Small Poultry Enterprise Management

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Updated – 2019 by Michael Pennington-Martel

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animalscience.uconn.edu/extension/poultry-extension.php

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Small Flock Information

- Breeds and Housing of Small Flocks
- Chicken Coop Designs
- Cleaning and Disinfecting Your Poultry House
- Common Clinical Conditions
- Diseases of Small Poultry Flocks
- Guinea Fowl Management
- Helpful Hints for Teachers on Incubation and Embryology
- Incubation and Embryology for Teachers
- Light Management for Poultry

Popular Pages

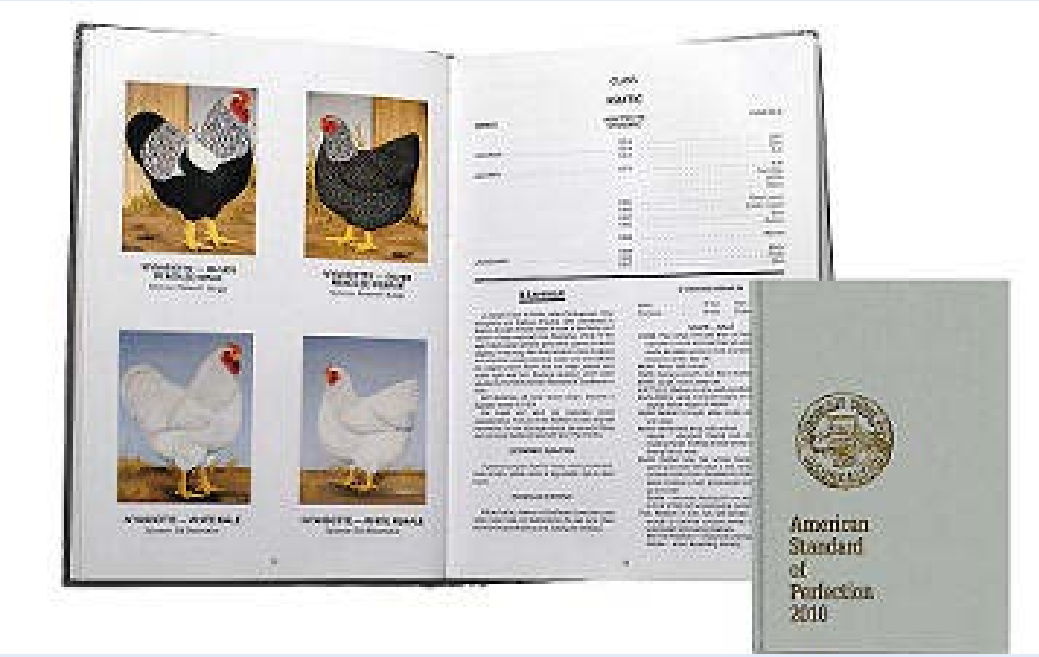
- Equine Program
- Pre-Vet Program
- Programs and Events
- Newsletter
- Compliance
- UConn Creamery

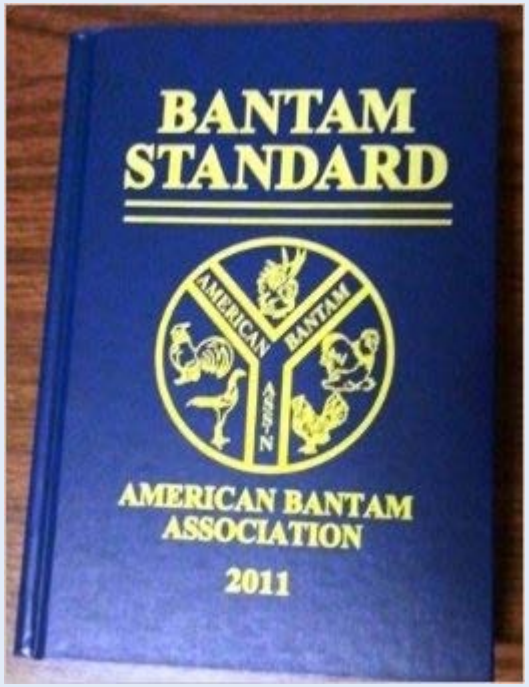
http://animalscience.uconn.edu/extension/poultry-extension.php

What does rearing a small poultry flock involve?

Physiology
Nutrition
Genetics
Health
Food Safety - HACCP
Engineering
Economics
Behavior
Management
Other . . .

