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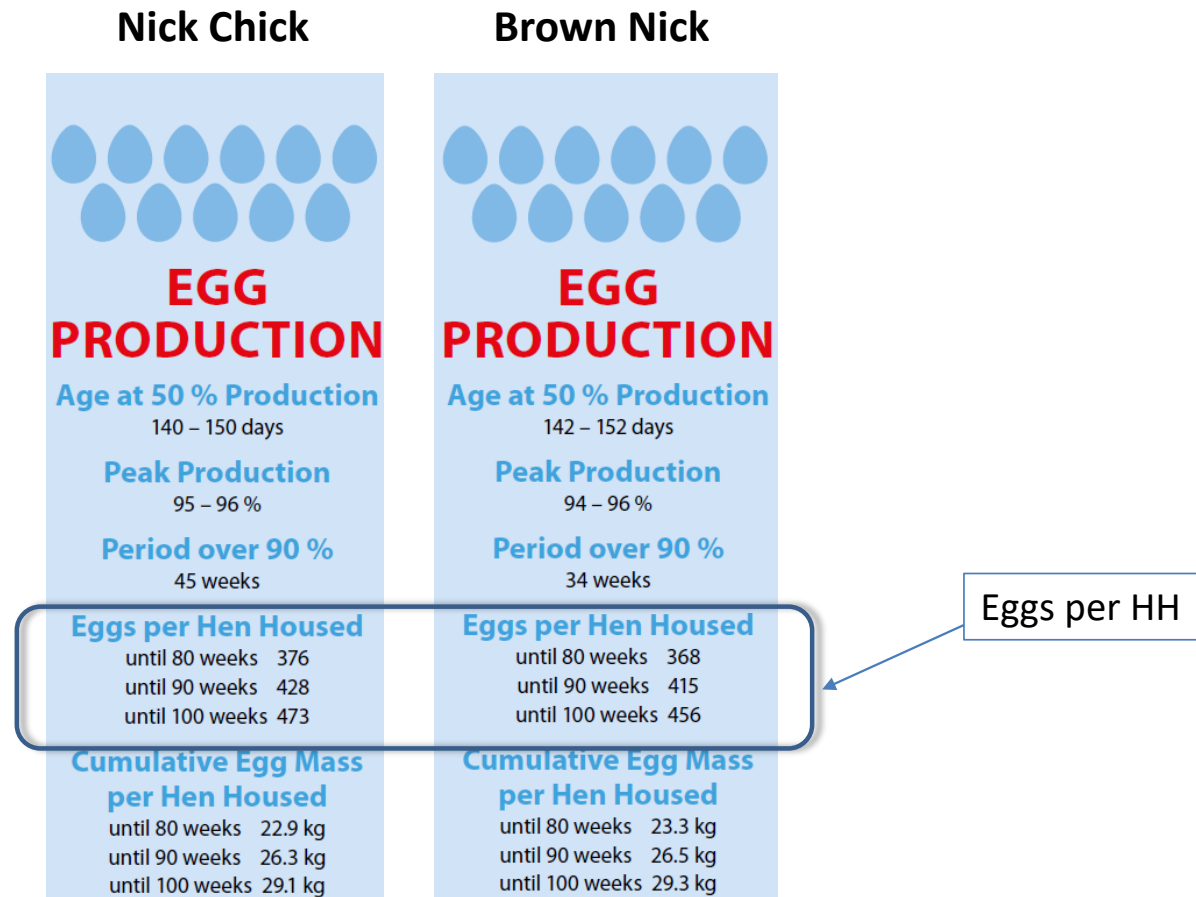
# Transfer to Production: critical period

H&N Academy 2019

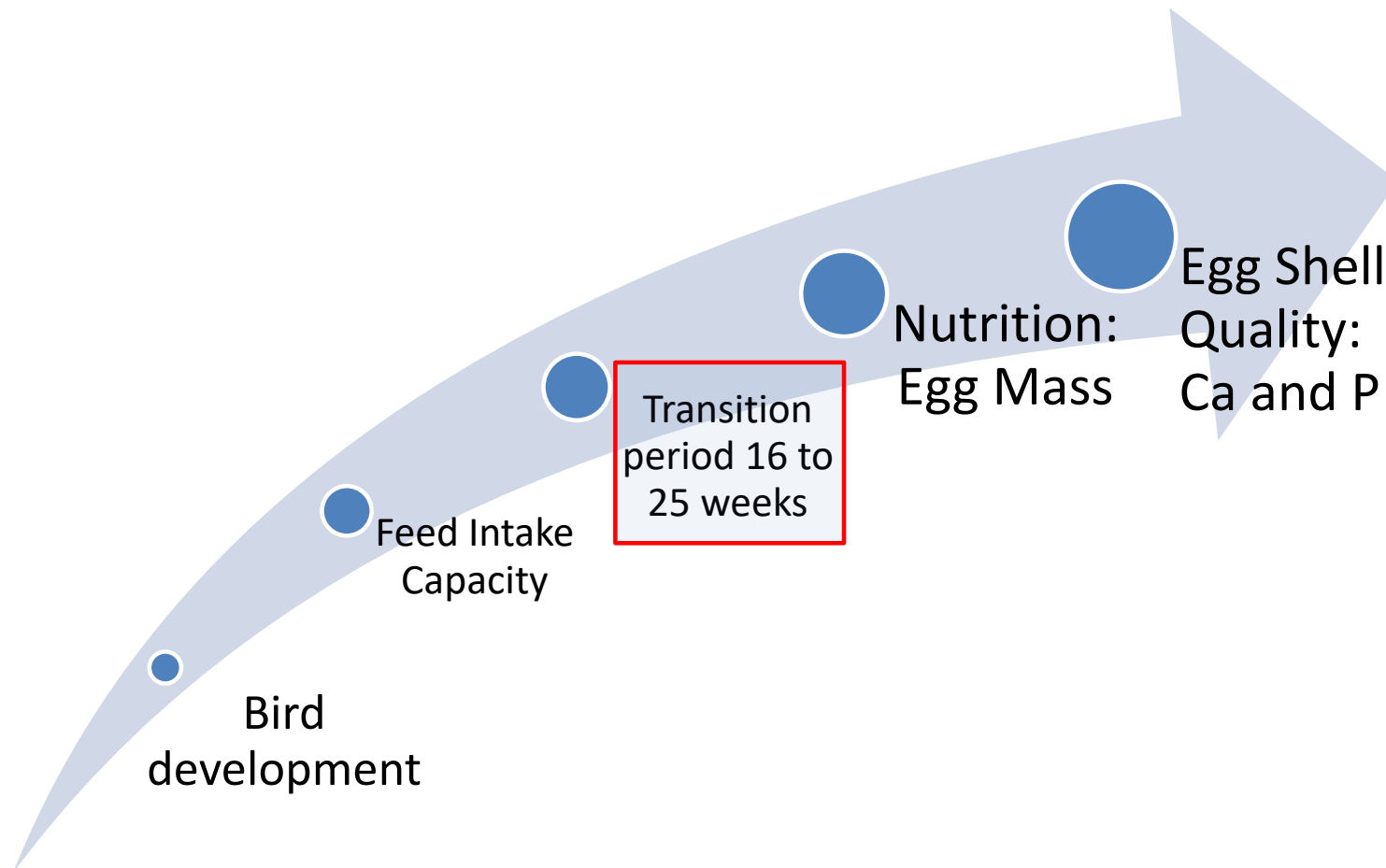
Maurice Raccoursier MV MSc

Global Technical Service

# What is the genetic potential we are working for?



# 5 Keystones: Express the genetic potential



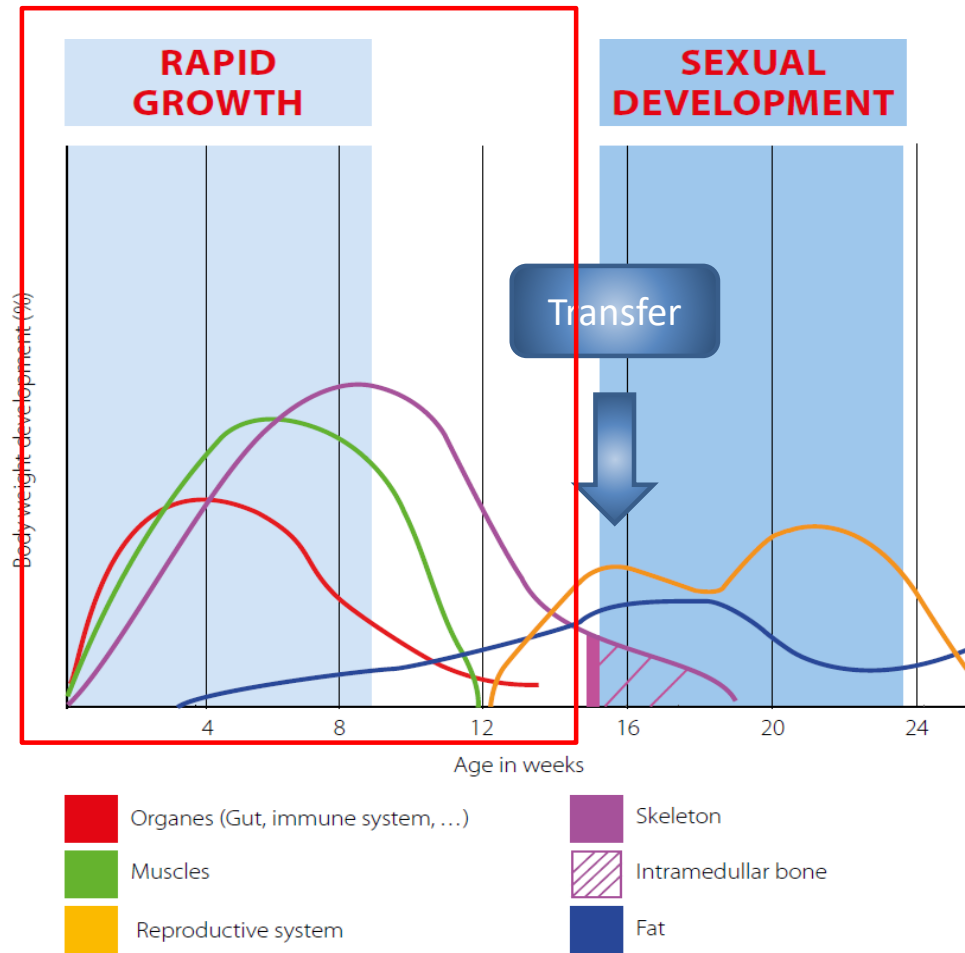
# Transfer to production: 16 to 25 weeks

Success greatly depend on:

Strong base from brooding and rearing:

- Good **body development**.
- Good **BW** and **uniformity**.
- Had worked on **feed capacity** in rearing.
- Correct lighting program

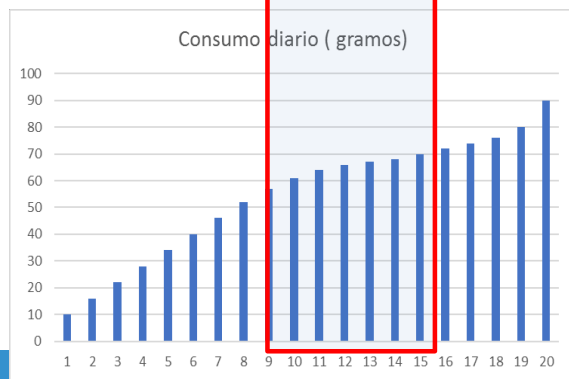
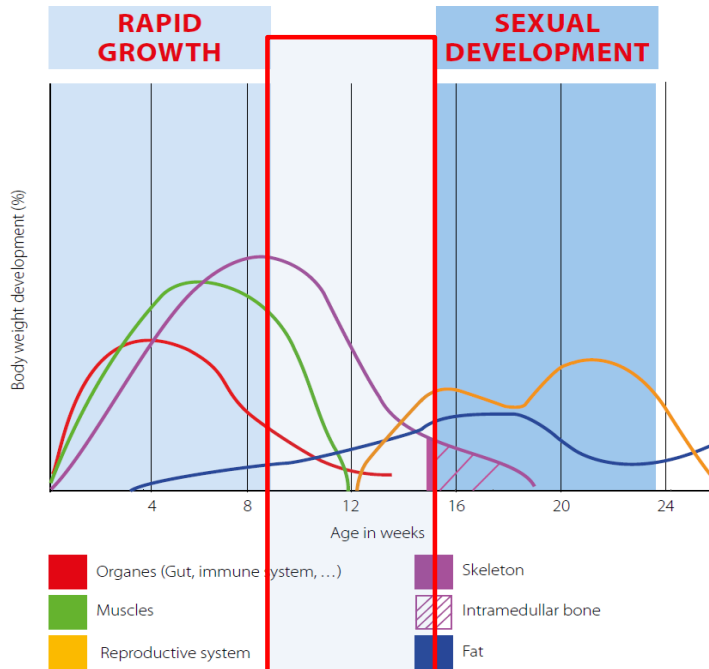
# Good body development



# Body weight and uniformity

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

# Feed intake capacity



## 9 to 15 weeks

- Granulometry - uniformity
- Diets: lower in density and high in fiber
- Feeding program.



