



Male Management

种公鸡的饲养管理

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Technical Service Manager

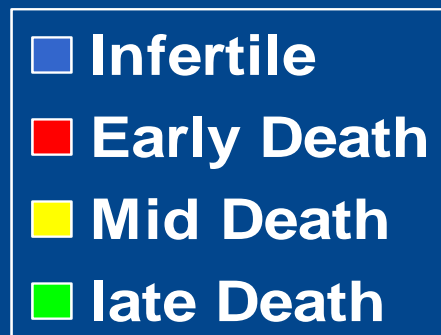
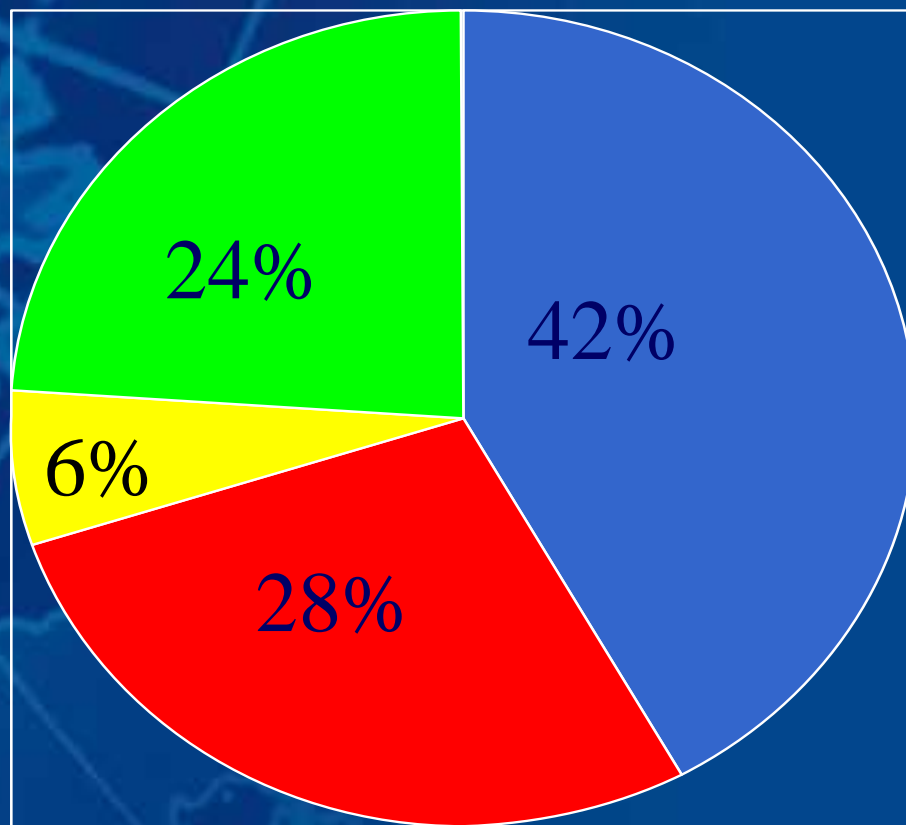
亚洲区技术服务经理

Today 2013



Causes for Losses In Hatchability

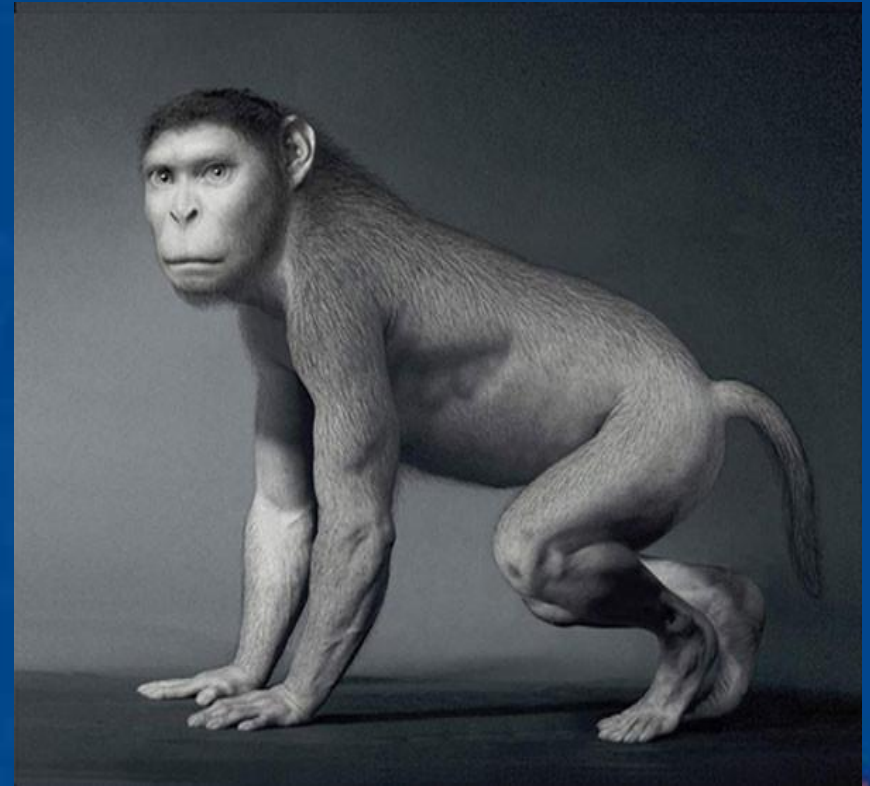
孵化率损失的原因



Male Line Evolution- The Classic Male

公鸡的演变-常规系公鸡

- Low Breast Meat Yield – control confirmation easy.
胸肌少-体况容易控制
- Poor feed efficiency – doesn't require Sex Separate Feeding.
饲料转化率差-不需要公母分饲
- Natural mating behavior not affected by over developed breast muscle.
胸肌发育过多也不会影响自然交配



Yield Males 宽胸型公鸡

- More emphasis on management
更强调管理细节
- Yield males have better FCR-
Broiler driven 宽胸型公鸡饲料转化率好- 肉鸡性能驱使
- Yield males must be in good condition to maintain fertility
宽胸型公鸡必须保持良好的体况以维持较高的受精率
- Yield males need good beak to properly mate 宽胸型公鸡需要良好的喙部才能达到有效的交配
- Must have complete separate sex feeding
必须要有彻底的公母分饲系统



肉种鸡生长发育曲线及模式

体重

0-27日龄 / 0-4周龄

- 均匀地达到标准体重。
- 通过良好的育雏管理，培养鸡只的食欲。
- 确保充足的采食位置和饮水位置。
- 检查喙囊的饱满度。
- 观察鸡只行为。
- 保持最适宜的温度、湿度和通风。
- 开始监测每周体重。从14到21日龄开始个体称重并计算变异系数。
- 10日龄时，在遮黑的条件下，减小光照强度至10-20勒克斯（1-2烛光）。



骨骼、免疫系统、消化和心血管系统及羽毛的快速生长发育。

28-63日龄 / 4-9周龄

- 均匀地达到标准体重。
- 28日龄分群。
- 变异系数小于12时，分成两栏，变异系数大于12时，分成三栏。
- 分栏后控制各栏鸡群的饲喂和生长，使其在63日龄时达到重新制定的体重标准。
- 63日龄时各栏鸡群之间不再进行调整。
- 63日龄时比较实际体重和标准体重，如需要重新制定目标体重。



继续生长发育的阶段

64-105日龄 / 9-15周龄

- 调整饲喂量使鸡群均匀地达到标准体重。
- 体重低于标准的鸡群应专门设定生长曲线，使其在105日龄时量归到标准体重。
- 体重高于标准的鸡群应按照重新设定且平行于标准体重的曲线生长。
- 这段时期鸡群的体重不应有任何下降。



80-95日龄时，鸡只90%的骨骼发育已基本完成。

106-161日龄 / 15-23周龄

- 按照体重标准增加料量水平，刺激生长速度，使鸡只做好性成熟的准备。
- 每周检查和评估种母鸡的耻骨间距，监测性成熟的程度。
- 计划加光前一评估鸡群的均匀度：
- 如果鸡群体重达到标准且均匀度良好（变异系数小于10），根据建议的程序给予光照刺激。
- 如果鸡群体重没达到标准或均匀度不好（变异系数大于10），至少推迟7天加光。
- 147日龄公母混群；确保种公鸡与种母鸡性成熟一致。
- 定期观察鸡群采食行为，监测公母分饲和饲料分配情况。



促进鸡群生长和增重，使鸡群做好性成熟和混群的准备。

162-210日龄 / 23-30周龄

- 按要求的饲喂种母鸡，刺激提高产蛋率和蛋重的增长及生长发育。
- 产蛋率达到5%之前，将育成鸡换成产蛋饲料。
- 按要求的饲喂种公鸡，使其获得良好的生长发育，提高受精率。
- 执行种公鸡淘汰程序，按照下列要求评估种公鸡的体况：
- 腿部和脚趾
- 丰满度
- 面部颜色
- 泄殖腔状态
- 环境控制鸡舍，光照时间不要超过13-14小时。（30-60勒克斯/3-6英尺烛光）。