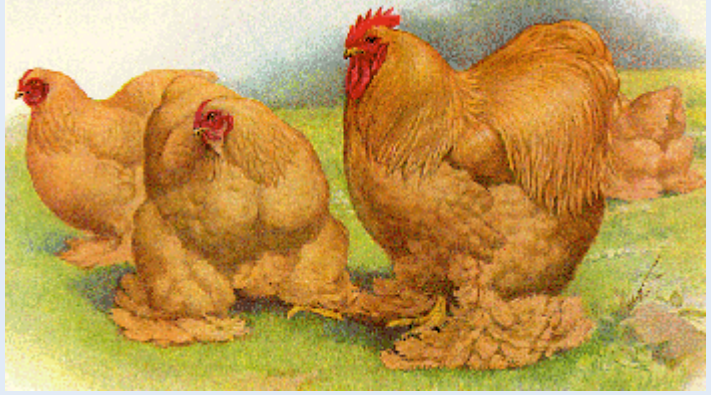
Choosing a breed

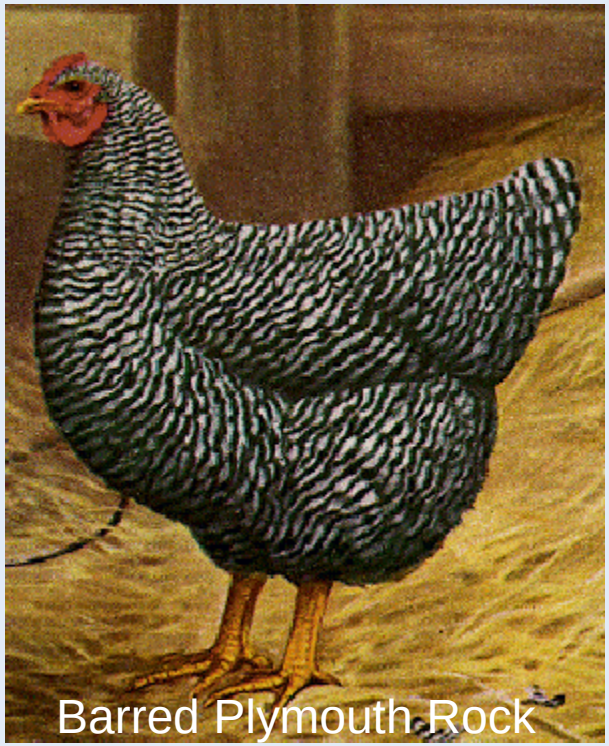




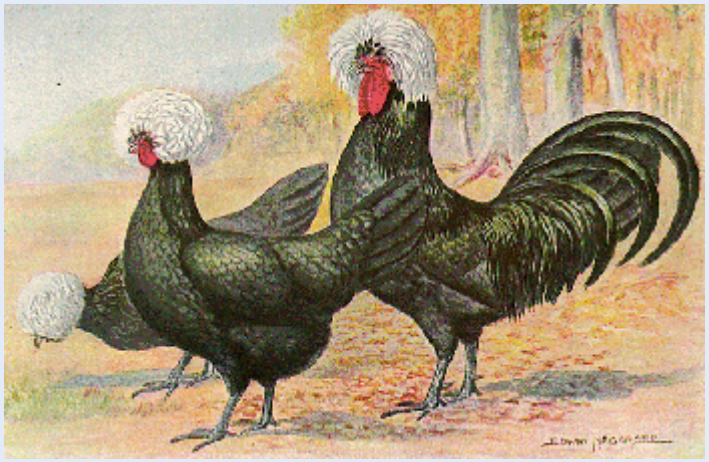
Some Examples of breeds for Pastured Laying Hens

Cochin



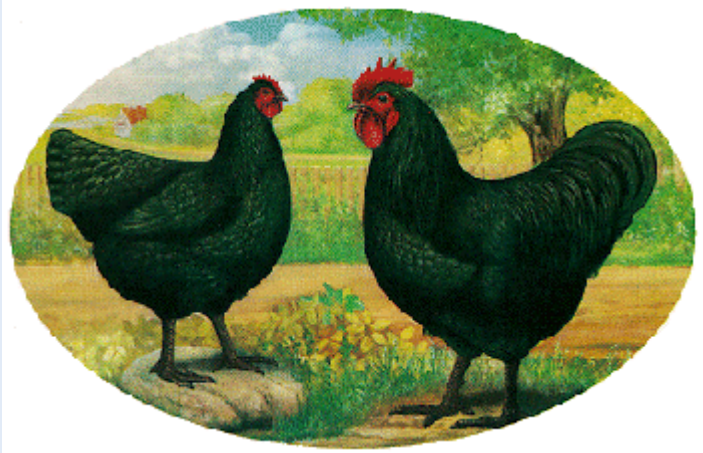


Barred Plymouth Rock



Polish

Black Australorp



Light Brahma

ARAUCAUNA

Black Australorp

Partridge Wyandotte

Red Sex-linked

Buff Orpington

Rhode Island Red

Barred Plymouth Rock

Brown Egg Layers

Rhode Island Red

Through the years this breed has maintained their reputation as a dual purpose bird. A truly American breed known for outstanding egg production of large eggs and for their ability to withstand our harsh New England winters.

Black Australorp

One of the best layers of large, light-brown eggs of all the heavy breeds. They are extra-large birds of a quiet & gentle nature and stand confinement well. They mature early & will start laying at about 5 months of age. Excellent cold tolerance.

Barred Rock

An all-time favorite dual-purpose breed in this country. Prolific layers of large eggs and very tolerant of our cold New England winters. Their solid plumpness and yellow skin make a beautiful, heavy roasting fowl. A large bird of good disposition.

New Hampshires

Developed in New Hampshire from Rhode Island Reds, these are an extra-large, early maturing, dual-purpose breed. Prolific producers of extra-large eggs and very cold tolerant. Mature birds are a rich chestnut color and have an excellent disposition.

Silver Laced Wyandotte

A large, colorful, hardy, productive breed. The close-fitting rose comb and good body size are valuable assets for winter laying. Cold weather doesn't seem to bother them at all as their hardiness and vigor keep them laying large brown eggs straight through the winter.

Specialty Breeds & White Egg Layer

Araucana/Ameraucauna (The "Easter Egg Chicken")

A special cross known for their ability to lay colored eggs of shades varying from turquoise, deep olive & shades of brown. Beautiful, medium-sized birds that exhibit a combination of colors and patterns. A unique breed and great fun when the eggs start coming!

Salmon Faverolles

Large chickens with a beard, muff, feathered legs & feet and fifth toe. Good layers of medium, cream colored eggs. They do not do well in a free range setting but bear confinement well. Very cold tolerant, have a nice disposition and are extremely likely to set.

