

Small Poultry Enterprise Management

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What does rearing a small poultry flock involve?

Physiology

Nutrition

Genetics

Health

Food Safety - HACCP

Engineering

Economics

Behavior

Management

Other . . .

SMALL POULTRY FLOCK OWNER CHECKLIST

Selecting the bird:

- ☐ Type of poultry: Layer, meat type or show (ornamental)
- ☐ Purchase disease free stock (from NPIP source, Pullorum and AI free)
- ☐ Plan for all-in - all-out flocks

Before the birds arrive:

- ☐ Draft free coop or housing, cleaned and disinfected
- ☐ Brooder stove or heat lamp (red bulb type, if needed) set to 95°F for first week.
- ☐ Dry litter, (pine shavings preferred), 3-4 inches on clean floor.
- ☐ Roosts (use clean tree branches)
- ☐ Nest boxes (if needed) 1 for every 4-5 hens
- ☐ Feeders and Waterers, cleaned and disinfected
- ☐ Fresh Feed, appropriate for age and type of bird

When the birds arrive:

- ☐ Check for symptoms such as coughing, sneezing, watery eyes, labored breathing, diarrhea, or pasty butt. Check for external parasites
- ☐ Provide water for first couple of hours, then add feed. (if birds have been shipped overnight, then make a 5% sugar water solution for first day)
- ☐ Check waters, feeders, heat source, eliminate drafts, etc.
- ☐ Wild bird and rodent proof coop, set bait stations, traps, etc., as needed.
- ☐ Biosecurity - foot dips, clean shoes or boots, limit visitors and traffic, set up a quarantine area.

General Management:

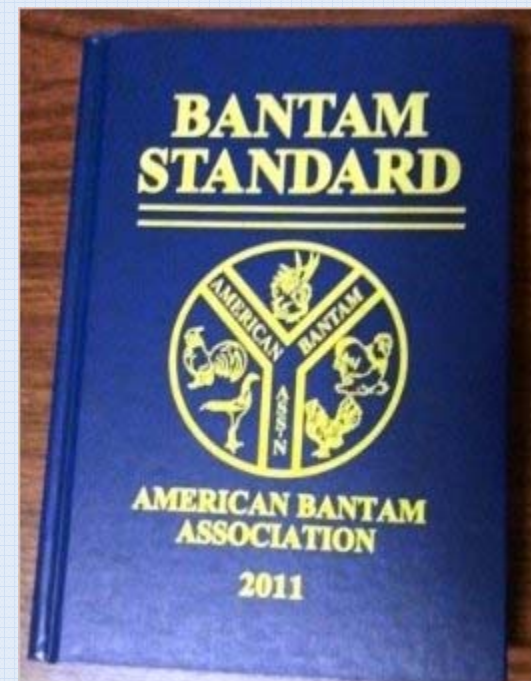
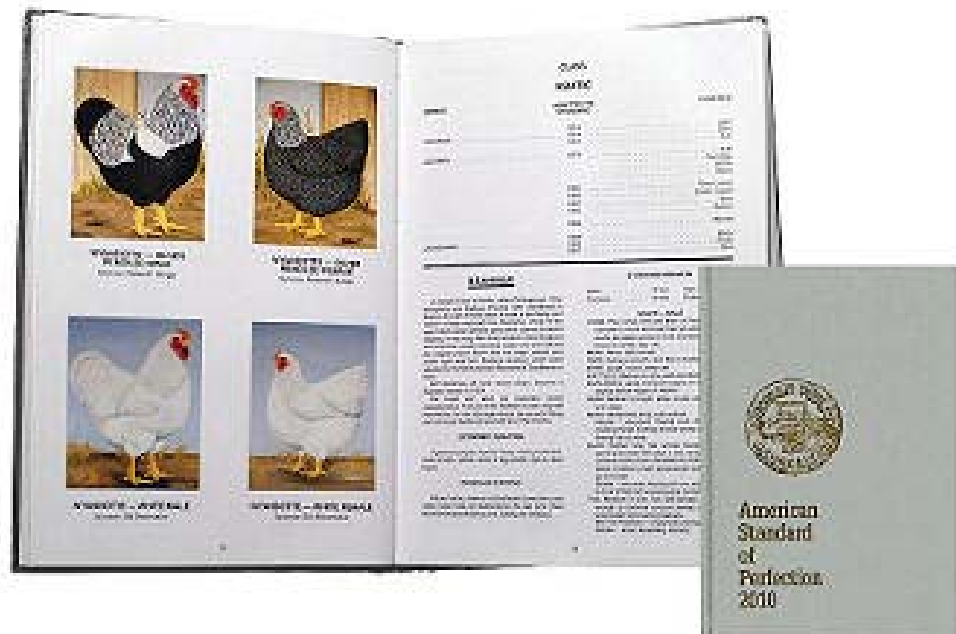
- ☐ Check birds daily for signs of disease.
- ☐ If disease is suspected get a reliable diagnosis and treat as necessary.
- ☐ Cull very sick or injured birds, use proper disposal (burn or bury deep)
- ☐ Establish a regular de-worming program
- ☐ Keep litter clean and dry, replace wet litter. Do thorough clean out every six months including disinfection.
- ☐ Proper disposal of manure such as composting.

General Biosecurity/Sanitation Program for Poultry

- Do not expose your flock to birds from other flocks.
- Buy chicks from known sources.
- Buy chicks from pullorum-clean flocks.
- Keep young chicks away from older birds.
- Burn or bury dead birds.
- Allow no contaminated equipment to be brought on your premises.
- Keep visitors away from your poultry houses or ranges.
- Keep chickens that have left the premises from getting back into the flock.
- Dispose of sick chickens.
- Should disease appear, seek authoritative advice promptly.

- Use preventative and control medications with extreme caution.
- Treat droppings as potential disease spreaders.
- Try to eliminate rats, lice, and other pests.
- Handle vaccines properly. Follow the manufacturer's directions.
- Keep different species of fowl segregated.
- Do not sell birds known to be diseased.
- Clean poultry buildings carefully and thoroughly.
- Enforce a strict program of sanitation and quarantine.

