



Small Poultry Enterprise Management

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**Updated – 2022 by Michael Pennington-Martel
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UConn Poultry Extension Resources

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poultry.newengland@maine.edu

Small Flock Information

- [Cleaning and Disinfecting Your Poultry House .pdf](#)
- [Common Clinical Conditions .pdf](#)
- [Penn State Poultry Extension Resource Page](#) [↗](#)
- [Poultry Diseases & Medications For Small Flocks .pdf](#)
- [Poultry Ventilation and Housing](#) [↗](#)
- [Salmonella .pdf](#)
- [Small Flocks Management .pdf](#)
- [Small Scale Egg Handling .pdf](#)
- [Small Scale Poultry Processing .pdf](#) [↗](#)



<https://animalscience.cahnr.uconn.edu/uconn-poultry-extension-resources/>



What does rearing a small poultry flock involve?

Physiology

Nutrition

Genetics

Health

Food Safety - HACCP

Engineering

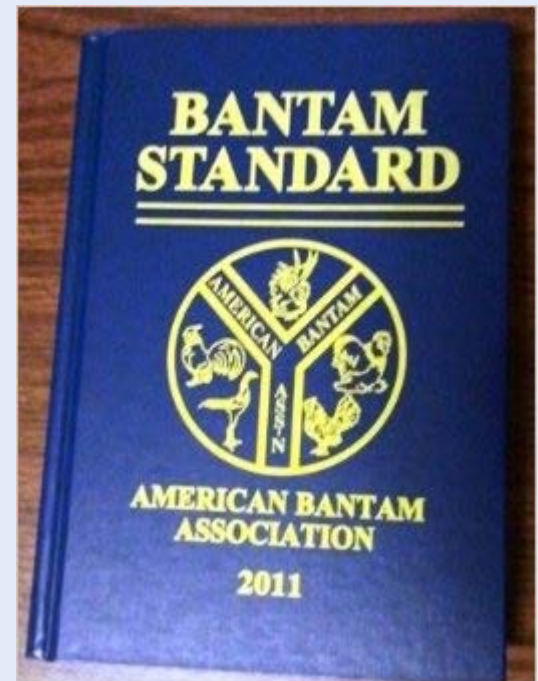
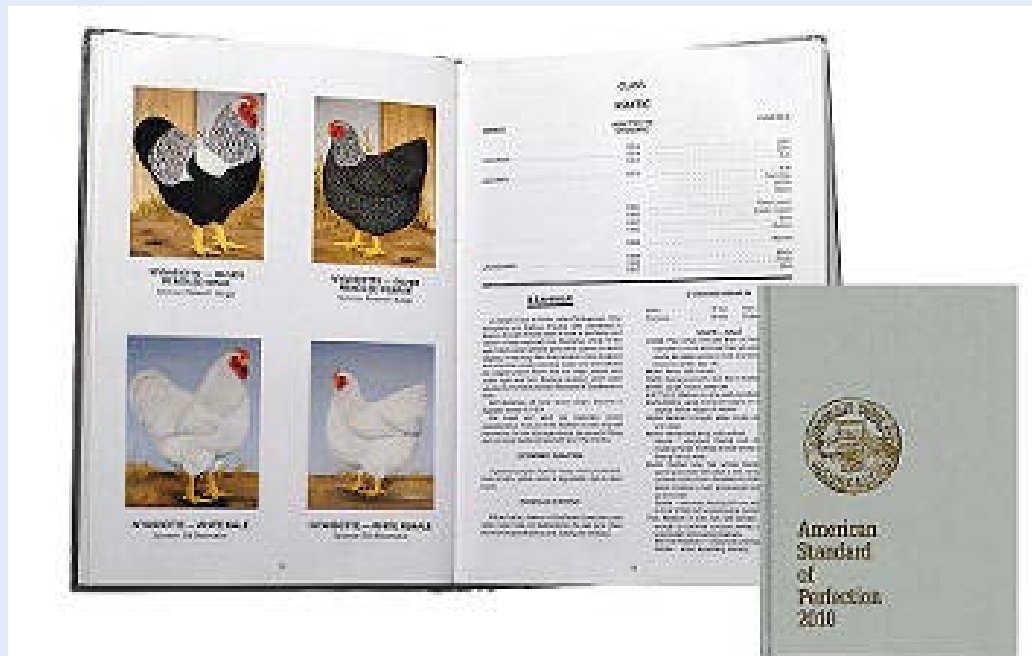
Economics

Behavior

Management

Other . . .

