

UNIVERSITY OF
MARYLAND

EXTENSION

Solutions in your community

A Supplement to the PowerPoint Program:

Introduction to Developing a Free-Range Poultry Enterprise



**Terry E. Poole
Principal Agent Emeritus
University of Maryland Extension
Frederick County Office**

Rationale for Raising Free-Range Poultry

Small farm operators looking for a non-traditional farm enterprise to fit the unique needs of their small farm should seriously consider giving free-range poultry a try. Raising poultry requires less startup capital, land, and equipment than other comparable enterprises. An important point is that there is a consistently strong market for fresh, farm-raised eggs and meat birds.

Marketing locally produced poultry products is often made easier by the media as they condition the public to distrust the quality and safety of poultry products in the chain stores. As we have seen with locally grown produce, the public would prefer to purchase locally produced poultry products, because they perceive them to be more natural and safer for their family to eat.

In commercial poultry houses, the birds are raised in confined, unnatural conditions, because of the stress from over-crowding and the air they breathe; the birds are fed feed containing antibiotics. In a free-range poultry enterprise, the birds are raised in a stress-free environment where they are not crowded, have a diet of grains, forage, and bugs, and have plenty of fresh air and sunlight. This is an antibiotic-free system that also includes hand-processing on the farm that ensures that the carcass remains clean and free of fecal matter, which is a contributing factor to food safety regarding commercial poultry products.



Alternative Poultry Production Techniques

While the term “free-range” is often applied generically to all poultry raised outside of a cage, it is not correct to put this label on all alternative poultry production techniques. These alternative production techniques include:

Free-Range: This refers to enterprises using moveable housing with access to pasture. In free-range enterprises, portable houses or pens are moved regularly so that chickens may forage on grass, seeds, and insects outside of the house during daytime hours. At night the chickens return to the safety of the house, where it can be moved to a new site for fresh grazing the next day. This system is popular with egg laying enterprises.



Pastured Poultry: This term is used to describe a modification of free-range. In this system, a field pen is used to strictly control the grazing area and bird density. The birds are pastured in floorless pens and moved daily to maintain a continued supply of fresh forage. This system works well in a rotation where the birds follow cattle. This system is preferred in fryer and broiler enterprises.



Semi-intensive: This refers to a system, where the birds are kept in permanent housing with access to a surrounding yard or pasture. The surrounding yard or pasture should be divided into smaller units or paddocks, where the birds can be rotationally grazed; otherwise they will quickly over-graze the area into bare soil. This system works well with egg laying operations.



Yard and Crop: This is a catch-all term referring to poultry enterprises that do not include a formal plan for rotating pasture or have no access to pasture. In this system, birds are allowed to roam the farm at will and are shut up at night in a house for protection from predators. This is the typical poultry production system on most family farms.



Innovative: In this system birds forage fallow land, such as last year's garden, in a floorless pen, which is moved daily. Birds will feed on weeds, seeds, and insects, as well as depositing manure on the ground for next year's crop. The field will be rotated back to crop production the following year. This would be an alternative to the yard and crop system for the family farm poultry production.



Table Birds: This enterprise refers to birds that are raised and marketed for meat, which includes:

- Fryers, young birds less than 4 pounds
- Broilers, birds weighing 4 to 5 pounds
- Roasters, young birds 5 to 10 pounds
- Capons, males castrated at 3 weeks and sold at 7 to 11 pounds
- Laying hen with eggs, in-production hen is harvested and sold with un-laid eggs
- Stewing Hen, old retired laying hen
- Pieces and Parts, cut up chicken parts sold as value-added product

Layers: This enterprise is especially strong in this region as most people prefer fresh from the farm eggs. There is a year-around demand for both white and brown eggs. Free-range and semi-intensive production systems work well with managing laying flocks.



Turkeys: This is obviously a more seasonal enterprise than raising chickens, however much of the production management is the same. During holiday seasons, this can be a profitable niche enterprise.

Ducks and Geese: This is another niche enterprise to consider. Ducks and geese are very good grazers and fit well in a free-range operation. They are however more difficult to process because of the oil in the feathers, which makes them more difficult to remove.

Game Birds: There are restaurants in the region that would love to be able to offer free-range raised game birds such as pheasant and quail to their customers. The production of these birds is not too different from raising chickens; however the Maryland Department of Natural Resources requires the producer to obtain a license from them before beginning this enterprise.