Light Brahma

A very old x-large feather footed breed originating from Asia that is exceptionally quiet, gentle & easy to handle. Their small pea comb, great size and heavy plumage make them almost immune to cold weather. Good producers of large eggs, especially in winter and are also very likely to set.

Pearl White Leg Horn

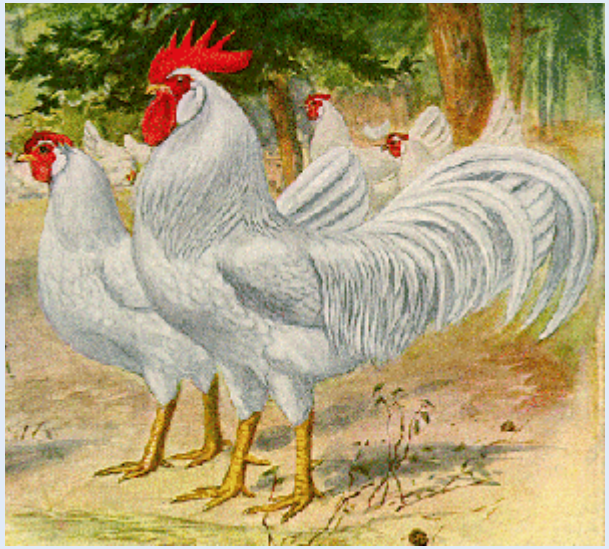
One of the best smaller breed white egg layers of all time. They start laying at 4 ½ - 5 months and continue laying right through hot summers and cold winters. They require less space and feed compared to other larger breeds so they are one of the more economical breeds to raise.

Red Star (Sex-Link Variety)

One of the best large egg layers that continue to lay right through hot or cold weather. Early maturing with an excellent disposition. They bear confinement well and are extremely winter hardy. A sex-link chick is one that can be sexed by their color at the time of hatch so there is 100% sexing accuracy!

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

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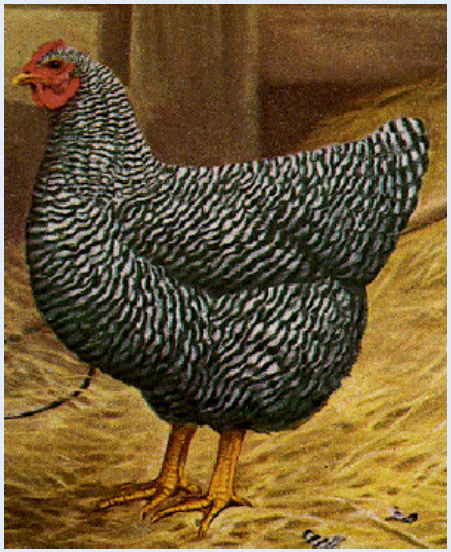

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Z Z
B b

Z Z
b b

Z W
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.

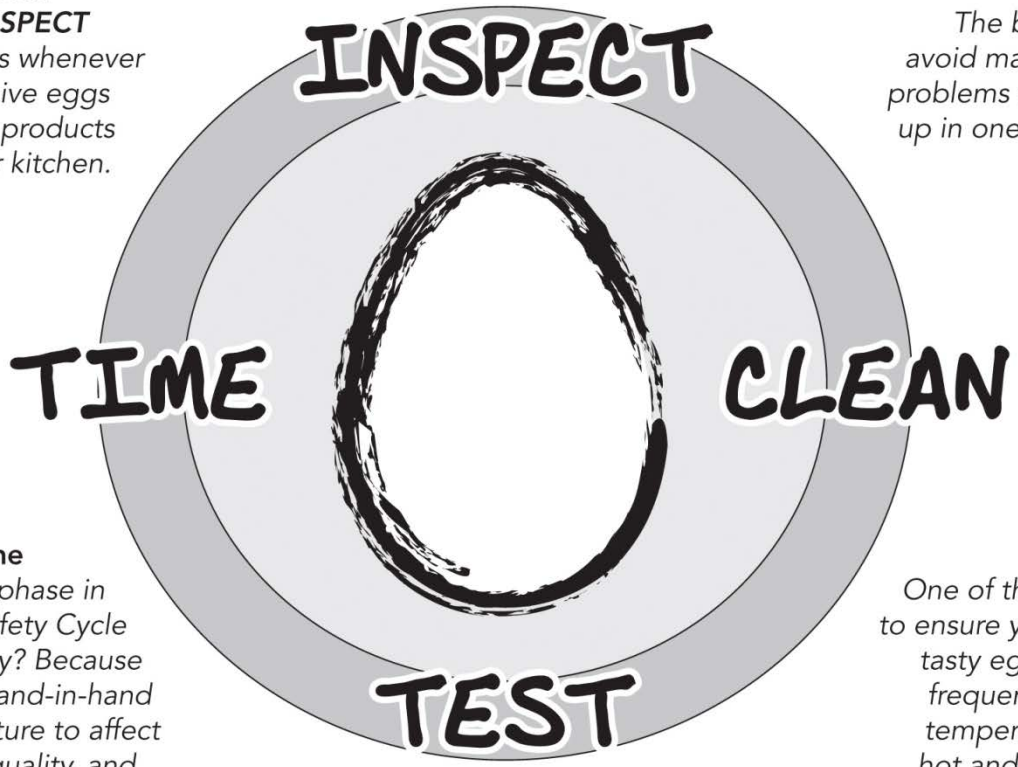
incredible!
American Egg Board
Per Capita Consumption in the US is the highest in 5 years[II]
248.4
258.7
263.3
2009
2013
2014
USDA projects an increase in 2016 to 265.8 eggs per person
Typically, Iowa, Ohio, Indiana, Pennsylvania & California are the top egg producing states that represent more than half of all U.S. hens[I]
The egg industry has added nearly 15 eggs per person in consumption over the last five years[II]
THE EGG BUSINESS
U.S. egg exports
27.4% increase in US eggs exports since 2012. 27.1% increase in value[IV]
2014
353 million dozens, representing $337 million in value
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%
According to USDA, in 2014:
305 million shell egg hens
286 eggs per hen
223 million eggs laid per day
Speciality egg production ...
Cage-free 3.2%
Organic 3.2%
... accounted for 6.3% of all egg production, as of March 2015[II]
Sources: [I]USDA's National Agricultural Statistics Service's Chicken & Eggs' Report, page 9: http://tinyurl.com/topfiestates.
[II] WASDE – 529 – 33, produced by USDA: http://tinyurl.com/1314percapita and http://tinyurl.com/2009percapita. 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, USAPEEC.

