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The key to your profit!

The Foundations of Success

Maurice Raccoursier MV MSc
Global Technical Service
H&N International

Outline

- Introduction
- Why is so important?
- Chick Housing
- Brooding Lighting Program
- Management
- Beak Treatment
- Key Points

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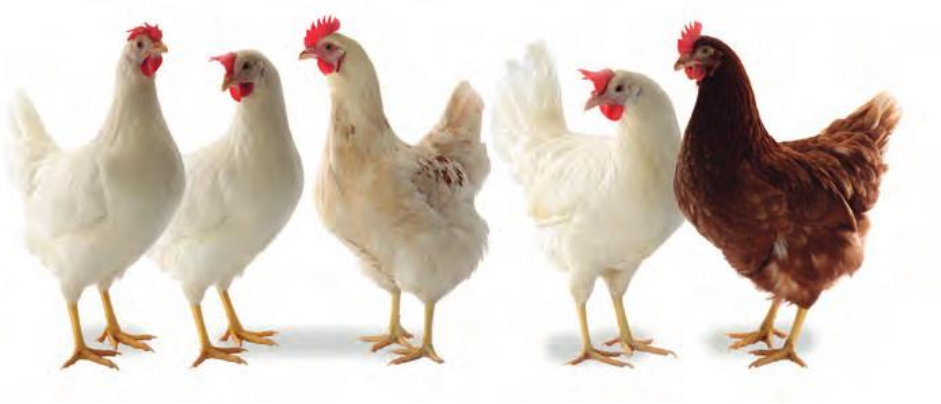
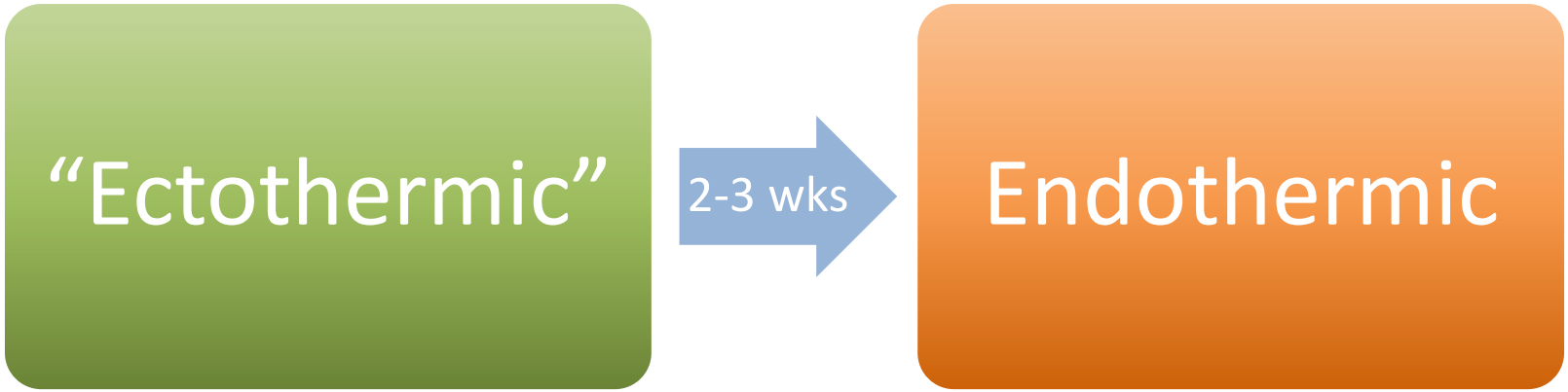


Introduction

Introduction

- “The art and science of rearing baby chicks”
- “Application of heat to the birds at early part of their life”
- Transition period: first 3 - 4 weeks of life



- Temperature
- Water and Feed

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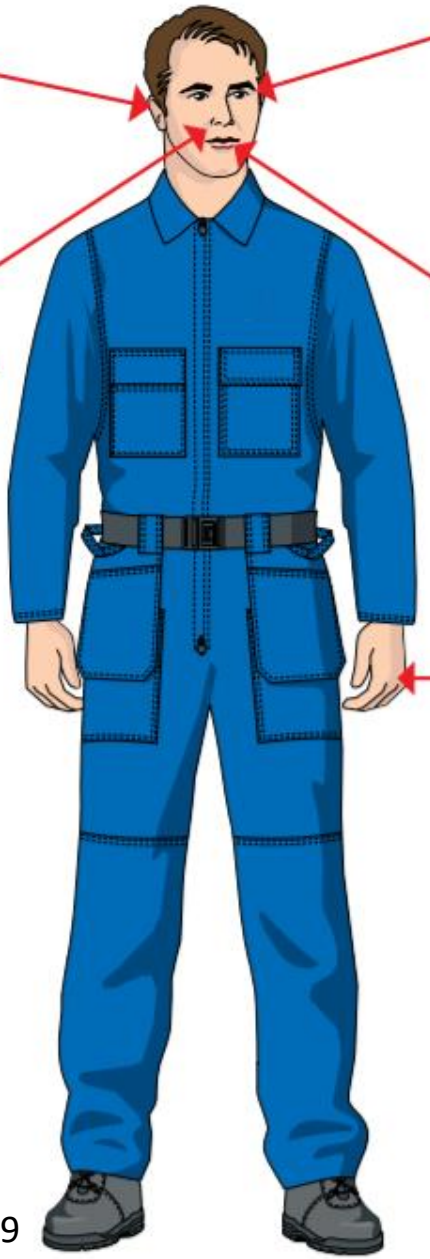
Stockmanship and tools



Hearing
Listen to the birds' vocalization, breathing and respiratory sounds. Listen to the mechanical sounds of fan bearings and feed augers.

Sight
Observe behaviors such as bird distribution in the house and number of birds feeding, drinking, preening, mating and using nest boxes. Observe the environment such as dust in the air and litter quality. Observe bird health and demeanor such as posture, alertness, eyes and gait.

Smell
Keep notice of smells in the environment such as ammonia levels. Is the air stale or stuffy?

Taste
Water and feed quality.

Feel
Handle the birds to assess crop fill and check the birds' general condition (breast conformation, vent and feather condition). Take notice of air movement across your skin. Is there a draft? What does the temperature of the house feel like?

Broiler handbook, Aviagen, 2019

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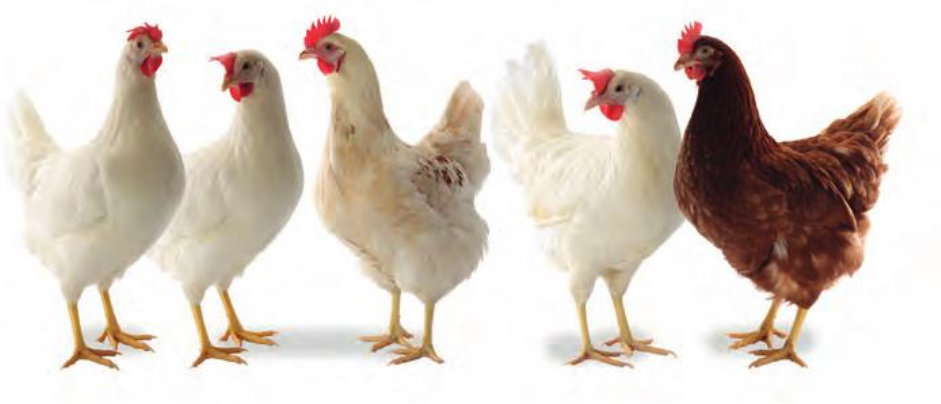
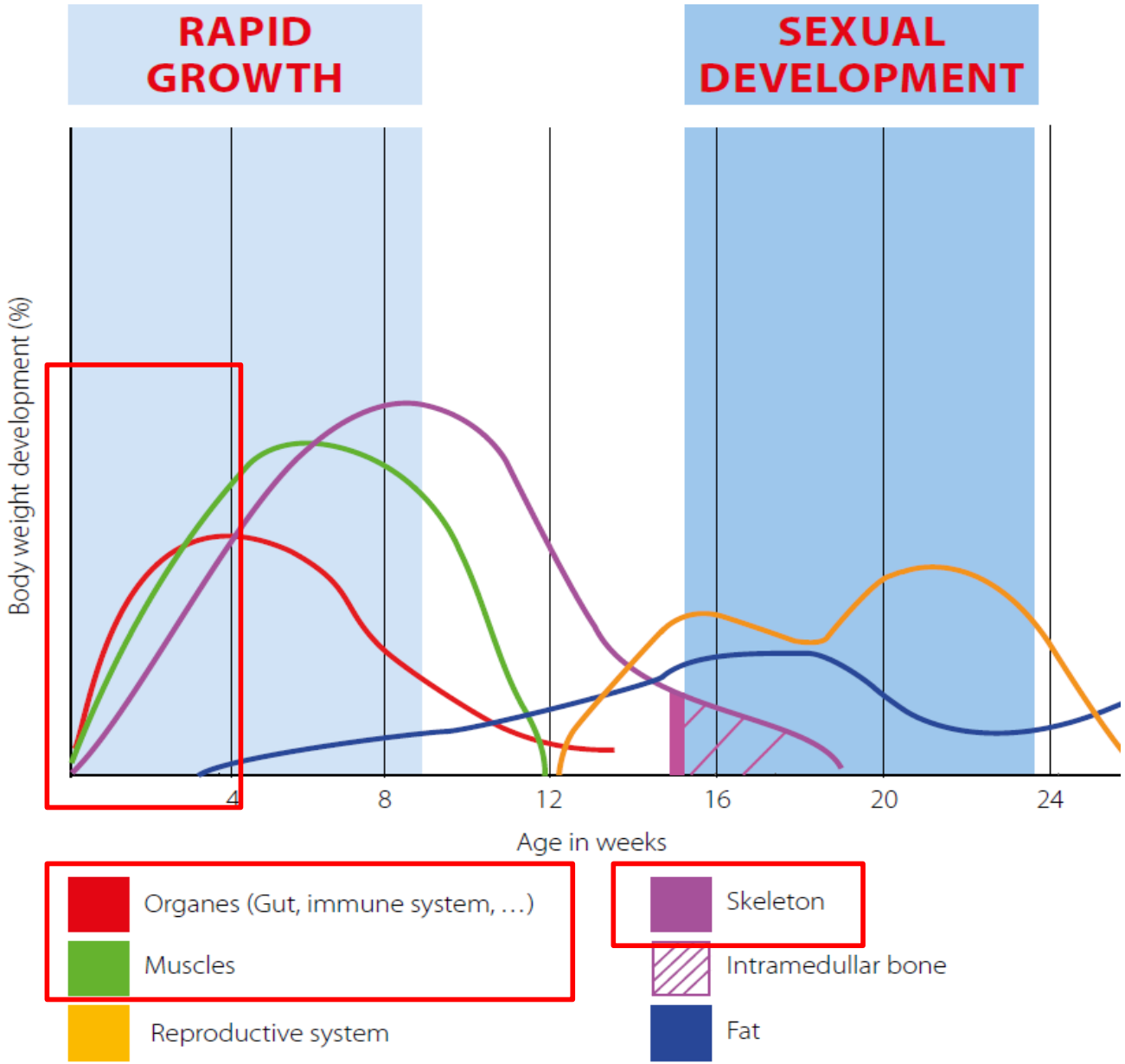
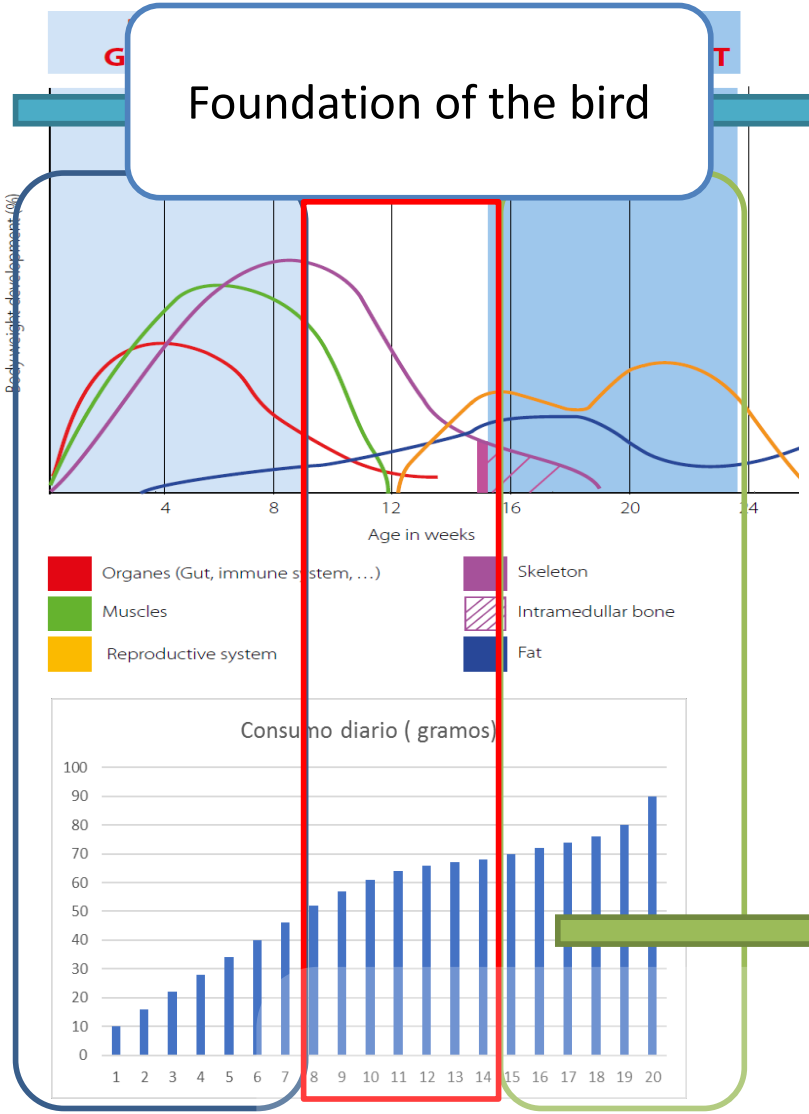


Why is so important?


RAPID GROWTH
SEXUAL DEVELOPMENT
Body weight development (%)
4
8
12
16
20
24
Age in weeks
Organes (Gut, immune system, …)
Muscles
Reproductive system
Skeleton
Intramedullar bone
Fat

Bird development



Weeks 9-15

Weeks 1-8:

- Fast growth
- Development of important organs:

a) Immune System.
b) Digestive system.
c) Thermoregulatory system

- Limited feed intake
- Excellent correlation between BW at 5 weeks and production parameters

Weeks 16-22

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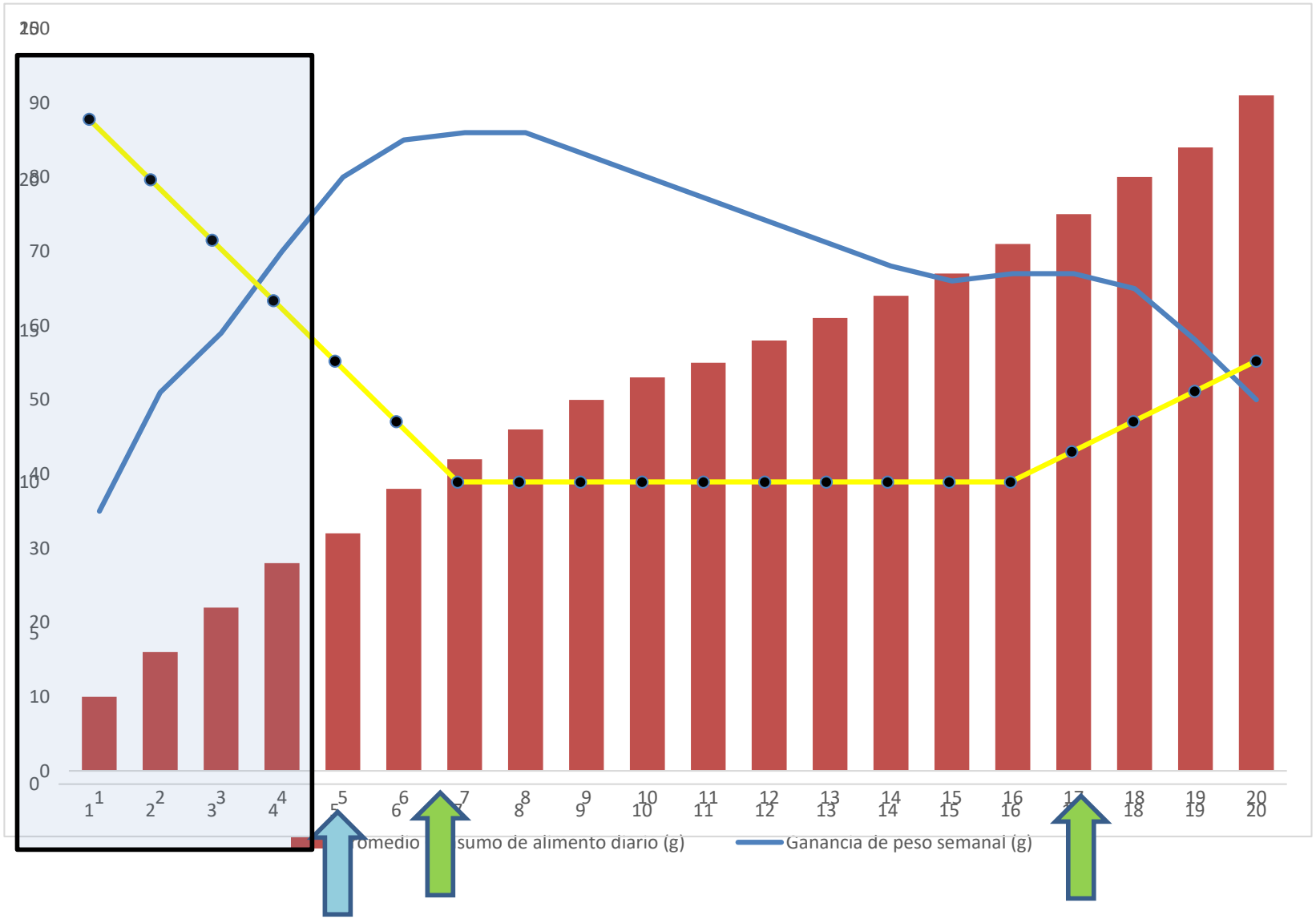
Body development



