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

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Pastured poultry
Free range chicken

This project is partly sponsored by
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What is pastured poultry?

It is a sustainable agriculture technique that calls for raising of poultry on pasture, as opposed to indoor confinement.

Pastured poultry is perceived as promoting welfare to the animals and nutritional content, texture and/flavor of the products

Also it is gaining popularity because it helps increase farm productivity by improving pasture fertility

What is your idea of pastured poultry?

Pastured poultry vs. free range

- Most people like the term "free range"
  - Free range only means that they are not kept in cages but there is no clear definition or regulation to define this term
  - It sounds like "farm chicken"
  - Some people say that "pastured poultry" sounds like pasteurization
  - "Grass-fed" is starting to catch on with the public

Why pastured poultry?

There are many reasons to start a pastured/free range chicken operation

- Lifestyle?
- Concerned about animal/environment welfare?
- Hobby?
- Personal Use?
  - Friends and family?
  - Once a year, weekly, everyday?
- Sales?
  - On farm sales
  - Farmers' Markets/CSA's/Restaurants
  - Food Stores
- On-farm Manure?

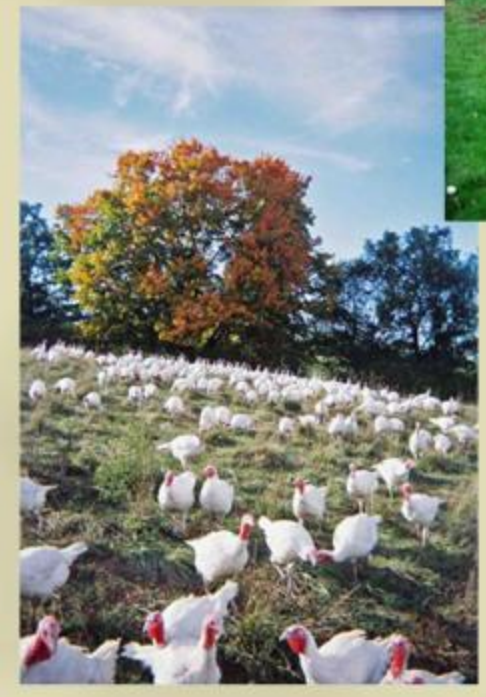
Why pastured poultry?

- Low capital investment
- Can start small and grow
- Strong demand
- Potential for extra farm income
- Can be run by one person (considering 100-250 birds)
    - About 20-30 hours a week
    - The majority of time is for watering and feeding
    - Usually it is a 4-6 month operation a year
    - Annual return of approximately $5,000 a year (after covering initial expenses)
- Chickens build soil fertility
- Chickens attract customers for other products

Raising pastured poultry

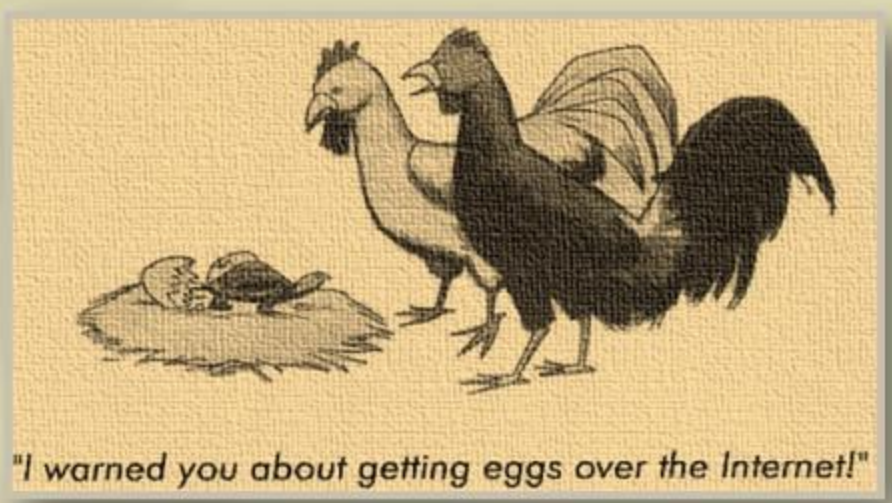
Whether you are raising birds for profit, for personal consumption or as a hobby there are many things that need to be considered

What are you interested in doing?



Getting started

- Choice of hatchery depends on:
  - species and breed you are looking for
  - hatchery reputation and customer service.
- location of the hatchery
  - especially with regards to how far away they are
- Remember: "Cheaper is not always better."



Getting your chicks

In general, you have 2 choices:

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 thought the mail
    - It helps with planning because you will know for sure how many chicks you will get
    - Plus, most hatcheries offer you the choice of all males, all females or "straight run" which is the natural mix of genders at hatching (about 50-60% males)
    - 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
    - For other species, the minimum order may vary, for duckling for example, it can be 10, 12 or 15
    - This is a great way to find some unusual breeds or to expand your business

Getting your chicks

- Chicks are shipped in cardboard boxes designed to keep them warm while allowing fresh air inside for them to breath
- Although some hatcheries use small boxes designed for 25 chicks, many can use boxes that fit up to 100 birds in them
- Before placing your order, check on shipping options
  - Birds are shipped via express mail or priority mail to ensure quick delivery, which is always better for the chicks
  - Call the post office and let them know, they will usually call you to pick your order instead of delivering and leaving a box of chirping babies by your mailbox
- Try to find a hatchery nearby instead of shipping birds across the country

Brooding

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

NURSERY MINDSET!