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 (Buffs, 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

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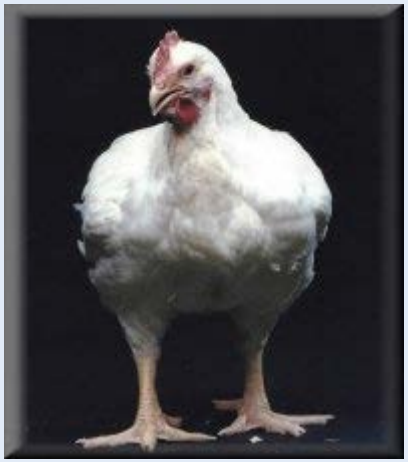
Moyer's CHICKS, INC. QUAKERTOWN, PA

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.

Meat Birds & Important Information

Jumbo Cornish X Rock (unsexed)

The Cornish Cross Rock is a hybrid developed by crossing the commercial Cornish chicken with a White Rock chicken. This special mating produces birds with broad breasts, big thighs, white plumage, and yellow skin. These broiler chickens are known for their rapid growth and feed efficiency. Whether you are looking to raise these top-selling meat birds for your own pleasure, or to raise and sell, you won't find better.

- **Order early, limited quantities are available. Availability will be determined at the time you place your order.**
- **Chicks are very fragile & must be cared for properly. Therefore, they cannot be guaranteed once they leave the store. All chicks are vaccinated for Marek's disease.**
- **The hatchery guarantees 90% accuracy on all sexed poultry. At no time will the guarantee exceed the purchase price.**
- **We will call the day the chicks arrive. All orders must be picked up the day they arrive.**
- **Before ordering, please check with your town regarding zoning laws. No refunds will be given after March 29, 2020**

AGWAY®

www.EllingtonAgway.com
74 West Road (Rte. 83)
860-875-3355 Ext. 4

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.

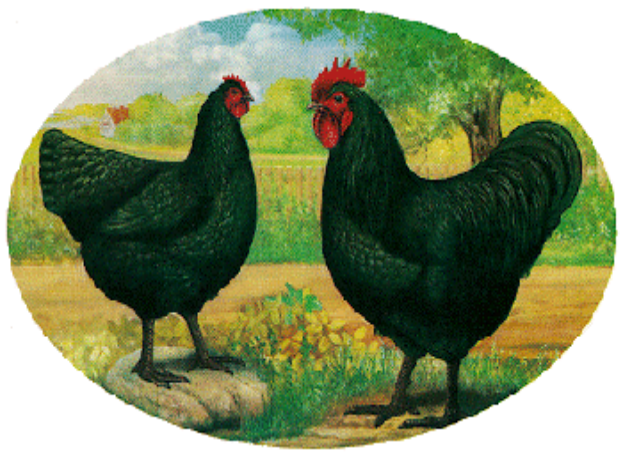
Kosher King (Silver Cross)

