

# UF/IFAS Extension

## The Journey to Sustainability Begins with Education



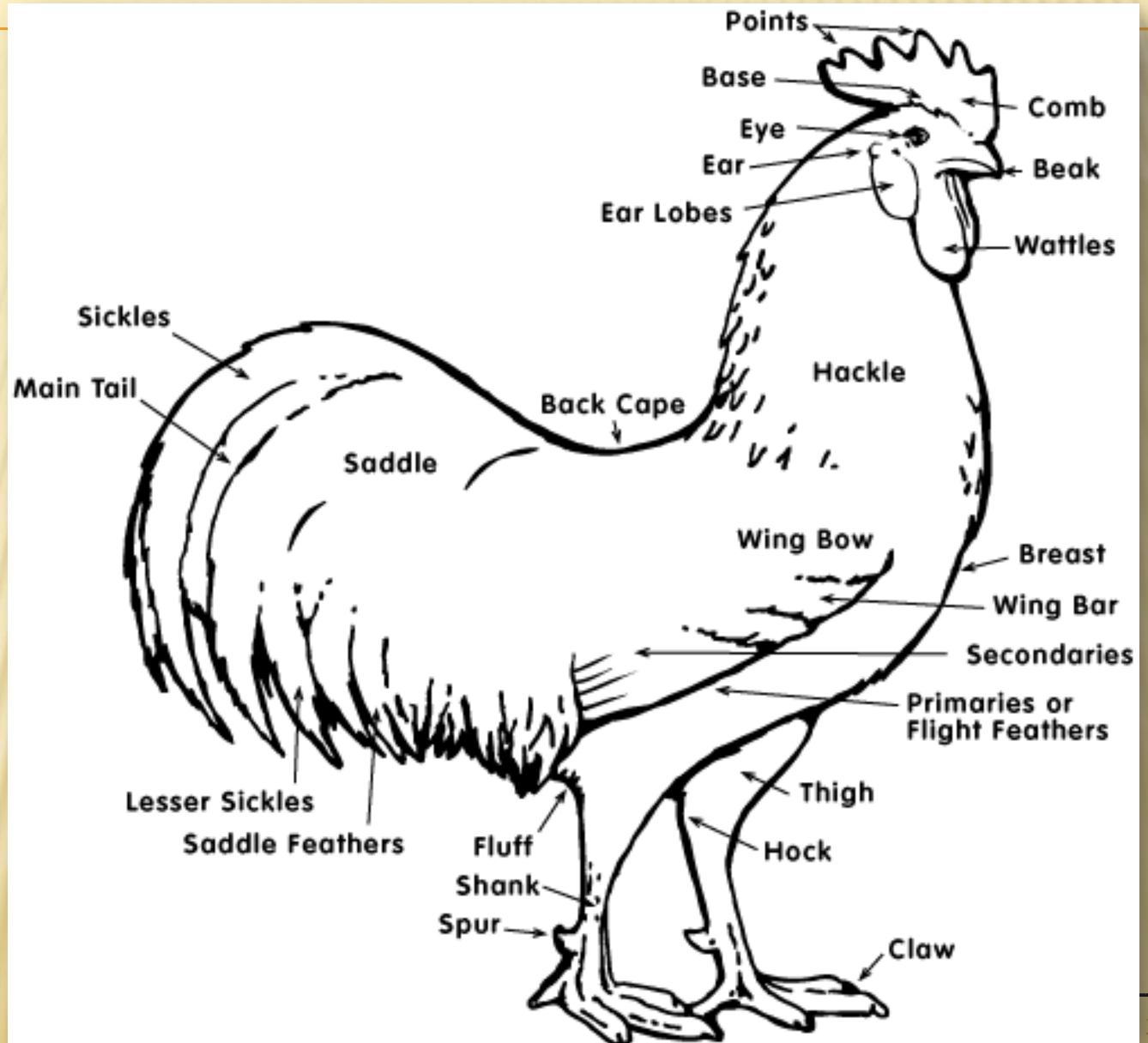


**CHICKENS 101**  
**BIOLOGY**  
**(ANATOMY, BREEDS,**  
**DEVELOPMENT, &**  
**REPRODUCTION)**

# THE BASICS: TERMS

1

## Chicken Anatomy



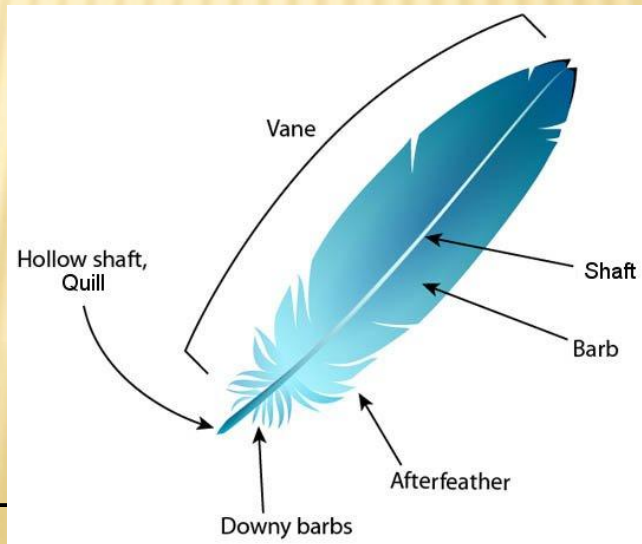
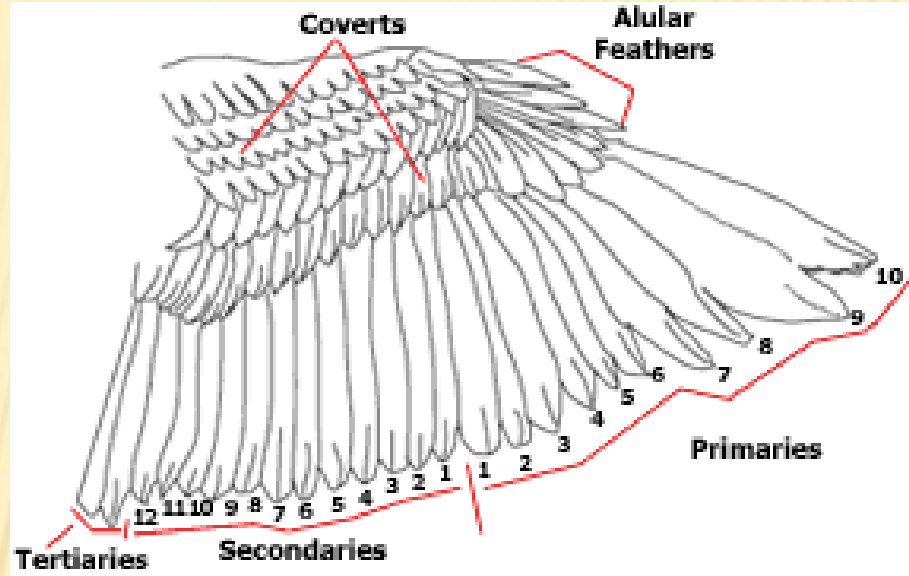
# THE BASICS: TERMS

Chicken

Wing &

Feather

Anatomy



# THE BASICS - TERMS

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Chick – a new hatch or very young chicken

Pullet- a young female chicken

Hen – a mature female chicken

Cockerel – a male chicken less than 1 year old

Cock – a male chicken more than 1 year old

Rooster- a male chicken



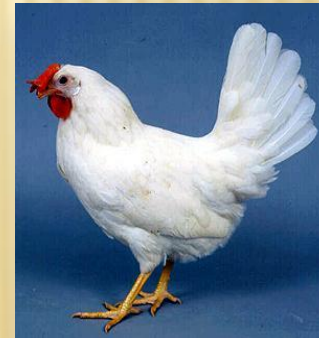
# THE BASICS - TERMS

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Broiler - used mainly for meat. A broiler is a chicken is 6 to 7 weeks of age and weighs 4 pounds when it is sent to market.



