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This presentation is part of an educational modular program designed to provide new and beginning farmers and ranchers with relevant information to initiate, improve and run their agricultural operations

This program is funded by the Beginning Farmer and Rancher Development Program (BFRDP)

USDA-NIFA-BFRDP 2010-03143

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Pastured Laying Hens

RAISING PASTURED POULTRY

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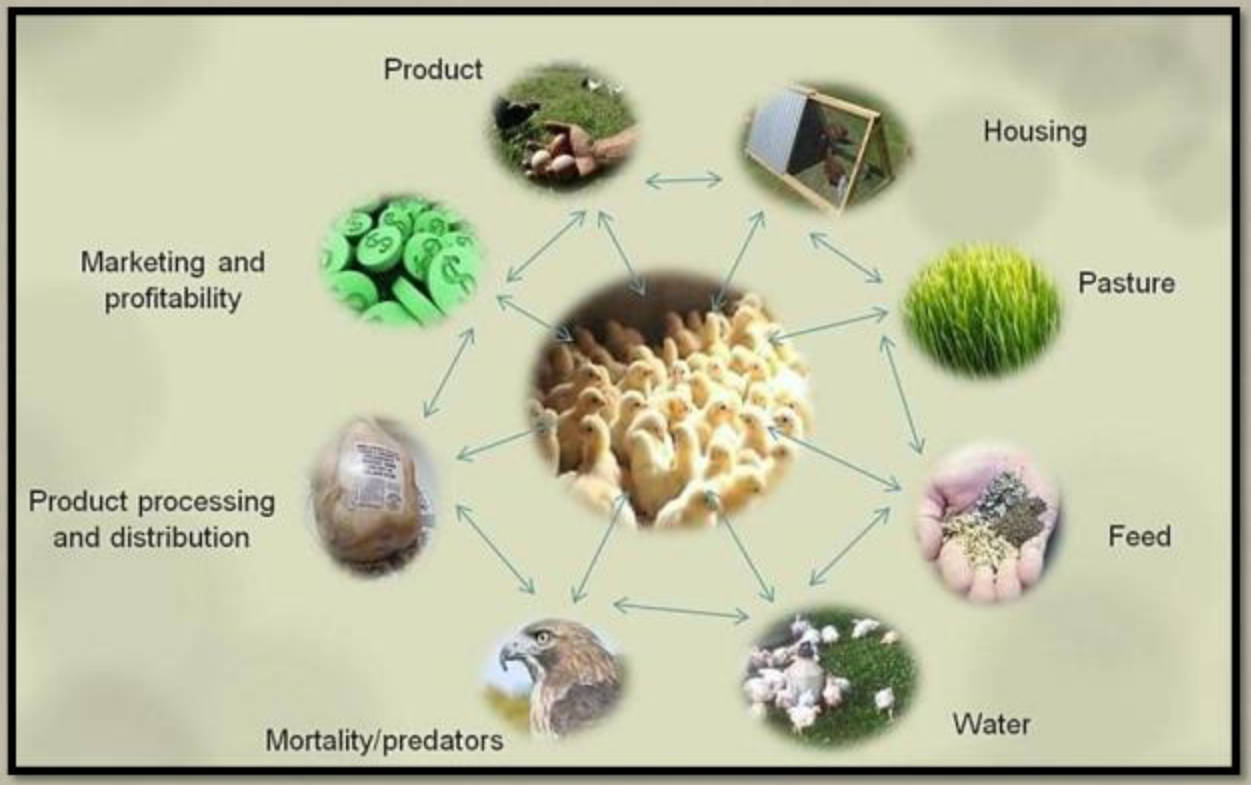
Whether you are raising birds for profit, for personal consumption or as a hobby, there are many things that you need to consider



EGG LAYERS

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These are birds that usually grow slower than breeds for meat and reach a lower body weight, but are great at laying eggs

EGG LAYERS

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Individual farmers have their preferences about the color of the eggs, the breed choices and the housing system that they want