输卵管、卵巢、睾丸的快速发育。光照刺激10-14天后种鸡开始性成熟。

日龄

Physiology vs Management

生理发育与饲养管理

Understand the relationship between
Physiological Development
了解生理发育



与饲养管理要求之间的关系以达到最佳的生产性能

And the **management tasks** required to achieve **Optimum Performance**

DIAGRAM 1: PHYSIOLOGICAL DEVELOPMENT

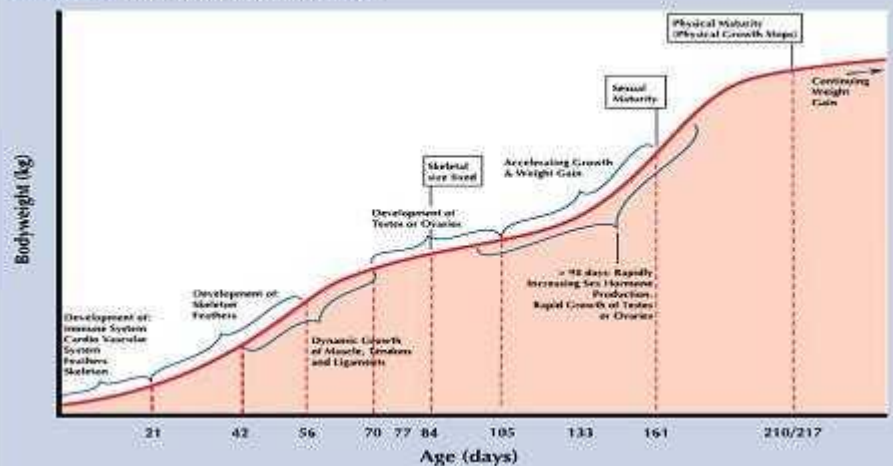
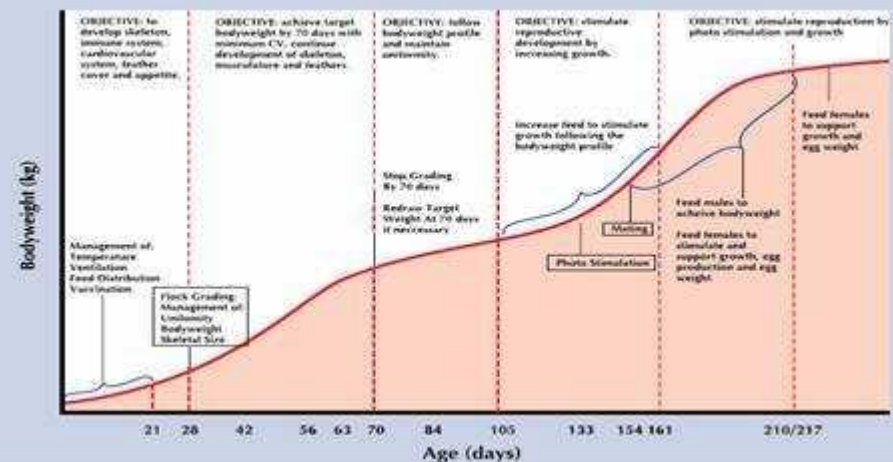
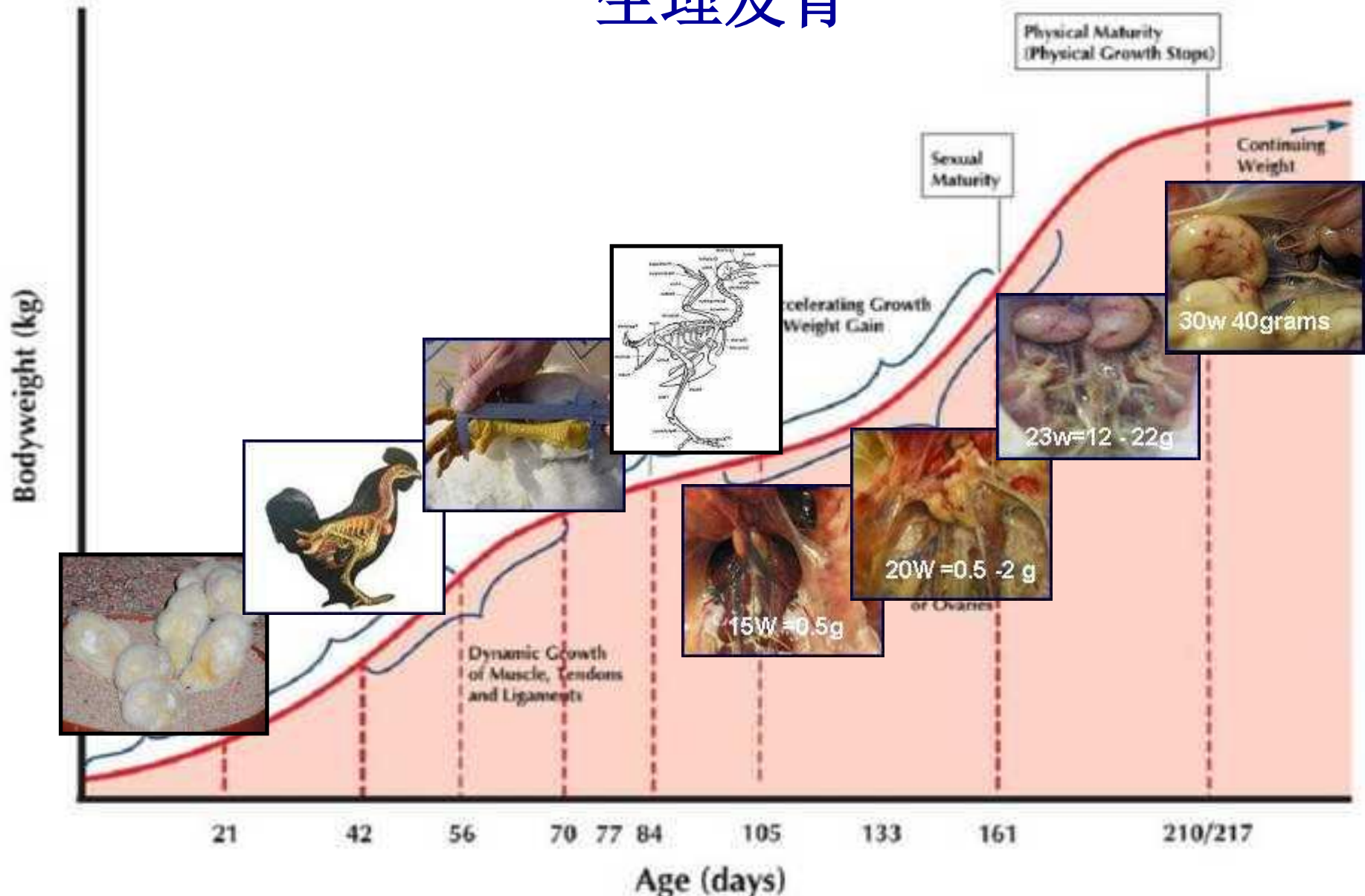


DIAGRAM 2: MANAGEMENT PROGRESSION



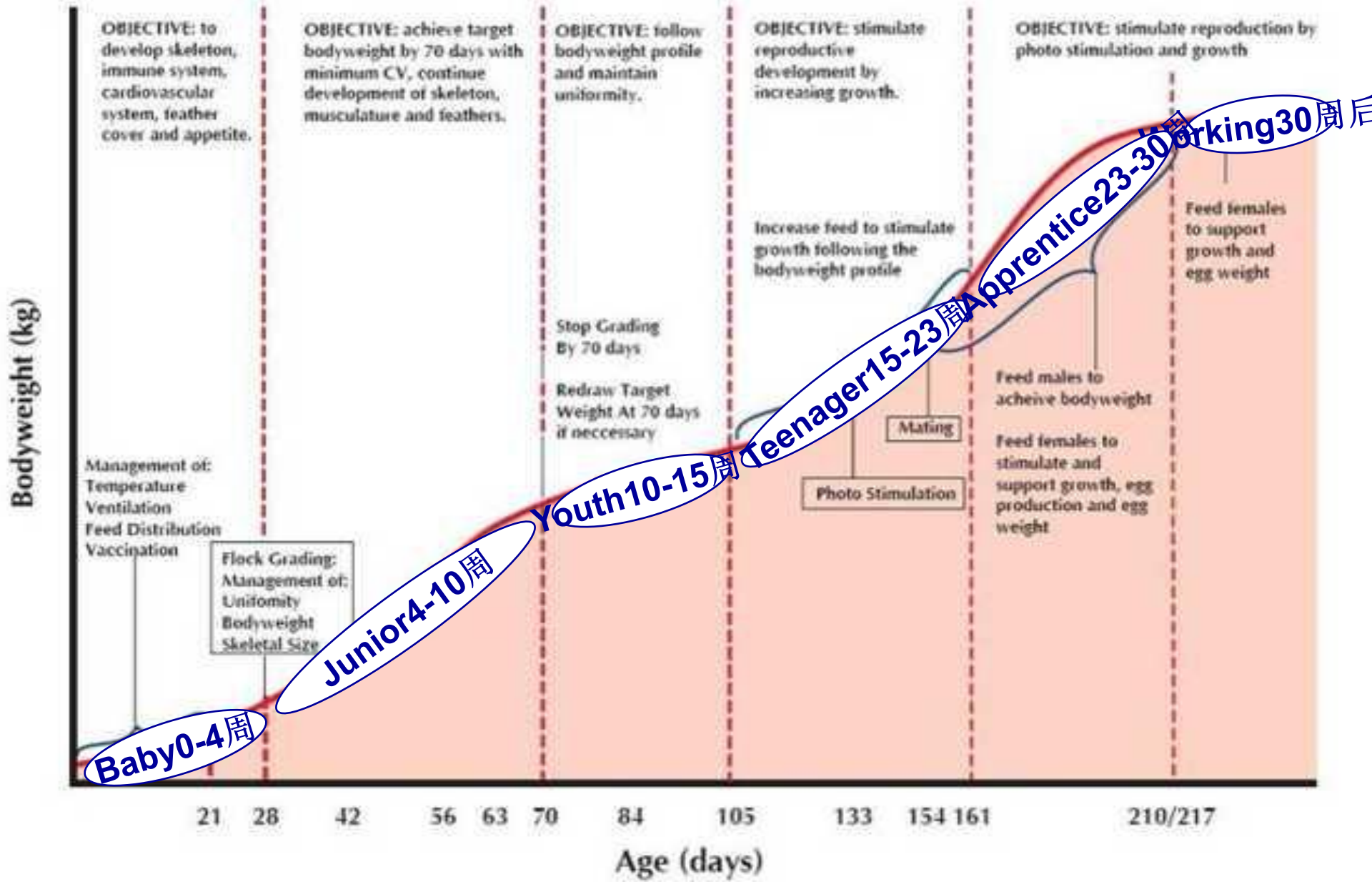
Physiological Development

生理发育



Key Management Periods

关键管理阶段



Baby: 0 to 4 Weeks 育雏期0-4周

Physiology 生理发育

Growth of skeleton and digestive tract.
骨架与消化系统生长发育

Testes “development” 睾丸“发育”

Cardiovascular System 心血管系统

Immune System 免疫系统

Feather Cover 羽毛覆盖

Appetite 食欲

Density 密度

Populations 群体

Water 水

Feed 饲料

Temperature 温度

weights 目标体重

Management 管理

Baby 育雏

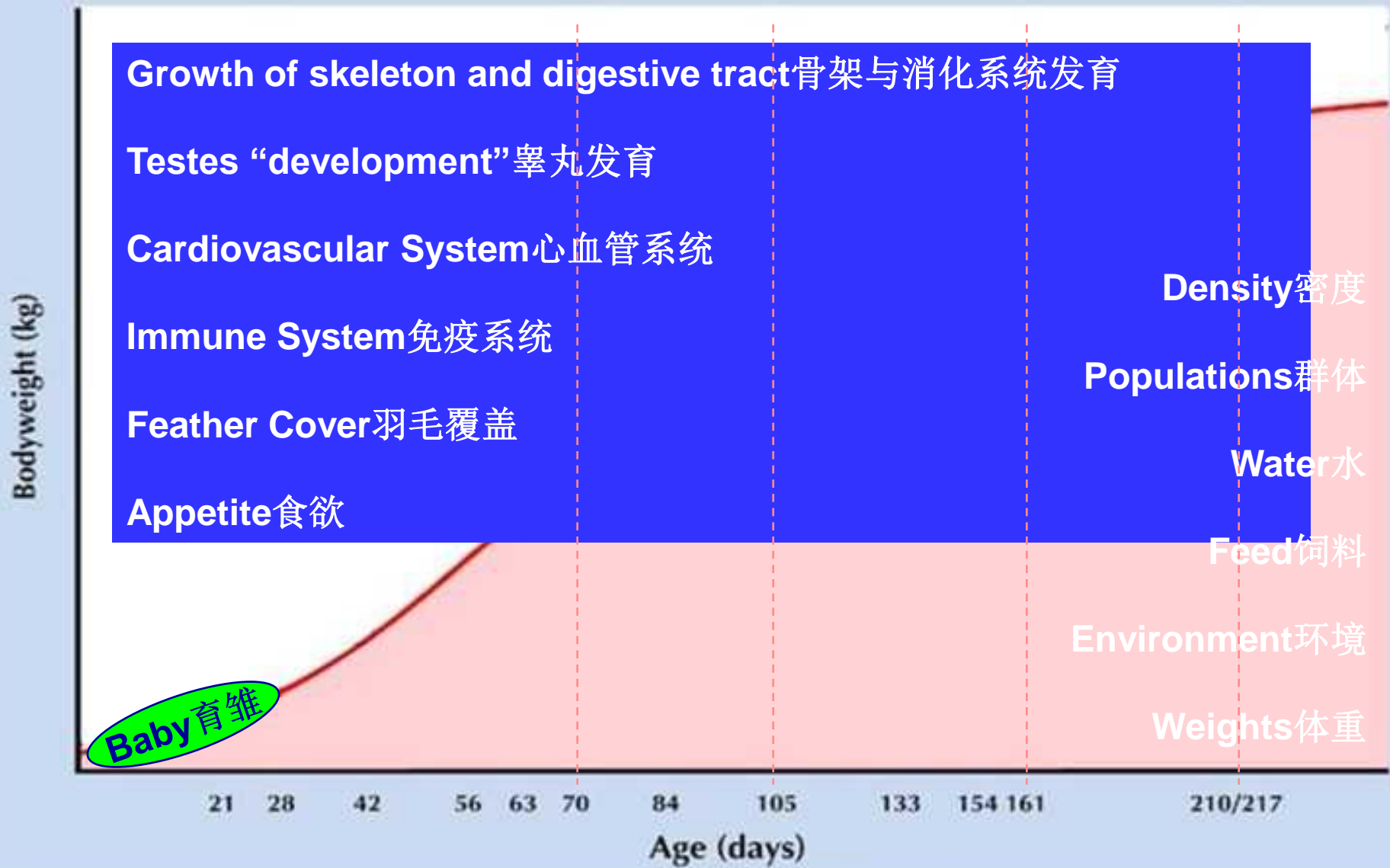
Bodyweight (kg)

21 28 42 56 63 70

Age (days)