Layer - a mature female chicken that produces eggs. Most can lay 300 eggs/year.



# THE BASICS: BREEDS

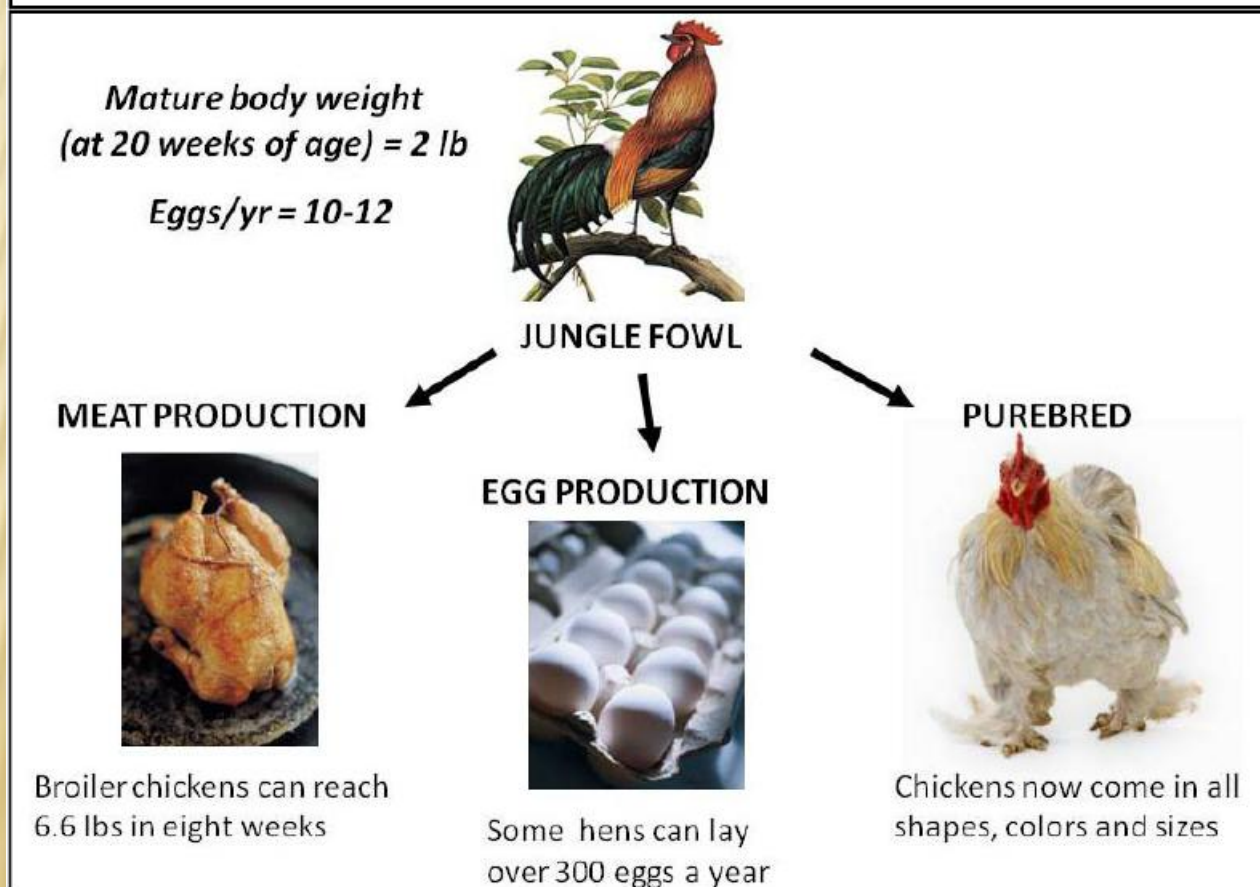


# THE BASICS: BREEDS

## How Did Chickens Originate?

- All breeds are descendents of an original Red Jungle Fowl of East Asia. Domestication impacts are great.

Figure 1. Graph illustrating the results of generations of genetic selection of the Jungle Fowl chicken to create specific purpose breeds





# THE BASICS: BREEDS

1

- ✘ There are many things to consider before selecting a chicken breed for your flock - whether you are planning to start a new flock or to add to an existing one.
- ✘ For instance, what are you looking for?
  - + a broiler breed
  - + a layer breed
  - + a dual-purpose breed
  - + a pet
  - + chickens to show at exhibitions
  - + a heritage breed

# THE BASICS: BREEDS

1

- ✘ Before selecting your chickens also review your zoning restrictions
- ✘ For instance . . .
  - + is slaughtering allowed ?
  - + how many chickens can you have ?
  - + are roosters allowed ?

# THE BASICS: BREEDS

Many Websites Available on Breed Traits Info e.g., the Handy Dandy Chicken Chart



<http://www.ithaca.edu/staff/jhenderson/chooks/chooks.html>

## Henderson's Handy-Dandy Chicken Chart



An Alphabetical List of More than 60 Chicken Breeds

With Comparative Information

[A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [H](#) | [I](#) | [L](#) | [M](#) | [N](#) | [P](#) | [R](#) | [S](#) | [W](#)

We have had personal experience with only a couple dozen of the breeds and varieties on this list. The birds from our flock, past or present, are those listed with illustrations and "Our Birds" comments.





[Chicken Resources](#); [Information on Breeds](#); [Advice for Small Flock Owners](#), and more.

Why another [chicken](#) page?

**NOTES:** This page loads slowly with dial-up connections (Sorry).

If the table does not fit on your screen, expand page to full screen and decrease font size.

Sage Hen Farm is not a hatchery. The information is provided for **educational** purposes only. We do **not** sell chicks or hatching eggs.