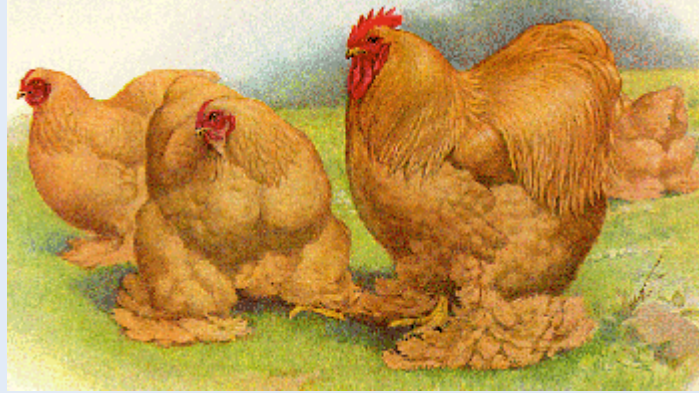
Choosing a breed



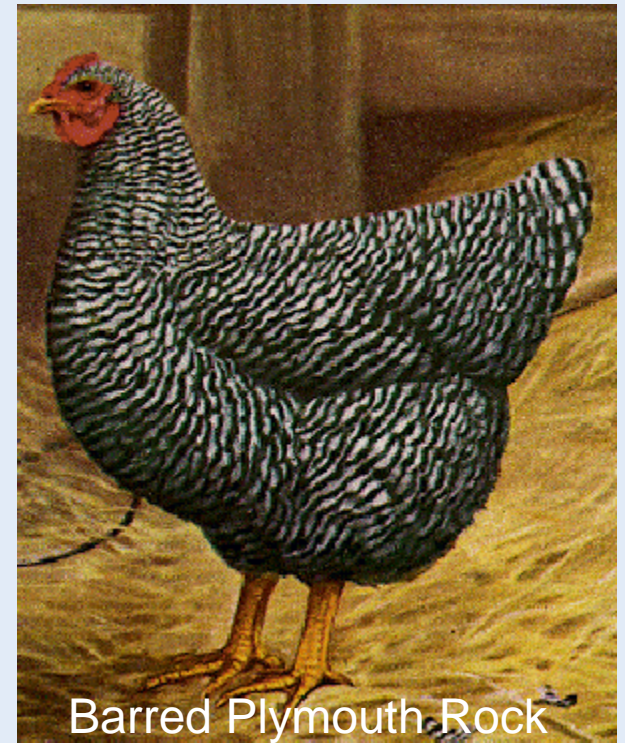
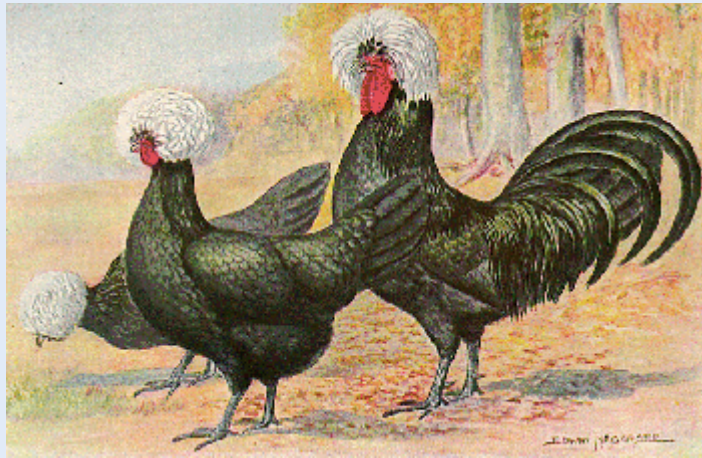
Some Examples of breeds for Pastured Laying Hens



Cochin

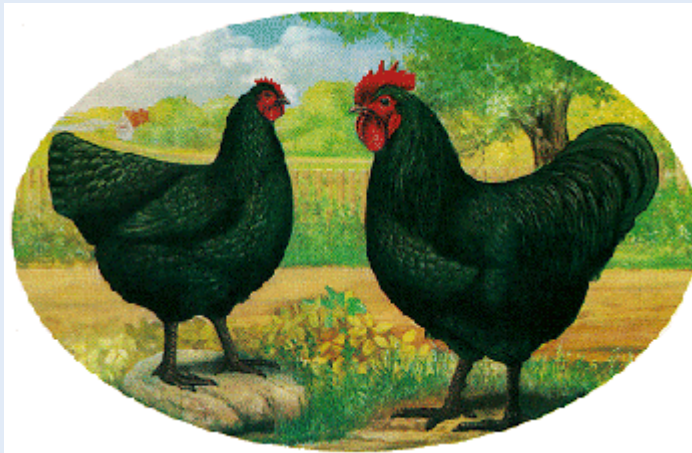


Polish



Barred Plymouth Rock

Black Australorp



Light Brahma

ARAUCAUNA



Black Australorp



Partridge Wyandotte



Red Sex-linked



Buff Orpington



Rhode Island Red



Barred Plymouth Rock



Sort by Best Selling

Show 24 36 48

View as [Grid] [List]