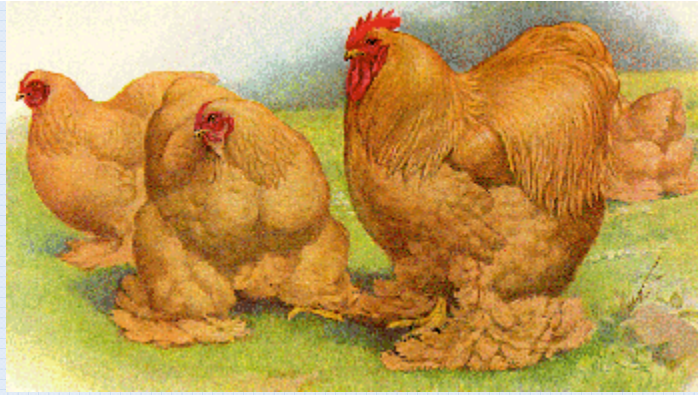
Choosing a breed



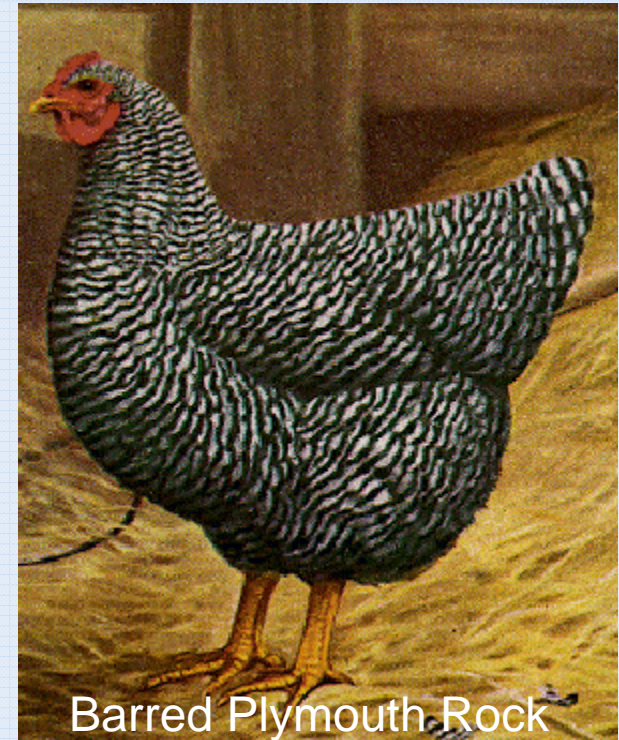
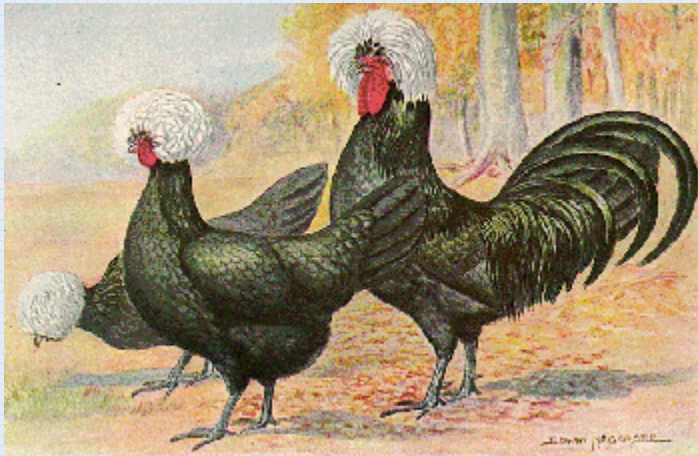
Some Examples of breeds for Pastured Laying Hens



Cochin

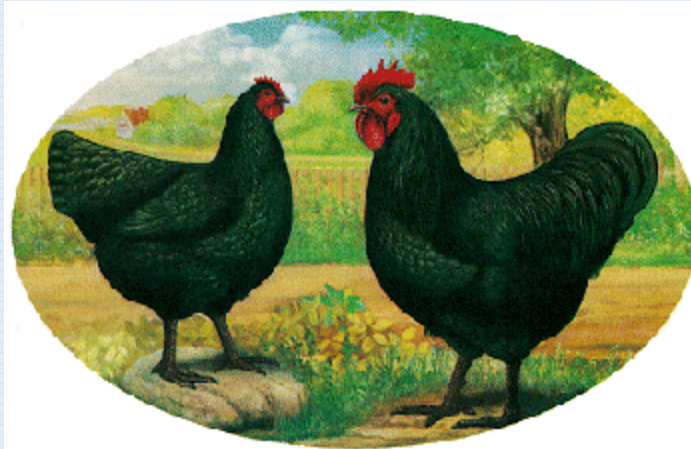


Polish



Barred Plymouth Rock

Black Australorp



Light Brahma

ARAUCAUNA



Black Australorp



Ameracauna



Partridge Wyandotte



Red Sex-linked



Buff Orpington



Rhode Island Red

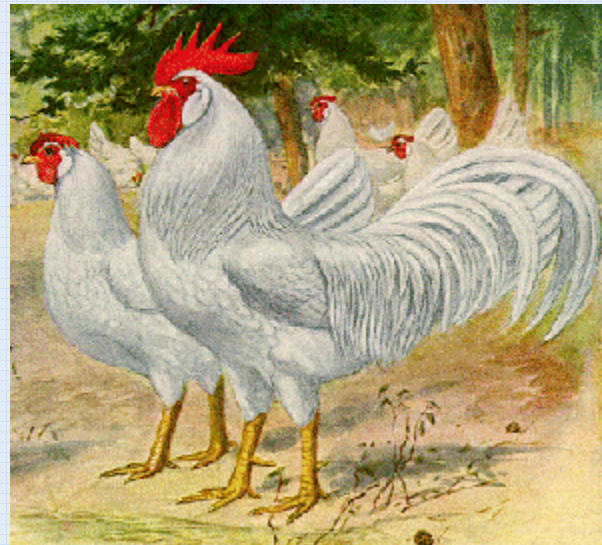


Barred Plymouth Rock



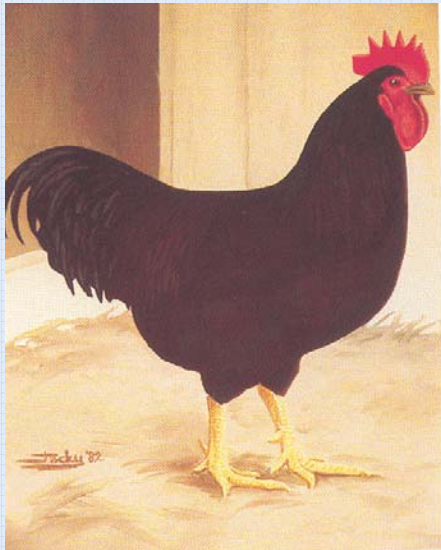
Of about 300 breeds listed in the
American Standard of Perfection -
only about 20 are of commercial importance.

For Egg Laying Birds
White Eggs - Single Comb White Leghorns



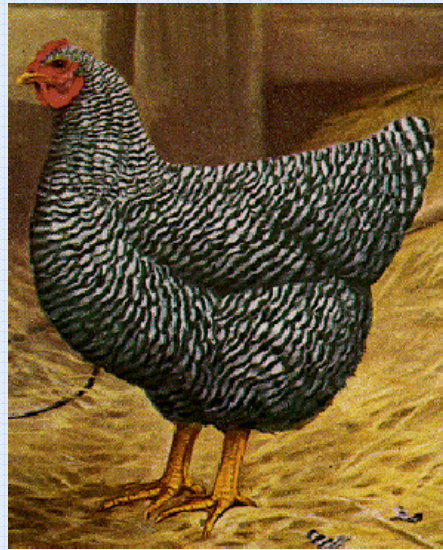
Brown Egg Layers

Usually use a Sex-Link - a cross between the Rhode Island Red male and Barred Plymouth Rock Female



Z Z
b b

X



Z W
B -

=



Z Z
B b



Z W
b -

Dark-brown-egg layers

Barnevelders, Marans, and Welsummers all lay a very dark brown, almost chocolate-colored egg.

White-egg layers

Babcock B33V*, *Hyline White**, *Hubbard White Leghorn**, and *Pearl Leghorn** are company creations and are generally strain crosses within the Leghorn breed. You can also buy pure strains of White Leghorns from many hatcheries but egg production will not equal that of the strain crosses.

Other white egg layers include California White, California Gray, Ancona, and Brown Leghorn.

Tinted-egg layers

The *Austra-White** is one of the few hatchery breed crosses laying tinted or light-brown-colored eggs.

Another popular layer of tinted eggs is the Ameraucana (sometimes called the Easter Egg chicken), which will produce eggs in shades of brown, green, and blue.

incredible!

American Egg Board



Typically, **Iowa, Ohio, Indiana, Pennsylvania & California** are the top egg producing states that represent more than half of all U.S. hens¹

Per Capita Consumption in the US is the **highest** in 5 years²

248.4

2009

258.7

2013

263.3

2014

USDA projects an increase in 2016 to **265.8 eggs** per person



The egg industry has **added nearly 15 eggs per person** in consumption over the last five years³

THE EGG BUSINESS

In 2014, the 242 million (est.) cases⁴ of **shell eggs** produced:

Retail
54.9%

Further processed
31.5%

Foodservice
9.0%

Export
4.7%



U.S. egg exports

27.4% increase in US eggs exports since 2012. 27.1% increase in value⁵



2014

353 million dozens, representing \$337 million in value

According to USDA, in 2014:
305 million shell egg hens
286 eggs per hen
223 million eggs laid per day

Specialty egg production...