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**16 to 25 weeks**

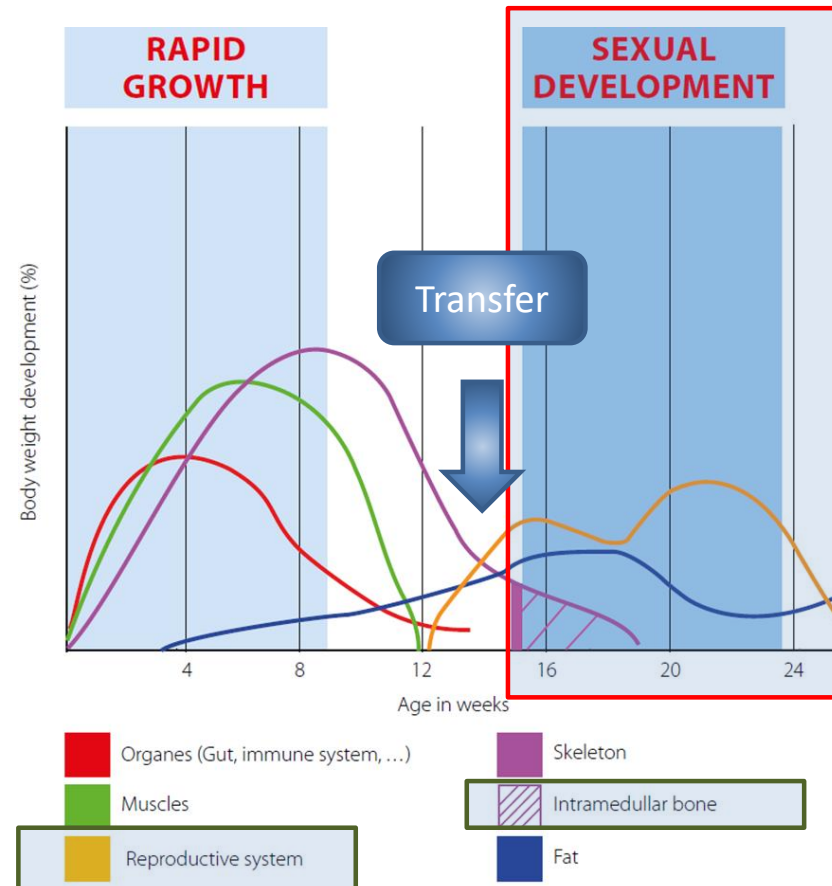


# Critical period: many changes

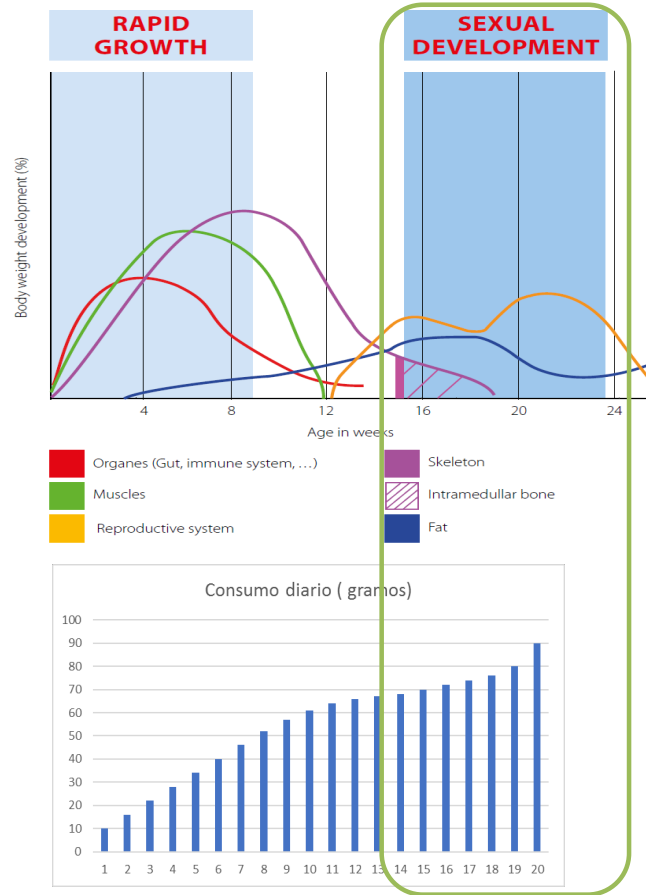
- Transportation
- New house.
- New equipment
- New environments
- New socialization
- Light stimulation
- Start of production
- Feed composition

Anything else?

# Period from 16 to 25 weeks



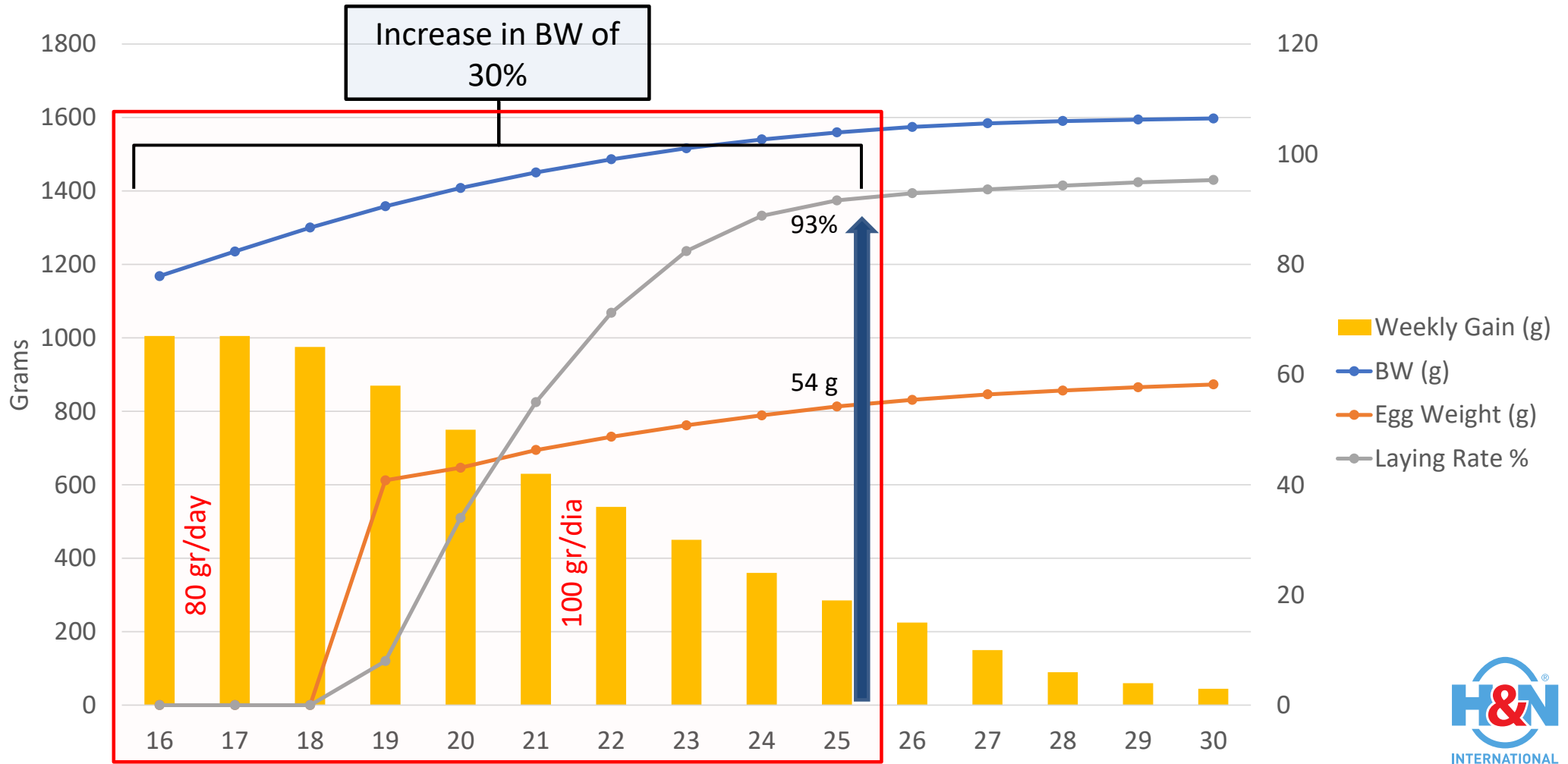
# Bird development



## Weeks 16-25

- Growing (reproductive system and fat)
- Feed intake developed but high demand for nutrients.
- Development of medullary bone

# 16 to 25 weeks



# So what?

Critical period to the **future** of the flock: pick, persistency (90/100 weeks) and livability.