\$4.69

Barred Plymouth Rock Baby Chick, FEMALE
Ellington Agway



\$4.99

Americana Baby Chick, FEMALE
Ellington Agway



\$4.69

Silver Laced Wyandotte Baby Chick, FEMALE
Ellington Agway



\$4.69

Black Australorp Baby Chick, FEMALE
Ellington Agway



\$4.69

Rhode Island Red Baby Chick, FEMALE
Ellington Agway



\$4.69

Cinnamon Queen Baby Chick, FEMALE
Ellington Agway



\$4.99

Rainbow Baby Chick, FEMALE
Ellington Agway



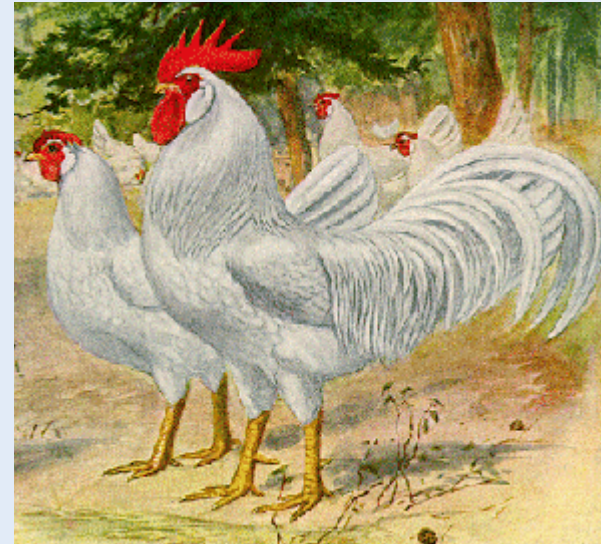
\$4.69

California White Baby Chick, FEMALE
Ellington Agway

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

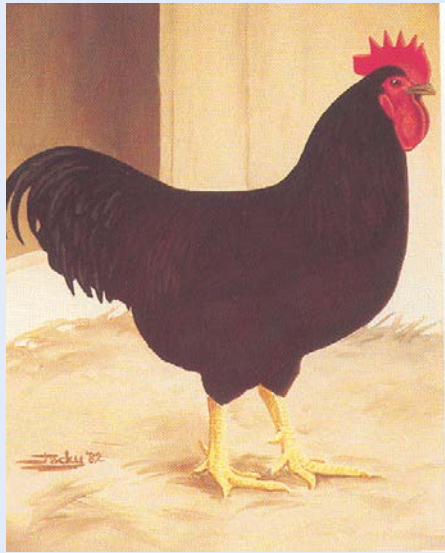
For Egg Laying Birds

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



Per Capita Consumption in the US is the **highest** in 5 years¹

248.4

258.7

263.3

2009

2013

2014

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



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

The egg industry has **added nearly 15 eggs per person** in consumption over the last five years¹

THE EGG BUSINESS

In 2014, the 242 million (est.) cases^{III} 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 value^{IV}



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 2015^V

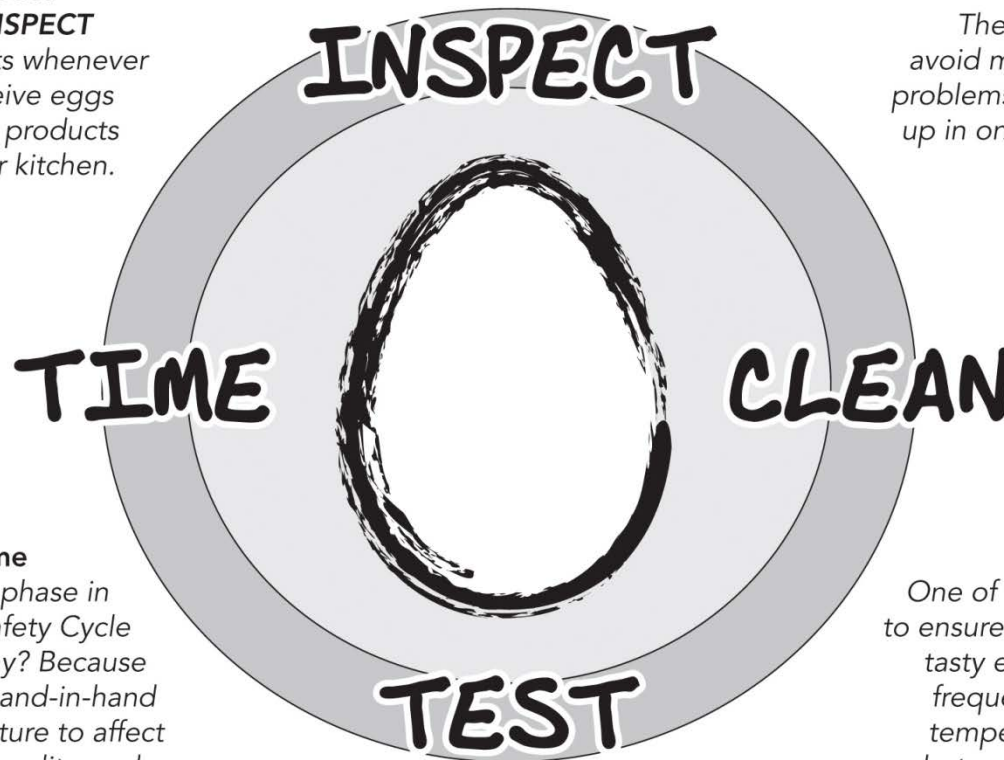
Sources: ^IUSDA's National Agricultural Statistics Service's Chicken & Eggs Report, page 9: <http://tinyurl.com/foj6t6ab>.
^{II}WASDE - 829 - 33, produced by USDA: <http://tinyurl.com/1314pncpfa> and <http://tinyurl.com/009pncpfa>. Per Capita Consumption is a measure of total egg production, less exports, plus imports, divided by total population. It doesn't represent demand.
^{III}USDA AMS Agricultural Analytics Division ^{IV}Includes shell eggs, plus processed egg products in shell egg equivalents, ^VNAUPIC.

The Egg Safety Cycle

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


Inspect
The **INSPECT** phase starts whenever you receive eggs and egg products into your kitchen.

Clean
The best way to avoid many food safety problems can be summed up in one word: **CLEAN**.



Time
The final phase in the Egg Safety Cycle is **TIME**. Why? Because time works hand-in-hand with temperature to affect the safety, quality, and taste of every egg dish.

Test
One of the easiest ways to ensure your guests' safe, tasty egg dishes is to frequently **TEST** the temperature of both hot and cold entrées.



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...