Breeds

Rhode Island Reds, White Rocks, and New Hampshire Reds are dual purpose breeds that lay eggs fairly well, are deep bodied, and yield a meaty carcass. The Production Red is a genetically improved Rhode Island Red that is a better layer, but is a smaller bodied bird. The White Leghorn is the top bird of choice among commercial egg enterprises. It is a 3-pound bird that produces over 300 eggs per year. The Cornish Cross is the bird of choice in commercial meat-bird enterprises. It is a cross (hybrid) between the double-breasted Cornwell chicken and the White Rock; almost all of the broilers in the U.S. are Cornish Cross.



The marketability of the Cornish Cross needs to be considered when selecting a breed for raising meat birds. Most of the public are not used to tougher, narrow-breasted types of chicken, but niche markets can be developed for the other breeds of birds. Cornish Cross chickens will take more management to produce successfully, since this breed was developed for commercial caged production and not for grazing.

Purchasing purebreds vs. hybrids is a big decision when starting out. Hybrids will be more efficient in egg and meat production, while purebreds will produce more consistent offspring, if producers decide to develop their own replacement flock. Non-hybrid breeds are hardy and mortality for them during production runs close to zero. Non-hybrid breeds take 12-weeks to reach 4 pounds rather than 8-weeks like the Cornish Cross hybrid; this longer production time means that producers can expect less palatable birds and a lower profit.

Producers, who decide to begin their laying enterprise with started pullets (females less than one-year-old, may be limited to one of the hybrid breeds. If producers are willing to raise their own pullets, there may be more options; if they wanted to look at some of the dual purpose breeds. There are some breeds that produce white shelled or brown shelled eggs; producers need to decide which one or both they want to produce.

Inspection

The customer is the ultimate inspector; part of marketing and customer service revolves around their observance of the farm operation. How they perceive the farm's overall management will directly affect their perception of quality control on the products marketed from the farm.

Early direct market poultry producers got around selling processed birds to customers by selling live birds and then providing the processing free. The size and scope of most small farm enterprises should fall through most regulatory cracks; for this reason, it is recommended that first-time producers should start-out small, so that they can see if there are any other red tape issues that they have missed.

Small farm poultry enterprises can process up to 20,000 birds on the farm without having USDA inspection. This works well for direct marketing birds to the public, however if producers decide to sell their birds to restaurants, food stores, or caterers, it is recommended that they get USDA inspected. The laying flock has to be inspected by the Maryland Department of Agriculture (MDA) for diseases that may be carried in the eggs, if eggs are going to be marketed to the public.

There are limited federal regulations on egg laying operations with less than 3,000 birds. The FDA labeling, which includes safe handling instructions, fair packaging, and nutritional information do apply.

Maryland egg regulations apply to all producers regardless of the number of birds. Producers must register annually with the Maryland Secretary of Agriculture; there is no fee for operations with less than 3,000 birds. Registered producers are considered approved by the health department, so eggs can be sold on and off the farm.

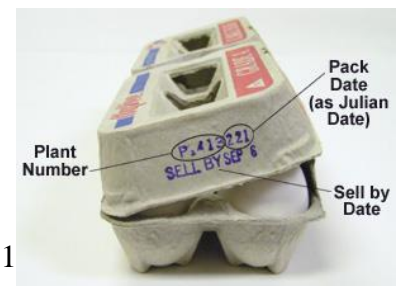
Maryland egg regulations require that flocks must originate from a source monitored for *Salmonella enteritidis*. Registrants must comply with all requirements of the Maryland Egg Law. Producers registered to sell eggs are automatically registered in the Poultry Premise Registration Program.

Maryland egg standards include factors essential to food safety; these include:

- Fresh, clean, and unbroken eggs
- No inedible eggs; large blood clots, mixed rots, or black rots
- No adulterated eggs; contaminated with bacteria, pesticides, or filth
- Must meet weight requirements for labeled size; Jumbo 30 oz./doz., Extra Large 27 oz./doz., Large 24 oz./doz., and Medium 21 oz./doz.

Maryland egg labeling requirements include:

- Grade and size
- Net quantity, weight, or count
- Identity of product, eggs
- Packer or distributor name and address
- MDA registration number
- Lot number to designate flock; small producers can use Lot 1
- Safe handling statement
- Cartons can be reused, but must be clean



Maryland egg regulations include refrigeration. The law requires shelled eggs to be kept at an ambient temperature of 45⁰ F after packing and during transport. MDA allows coolers as long as the eggs are not submerged in ice. Some counties require commercial refrigeration at farmers markets and some also require a retail license to sell at farmers markets.