Set up everything well ahead of time!!

On the day that you are receiving your chicks:

- Be ready to pick, transport and set your chicks promptly
- Area should be clean, pest and disease free
- Heaters should be on 12-24 hs before to make sure that the area is warm when they arrive
- Feed and water must be at least room temperature
- Be prepared to check your chicks at least twice per day
- Be prepared for about 4-5% mortality within the first week
    - If you ordered your chickens thought the mail, you need to open the box at the post office to make sure that all your birds are there and okay. If there is any losses, the postal employee needs to sign your claim form

Brooders

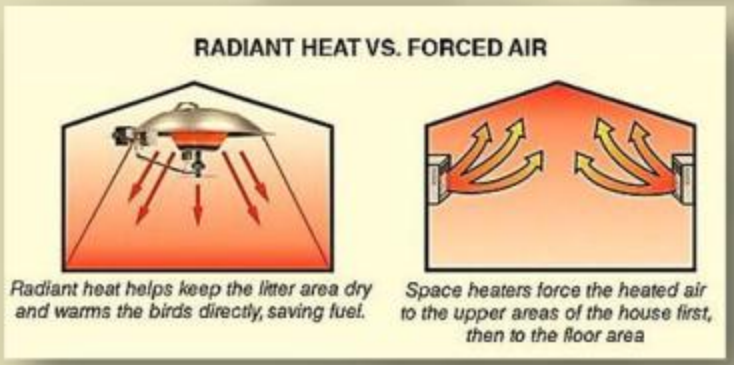
Brooder

Electric Lamp Hover Brooder

Temperature

- **Always start at 90-95°F**
- Adjust for bird comfort
  - One 250-watt infrared lamp is enough for 25-100 chicks
  - Hang the lamp about 18 inches above the chicks
  - Cold birds will huddle
  - Hot birds will disperse and pant
- Drop temperature 5°F every week
- Drop to ambient temperature or 55-60°F

Temperature



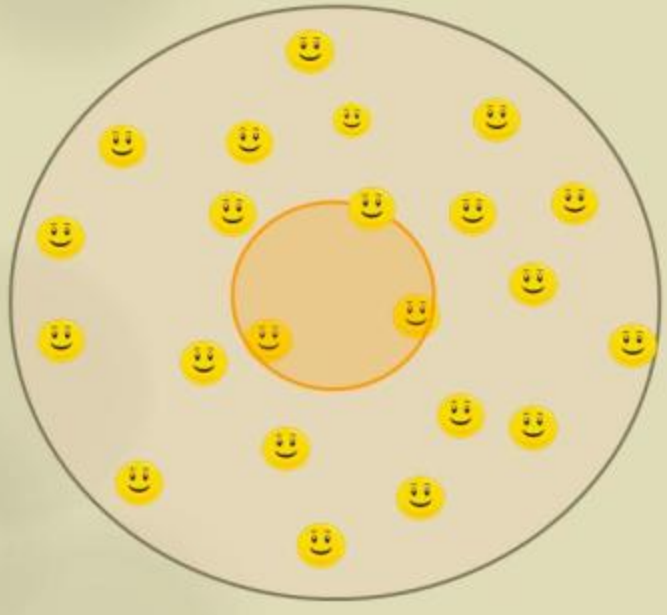
- **Electric heaters**
  - Electric utility heater
  - Standard or heavy duty brooder lights
  - Infrared heaters (tubes or ceramic)
  - Flat panel heaters
  - Heater mats
- **Gas brooder**
  - Gas-fired infrared system
  - Depending on the area it might be cheaper than electric
  - Portable propane heaters


Ohio brooder (AT Hagan)

- **Ohio (Hover) brooder**
  - Upside down box with legs with heat lamps inside. The legs give 4 inches clearance so the chicks can go under the brooder into the heated area. The food and water is outside in a fenced area. Put the lamps in one side so that there is one warm area and one cooler zone so that they can choose where to go (you could add an extra lamp on the opposite side of the brooder, if it a particularly cold week)

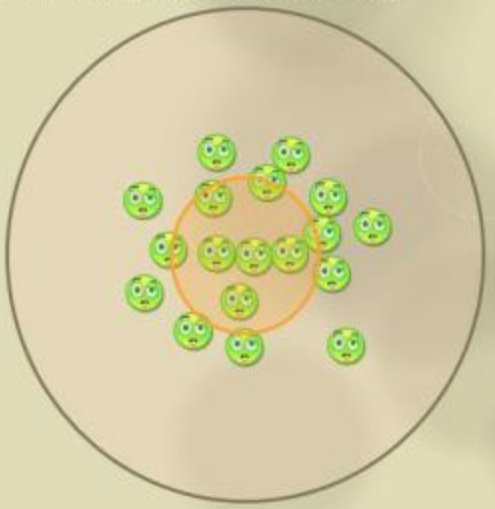
Temperature

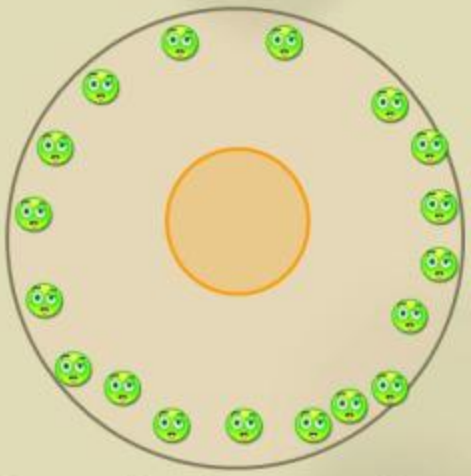
The chicks behavior will tell you if the temperature is right or not



Evenly spaced out.
This chicks are just right!!