Organic
3.2%

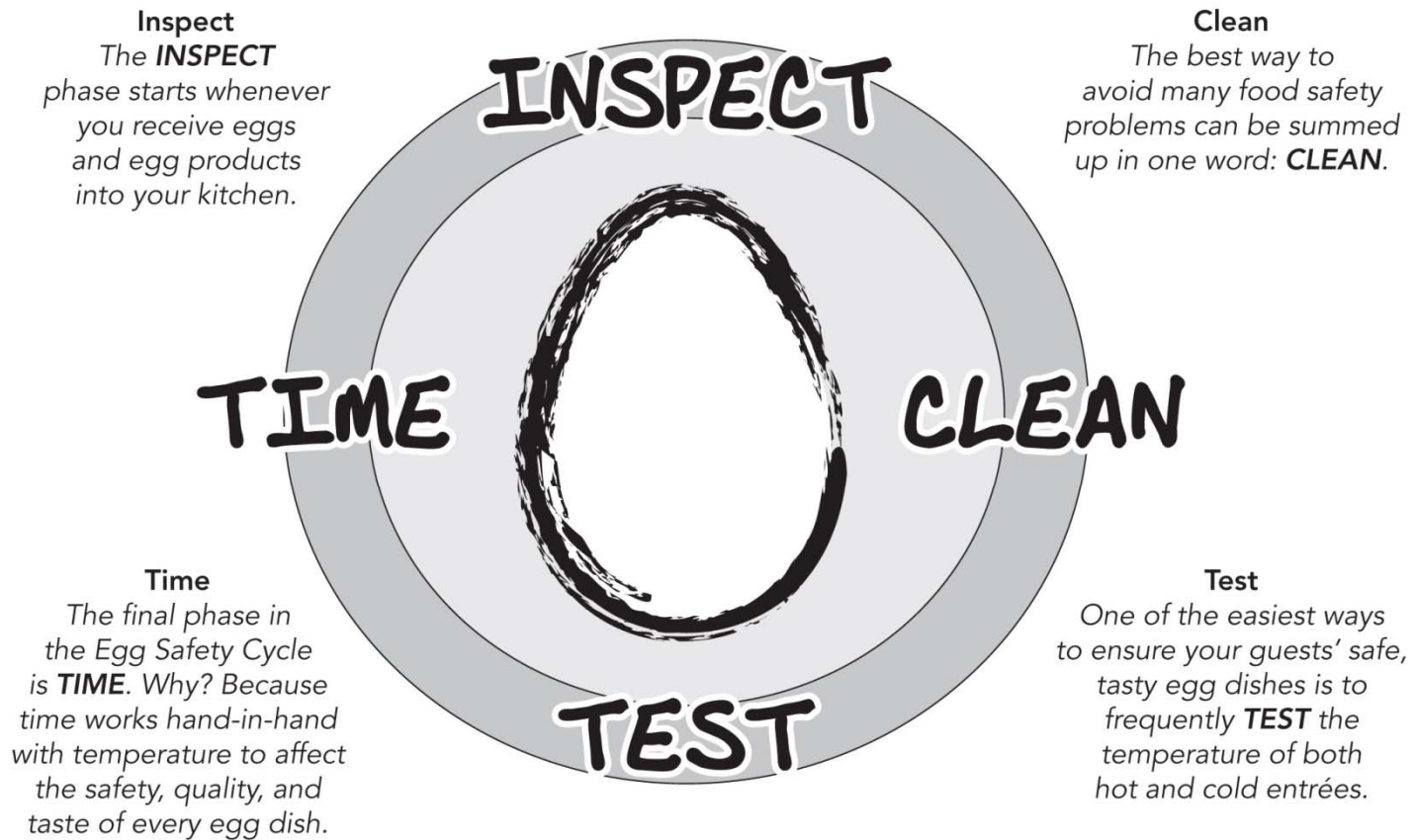
Cage-free
3.2%

... accounted for 6.3% of all egg production, as of March 2015⁶

Sources: ¹USDA's National Agricultural Statistics Service's Chicken & Eggs⁷ Report, page 9: <http://tinyurl.com/fofdebbas>.
²NAHSE - 828 - 33, produced by USDA: <http://tinyurl.com/134pennsylv> and <http://tinyurl.com/2009pennsylv>. Per Capita Consumption is a measure of total egg production, less exports, plus imports, divided by total population. It doesn't represent demand.
³USDA AMS Agricultural Analytics Division ⁴Includes shell eggs, plus processed egg products in shell egg equivalents, USDA/EEC.
⁵USDA AMS Agricultural Analytics Division ⁶Includes shell eggs, plus processed egg products in shell egg equivalents, USDA/EEC.

The Egg Safety Cycle

One memorable way to think about egg safety is as an ongoing cycle consisting of four key parts.



Safe Egg Handling

For large numbers of eggs

1. Wash eggs with water at least 20 °F (11.1 °C) warmer than the internal temperature of the eggs and at a minimum of 90 °F (32.2 °C).
2. Select a detergent or detergent sanitizer that is compatible with the wash water and one that will not give off foreign odors that may be imparted to the egg.
3. Use only potable water with an iron content of less than 2 parts per million (p/m) for washing and keep wash water as clean as possible.
4. Rinse by spraying with water slightly warmer than the wash water.
5. Use an approved sanitizer in the spray rinse. The strength of the sanitizing spray should be no less than 50 ppm nor more than 200 ppm of available chlorine or its equivalent.
6. Dry the eggs to remove any excess moisture prior to packaging.
7. Store eggs large end up at a temp of < 45°F

For small numbers of eggs you can use disinfecting wipes.



Try to find unscented if you can

Choosing Meat Breeds



Unlike with layers, there are limited options...

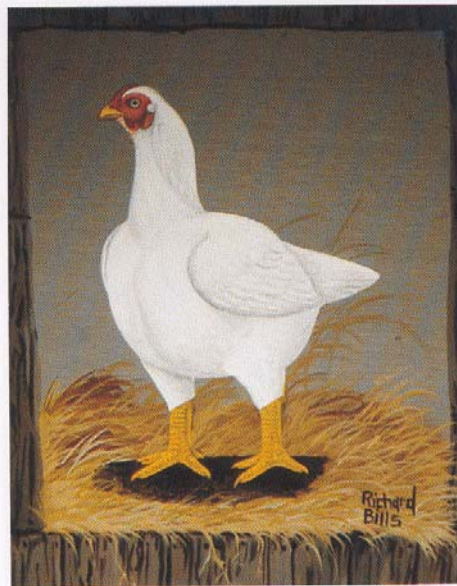
- Cornish X
- Other hybrid varieties (Barred Silvers.etc)
- Dual purpose varieties (Bufs, Barred Rocks)

Meat type birds:

Usually a cross between White Cornish and White Rock
With a few other breeds thrown in for egg production
and other factors.



X



CORNISH — WHITE FEMALE

=

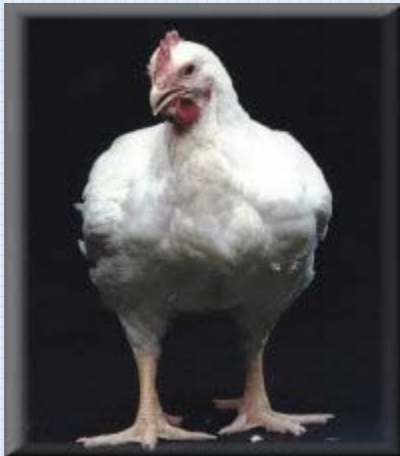




*Baby Chicks
Broilers
Egg Layers
Pullets*

266 E. Paletown Rd. Quakertown, PA. 18951
Phone: 215-536-3155 • Fax: 215-536-8034

Office hours:
Mon - Fri 8am-5pm



Moyer's Broiler/Roaster chicks (sometimes nicknamed Cornish Giants) can be grown to a live weight of over 4 lbs. by 6 weeks of age Or, to a roaster weight of 8-10 lbs. Live weights of 4-5 lbs. can be achieved on close to 2 lbs. of feed per pound of meat. They have excellent conformation, plump, tender breast meat and good skin texture.



Moyer's K-22 Red Broilers (Cockerels Only) is a hearty meat bird that has resistant genetics providing good textured, flavorful meat for the discriminating consumer. They are perfect for the pastured poultry producer. The K-22 is a slower growing bird than the cornish giant with the males growing to a live weight of 5 pounds at around 8 weeks.



Cornish Cross Broilers (fast growth).

Cornish Cross (also called Cornish Rock) is an extremely fast growing chicken that is processed between six and eight weeks.



