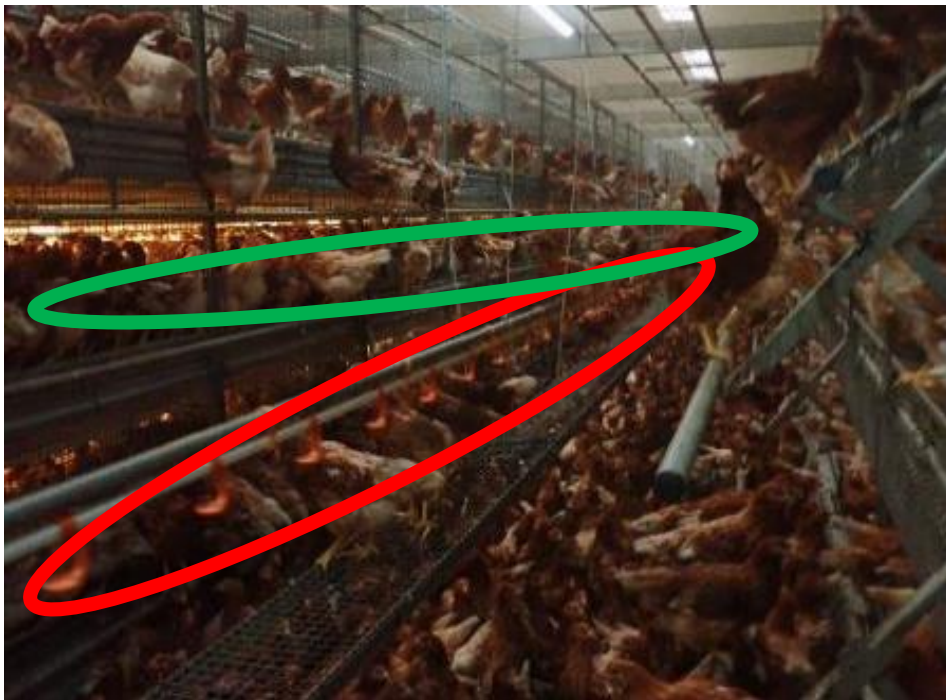


CONSEQUENCE	Vaccine is not taken within 2 hours Poor coverage
EXACERBATING FACTORS	Old chicks, Long privation period, High temperatures, High stock density
CORRETIVE MEASURES	Use pression pump, shut down lights when distributing the vaccine
WARNING LOG	Dye control, Vaccine intake time



Water training pipe lines

Do not use the training water pipe lines for vaccination.
Keep them out of service