# Transition Period: 16 to 25 weeks

A. Pre-lay → Medullary bone

B. Transfer

C. Follow space recommendations

D. Nutrition: Feed Intake capacity and stimulate consumption.

E. Lighting program / intensity





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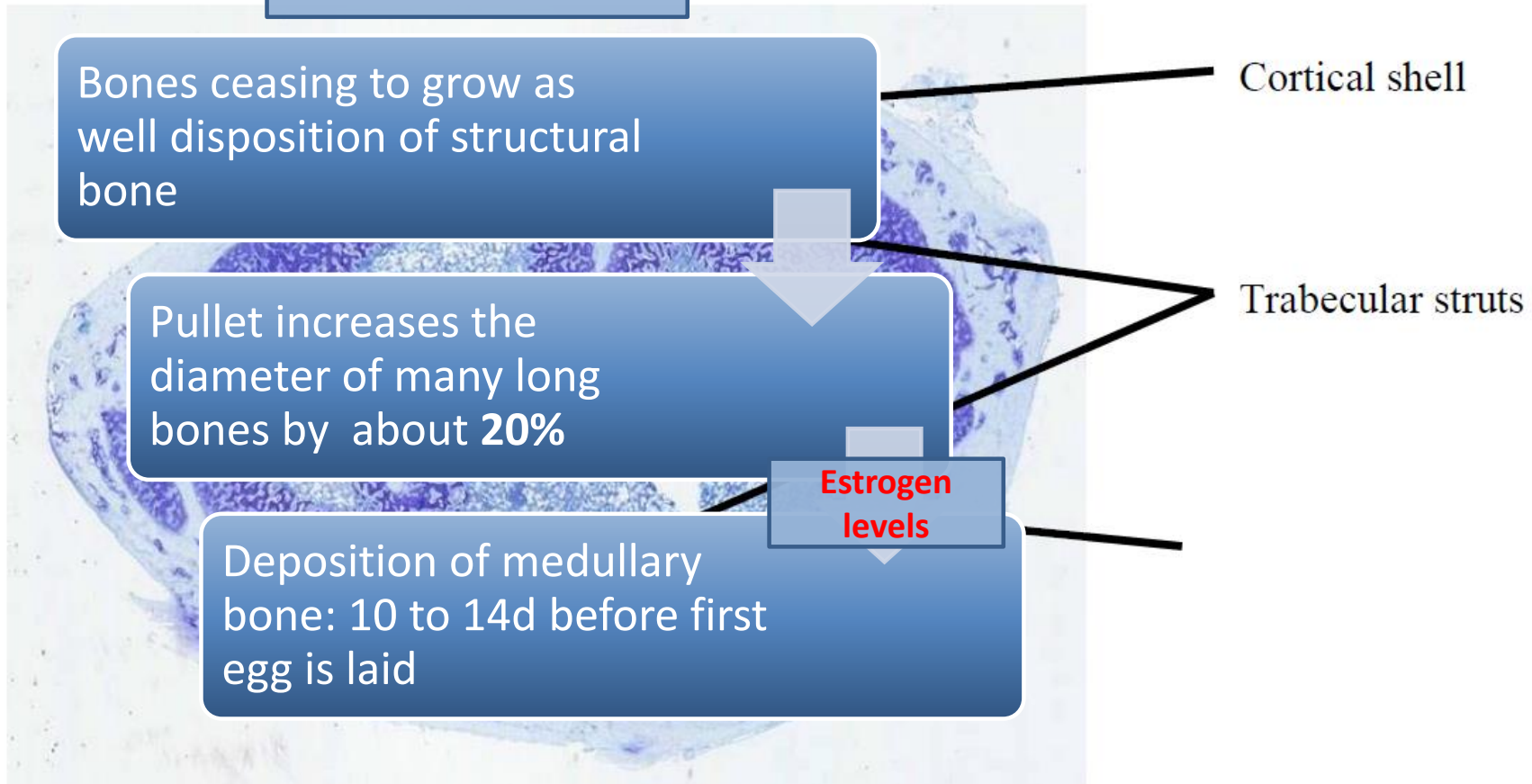
**Pre-Lay: Medullary bone**

# Medullary bone

- Formed as hen approaches the on-set of production.
- Supply Ca when dietary Ca isn't available (night).
- Eggshell production is greatest at night!
- Mobilized and replaced on a daily basis

# Bone development in the pullet and layer

Histological section of the **Sexual Maturity** of a laying hen at first egg.