Colored Feathered Birds – becoming more popular

Freedom ranger

J.M. Hatchery

178 Lowry Road, New Holland, PA 17557

(717)336-4878

Red Broilers:

The *Label Rouge (France)* birds grow to 2.25 kg in 12 weeks, while the *fast-growing broilers* (Cornish cross) reach the same weight in 6 weeks. The carcass is generally more elongated and has a smaller breast and larger legs than conventional carcasses. In addition, slower-growing breeds are more suitable to outdoor production than fast-growing broilers.



Kosher King (Silver Cross)

Myers Poultry Farm
966 Ragers Hill Road
South Fork, PA 15956
USA

(814) 539-7026

MyersPF@juno.com

www.myerspoultry.com



Developed for markets desiring a heavier meat yielding colored bird with stamina. Very popular with ethnic markets & growers for color & tasty meat qualities. Feathering resembles a Barred Rock, large body size yellow feet

Basic Needs

Fresh Feed

Fresh Water

Fresh Air

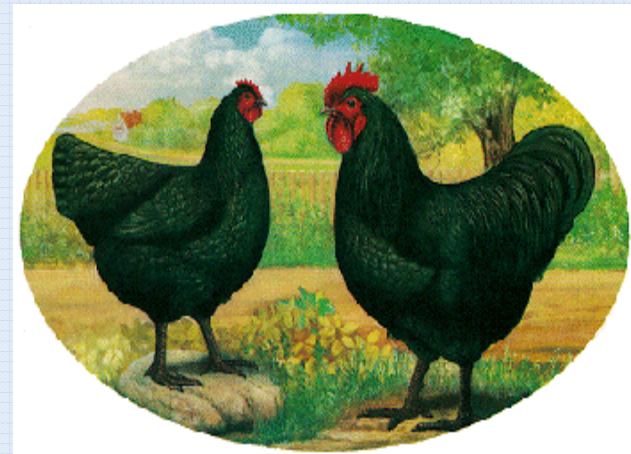
Light

Darkness

Thermal Environment

Protection

Space







BriteTap Chicken Waterer

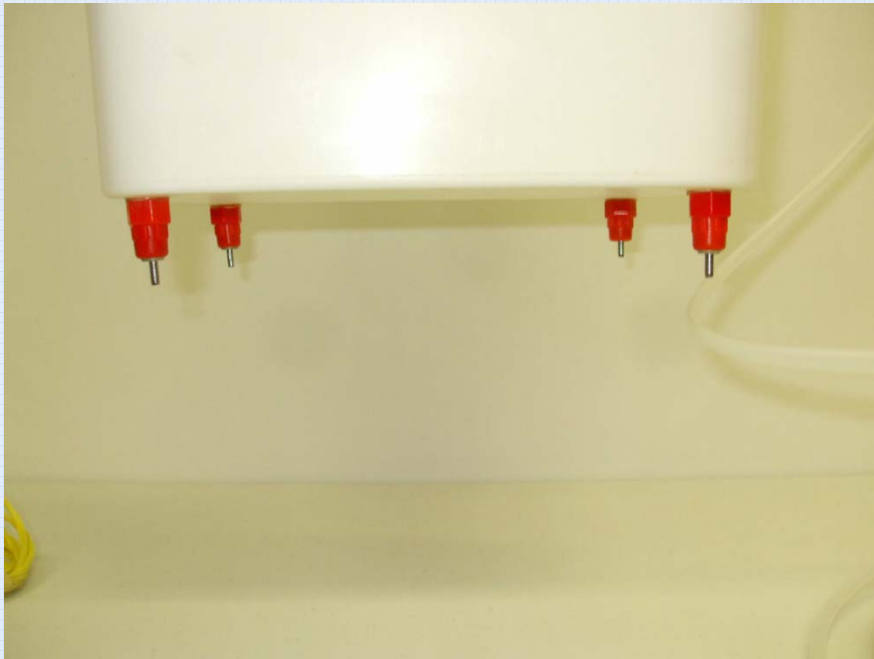


Photo credit: Alexandra Kent

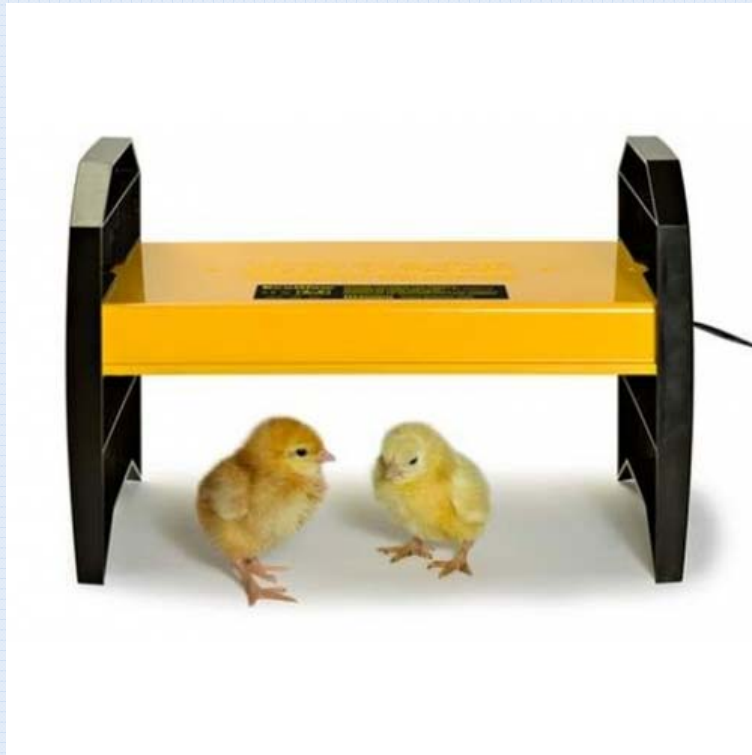
<http://www.chickenwaterer.com/BriteTap-Chicken-Poultry-Waterer-p/bt100.htm>



Cornell University







<https://www.brinsea.com/p-390-chicken-brooder-enclosure.aspx>

H O U S I N G

Protection

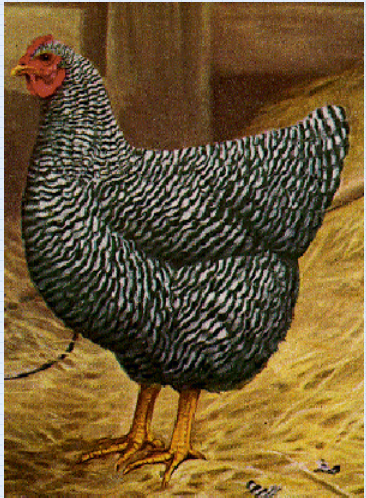
elements
predators



Dry and Draft Free

flexible

H O U S I N G



Housing For Pasture Birds





Old hay wagon trailer, second-hand nest boxes



Roosts of small diameter (1 1/2 inch) tree branches or closet poles work well



Hens concentrate
around feeders and
waterers



Wire mesh ramp, sloped
corrugated metal roof



Not a good idea!
Rain water off roof
contains all the
contaminates on the
roof in what I call
“Poop Soup”

Chicken Tractor?



Do I Look
Like John
Deere?

































Backyardchickens.com



Minimum Space Requirements

Type of Bird	Sq ft/bird inside	Sq ft/bird outside runs
Bantam Chickens	1	4
Laying Hens	1.5	8
Large Chickens	2	10
Quail	1	4
Pheasant	5	25
Ducks	3	15
Geese	6	18

Bottom Line:

Keep birds in a DRY and DRAFT FREE
Environment!!