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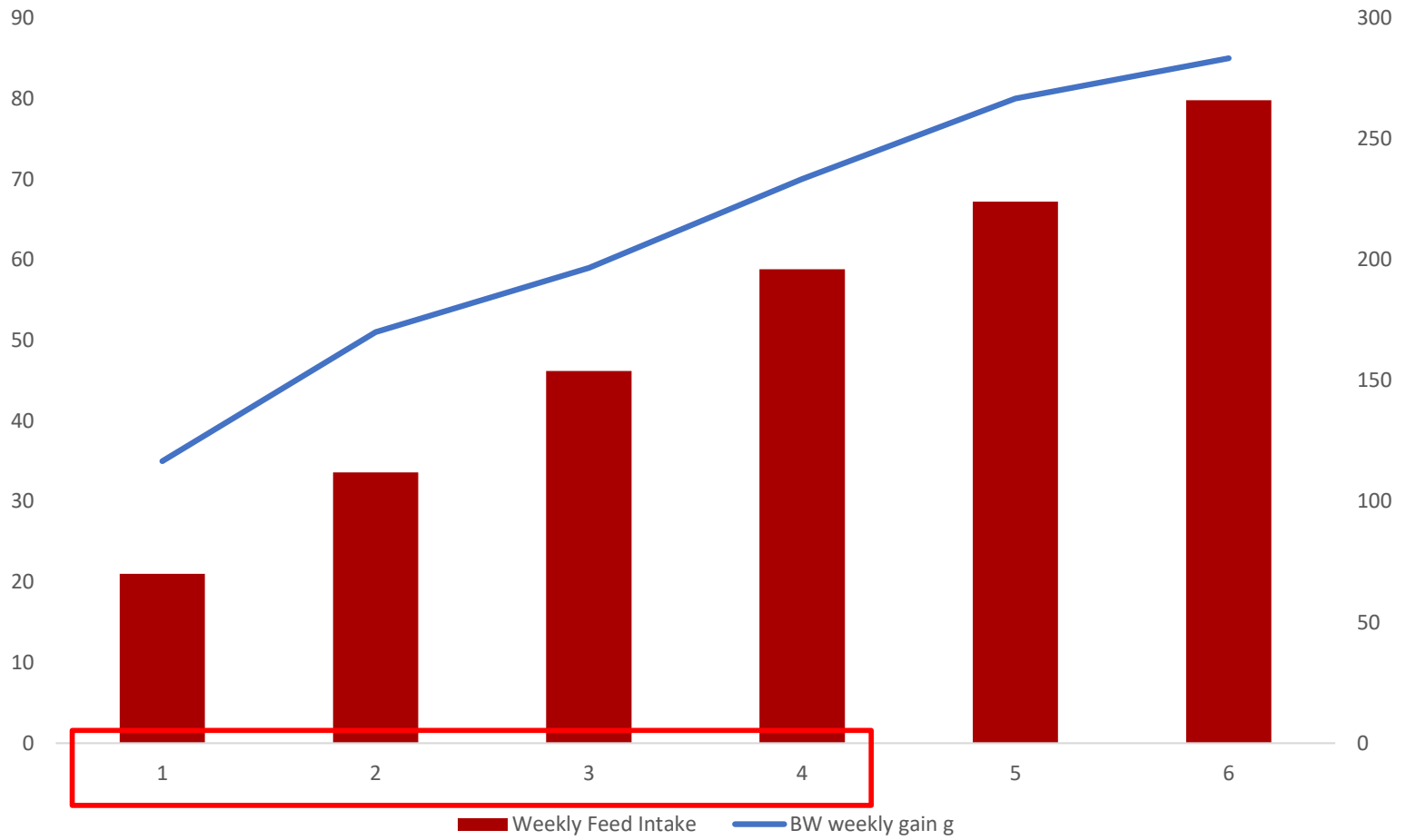
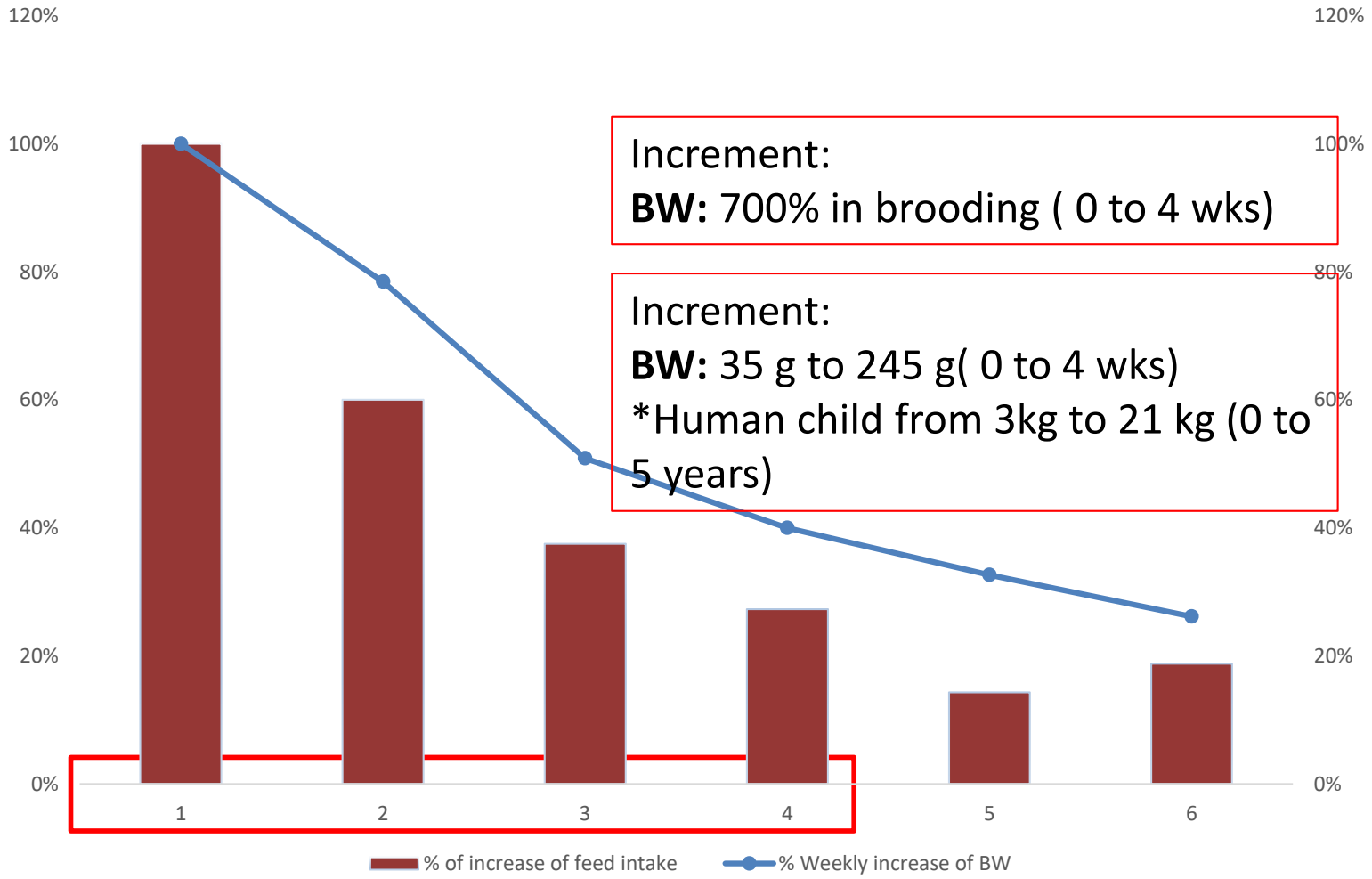
Brooding period



Brooding period: % of weekly increase of feed intake



Increment:
BW: 700% in brooding (0 to 4 wks)

Increment:
BW: 35 g to 245 g(0 to 4 wks)
*Human child from 3kg to 21 kg (0 to 5 years)

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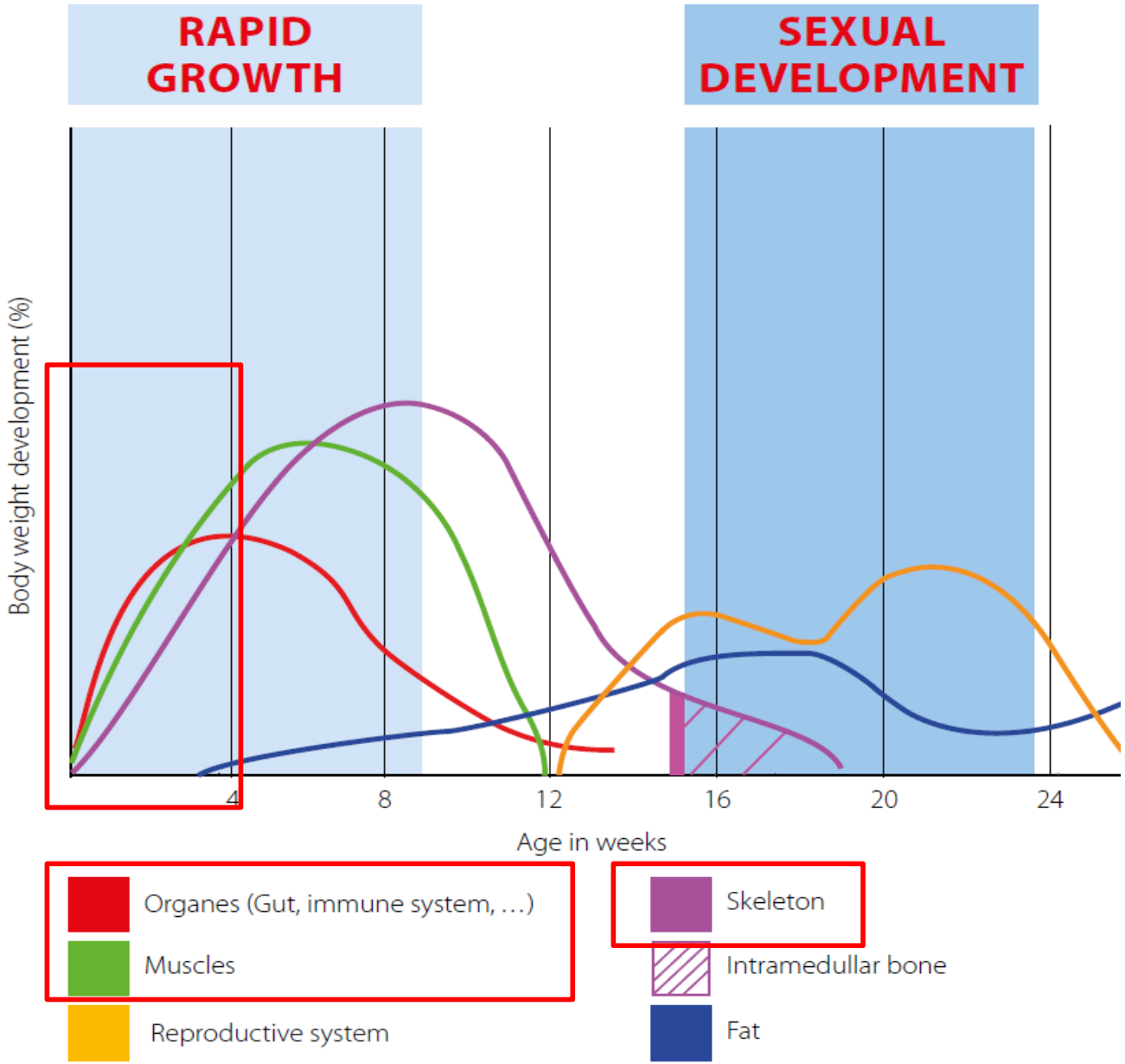
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Age in weeks
Organes (Gut, immune system, …)
Muscles
Reproductive system
Skeleton
Intramedullar bone
Fat

Mistakes in this early period of life cannot be corrected later on.

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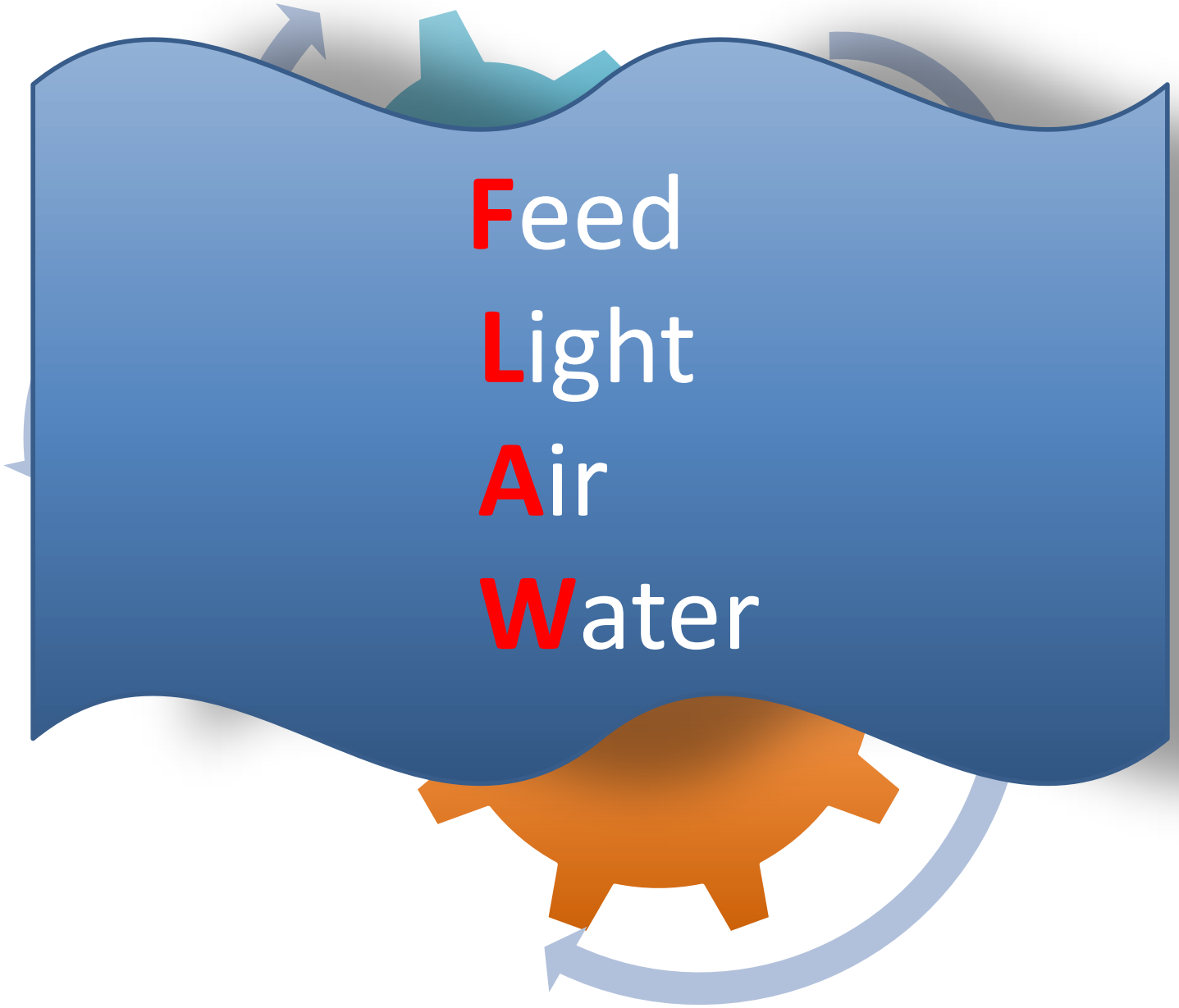
Keystone of brooding



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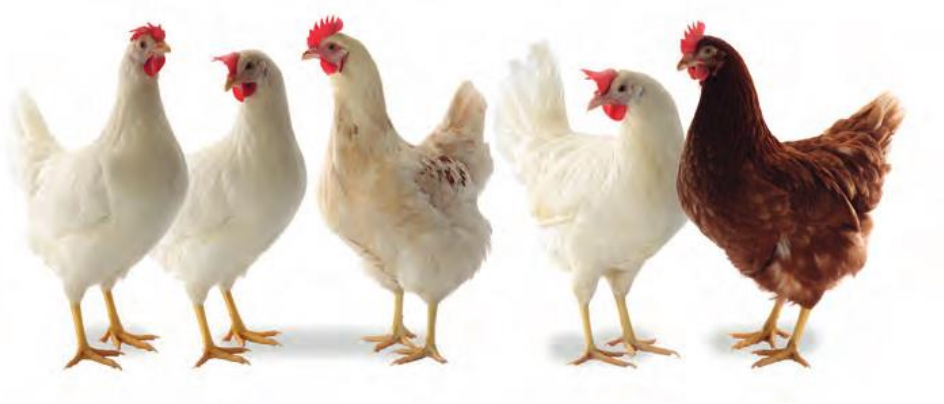

Chick Housing

Chick Housing

1. Request information from the hatchery: flock source, age for the breeders, body weight at hatchery, etc.
2. Check the status of the birds in the truck
3. Unloading the birds: fast and gently (trained crew).
4. Chick Quality and Body Weight
5. Report to hatchery
6. **FEED-BACK OF INFO**

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Who weight the chicks at day one?