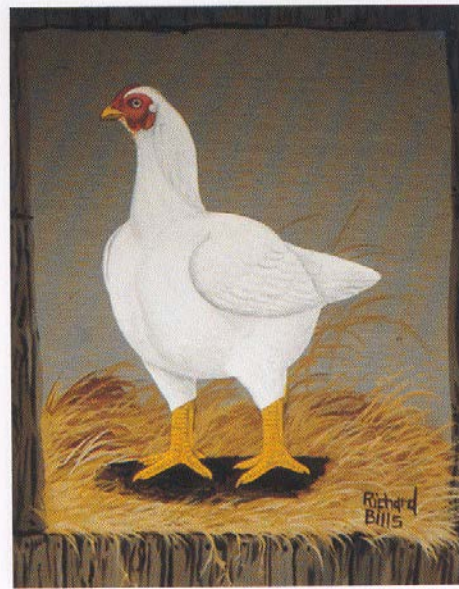
- Cornish X
- Other hybrid varieties (Barred Silvers.etc)
- Dual purpose varieties (Bufs, Barred Rocks)

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



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

Basic Needs

Fresh Feed

Fresh Water

Fresh Air

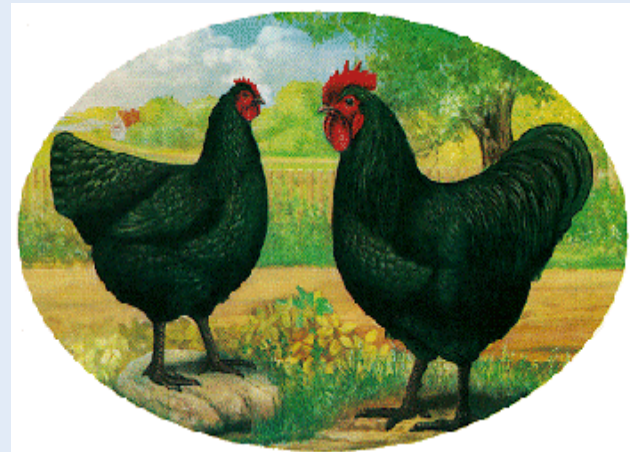
Light

Darkness

Thermal Environment

Protection

Space





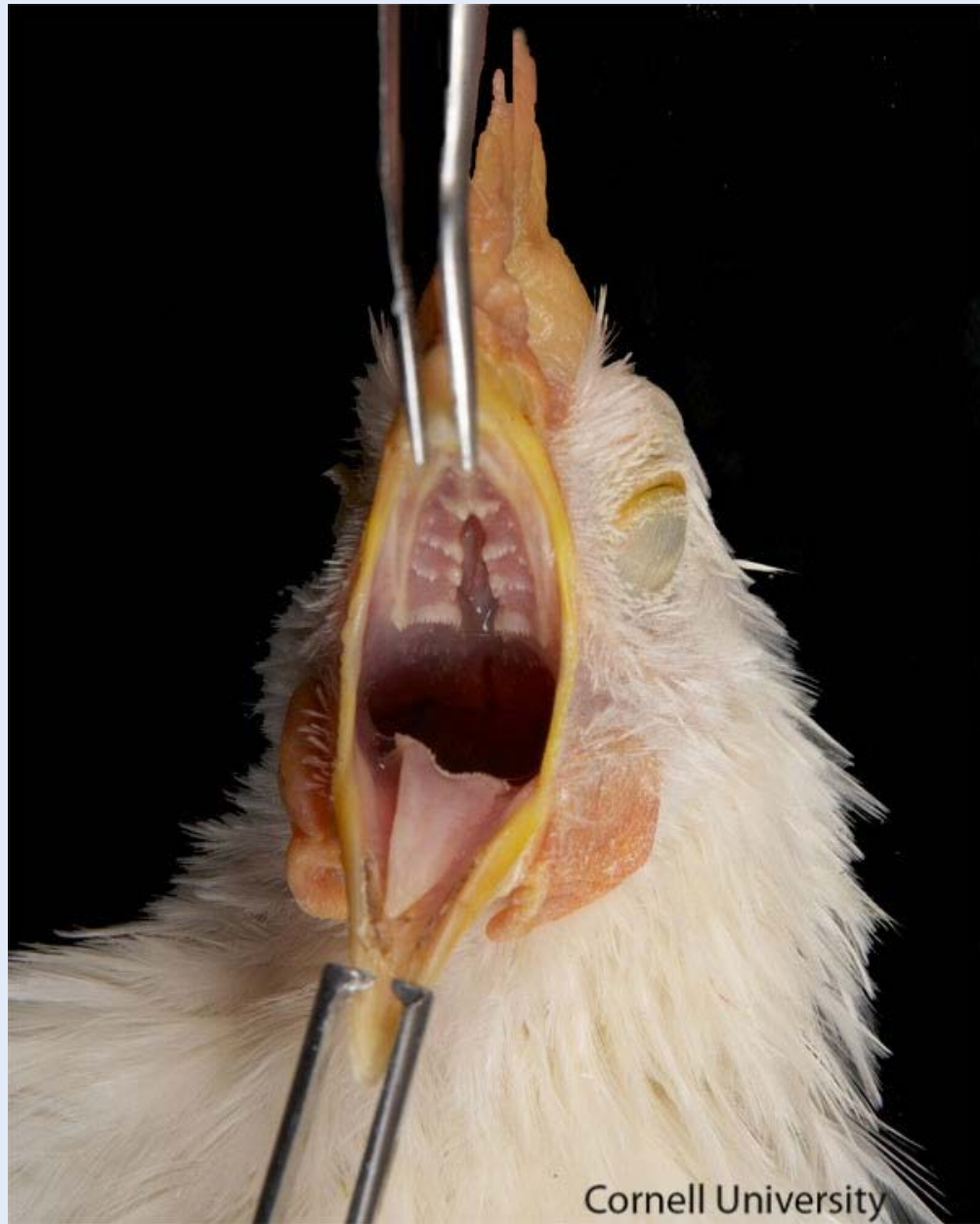


BriteTap Chicken Waterer