Breed (with links to other sites with images and more information)	Varieties / Rarity / What's a hen weigh?	Class and Type	Origins	Egg color & productivity; egg size	Comb Skin color Earlobes	Brooding Hardiness Maturing	Behavior
 <a href="#">ES</a> <a href="#">PB</a> <a href="#">chub</a>	Black, Blue, Blue-wheaten, Brown-red, Buff, Silver, Wheaten, & White  Easter Eggs are common. Standard Ameraucanas are rare.  88%/8% (EEs/pure)	<b>APA (1984): Large:</b> All Other <b>Bantam:</b> All Other Clean Legged PC: Not recognized  Layer Fancy: Muffed, Bearded	South American. May or may not be genetically related to the Araucana. In pre-Columbian Chile, there are several different blue egg-laying chicken breeds, none called Araucana. Standardized & accepted into APA in 1984. Most hatcheries, however, sell Easter Egg chickens with mixed breeding that may lay blue, green (or other colored) eggs, but do not conform to standard.	  various shades of blue & blue-green	pea  white with slate colored shanks  red	occasional brooder (none of ours has)  very cold hardy  moderately early maturing	well adaptable to confinement or free range; mostly calm, non-aggressive  <b>Our Birds</b> (mostly mongrel Easter Eggers): a few have been among the most curious & most easily handled birds we have owned. Others have been calm, non-aggressive, but stand-offish. We wouldn't have a flock without them.
The chipmunky blue-egger.	Standard: 5.5 lb/2.5 kg Bantam: 1.6 lb/0.75 kg			average to above average			
 <a href="#">ES</a> <a href="#">OK</a> <a href="#">Om</a> <a href="#">AR</a> <a href="#">PP</a>	Black mottled, only  Rather rare & in decline. 40%	<b>APA (1898): Large:</b> Mediterranean <b>Bantam:</b> Single Comb Clean Legged PC: Soft Feather Light  Layer	Developed in Italy in mid-19th century probably from leghorns sporting mottled feathers. Once rivaled the Leghorn in Europe, but never caught on in North America.	  white to light cream	single, also rose  yellow skin & shanks  white	non-setter  generally hardy; very cold hardy except for combs  early maturing hens	prefers free range; nervous & restless in confinement; Tyler, active, flighty, marked wildness, avoids human contact
Much like a leghorn, with black mottling	Standard: 4.5 lb/2 kg Bantam: 1.5 lb/0.7 kg			below average			

# THE BASICS: BREED GROUPS

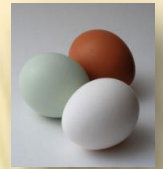


## Meat Breed Factors

- ✘ a fast growing 'broiler' breed
  - ✘ a Cornish cross can reach 4-5 lbs in six weeks and 6-10 lbs in twelve weeks
- ✘ a slower growing breed (for 'ethnic markets')
  - ✘ Australorp and Silkie breeds



# THE BASICS: BREED GROUPS

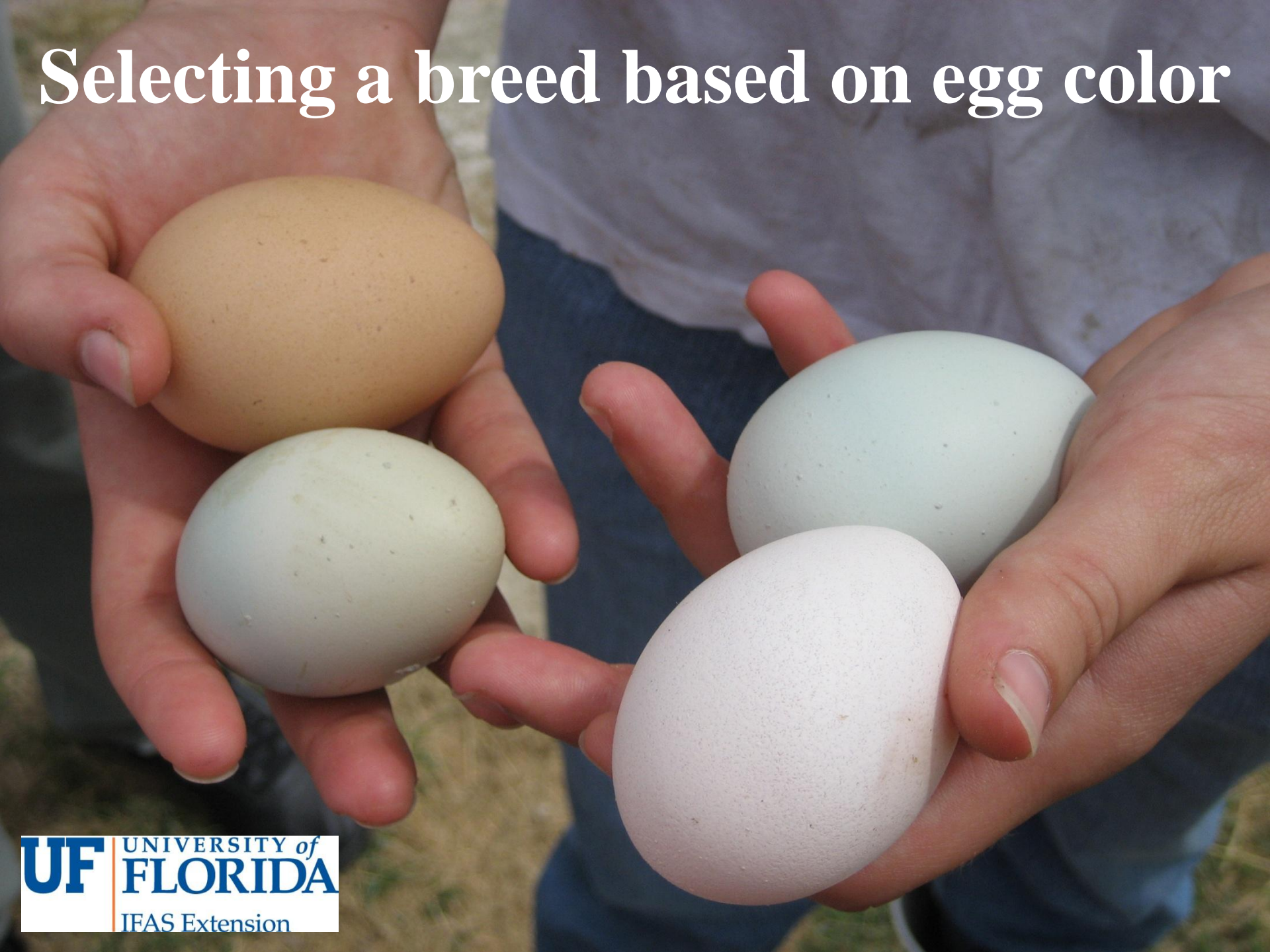


## Egg Breed Factors

- + Hybrids (Production): Not a specific breed but a cross of known breeds.
- + Layers grow slower
- + Flock uniformity
- + More production types
  - × Red Sex links
  - × Production Reds
  - × White Leghorns