Huddled under the heater.
This chicks are cold!!

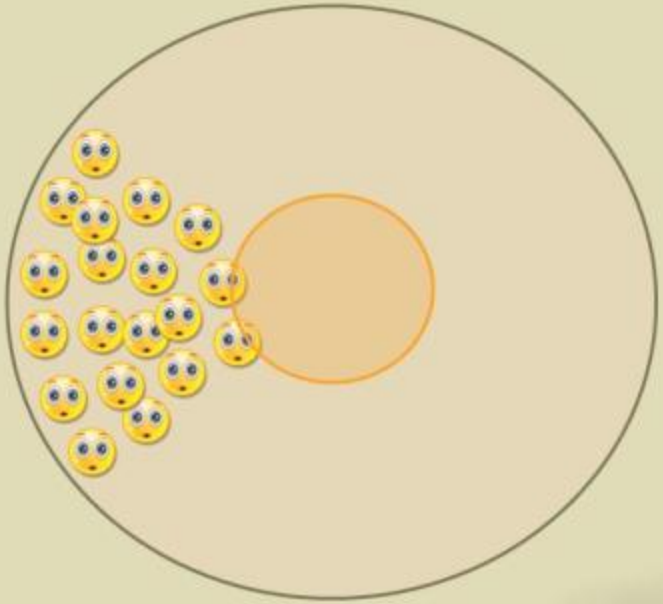




Spaced as far away from the heater as possible.
This chicks are too hot!!

Temperature

- Chicks that are in a draft move to a protected area away from the draft
- Use tissue paper to look for drafts before chicks arrive
- If you are not moving but the tissue paper is then you have a draft
- Find were the draft is coming from and protect the chickens from it



Brooder set up

Adequate space		
First 2 weeks	.25 sq. ft./bird	Brooder room
Next 2 weeks	.5 sq. ft./ bird	Pen or pasture shelter
Next 4 weeks	1 sq. ft. /bird	Pen or pasture shelter

Always have plenty of feeding and watering stations

- Minimum three 2 gallon waterers/100 chicks
- Minimum of 12 feet of space in feeders/100 chicks
  - (two 3 feet long feeders)
  - Keep feeders and waterers filled all the time

Waterers and feeders

It is very important that you show the chicks where the water and feed are by dipping the tip of their beaks in the water and feed

First stage waterers

There are many choices of waterers. They are generally divided as those for the first stage and second stage

- In the first stage, the waterers are smaller and clear to monitor water consumption and cleanliness of the waterers
- In the second stage, when the chicks are 2 weeks old, you can switch them to automatic or larger waterers

Some commonly used waterers are:

- Glass ball waterers with galvanized bottoms
- Plastic waterers with red bottoms
- Bell waterers
- Gravity filled drinkers
- Nipple waterers

Brooder

BEDDING

- Pine shaving
  - Don't use sawdust
- Sand
- Rice hulls
- Processed paper products

- Hay or straw can clump and don't hold moisture well
- Keep bedding clean. Add fresh shavings often
- Stir bedding

VENTILATION

Make sure there is enough natural ventilation

- High ammonia or dust can cause respiratory problems
- Make sure the air doesn't get too dry under the heat lamps

When to move them out of the brooder?

- Consider the weather (is it cold, will it rain in the next 48 hours?)
- It is better to wait until they are almost or fully feathered to protect them from temperature changes
- By 2-3 weeks of age they are usually ready, depending of breed… For example, the Cornish cross feathers slowly
- Have feed and water close by so they can eat as soon as they get to their new place
- Some people prefer to move them at night to reduce stress

Moving out

Pasture in "Pastured" Poultry

When we speak about pastured poultry, the pasture part becomes an essential component of the production system

- Vegetation must be 4 inches high or shorter
  - Vegetation will contribute about 1/3 of the diet, including the bugs and worms that they catch
- Make sure that the area is clean, dry and that there are no poisonous plants (the birds will surely try them)
- They need to have protection from the sun and wind and an area for dust bathing and scratching

Pasture: what to plant?