A. Yes
B. No

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H & N International GmbH • Am Seedeich 9-11 • 27472 Cuxhaven

APEX Breeder Farm Co., Ltd.
100 Moo 1, Tumbol Nongree
Amphur Muang
20000 Chonburi
Thailand

H & N International GmbH
Am Seedeich 9-11
27472 Cuxhaven
Germany
Phone No. +49 4721 564-0
Fax +49 4721 564-111
E-Mail info@hn-int.com
Home Page www.hn-int.com

DELIVERY NOTE 13141

Customer No.	Document	No.
10144	10.07.19	13141

Contact Jessica Korella Dispatching Amsterdam Point of Arrival Bangkok

Art.No.		Quantity	
20020	H&N BROWN NICK PARENT STOCK FEMALES, DAY OLD CHICKS	10.000	pieces
20021	H&N BROWN NICK PARENT STOCK MALES, DAY OLD CHICKS	1.120	pieces
98001	Marek Rispens (monovalent) vaccination service	11.120	x
98029	Innovax-ND-IBD vaccination service	11.120	x
98020	IB Ma5 vaccination service	11.120	x
98023	Hatchling Supplement treatment	11.120	x
98011	Paracox 8 vaccination service	11.120	x
98025	Comb treatment males	1.120	x

Number of boxes: 139 Boxes

Terms of delivery/dispatch CPT Bangkok by Airfreight

Custom Office No.:

Packing

139 Boxes marks addr. no. 1 - 139

Total Net Weight 445 kg
Total Gross Weight 578 kg

Packing list:

10.000 Pos. 1 (125 Crates à 80 Females) Nr. 1 - 125
1.120 Pos. 2 (14 Crates à 80 Males) Nr. 126 - 139

0.00 % chicks from flocks < 27 weeks
0.00 % chicks from flocks > 67 weeks

	Name of Vaccine	Batch Number	Expiry date
0.4 ml Rispens + Innovax-ND-IBD	NOBILIS RISNAVAC INNOVAX-ND-IBD	A999C A968B	07-2021 03-2020
IB Ma5 + Paracox 8	NOBILIS IB MA5 VET. PARACOX 8	A258A1N01 0638B	08-2020 19-09-2019

	Marking:
1. 20020 | H&N BROWN NICK PARENT STOCK	/
2. 20021 | H&N BROWN NICK PARENT STOCK	/

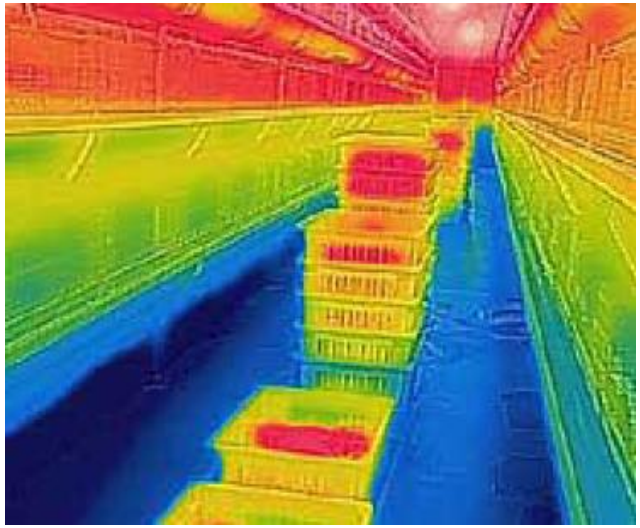
COUNTRY OF ORIGIN Denmark

H & N International GmbH

The delivery has been verified and corresponds to the information on the delivery note.

Location Code Danemark	Date Time	Driver	Carrier	Customer
4160 Herlufmagle R. Nielsen	09-07-2019			

Managing Directors: Javier Ramirez Villaescusa
Tax ID No. 68/207/03981 - VAT ID No. DE 189 148 615 - Registered Office: Cuxhaven, Amtsgericht Tostedt, Reg-No. HRB 110334
Bank details: Commerzbank Oldenburg, IBAN: DE90 2804 0046 0409 4553 00, SWIFT Code: COBADEFF 286



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What do you see wrong?

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- Optimal circumstances DOC will lose 1 to 2 gram of BW per 24h
- Panting + high temperatures **5 to 10 grams** of BW (water) in 24 h

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Quality control

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		DAİLY Mort		Dead in box		red hocks	blind bird	cross beak
	H1	female	male	female	male			
date	10-Sep	58	12	58	12	0	0	0
	11-Sep	32	7			15	4	2
	12-Sep	40	3			12	2	0
	H2							
date	10-Sep	62	12	60	12	0	0	0
	11-Sep	25	7			10	3	0
	12-Sep	40	16			10	2	0

[redacted]

19 July 2019

Dear Maurice

I write to feedback you that some of the chick's first shipment received from your organization between 11.7.19 to 18.7.19 (7 days old) are considered as damaged. We have examined them, and enclose herewith a detailed claim, Include;

1. Comb of all males are not cut as mentioned in invoice.

2. Amount of 41 females less than invoice.

3. 3 basket of 100% black navel females.

4. 2 basket on top found wet chick.

4. Amount of 12 females have defect.

5. Amount of 181 females and 37 male dead chick arrival in basket.

6. Amount of 132 chick are 7 days mortality.

7. 5% from random found small chick BW less than 34 g.

Please let me know if there are any problems.

Thank you for your cooperation.

Parinya Saengchai

All males with comb

Chick with Black Navel

Wet chick in box on top

Dehydrate Chicks

Chick dead in the basket

7 day Mortality

Defect Chicks

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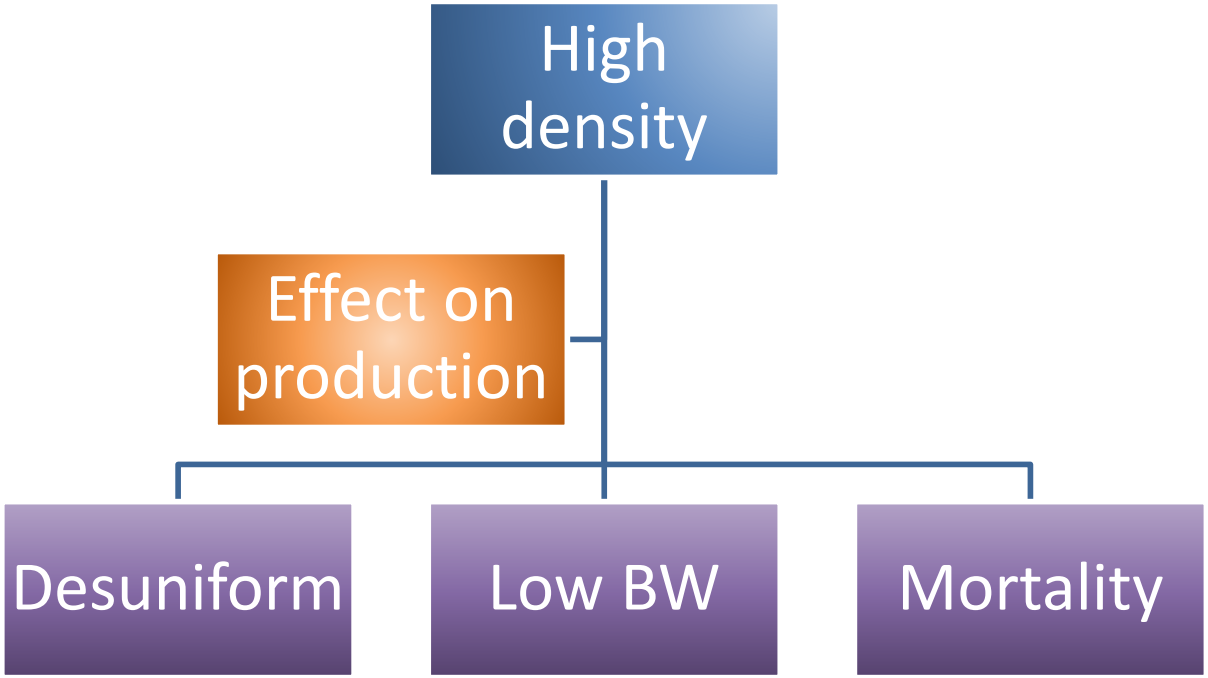
Chicks condition	NC Females: they look active, eating and drinking. Legs problem associated with incubation conditions. Males: look good.								
Aiport	Not applicable								
Transport	It was ok.			**Length**	21,5 hour	**DOA**	0,23%		
Males dubbed	Yes								
Temperature	**Air**: - **Floor** (wood shavings) 33-34C								
relative Humidity	63-64%								
Feed	Mash								
Feed on paper	No.								
Feeder space	It is ok after brooding. But short for the first 7-14 days. There were 28 small paper trays with feed (extra feeders). 433 birds / paper tray. Suggest to have 100.								
Feeders	ok. Several with wood shavings								
Water	Pressure **ok** Drinkers clean **yes** Water tre **yes,** Proxy Clen to clean them before placement but nothing while chicks are in the house								
Drinking space	ok. Auxiliary drinkers for the first days								
Crop fill	**Females NC**	87%	**Males NC**	87%					(16 hours after placement)
Weights g	**Females NC**	35,4	**Males NC**	36,1					
Light intensity	17-18 lux. Suggested to switch out the light bulbs for brighter ones (4 to 6 w)								
Lighting program	Intermmitent ligthing program first 7 days then a weekly reduction until week 7 (10 hours). Always according BW and uniformity								
Vaccination Program									
Employees	Placement was fast					Counted	No		
Source	Canada								
Flock	67,7% from a super young flock (<27wks). This could cause higher than normal mortality. Also, the order was short in 260 females (2,3% of the original order). Both things.								

Follow densities

Age	Floor space		Feeder space		Drinker Space	
	Cage	Floor	Cage	Floor	Cage	Floor
0 – 3 weeks	140 cm^2/bird	21 birds/m^2	2.5 cm/bird	4 cm/bird 60 birds/pan	1.25 trough cm/bird 16 birds/nipple	1.4 trough cm/bird 16 birds/nipple 100 birds/fontain
3 – 16 weeks	285 cm^2/bird	16 birds/m^2	5 cm/bird	8 cm/bird 30 birds/pan	2.5 trough cm/bird 8 birds/nipple	2.5 trough cm/bird 8 birds/nipple 75 birds/fontain



Keypoints

- Ensure house is ready before chicks arrive
- Preheat the house to the correct temperature
- Follow stocking density
- Adapt drinking and feeding system to the brooding period.
- Have **paper covering** 100% of the floor surface (cages or floor). Floor system at least 50% and under drinker and feeder lines.
- House the chicks quickly (in cages at eye level)
- Inspect the chicks for body temperature and quality
- Feed back with Hatchery

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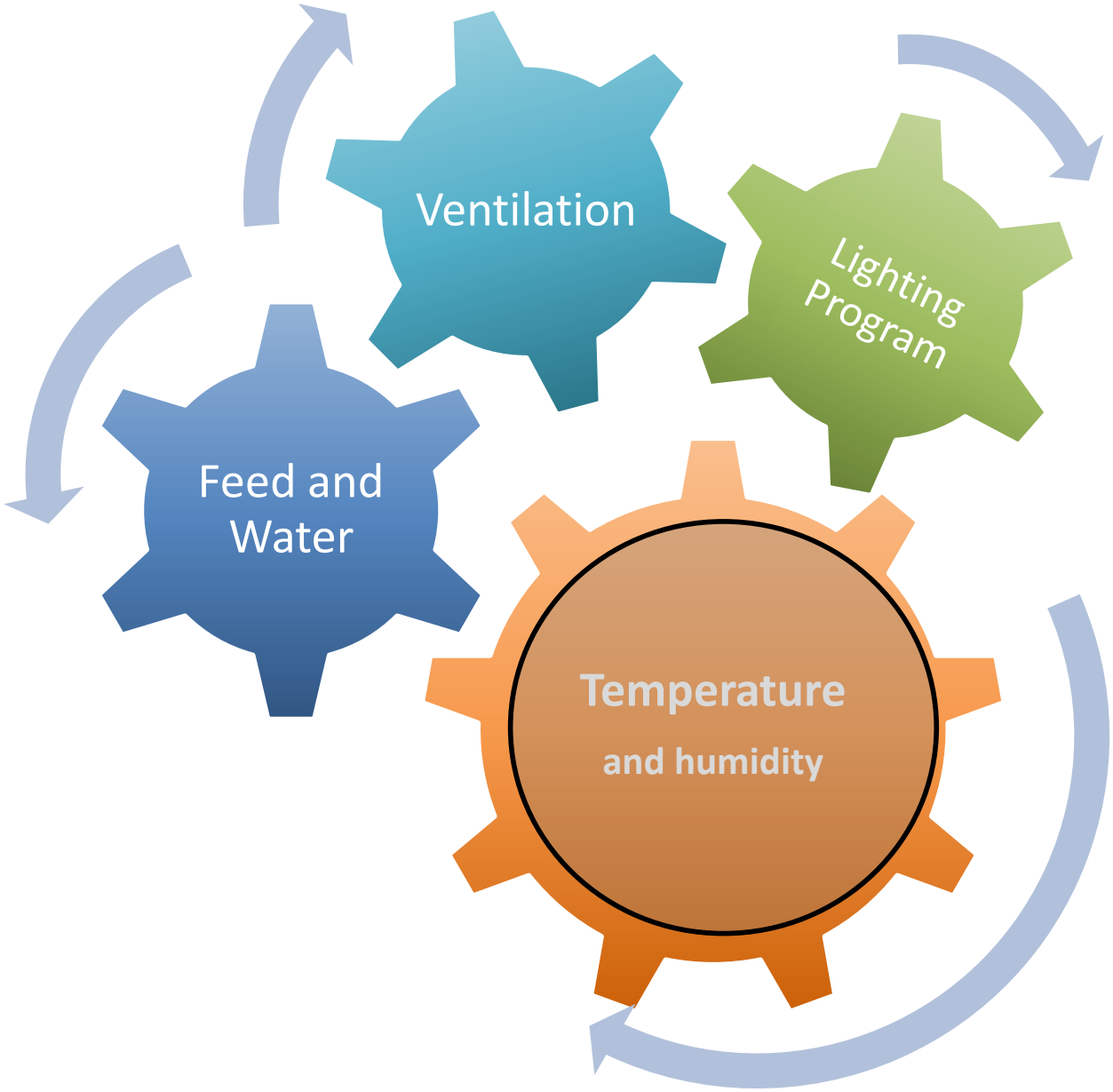
Keystone of brooding



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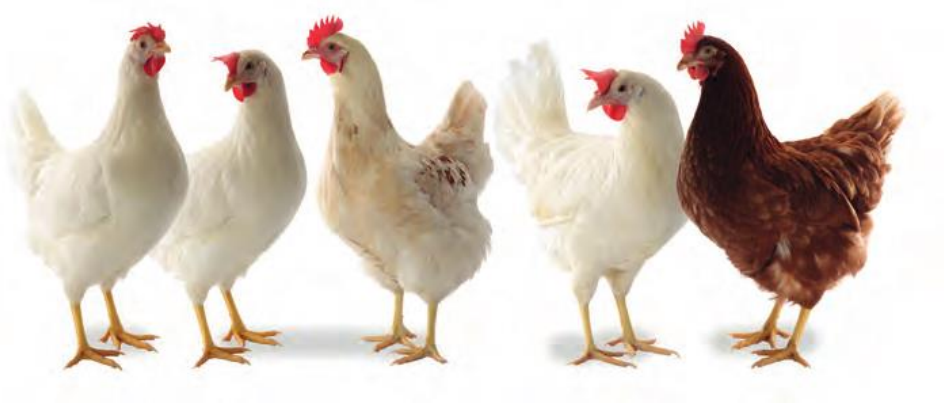

Brooding: Temperature

Thermoregulation

1. Prenatal phase
2. Early postnatal phase (10-13d)
3. Full blown homeothermy phase

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Thermoregulation

- Lose heat more quickly due to:

a) High metabolic rate.
b) Lower body temperature than adult bird.
c) Lack of feathers.

- Hypothalamus is not completely functional.
- When chicks hatched, the following systems not fully activated:

a) Immune System.
b) Digestive system.
c) Thermoregulatory system

Low Temperature !

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Important points

- DOC can’t adjust metabolism under low temperatures
- Chicks are **poikilotherm** for first 4-6 days.
- Body temperature can drop quickly.
- Direct impact of **ambient conditions.**
- Chicks from older flocks become homeotherm earlier than chicks from younger flocks.
- Fully homoeothermic at 4-5 days of age.
- **End of brooding:** down replaced by feathers and birds can fully control their body temperature (3 weeks).

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Recommendations

Type of brooding	Temperature at chicks arrival	Temperature decrease
Cage	34 – 35 °C 93 – 95 °F	Reduce 3 °C/5 °F each week until supplementary heat is no longer needed.
Floor	35 – 36 °C 95 – 97 °F	

- Place in the hottest areas or cages:

a. Smallest chicks.
b. Chicks from young breeders (<35 wks.)
c. Youngest chicks (flocks arriving over several days).