Feeding your birds

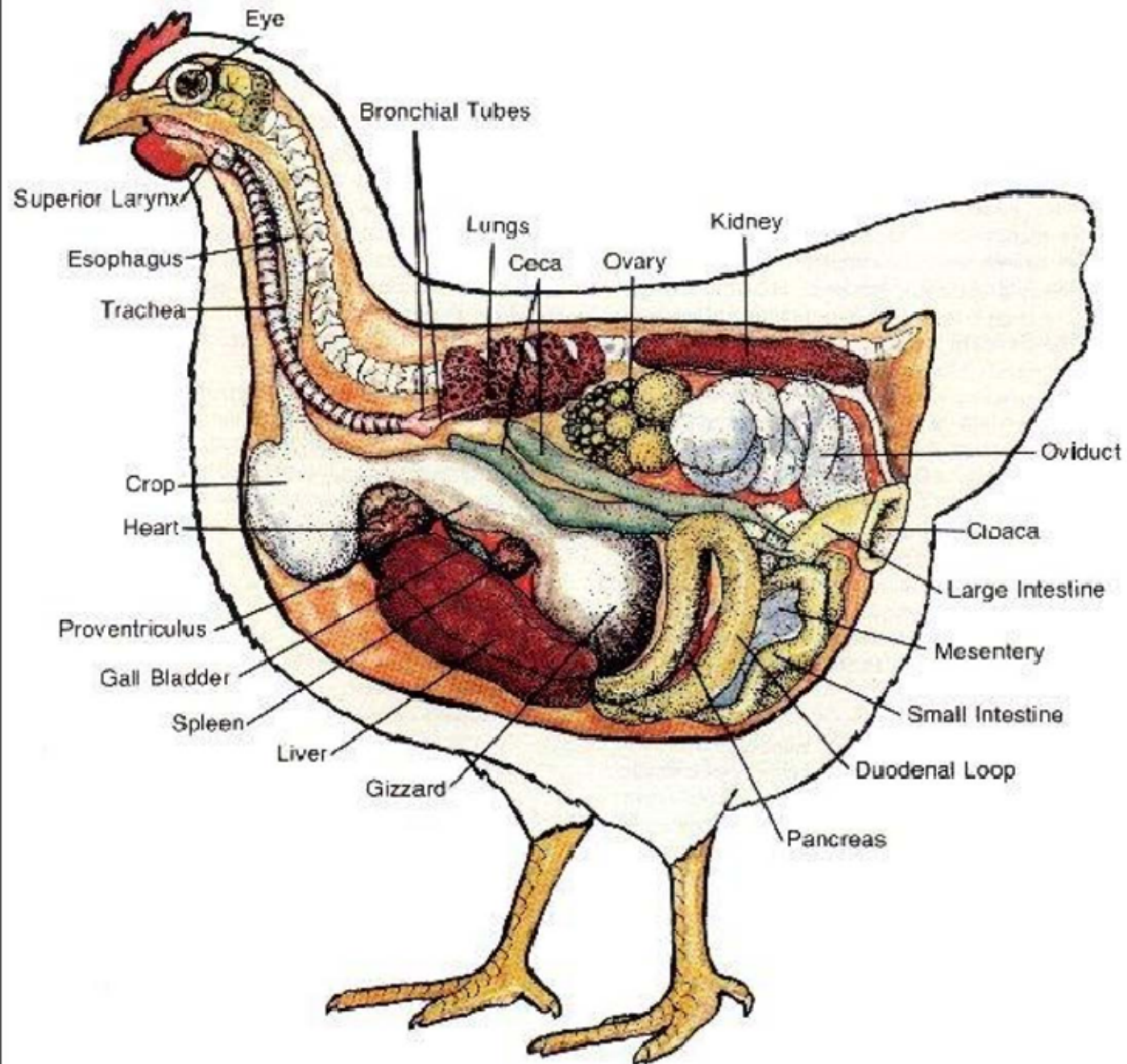
It is the most practical for small flock owners to purchase ***bagged*** feed from your local feed supply store.

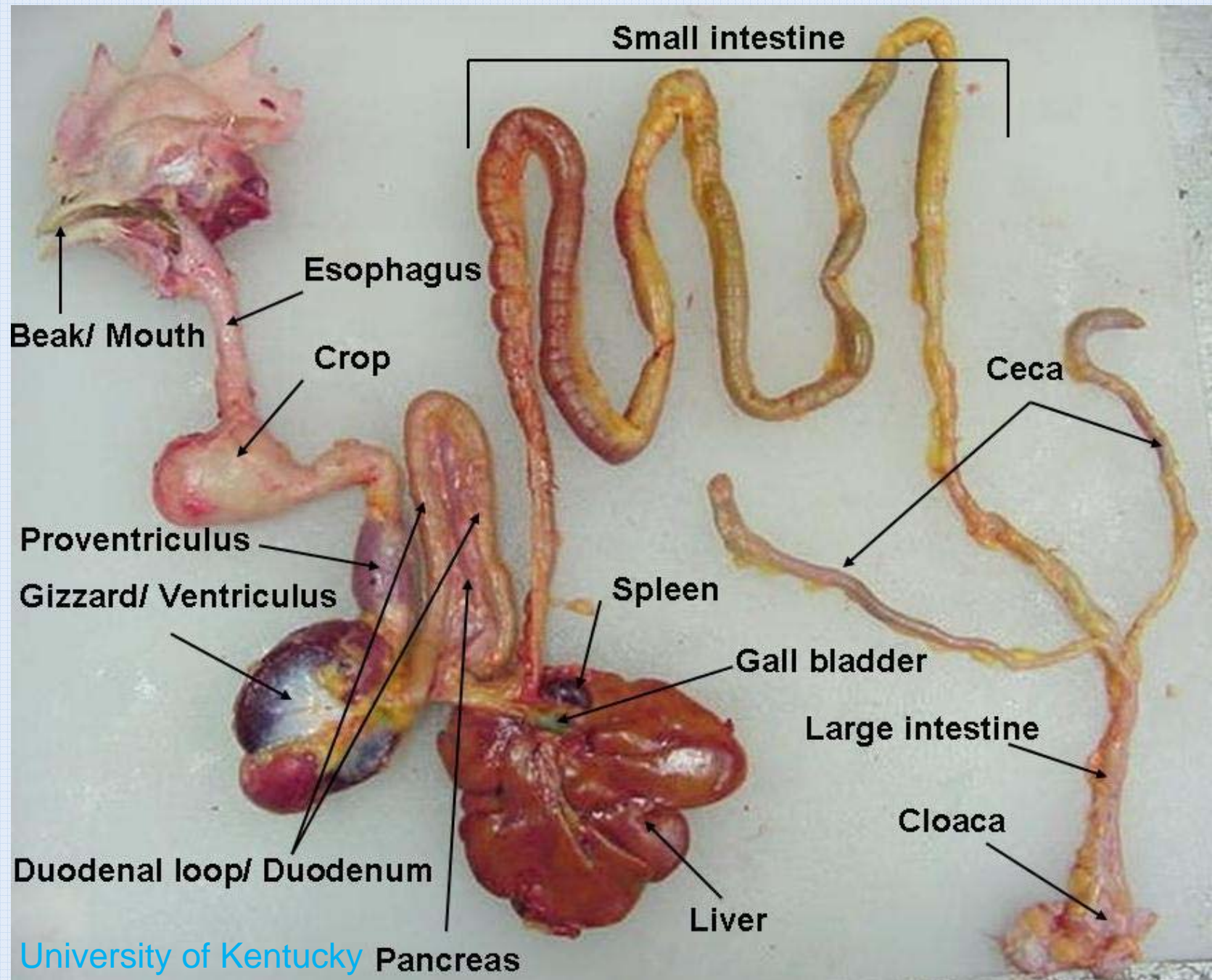
In general use the following guides:

Layers: Medicated 20-21% CP Starter feed – 6-8 weeks
16-18% CP grower feed till first egg
14-16% CP layer feed during lay.

Broilers: 22-24% CP Starter feed (medicated if they have
it.) 3-4 weeks
20 % CP Grower or Grower Finisher from 5 weeks
till processing.