- Usually mixed prairies work better (grasses + legumes)
- Birds prefer plants with low fiber content, tender and short plants are better because as they grow the fiber content increase

- Grasses may be annual or perennials
  - Bunch type grass (orchard grass)
  - Sod-forming grass (Kentucky grass)
- Legumes
  - What grows well in your climate and soil
    - Summer and winter

If you are going to have the birds grazing with other species of livestock (e.g. sheep, goat, cattle), you need to take into consideration the needs of both groups of animals

Free range

Remember that chickens usually are prey! So they don't like being out in an open field

- You will have to provide them with:
  - Shade or shelter
    - Bushes or shaded areas will provide shade and shelter and encourage them to walk around the range (edible bushes are a double motivation!)
    - Water and feed outside will also encourage them to range
  - Perches and dusting areas are also needed

Pasture: preserving quality

- Frequent moves of the shelter and rotating the pastures helps to:
  - Spread manure effectively (fertilizing w/o overload)
  - Limits chicken scratching and allows the pasture to recover
  - A thick and lush pasture will promote bugs, insects and worms for the birds to eat
  - Helps to keep the birds clean and promotes chicken health by limiting pathogen buildup
  - Allows to incorporate other livestock into the rotation

Sharing pasture

- Ruminants (cattle, goats, sheep)
- Keep grass short for chickens
- Chicken feed problem
  - Everybody likes it!
- Other poultry
  - Laying hens
  - Ducks and geese
  - Turkeys
  - Others (quails, pheasants, etc.)

It is important to consider that some poultry species can share some diseases, so you shouldn't have them in the same area
For example, chickens act as carriers for blackhead disease (histomoniasis), which doesn't affect the chickens, but has very high mortality for turkeys

Seasonal or year around

- Climate factors
  - Winter challenges: cold and frozen water
  - Summer challenges: heat and humidity
    - Shade is essential!!
    - Poultry cannot sweat! They pant and cup their wings away from their bodies so air can reach the un-feathered skin in their "armpits"
- Market factors
  - Year round or seasonal sale outlets
  - Customer interest in purchasing weekly or stocking up?

Just because the chickens have outdoor access that doesn't mean that they will be OK.

They still need food, water, protection from predators and the elements, hygiene and disease prevention strategies

Housing

Fixed houses

Portable houses

Portable small pens

Imagination is the limit!
Chicken coops

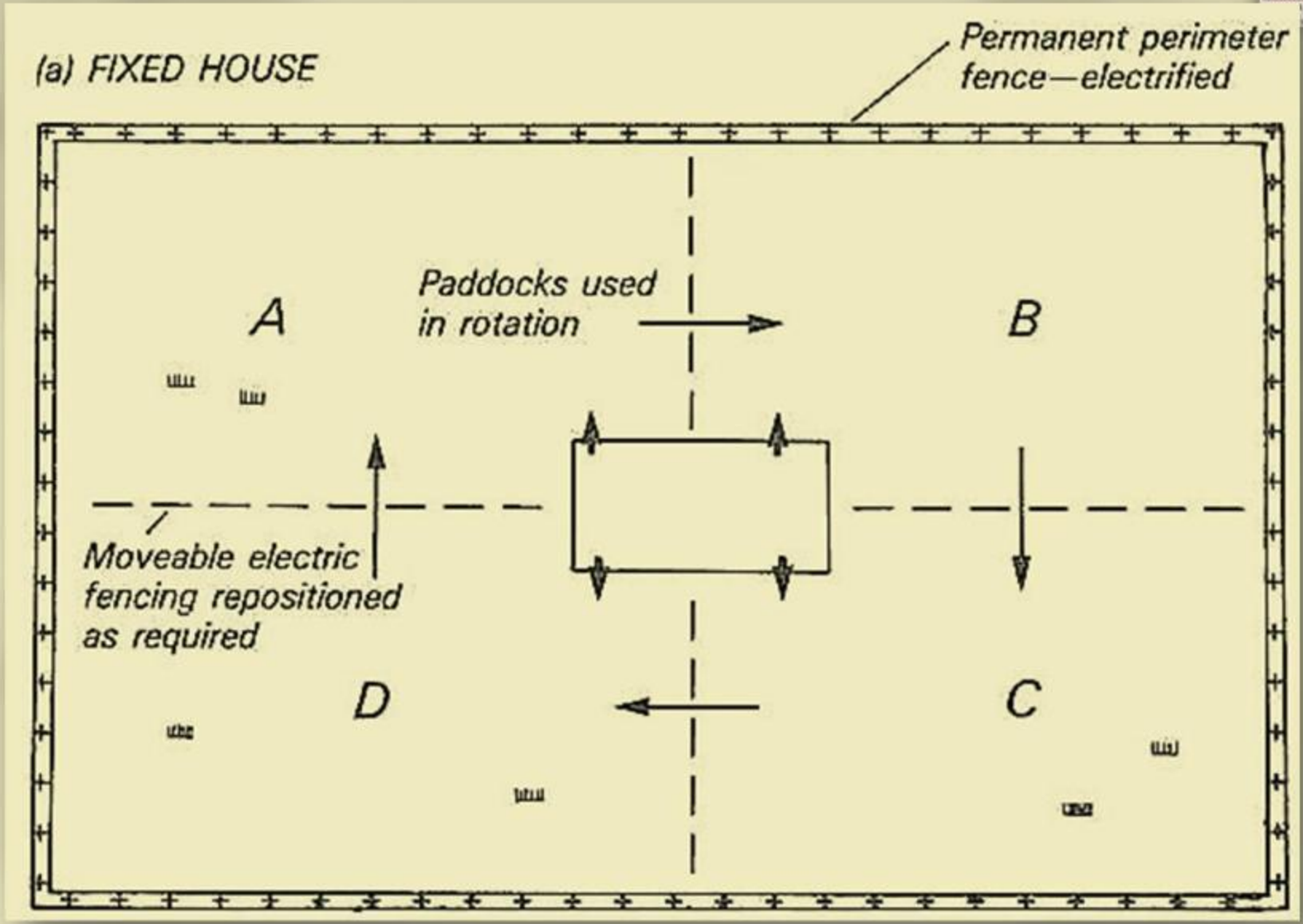
Pastured poultry

- Birds in small portable houses need to be moved everyday
  - Birds eat more during dawn and at dusk so try to move them early in the morning
  - Some people move it twice a day as the birds grow older
- Thick vegetation will support a lot more insects