Very often in today's farming culture we find that the most critical inspector or complainer of a farming operation is the next door neighbor. In order to avoid future

issues with neighbors, it is recommended that neighbors be treated with an occasional bird or some fresh eggs.

Nutrient Management

If the farm generates a gross income of \$2,500 or more, or has eight (8) animal units or more, producers are required by the State of Maryland to have a certified nutrient management plan. This is a result of The Water Quality Improvement Act of 1998, which was enacted to help protect the Chesapeake Bay and its tributaries from nutrient run-off pollution. An animal unit is defined as 1,000 pounds, for example 2,000 four pound fryers would be an animal unit. Animal units on a farm would include the total weight of all of the animals, including poultry, goats, sheep, cattle, horses, etc.



In its simplest form a nutrient management plan is an outline or accounting of what plant nutrients are generated on or are brought onto the farm; this includes animal manures, compost, and commercial fertilizer. Producers can hire someone to write a certified plan for them, or they can become certified to write their own plan. The local University of Maryland Extension office can be contacted for more information on nutrient management planning.

Getting Started

The least expensive way to begin a free-range poultry enterprise is by purchasing chicks and raising them to production age. There are some advantages and disadvantages to doing it this way. In addition to being less costly, chicks are less likely to bring a disease in with them to the farm that could devastate the flock. Another important positive with starting out with chicks is that they will grow up to become familiar and comfortable with the people around them. The obvious downside with chicks is that they will require a lot of care, if they are to reach production age.



The producer should always expect some mortality of the chicks along the way too; normally, about 1 to 2% of chicks die in the first couple of days after they arrive on the farm. These are typically runts and those that come from the

hatchery sick. If the mortality rate over this same time period is 4 or 5% or higher, something is wrong.

Another option besides chicks when beginning a poultry enterprise is getting started birds; these are typically young birds less than a year-old. This works well for egg laying operations; for example, a producer may consider getting pullets, which are young hens just entering egg laying age. These are a good deal if a producer can get them. This reduces much of the risk in raising chicks, and saves money by not having to feed unproductive birds.

The most expensive way to start a poultry enterprise is with the purchase of mature birds. The upside here is that the birds will be productive immediately and will present the fewest surprises. Besides the expense, other negatives include the risk of disease being higher with mature birds and the fact the age of these birds may not be known when they arrive on the farm.

A good recommendation, when beginning a new broiler enterprise, would be to start with between 50 to 100 birds. Do not worry about selling the first batch of birds; chalk this up to gaining experience and learning how to be a poultry producer by giving the finished birds to friends, neighbors, and relatives and ask them for their feedback on the quality.



About three (3) acres of land is needed for each 400 birds to be raised; this allows for a rotation to a new, fresh acre of pasture each year, giving the previous year's pasture time to be decontaminated of potential disease organisms. It would be perfectly safe for other livestock, except for turkeys, to graze on this pasture during the rest years. In fact, it is preferred to have cattle graze a pasture prior to poultry, since poultry prefer shorter forage and cattle dung provides valuable nutrients and more.

Getting Chicks

When starting an enterprise with chicks, purchase 25% more birds than is expected to be needed; this allows for mortality and culling. When beginning a laying flock, decide on how many eggs will be needed and size the flock accordingly. Unless the enterprise includes raising cockerels (young roosters) for meat, most birds should be hens, since too many roosters will fight.

Initially it is a good idea to get chicks from a hatchery, however a producer may decide, after they have gained more experience, to hatch their own chicks. Once chicks are brought to the farm, be sure to control the cat and dog; they can be one of the deadliest predators of young birds. Rats are also serious predators of chicks. A producer does not really want to add losses from predators to the mortality rate normally expected with chicks.



Commercial feeds such as Game Bird Starter (21-24% protein) can be used for the first 2-weeks, and then can be switched to a locally mixed feed ration. An important note here is that most commercially mixed poultry rations are medicated with antibiotics. If a producer is planning on being certified organic or just does not want to use antibiotics in the feed, the dealer can be asked for antibiotic-free feed.

Cold is one of the hardest and deadliest things on chicks, the season should not be rushed by getting chicks too early in the year. Producers should be sure that, if they are having chicks shipped to them, that the postal truck handling the chicks will have at least 50⁰ F in the non-heated truck. When the chicks arrive, they will need to get warmed up to 90⁰ F as quickly as possible. When they are cold, chicks do not eat, since their first desire is warmth.