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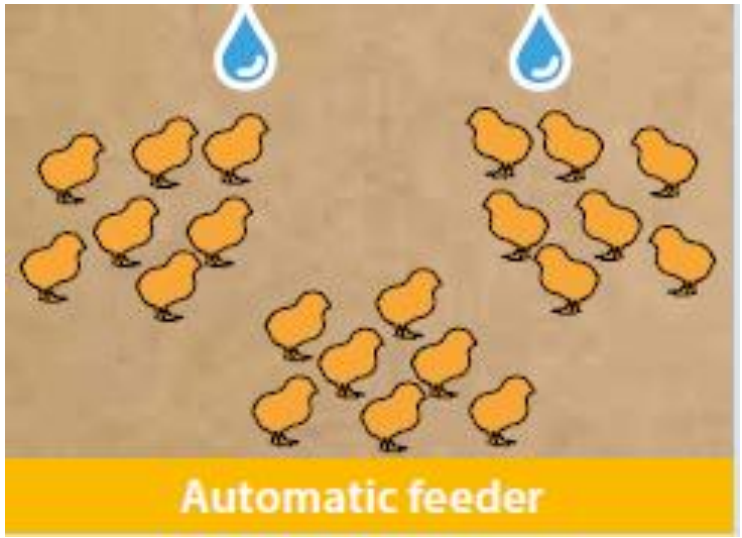
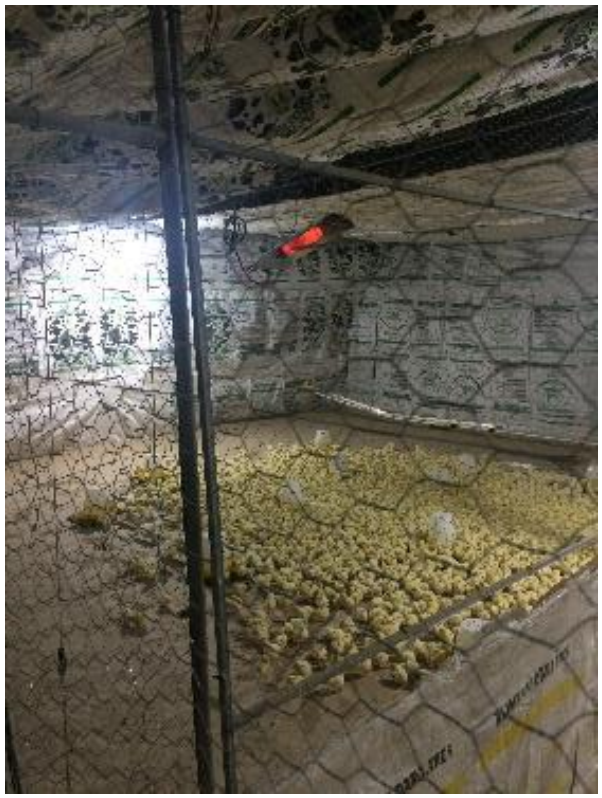
Behavior





- Low temperature

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Behavior

- Hot temperature

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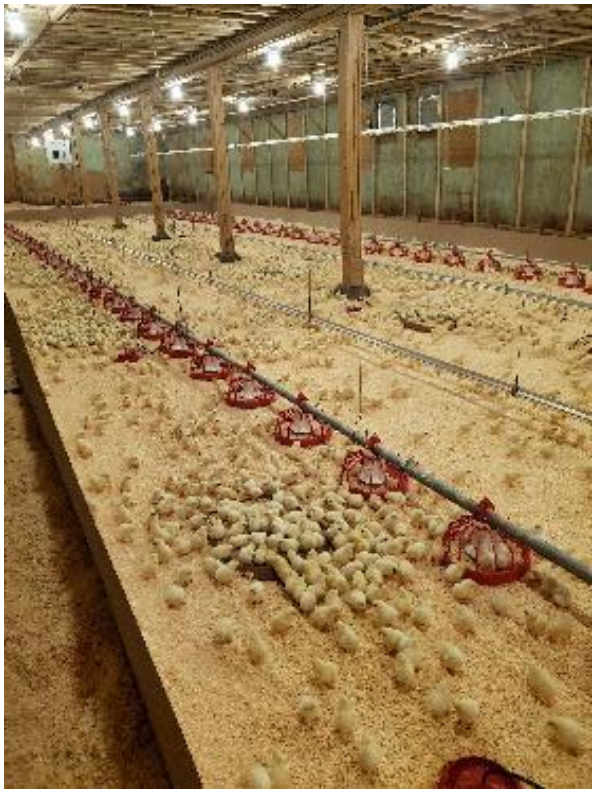
Behavior



- Good Temperature

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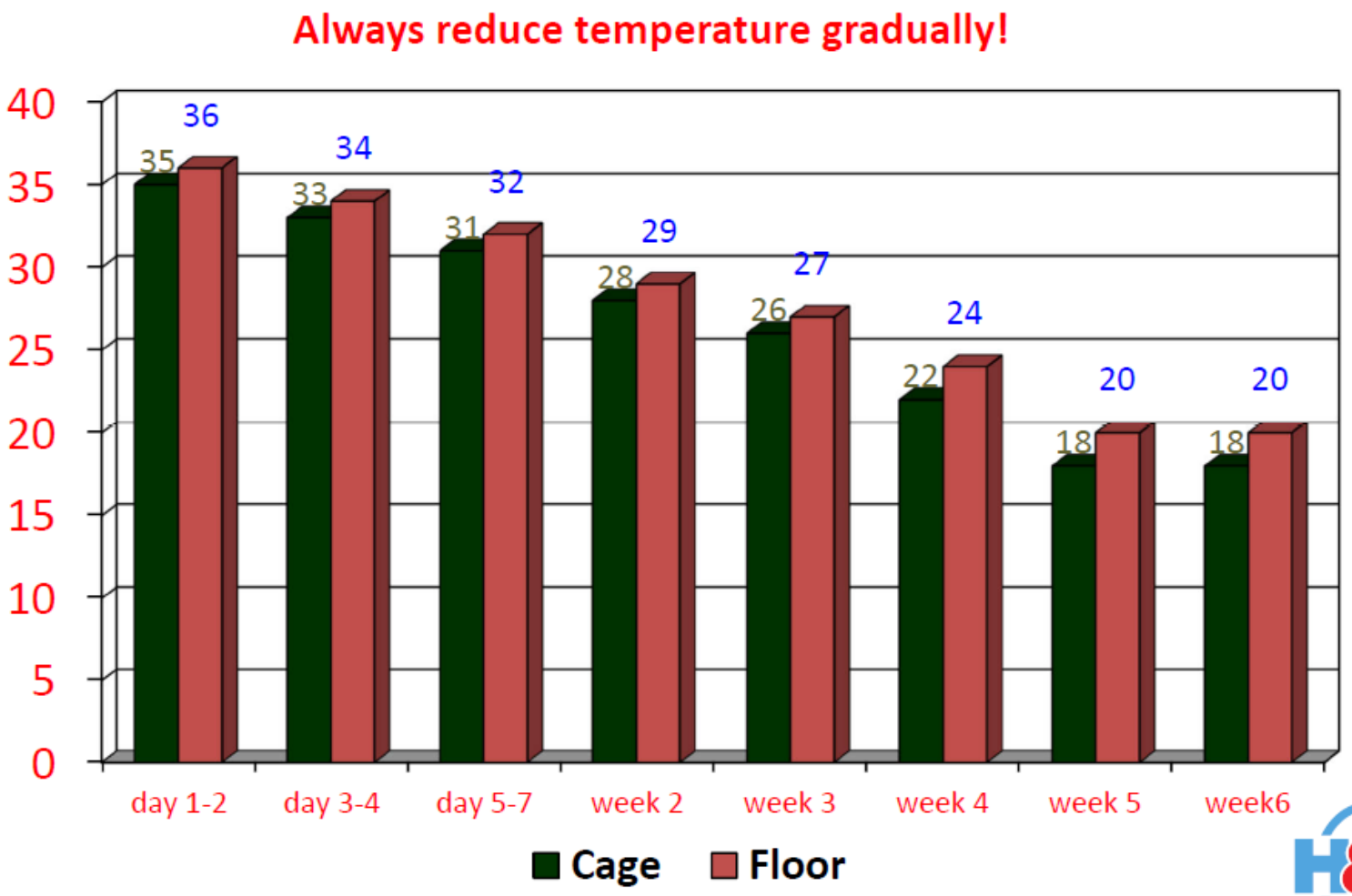
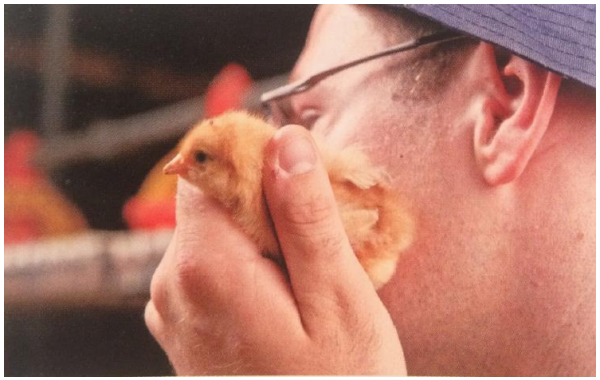
Gradual reduction



Schouren, 2019.

Body temperature

- Vent or rectal temperature



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Vent Temperature




- **DOC:** 39,7-40,5C (103,5-105F)
- **5d:** 40-41,1C (104-106F)

- **Adjust environmental temperature according to body temperature**


15.2 ˚C
59.0 ˚F

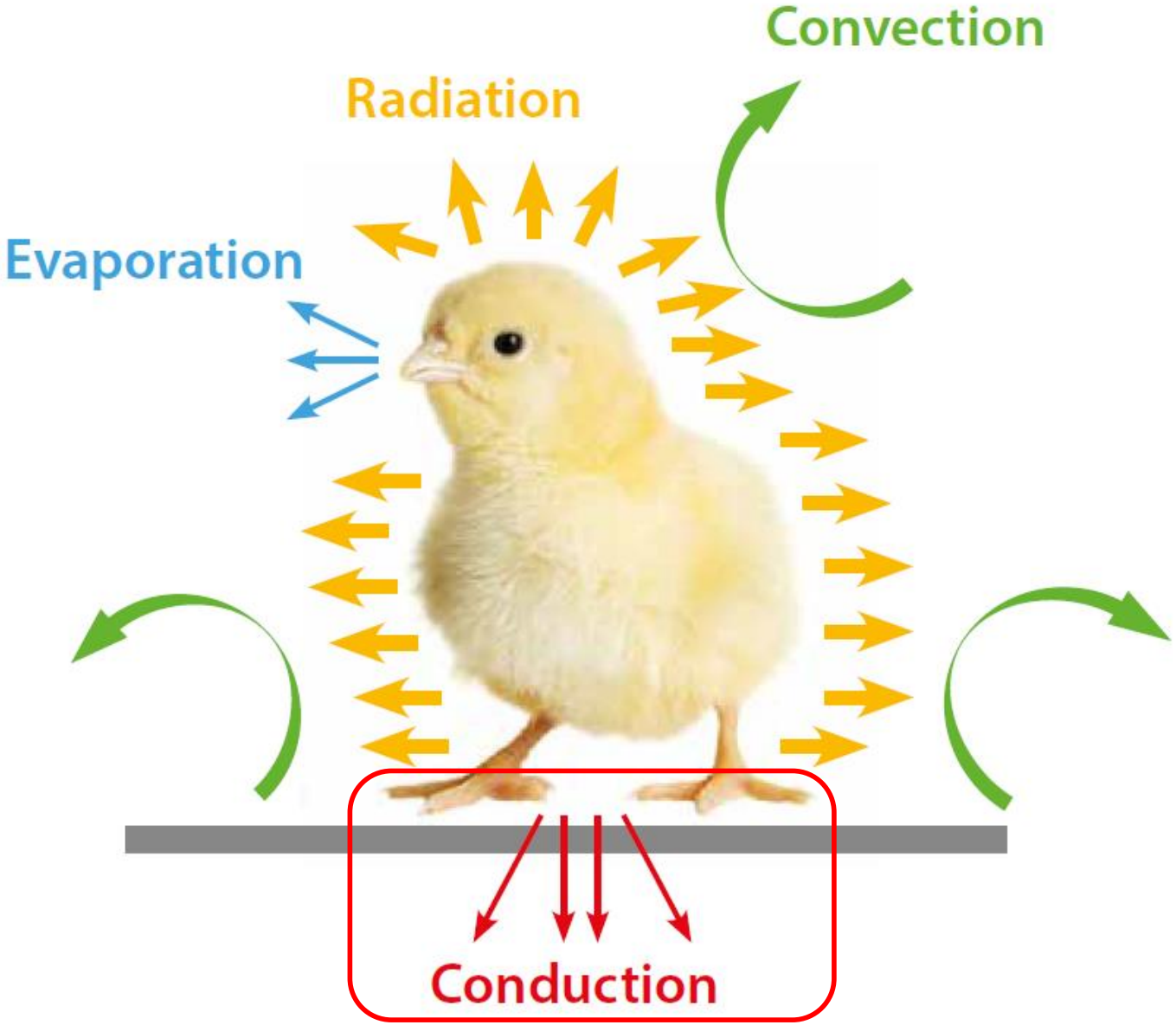

35.4


17.0 ˚C
62.6 ˚F


18.8 ˚C
64.4 ˚F


37.0 ˚C
98.6 ˚F
37.0

Thermoregulation



40˚ C
104 ˚F

41˚ C
105.8 ˚F

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What are the effects of low body- temperature?

- Chicks lie down and will not look for feed or water!
  (No heat from digestion)
- Residual yolk will stay much longer in body cavity!
  (Early intake of carbohydrates needed to absorb residual yolk.)
- More risk of yolk sac infection and reduced benefits of maternal antibodies
- Immune and digestive systems cannot function properly!
- More susceptible for bacterial infections!
- Higher first week Mortality!
- Insufficient Body-Weight development of survivors!

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Is there a problem?

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Low or high temperature
Body Temperature

Relative Humidity (RH)

- First week is 60% (60 to 70%)
- Lower than 40%:

a) Dehydration
b) Damage respiratory tract.
c) Pasty vents
d) Distress
e) Feather cover

- After 1st week → 40 to 50%

* Relationship between humidity and temperature

RH > 85% → Temperature comfort zone decreased by 1C

RH < 40% → Temperature comfort zone increased by 1C

- **TEMPERATURE** is more important

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Environmental temperature on behavior and body temperature

Table 1. The influence of environmental temperature on behaviour and body temperature of day old chicks at constant relative humidity of 60% (after Kaltoven & Dijk, 1984)

Solitude			*Group*		
T air (C)	*T rectal (C)*	*Chick behaviour*	*T air (C)*	*T rectal (C)*	*Chick behaviour*
44	44.0 - 44.0	Heavy panting, moments of panic, lying down, sudden movements, some chicks die	44.0 - 44.5	44.5 - 45.5	Equal to solitude; many chicks become unconscious and die
42	43.5	Heavy panting, sudden movements, dropped wings, high chirps, alternate standing/sitting	42.0 - 43.0	44.5 - 45.0	Heavy panting, high chirps, high distress, many chicks become unconscious, some die
40	41.0 - 43.0	Strong panting, lying with legs stretched, some distress, high chirps, dropped wings	40.5 - 41.0	44.5 - 45.0	Heavy panting, strong chirps, moments of panic, sudden movements, many chicks become unconscious
38	40.5 - 41.0	Fast and irregular panting, dropped wings	39.5 - 40.5	43.5 - 44.5	Distress, strong panting, beaks open, chicks walking, some become unconscious
36	39.5 - 40.0	Some chicks have dropped wings	37.9 - 39.5	42.5 - 43.5	Distress, fast panting, beaks open
34	39.0 - 39.8	No remarks	37.0 - 39.0	41.5 - 42.0	Distress, some birds with open beak, fast breathing
32	38.5 - 39.0	No remarks	34.5 - 37.5	40.0 - 40.5	Chicks are spread out in the boxes, are distressed
30	37.5 - 38.0	Quiet, some chicks look droopy, some chirping	33.0 - 36.0	40.0	No remarks
28	37.0 - 38.5	Droopy, blinking eyes, shaking of heads	30.5 - 35.0	39.5	No remarks
24	36.8 - 38.0	Droopy, some chirping, chicks sit in hunched-up position	28.5 - 34.0	39.0 - 39.5	Incidental huddling
20	36.0 - 37.5	Chicks sit hunched-up, chirping	24.5 - 33.0	38.5 - 39.0	Most chicks huddling
15	32.0 - 35.0	Chilled, hunched-up appearance	18.0 - 35.0	37.0 - 38.0	Huddling, all chicks close together
10	30.5 - 34.0	Chilled, hunched-up appearance	15.0 - 35.0	36.5 - 37.5	Huddling, all chicks at one side of box

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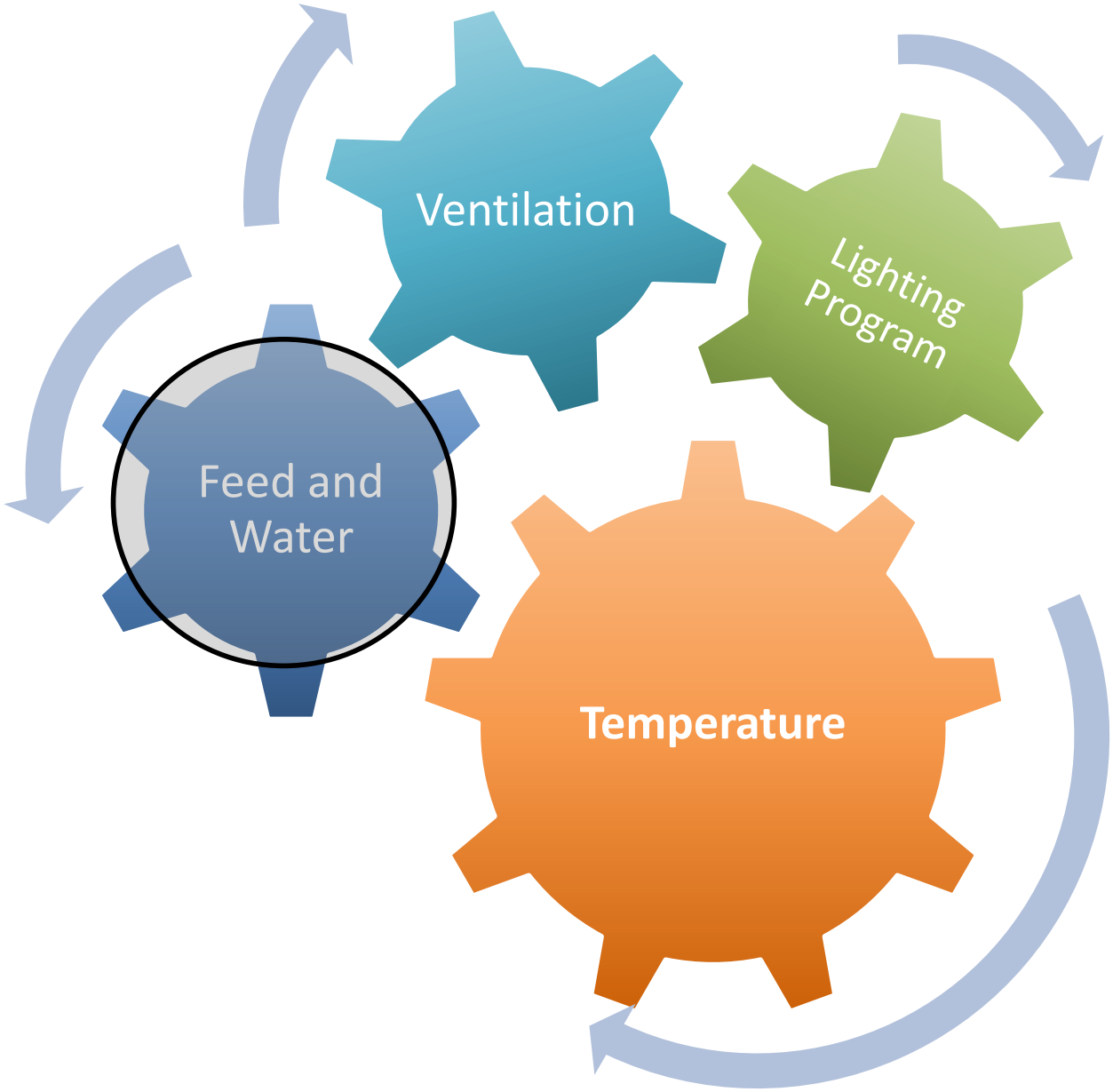
Key points

- Adjust environmental conditions according to body temperature
- Gradually reduction of environmental temperature
- Behavior!