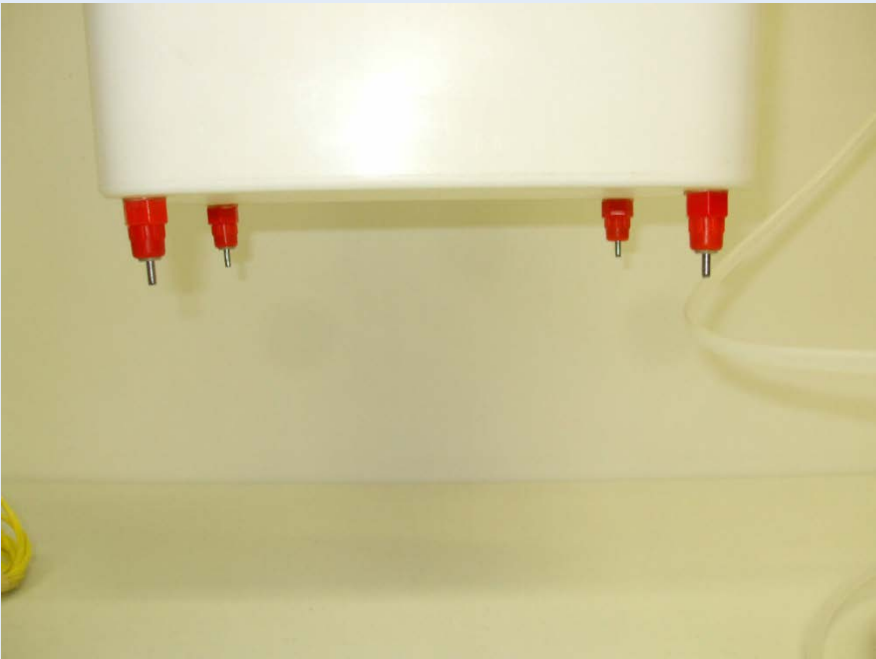
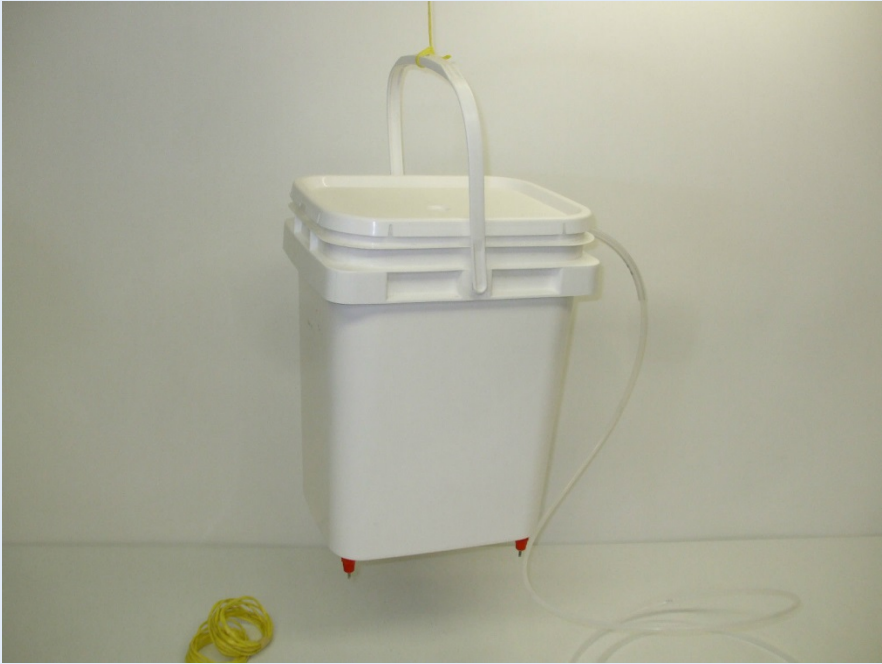


Photo credit: Alexandra Kent

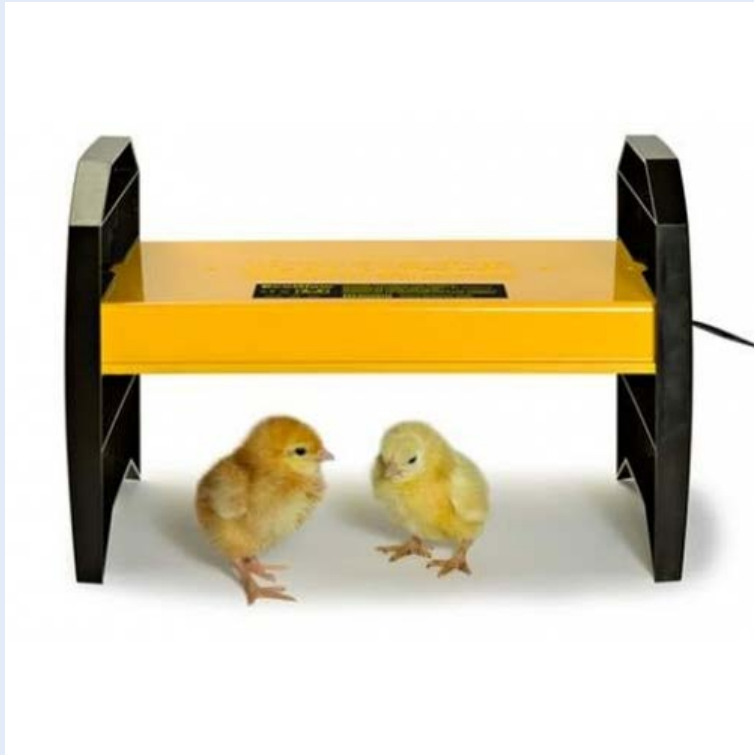
<http://www.chickenwaterer.com/BriteTap-Chicken-Poultry-Waterer-p/bt100.htm>



Cornell University







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



H
O
C
S
H
Z
G

Protection

elements
predators



Dry and Draft Free

flexible



H O C S H Z 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!!