# Selecting a breed based on egg color





# THE BASICS: BREEDS



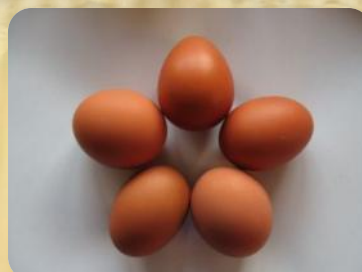
## Egg Breed Examples



**WHITE LEGHORN**



**RHODE ISLAND RED**



**ARAUCANAS**



# THE BASICS: BREEDS

## Heritage Breeds

- Allow you to participate in conservation of genetic and breed diversity
- Use breeds that are adapted to area's environmental conditions
- Opportunities to provide specialty products





# THE BASICS: BREEDS



## Heritage Meat Breed Examples



**NEW  
HAMPSHIRE**



**BARRED ROCKS**



**BUFF  
ORPINGTONS**

# THE BASICS: DEVELOPMENT



Steps in Natural Development

# THE BASICS: REPRODUCTION

## Chicken reproductive system

(photo of poster in Norfolk zoo, VA)



*GeoChemBio.com*

# THE BASICS: REPRODUCTION

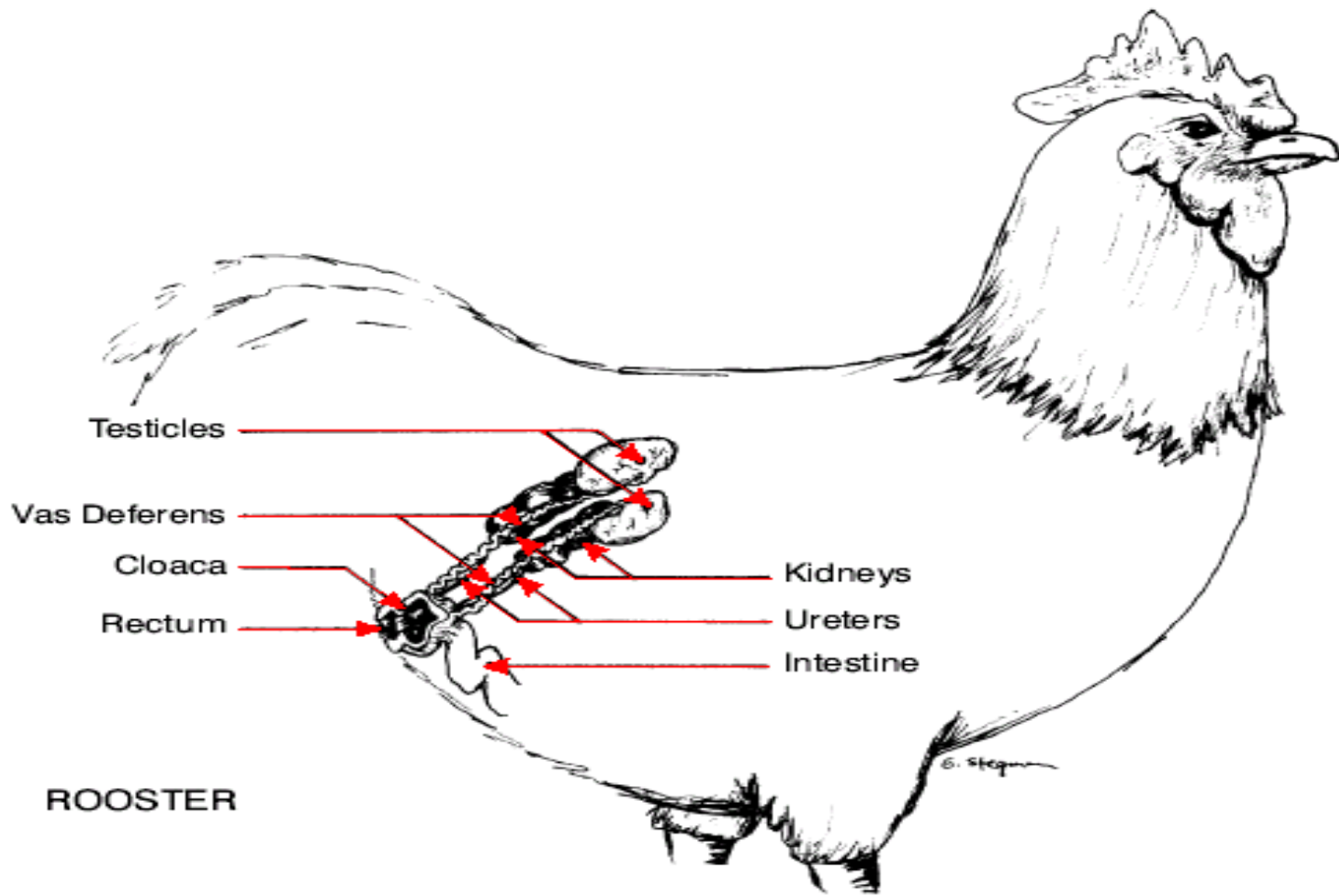
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## FEMALE POULTRY REPRODUCTIVE SYSTEM

- The ova produced in the ovary develop into egg yolks.
- The oviduct of the chicken has five parts
- It takes approximately three hours for the thick white to be placed around the yolk in the magnum.
- It takes approx. 1 ¼ hrs for two shell membranes to be placed around the yolk and thick white.
- It takes about 25 to 27 hours for a chicken to produce one egg

# THE BASICS: REPRODUCTION

## REPRODUCTIVE ORGANS OF A MALE CHICKEN



# THE BASICS: REPRODUCTION

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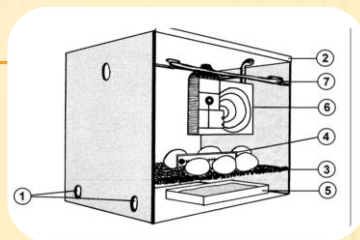
## MALE POULTRY REPRODUCTIVE SYSTEM

- 1. The vas deferens carries the seminal fluid and sperm cells to the cloaca.
- 2. The cloaca is the enlarged part where the large intestine joins the end of the alimentary canal.
- 3. The alimentary canal is the food-carrying passage that begins at the mouth and ends at the vent.
- 4. The papilla is the organ in the wall of the cloaca that puts the sperm cells into the hen's reproductive tract.
- **5. Roosters are necessary only for fertile eggs**