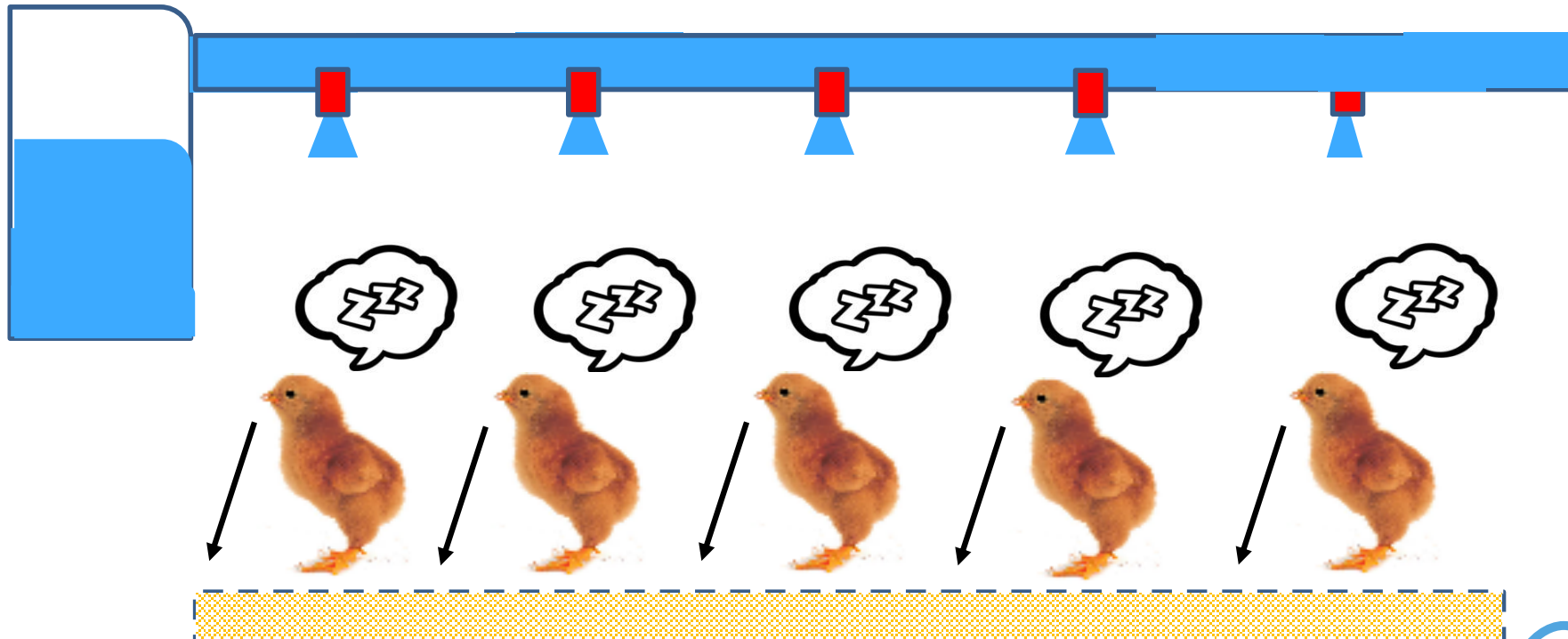


Water vaccination

50 % vaccine doses
90 min water consumption



Around 30
min before
lighting on



SPRAY VACCINATION

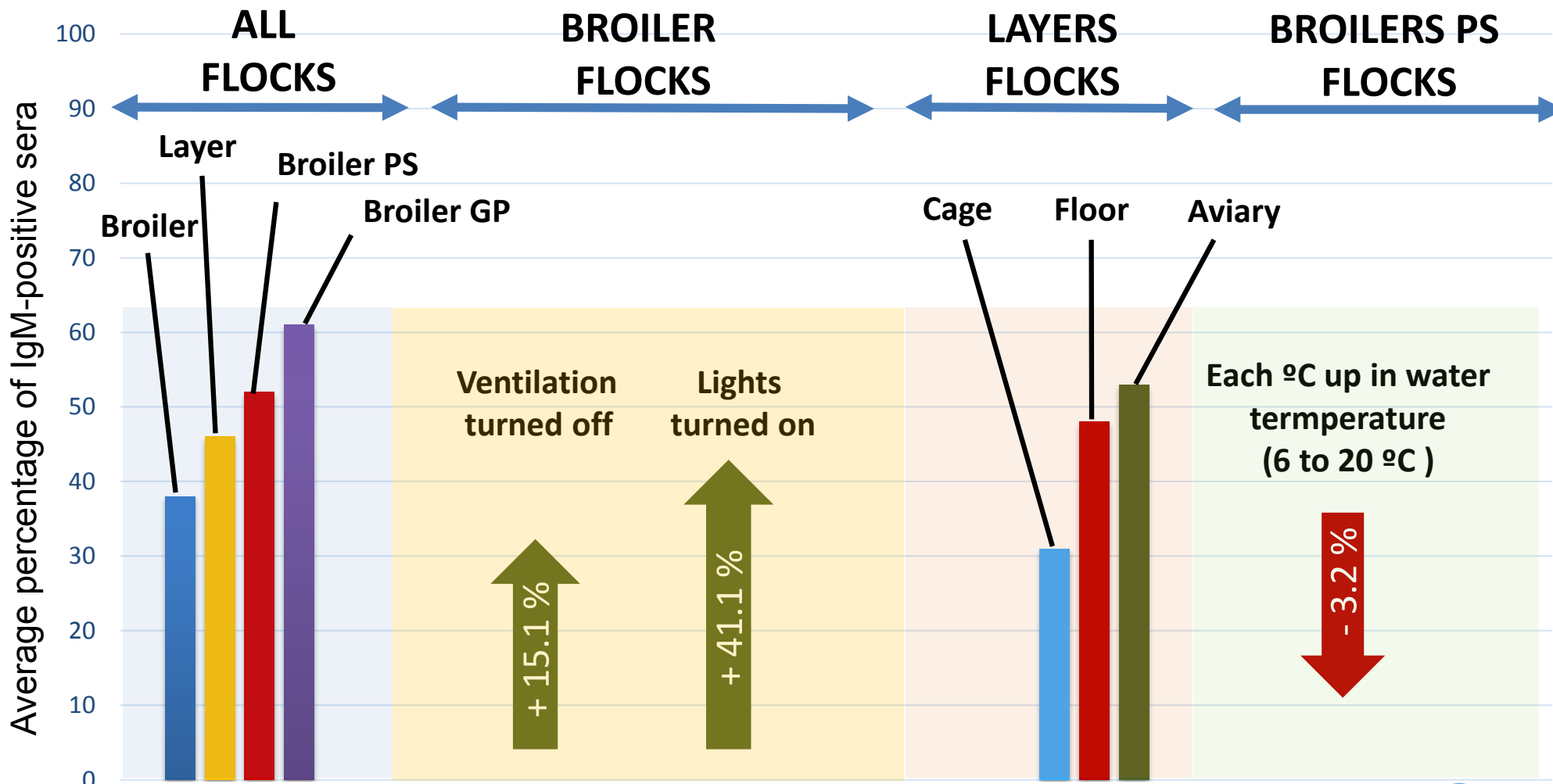
Available vaccines against:

- IB
- ND
- ILT
- MG
- MS
- AMPV

- Local protection
 - Respiratory tract
- Mass application
- Used for vaccines that should replicate in the respiratory tract