BREEDS

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EGG LAYER BREEDS

- Ameraucana
- Ancona
- Araucana
- Australorp
- Fayoumi
- Hamburg
- Houdan
- Leghorn
- Light Sussex
- Minorca
- Orpington
- Polish
- Rhode Island
- Penedesca
- Plymouth rock
- Sex Links
- Wyandotte

Ameraucana

Leghorn

Minorca

Orpington

Wyandotte

BREEDS AND COLOR OF THE EGG

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Egg color	Breed
White	Leghorn Hamburg Polish Fayoumis Ancona Houdan
Light brown	Orpington Malay Cochin Rhode island Plymouth rock Jersey giant
Dark brown (chocolate)	Marans Welsummer
Brown	Wyandotte Dominique Cornish cross Rhode island Java Naked necks New Hampshire Delaware Australorp
Blue/green	Araucana Legbar Ameraucana

CHOOSING A BREED

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You will be keeping these hens for a long time, so you need to consider the weather in your area

- If you have cold winters, you may choose a heavier bodied, well feathered bird, if you have hot and humid summers then you should choose smaller birds
- If you want to breed and raise your own replacements, then you probably want a broody breed that will sit on the eggs and hatch them, but if you only want the eggs then you don't want a broody breed

CHOOSING A BREED

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There is no real difference in the nutritional content of eggs of different colors (white, brown or even blue/green eggshells)

- The color of the shell is given by the breed of the hen, but the contents depend on the diet of the hens

But most people have an idea and a preference, so don't argue with them, find out what kind of eggs your clients like and make sure to get hens that lay that color of egg

CHOOSING A BREED

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If there is a lot of interest for heritage breeds in your area, then that is probably the best way to go, but if your main concern is egg production then you would be better with a modern hybrid breed

Heritage breeds

Wheaten Old English Game Hen

Golden Campine hen

Delaware (Indian River)

AMERICAN LIVESTOCK BREEDS CONSERVANCY (ALBC) CONSERVATION POULTRY PRIORITY LIST

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CHICKENS				• links
CRITICAL	**THREATENED**	**WATCH**	**RECOVERING**	**STUDY**
Campine	Andalusian	Ancona	Australorp	Araucana[1]
Chantecler	**Buckeye**	Aseel	Leghorn- Non-industrial	**Iowa Blue**
Crevecoeur	Buttercup	Brahma	Orpington	**Lamona**
Holland	**Cubalaya**	Catalana	**Plymouth Rock**	Manx Rumpy (aka Persian Rumpless)
Modern Game	**Delaware**	Cochin	**Rhode Island Red - Non industrial**	Naked Neck (aka Turken)
Nankin	Dorking	Cornish	Sussex	
Redcap	Faverolles	**Dominique**	**Wyandotte**	
Russian Orloff	**Java**	Hamburg		
Spanish	Lakenvelder	Houdan		
Sultan	Langshan	**Jersey Giant**		
Sumatra	Malay	La Fleche		
Yokohama	Phoenix	Minorca		
		New Hampshire		
		Old English Game		
		Polish		
		Rhode Island White		
		Sebright		
		Shamo		

BROODING AND GROWING

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GETTING STARTED

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In general, you have 3 choices for getting your chicks:

1. You can hatch your own eggs (incubated with a hen or in an artificial incubator
2. You can order baby chicks to be shipped from a poultry hatchery through the mail
   - It helps with planning because you will know for sure how many chicks you will get
   - You can be sure that you get only females
   - Usually the minimum order is 25 birds, so prepare or make arrangements to share with a neighbor or friend. Smaller numbers may be shipped during warmer months, when keeping the birds warm is not an issue
3. You can buy older pullets ready for laying
   - You will avoid the work of brooding and growing the hens, but they are usually more expensive per bird and you will have to build quarantine areas before you introduce the pullets to the other birds
   - You just don't know how they have been raised, treated, fed or if they have had any health problems