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



E = 100cm
F = 50cm
G = 30cm
E
F
G

Shenandoah

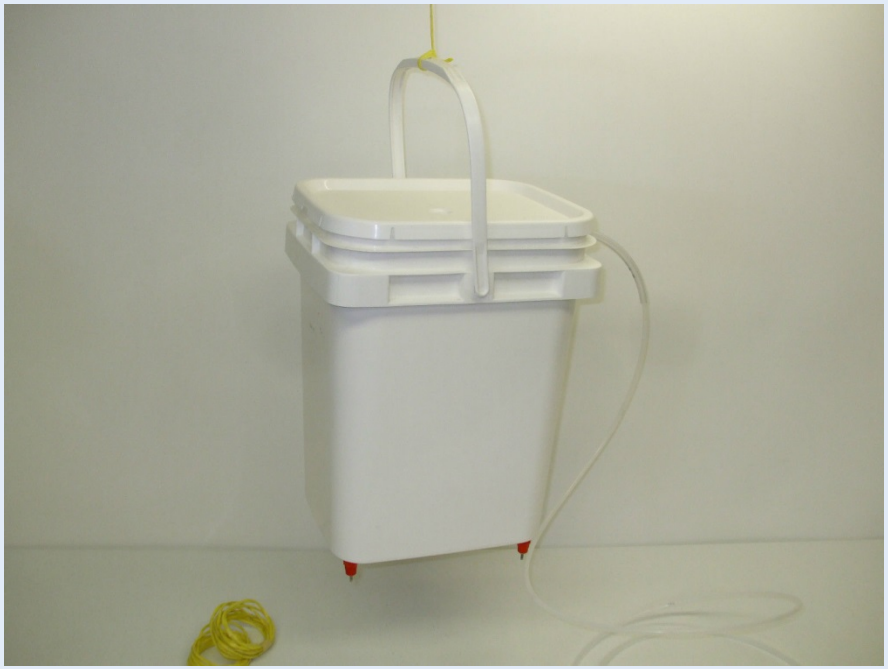
Shenandoah

BriteTap Chicken Waterer

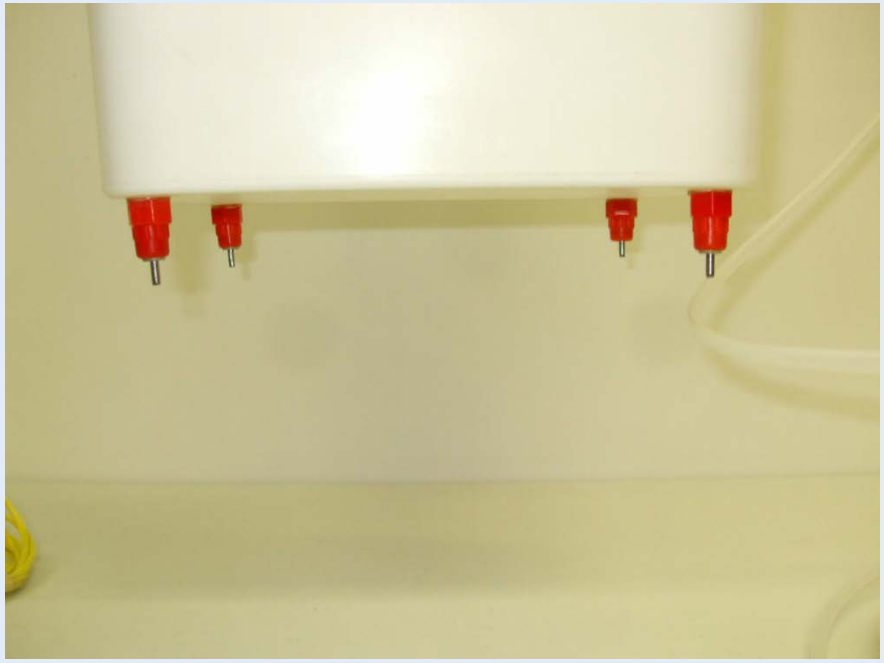
Photo credit: Alexandra Kent

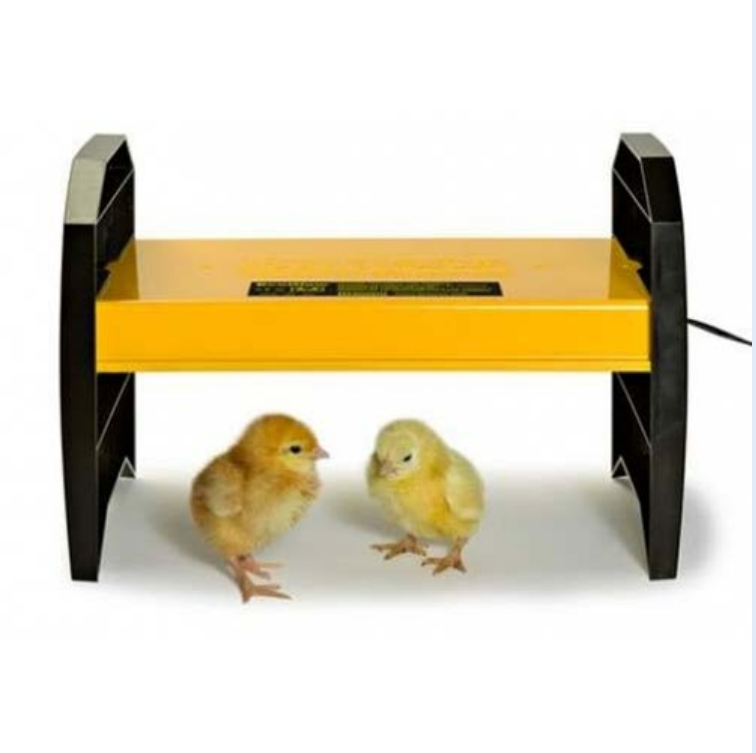
http://www.chickenwaterer.com/BriteTap-Chicken-Poultry-Waterer-p/bt100.htm