Spray vaccine administration



De Witt, 2010



Spray vaccination

VACCINATION PROCEDURES



Vaccine storage

Vaccine reconstitution

Set sprayer

Application

1. Cold chain break

1. Disinfectant in material or water

1. Incorrect droplet size

1. Poor coverage

Drinking water vaccine preparation

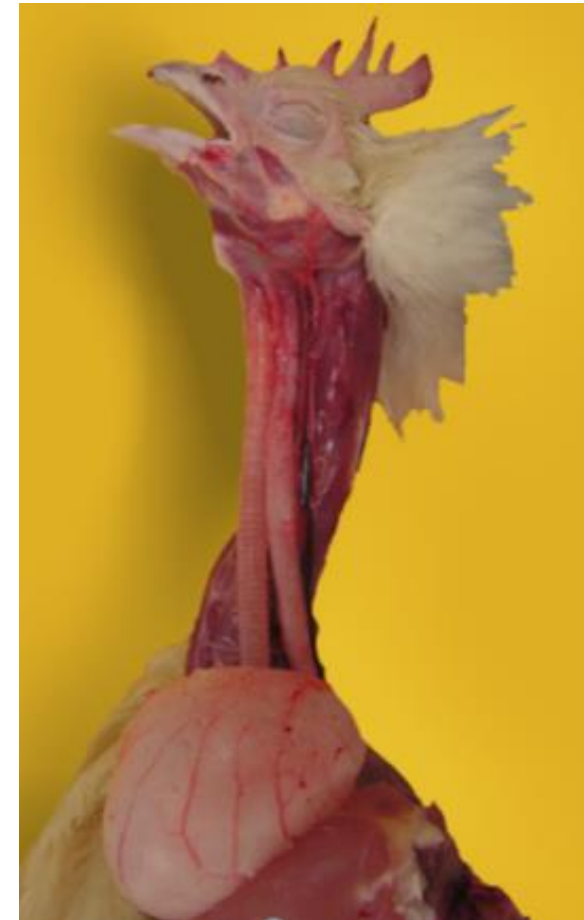
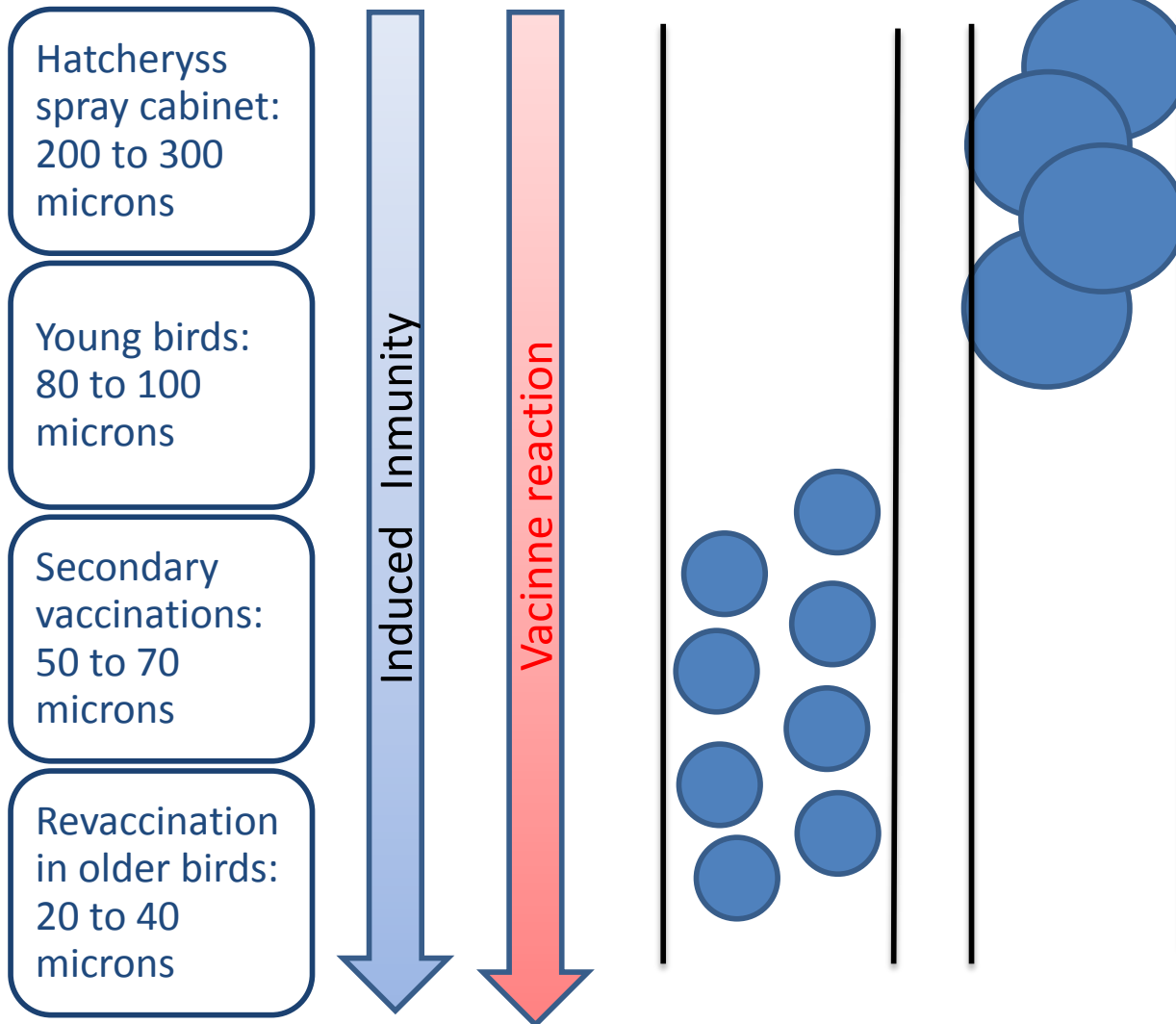