GETTING YOUR CHICKS

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- Chicks are shipped in cardboard boxes designed to keep them warm while allowing fresh air inside
- Although some hatcheries use small boxes designed for 25 birds, many can use boxes that fit up to 100 birds in them
- Try to find a hatchery or producer nearby instead of shipping birds across the country

BROODING

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You will need to prepare everything before your chicks arrive

- **Be ready to pick up, transport and set your chicks promptly**
  - If you ordered your chickens through the mail, you should let the post office know that you are expecting birds and make arrangements for their delivery
  - When they arrive, you need to open the box at the post office to make sure all your birds and there and okay
  - If there are any problems, the postal employee needs to sign your claim

BROODING

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- **Heaters should be on 12-24 hours before the chicks arrive to make sure that the area is warm (90-95°F the first week and then reduce the temperature 5°F every week)**
- **Feed and water must be at least room temperature**
- **Be prepared to check your chicks at least twice per day**
- **Be prepared for some mortality within the first week (4-5% is normal)**

The first few weeks of the chick's life will determine its long term survival and development

GROWING

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Layer pullets are raised just like broilers

- They are usually kept in the brooder for 2-3 weeks
- Then, they are kept in houses or pens with access to pasture
- Most pullets will start laying around 4-6 months of age. It depending on the breed and the season of the year. Some may wait until the next spring to lay eggs
- On average, each bird consumes about 31 pounds of feed to reach laying age

MOVING INTO THE HEN HOUSE

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- **You will need to provide the birds with nest boxes, perches for roosting**
- **When they begin laying switch their feed to a ration for layers**
  - They will also need calcium and other supplements to ensure adequate egg production
    - <u>Some hens may lay about 200 eggs a year</u>
    - Depends on breed, nutrition and environmental conditions
    - It is wise to be conservative in your estimations when you are beginning

ROOSTERS?

You don't need a rooster to get eggs!

- **Roosters are only needed in order for the eggs to be fertilized (to breed chicks)**
- **Hens lay just fine with no male supervision ☺**

Pros and Cons of having a rooster

Pros

- Most roosters are territorial and protective over the hens
- Some hens are easier to handle if they have a rooster around

Cons

- You must candle all eggs to make sure that the eggs that you sell are not fertilized
- Some males can be mean and aggressive towards people
- And of course, they can be very loud and cause problems with neighbors

EGGS

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EGGS

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On average, 3 hens will give you 2 eggs a day

That means that you need 18 hens to get a dozen eggs a day

EGGS

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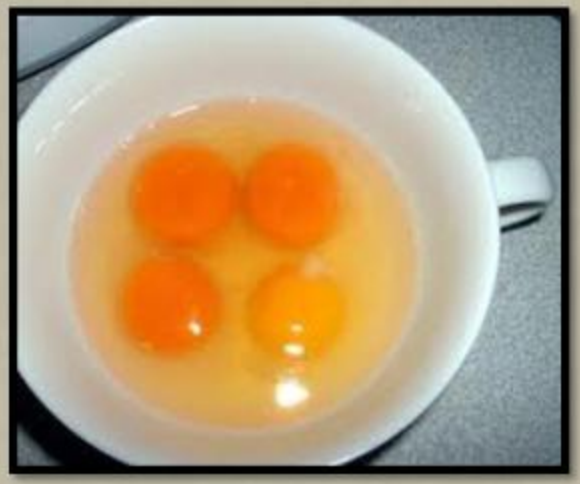
A study by the USDA (2010) showed that there is no significant different in protein and crude fat content between conventional and free range eggs

- **However, other studies have shown that eggs from hens that have access to forage daily can have higher levels of omega 3 and 6 fatty acids and vitamins A and E**

There are several reports about differences in nutritional content in conventional and free range eggs.
However, the reported differences in cholesterol content, saturated fat, vitamins, carotenes and fatty acids are not enough to have a significant impact in a person's diet.