Cornell University



QC SUPPLY
www.qcsupply.com
800-433-6340





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

HOUSING

Protection

elements
predators

Dry and Draft Free

flexible

HOUSING

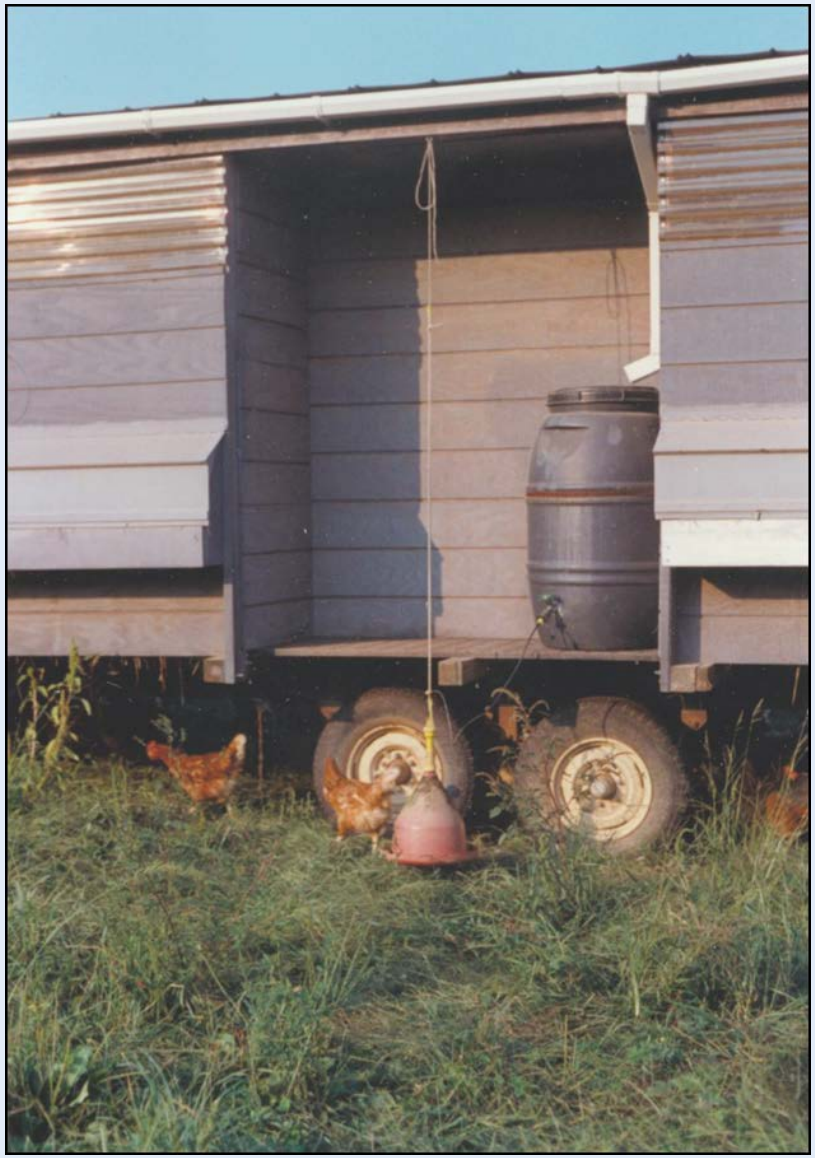
Housing For Pasture Birds

Old hay wagon trailer, second-hand nest boxes

Roosts of small diameter (11/2 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?

DECATHLON
MID-WEST
TRACK CLUB

鶏

鶏

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

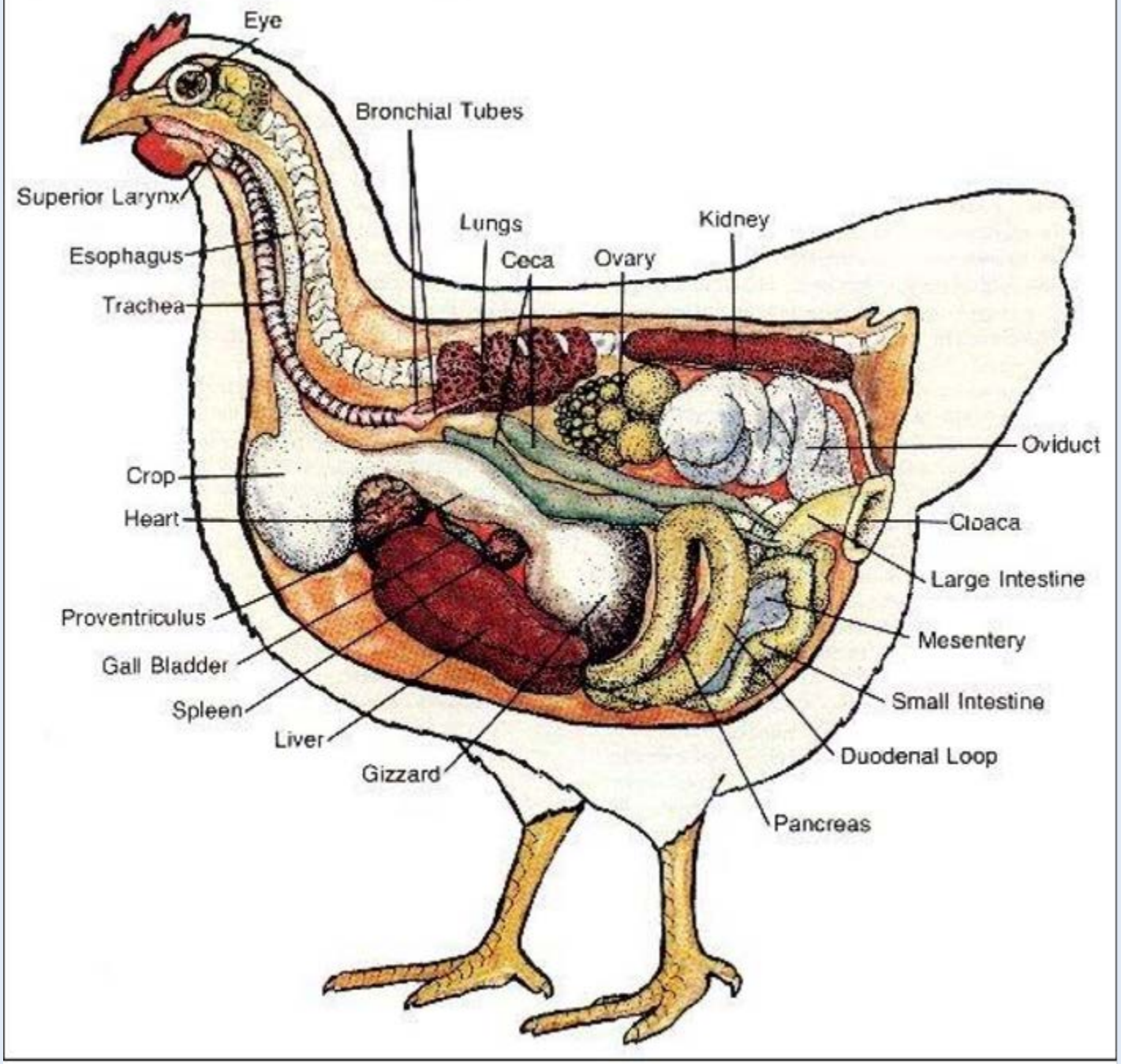
Feeding your birds

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.