For a small batch of about 100 chicks, an area of 100 ft² is adequate; a cardboard box with a light bulb hanging down will work quite well. A thermometer at chick level can be used to monitor the temperature. A waterer and feeder will also be needed, but initially some newspaper with feed and grit sprinkled on it is okay. The main point at this time is that chicks should have unlimited access to feed and water.



Housing Chicks

A 6x8 ft room is adequate for 100 to 200 chicks and a 15x15 room can accommodate 400 chicks. If more than 200 to 300 birds are put together in a room, they should be partitioned apart. Studies have shown that performance drops off in groups of more than 300 birds. More room should be provided for the birds as they grow.

Rooms need to be very weather-tight, since cold, drafty, and damp spaces are lethal to chicks. For heating, some producers use a combination of red infrared 250 watt electric brooder lamps and propane infrared heaters. However, woodstoves, light bulbs, or other innovative devices will work just fine. The temperature at the floor level should be 90⁰ F the first week, then can be dropped an average of 5⁰ F/week after that. Chicks can handle freezing temperatures at three (3) weeks of age; the decreasing temperatures will help to get them ready for moving outdoors. Producers have to be visual observers of their birds. For example, if birds are spread out to the edges of the brooder house, it is too hot for them. If they bunch up under the heat sources, or pile up together, they are too cold.



Bedding

Bedding type and maintenance in chick housing is critical to the health and success of free-ranging pastured poultry operations. Suggested bedding materials include sawdust or wood shavings. Wood shavings are the preferred material, since it is desirable not to use anything that will mat down; materials such as hay and straw will mat. If matting does occur, it reduces manure penetration, which leads to the formation of a damp, filthy layer on top. Wood chips are too big for chickens to scratch around and wire mesh floors should not be used, because they do not allow the chickens to scratch and are devoid of beneficial microorganisms that contribute to the health of young, growing birds.



Joel Salatin, a pioneer in the history of pastured poultry, found a direct relationship between mortality and the quality and quantity of bedding. He observed that, when the brooder house was cleaned out and new bedding was put in, mortality was higher than if it was not cleaned, but only aerated and new material was added on top of the existing bedding.

What Joel Salatin discovered was that it was healthier for the chicks, if the bedding was managed as a compost pile. For best management of composting material, it should have a carbon: nitrogen (C: N) ratio of 30:1. The easiest way to determine if the ratio is right is through smell, if there is the smell of ammonia, there is not enough carbon to soak up the excess nitrogen. Raw poultry manure has a C: N ratio of 7:1, cow manure is 18:1, and wood shavings are 500:1. Carbon bonds quickly to soluble nutrients, so anytime the smell of ammonia is detected in a livestock facility, some carbon-based material can be spread on the area to reduce the smell. It is best to always keep a supply of clean, dry shavings handy to throw on damp spots, especially around waterers and under lamps where birds hang around. If the C: N ratio is correct, the bedding will compost if air is injected into it.



Between batches of chicks, the bedding litter can be wet down with water and then stirred with a rake or fork; this injects the needed air into the bedding. After this, a couple of inches of fresh shavings can be added on top. In Joel Salatin's system there is no need for regular major clean outs of the room, which usually requires the use of sanitizers and germicides.

Salatin found that, the deeper the bedding, the better it supported the composting process of the litter material, which also provided extra heat for the chicks during the process. Deep bedding also provided an environment, which supported an ecosystem that included insects and other small creatures that served as a bonus food source for the birds. Foraging for these creatures help chicks learn the necessary skills for when they are moved to pasture.

It will be up to the producer to decide when it's time to clean out the house; Joel Salatin waits until the bedding is about 18 inches deep, since this is all that his room can accommodate. A warm, sunny day should be selected when tackling the job of cleaning out the house; this will help it dry more quickly. It is recommended that the walls and equipment be lightly sprinkled with some water, so as to reduce the dust as the room is cleaned. Remove everything that is portable including feeders, waterers, nests, and cages, before you start to remove the litter and droppings from the floor. This material should be pretty well composted by this time, so it can be spread onto a field or garden area where birds will not be grazed for at least one to two years. Be sure to remove all dust and cobwebs from the ceiling, walls, fans, vents, and equipment. Make sure to thoroughly scrape any lingering manure from perches, floor, and other places. When satisfied with the broom and scraper job, apply detergent, hot water, and brush to the ceiling, walls, and everything else that is washable. When finished, open up the room and let it completely dry before putting in fresh bedding.