# THE BASICS: PRODUCTION DEVELOPMENT



Eggs for Consumption and/or Incubation



Incubator



Brooder



Housing & Feeding

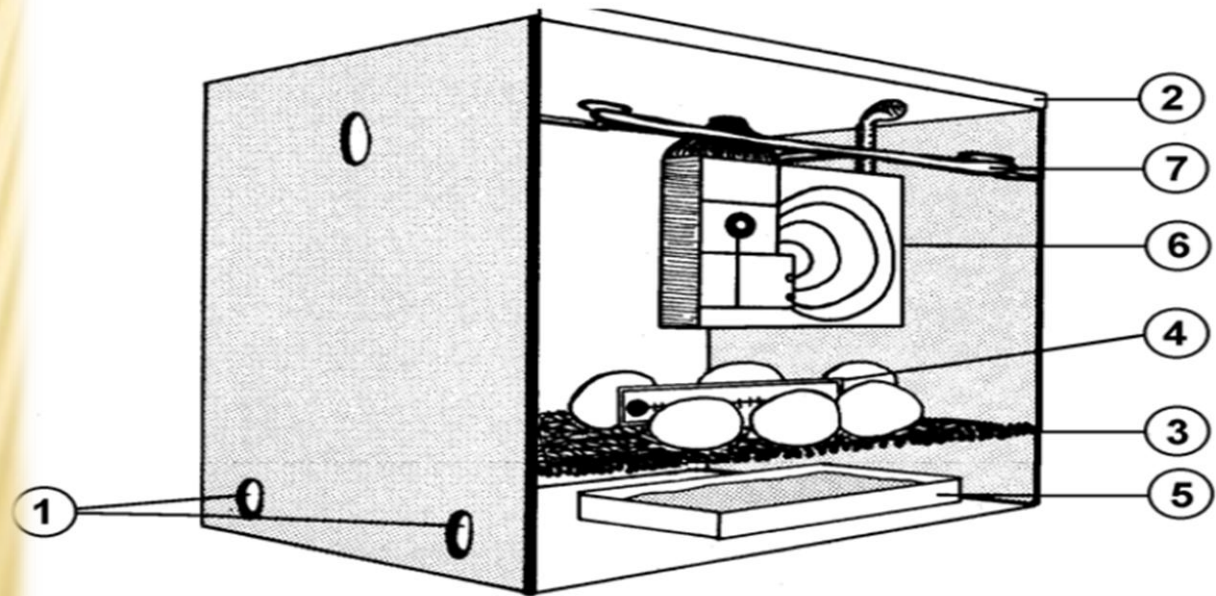


Laying Hens

# THE BASICS: DEVELOPMENT

An **Incubator** provides and maintains a favorable environment for hatching fertile eggs.

The incubator replaces the hen.





# ***THE BASICS: DEVELOPMENT***

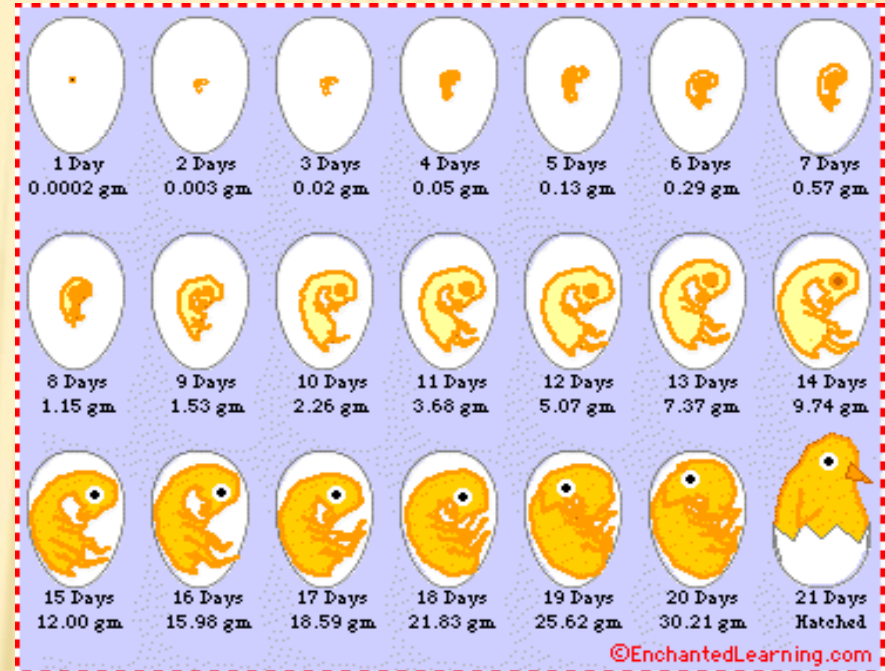
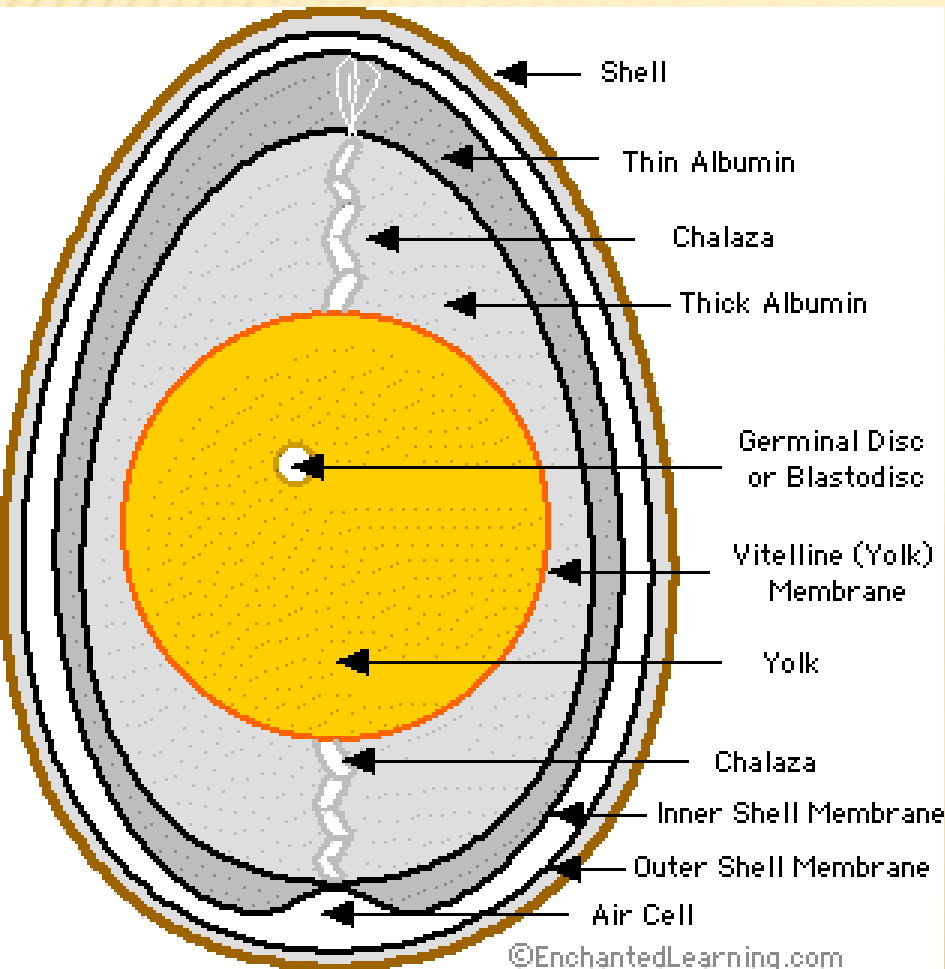
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## ***4 Important Factors to Successful Incubation Are:***