NO CHLORINE
(OR ANTIBIOTICS) IN
THE WATER

USE WITHIN 2 HOURS

Droplet size

DROPLET SIZE IN SPRAY VACCINATION



Source: Eric Betti

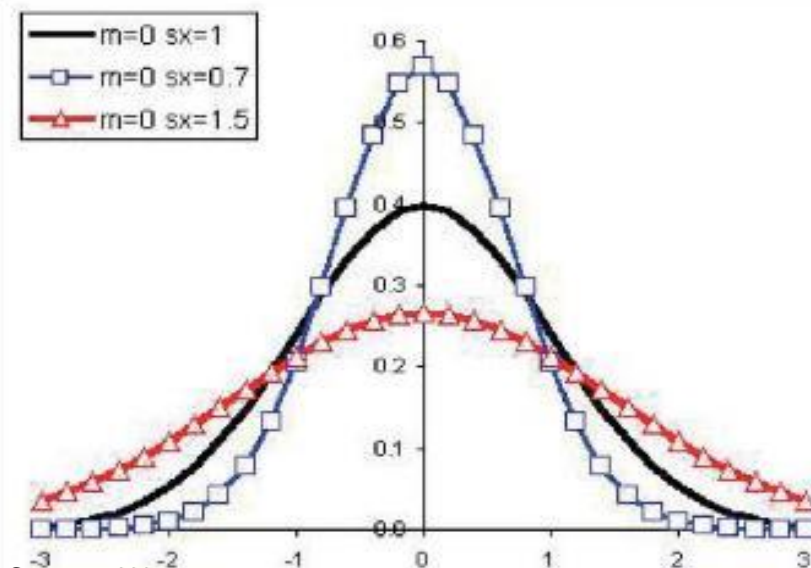
Droplet size



Droplet size mainly depends on

- Pressure
- Nozzle

Examples of spray distribution curves



Source: Wattagnet

Pay attention not only in the droplet average size but:

- the droplet homogeneity
- Droplet size variation during the vaccination time

Poor Coverage (Vaccines losses)