EGGS

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The color in the yolk of the eggs is determined by the diet of the hen

- If the diet contains yellow/orange plant pigments (xanthophylls) they will be deposited in the yolk and color it. A colorless diet can produce a pale yolk
- There is no nutritional value of the color of the egg nor does it indicate how fresh is the egg

Some consumers are surprised to see brightly orange yolks, talk to your customers and explain why they look like that

SHELL DEFECTS

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Any defects in the eggs and eggshells of your hens indicates a problem in their health, diet or environmental stressors

- High temperatures or high humidity
- Poor nutrition (especially calcium or oyster shell supplements)
- Overcrowding
- Changes in the lighting program
- Hens are too young or getting old
- Disease
  - Egg drop syndrome
  - Infectious bursal syndrome
  - Infectious laryngotracheitis

- <u>If you observe any of these problems frequently, call your veterinarian as soon as possible</u>

SHELL DEFECTS

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Defect	Causes
Mottled or glassy shells	High humidity in the shed, crowding, disease such as infectious bursal disease
Hairline, star cracks	Ageing, poor nutrition, diseases such as infectious bronchitis, hot weather, infrequent egg collection
Thin-shelled eggs and shell-less eggs	Immature shell gland (very young hens), defective shell gland (if this happens all the time, this hen will have to be culled), stress, poor nutrition, diseases
Sandpaper or rough shells	Diseases such as infectious bronchitis, infectious laryngotracheitis or avian encephalomyelitis, defective shell gland, changes in the lighting program, water shortages
Misshapen eggs	Immature shell gland (very young hens), defective shell gland, diseases, such as infectious bronchitis, stress, crowding
Flat-sided eggs	Diseases such as infectious bronchitis, stress, crowding, changes in the lighting program
Body checked eggs	Ageing birds, stress, problems with the lighting program, crowding, disease such as infectious bursal disease
Calcifications and Pimples on the shell	Ageing, poor nutrition (excess of calcium intake in winter, strain of bird

SHELL DEFECTS AND MORE

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Shell-less egg

Body checked eggs

Differences in sizes are related to breed, strain and age of the birds

Flat sided egg

Pimples and calcifications on the shell

Deformed eggs

WASHING EGGS

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All eggs need to be cleaned if they are used for human consumption

- This is a long and tedious chore. This labor requirement is one of the downsides of egg production which is sometimes overlooked by prospective producers who thinks this enterprise would be more to their liking (and easier) than butchering broilers
- See the module on Safe Egg handling in this series

- The key to having clean eggs and less washing and cleaning to do is to have clean nest boxes and making the hens use them

What goes into the price of an egg?

Percentages reported in the Portland Farmers Market webpage
http://us1.campaign-archive.com/?u=032c7f72562b519ff92a6be41&id=52ef8792d5