There are many options to move and keep your birds

- Semi-fixed house with large grazing area useful for rotational grazing

- Portable house with wheels that can be moved daily to a new grazing area and allows to keep the birds inside for the night



Multiple Yarding

Thear, 1997

- According to the USDA, Free range means that they need to have access to out-of-doors space for at least 51% of their lives.
  - Free range is permitted on labels after review process
  - Producer must submit description of production

Changes in temperature

- They don't like weather changes!!
  - In general they don't do very well when there are big changes in temperature (30 degrees difference from night to day)
- Protect from rain or wind by putting straw under them and around the pens and in low spots
- Flooding rain is the worst problem because chickens sit in water and can't warm up.
  - They tend to pile on to stay warm and this causes mortality from piling

Feeders

- Easy to clean
- Prevents roosting
- Lipped on the edge to prevent feed being wasted
  - Start them on a tray or small lid, when they start scratching the feed, it is time to move them to a feeder (2 wks)

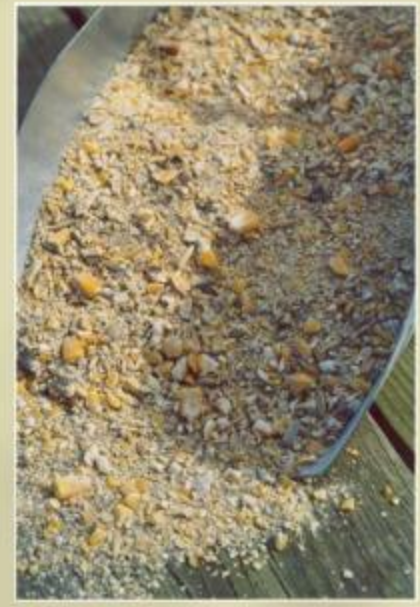
- Design
  - Round/gravity fed (less refilling)
  - Trough (more feeder space)
- Material
  - Metal (rusts)
  - Plastic (easy to clean but may become brittle with sun and cold)
  - Wood (hard to clean, rots)

Feeder options: make our own

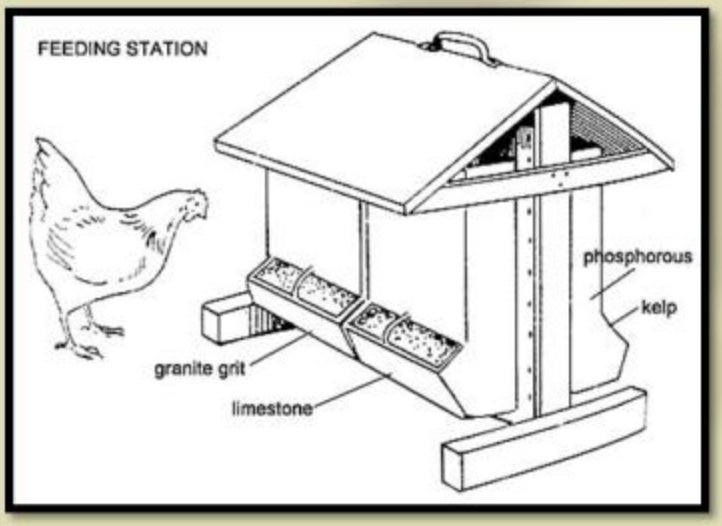
- Low cost, easy to clean feeders
- large diameter PVC pipes
  - Cut in half lengthwise
  - Or cut out 1/3 of the top
  - Add feed and ends
  - Plastic gutter
  - Suspend inside pen or add feet

Feed options: sources

Feed store commercial bagged feed	Custom formulation/ self mixed	Custom formulation/ custom med
Convenient	Least convenient/ labor and more research is needed	Convenient if delivered
Usually medicated	Can include or exclude meds depending on the situation	Can include or exclude meds depending on the situation
Exact composition of the feed will vary with the price of each ingredient	Can control ingredients/ choose high quality	Can control ingredients/ choose high quality
Practical for low to medium volume	Workable for low volume, becomes labor and /or capital intensive with growth	Medium to high volume solution; may need to order by the ton



Feed ration: other additions



- Whole grains
- Alfalfa meal
- Kelp meal
- Probiotics
- Fish meal
  - High protein and essential amino acids
- Hard grit (flint, granite, small rocks)
  - Aids in digestion
  - More growth per lb. of feed
  - Provided with feed or free choice
  - Crushed oyster shell or limestone grit can also added as a soluble grit and sources of soluble calcium