Figure 1. Model showing the internal organs of the female chicken





Health Risks

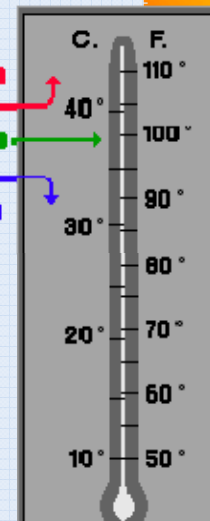


Factors

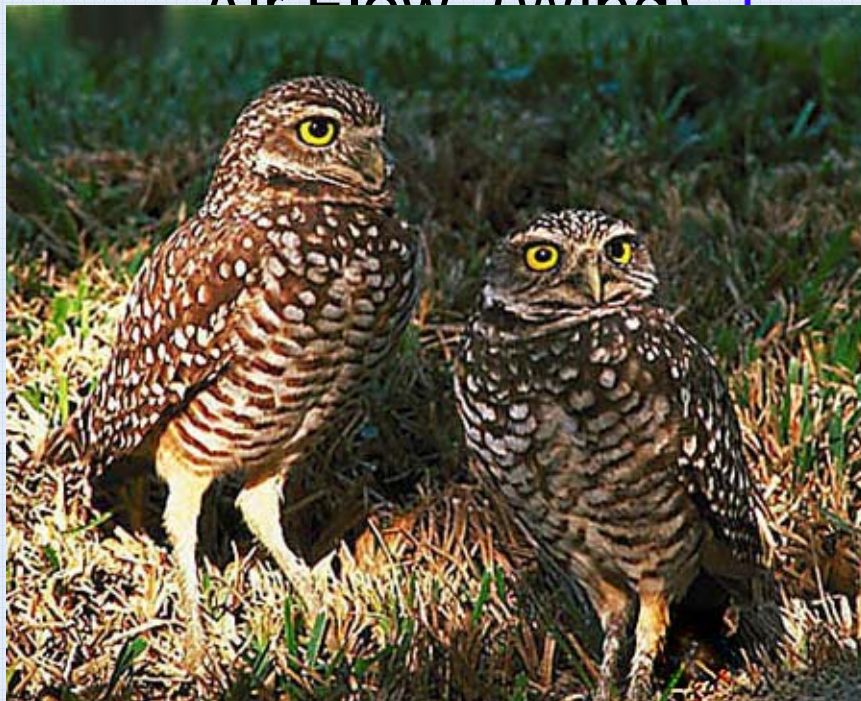
hyperthermia

normal range

hypothermia



Air Flow (Wind)



Basic Poultry Health

1. Salmonella pullorum free, from hatchery (NPIP)
2. Marek's disease – in-ovo or just after hatch
3. Avian Influenza (AI) free
4. Coccivac?
5. Most other vaccines you must boost, so not for backyard flocks.

Health Problems may arise due to many different factors, including:

- *Nutritional*
- *Metabolic*
- *Genetic, hereditary*
- *Congenital*
- *Degenerative*
- *Toxicity*
- *Non-specific (management)*
- *Neoplastic (cancers)*
- *Infectious agents*

What are the “common” health concerns for laying hens?

1. Neoplastic Diseases
 - a. Marek’s Disease (herpes virus, cancer like)
 - b. Lymphoid Leucosis (retro virus)
2. Respiratory Diseases
 - a. Chronic Respiratory Disease (CRD) (Mg and *E.coli* involved)
 - b. Coryza (Viral ,*H. paragallinarum*)
 - c. Aspergillosis (*Aspergillus fumigatus*) Fungal Pneumonia
 - d. Newcastle Disease (ND) (viral)
 - e. Infectious Bronchitis (IB) (corona virus)
 - f. Infectious Laryngotracheitis (ILT) (herpes group virus)
 - g. Avian Influenza (myxovirus)
3. Other Viral Diseases
 - a. Fowl Pox
 - b. Avian Encephalomyelitis (AE), Epidemic Tremor)
 - c. Infectious Bursal Disease (IBD, Gumboro Disease)
4. Other Bacterial Diseases
 - a. Infectious Synovitis (*Mycoplasma synoviae* (Ms))
 - b. Fowl Cholera (Pasteurellosis, *P. multocida*
 - c. Pullorum (*Salmonella pullorum*)
 - d. Fowl Typhoid (*Salmonella gallinarum*)

5. Parasitic Diseases

a. Protozoan

- i) Coccidiosis
- ii) Blackhead (*Histomonas meleagridis*, from *Heterakis gallinarum* cecal worm)

b. Endoparasites

- i) Worms
 - 1. Roundworms (Ascarids)
 - 2. Hairworms (Capillaria)
 - 3. Cecal Worms (Heterakis)
 - 4. Tapeworms

c. Ectoparasites

- i) Lice
 - 1. Chicken body louse (*Menacanthus stramineus*)
 - 2. Shaft or Feather louse (*menapon gallinae*)
- ii) Mites
 - 1. Chicken mite (red poultrymite, *Dermanyssus gallinae*)
 - 2. Northern fowl mite (*Ornithonyssus sylviarum*)
 - 3. Scaly leg mite (*Knemidocoptes mutans*)

Disease Risks

Internal Parasites

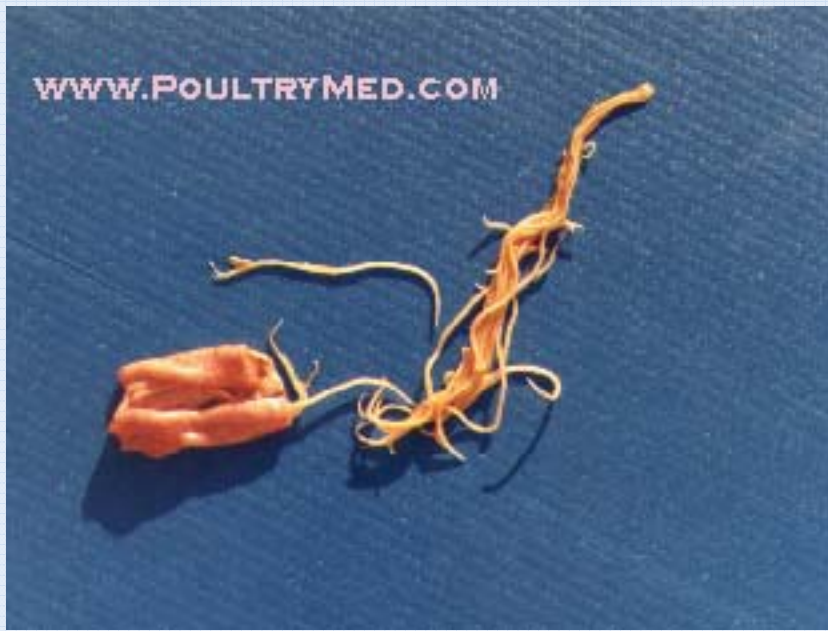
Nematodes - earthworm, cockroach, grasshoppers, possibly ducks and geese.

Cestodes (tapeworms) - earthworms, ants, beetles, grasshopper.

Trematodes (flukes) - snails (from ponds), dragonfly larvae.

Coccidiosis – (protozoa) wet soil or litter, outside conditions.

Roundworms



ROUNDWORMS

1. Very common. *Ascaridi galli* is most common.
2. Live in central portions of small intestine
3. Symptoms: droopiness, emaciation and diarrhea.
4. Prevention: Adequate levels of vitamin A and B- complex in diet. Sanitize
5. **Treatment:** Piperazine 17, (Wazine 17) 1.5-2 oz /gal of water for 12-24 hrs then repeat 14-21 days later.
do this in spring and fall and as necessary.
6. Hygromycin B – feed additive VFD controlled

External Parasites of Poultry:

Lice, Mites, Ticks and Chiggers.

Northern Fowl Mite

Chicken Mite

Depluming Mite (feather mite)

The most effective treatment for all mite species is a regular inspection and spraying program of both the birds and their premises. An appropriate solution of permethrin, or spinosad when sprayed on the birds, will eliminate all mites that infest the bird. The spraying of all facilities will ensure that any mites hiding in cracks and crevices will be destroyed. The treatment should be repeated on a one to two month schedule or whenever populations of the mites are detected.

<http://pest.ca.uky.edu/EXT/Recs/ENT28-Poultry.pdf>

Scaly Leg Mites



Scaly Leg Mites

For cases of scaly leg mites, I recommend dipping the legs in gasoline for about 45 seconds, then air dry and apply A&D ointment. On the second day just apply the A&D ointment and then do a second gasoline dip on the third day. Keep applying the A&D till the scales appear normal.