Keystone of brooding



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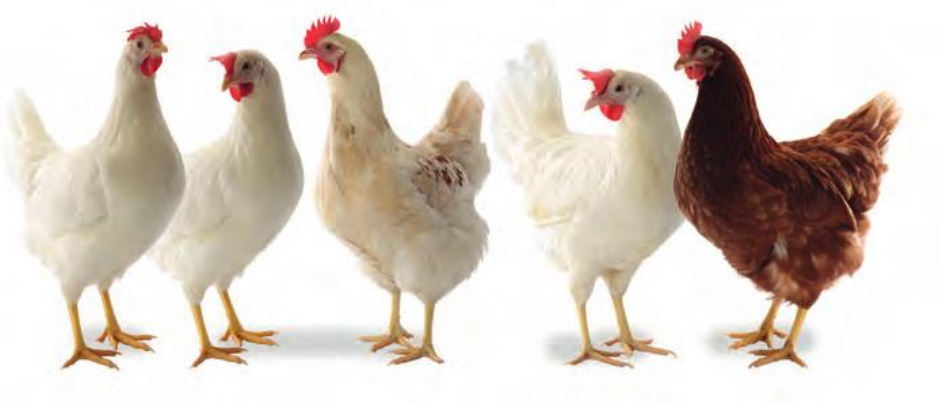

Brooding: Feed and Water

Stocking densities

Age	Floor space		Feeder space		Drinker Space	
	Cage	Floor	Cage	Floor	Cage	Floor
0 – 3 weeks	140 cm^2/bird	21 birds/m^2	2.5 cm/bird	4 cm/bird 60 birds/pan	1.25 trough cm/bird 16 birds/nipple	1.4 trough cm/bird 16 birds/nipple 100 birds/fontain
3 – 16 weeks	285 cm^2/bird	16 birds/m^2	5 cm/bird	8 cm/bird 30 birds/pan	2.5 trough cm/bird 8 birds/nipple	2.5 trough cm/bird 8 birds/nipple 75 birds/fontain

- Feeder space has a significant impact on body weight and uniformity

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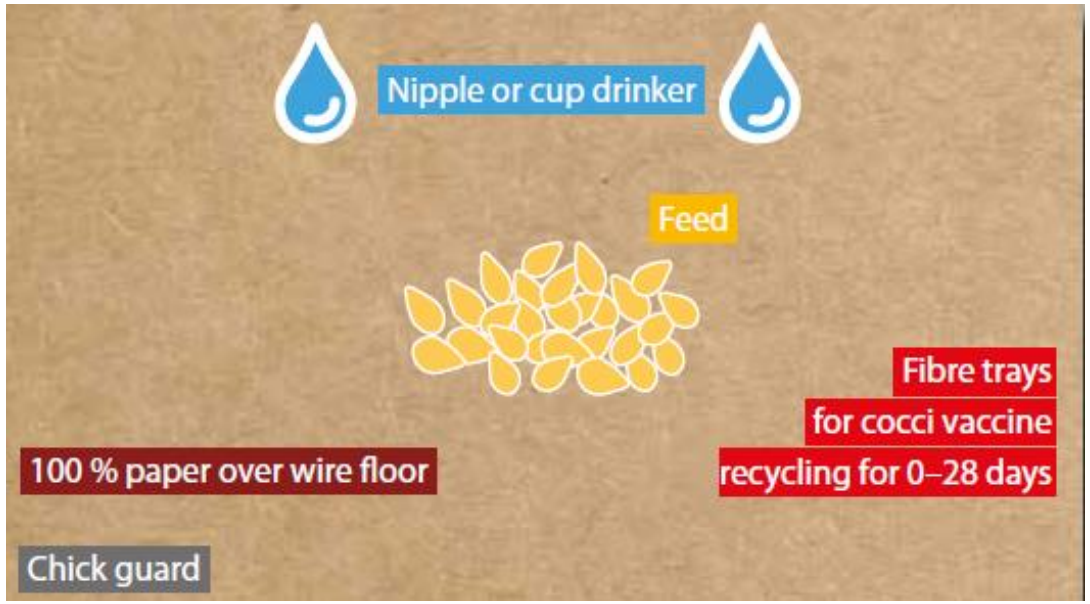
Feed

- Available immediately after placement.
- Correct feed structure
- Feed scattered on paper 3-5 days.
- Place abundant feed.
- Floor: Auxiliary feeders 1/80 to 100 chicks (depend on size)

Feed and water



- Abundant feed in feeders.
- Paper covering 100% of the floor cage.
- In front of permanent feeder
- Floor brooding covering at least 50% and critical under feeder and water lines.
- Remove paper when feet cant get through the mesh (2-3 wks)
- Several layers of paper.

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Water

- 360-activated nipples are preferred

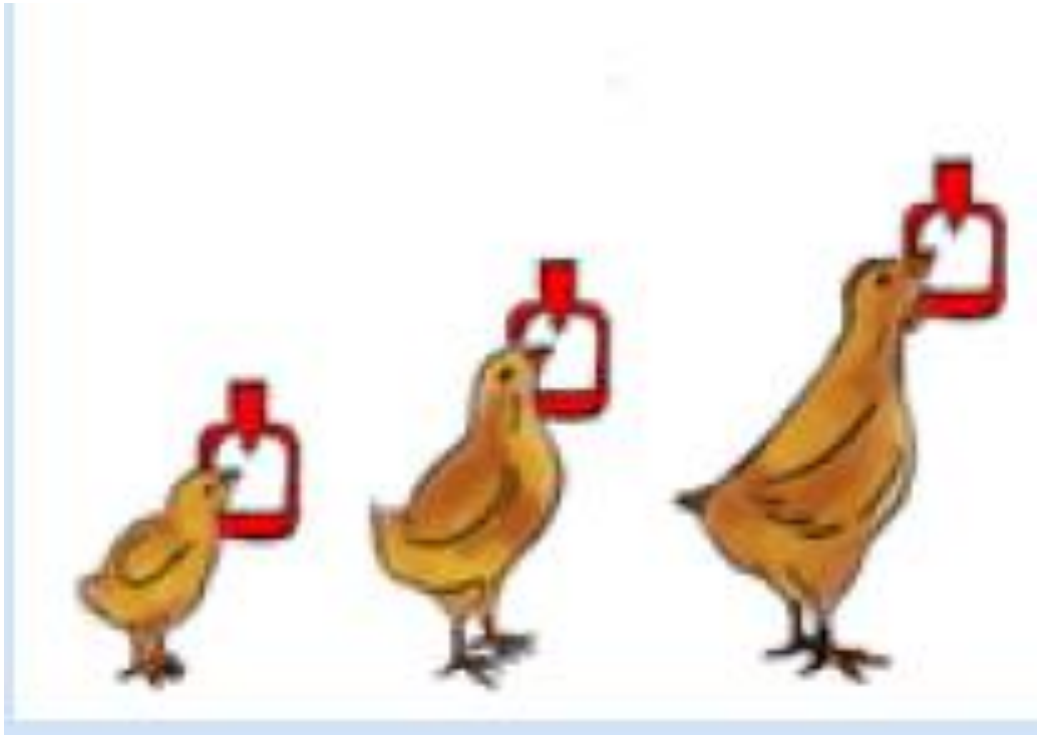
*cup drinkers or extra drinkers for first week (1/80 to 100 chicks in comfort zone).

- Reduce water pressure (follow manufacturer recommendations).
- Flush the lines and cup drinker before housing chicks and do it in a regular basis for the first week (avoid hot water).

Water

- Trigger drinkers first 3-4 days and nipple at chick eye level.
- Target water temperature 20-25C.
- Adjust height according to birds growth.
- Place paper under drinking lines (first 3 days; floor brooding)
- Must monitor the daily consumption.

Adjust drinker height



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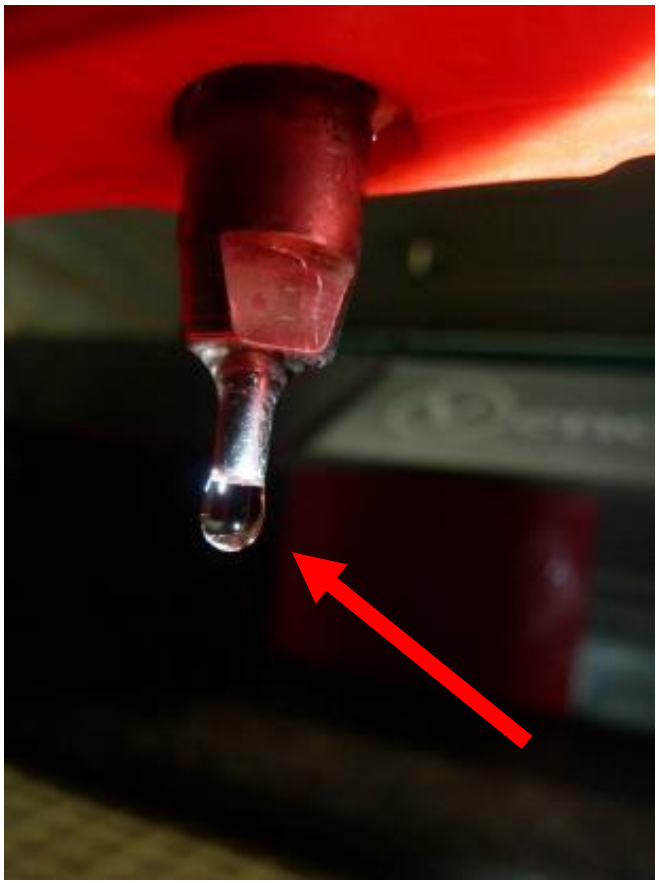

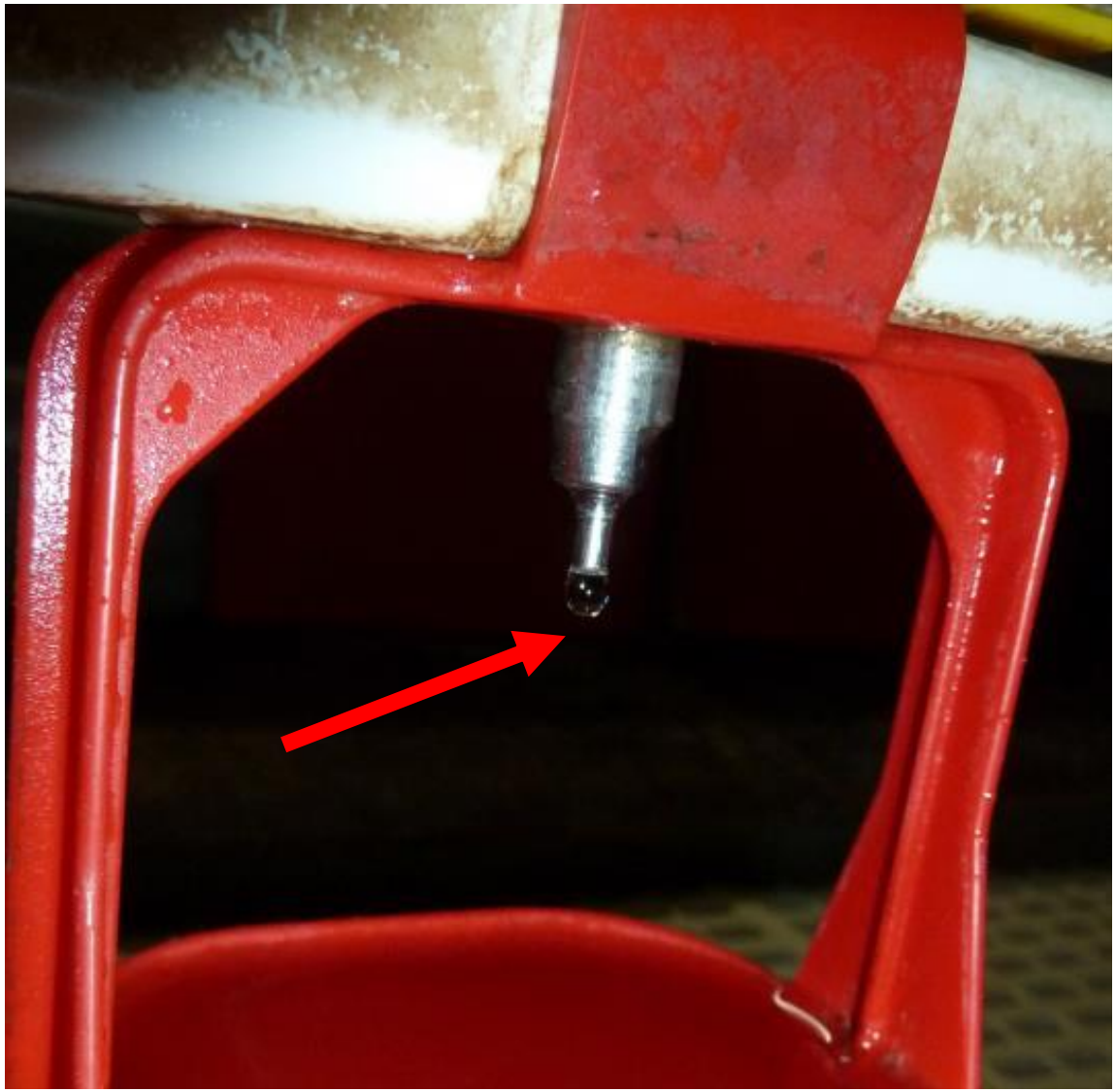

Reduce the water pressure of the nipples in order to enable chicks to find water easily!

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Mozafar, 2017

- The optimal water temperature is about 18 - 22˚C!
- Birds refuse to drink, if the water temperature is too high!
- Birds do not EAT, if they do not DRINK!

Mozafar, 2017

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Drinking water can be cooled by flushing waterlines with fresh cool water or renewing water in bell drinkers!