1. Temperature – 98 – 102 degrees F
2. **Ventilation – air must flow through the incubator**
3. Turning the eggs- at least 3 times daily. Incubators can have automatic turners
4. **Humidity (water)– there must be moisture to keep the egg shell healthy**

# THE BASICS: DEVELOPMENT

## Chicken Egg Anatomy and Embryo Development



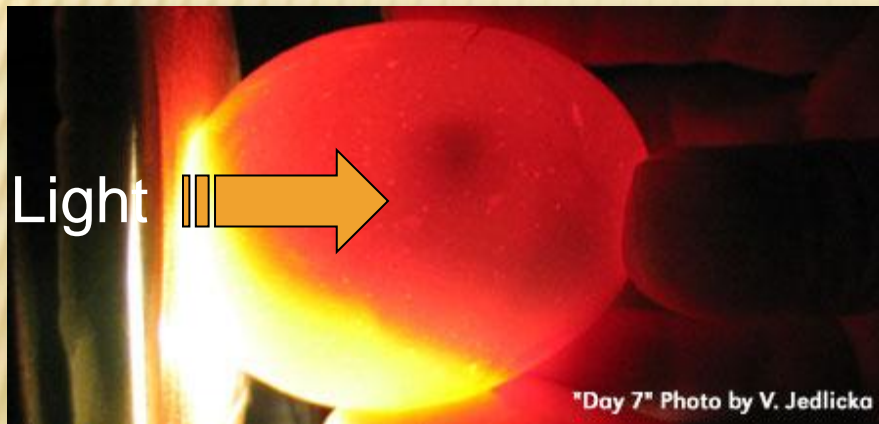
See video of chicken egg development at

<http://www.youtube.com/watch?v=LKvez9duEHQ>

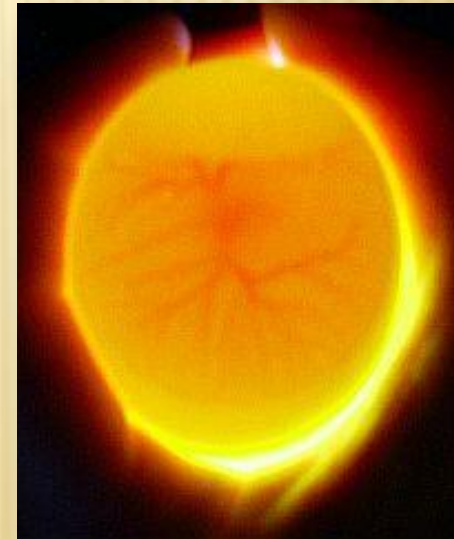


# THE BASICS: DEVELOPMENT

**Candling** is the process of using a bright light to look inside of the egg without cracking it to see if the chick is developing properly.



Notice the embryo has begun to develop.



Notice the veins, this is the embryo forming.

# THE BASICS: DEVELOPMENT

## INTERNAL DEFECTS

Focuses on albumen cleanliness and viscosity, size of air cell, yolk shape and strength.

OLD CRACK



FRESH CRACK



SOFT SHELL



BEAK OR TOE PUNCHED



BLOODSPOT IN WHITE EGG



BLOODSPOT IN BROWN EGG



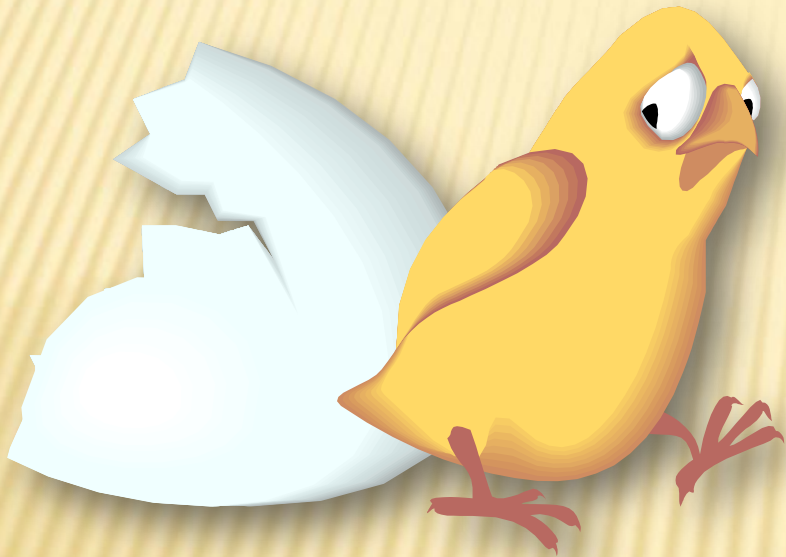
BLOOD EGG



**X**

# THE BASICS: DEVELOPMENT

## Hatching Time



- ✘ Hatching Begins on Day 21 give or take 3 days
- ✘ Impacted by Light and Temperature
- ✘ May take Several Hours for Chick to Exit Shell
- ✘ Don't help Chicks Hatch -- Struggle Necessary for Survival

# THE BASICS: DEVELOPMENT



Chicks hatching and drying in incubator.

## *And Then?*

- Chicks remain in incubator until dry and fluffy
- May take several hours to dry
- Once dry and fluffy place in **brooder**

# THE BASICS: DEVELOPMENT

## What's a brooder?

- ✘ Pen for chicks
- ✘ Absorbent bedding i.e. saw dust, newspaper, etc
- ✘ Shop light hung low to warm chicks



# ***THE BASICS: DEVELOPMENT***

## ***Why Is Proper Brooder Management So Critical?***

- ✘ All of the chicken's body systems are developing
  - + Immune system
  - + Thermoregulatory system
  - + Digestive system
  - + Feathering
  - + Eating and drinking behavior





# BROODER EXAMPLES



Lamp Type

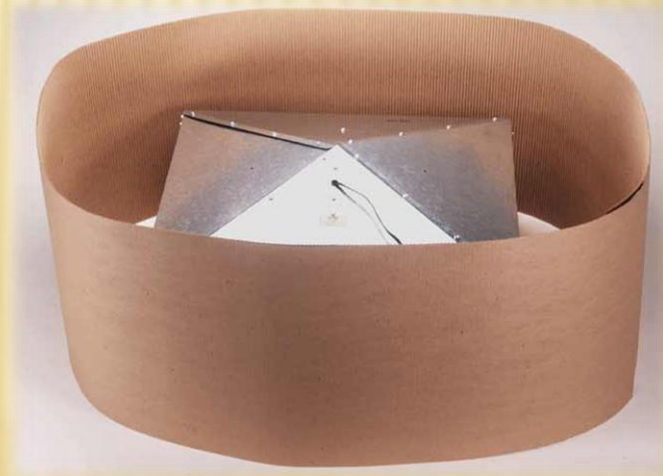
# ***BROODER EXAMPLES***



**Battery**



**Box**



**Ring**

# ***THE BASICS: DEVELOPMENT***

## ***Brooder Requirements***

- Space
  - Draft shield 12-18” high
  - ½ square foot of space per bird
- Heat Sources
  - light bulb
  - 95° F for week 1 – then decrease 5° F per week.
- Litter
  - 3 inches of clean dry litter ( *No VERY fine sawdust or cedar* )
  - Keep litter around water and feed **dry and clean**