Poultry Feed

- **Commonly used ingredients**
- **Corn** (ground or cracked)
  - Primary energy source
- **Roasted soybeans or soybean meal**
  - Primary protein plus some energy
  - Never use raw soybeans (trypsin inhibitor)
- **Oats**
  - Fiber, calcium, energy reducer
- **Calcium**
- **Mineral and vitamin supplement**

Other considerations:

- Pellets vs. crumbles
  - Crumbles don't gravity feed well with humidity
- Bagged or bulk?
  - Volume, cost, handling
  - Bulk bins or ton bags

Choice of feed types depends on the production system

In conventional poultry production system, you can choose any type of ingredient for your diet, but if your goal is to produce organic poultry products (or you are transitioning into organic production)

- The type of ingredients that can be used are closely regulated by the National Organic Standards Board (NOSB-USDA)

Organic feed

- If you plan to produce organic poultry products then it is essential that the feed that you use is <u>certified organic</u>
  - That means that all agricultural products in the feed and feed supplements must be produced in a certified organic facility, this includes secondary ingredients such as soy oil or wheat middlings
    - NO genetically modified (GM) food or ingredient can be included
  - Non-agricultural natural ingredients, such as kelp, grit, calcium, or fishmeal must be approved for use in organic operations.
  - No synthetic preservatives, antibiotics or coccidiostats, colors, flowing agents or dust suppressants are allowed
  - It cannot include any type of animal products or byproducts

Organic feed

- Unfortunately, certified organic poultry feed tends to be 50-100% more expensive than conventional poultry feed
- Another option is to use non-medicated or supplemented feeds, that are not certified organic. However if you use this option your products cannot be marketed as organic
- It is important to talk to your clients and explain to them how you raise your chickens

Waterers

- The birds must have access at all times to clean and fresh water (to prevent diseases)
- Now you have to consider how to get the water to waterers to the birds in the pasture
  - Long hoses or black pipe
  - Moving water tank
  - Shelter storage (buckets, barrels)

There are many options:

- Materials: metal or plastic
- Automatic vs. manual fill
  - Automatic types
  - Bell type/low pressure
  - Open pan w/float valve
  - Cup waterers
  - Drip line (nipples)

Waterers

- The birds prefer to drink when the waterer is level with their backs or a little higher
- Easy to refill, clean and sanitize
- Hold enough water without running out
- Not easy to turn over
- Not leak
- Designed so that chicks cannot roost on top

Waterers

- Water must be available at all times
  - If you have automatic waterers make sure that water is flowing correctly all the time
- Waterers must be cleaned every day and washed and sanitized often

- Protect your waterers from weather
  - In cold weather, pipes, hoses and waterers can freeze and break. Check your waterers often, your birds could be getting no water or lots of it if your hoses or pipes burst!
  - In the heat, protect the water reservoirs, pipes and hoses from direct sunlight. Water in black hoses and metal pipes, especially, can get very hot very quickly and birds will not drink

Keep dry the area around waterer

Avoid or clean up caking

Layers

Layer pullets are usually raised the same way as broilers

- Leghorn layers usually begin laying at 18-22 weeks of age
- Brown-egg hybrids may start a little earlier (18 weeks of age)
- Dual purpose hens usually start later (24-26 weeks of age)

- Approximately every 25 hours one egg is formed
  - They may lay every day and then skip a day and then start again
  - Most hens stop laying in winter (because of the change in daylight hours)

Roosters are not needed for egg laying

Layers

- In average a hen can produce about 250 eggs or more a year (depends on breed, diet and environmental conditions)
  - Egg size depends on breed, weight and age of the hen (they get bigger with age)
  - Color is determined by breed and environmental conditions (temperature, stress)
- A good laying hen can last for several years, 3-6 in general, but 10-12 is not odd

White-egg	Brown-eggs	Blue-eggs (Easter eggs)
Ancona Appenzeller Campine Buckeye Dorking Fayoumi Hamburg Houdan Leghorn Minorca Old English Phoenix Polish Silkie Sultan Yokohama	Assel Australorp Brahma Chantecler Cornish Delaware Dominique Java Jersey Giant Malay Orloff Orpington Plymouth Rock Red Sex Link Rhode Island Wyandotte	Ameraucana Araucana

Green eggs result from crossing a blue-egg layer with a brown-egg layer

Penedesca layers lay the darkest brown egg of any breed (people call them "chocolate eggs")

Safe egg handling

- Eggs will easily get covered with mud, dirt, feces, feathers which predispose them to bacterial contamination, thus keeping them clean should be an essential part of your business
- Hens must have access to clean nesting material and a clean area around the nests (you can use wood shavings, shredded paper. Hay and straw can get moldy quickly so keep an eye on it)
- Hens should not sleep in the nest boxes because they will defecate in them
- Some nest boxes have a grill or door to keep birds out during the night
- If you decide to use communal nests, instead of individual nest boxes, you need to follow the manufacturer's recommendations regarding the size of the nest and number of hens (usually no more than 5 eggs per box)

- Most hens will lay eggs within 5 hours of the first light in the morning
- You should collect eggs twice in the morning and check once in the afternoon to reduce the number of dirty and broken eggs
- Collections should be more often in very cold or hot weather