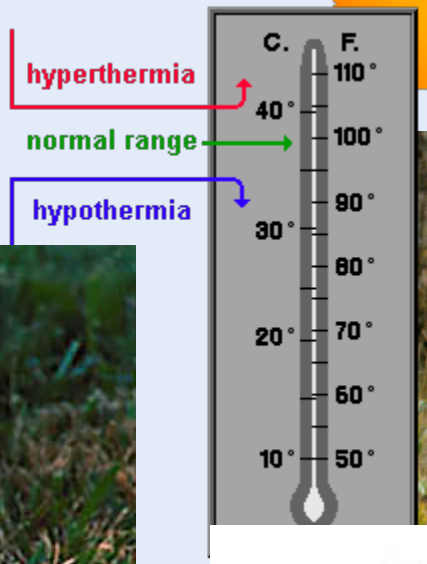
Broilers: 22-24% CP Starter feed (medicated if they have it.) 3-4 weeks
20 % CP Grower or Grower Finisher from 5 weeks till processing.

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

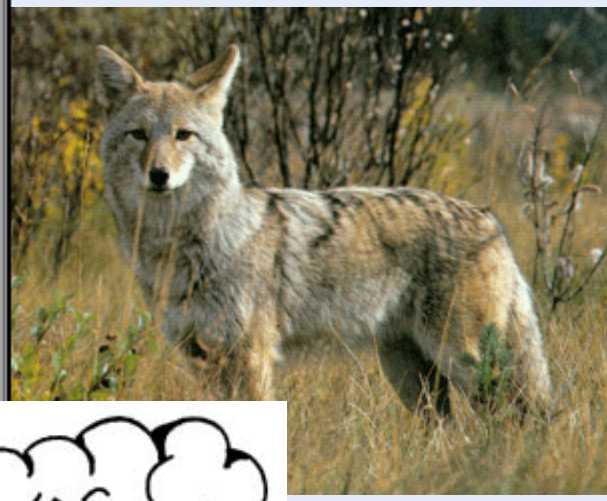


Health Risks

Factors



Air Flow (Wind)



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 melegridis, 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

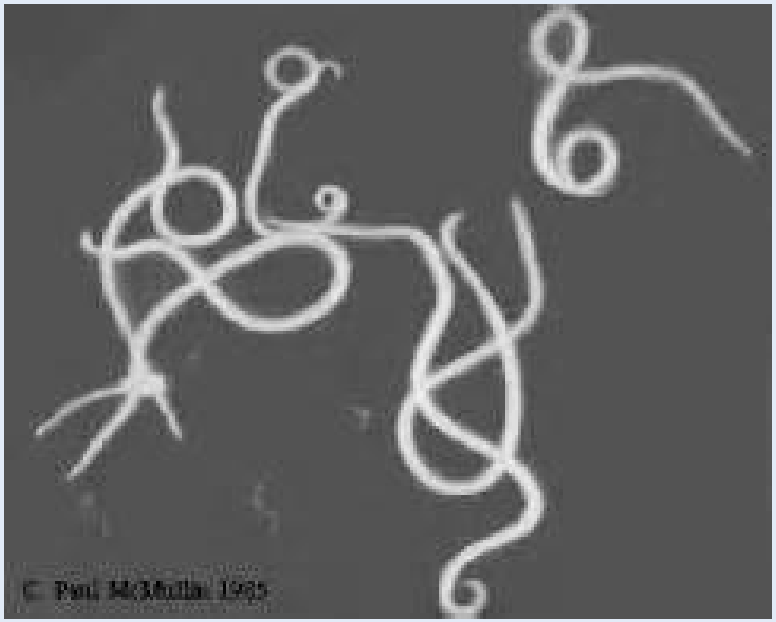
Nematodes - earthworm, cockroach, grasshoppers, possibly ducks and geese.

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)