210/217

Baby: 0 to 4 Weeks 育雏0-4周

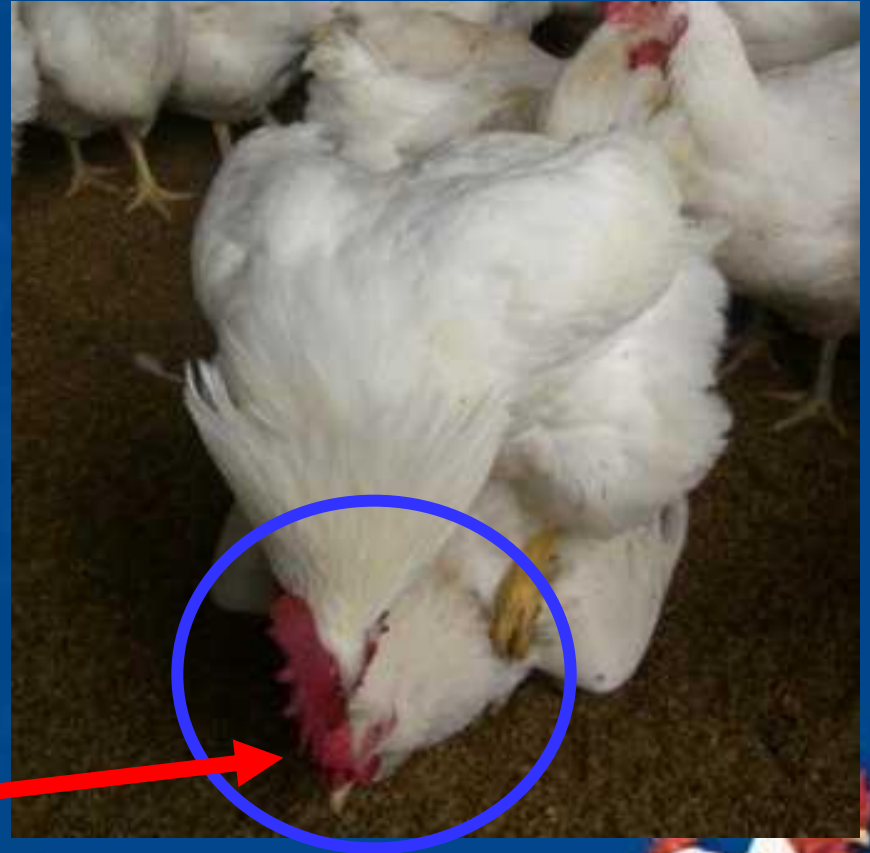


Good Beak Trimming

精确的断喙



**Yield males need
good beak to
properly mate** 宽胸型
公鸡需要良好的喙部进
行有效的交配



Bad Beak Trimming results

...断喙不好会造成:



- Will hinder feed consumption. 影响饲料消耗
- Could be used to break eggs easier. 容易啄破蛋壳
- Will not be an effective tool for a fertile male. 影响受精率
- Can also damage female 伤害母鸡



Early Stage Male Feeding

早期公鸡饲喂

- Ad lib feeding up to 4 weeks=important to achieve weekly body weight target
前4周自由采食=达到每周体重目标非常重要
- Direct body weight = skeletal frame size at 6 weeks of age
6周龄体重与骨架有直接的关系
- We want tall and lean males
公鸡应该骨架大、不胖



Grading and Selection

分群与选种

- Must grade at 28 days of age. 28日龄分群
- Another grading at 6 weeks. 6周龄第二次分群
- Additional grading, if necessary, at 12 weeks. 如有必要12周龄再次分群
- Selection prior to Mixing 混群前选种



Early Male Bodyweight vs. Standard 公鸡早期体重与标准比较

- Good body weight at 6 weeks of age 6周龄达到较好的体重
- Benefits: 好处:
 - Frame size for later reproductive success 好的骨架有利于后期受精率
 - Favorable condition for Sertoli cells growth which support and provide nourishment for the developing sperm later on 好的体况有利于滋养细胞的生长发育，为将来精子的发育提供营养



Male Development on Fertility

公鸡发育对受精率的影响

4 WEEKS 4周龄		12 WEEKS 12周龄		FERTILITY IN % 受精率
WEIGHT 体重	SHANKS 胫长	WEIGHT 体重	SHANKS 胫长	
560	7.1 cm	1805	12.9 cm	91.7
475	6.9 cm	1705	11.1 cm	85.0
360	6.4 cm	1535	10.4 cm	84.2



Rearing Space for Males

公鸡育成期饲养面积



3.5 birds/m²

**MALE
PEN**
公鸡



Females 母鸡



Junior: 4 to 10 Weeks 4-10周龄

Physiology 生理发育

Continued growth of skeleton
骨架继续发育

Muscles, Tendons & Ligaments
肌肉、肌腱及韧带

Continued Testes “development”
睾丸继续“发育”

Feeding 饲喂

Grading at 4 weeks
4周龄分群

Skeletal growth
骨架发育

Redraw bodyweight
profiles
重新制定体重曲线

Management
管理

Bodyweight (kg)

Baby 育雏

Junior 4-10周龄

Age (days)

21 28 42 56 63

Junior: 4 to 10 Weeks 4-10周龄

Fast, Uniform Feed Distribution critical快速
均匀的饲料分配是关键

Continued growth of skeleton骨架继续发育

Muscles, Tendons & Ligaments肌肉、肌腱及韧带

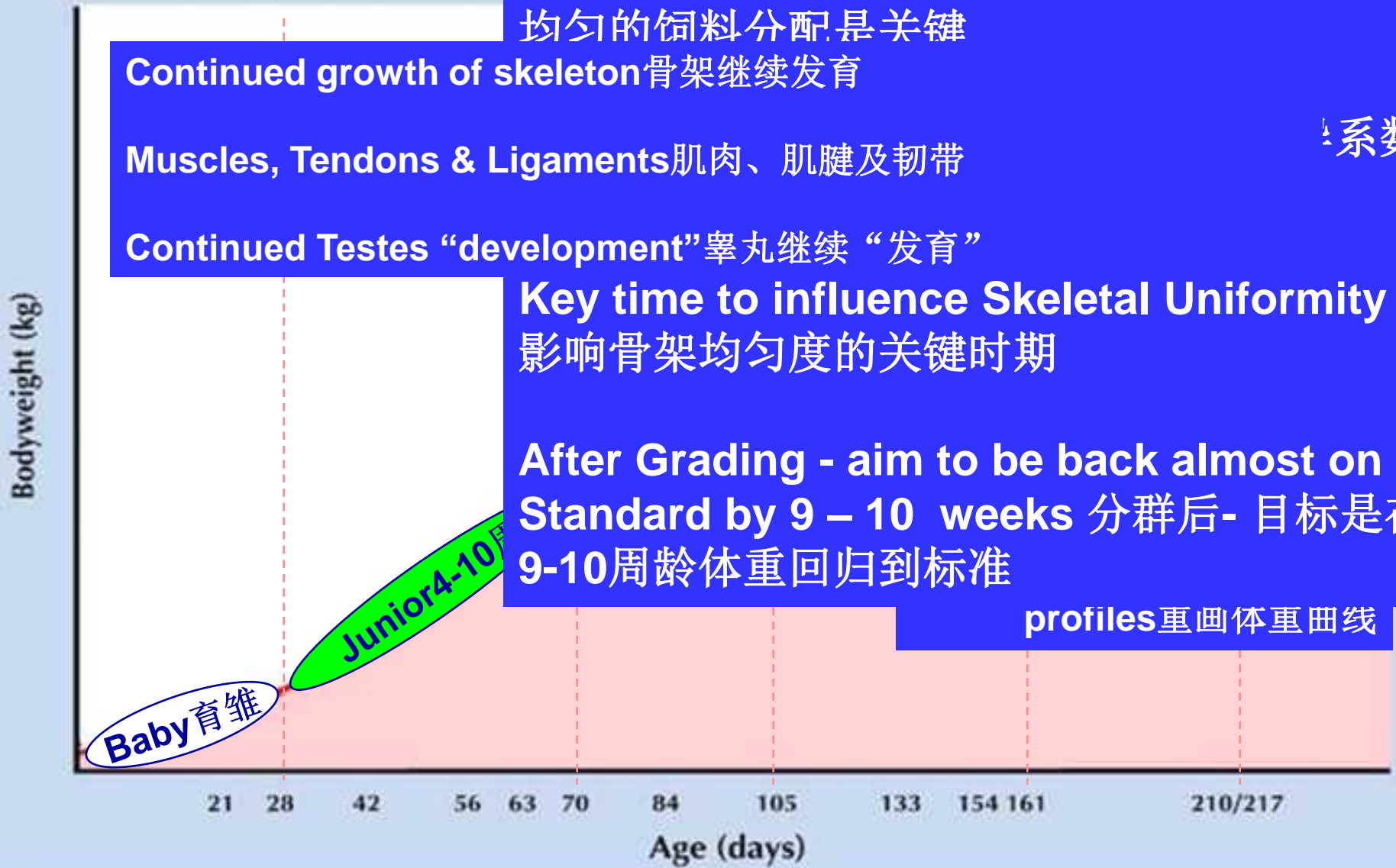
系数

Continued Testes “development”睾丸继续“发育”

Key time to influence Skeletal Uniformity
影响骨架均匀度的关键时期

**After Grading - aim to be back almost on
Standard by 9 – 10 weeks**分群后- 目标是在
9-10周龄体重回归到标准

profiles重画体重曲线



Sample Weighing 抽样称重

- Use an accurate scale 使用准确的磅称
- Weigh birds weekly, preferably at 7-day intervals from their placement date. 每周称重，最好入舍后每隔7天称重
- Hold birds by the wings or by two legs to avoid leg damage. **Never hold by one leg.** 抓住鸡的翅膀或同时抓住两条腿以避免损伤。
不要只抓一条腿
- Record weight accurately and calculate % uniformity & C.V. 记录体重并计算均匀度
- Weigh all the birds in the “catch” pen 被拦的鸡只都要称重



Key to obtaining accurate weights is being **CONSISTENT** from week to week
每周持续一致的称重是获得准确体重的关键



Male Selection 公鸡的选种

- At 6 weeks go from 15 to 14 %.
6周龄从15%到14%
- At 12 weeks go from 14 to 12.5 – 13%
12周龄从14%到12.5-13%
- House around 9.5 to 11% if sexual maturity permits.
混群时9.5-11%
- Always pick up males by both legs. 必须始终抓住公鸡的两条腿