1. Turn of the ventilation during spraying



Losses by drift



Losses by evaporation



Emission

2. Group the birds together before vaccination (when possible)



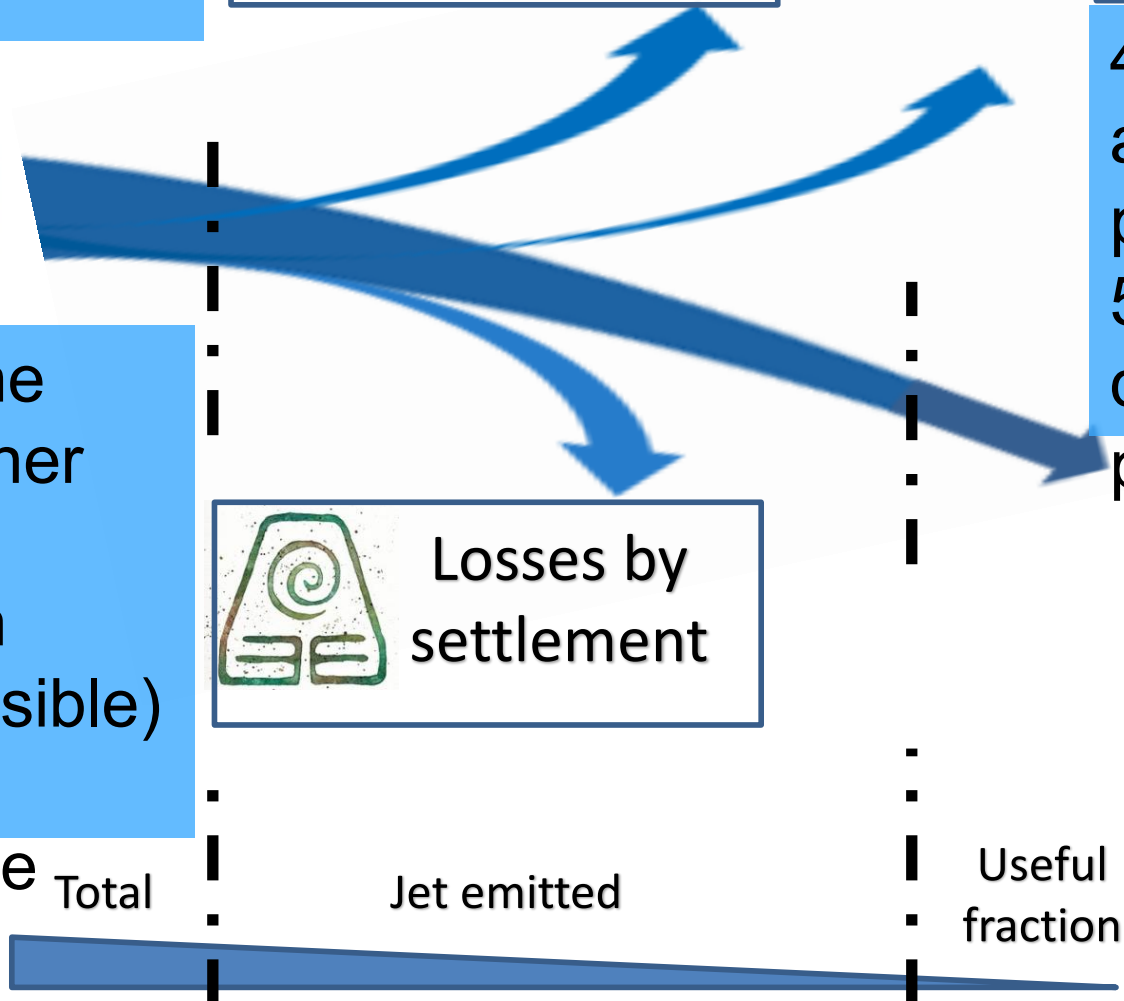
Losses by settlement

4. Use droplets as coarse as possible
5. Vaccinate during the cool part of the day

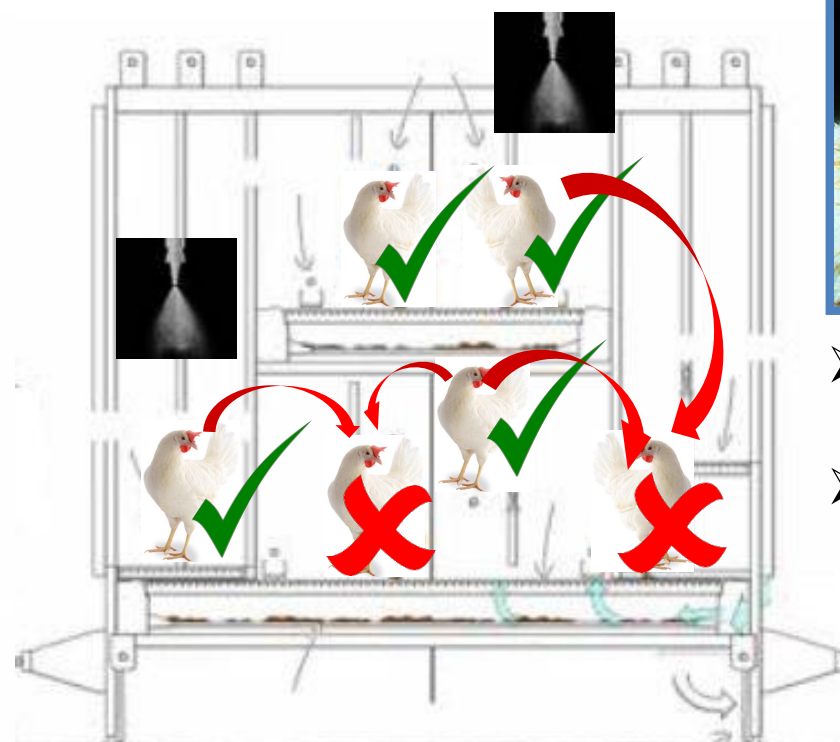
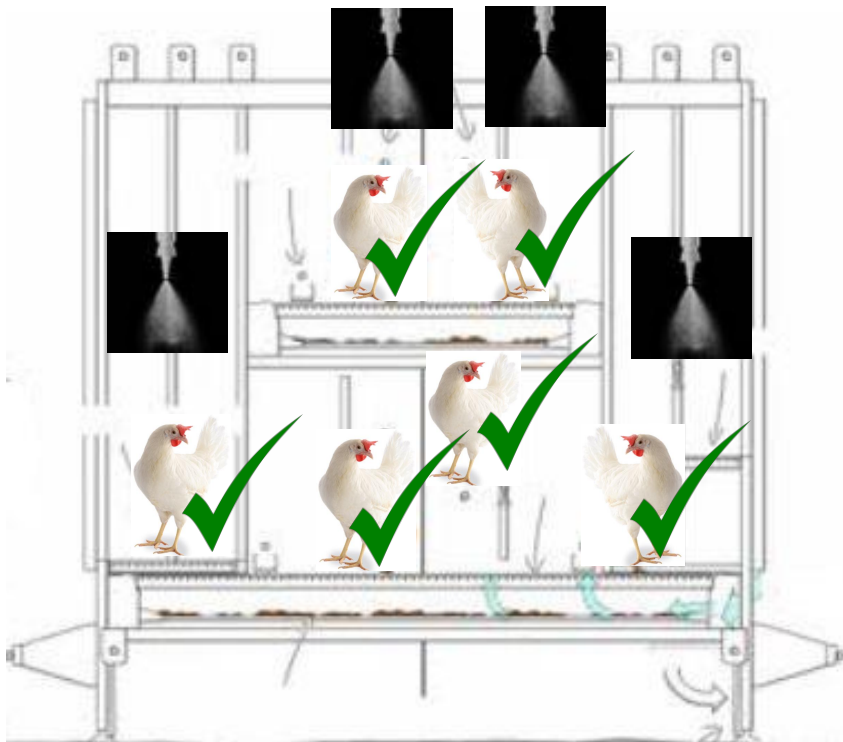


Impact

3. Directly the nozzles



Poor Coverage (Poor distribution)



- Rolling reaction
- Post vaccinal reaction.

6. Use enough amount of vaccine dissolution (min 450 - 1000 ml / 1000 birds)

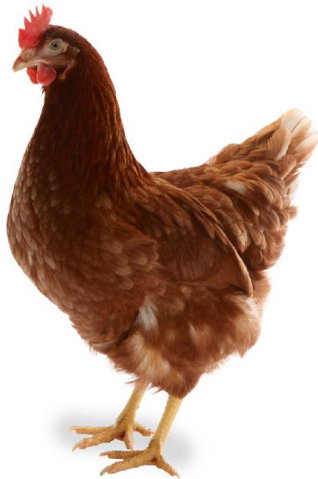
7. Distribute correctly among all the birds

8. Hold the nozzle about 40 cm above the birds' head

9. Reduce the light intensity as much as possible

Keep the birds calm and vaccinate them all

REDUCING LIGHTING INTENSITY IS
THE BEST WAY TO KEEP THE BIRDS CALM



BROWN LAYERS

- Lighting intensity as low as possible (>3 luxes)



WHITE LAYERS

- Vaccinate during dark period while birds are sleeping

Bird confinement

If it is possible to confine birds to a cage, enclose birds for vaccination



No birds confinement



- ✓ Keep low lighting intensity during all vaccination process
- ✓ Walk slowly and do not disturb the birds
- ✓ Spray all the areas where the birds are
- ✓ Two vaccinators should work at the same time