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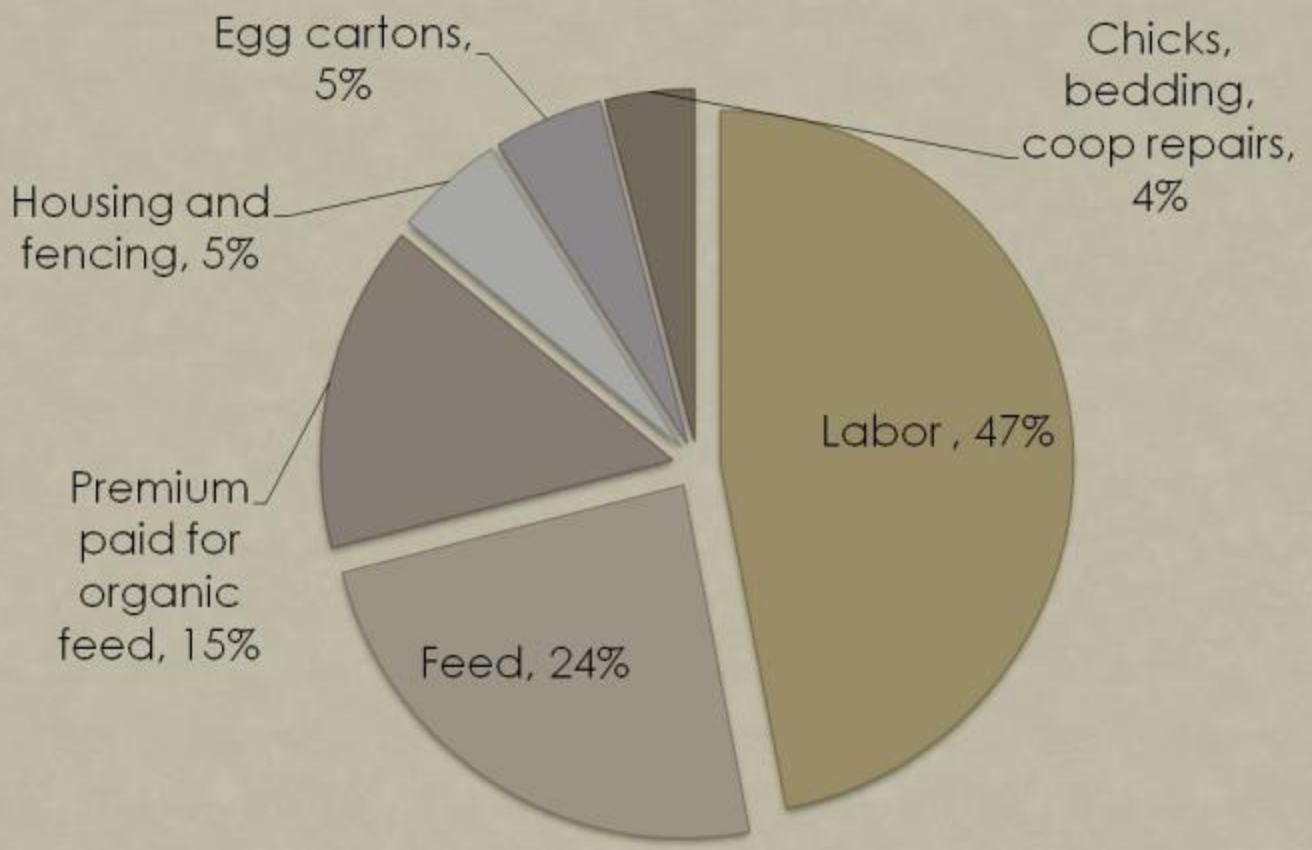

Plus:

- Marketing expenses
- Contribution of farm overhead (buildings, utilities, interests, equipment, etc.)

NEST BOXES

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NEST BOXES

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Hens like to lay their eggs in a dark, safe and secluded places

- Train the hens to use the boxes by leaving them at ground level until the learn how to use them
- Once they are using them, then you can raise them and secure them at 18-24 inches off the floor
- Having the boxes off the floor, discourages hens from scratching in them
- Place a perch just below the entrance to give the hens a place to land when they jump into the nest box

NEST BOXES

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- Usually one box for every 4-5 hens is enough
  - Some hens prefer "more privacy" so partitions can help with this problem
  - Also, with partitions you avoid having hens walking on the eggs, while they find a spot
  - Boxes should be 12 inches high by 12 deep

NEST BOXES

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NEST BOXES

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- Dirty nests would be a problem in any system of production, but in pasture it becomes a real problem
  - On rainy days, when the hens are wet, they get the nest bedding and the eggs covered in mud
  - Keeping the bedding in the nests fresh and clean is the best thing one can do to minimize cleaning chores later on

One option is to open the nest boxes early in the morning and then close them at night so that they don't sleep in them and soil their nests

NEST BOXES

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- Some system to close the nests at night is always a good idea
  - Doors
  - Nest boxes usually have a perch in front of them, you can put them on hinges or screws so that you can put them up in front of the nest entrance to block the hens from entering the nest