Straight legs and toes

挺直的腿部与脚趾

Good 较好



Bad 不好



Good skeletal conformation

良好的骨架

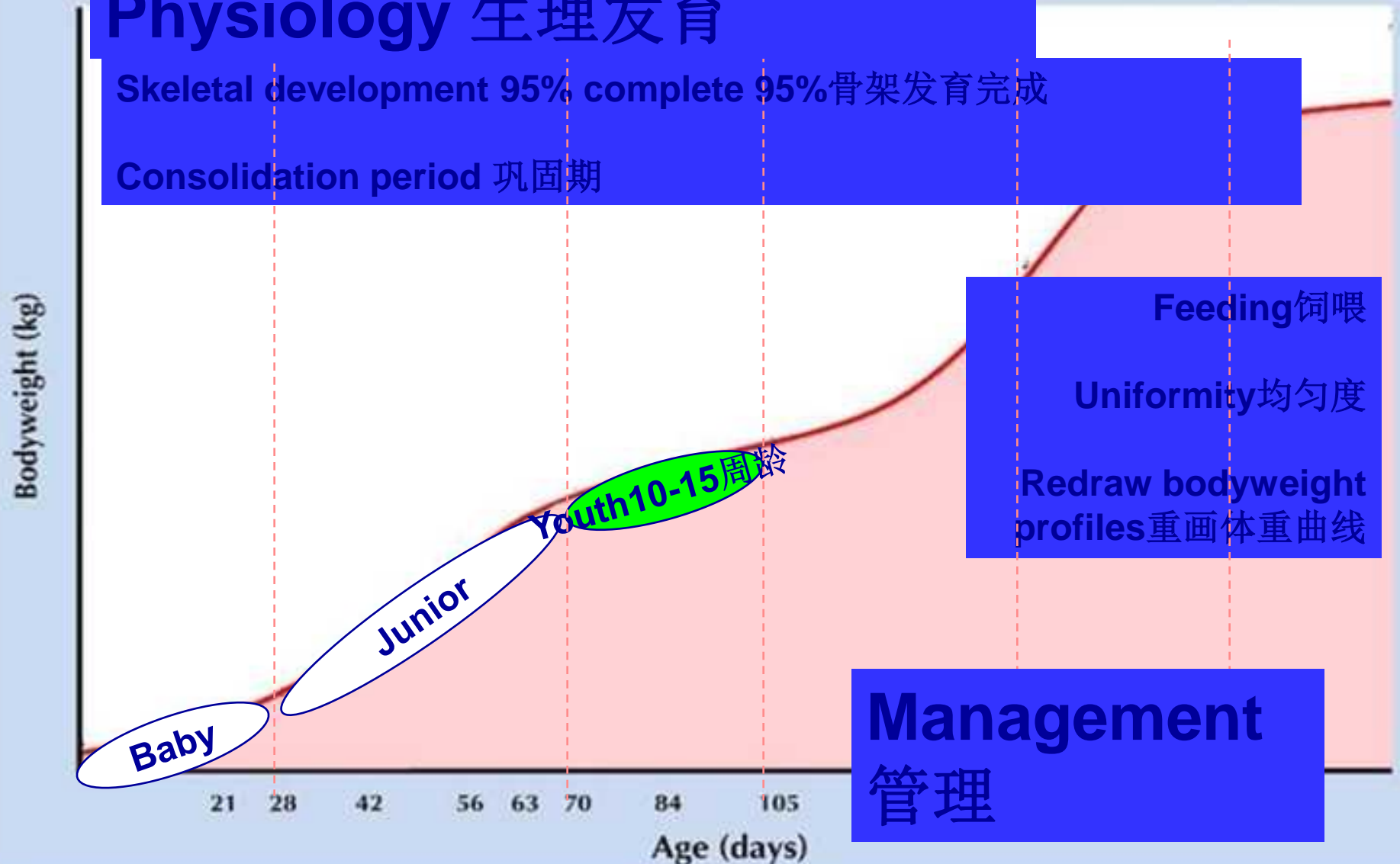


Youth: 10 to 15 Weeks 10-15周龄

Physiology 生理发育

Skeletal development 95% complete 95%骨架发育完成

Consolidation period 巩固期



Youth: 10 to 15 Weeks 10-15周龄

Small Increases – Slower Growth

Skeletal development 90% complete 90%骨架发育完成

Consolidation period 巩固期

困难阶段-饲料分配很关键

Redraw bodyweight profile at 10 weeks to parallel the Standard to avoid conformation issues 10周龄重新制定体重曲线，使体重平行于标准，避免体况问题

Bodyweight (kg)



10-15 Weeks 10-15周龄

- Adjust feed to achieve target body weight
调整饲喂量，达到目标体重
- Birds under target BW should follow a profile that will reach targeted weights by 105 days
体重低于目标，应该按照新的曲线使体重在105日龄达到标准体重
- Birds over target BW should follow a profile that runs parallel to the standard
体重超过标准，应将体重平行于标准体重增长
- Birds cannot lose weight during this period
该阶段体重不能下降
- 90% of skeletal growth is completed around 80-95 days
80-95日龄时，90%的骨架已发育完成



When Weighing...称重时

- We should evaluate the male fleshing condition as well. 评估公鸡的胸肌发育
- Fleshing condition uniformity should always be similar to Bodyweight Uniformity.
胸肌发育的均匀度应该与体重均匀度一致
- If there are issues we might look at other factors such as beak, back, legs, feet..
还应评估其他方面如喙部、背部、腿部及脚趾



Teenager: 15 to 23 Weeks 15-23周齡

Physiology 生理发育

Reaching Sexual Maturity 进入性成熟

Behavioural Changes 行为变化

Testes Growth 0.5gm – 12gm (Single Testis)

睾丸发育

Increasing Sex Hormone production 激素增加

Bodyweight (kg)



Final Selection 最后选种

Mating Up 混群

Separate Sex Feeding 公母分饲

Light Stimulation 光照刺激

Sexual Maturity 公鸡/母鸡性成熟

Management 管理

Baby 育雏

Junior 4-10周

Youth 10-15周

Teenager 15-23周

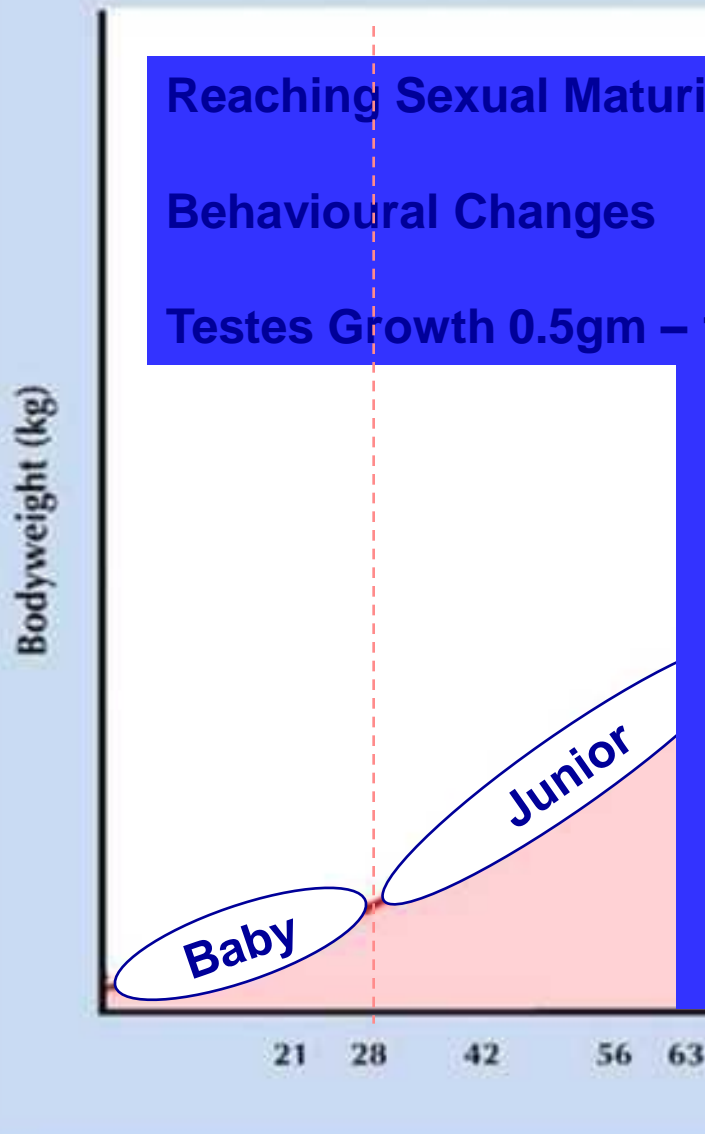
21 28 42

Age (days)

154 161

210/217

Teenager: 15 to 23 Weeks



Reaching Sexual Maturity

Behavioural Changes

Testes Growth 0.5gm –

Good conformation, defect free 体况好, 无畸形

Training Period 选练期

Critical for Male Conformation & Fertility
公鸡体况与受精率的关键

Initiate Sexual Maturity 初期性成熟

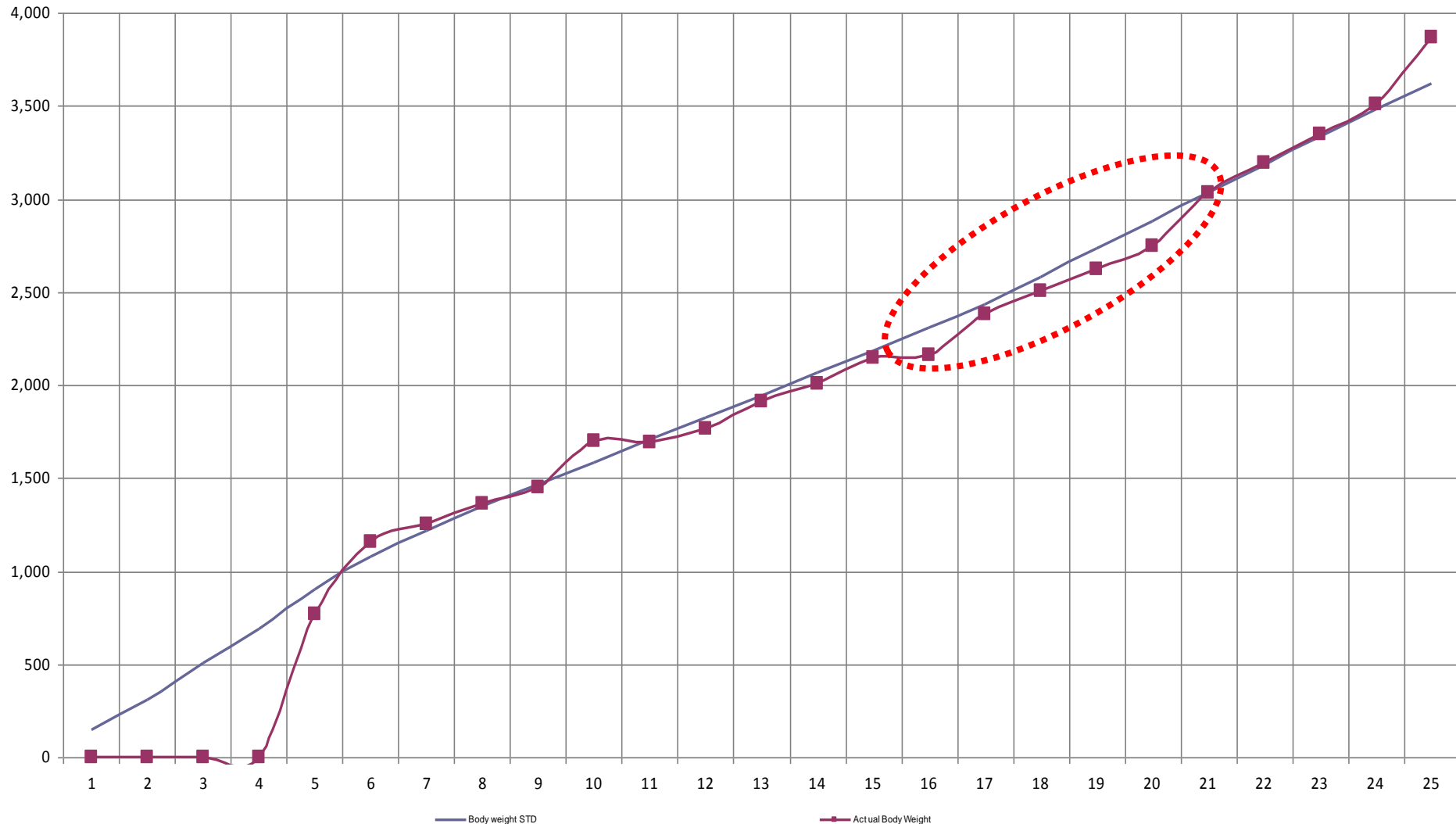
Synchronise. Aim = Chicks/HH 同步

Underfeeding at this stage can seriously affect whole of life fertility. 该阶段饲喂不足影响整个周期的受精率

18-25 Week Period – Male Growth

18-25周龄- 公鸡生长发育

Males Rearing



18-25 Week Period – Male Growth

18-25周- 公鸡生长发育

Problem? 问题?