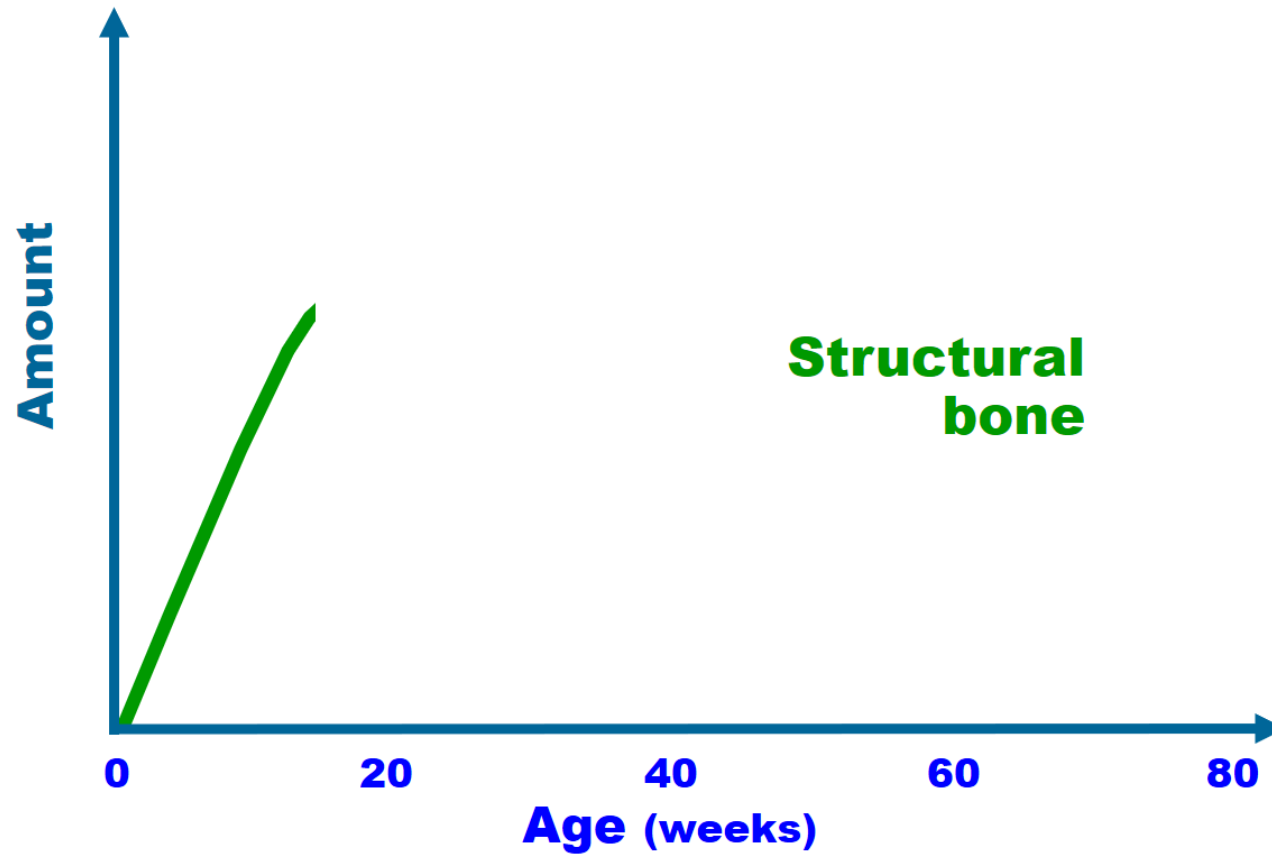
Korver, 2012

# Pullet and adult hen

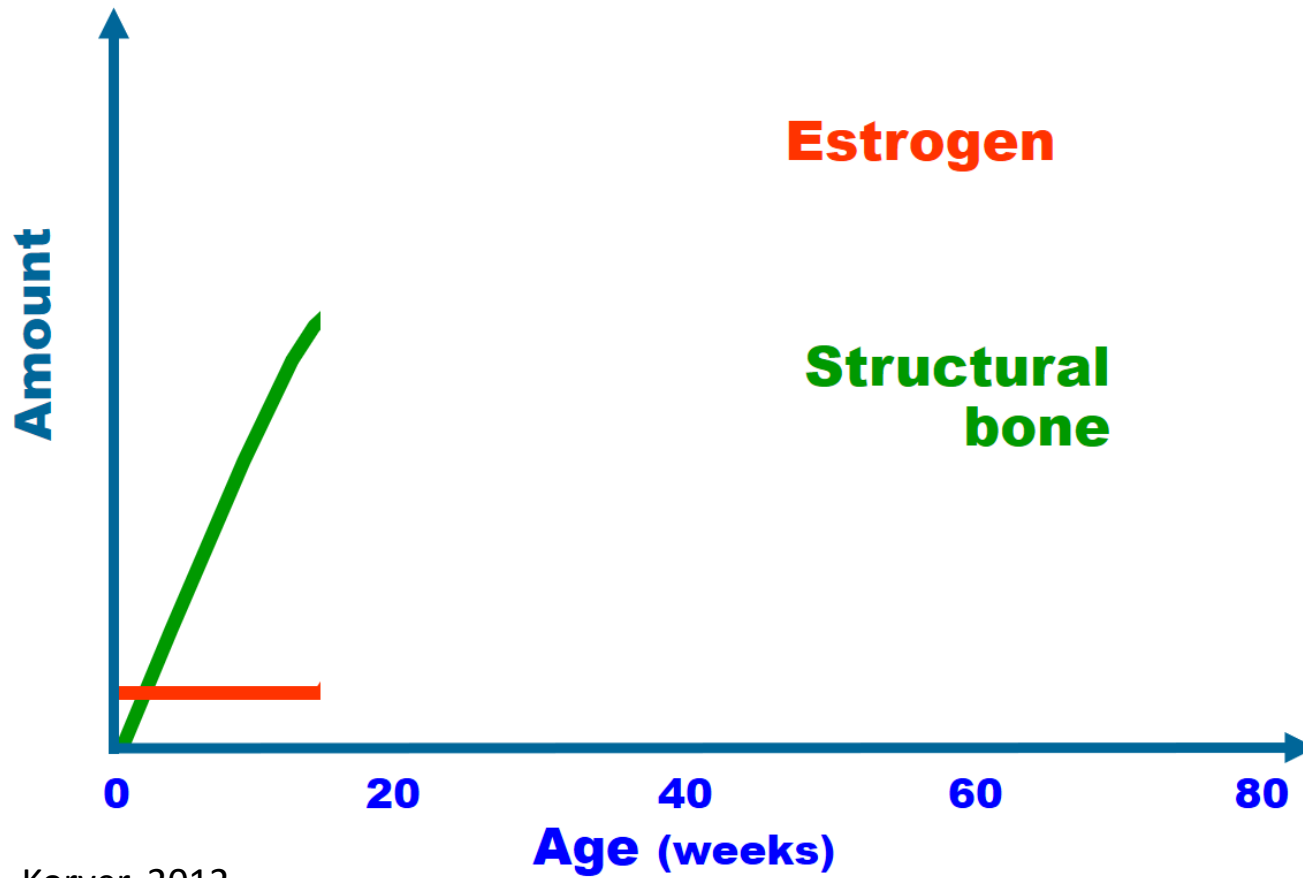


Korver, 2012

# Estrogen-driven the changes in medullary bone



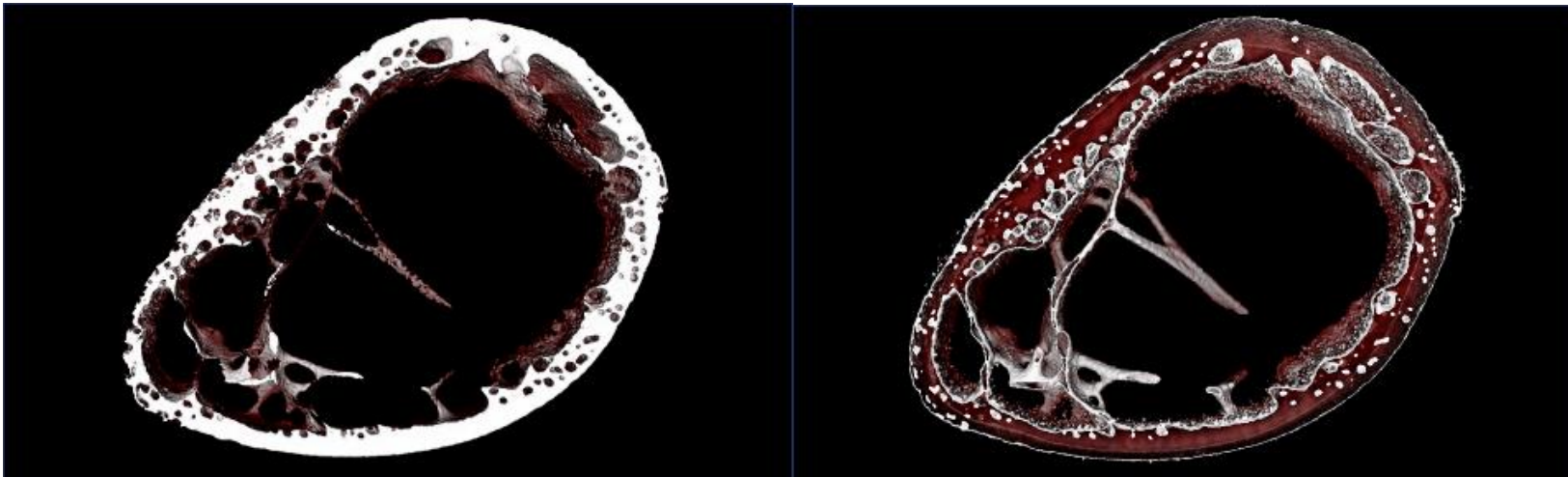
Korver, 2012



Korver, 2012

# Structural and Medullary Bone

## 16 weeks pullet

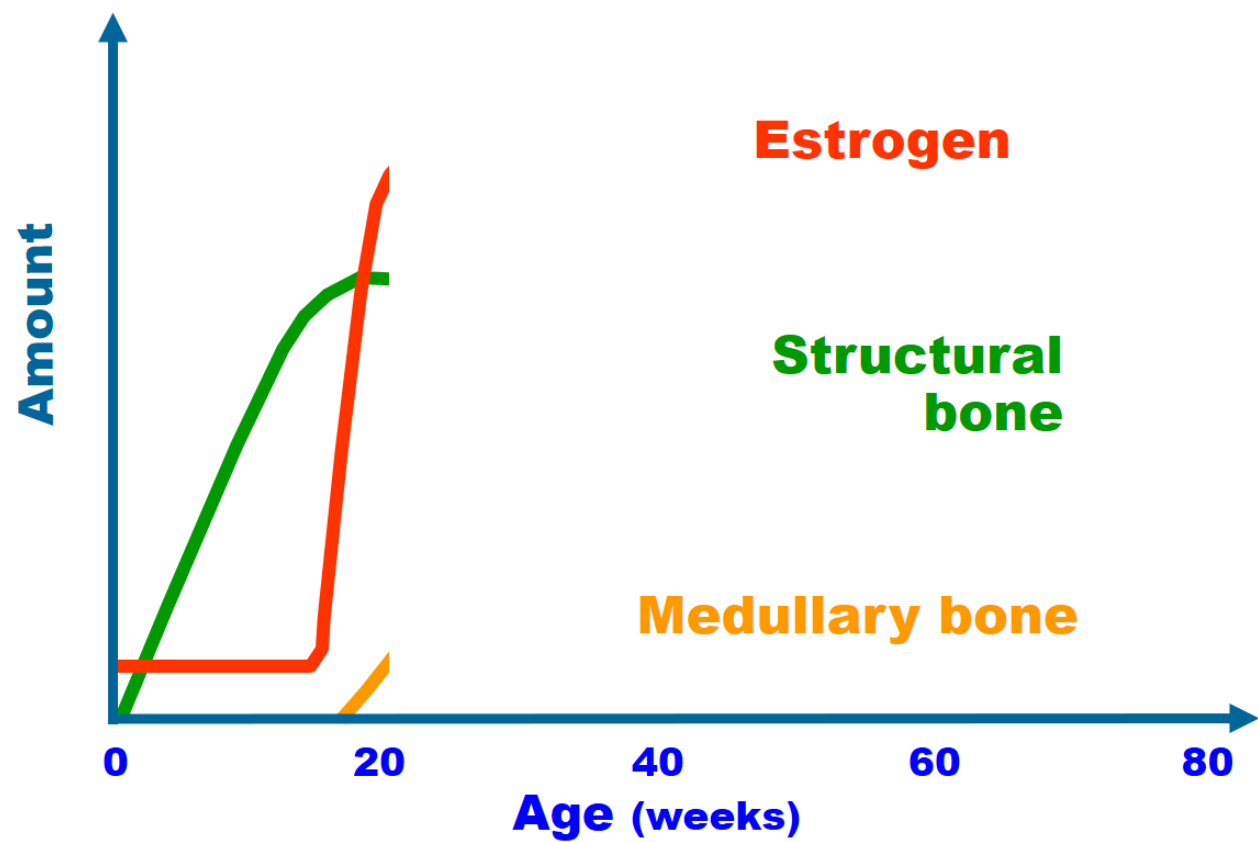


**Cortical/Trabecular Bone**

**Medullary Bone**

Korver, 2012

# Estrogen-driven the changes in medullary bone

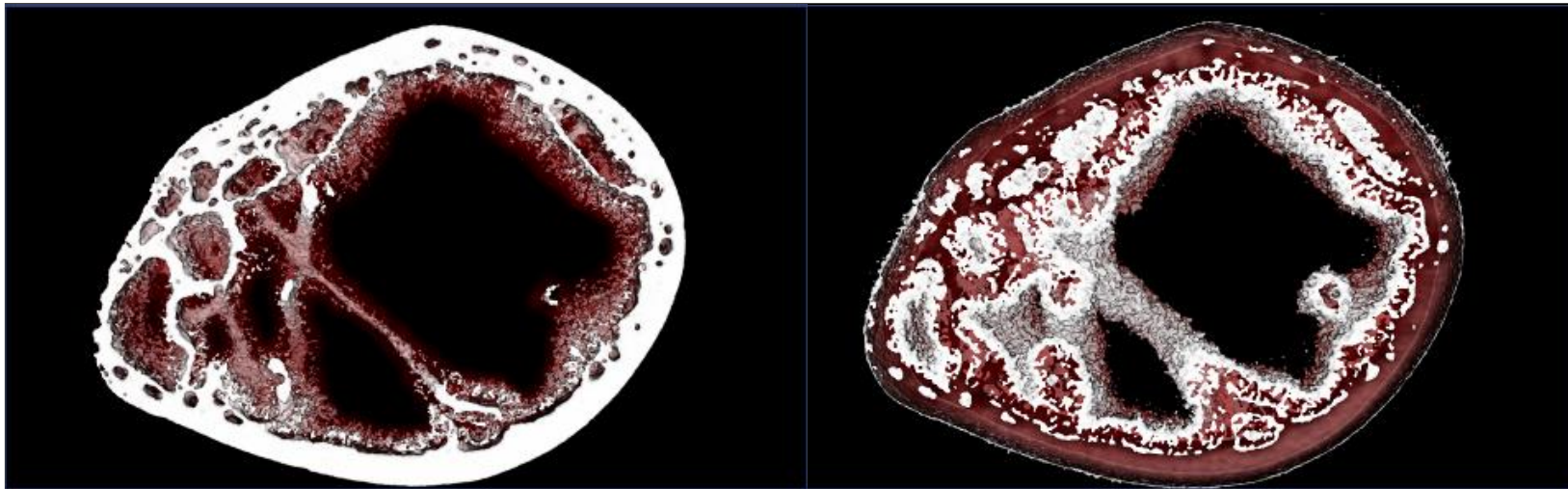


Korver, 2012



# Structural and Medullary Bone

## 1<sup>st</sup> Egg

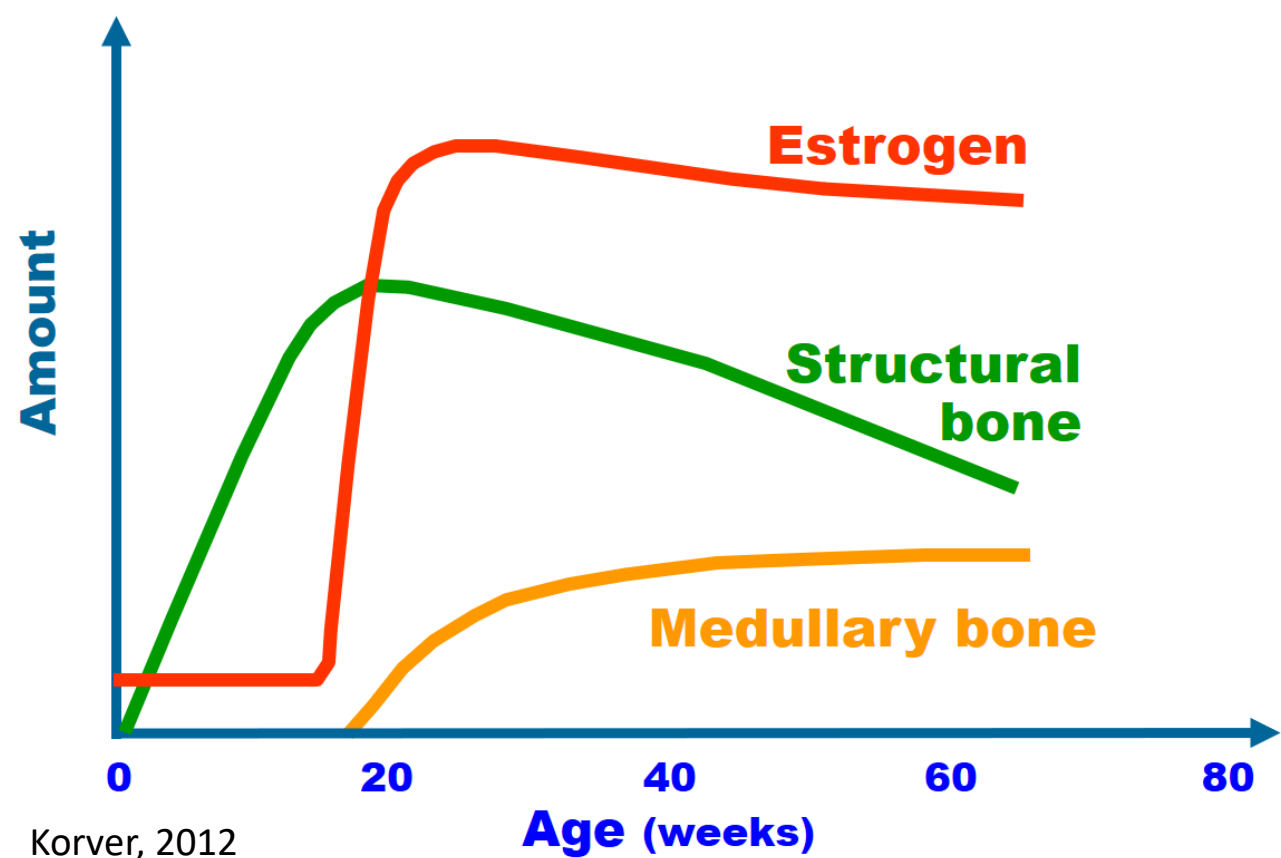


**Cortical/Trabecular Bone**

**Medullary Bone**

Korver, 2012

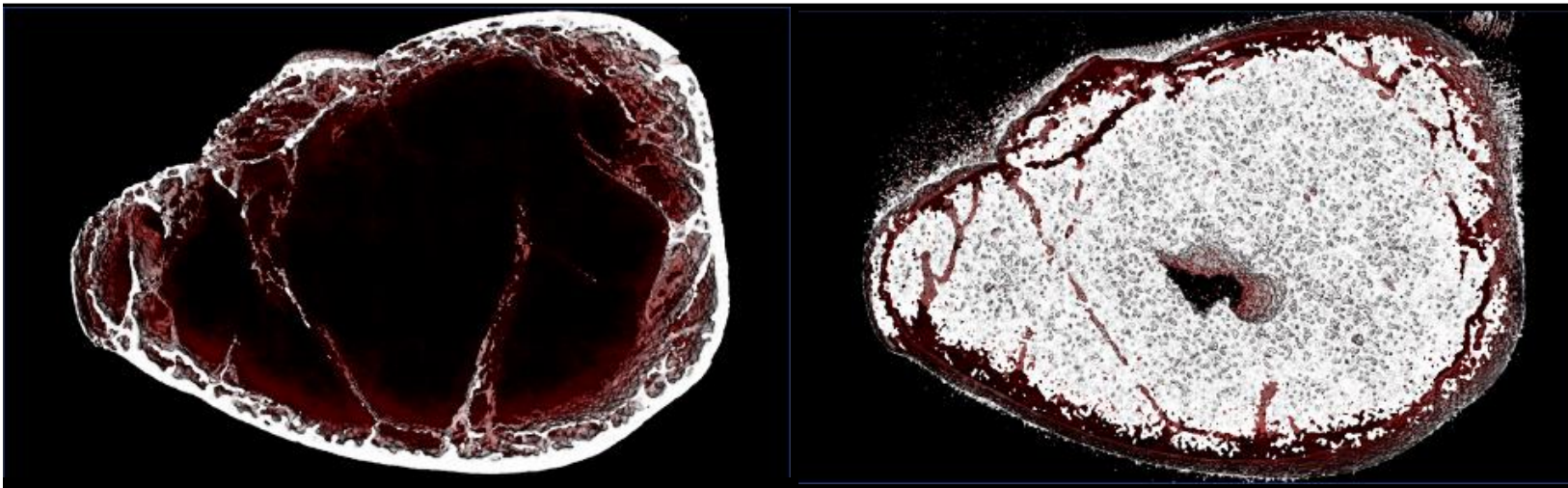
# Estrogen-driven the changes in medullary bone



Korver, 2012



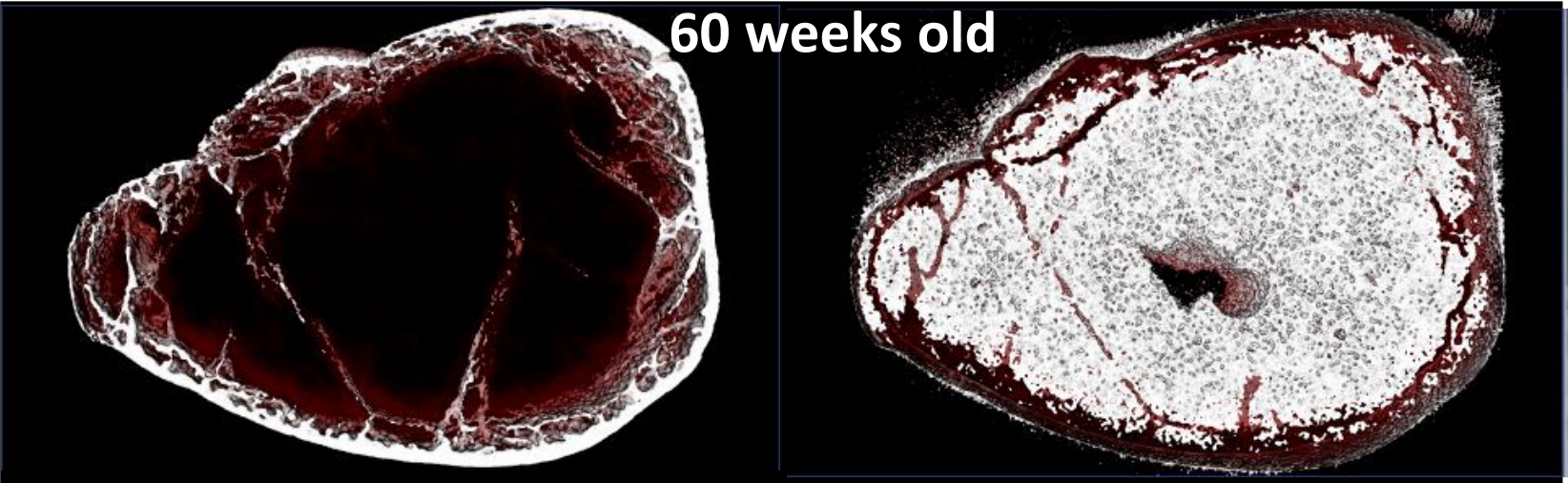
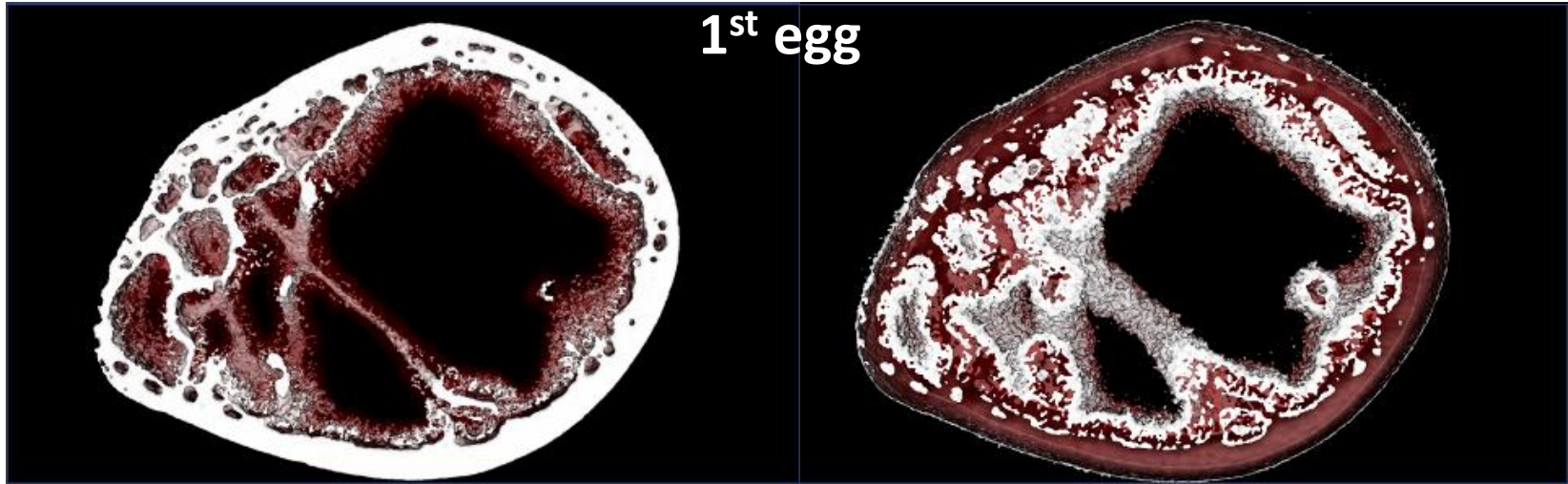
# Structural and Medullary Bone 60 weeks old



**Cortical/Trabecular Bone**

**Medullary Bone**

Korver, 2012



**Cortical/Trabecular Bone**

**Medullary Bone**

Korver, 2012

Well developed pullet:

- Thick cortical and trabecular structures at the onset of sexual maturity
- **Substantial lining of medullary bone** coating the surfaces of the structural bone within the medullary cavity of the bone