Heat  
Source



Water  
Source



Feed  
Source

# THE BASICS: DEVELOPMENT

## Keep Brooder Clean !

- ✓ **Change out daily**
  - Bedding
  - Water
  - Food



# ***THE BASICS: DEVELOPMENT***

## ***Brooder Success Rules of Thumb***

- Water
  - ❑ 1 quart for every 25 birds (clean and fill daily)
  - ❑ For large number automatic watering systems work best
- Feeders
  - ❑ Place near heat, but not directly underneath source
  - ❑ Fresh food in front of chicks at all times
- Delivery Day
  - ❑ Brooder up and running 24 hr before chicks arrive
  - ❑ Have them sent overnight
  - ❑ Show each bird water source

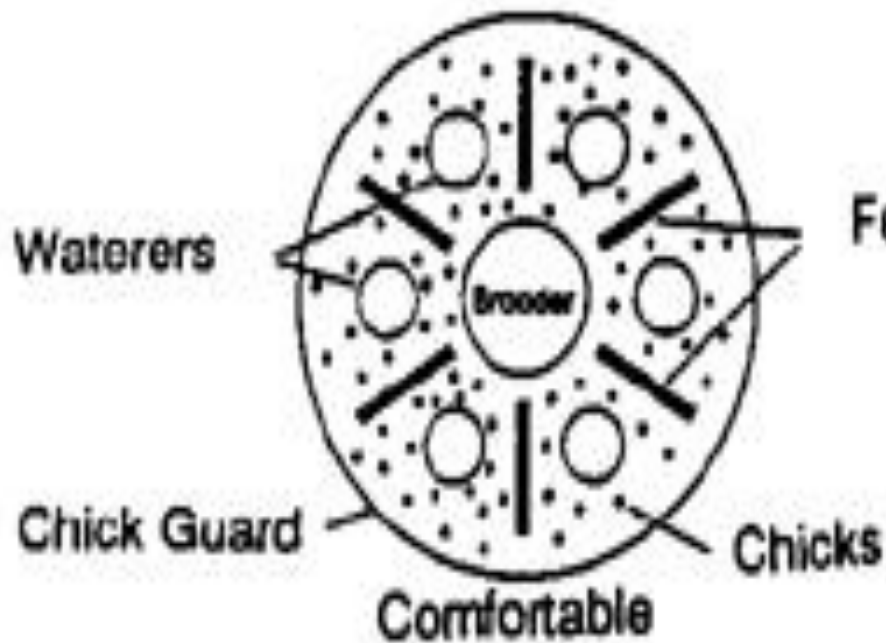


# ***BROODER MANAGEMENT***

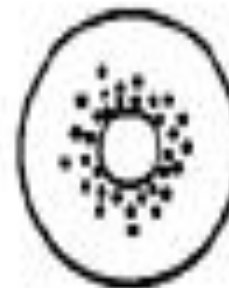


**THE CHICKS WILL TELL YOU IF THEY ARE COMFORTABLE**

Ideal Brooding Temperature and  
Equipment Arrangement



Feeders



Too Cold



Drafty

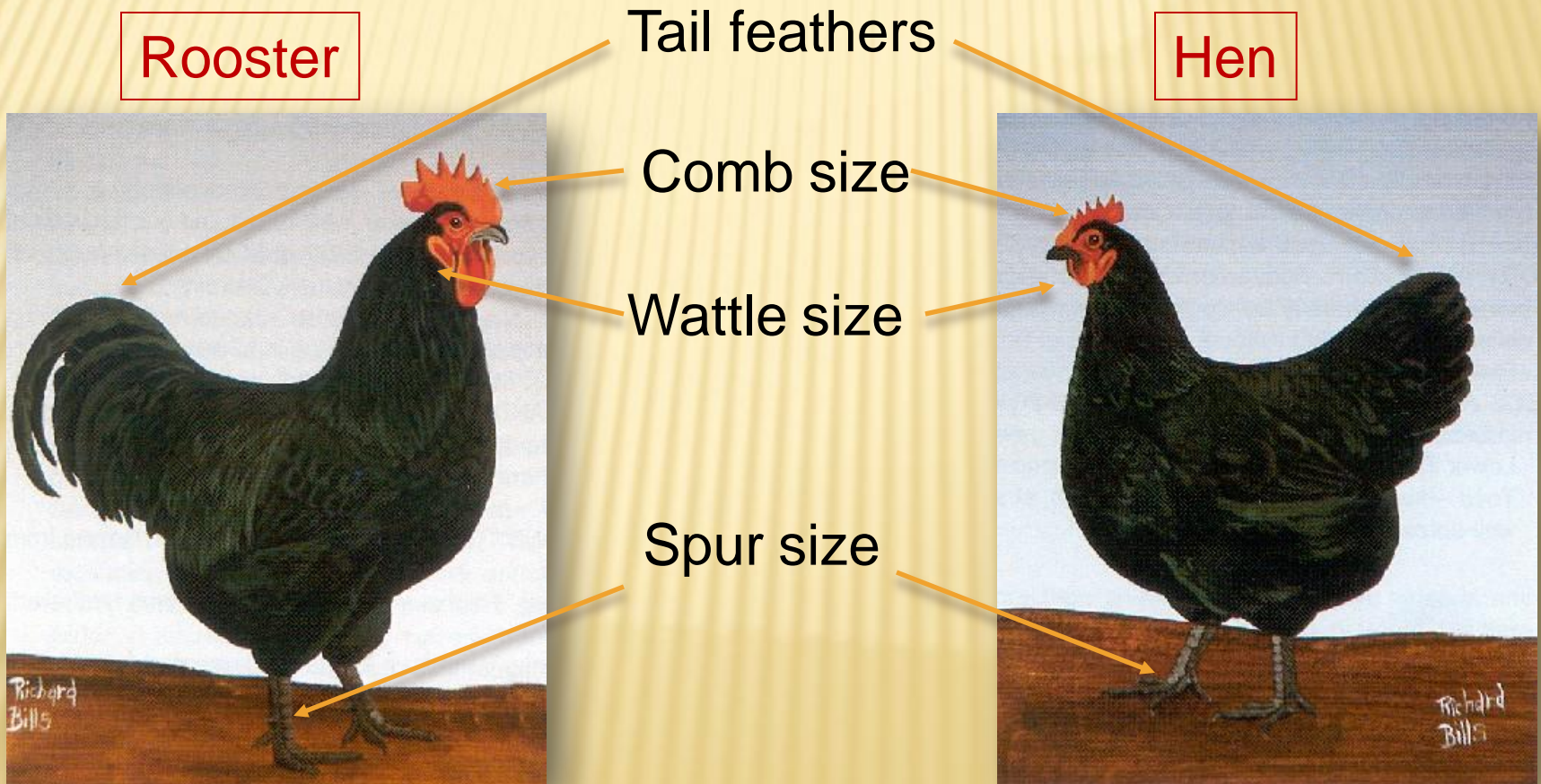


Too Hot

Brooding Units

# THE BASICS: SEXING YOUNG POULTRY

- ✦ Best way to tell is to wait till they grow up



# THE BASICS: EGG LAYING

## *Why have my hens stopped laying?*

- × **Nutrition**

- + Completely balanced diet
- + Out of feed or water

- × **Disease**

- + Vaccinate (esp. in confinement systems)