- Not meeting Std bodyweight gain by week
没有满足标准周增重

Period of rapid growth of testes 睾丸快速发育阶段

Period where males comb and facial features is developing rapidly

公鸡鸡冠与脸部特征快速发育阶段

Causes 原因

Male competition 公鸡相互竞争

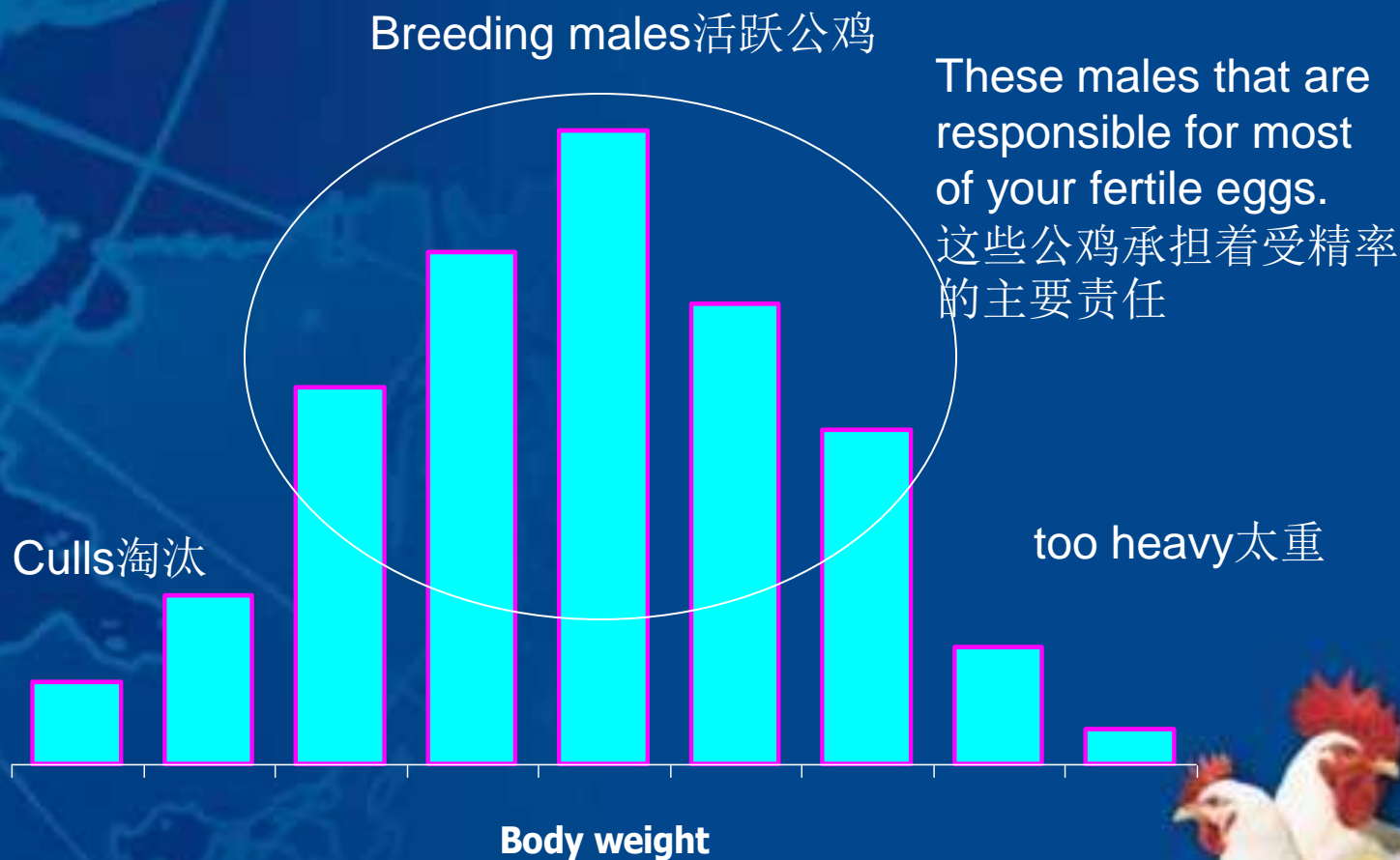
Feed space 采食位置

Transfer period from rearing to laying house

Aviagen 育成期到产蛋期转换阶段

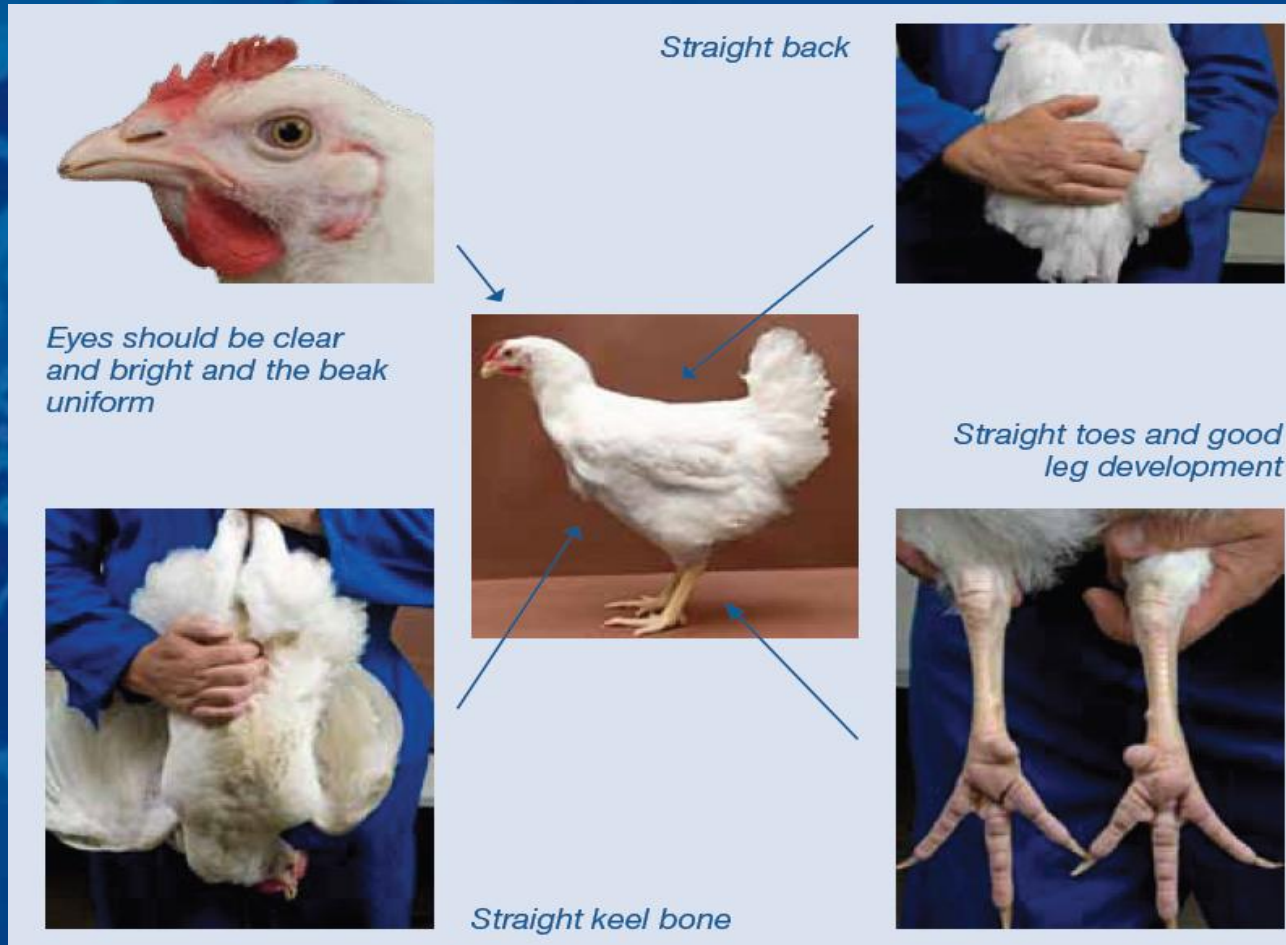


Trying to create and maintain these average males? 使群体内的公鸡保持在平均体重附近?



Final Selection (18-22 weeks)

最后的选种（18-22周龄）



Excluding males from female feeder, for Good SSF 防止公鸡偷吃母鸡料-公母分饲

Processing - Full comb.
处理- 留有全冠

- **Good for separate sex feeding.**
- 有利于公母分饲
- **More comb damage. 鸡冠损伤多**
- **More difficult to find sex errors.**
- 不容易发现鉴别误差



**Full comb males act as
cooling pad. 留有全冠的公鸡具
有蒸发冷却作用**



转群前选种

- Frame Size, Shank Length, Bodyweight and Uniformity.
骨架，胫长，体重及均匀度
- Conformation & Fleshing - breast muscle development.
体况与肥胖度- 胸肌发育
- Backs - straight no deformities – posture shaped not T.
背部-平直，无畸形—站姿不能像“T”形
- Legs and feet - straight legs no feet or toe deformities.
腿与脚趾-挺直无畸形
- Comb and Facial Color 鸡冠与脸部颜色
- Beaks - Males that have poor beaks will have mating problems (can't hold on) 喙部-喙部不好会造成交配问题（抓不住母鸡）
- A Poor Male at this age will always be a Poor Male – don't kid yourself that it “will come right” 该阶段如果公鸡不好，其始终会是不好的公鸡-



Mating or Mixing 混群

Should be done after 147 days

应该147日龄以后

Restriction grill size is of vital importance 限饲格栅大小非常重要

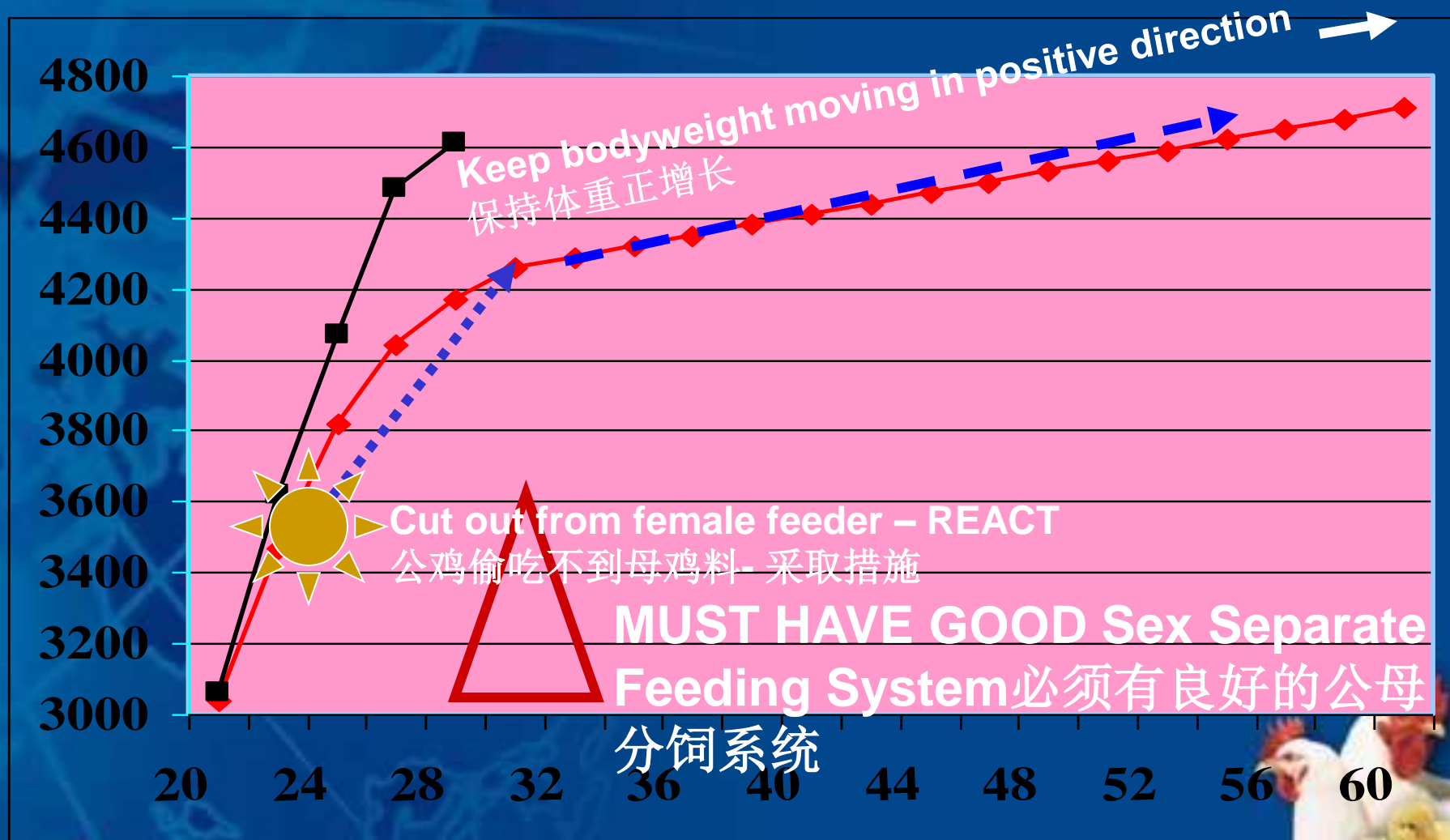
We must teach males where to eat and keep females restricted as well
必须调教公鸡去哪里采食，而且不能让母鸡偷吃

Female restrictive grill must be allow must be managed correctly so males will not injure themselves
母鸡限饲格栅必须管理良好以防止对公鸡造成损伤