INTERNATIONAL

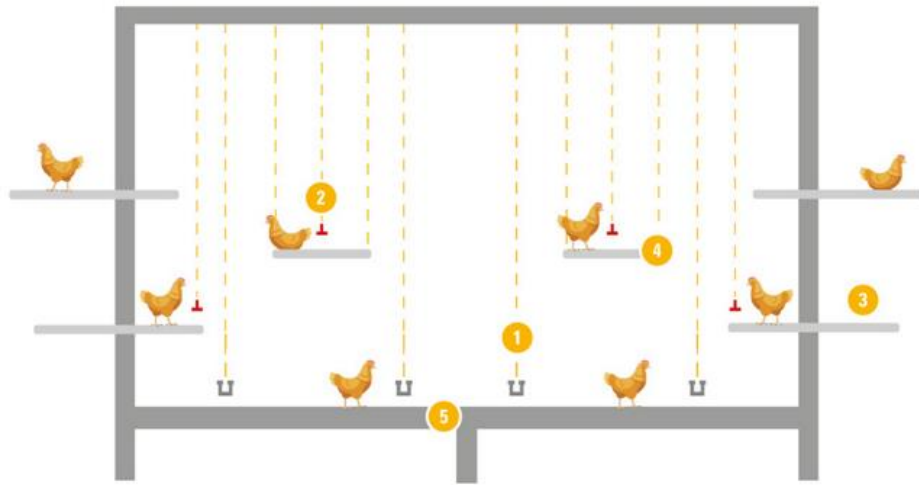
The key to your profit!



Individual vaccination

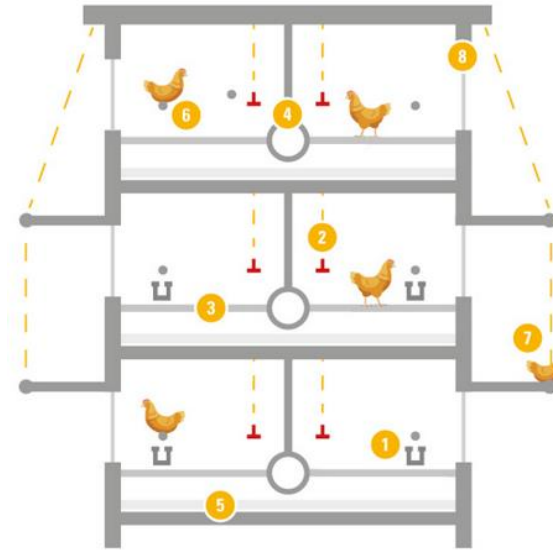
Catching the birds

Confinement not possible



- 1) Divide production unit in two areas: vaccinated and non vaccinated
- 2) Move all birds to non vaccinated area
- 3) Catch one by one birds, apply vaccine and move to vaccinated

Confinement possible



- 1) Close birds into the cage and act as in cage system

Working conditions

KEEP THE BIRDS AS CALM AS POSSIBLE

Lighting intensity

- White / Non confined bird
>3lux
- Brown confined birds
5 lux

Do not disturb bird by your movement or noises

Catch the birds gently and do not provoke hysteria reactions



Working conditions

ALL BIRDS IN A UNIT SHOULD BE VACCINATED DURING THE DAY



Work team



Correct equipment

Eye drop vaccination

Available vaccines against:

- IB
- ND
- ILT
- MG
- MS

- Individual application
- Local protection
 - Respiratory tract
- Each bird receives a full dose of vaccine.
- Both local and humoral immunity due to the presence of the Harderian gland behind the third eyelid.



Eye drop vaccination

EYE DROP PROCEDURES



Vaccine storage

Dissolve vaccine in the applicator

Administration

1. Cold chain break

1. Vaccine not used immediately

1. Birds not vaccinated

Eye drop vaccine preparation



USE DYE TO ASSESS
THE EFFICIENCY OF
ADMINISTRATION

PREPARE ONLY THE
VIALS FOR THE USE IN
THE NEXT HOUR

USE WITHIN 1 HOURS

Eye drop vaccination

EYE DROP APPLICATION

Birds dosed effectively will show staining at the nares shortly after vaccination.

Ensure that the fluid does not 'roll off' the eye.

Each bird should be held until it blinks after the droplet is applied





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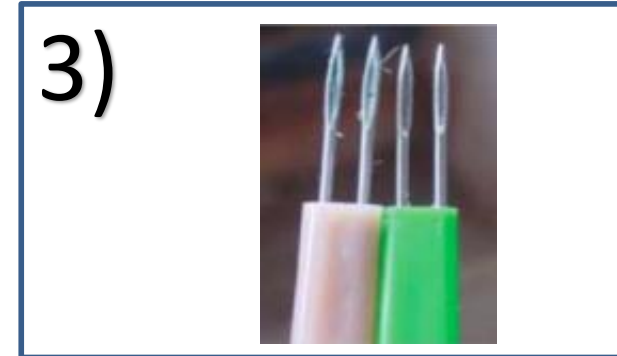


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Wing Web vaccine preparation



OR



PREPARE ONLY THE
VIALS FOR THE USE IN
THE NEXT HOUR

USE WITHIN 1 HOURS

WING WEB

VACCINE REACTION

Appears 5-10 days after vaccination

Ensure a correct vaccination

Check at day 7 post vaccination

- >90%: OK
- 80-90%: Doubtful Vaccination success
- <80%: Vaccination failure



Injection administration

- IB
- ND
- MG
- MS
- EDS
- AMPV
- SE
- FP
- Coryza
- ...