# Pre-Lay

Age at Transfer	Feeding Program		
	Developer Feed	Followed by	Pre-lay Feed
week	kg feed	→	kg feed
15	1.0	→	1.0
16	0.5	→	1.0
17	-	→	1.0
18	-	→	0.5
after 18	immediately supply layer Phase-1-feed		

**Table 11: Nutrient recommendations for Pre-lay period**

Nutrient		Pre-lay
Energy	Kcal/kg MJ/kg	2750-2800 11.4
Crude protein	%	17.5
Methionine	%	0.42
Dig. Methionine	%	0.35
Met. + Cysteine	%	0.76
Dig. Met + Cys	%	0.63
Lysine	%	0.84
Dig. Lysine	%	0.7
Threonine	%	0.59
Dig. Threonine	%	0.49
Tryptophane	%	0.18
Dig. Tryptophane	%	0.15
Isoleucine	%	0.67
Dig. Isoleucine	%	0.56
Valine	%	0.74
Dig. Valine	%	0.62
Arginine	%	0.87
Dig. Arginine	%	0.73
Calcium	%	2
Total Phosphorus	%	0.6
Avail. Phosphorus	%	0.4
Dig. Phosphorus	%	0.35
Sodium	%	0.16
Chloride	%	0.16
Potassium	%	0.5
Linoleic acid	%	1
Crude fiber	%	4

# Transition Period: 16 to 25 weeks

A. Pre-lay → Medullary bone

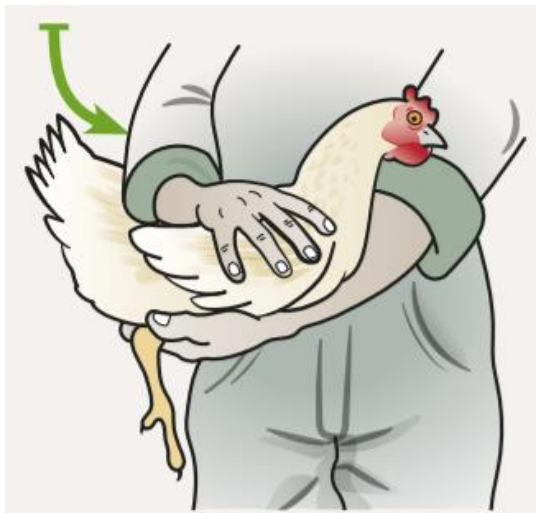
B. Transfer

C. Follow space recommendations

D. Nutrition: Feed Intake capacity and stimulate consumption.

E. Lighting program / intensity

# Transfer: Preparation and Catching



- Well planned in advance
- Trained crew (animal welfare, work safety and biosecurity)
- Withhold feed for a few hours.
- Loading quickly and smooth
- Good ventilation while loading.