- × **Age**



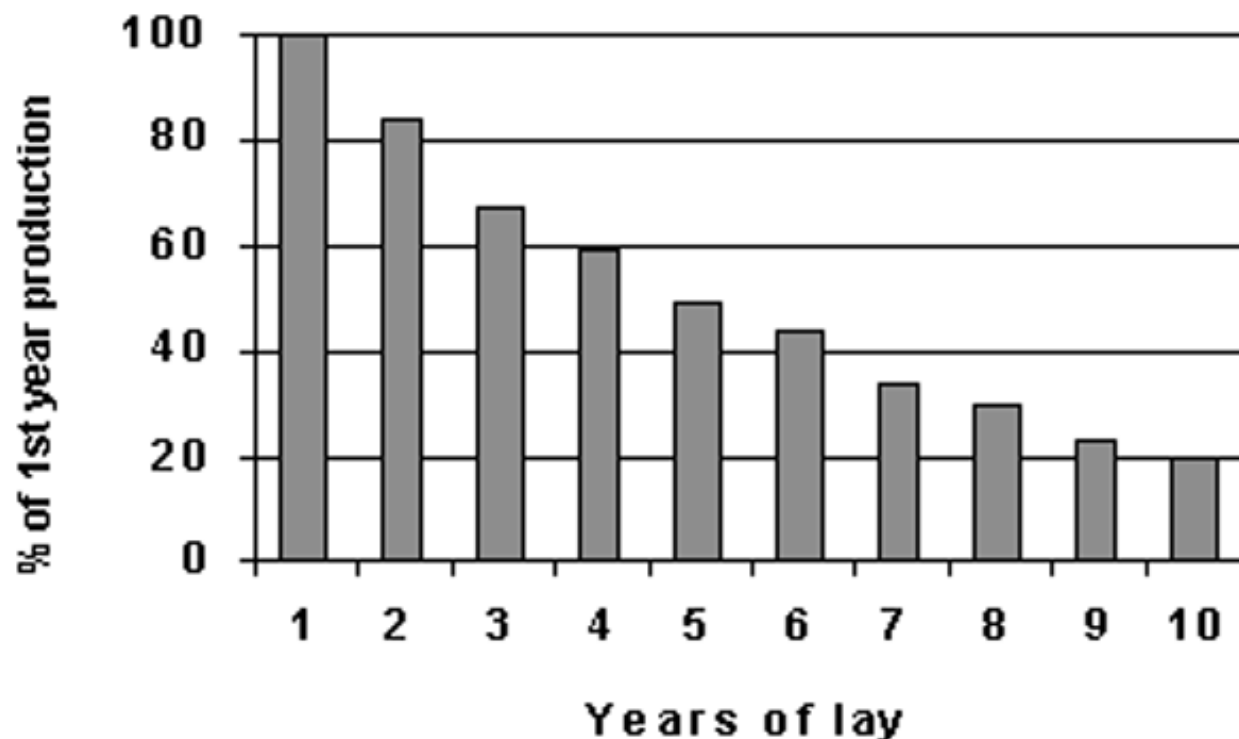
- × **Management**

- + Heat
- + Overcrowding
- + Light



# THE BASICS: EGG LAYING

## *Why have my hens stopped laying?*

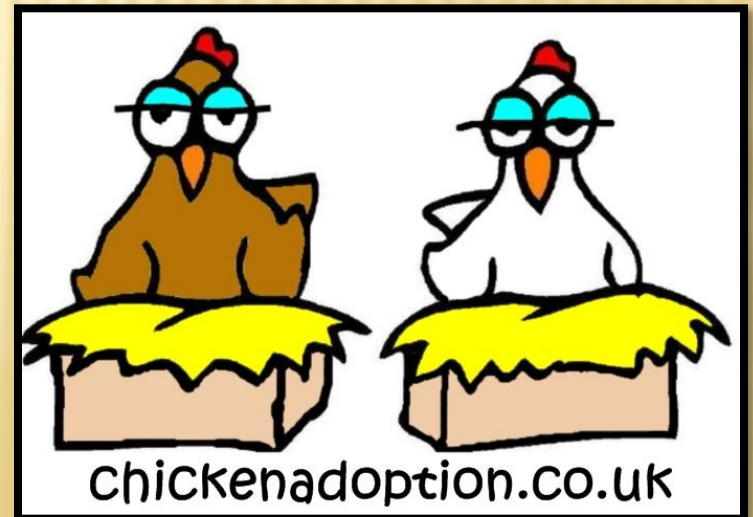


**250 eggs per year = 1<sup>st</sup> year of production**

# THE BASICS: EGG LAYING

## *Why have my hens stopped laying?*

- ✘ A layer will produce an egg every 1-2 days
- ✘ Pullets start laying when they reach 20-24 weeks
- ✘ First eggs will be small and on the floor
- ✘ Light hours (have a program)
  - + Decrease light hours for growing pullets
  - + Increase hours after they start laying with artificial lights (orange/red lights are best) to maintain 14-16 hr day



# INFORMATION RESOURCES

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- × **UF/IFAS Extension Sarasota County Office**

<http://sarasota.ifas.ufl.edu/>

- × **UF/IFAS Solutions for Your Life - Poultry**

<http://solutionsforyourlife.ufl.edu/agriculture/livestock/poultry.html>

# ONLINE RESOURCES<sup>1</sup>

- American Livestock Breeds Conservancy - <http://albc-usa.org/>
- Backyard Chickens - <http://www.backyardchickens.com/>
- Bio Pod - <http://thebiopod.com/index.html>
- Build A Chicken Coop Easy: How to Build a Chicken Coop - <http://www.buildachickencoopeasy.com/>
- 4 H Virtual Farm – Poultry - <http://www.sites.ext.vt.edu/virtualfarm/poultry/poultry.html>
- Heritage Poultry Conservancy - <http://www.heritagepoultry.org/>
- The City Chicken.com – <http://home.centurytel.net/thecitychicken/index.html>
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# ACKNOWLEDGEMENTS

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- Butcher, G. 2010. Poultry Disease Prevention and Control for Small Flock Owners. UF/IFAS.
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# ACKNOWLEDGEMENTS<sup>1</sup>

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- Wiggins, L. Chicken Embryology. 4H School Enrichment Program. UF/IFAS Taylor County Extension.
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