SMALL POULTRY FLOCK OWNER CHECKLIST

Selecting the bird:

- Type of poultry: Layer, meat type or show (ornamental)
- Purchase disease free stock (from NPIP source and AI free)
- Plan for all-in-all-out flocks (Not feasible for backyard poultry folks)

Before the birds arrive:

- Draft free coop or housing, cleaned and disinfected
- Heat plate 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 or you can buy electrolytes and other additives)
- 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 (my opinion only deworm if symptoms)
- 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.
- 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.
- 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.
- Medicated Feed for coccidiosis

Feeding your birds

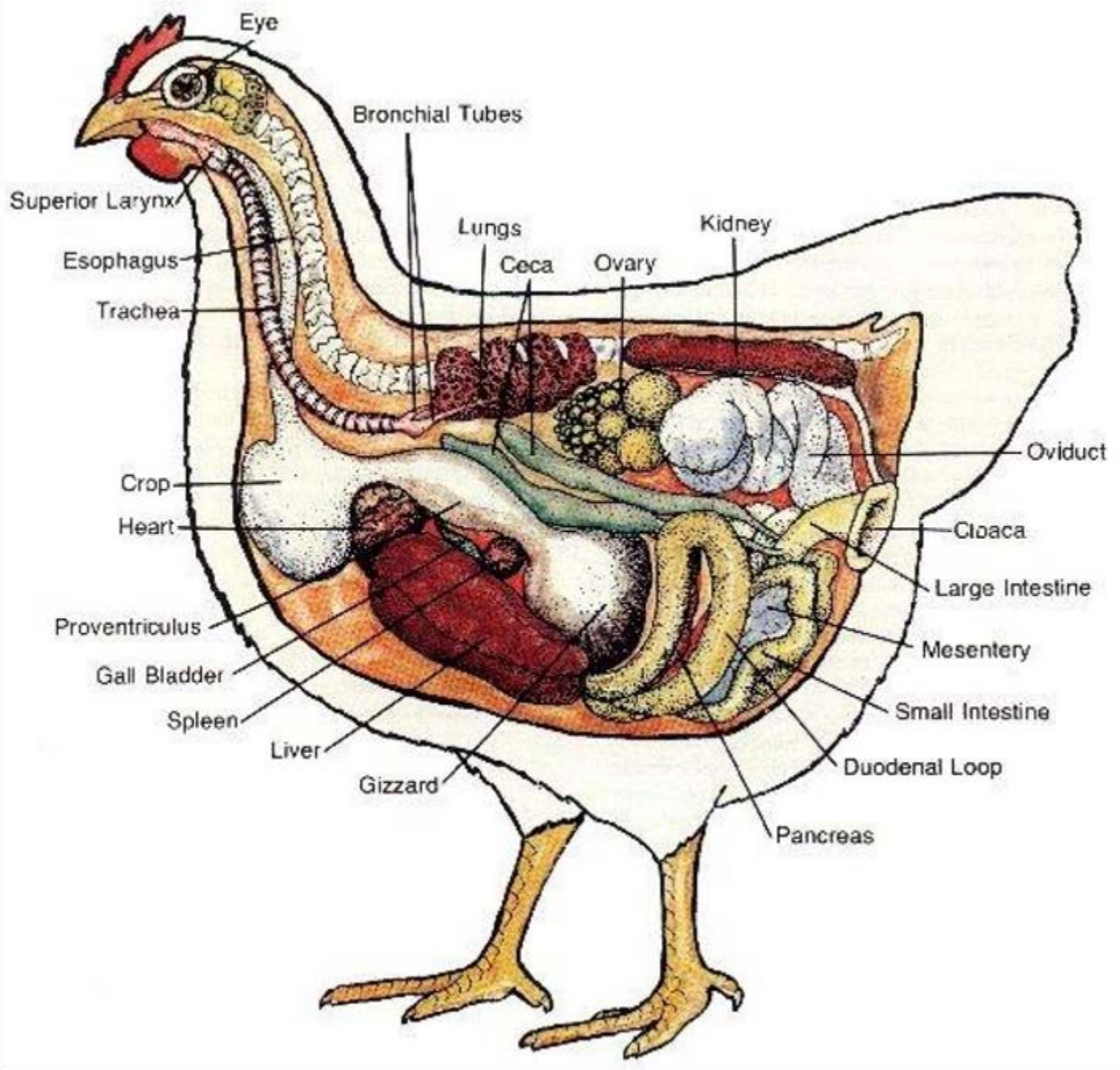
It is the most practical for small flock owners to purchase **bagged** feed from your local feed supply store.