Catch this early for best results.



Northern Fowl Mite

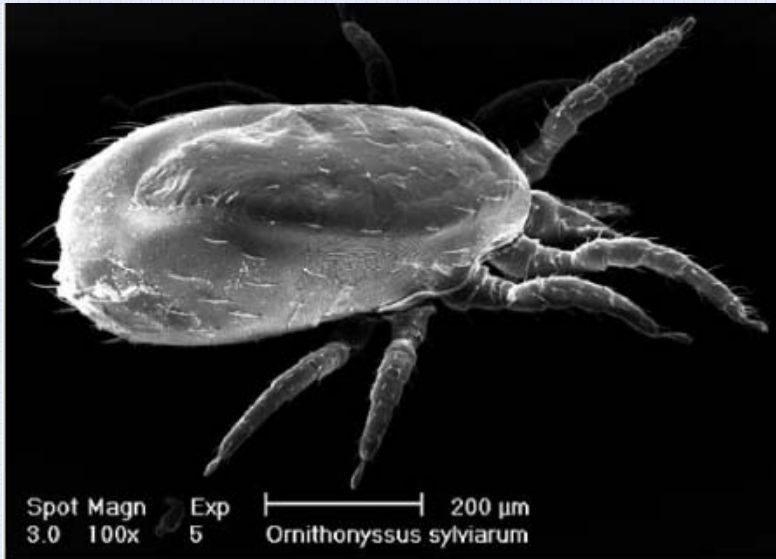


Figure 3. Scanning electron micrograph (SEM) of a northern fowl mite. The scale shows this unfed mite to be slightly less than 1 mm long. Photo by Jeb Owen, UC Riverside.



Figure 4. Northern fowl mites feeding on poultry. Photo by Brad Mullens, UC Riverside.

Treat external parasites
with Sevin (Carbaryl)
or pyrethrin or permethrin
or Spinosad

Chicken Louse →



Chicken Mite



Feeds at night, jumps off Bird during the day. Use pesticide sprays in the chicken coop, both on the bedding and the building structure. These sprays kill any of the chicken mites that are hiding within the coop.





Depluming Feather Mites



Treat external parasites
with Sevin (Carbaryl)
or pyrethrin or permethrin

Other problems

- a. Bumble foot
- b. Cannibalism
- c. Egg Bound
- d. Prolapse
- e. Internal layer
- f. Molting



www.backyardchickens.com

Why Lights for Chickens

1. to facilitate sight,
2. to stimulate internal cycles due to day-length changes, and
3. to initiate hormone release

DURATION

Meat Birds

Day 1 - 3 use 20-23 hrs

Day 4 - Processing
use 18 - 20 hrs

DURATION

Laying Hens

Day 1 - 3 use 20-23 hrs

Day 4 - 13 weeks
use 8 - 10 hrs

Production 16 hrs

DURATION

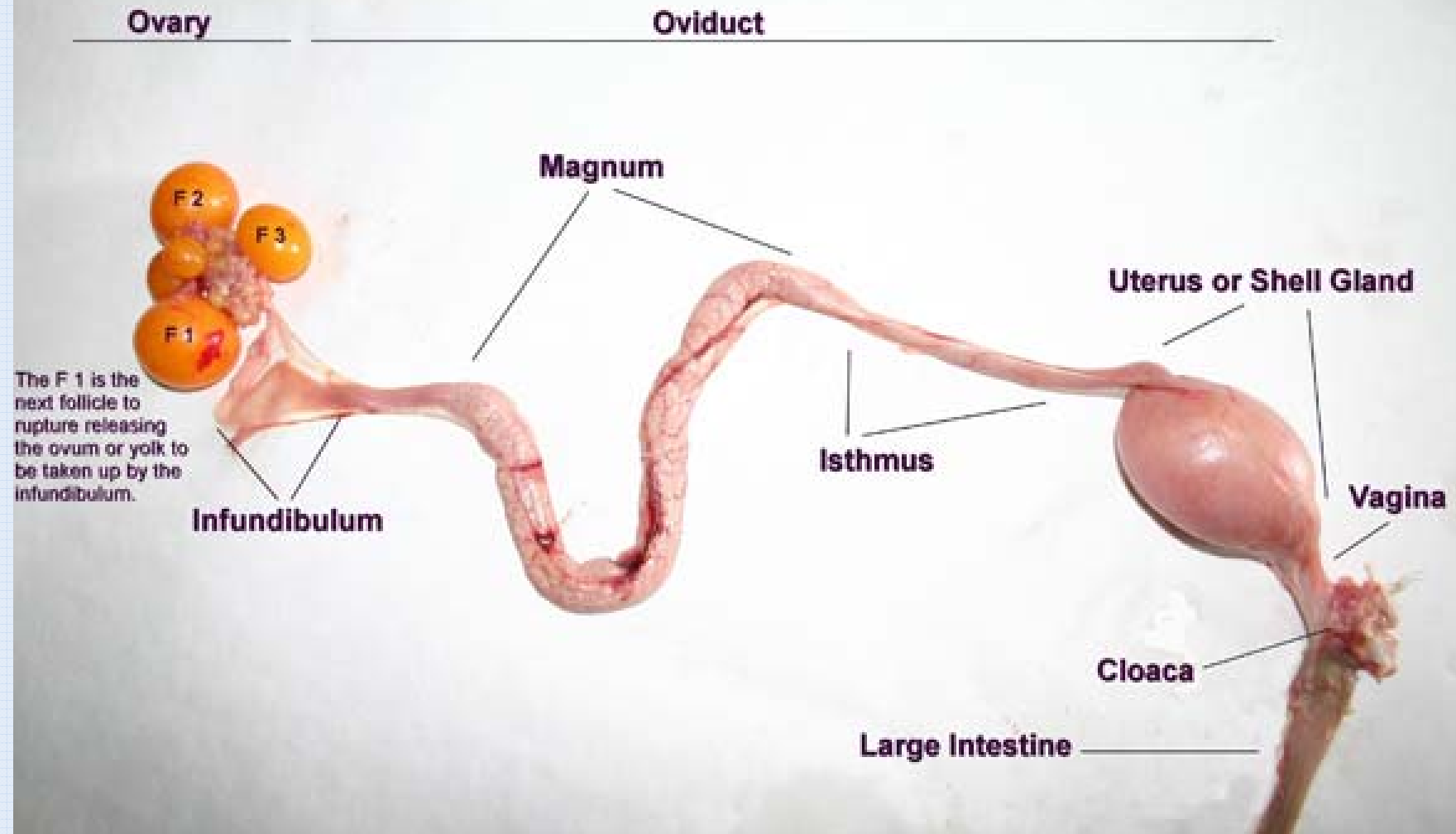
1. **NEVER INCREASE** the duration or intensity of light during the growing period.
2. **NEVER DECREASE** the duration or intensity of light during the production period.