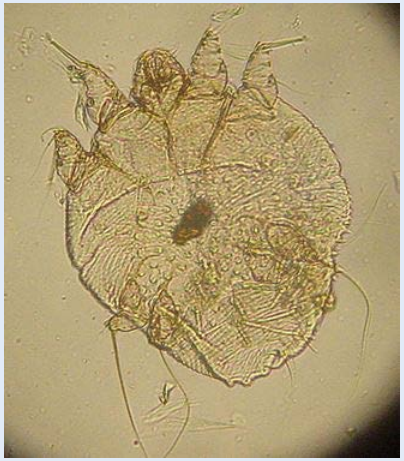
Scaly Leg Mites

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

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

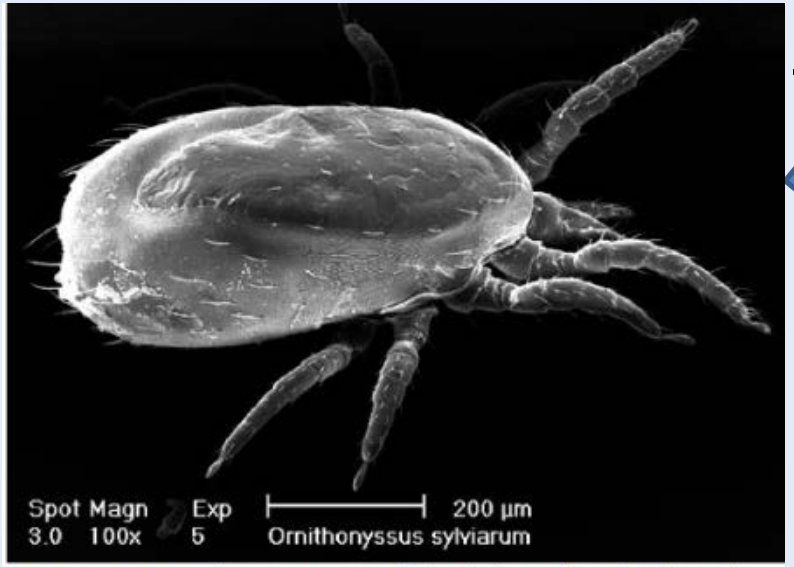


Figure 3. Scanning electron micrograph (SEM) of a northern fowl mite. The scale shows this unfed mite to be slightly less than 1 mm long. Photo by Jeb Owen, UC Riverside.

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
g. Sour crop

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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

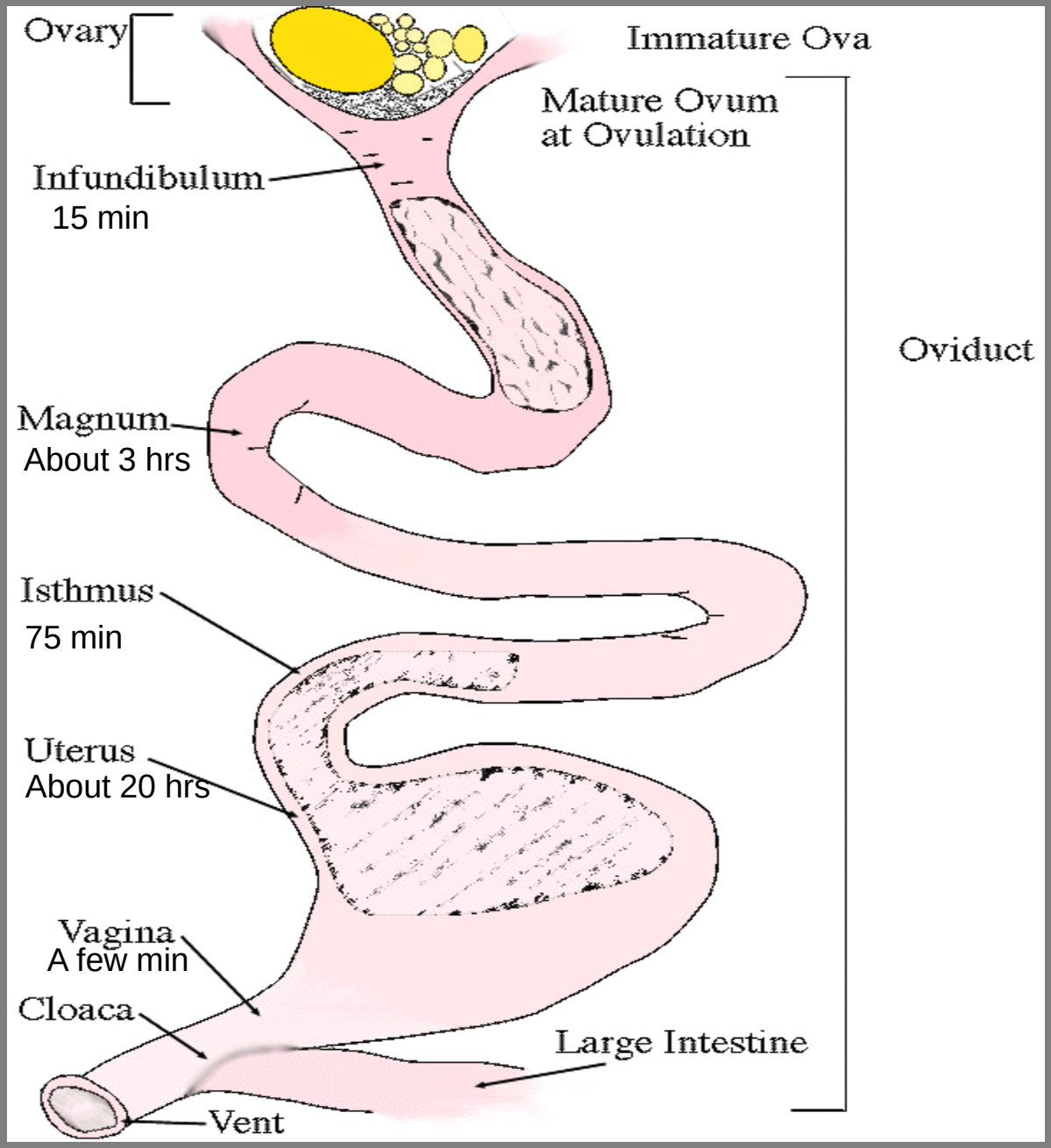
Production 16 hrs

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


Ovary
Immature Ova
Mature Ovum
at Ovulation
Infundibulum
15 min
Oviduct
Magnum
About 3 hrs
Isthmus
75 min
Uterus
About 20 hrs
Vagina
A few min
Cloaca
Large Intestine
Vent

Characteristics for culling layers:

Character	Layer	Non-Layer
Comb & Wattles	Large, brightred, 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!!