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

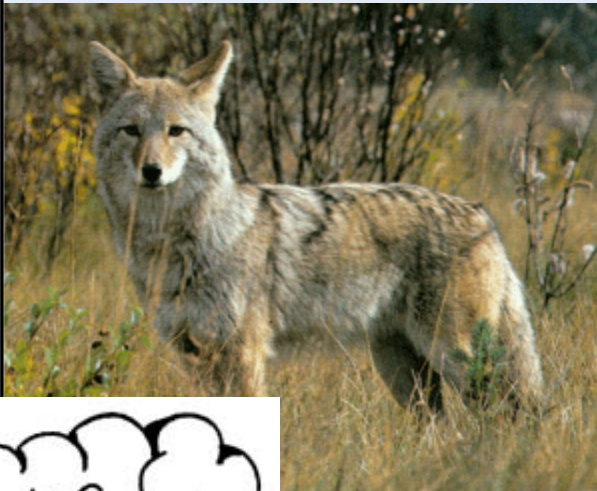
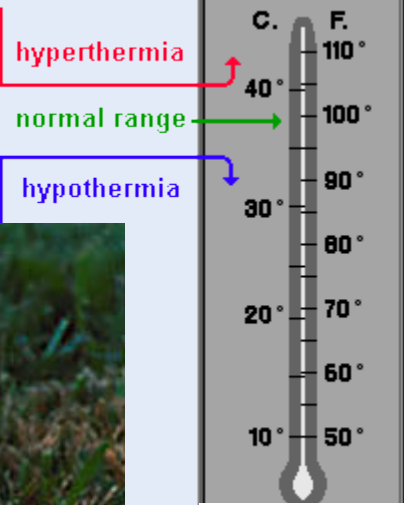


Health Risks



Air Flow (Wind)

Factors



Basic Poultry Health

1. Salmonella free, from hatchery (NPIP)
2. Marek's disease – in-ovo or just after hatch
3. Avian Influenza (AI) free
4. Coccivac? (If using medicated feed, no need)
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)(big issue in California)
 - 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

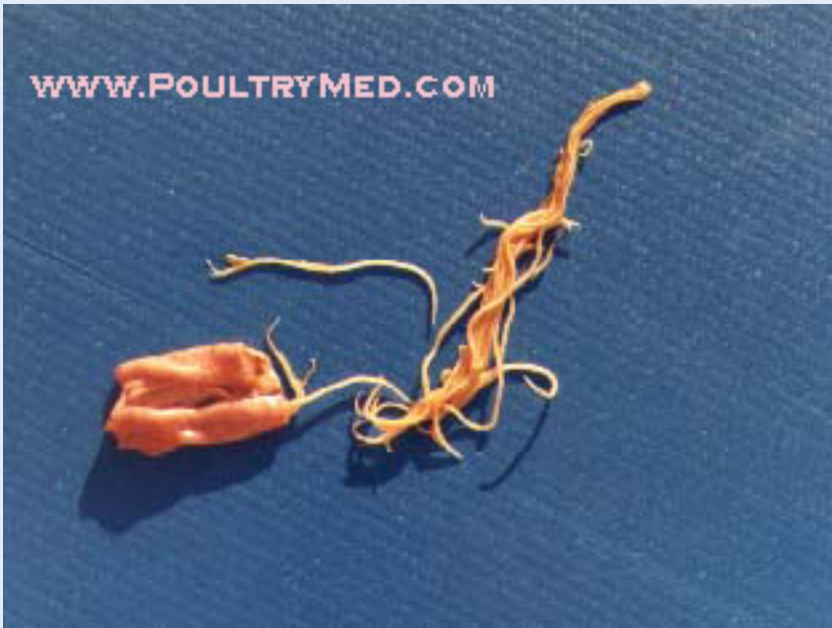
Internal Parasites

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

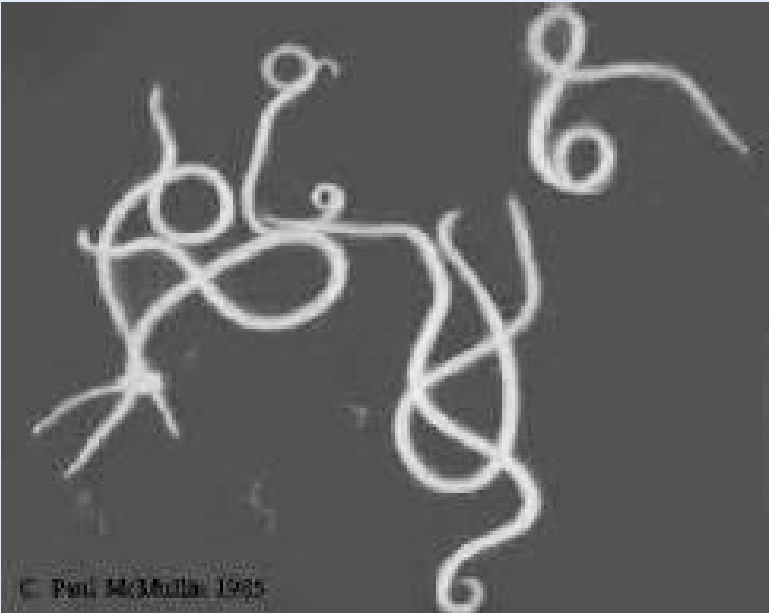
Cestodes (tapeworms) - earthworms, ants, beetles, grasshopper.