Reproduction and Culling your birds

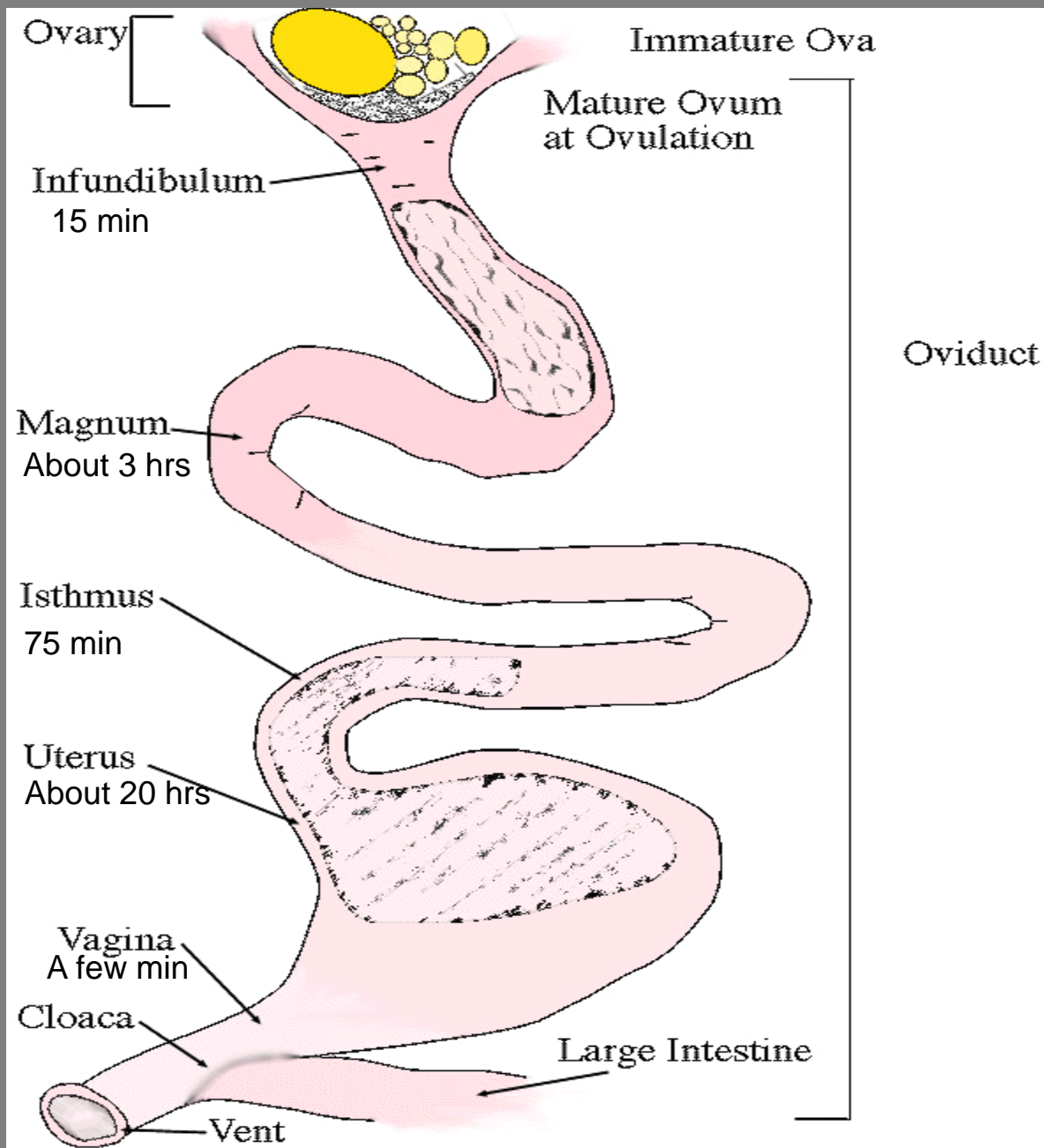




Reproductive Tract of the Laying Hen



<http://explainagainplease.blogspot.com/2013/04/breeding-and-growth-of-chickens.html>

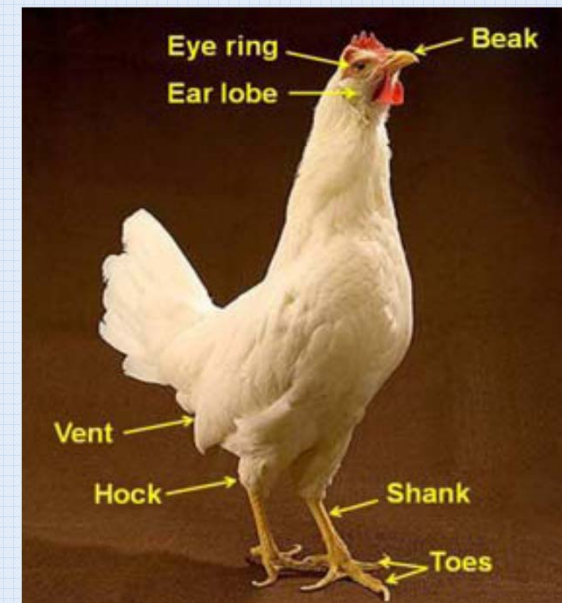


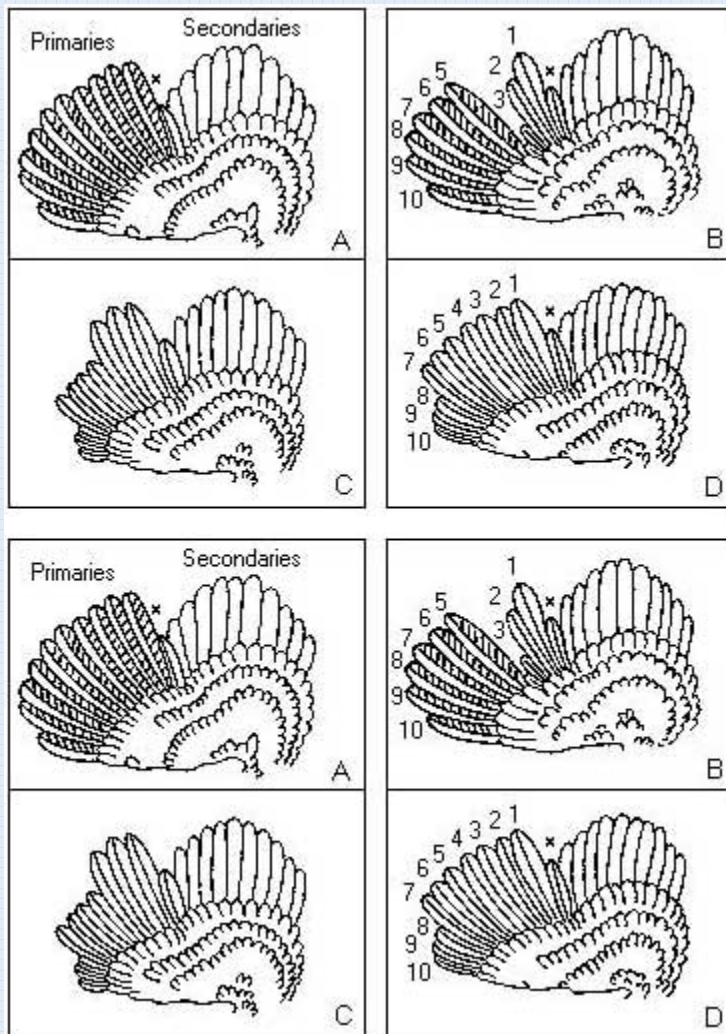
Characteristics for culling layers:

<u>Character</u>	<u>Layer</u>	<u>Non-Layer</u>
Comb & Wattles	Large, bright red, glossy	Small, dull, shriveled
Head	Neat, refined	Beefy, weak
Eye	Bright, prominent	Dull, sunken
Eye ring	Bleached	Yellow tinted
Beak	Bleached	Yellow
Abdomen	Deep, soft, pliable	Shallow, tough, tight
Pubic bones	Flexible, wide apart	Stiff, close together
Vent	Large, moist, bleached	Small, dry, puckered, yellow

Order of bleaching for layers, color returns in order it left.

<u>Body Part</u>	<u>Time After First Egg</u>
Vent	4-7 days
Eye Ring	7-10 days
Ear Lobes (white leghorn)	14-21 days
Base of Beak	4-6 weeks
Tip of Beak	6-8 weeks
Bottom of Feet	8-10 weeks
Front of Shanks	15-18 weeks
Rear of Shanks	20-24 weeks
Hock Joint	about 24 weeks





Estimating Duration of Molt

The time a bird has been molting can be determined by examination of the large primary wing feathers. Length of molt can be estimated by allowing six weeks for the first mature group of primaries and two weeks for each additional feather or group of feathers. If the primary feathers are not fully grown, the time of molt can be estimated based on the feathers' present stage of growth.

A primary feather reaches half its full length after two weeks, two-thirds its growth after three weeks, and completes its growth six weeks after the old primary is lost. The growth rate of the replacement feathers is the same for both early and late molting hens.

Often pullets undergo a partial molt, involving the neck and tail feathers. This condition can usually be eliminated by purchasing pullets hatched in April or later in each year and by following proper management practices. The length and incidence of a molt are influenced considerably by the bird's body weight, physical condition and environmental conditions such as nutrition and management.



The.... ! Well you know!!