Safe egg handling

One of the first things you should do to avoid dirty eggs is to encourage your hens to lay in the nest boxes

- Provide them with clean nesting material, and change it often
- Keep the boxes in a dark, quiet corner of the coop
- Boxes should be a few inches off the floor
- Some producers set ceramic eggs or golf balls in the nest boxes to give the hens a hint as to where to lay their eggs
- Since most hens will lay early in the first hours of the morning, keep them in the coop until most of the egg-laying is done, that way you maximize the chances that they will lay in the nest boxes instead of running to their favorite spot outside the coop
- Young hens will often lay outside the boxes, so keep an eye on them

Safe egg handling

ALL eggs should be cleaned always

- Eggs are usually covered with dust, mud, feces, feathers that promote bacteria that can contaminate the eggs

Safe egg handling

- There are two options for cleaning the eggs
  - **Dry cleaning**
  - **Wet washing**

- Dry cleaning

  •A slightly dirty egg can be gently cleaned with a soft sponge or brush. Dry stubborn small spots can be gently rubbed with sandpaper

  •Even if the egg appears clean, you should wipe it with a dry soft sponge or towel

Wet cleaning of eggs

There are two very important things to know

1. **Eggs should NOT be soaked or immersed in water**
   - USDA doesn't allow this because it can allow the passage of bacteria into the egg through the shell pores
2. **All the water used for cleaning eggs should be at least 90-120ºF.**
   - If the water is colder than the egg, it will penetrate the shell and could carry bacteria into the egg.

Do not soak eggs!!

Wet cleaning of eggs

The egg is naturally covered with a waxy layer that prevents microbes from entering into the egg (called the cuticle or the "bloom")

- To avoid removing the bloom (cuticle), it is important to limit the amount of time that the shell is wet

This is the reason why old books recommended not to wash the eggs, but that was before refrigeration was available, so now the recommendation is to
ALWAYS clean all eggs for human consumption

Wet cleaning of eggs

- Washing can be done by spraying, pouring or dipping the egg to reduce the time of contact between water and egg
- If you have just a few eggs, use a soft brush and wash them in a sink with hot running water and then dip them quickly in a water with a sanitizer

Wet cleaning of eggs

- There are specific detergents and sanitizers in the market available for egg cleaning.
- For example, chlorine (bleach) cannot be used for organic eggs and detergent for dishes is usually to harsh.
- It you sell organic eggs, you should review the list of USDA approved sanitizers for eggs.

  - If you decide to use bleach, it should be added to about a tablespoon of bleach into a gallon per water (to get about 200 ppm of chlorine)
  - But, the chlorine is inactivated by organic materials such as dirt, feces, feathers, so the sanitizing solution needs to be prepared again as soon as the water becomes dirty

Safe egg handling

- If you have several dozen eggs to wash, make up separate basins of washing water, rinse water and sanitizer solutions
  - Wash each egg separately and DO NOT SOAK!
    - There are specific detergents for washing the eggs that you can buy (dish detergent can be too harsh!)

  - **Dip the egg in rinse water and then dip in the sanitizer**
    - You can wash the eggs and then put them in an egg basket or colander to rinse and sanitize several eggs at the same time
    - You should change the wash and rinse water after 3 or 4 dozen eggs. The sanitizer water should be changed when it looks dirty or murky

Safe egg handling

- Eggs are usually left to air dry or wiped dry
  - A fan can help to dry the eggs faster
  - Eggs should be completely dried to avoid the development of fungal or microbial organisms

This kind of trays help to dry the eggs faster and can be stacked, if needed

- After washing, eggs should be stored at 45ºF and 70-80% humidity
  - Clean eggs stored at these conditions can keep for up to 3 months
  - In a standard refrigerator, the humidity is lower (usually around 40-50%) and eggs should only be kept for 5 weeks

Safe egg handling

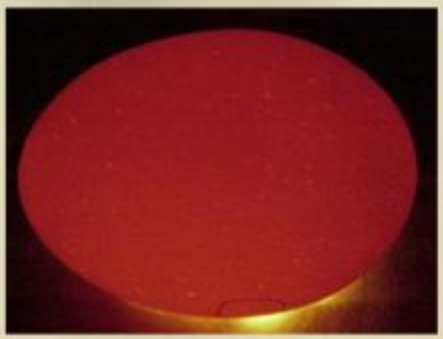
Final notes:

1. Only potable water should be used for egg cleaning
2. Use gloves to protect your hands from the hot water and sanitizers
    - If the eggs are too cold, let them get to room temperature before you wash them with hot water to avoid cracking them
3. Brushes, towels, sponges, baskets and other tools that you use for washing eggs should be used ONLY for this purpose!!
4. After you finish washing the eggs, you must wash and disinfect all your tools and the sink or tub that you use for egg washing
5. The detergents and sanitizers used for egg washing can affect a septic tank system

Egg candling

•If you have a rooster with the hens, then you might get a fertile egg. Even though there is nothing wrong with those eggs, most people will not appreciate opening the eggshell to find a partially formed embryo