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



Northern Fowl Mite

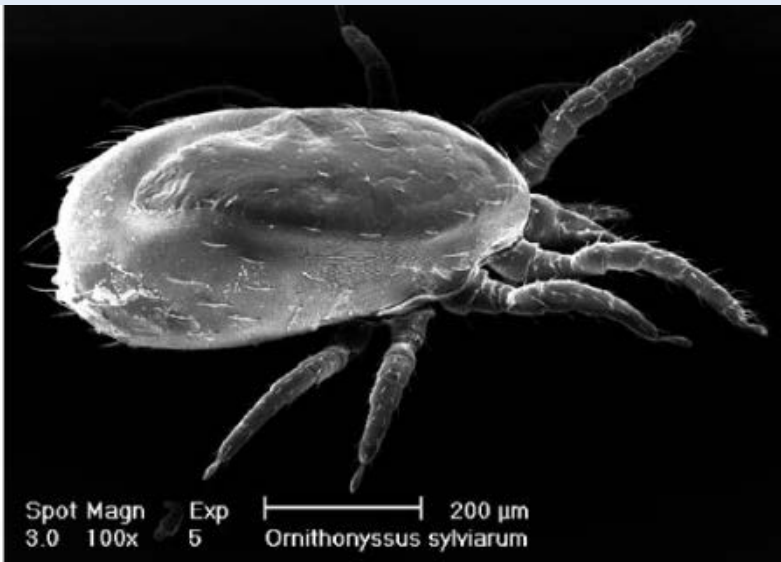


Figure 3. Scanning electron micrograph (SEM) of a northern fowl mite. The scale shows this unfed mite to be slightly less than 1 mm long. Photo by Jeb Owen, UC Riverside.



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
- g. Sour crop



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

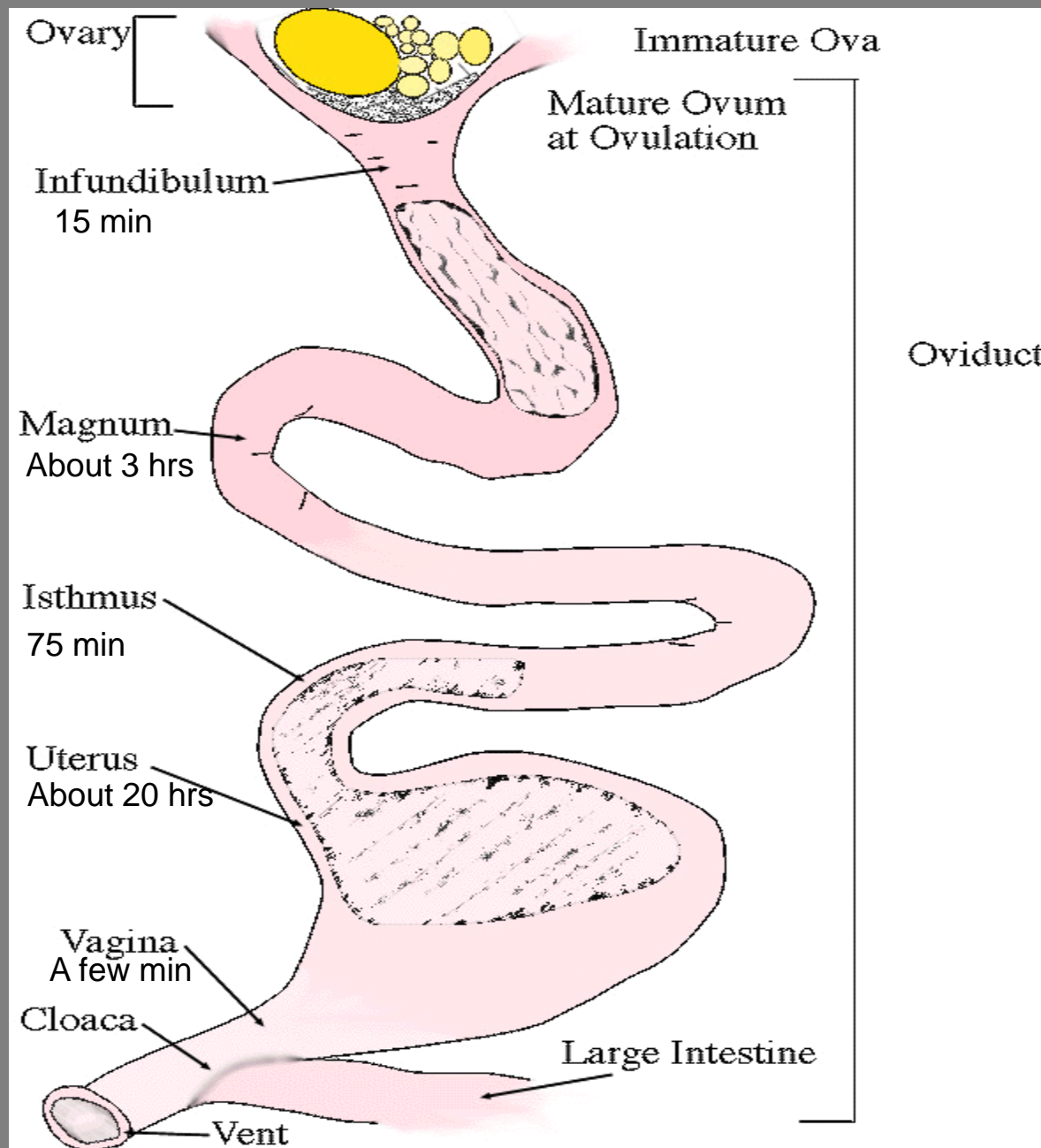
DURATION

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





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



The.... ! Well you know!!