Mozafar, 2017

Mozafar, 2017

DRINKERS HEIGHT

Mozafar, 2017

DRINKERS HEIGHT

Mozafar, 2017

Paper under drinking line

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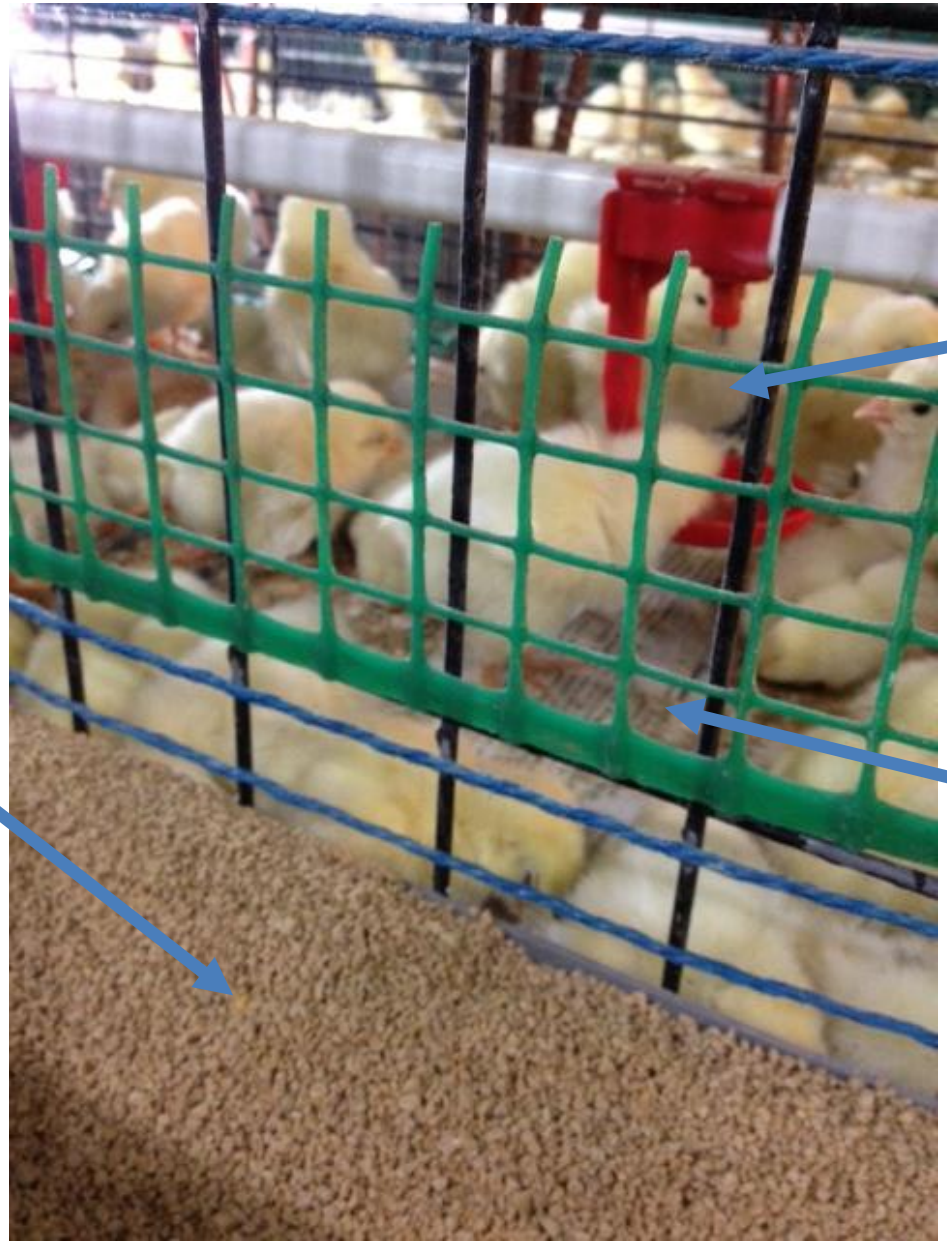
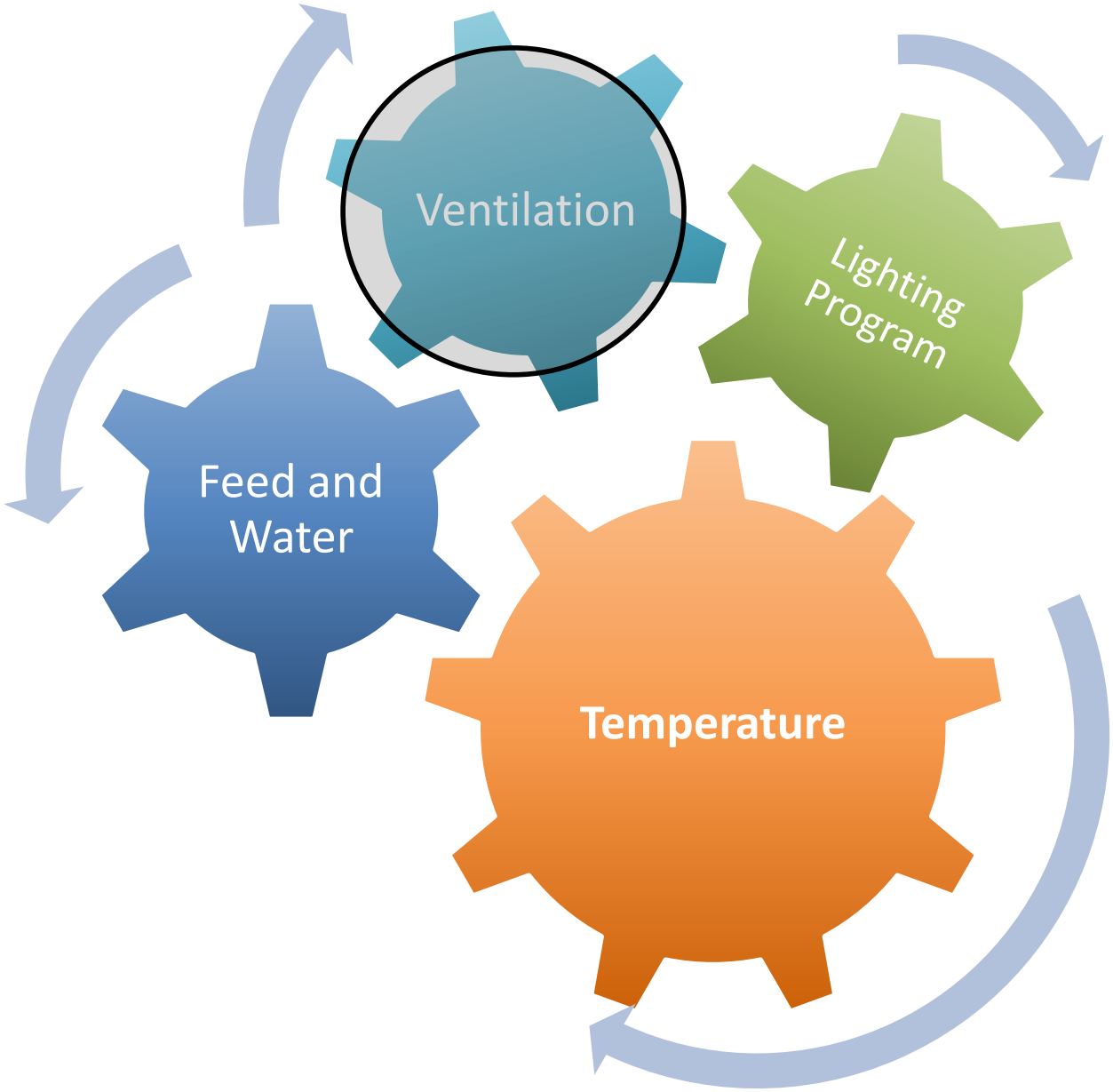

Water
Feed
Paper

Keystone of brooding



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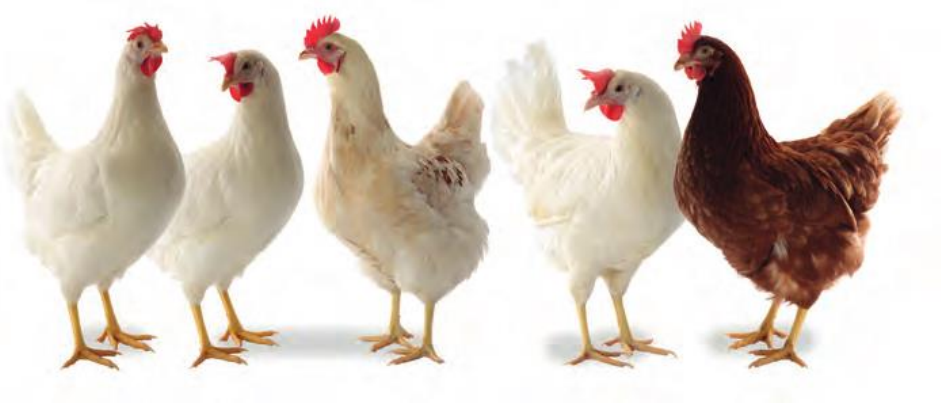

Brooding: Ventilation

Ventilation

- Minimum ventilation to control moisture and air quality.
- Starts pre-placement
- Keep RH below 70%
- AVOID drafts → chilling effect.
- Provide optimum air quality from the beginning.

Air Movement

Weeks of age	Ambient Temperature					
	32	21	10	0	–12	–13
1	360	180	130	75	75	75
3	540	270	180	136	110	110
6	1250	630	420	289	210	210
12	3000	1500	800	540	400	400
18	7140	3050	2240	1500	600	600
19+	9340–12000	5100–6800	3060–4250	1020–1700	700–1050	700–850

M3/hr/1000 birds

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Drafts

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Air Quality

Oxygen	> 19.6%
Carbon dioxide	<0,3%/3000 ppm
Carbon monoxide	< 10 ppm
Ammonia	<10 ppm
Inspirable Dust	< 3.4 mg/m3
Relative Humidity	>< 45-65%

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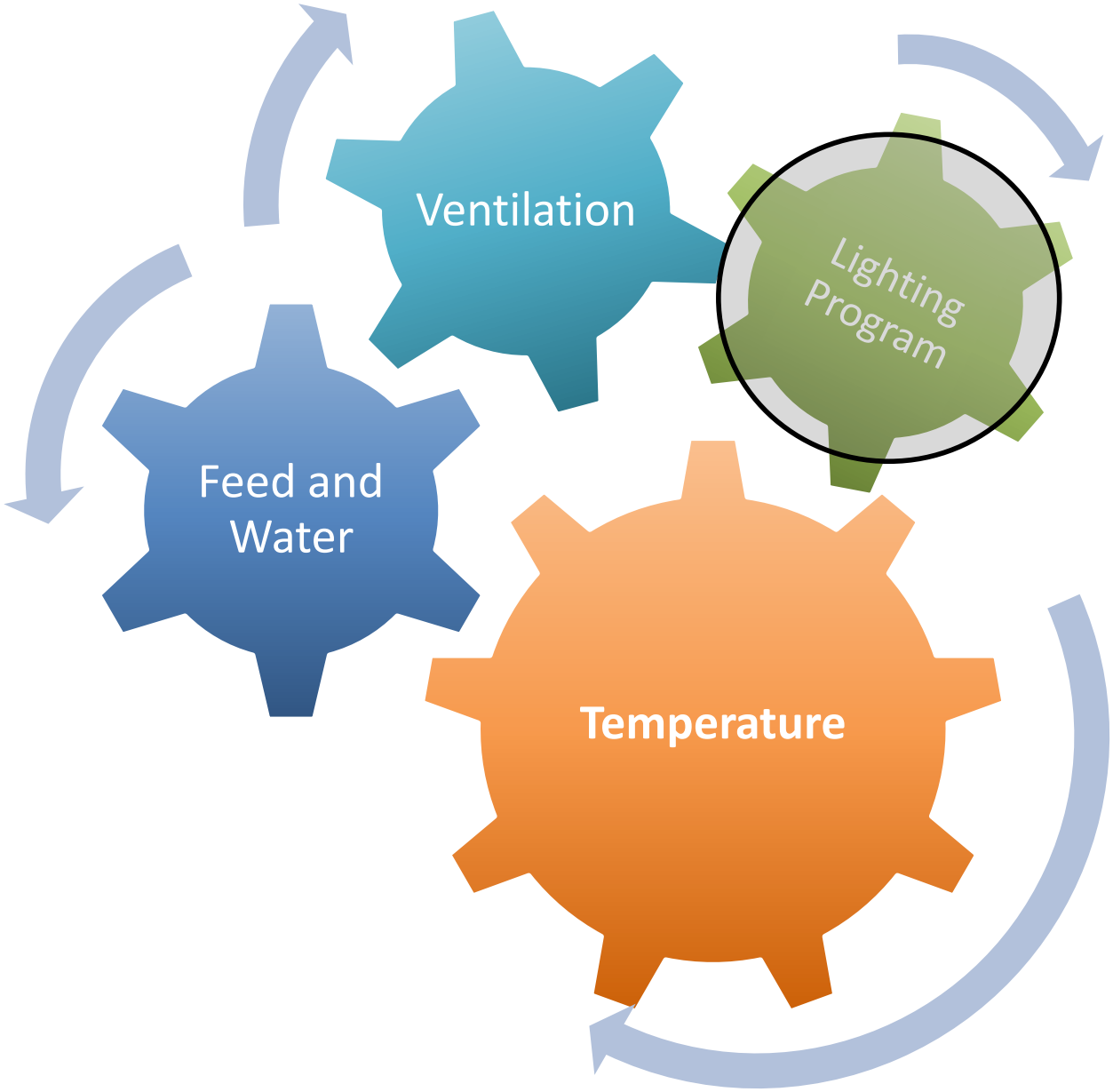
Keystone of brooding



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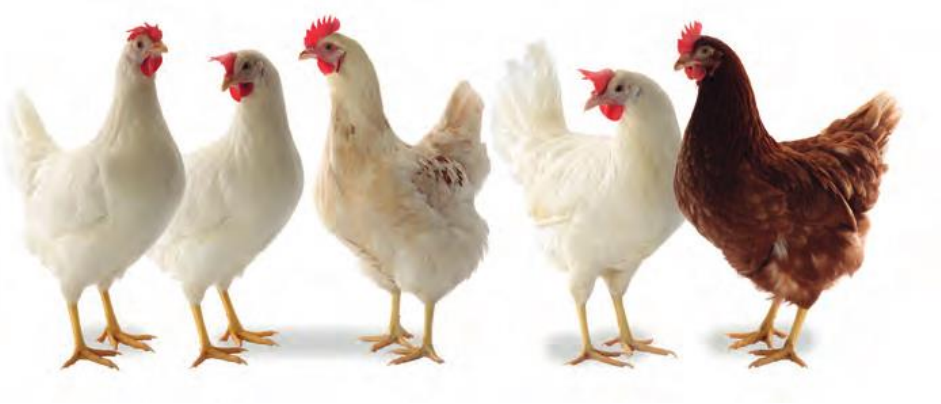
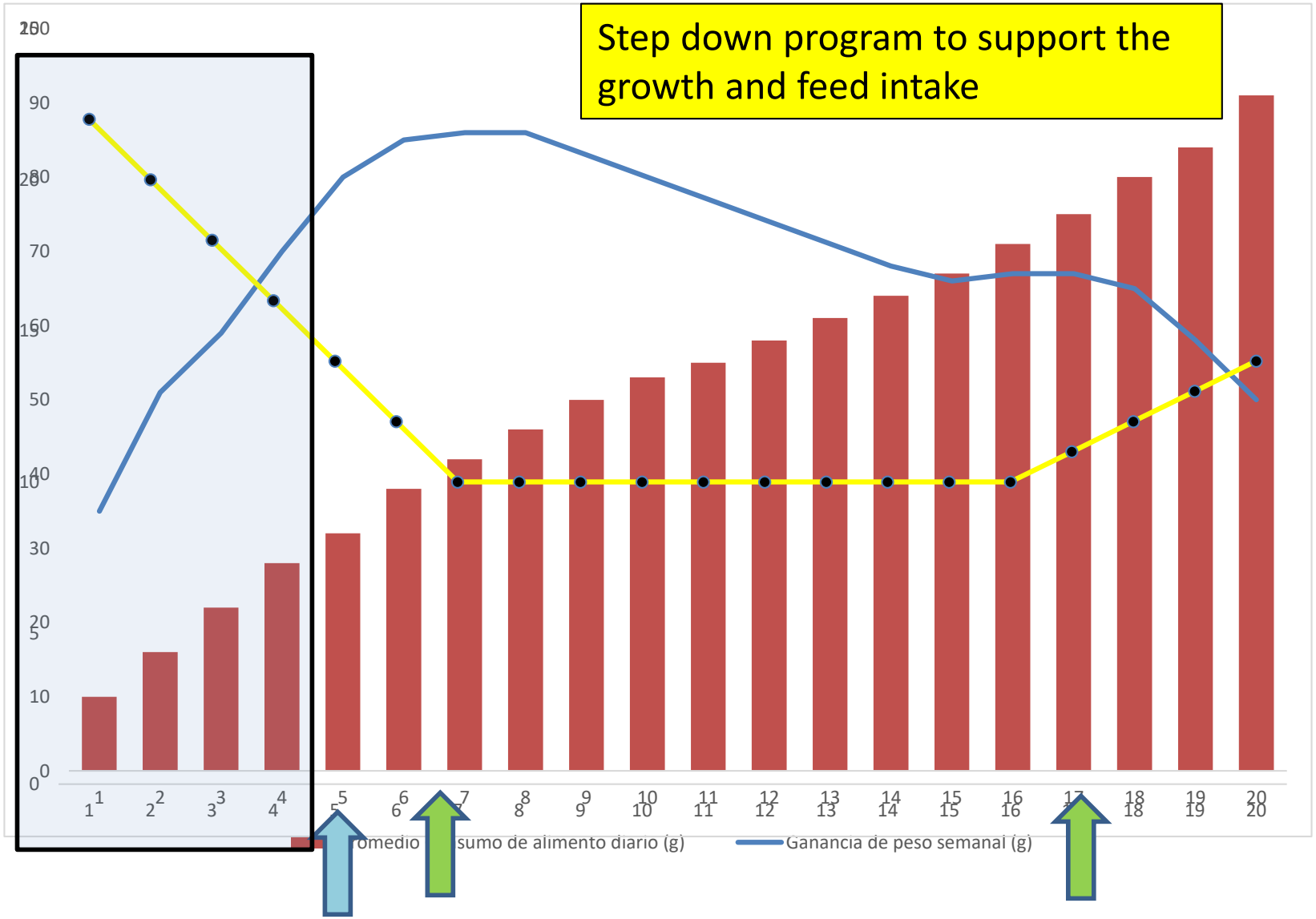