•The easiest way to find if the eggs are fertile is to check them by candling



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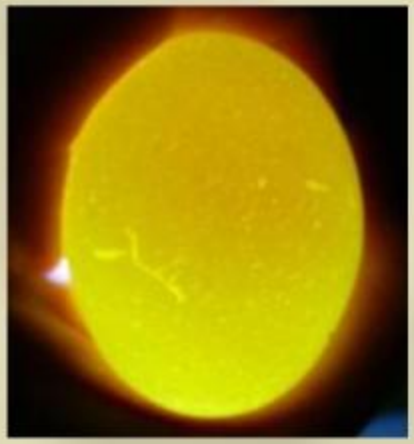
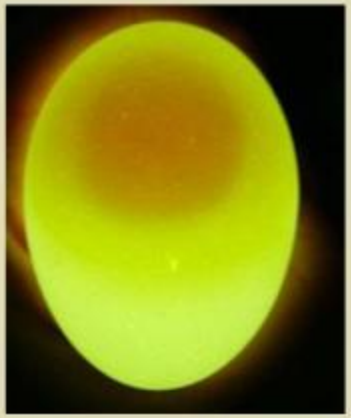
Chick developing





Day 1

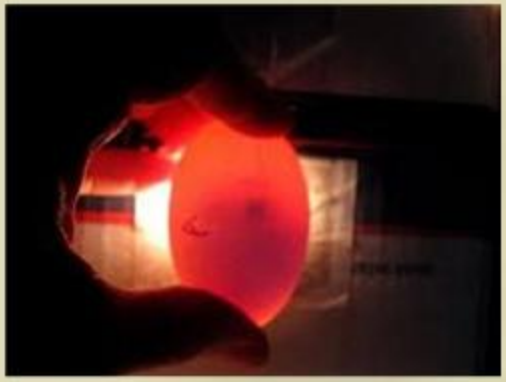
Day 2

Day 3

Egg candling

- **Candling** is a method used in embryology to study the growth and development of an embryo inside an egg
- The method uses a bright light source behind the egg to show details through the shell, and is so called because the original sources of light used were candles
- You can usually see something after day 3 and by day 8 you can see the chick moving inside
- It is not a hard method, but takes some practice

http://landy3008.blogspot.com/



http://www.tillysnest.com/2011/02/candling-eggs.html

Designer eggs?

Pastured eggs reportedly have*:

- **1/3 less cholesterol**
- **1/4 less saturated fat**
- **2/3 more vitamin A**
- **2 times more omega-3 fatty acids**
- **3 times more vitamin E**
- **7 times more beta carotene**

- But, e.g. for vitamin E, the increase goes from **0.8-1 mg to 2-2.5 mg** while the daily recommendation is **22-25 mgs.**
  - In Europe you can get eggs that have up to 6 mg
- You must be very careful in using these claims

*This is the link to the original source for these numbers:
http://www.motherearthnews.com/Real-Food/2007-10-01/Tests-Reveal-Healthier-Eggs.aspx

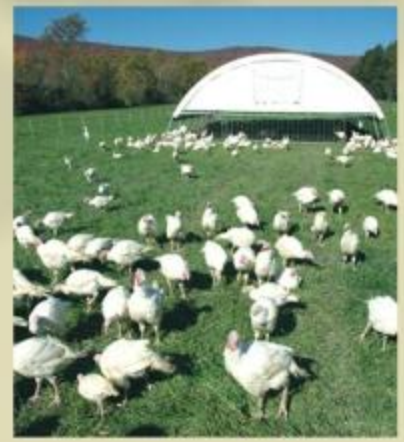
Designer eggs?

- Some egg producers take advantage of consumers' perceptions about pastured eggs to try to promote them as healthier options
  - Eggland's Best stated that their eggs have 25% less saturated fats (this amounts to less than half a gram)
  - Land O' Lakes promoted their eggs as a good source of omega-3 fatty acids and "good for heart health", while the amount of saturated fat and cholesterol in eggs doesn't meet the definition of healthy from the FDA
  - FDA has asked this companies to withdraw these statements as they are misleading
  - You need to be careful of the claims that you make

Other species

Turkeys

- In the brooder they need at least 95°F degrees and need to stay about 4 weeks
- Will eat up to 50% of their diet in forage
- Don't like novelty… keep a routine
- They can be scared of shade and shadows
- They are more tolerant of heat and cold
- Electric netting for day range may not work
  - they will stick their head through!– pens work better



Ducks and geese

- They can be very noisy!
  - Geese can be aggressive
- Choose flightless birds or clip wings often
- Ponds are nice but are not necessary
  - They will still need an area for bathing
  - It is hard to keep the water clean
  - If you want to breed them, then you must have a pond for mating
- Lots of fresh water!
  - They eat and drink and then eat, place feeder and waterer close together
  - They "scoop" the feed up. Avoid powdery foods, they prefer a mash ration
- They can be difficult to process (plucking)

Fencing / Predator control

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

Predators

Predators to be aware of:

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

- <u>Learn signs of attack and killing</u>
- 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

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

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

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

Electric fencing

There are different choices for electrifying your fence:

- Clip onto existing high tensile electric fencing
- Portable chargers, battery only
- Portable battery charger with solar panel to recharge battery
- Solar only charger (can be weak and ineffective, only for small areas)
    - Must size the solar panel charger to the battery

- High grass will short out our 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

- 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

- **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 LGD's as they have different behavior issues than pets

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Want more information?

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