Body weight control vs. Feed amount

体重控制与饲喂量



产蛋期种公鸡的评估

头部



- 种公鸡的鸡冠、肉髯、眼睛周围应呈均匀的鲜红色，喙部形状齐整。

腿部与脚趾



- 腿型直挺无弯趾。脚垫干净无损伤。附关节周围的红色斑点表明种公鸡的交配能力很好。

羽毛



- 交配能力好质量高的种公鸡身体某些部位会出现掉羽现象，尤其是肩部和大腿部。

体重与丰满度



丰满度最佳



正确的丰满度



丰满度过高

- 每周应对种公鸡的体况或丰满度及体重进行监测。

泄殖腔



- 泄殖腔（肛门）周围的羽毛应有些磨损且泄殖腔应该大而湿润。

Apprentice: 23 to 30 Weeks 23-30周龄

Physiology 生理发育

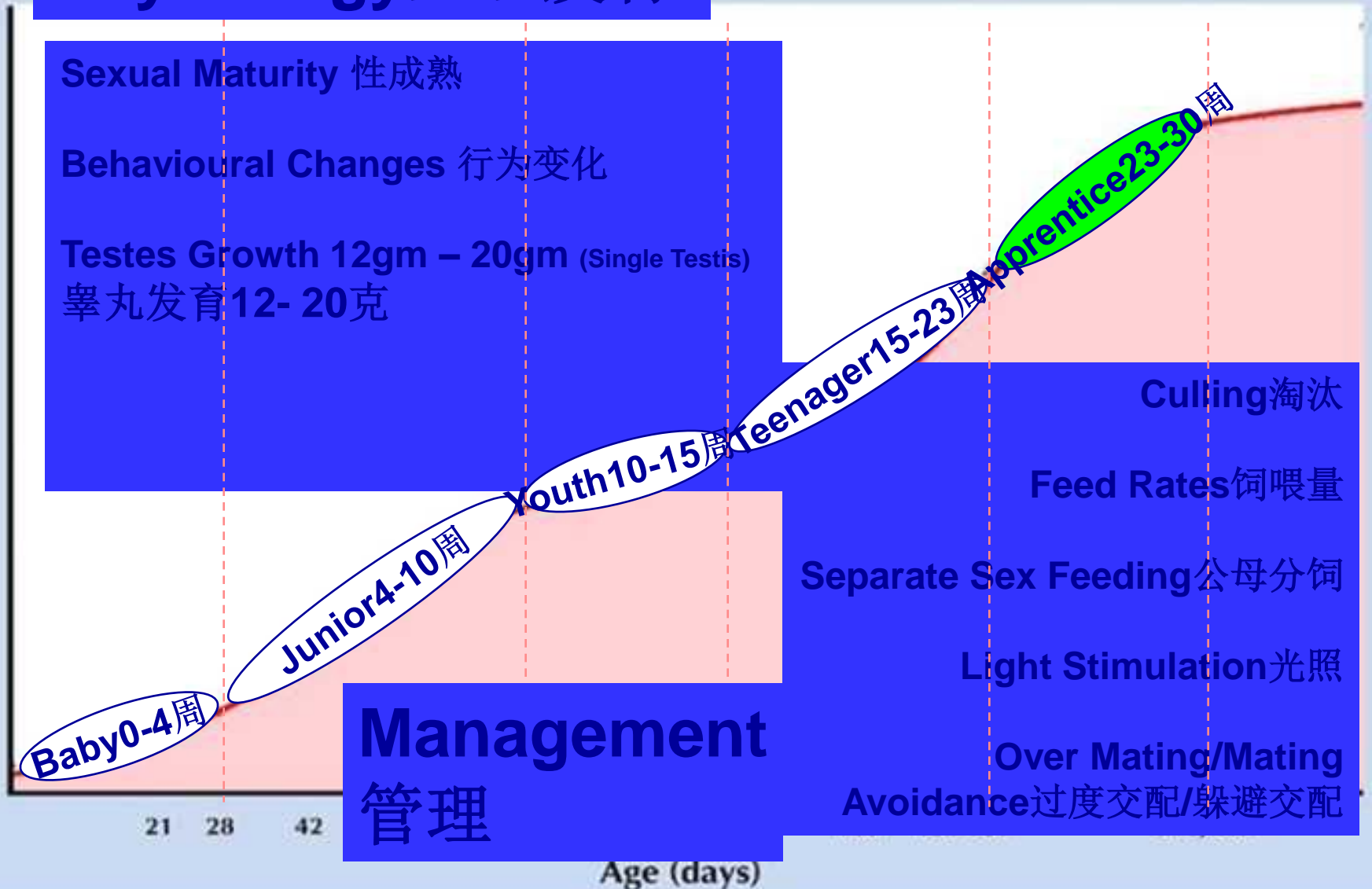
Sexual Maturity 性成熟

Behavioural Changes 行为变化

Testes Growth 12gm – 20gm (Single Testis)

睾丸发育 12- 20克

Bodyweight (kg)



Apprentice: 23 to 30 Weeks

23-30周龄

Sexual Maturity性成熟

Behavioural Changes行为

Testes Growth 12gm – 20g
睾丸发育12g-20g

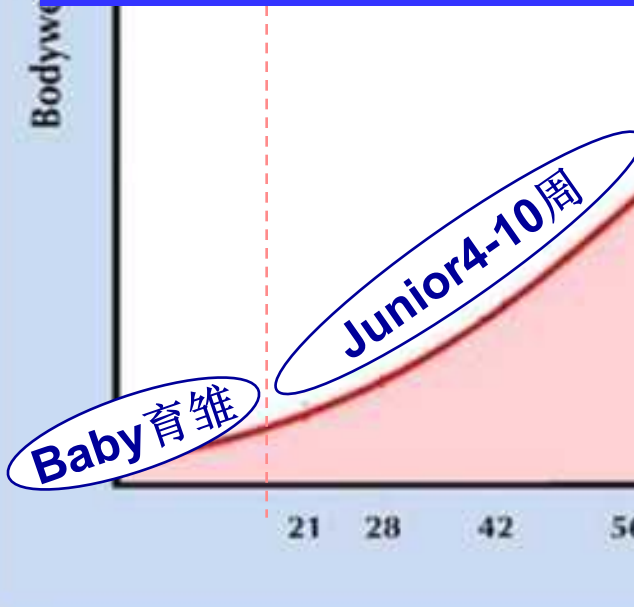
Poor Conformation/Sub Standard
体况差/不符合标准

Maintain correct conformation
保持正确的体况

Exclusion – adjust feed rates
公母分饲- 调整饲喂量

Daylength Increases 加光

Reduce M/F Ratio if necessary
必要时降低公母比例



Sex ratio 公母比例



- Good mixing of males and females tells you that the number of males to females is good.
公鸡/母鸡混合良好表明公母比例正确



- If the hen learns to run and tries to hide (slats), you know you have too many males
如果母鸡逃避或躲避在棚架，说明公鸡太多。



Feeder space impacts uniformity

采食位置影响均匀度

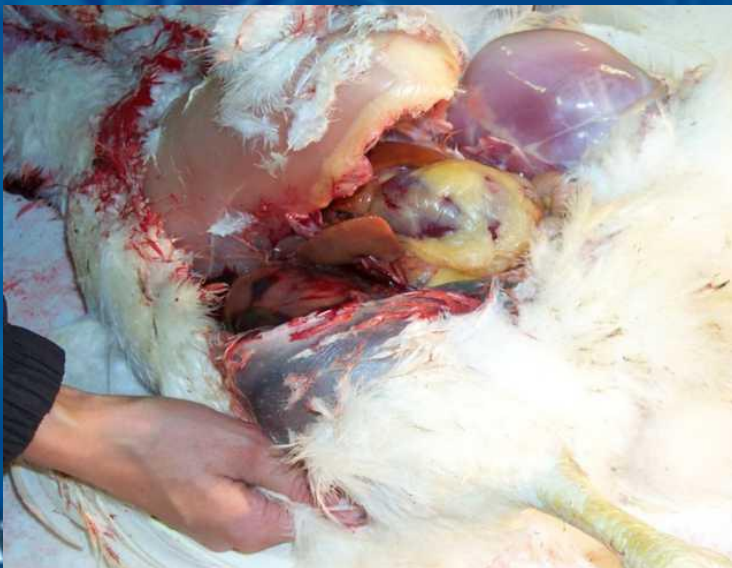


Poor matching of the ratio

公母比例不匹配



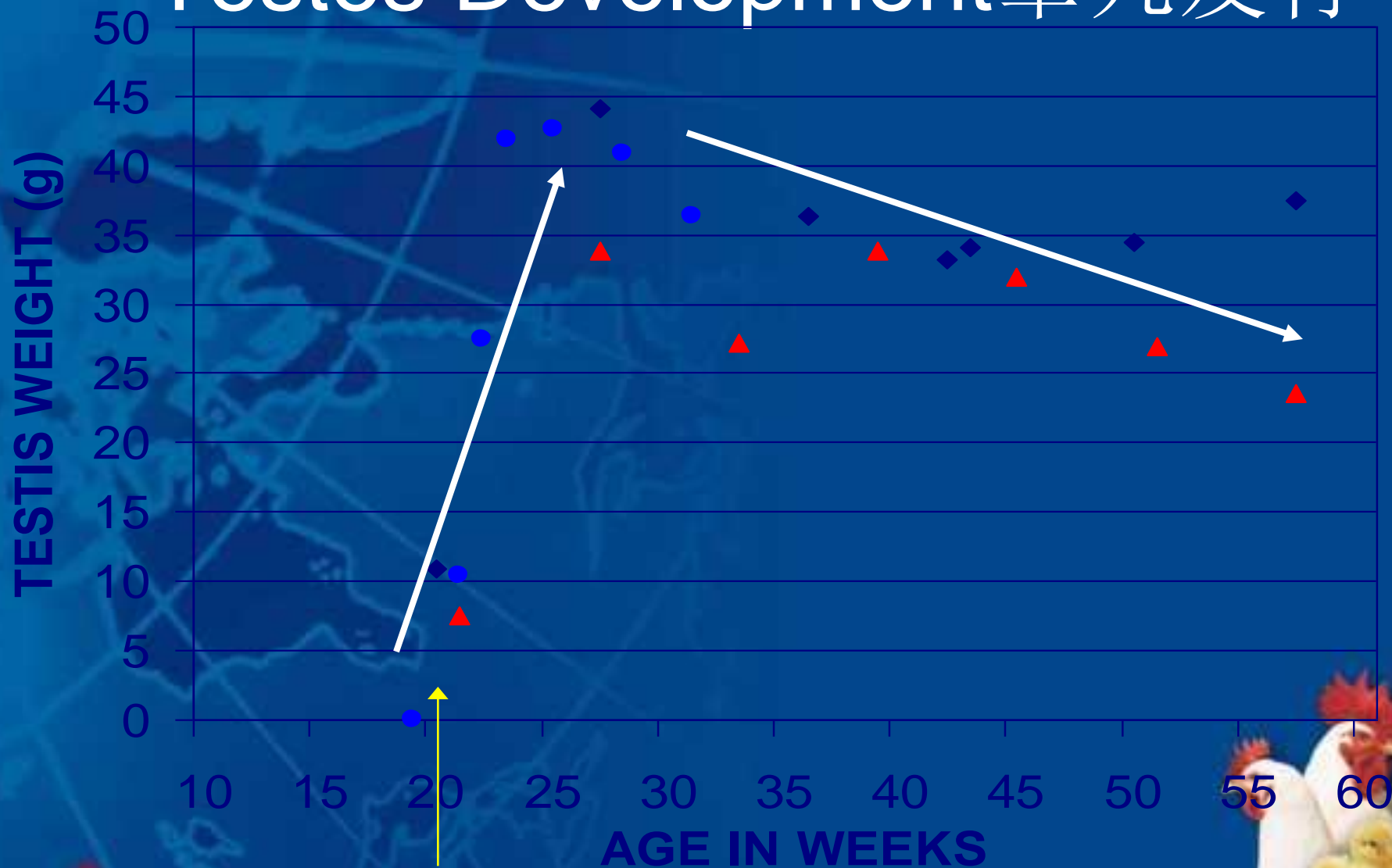
- Over mating leads to excess feather loss, wounds and fearful behavior 过度交配造成羽毛过度脱落，损伤及害怕行为
- High mortality 死淘率高
- Low fertility 受精率低



ly aggressive males because of high mixing
numbers or a delay in female development 公鸡攻
Over击性是由于公母比例高或母鸡发育晚