# Transfer: Transport



- Skilled driver
- Clean and disinfected transport and crates (vectors)
- Optimum stocking density in crates (according to BW)
- Meeting local regulations.
- As short as possible with good climate conditions

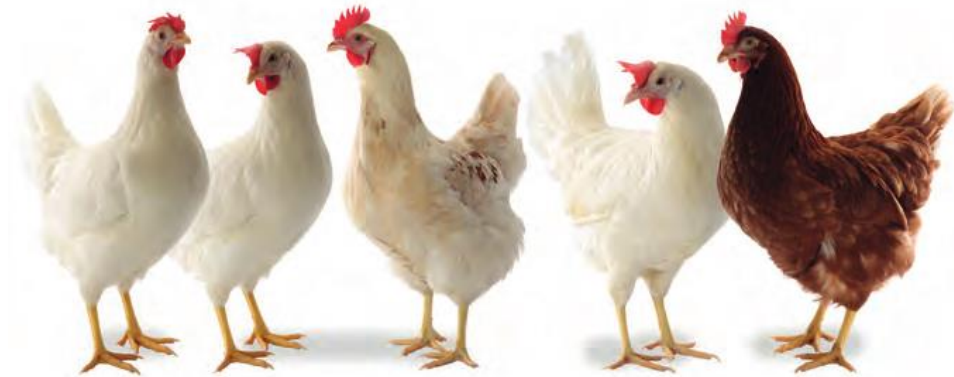
# Transfer: Housing

- All in – All out
- **Water:**
  - a) Correct height and pressure
  - b) Monitor water daily water intake
  - c) Same drinkers than rearing
- **Feed:**
  - a) Feeders filled up with feed
  - b) Stimulate feed intake
  - c) Same feed than in rearing
- **Light:** 24 hours first day ad brighter light intensity (For example, 20 lux).
- **Weight loss** should be recovered
- **Behavior**



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**Same equipment in rearing and production**

# Cage Rearing





# Cage production



# Floor system rearing



17 pullets/m<sup>2</sup>

Brak, 2018



# Floor system production



Brak, 2018

# Floor system production





# Floor system production



Brak, 2018

# Aviary System Rearing



Brak, 2018

18-20 pullets/m<sup>2</sup>



# Aviary system rearing

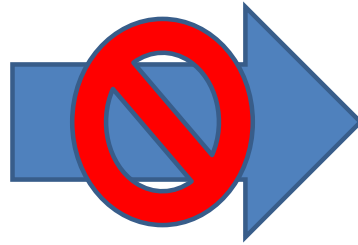


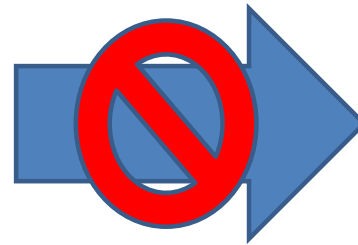
# Aviary system Production



Brak, 2018







# Transfer: important points

- **Do not delay**; BEST at least two weeks before the beginning of production.
- **All vaccines ready**. Do not vaccinate while transferring.
- Do not transport during hours of high temperature.
- **Same drinkers and feeders**
- **Monitoring body weight** before and after transfer.
- **Monitor the daily water** consumption.
- Pullet in the brighter / warmer cages of the rearing house to the brighter / warmer cages of the production house

# Transfer: important points

- Visit pullets during rearing
- Know and have all flock information (vaccinations, feeding times, type of feed, body weights, lighting program)
- Be present during transfer



# Transition Period: 16 to 25 weeks

A. Pre-lay → Medullary bone

B. Transfer

C. Follow space recommendations

D. Nutrition: Feed Intake capacity and stimulate consumption.

E. Lighting program / intensity

# Follow spaces recommendations

Equipment	Requirements*
<b>Stocking Density</b>	475 – 750 cm <sup>2</sup> /hen
<b>Drinkers</b>	
Round drinkers	1 drinker (Ø 46 cm) for 125 hens
Linear drinkers	1 running meter for 80 – 100 hens
Nipple drinkers	1 nipple for 6 – 8 hens (access to 2 nipples/hen)
<b>Feeders</b>	
Round feeder	1 feeder (Ø 40 cm) for 25 hens
Chain feeder	10 – 15 cm/hen

\*These recommendations should be adjusted to the local specific regulation.

- High stocking density:
  - a) Lower production
  - b) Lighter egg weight
  - c) Lower Egg Mass
  - d) Higher Mortality

# Transition Period: 16 to 25 weeks

A. Pre-lay → Medullary bone

B. **Transfer**

C. Follow space recommendations

D. Nutrition: Feed Intake capacity and stimulate consumption.

E. Lighting program / intensity

# Stimulate feed intake (Feeding management)



- Temperature between 18-24°C
- Aim for the lowest limit (18-19C) to stimulate FI
- Important first days after housing.
- Hens must fast increase the feed intake.
- Provide good nutrition and feed presentation (granulometry > 1mm)
- Fresh water
- Enough light intensity in the feeder line
- Higher light intensity for first weeks (caution when transferring to open houses)

Ubada, 2017

# Nutrition: Feed intake capacity and stimulate consumption.

- Previously developed: 9 to 16 weeks.
- On-set hybrid diet:
  1. Transition feed
  2. Up to a laying rate of 50-70% and a ascending curve of feed intake.
  3. Crude fiber (min 3,5%) y Ca → Fat
  4. Granulometry: **UNIFORMITY**
  5. As fast as possible reach 100 gr/bird/day (21-22 weeks)
  6. **Can replace pre-lay.**

Layer	Media %
> 2 mm	26.2
> 1.4 < 2 mm	30.3
> 1 < 1.4 mm	14.4
> 0.71 < 1 mm	9.0
> 0.5 < 0.71 mm	7.1
< 0.5 mm	12.6

## On-set hybrid diet

Nutrients			
ME	Kcal / kg	2700	Low Energy
Dig Lys	%	0.8	High amino acids
Dig Met	%	0.4	
Dig M+C	%	0.72	
Dig Thr	%	0.56	
Dig Trp	%	0.176	
Ca	%	3.8	Enough to produce one egg and 60% of gross particles.
Av P	%	0.44	
CF	%	4	Keep the devopement of feed intake
Salt	%	0.28	Stimulate the feed inkate

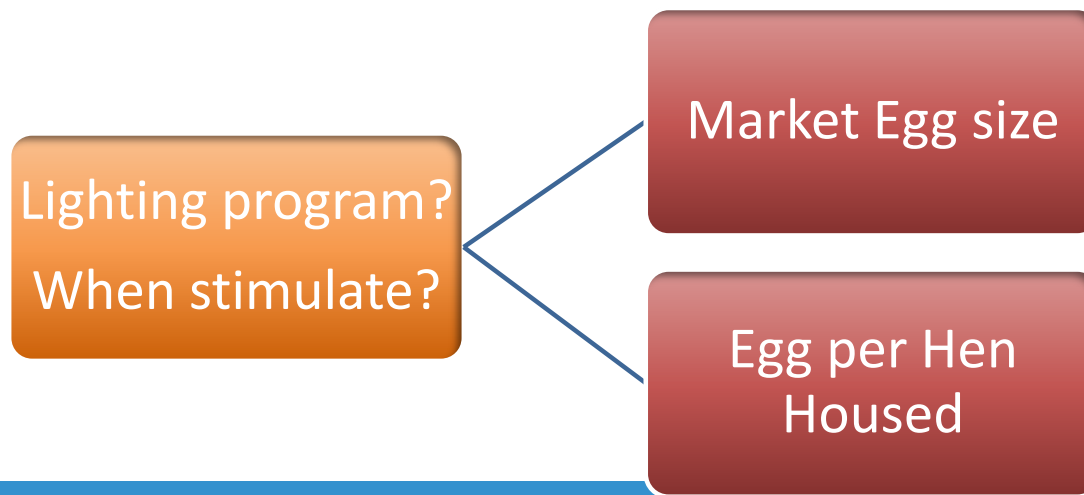
**Use: After transfer until 70% of production or feed intake over 90 g/día.**

# Transition Period: 16 to 25 weeks

- A. Pre-lay → Medullary bone
- B. Transfer
- C. Follow space recommendations
- D. Nutrition: Feed Intake capacity and stimulate consumption.
- E. Lighting program / intensity

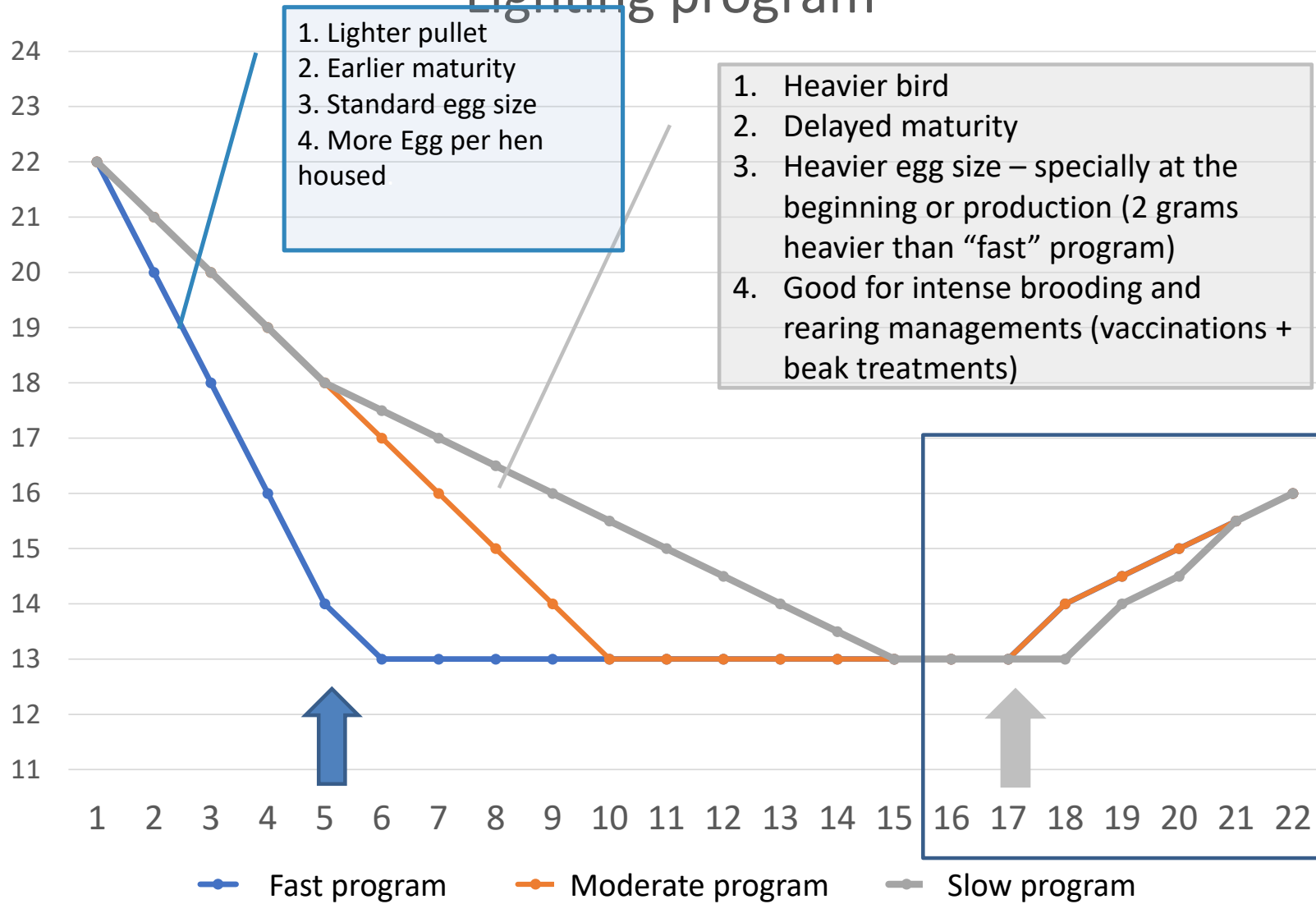
# Lighting program

- Guide recommendation: stimulate at 17 weeks with BW on standard and uniformity higher than 85%.
- Nick Chick: 1,235 g / Brown Nick: 1,440 g
- 1 to 2 hours and then at least 30 min until 14, 15 or 16.
- When possible delay if flock doesn't meet the uniformity and BW.
- Egg size ↔ Age and BW at 50% of production