- Only systemic immunity
- Individual vaccination
- Two types
 - Intramuscular (IM)
 - Subcutaneous (SC)



Injection administration

INJECTION PROCEDURES



Vaccine storage



Prepare automatic syringe



Application

1. Vaccine not sterile
2. IM application not respected

Preparation

Use clean and autoclaved syringes

Vaccine should have room temperature
(Max. Temperature 37° C)

Calibrate the syringes before starting
each vial (0.25 – 0.5 ml)

Use the correct needle:

- 0.8 – 1.1 x 10 mm
- Change the needles regularly

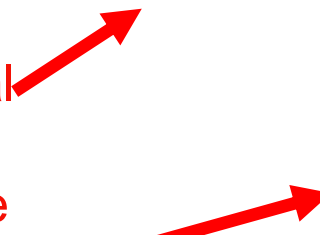


Intramuscular injection

INTRAMUSCULAR INJECTION VACCINATION

- Injection should be strictly intramuscular
- Two possibility of application:
 - Breast
 - Leg
- Bacterine reactions can cause issues
 - Leg → lame birds

Muscle pectoral
Muscle
supracoracoïde
M. Long peronier



Intramuscular injection



Single Leg
injection



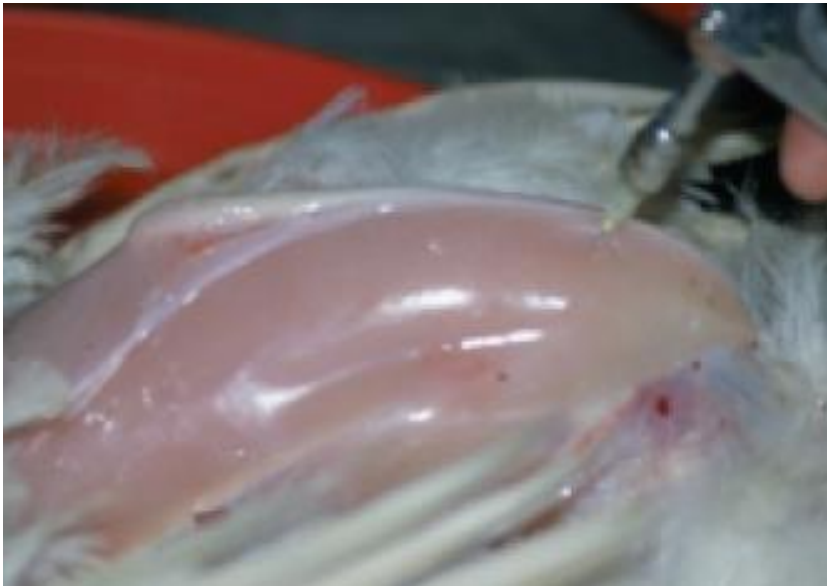