The board serves as a step to get into the box

- The board can be lifted during the night to block the entrance
- This specific design also has a flap that hides the eggs after they roll out and protects the eggs

NEST BOXES

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Some hens need a "hint" as to where to lay their eggs

- **Some producers put some wood or ceramic eggs in the boxes so that the hens can see them and lay their eggs in the boxes**

Put new bedding and fake eggs in the boxes to help the hens "get the idea"

"Fake egg"

HOUSING

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HOUSING

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- **An important difference between keeping broilers for meat and layers for the eggs, is that you will keep these hens for several years**
  - Usually 2-3 years, as opposed to a several weeks for broilers
  - You will need to protect the hens during cold winter months and during the heat of summer
  - Your housing design will have to be able to accommodate these challenges

Winter housing

HOUSING -- WINTER

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Enclosure

- If you have to keep the animals inside for periods of time, you will have to deal with manure, wet bedding and ammonia levels in their winter enclosure
- A fully protected run can allow them to go outside even in the coldest days
- Add extra bedding to keep them further protected from the cold

Winter in a hoophouse
In the spring the hoophouse can be used for horticulture to make a good use of the litter and all the manure

HOUSING -- WINTER

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Temperature

- Prevent drafts. The hens can tolerate cold temperatures, but not drafts
- They will need heat sources during the winter
- The house needs to be kept at 55-65°F
- If you don't food intake will increase significantly, egg production will drop and you risk health problems in the flock

HOUSING -- WINTER

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Lighting

- To keep the hens laying eggs and avoid molting in the winter (loosing the feathers in winter is not a good idea!)
- Supplementing light is advisable in the winter, especially in the north of the country, where days are really short
- Laying hens require approximately 12-16 hours of light to maintain egg production (optimum is around 14.5 hours)
  - Set the timer to go on from 5-8 am and again from 5-9 pm
  - That will give you enough extra light for the hens
  - You could use an electric 40 watt lamp for 10x10 ft area
  - Or a gas lantern, make sure that the lamp has enough fuel for the 3 extra hours and then let it turn off after that.

HOUSING -- WINTER

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FEED

- Hens will only lay eggs after all their other energy needs are met, so if they use their energy intake to maintain body temperature, they won't have energy to produce eggs
- Their food intake will increase significantly to get enough energy, so you should increase the energy levels in the diet to help them meet their needs. Talk to a veterinarian, nutritionist or a more experienced farmer before you make changes to their diet for the first time
- Make sure they always have plenty of food and water available (make sure that waterers and water lines do not freeze

HOUSING -- WINTER

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- As the day grows shorter, the birds eat more for body temperature. If you increase energy in the diet you can keep intake even, and slightly decrease the protein
- Also to control temperature, during the fall months 1 sq. ft. of space per hen is adequate. Give them .75 sq. ft. in December and then .5 sq. ft. in January or February to keep them closer together. This helps you save on heating expenses and makes sure that they can all keep each other warm

HOUSING -- SUMMER

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The birds will eat less, move less and egg production can drop rapidly in hot weather

- Change their diet to reduce protein levels in the diet and increase energy levels
- They will need energy to regulate their temperature and to keep producing eggs
- Visit the extension office in your county or another farm to ask for guidance on modifying the diet of your animals to combat heat stress