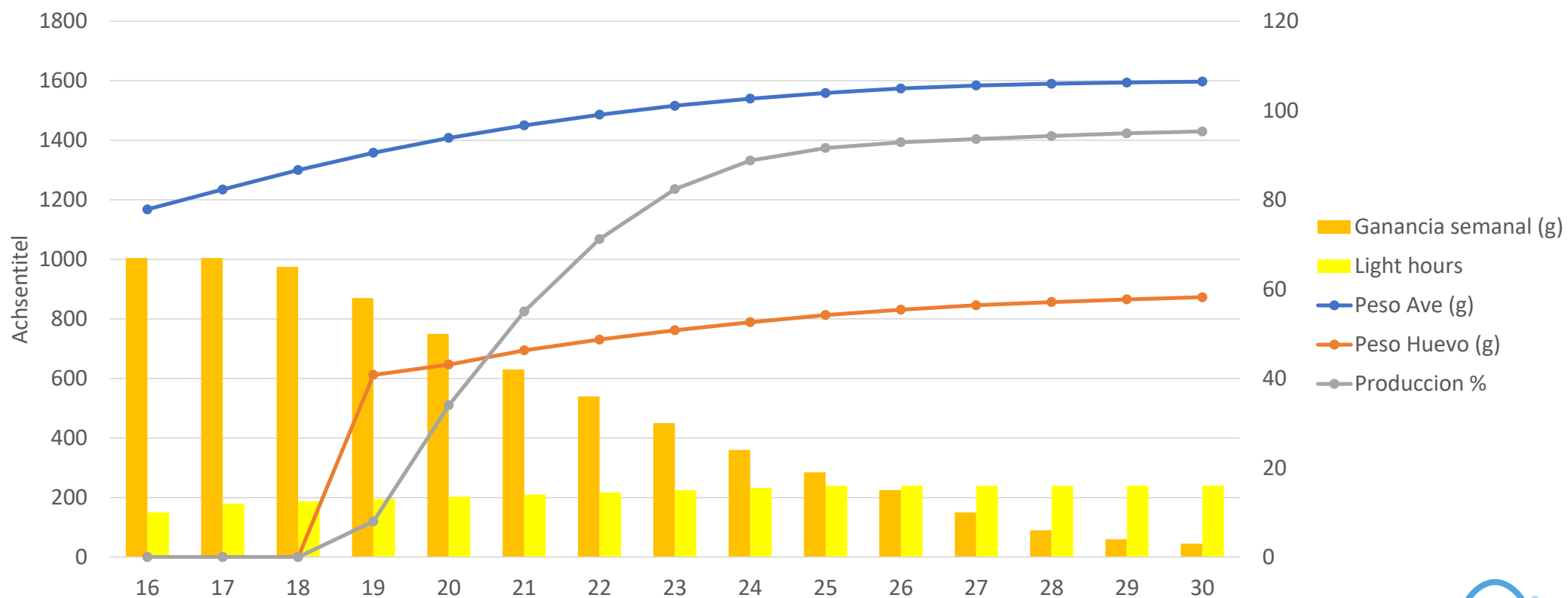




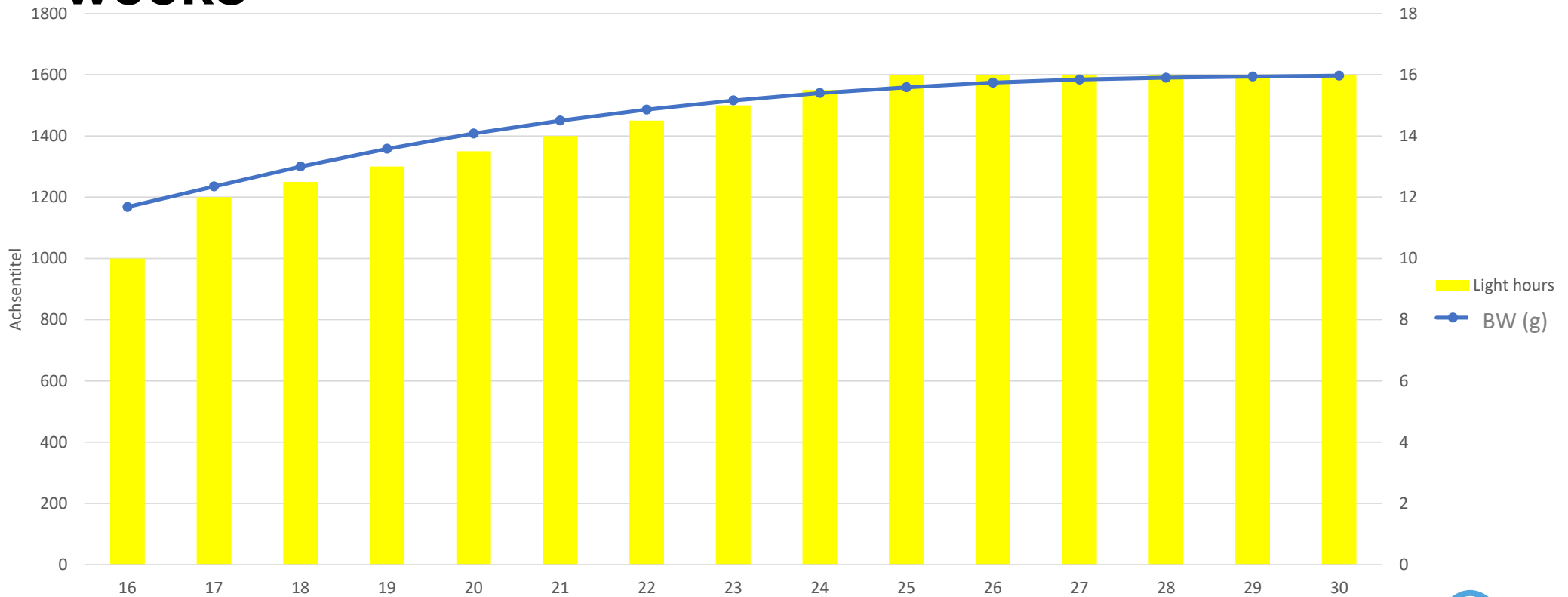
# Lighting program



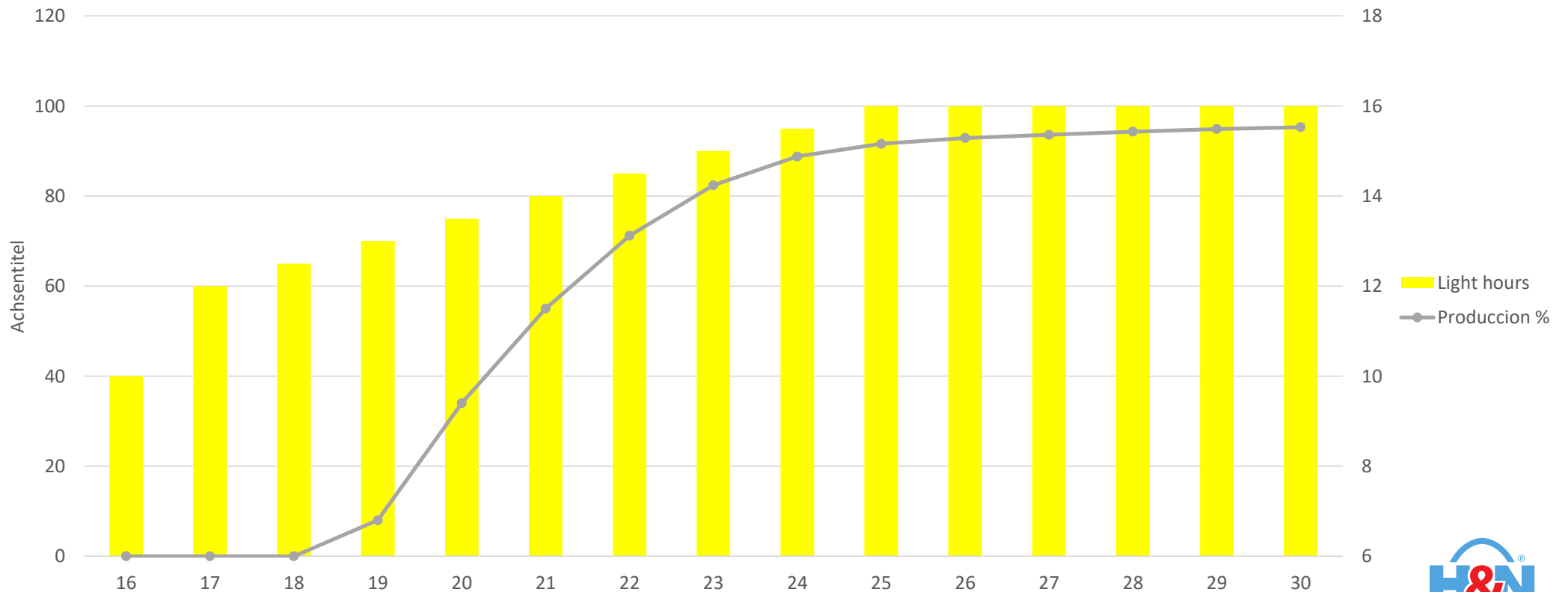
# 16 to 30 weeks of age



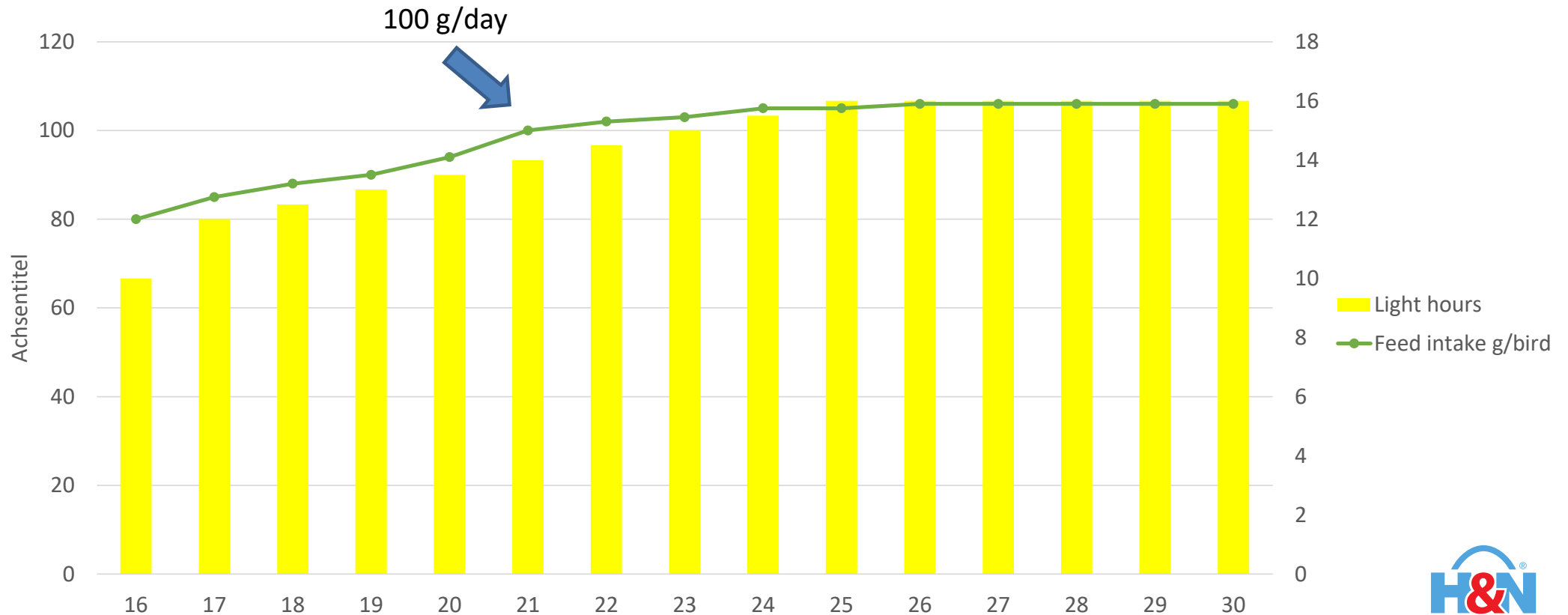
# Lighting program and body weight 16 to 30 weeks