Brooding: Lighting program

Body development



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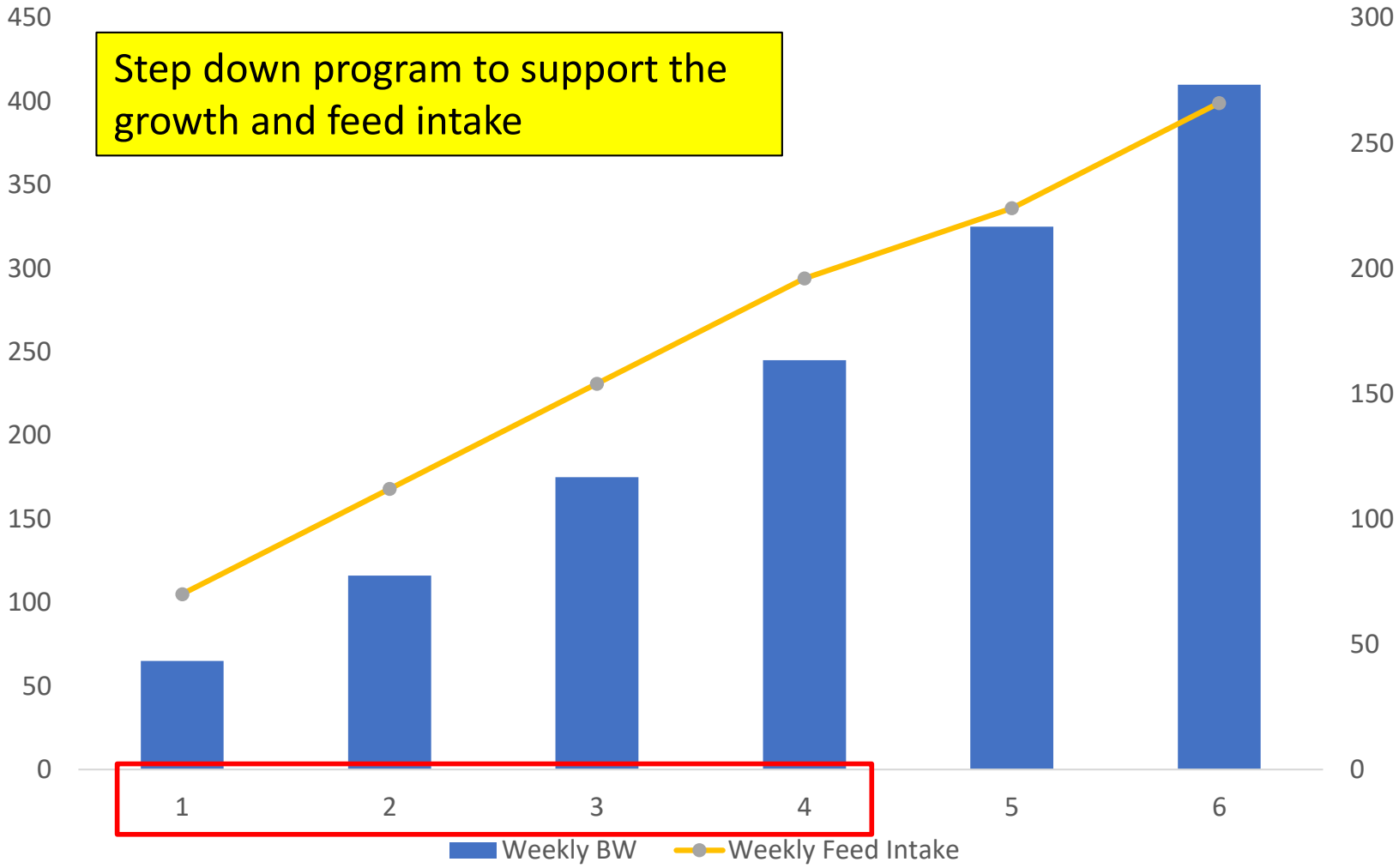
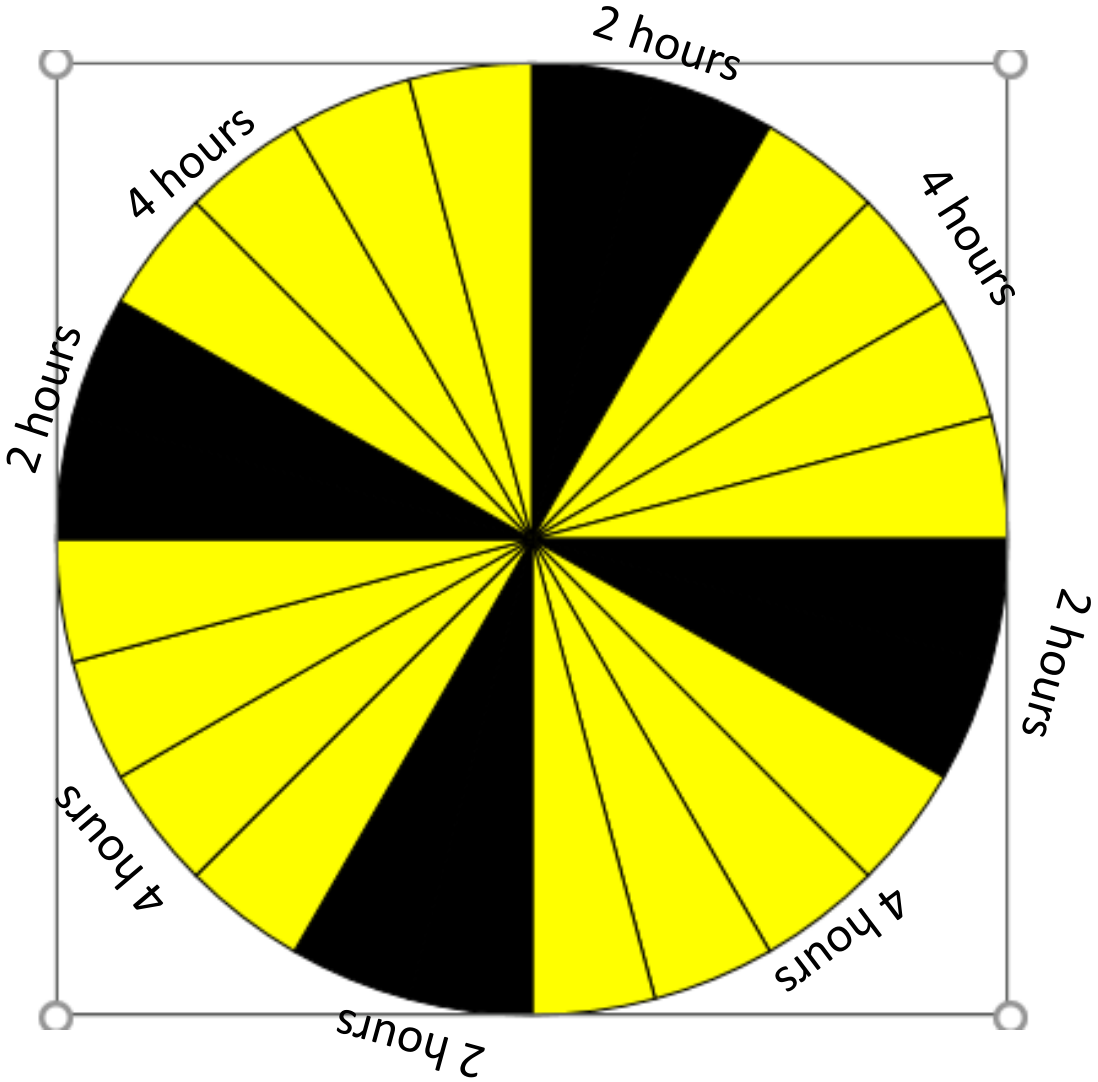
Brooding period



Lighting program: Intermittent program



- 7-10 days
- Improve BW and uniformity
- Better livability
- Uniform behavior
- Intensity: > 40 lx
- Dark houses < 3 lx

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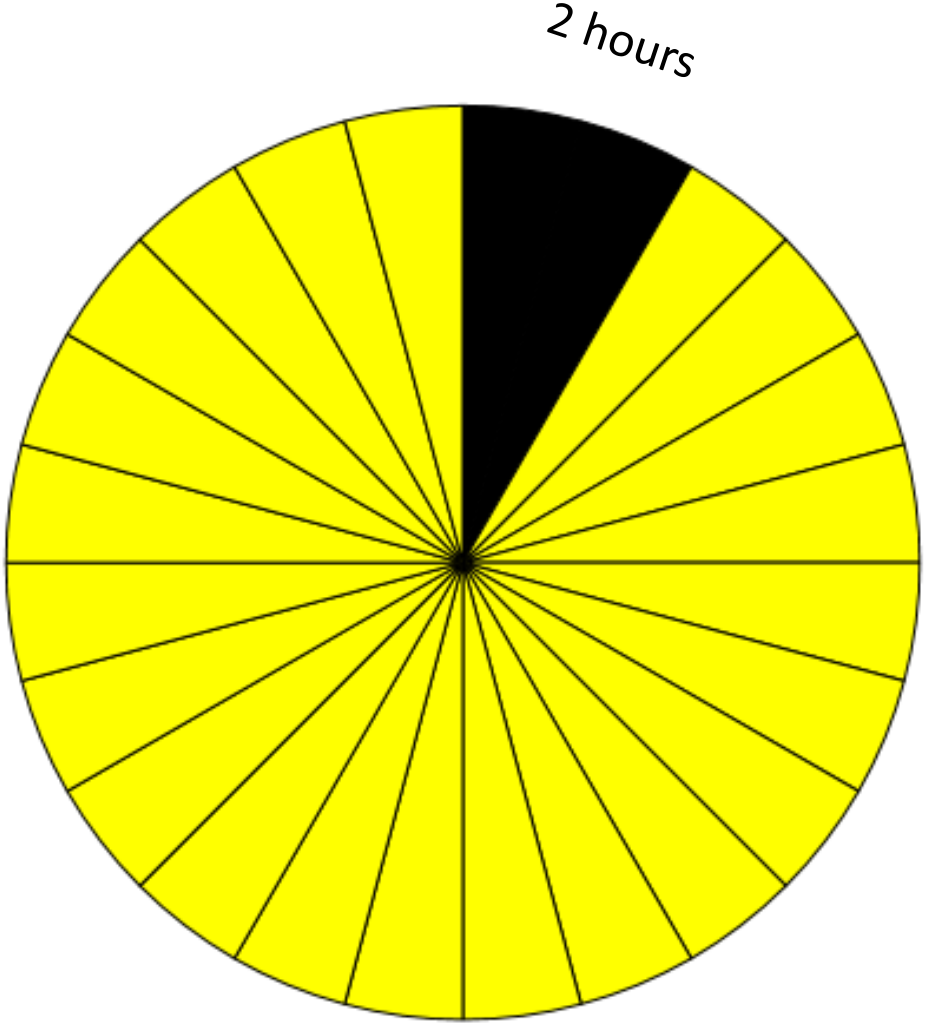
Lighting program: Traditional lighting program



- 22 hours first 2-3 days
- Then 20 hours up to 7d.
- After → 2 hours per week
- Adjust according to BW and uniformity

Intermittent or traditional?

1. Intermittent
2. Traditional

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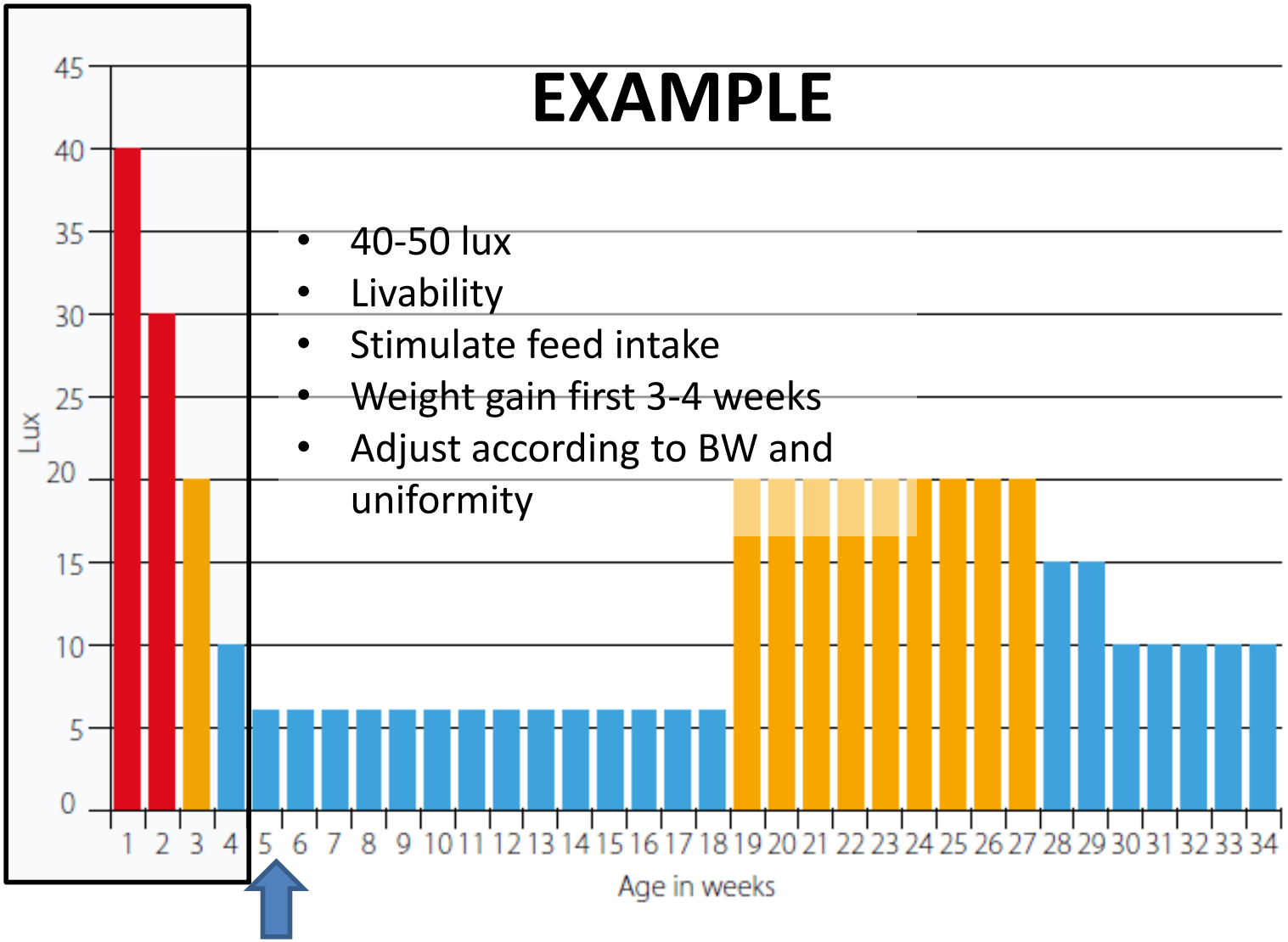
Lighting program: intensity



- 40-50 lux
- Livability
- Stimulate feed intake
- Weight gain first 3-4 weeks
- Adjust according to BW and uniformity

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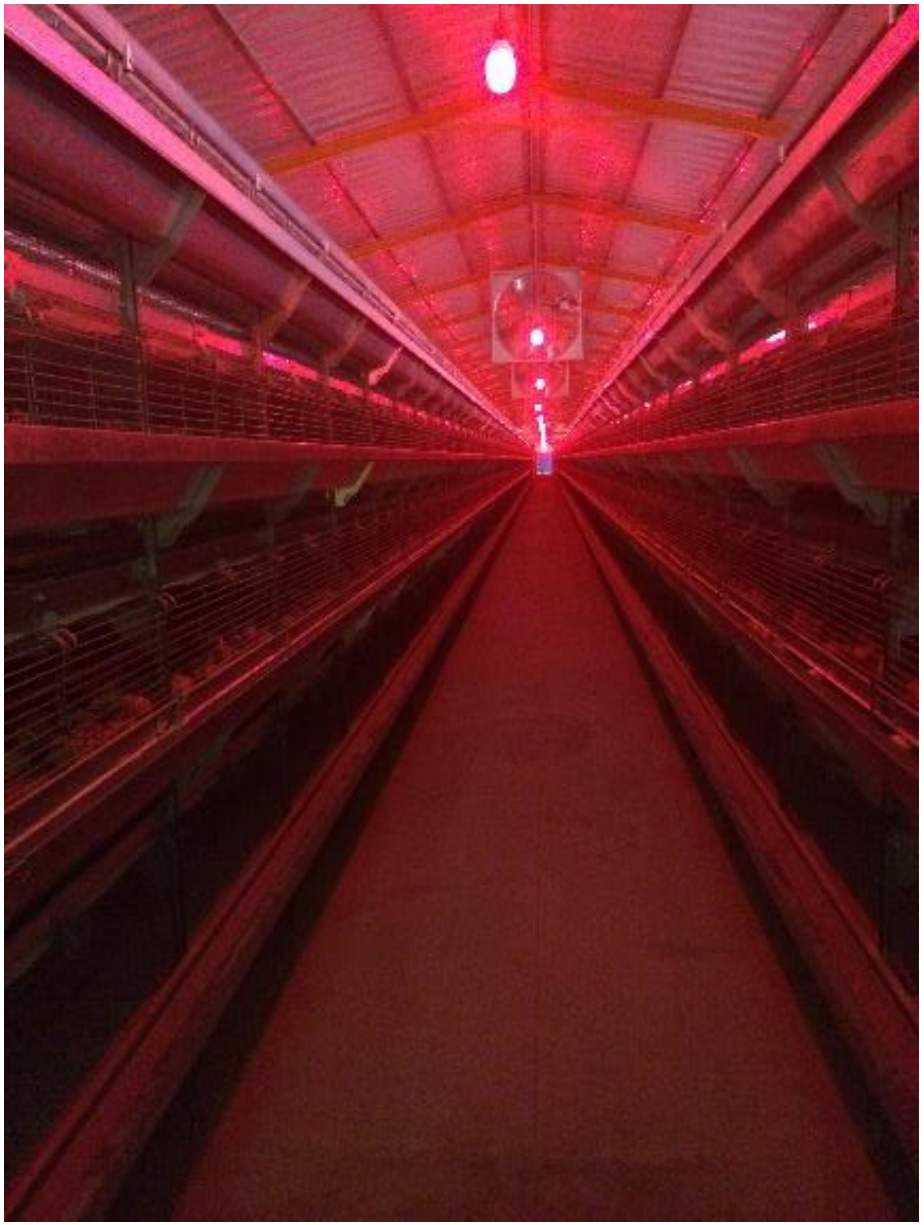