Testes Development 睾丸发育



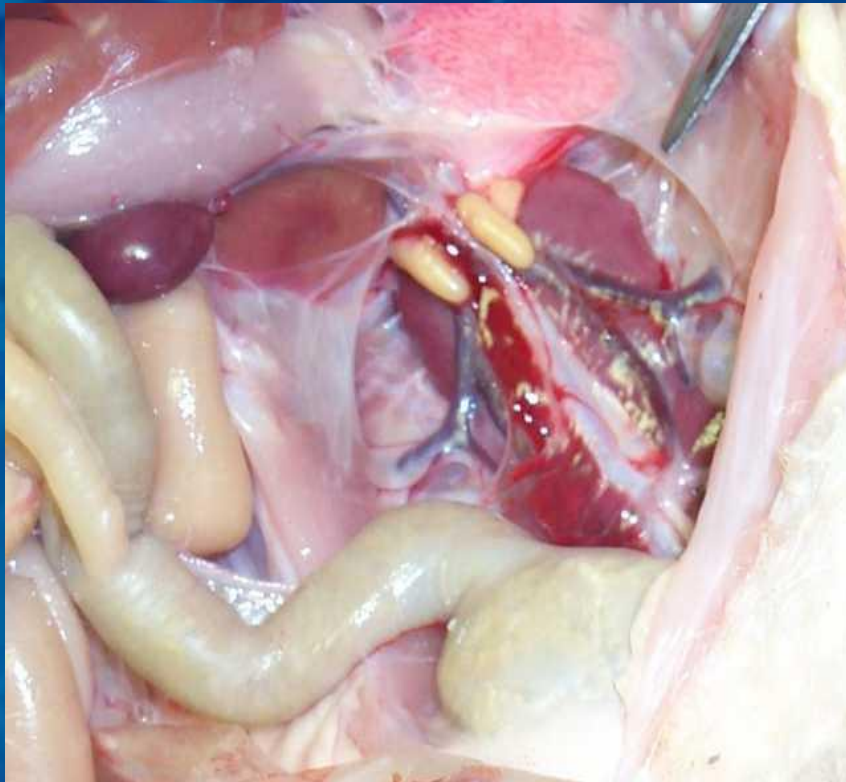
Semen quality and quantity 精液质量与数量



- Want good semen production (quantity of semen). 需要良好的精液数量
- Want highly mobile or motile sperm (quality). 需要较高活力的精子
- Feed restriction (excessive) reduces semen production by limiting testes size. 限饲（过度）限制睾丸大小，减少精液生产
- Weight loss can negatively impact semen production. 体重下降能影响精液生产
- Heat stress in rearing can permanently reduce semen quantity and quality. 育成期热应激会永久影响精液数量与质量
- Periodic heat stress in the lay cycle can reduce semen production (not permanently). 产蛋期间断性热应激会减少精液生产（不是永久型）