HOUSING -- SUMMER

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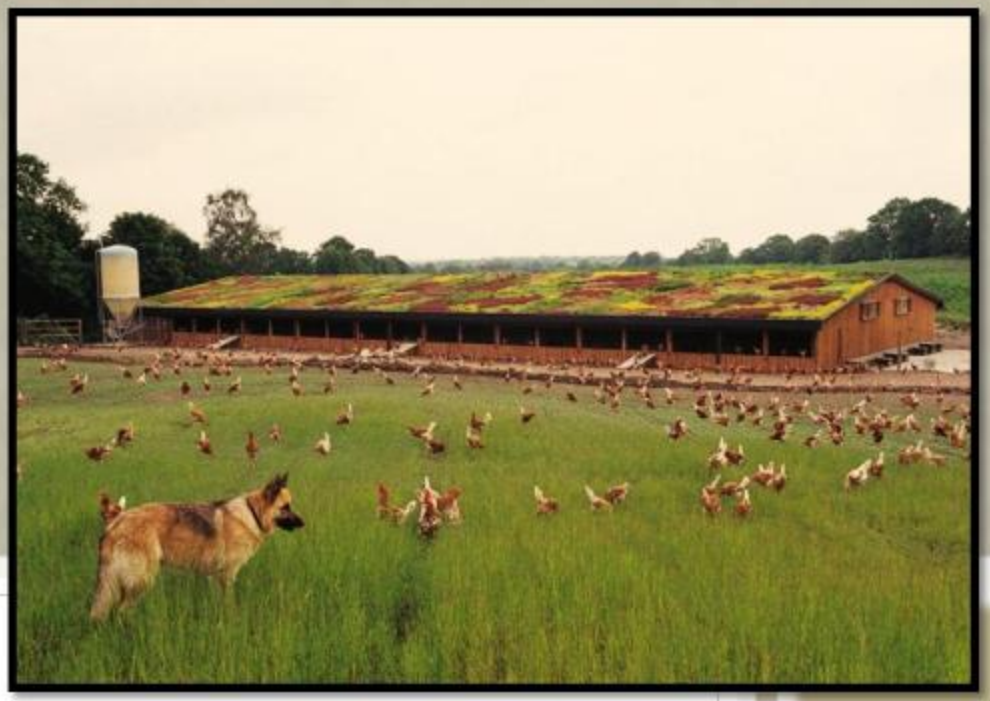
- The hens will need plenty of cool water and shade
- Keep an eye on the hens as they can suffer from heat stroke
  - If you suspect heat stroke in any of your hens, pick her up and take her to the shade as quickly as possible. You can use a fan to cool the bird and hold the wings away from the body to allow them to cool down. Then you can let them sit in a shallow baby pool or bucket with cool water

Also, remember that you will need to pick up the eggs as fast as you can to avoid them sitting in the heat for too long



FREE RANGE

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FENCING / PREDATOR CONTROL

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- Eliminate point of entry for predators
- Eliminate hiding spots
  - Brush, tall grass, trash piles, hay bales, equipment

PREDATORS

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Predators to be aware of:

Foxes	Raccoons
Possums	Dogs
Coyotes	Rats
Weasels	Hawks
Snakes	Owls
Humans	Skunks

Learn signs of attack and killing

- If deaths are occurring at night, house your birds
- If deaths are occurring during the day, improve your fencing or get a dog or burro to keep your chickens safe
- Moving the house often discourages and confuses predators
- If you have the same kind of problem often, you can call the local wildlife or animal control agency to see if they can trap it for you

PREDATORS

- Predators vary by location
- Each require different strategies
- In general, none of them like electric shocks or dogs
- Standard fencing will not keep them out

Single line electric fence around the exterior wall

Clues	Likely times	Predator
One or two birds killed		
Entire chicken eaten on site	Dusk/dawn	Hawk
Bites in breast or thigh; abdomen eaten; entire bird eaten on site	Night	Opossum
Deep marks on head and neck, or head and neck eaten, maybe feathers around fence post	Night	Owl
Entire chicken eaten or missing, maybe scattered feathers	Early morning	Coyote
One bird gone, maybe scattered feathers	Dusk/dawn	Fox
Chicks sometimes pulled into fence, wings an feet not eaten	Nightly	Domestic cat
Chicks killed, abdomen eaten (but not muscles and skin) maybe lingering smell	Night	skunk
Head bitten off, claw marks on neck, back and sides, body partially covered with litter	Night	bobcat (rare)
Bruises and bites on legs, partially eaten chick with head down tunnel	Night	Rat
Backs bitten, heads missing, necks and breasts torn, breasts and entrails eaten, bird pulled into fence and partially eaten, body found away from housing, maybe scattered feathers	Every 5-7 nights	Raccoon
Several birds killed		
Birds mauled but not eaten; fence or building torn into; feet pulled through cage bottom and bitten off	Anytime	Dog
Bodies neatly piled, killed by small bites on neck and body, back of head and neck eaten	Night	Mink
Birds killed by small bites on neck and body, bruises on head and under wings, back of head and neck eaten, bodies neatly piled, faint skunk-like odor	Night	Weasel
Rear end bitten, intestines pulled out	Night	Marten
Chicks dead, maybe faint lingering odor	Night	Skunk
Heads and crops eaten	Every 5-7 nights	Raccoon