Double breast injection

Breast IM Injection



Correct injection in the breast

Failures by breast IM injection

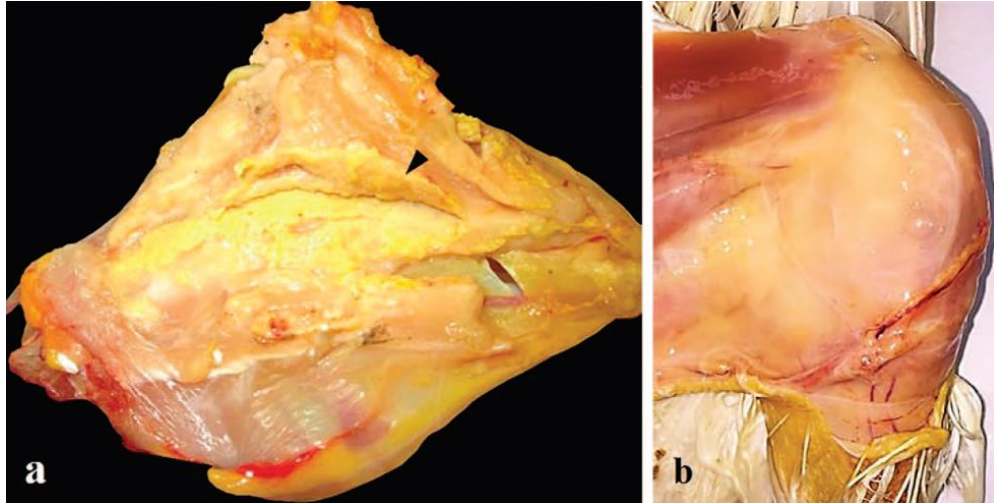


Injection too close to sternum

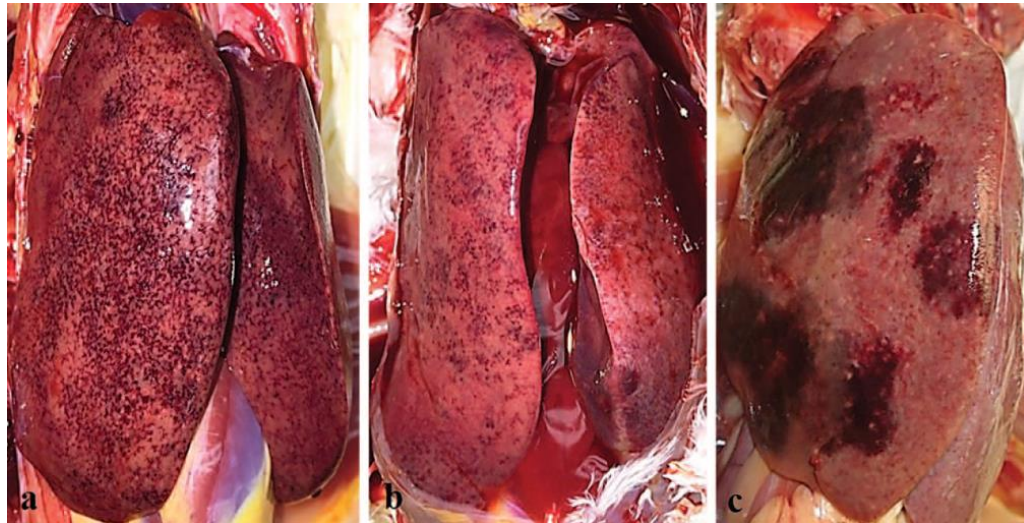


Injection too close to crop

Failures by breast IM injection

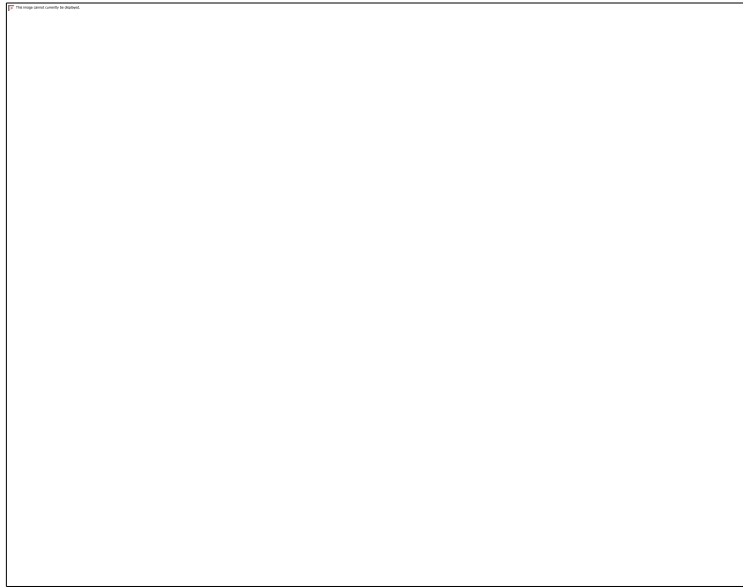


Contaminated injection



Carnaccini et al

Failures in breast IM injection



Injection in liver

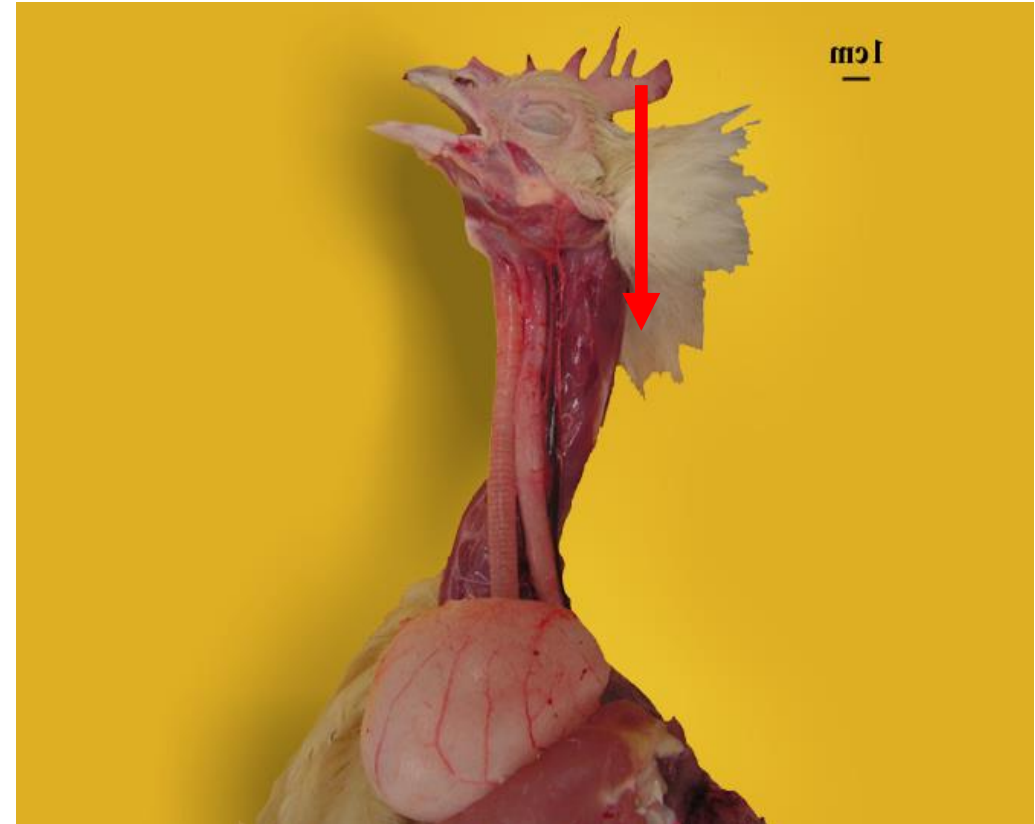


Injection in abdomen

SUBCUTANEUS INJECTION

INTRAMUSCULAR INJECTION VACCINATION

- Injection should be applied under the skin of the neck
- Do not damage the nerves, muscles or other structures in the area.
- Used also for live vaccines



NECK SUBCUTANEUS INJECTION



Correct injection in the neck

Failure by SC Injection



Edema



Damage in the neck due to incorrect injection

THANK YOU **FOR** YOUR INTEREST



Any
question?