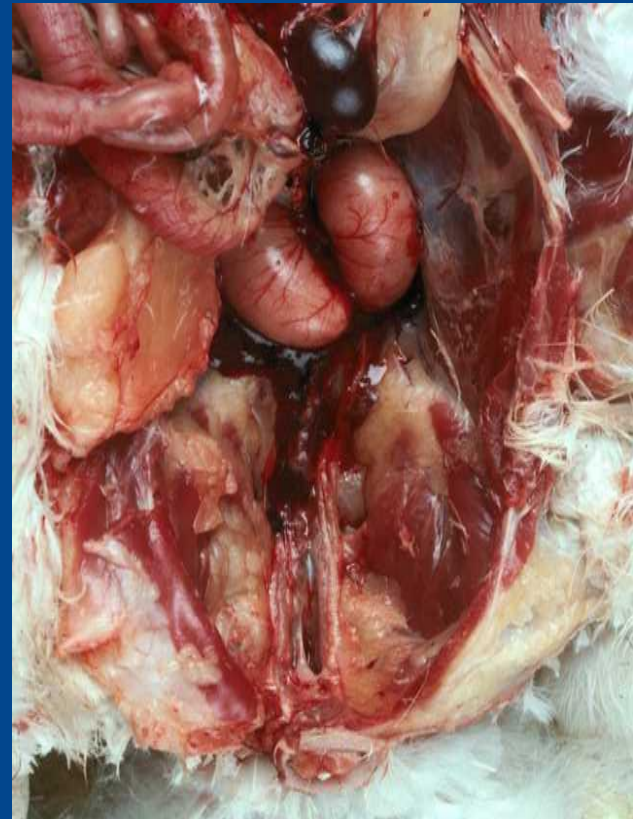


Testis Development -Growth from 2 g to 25 g (per testis) 睪丸发育- 2克到25克



3 weeks of age 3周齡

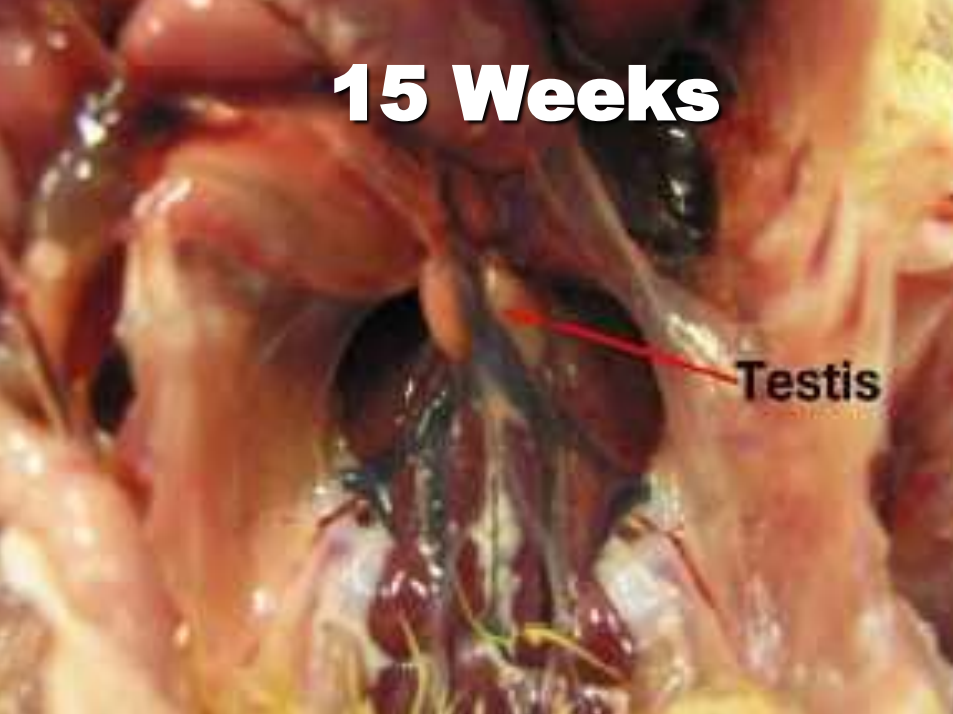
Aviagen™



30 weeks of age 30周齡



15 Weeks



20 Weeks



25 Weeks



Healthy
Cream Colour

Good Blood
30 Weeks

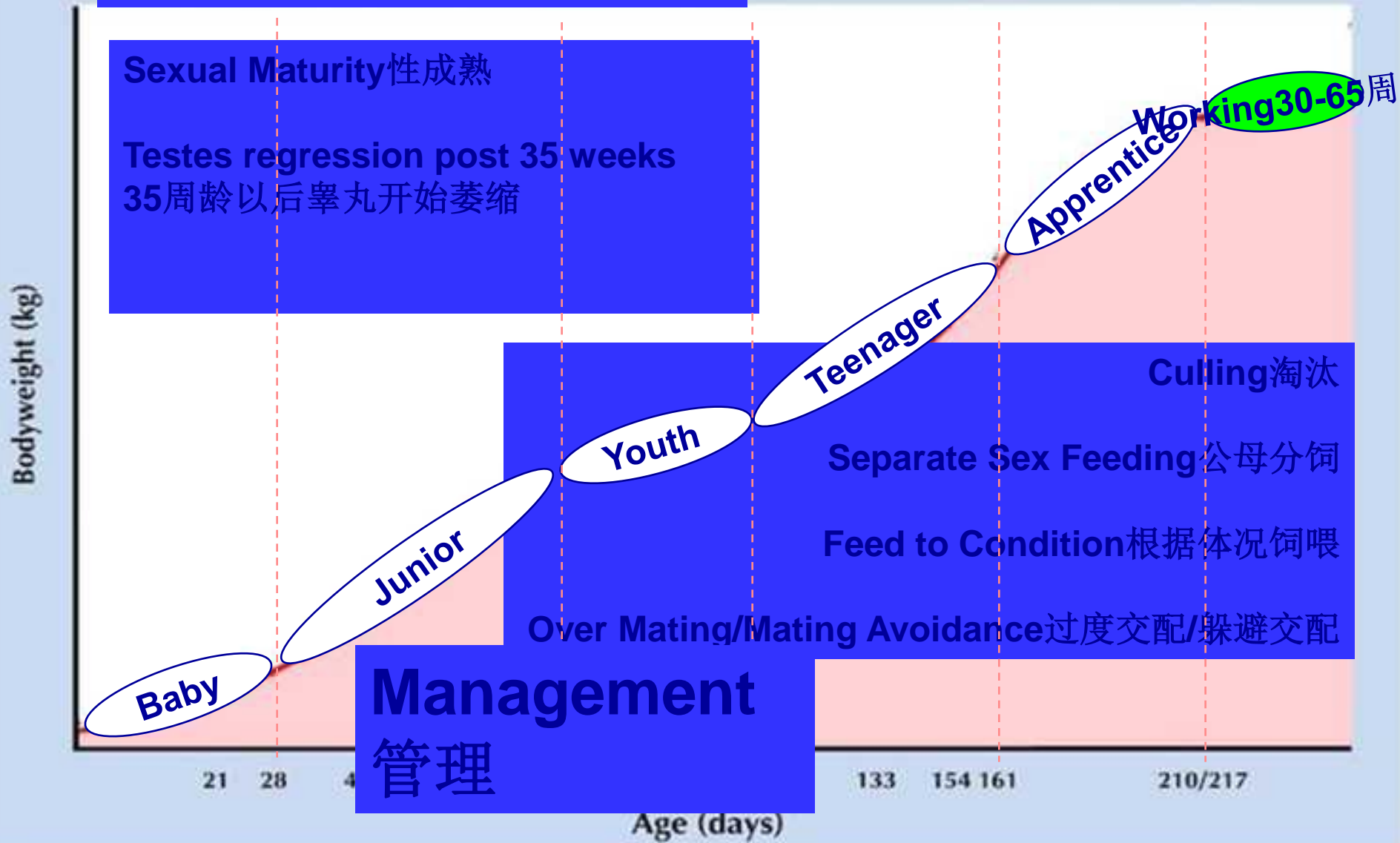


Working: 30 – 65 Weeks 30-65周齡

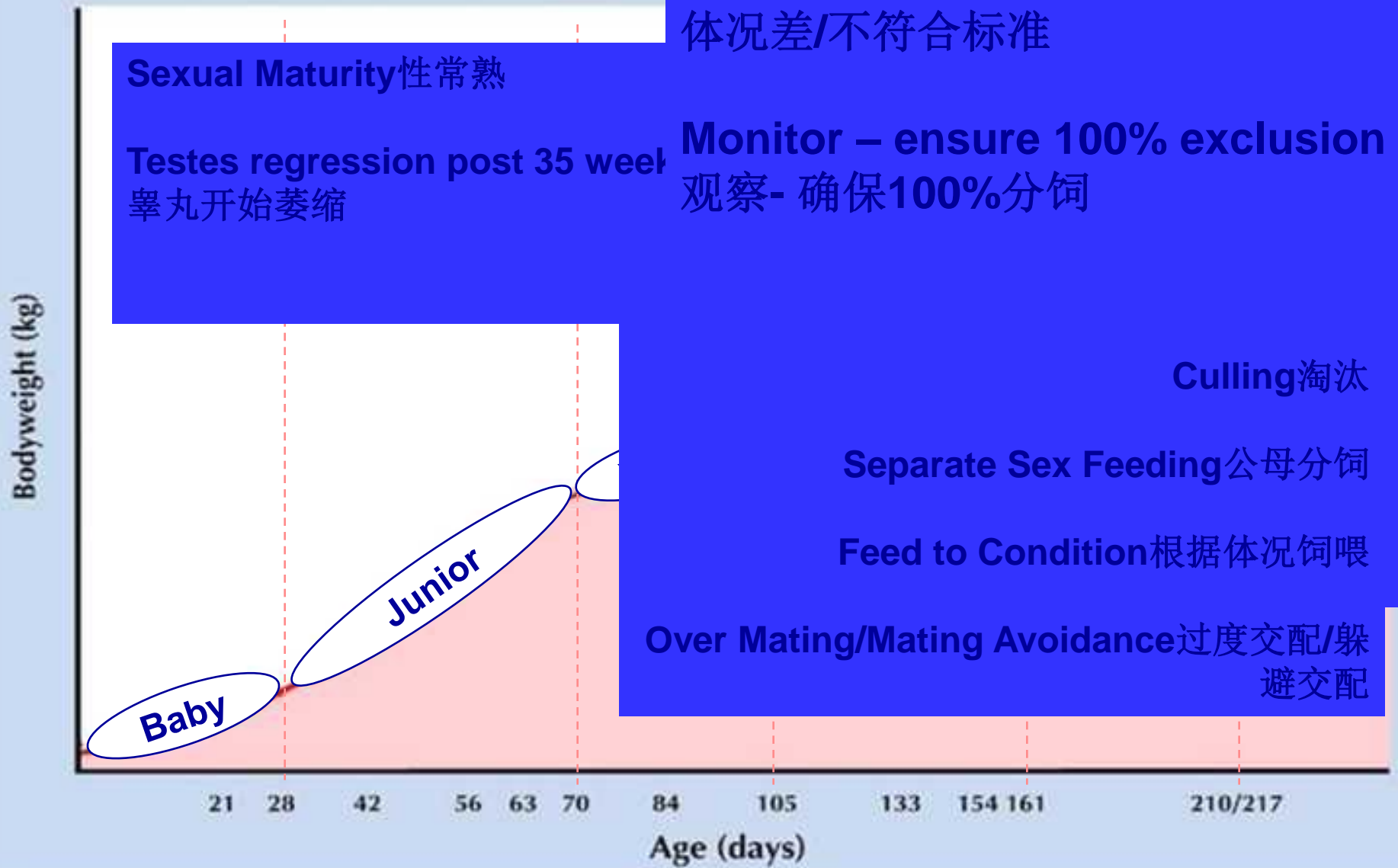
Physiology 生理发育

Sexual Maturity 性成熟

Testes regression post 35 weeks
35周齡以后睪丸开始萎縮



Working: 30 to 65 Weeks 30-65周齡



Foot Pad Issues 脚垫问题



- Poor litter condition
垫料差
- Poor ventilation – wet litter
通风差-垫料湿
- Excessive body weight
超重
- Foot pad issues limit the effectiveness of breeder males, 脚垫问题影响公鸡交配效果
- usually cull these roosters
这些公鸡应该淘汰



Fleshing 胸肌发育



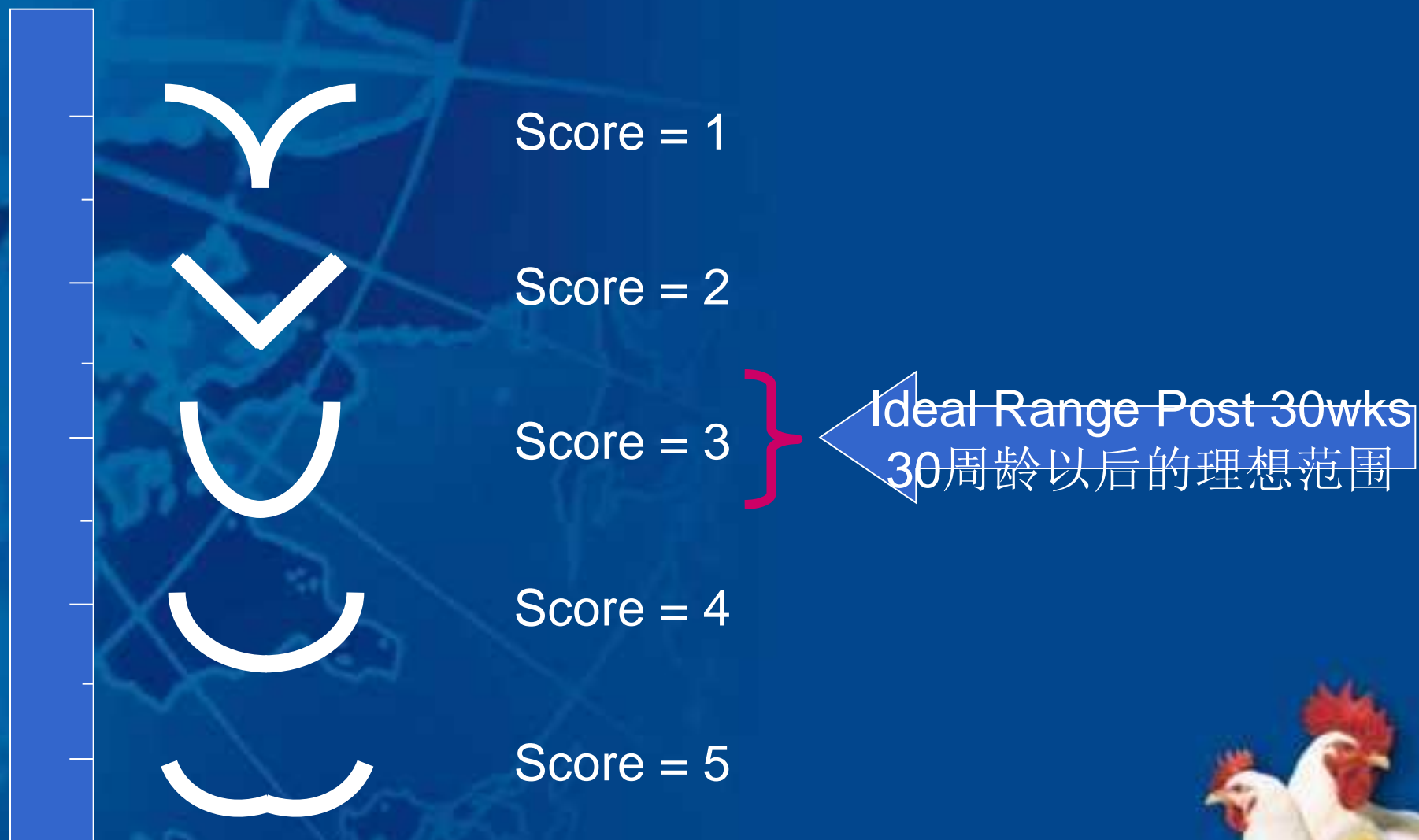
- Check Fleshing when weighing
称重时检查胸肌发育
- Feel breast either side of the keel bone
触摸龙骨两侧的胸肌
- Is the skin loose?
 - Additional feed needed 皮肤是否松弛，是否需要额外加料



Post 30 Weeks

30周龄以后

Breast Scoring 胸肌指数



Breast Scoring 胸肌指数



Male Body Condition

公鸡体况



Very important that male condition or fleshing is monitored. 观察公鸡体况或胸肌发育很重要

- Lean, correct conditioned males are more active and will complete more successful matings . 瘦但体况良好的公鸡更活跃，交配更成功



Completed mating – requires cloacal contact 成功的交配 – 需要泄殖腔接触



Why does fertility decline with age?

为什么受精率随着周龄增长而下降？

- Male is less interested and able to complete mating as he ages.
公鸡兴趣下降以及完成交配的能力下降
- Hen physiologically needs to be mated more often to sustain same level of fertility as she ages. 母鸡从生理上需要更多的交配才能维持同样的受精率



Why does fertility decline with age?

为什么受精率随着周龄增长而下降？

- It is difficult to maintain flock fertility without active management of the males after 40 weeks of age. 40周龄以后公鸡交配活跃性下降难以维持较好的受精率



Female Fertility 母鸡受精率

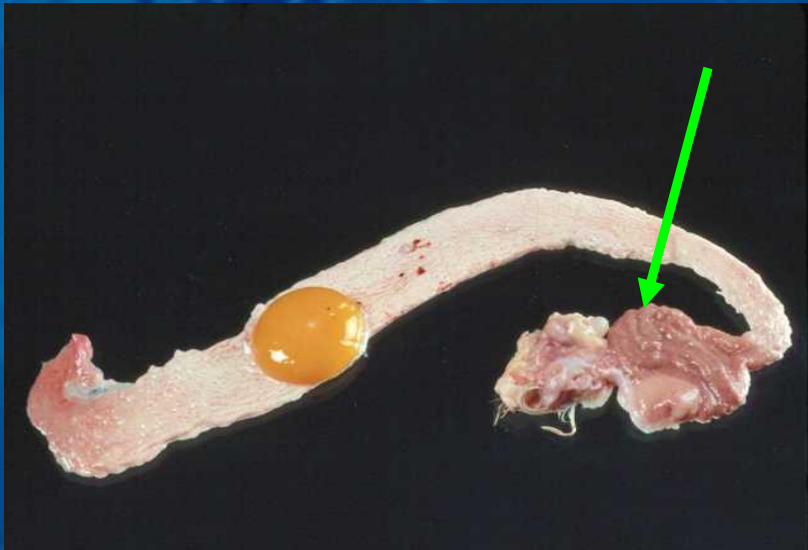
1. Older hens – heavier and fatty which reduce the size of sperm storage tubules (40+ weeks) 老龄母鸡- 超重与肥胖的母鸡会减少储精管的大小（40周龄以上）
2. Sperm stored in older hens do not retain their viability 储存在老龄母鸡体内的精子不能保持其活力
3. Older hens produce less sperm receptor sites in the ovum – for binding and penetration 老龄母鸡卵子产生较少的精子受体点- 吸附与穿刺
4. Older hens released more sperm from the sperm storage tubules (SST) 老龄母鸡从储精管释放较多的精子



Overweight hens 超重的母鸡



- Increased mortality
死淘高
- Carry too much abdominal fat
太多的腹部脂肪
- More fat infiltration around the oviduct
输卵管周围较多的脂肪浸润
- Poorer sperm storage
精子储存较差



Effect of Weight Loss during Production

产蛋期体重下降的影响

Weight Loss体重下降	Results on Quality/Quantity of Semen 对精液数量与质量的影响
Slight weight loss 轻微体重下降	Sperm quality declines 精子质量下降
> 100 grams in 5 weeks 5周内体重下降100克以上	Sperm volume and quality declines 精子数量与质量下降
> 500 grams in 5 weeks 5周内体重下降500克以上	Semen production stops and sometimes it is not recovered 精液生产停止，有时不可恢复



Comb Condition and Facial Color

鸡冠状态与脸部颜色



Vent – Large, Red and Moist

肛门- 大，红，湿润

Not always reliable – depends largely on recent mating activity



More important is the condition around the vent – worn feathers and “dirty”



Strategy for Increasing Male Activity 提高公鸡活跃性的策略

Method方法	Advantages优点	Disadvantages缺点
Spiking替换	<ul style="list-style-type: none">• Can give a significant increase in fertility 受精率提高明显	<ul style="list-style-type: none">• Biosecurity 生物安全• Added capital for spiking house 增加鸡舍成本• Cost of extra birds 增加公鸡成本
Intraspiking 交换	<ul style="list-style-type: none">• Reduced biosecurity risk 减少生物安全风险• Maintains fertility 维持受精率	<ul style="list-style-type: none">• May not show any improvement in fertility 也许看不到受精率提高• Often done too late 常常做的太晚
Separate Male Pen from 25 wks 25周龄以后留有后备	<ul style="list-style-type: none">• Reduced biosecurity risk 减少生物安全风险• Has an affect from week 25	<ul style="list-style-type: none">• More space needed in the production house 鸡舍需要较多的面积• Cost of extra birds 公鸡成本增加

Summary 总结

- Good chick start – Early target weights.
良好的开端- 早期体重达标
- Uniformity and controlled growth.
均匀度与体重控制
- Synchronize the maturity of males and females
公鸡/母鸡性成熟同步
- Correct management of Separate Sex Feeding.
正确管理公母分饲系统
- Dry, loose litter helps the birds to remain clean and well feathered with healthy legs
干燥、松软的垫料有利于保持干净、良好的羽毛以及健康的腿部与脚趾



Summary 总结

- Assessment of male condition daily or when weighing.
每天或称重时评估公鸡体况
- Observe feeding daily. 每天观察饲喂
- Observe behavior in the poultry house in the afternoons
– and be prepared to respond quickly.
下午观察行为- 及时采取措施
 - A good flock should remain active and well mixed at this time
良好的鸡群应该公母混合良好、交配活跃。



Thank you! 谢谢!