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Clues	Likely time	Predator
One bird missing		
Ranged bird missing, feathers scattered or no clues	Dusk or dawn	Fox
A few scattered feathers or no clue	Dusk or dawn	Hawk
Fence or building torn into, feathers scattered	Anytime	Dog
Ranged bird missing, feathers scattered or no clues	Dusk or dawn	Cougar (rare)
A few scattered feathers or no clues	Night	Owl
Small bird missing, lingering musky odor	Night	Mink
Ranged bird missing, no clues	Night	Bobcat (rare)
Several birds missing		
No clues	Anytime	Human
Ranged birds missing, feathers scattered or no clues	Dusk or dawn	Fox
Ranged birds missing, no clues	Early morning	Coyote
Ranged birds missing, no clues	Day	Hawk
Chicks missing, no clues	Day	Snake
Small birds missing, bits of coarse fur at shelter openings	Night	Raccoon
Chicks or young birds missing	Night	Rat, cat
Eggs missing from nest		
No clues	Day	Snake
Empty shells in and around nests	Anytime	Dog
Empty shells in nest or near housing	Day	Jay, crow
No clues	Night	Rat
No clues or empty shells in and around nests, maybe faint lingering odor	Night	Skunk
empty shells in and around nests	Night	Raccoon, mink
empty shells in and around nests	Nightly	Opossum
Eggs missing under broody hen		
No clues or faint lingering odor	Night	Skunk

ELECTRIC FENCING

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- Clip onto existing high tensile electric fencing
- Portable chargers, battery only
- Solar only charger, weak and ineffective
- Portable battery charger with solar panel to recharge battery
  - Must size the solar panel charger to the battery

- High grass will short out the fence leaving a very low voltage on the fence.
  - Mow a strip where the fence will go
  - Must have a good ground
- Must have a strong charger, 0.5 joule per 164 feet of electronetting

LIVESTOCK GUARDIAN DOGS

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- Any dog that won't chase and kill chickens
- It is better to have more than one dog, more depending on the type of predators and intensity of predation
- Both males and females are effective
  - Always neuter your guard dogs to avoid distractions and protect them from unwanted attention (e.g. wolves)
  - Most guardian dogs mature slowly and reach maturity around 18-30 months of age

Great Pyrenees

Maremma or Abruzzese

Akbash

Polish Tatra

Anatolian shepherd, Kangal or Karabash – black head

LIVESTOCK GUARD DOGS

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PROS

- Great for free range and day range
- Great for multiple species
- They also keep people out of the pastures
- Cheaper than buying fencing
- Don't have to move fencing

CONS

- Trial and error
- Must have good perimeter fence
- Barking can be an issue with neighbors
- Feed can be expensive
- Not always easy to get the dogs to the vet
  - Need special training and socialization
  - Must learn how to handle and care for your guard dogs as they have different behavior issues than pets

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WANT MORE INFORMATION?

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APPPA American Pastured Poultry Producers Association	www.apppa.org
Pastured Poultry Resources	pasturedpoultry.org
Pasture poultry yahoo group	http://tech.groups.yahoo.com/group/PasturePoultry
Appropriate Technology Transfer for Rural Areas (ATTRA)	attra.ncat.org
Sustainable Agriculture Research and Education (SARE)	www.sare.org