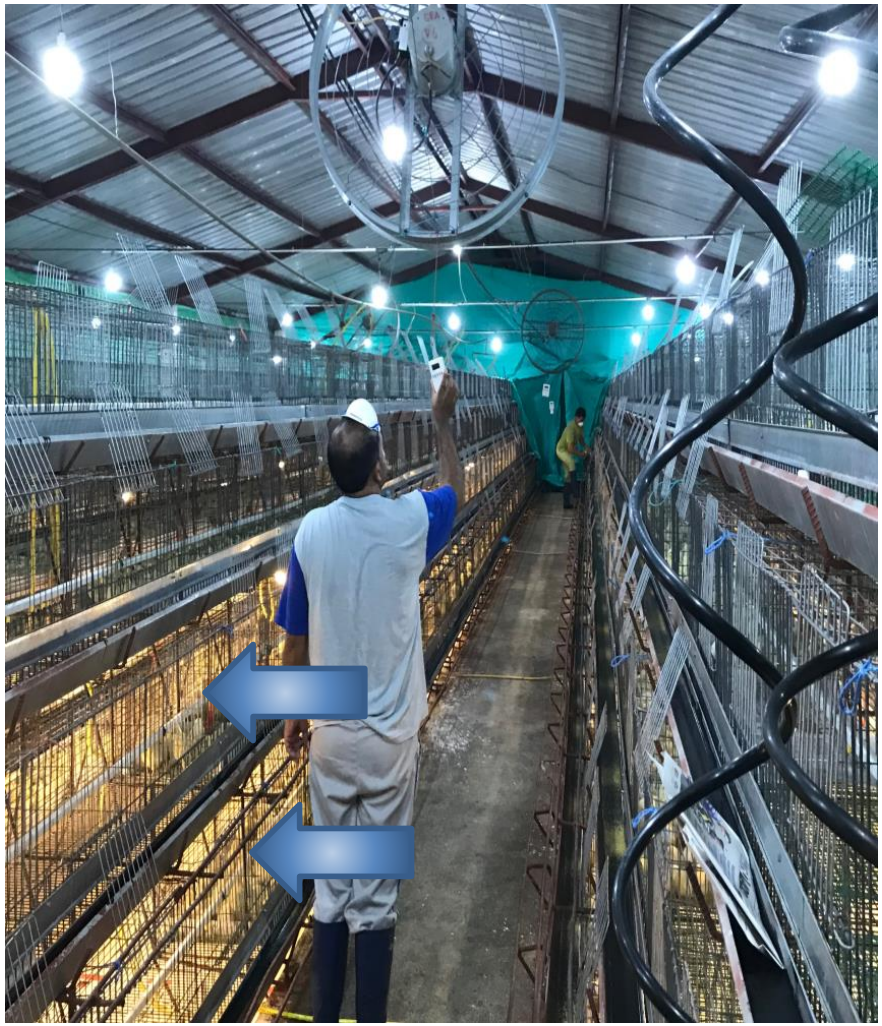

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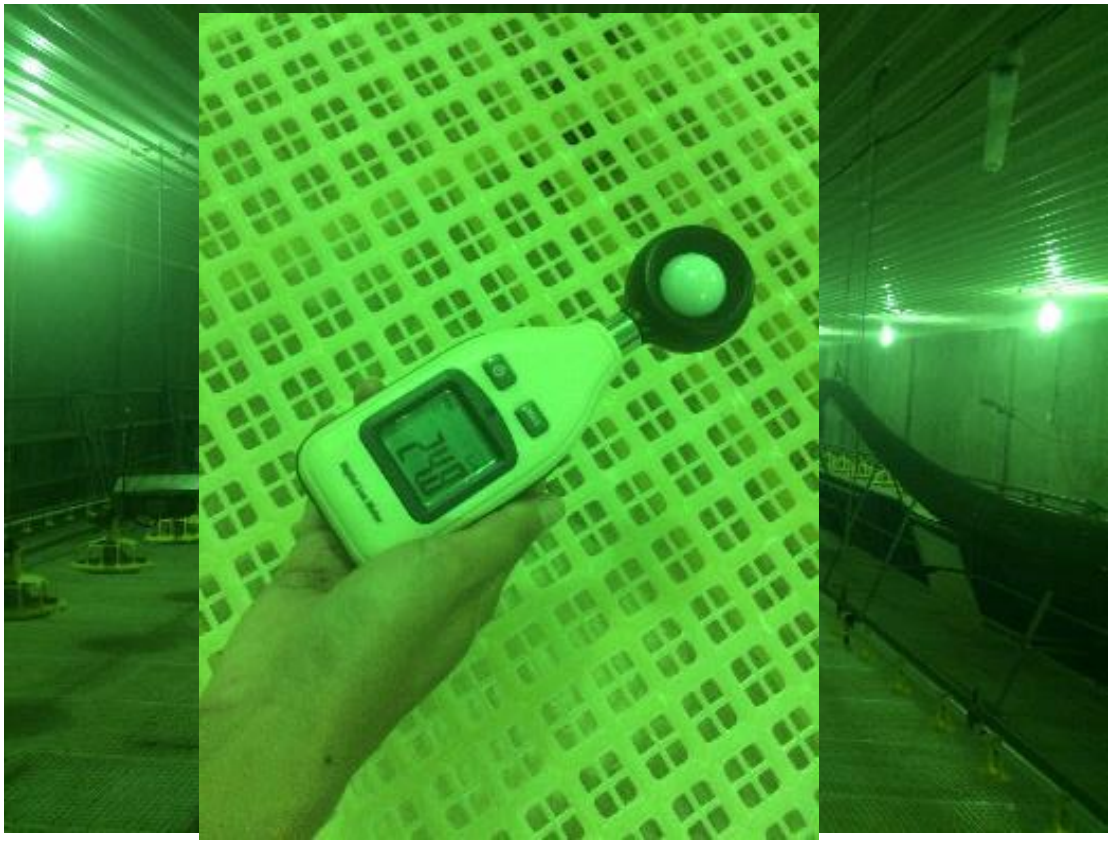

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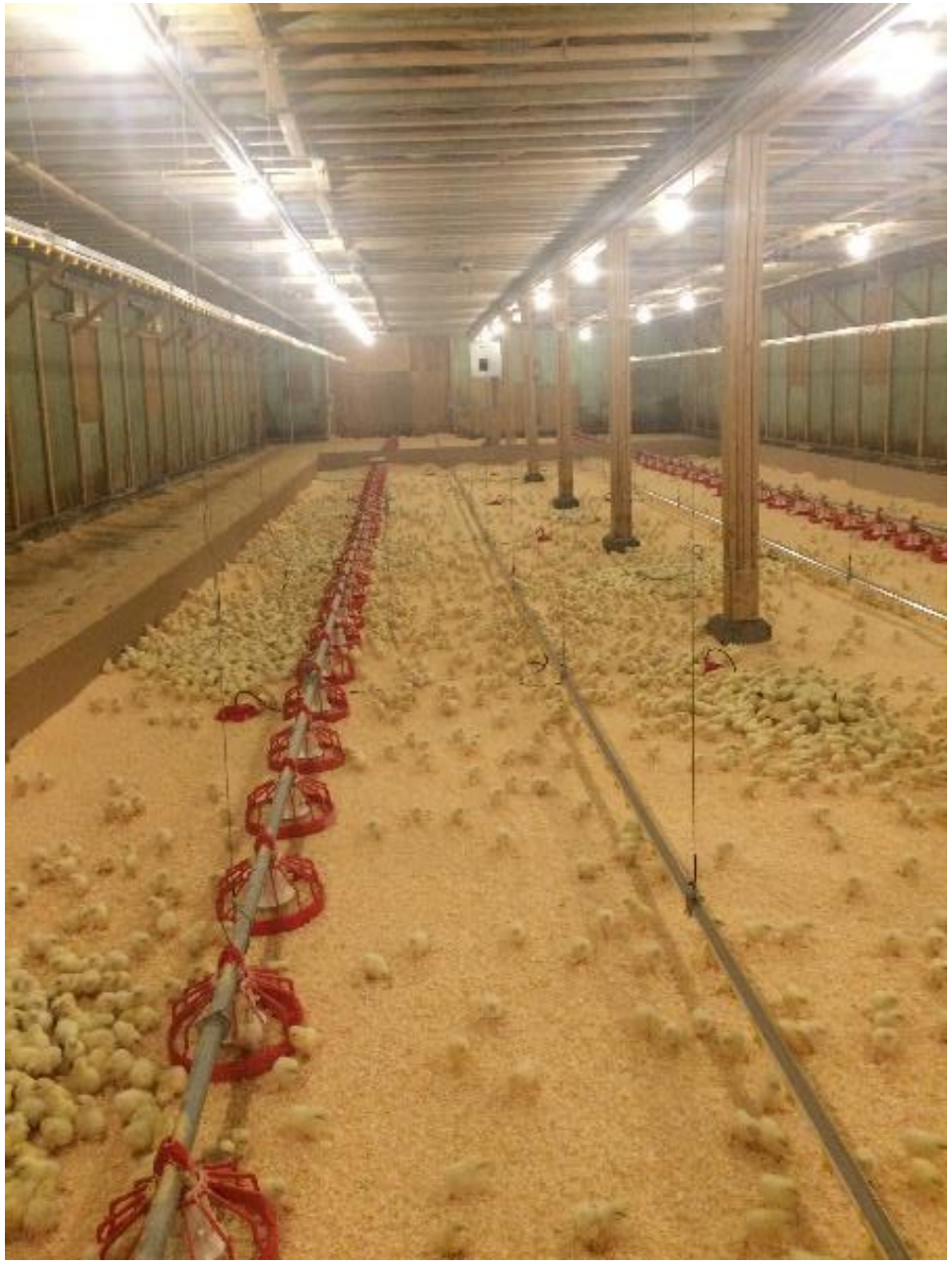
ere. How many

A. 10-20 lx
B. 20 to 30 lx
C. 30 to 40 lx
D. More tan 40 lx



Do not rely in your eyes. Use light meter.

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Key points

- Light intensity 40 to 50 lux for 7-10 days
- Avoid dark areas
- When possible → intermittent program
- Gradually reduce light intensity after 1st week.
- Adjust according to BW, uniformity and behavior.

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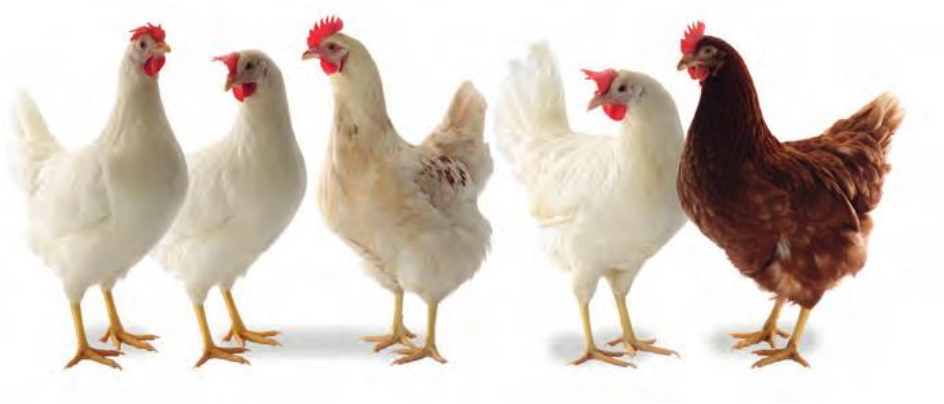

Beak Treatment

Beak Treatment (BT)

- Infrared BT at hatchery
- Hot blade beak treatment (7 to 10 days)

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What type of BT do you practice or prefer?

A. Hot Blade 7-10 days
B. IRBT
C. Hot Blade older than 1 week
D. No BT

Infrared beak treatment (IRBT)

- More uniform, controlled and welfare friendly method.
- 10 to 21 days the treated portion separates
- Extra care in brooding:

a) Drinking water: 360 nipples, extra cup drinkers, low water pressure

b) Light: 40 to 50 lux

c) Feed: high level and scatter feed on paper until day 7

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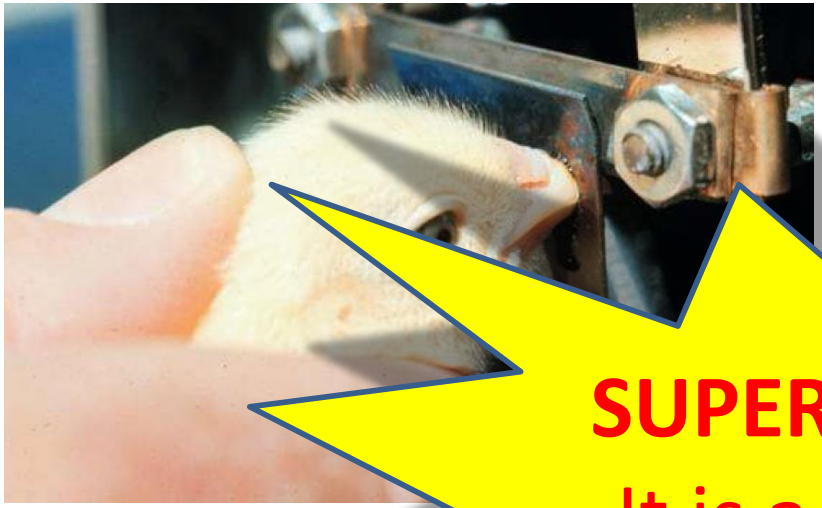
Infrared beak treatment

Under good management IRBT may produce heavier chicks than hot blade trimming at the end of brooding.

Hot blade beak treatment: 7 to 10 days



SUPERVISION!!

It is a surgery!

- 7 to 10 days
- Healthy birds and TRAINED crew.
- [illegible]ed up the
- [illegible]ment.
- [illegible]pera[illegible]e: two seconds at 650ºC
- **USE** pyrometer.
- **SUPERVISION**

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/Beak Trimming evaluation

Too long

Not straight

Too hot and too short

Too hot

Not straight and too short

Source: DR. S. MAQSOOD HAIDER JAFFERY

Too long


Too short
Neurome

Beak treatment: post surgery

- Monitor water intake
- Red water pr e
- Addition
- I
  day
- Increa re.
- Add vitamin s before and after B
- Add in the water v nins a electrolytes after BT

Permanent effect for the rest of the life of the flock: GOOD or BAD!

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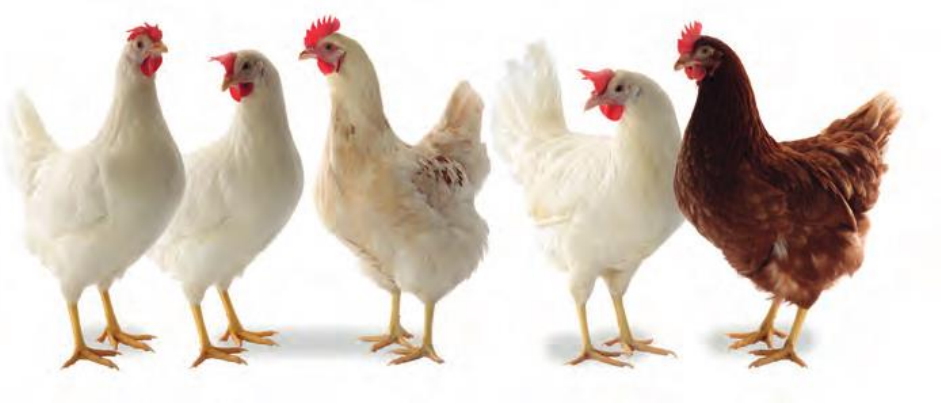

How do we know everything is going ok?

Body temperature: Vent Temperature

- **DOC:** 39,7-40,5C (103,5-105F)
- **5d:** 40-41,1C (104-106F)

- Adjust environmental temperature according to body temperature.
- Low or high impacts on performance

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Crop Fill Score

- Randomly sample around 50 to 100 birds.
- Low score: Check behavior, ventilation temperature, feeder and water access and lighting.

6 hours after placement 75%

12 hours after placement 85%

24 hours after placement 100%

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Firstt week body weight and uniformity

- The BW must at least double the BW at placement (always weight 100 chicks / flock at placement).
- Uniformity > 80%
- Good relation with 5th week body weight
- Related with good development and managements.
- Didn't make it: review managements (temperature, ventilation, lighting program, feed and water access, etc).

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	Body weight at 5 weeks	Body weight at 10 weeks	Body weight at 16 weeks	Uniformity at 16 weeks
Start of lay	+++ 0,63	+++0,59	0,39	0
Persitency	++++0,82	0	0	++0,46
Livability at 60 weeks	+++0,71	0	0	++0,4
Livability at 72 weeks	+++0,65	0	0	+++0,61
Production				
Production until 60 weeks	++++0,83	++0,3	0	+++0,54
From 60 to 72 weeks	++++0,94	0	0	+++0,6
Until 72 weeks	++++0,93	0	0	+++0,72

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7d Mortality

- Lower than 1%.
- Always do necropsies (even under normal mortality %).
- Higher than normal: take pictures and share with the technical team.

Stockmanship skills

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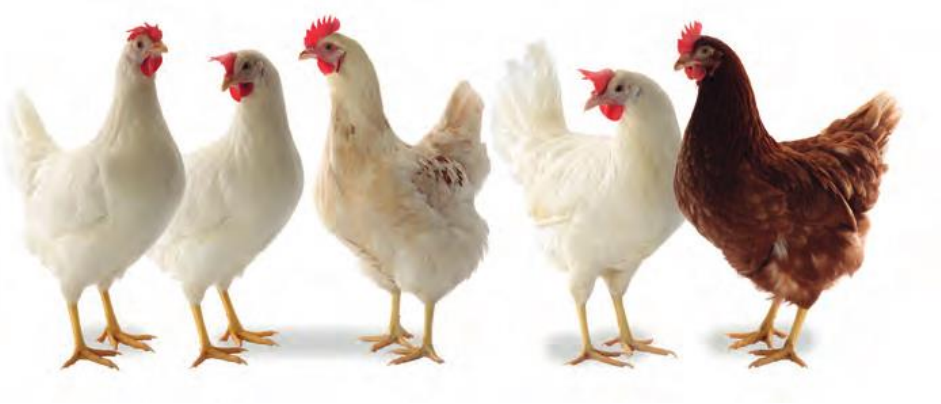

Conclusions

Conclusion

- Brooding is the art and science of developing a chick
- FLAW
- Foundation of the flock's future
- **Perfect** management
- Use the tools to evaluate how is the brooding
- **Stockmanship** skills.

Keep in mind

"Stop complaining, Just do it… but do it right!"

Carolina Altamirano, my wife, 2019.

…as I told you

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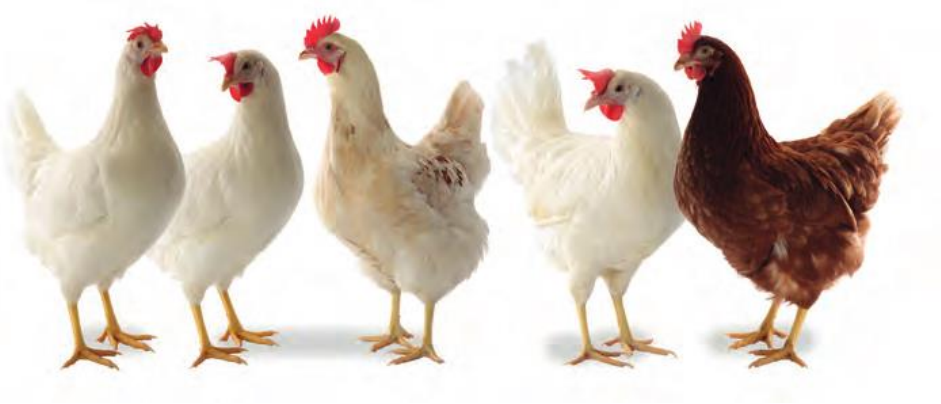

Thank you

Questions?