# Lighting program and Production %



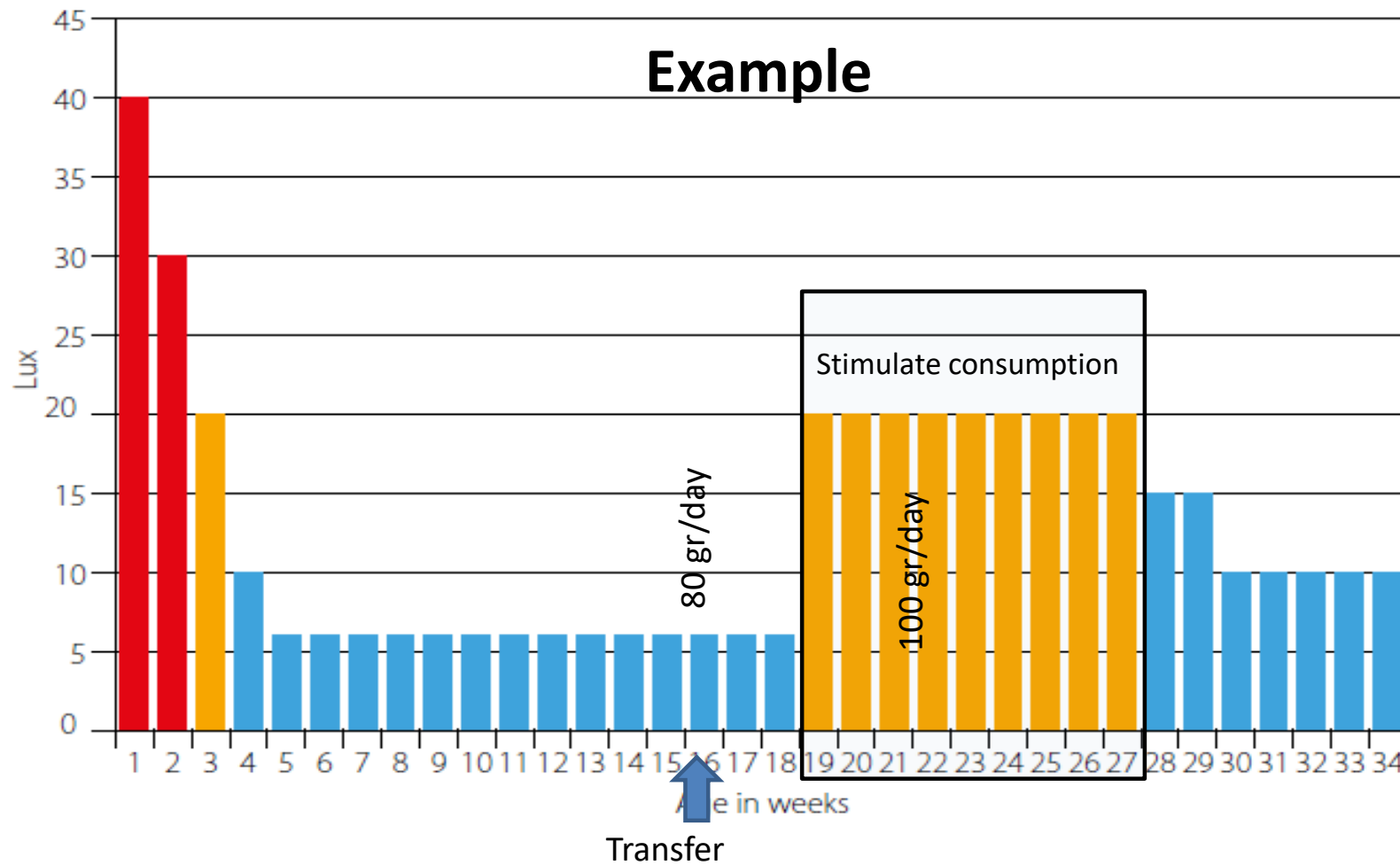
# Lighting program and Feed intake g/bird



Should see nice relationship between increase in hours of light and:

- Body weight gain
- Feed intake increase
- Production increase

# Lighting program: intensity





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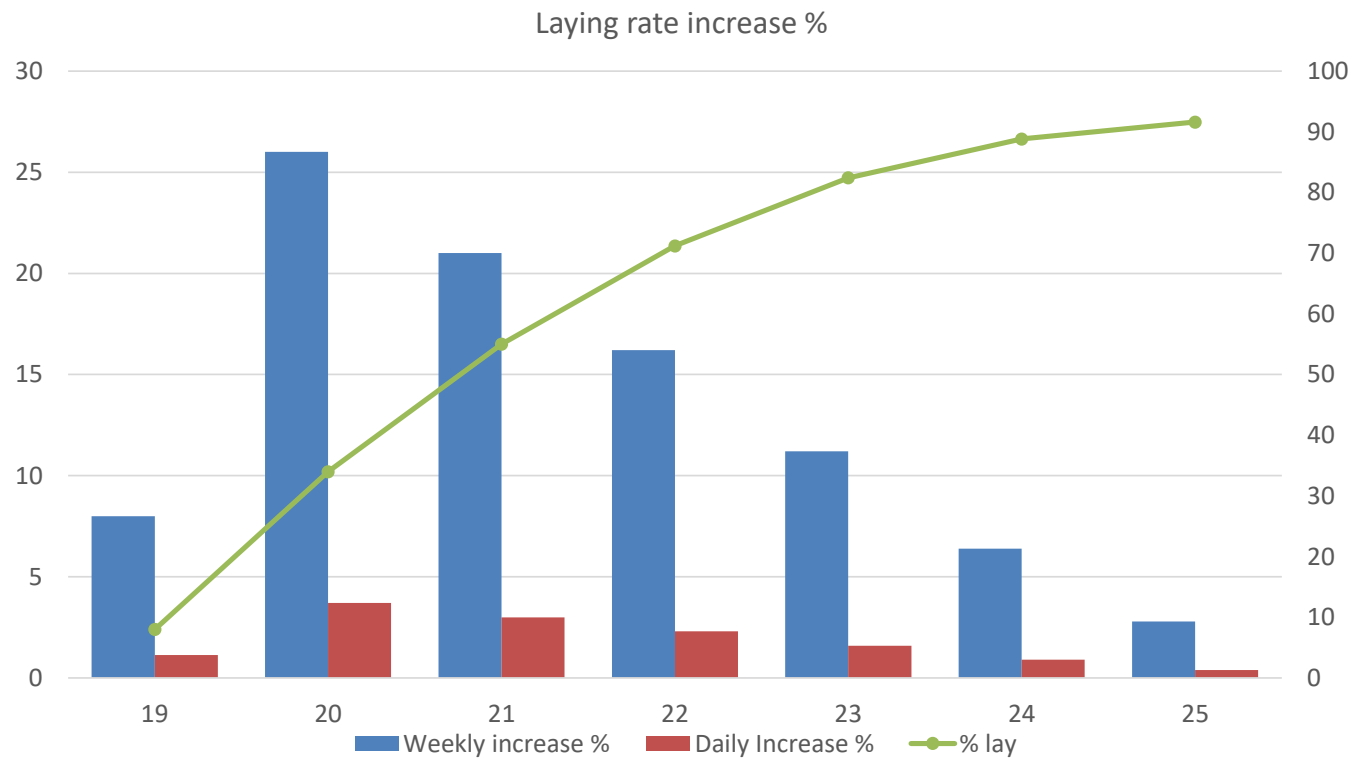


**How do we know if the transition period is good? (KPIs)**



# KPIs

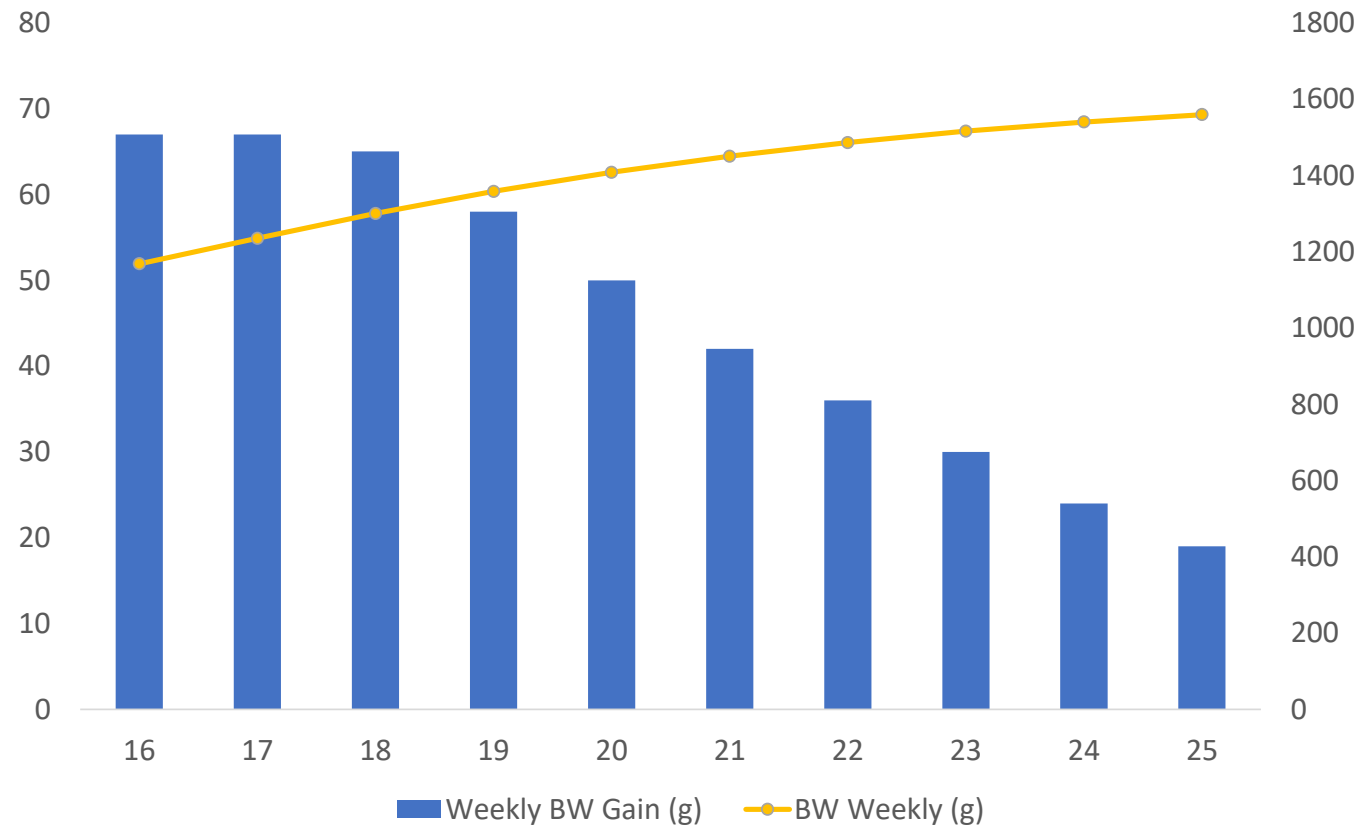
## ■ % Lay: Daily and weekly



- Daily increase of 1% first week of production.
- Daily increase of 3% second week of production

# KPI

- Body Weight and uniformity: weekly increase and  $> 85\%$ .



# KPI

- Feed:

- a) Monitor daily the feed intake
- b) Must increase every day
- c) Transfer with 80 g/bird/day
- d) 21-22 weeks of age **100 g/bird/day**

- Water:

- a) Monitor daily the water intake
- b) Must increase every day.
- c) Relation with feed intake: 1,4 to 2,0.

# Key Points

- Closely monitor how the flock is adapting
  1. Medullary Bone and reproductive system development
  2. Body weight.
  3. Feed intake stimulation
  4. Lighting program
- KPI: water, feed and body weight (uniformity).
- If need it, apply corrective measures ASAP



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**Thank you!**