Feeders

Chickens should never be debeaked, if they are expected to forage on plants and critters; debeaked chickens are useless on pasture. There is no need for debeaking chickens in non-caged systems, because cannibalism in open systems is not a problem. The birds are not stressed, bored, and there should be no nutritional deficiencies.

When feeders are set out for chicks, there should be enough linear space to accommodate 35-50% of the flock at any one time. It is not necessary to accommodate feeding space for all of them at one time, since chicks will spend a lot of time sleeping. When the chicks line up at the feeder count them, and if it is full of birds and not at least 35% of them, add some more feeders.



Every few days, feeder space will change as the birds grow, so fewer will fit around the feeders. Experienced producers say that, one of the easiest ways to foster leg problems in chicks is associated with the stress resulting from inadequate feeder space. It is also important that you make sure that the chicks never run out of feed; it is better to waste some feed rather than have them not have enough to eat.

Trough type feeders will provide more linear space than round types. Chicks should not have to stretch for their food, so the feeder should be nested into the bedding a half-inch or so to make sure the feeder lip does not exceed beak height.

Birds want to search down in the feeder for food and stretching too much can cause leg problems. The lip of the feeder should hit the birds at about breast height.

Waterers should be elevated as chicks grow for both cleanliness and drinking efficiency. For this reason, the waterer lip should be higher than the feeder trough.

Feeding Grit and Vegetable Matter

Silica and grit are necessary to the digestive process, where it serves as food grinding stones in the bird's digestive system. There are commercially available grit materials that can be purchased; however there are some producers who use creek sand and aggregates, which they believe have a more diverse content of minerals and more. Grit should be made available to chicks as soon as they arrive; it can be spread out onto newspaper along with some feed sprinkled on top of it to ensure that the chicks receive a good dose of grit right away.



Vegetable matter type feeds, such as hay chaff, lawn clippings, and weed seeds can be made available to chicks. They are nutritious and stimulate the scratching skills they will need when they begin foraging in the pasture. However caution needs to be taken with feeding too much of these fresh materials, since these types of feed are low in energy and reduce the amount of grain that is eaten.

Moving Chicks to the Field

If it is warm enough, the birds can be moved to pasture at 2 to 4 weeks of age. Joel Salatin waits until they are 4 to 6 weeks old; however it really depends on the weather.

When the birds can stand the nighttime temps without piling, they are ready to go outside. It is best to move the birds early in the morning, if it is going to be dry and warm. They can be loaded directly into the skid or mobile chicken house and towed to the field; they can also be moved to the field in chicken crates. If a confinement cage system is not being used, it is best to keep them in the mobile house or pen the entire first day, so that they can bond with the new environment; otherwise they will leave and not return when they are let loose. In the mobile house system, it should be moved to the next site in the pasture after the birds are in for the night; this way the following morning, when they go out, they are familiar with the house and will return.



Pasture Pens

Mobile chicken pens used to house grazing birds in the field vary in size and design. They are designed to be moved in the field, so the size of the pen depends on the method of moving it from one spot to another. There are dozens of different designs of poultry pens available on the Web where ideas can be found to help build a pen that fits particular needs; there are also commercial pens available to purchase. Typically a 10ft x 12ft x 2ft pen will house between 80 to 90 birds on pasture.

Water is critical for healthy, productive birds housed in the field. A white plastic five gallon bucket set atop the chicken pen in the field works well; the bucket gravity feeds water down to the waterer. For feeders, some producers have found that a six-inch PVC pipe, with one-third cut out at the top then hung in the cage works fine. Chicken pens should be arranged in a wing formation in the field, so that a hard rain will not wash water carrying manure through one pen into another (sanitation issue).

Many free-range egg laying operations use mobile layer houses, which provide outside access to the nest boxes where the producer can easily gather eggs. The typical mobile layer house will accommodate between 40 to 50 hens. One nest box is needed for every four hens; depending on the size of the breed of hens you have, a 12in x 12in x 12in nest box will work. Some producers will use a community nest box (4ft x 2ft x 12ft) which will serve 40 to 50 hens. It is a good idea to have a perch in front of the nest box to make it easier for hens to get in and out of the nest.



Pole Building Layer House

A pole style building is a good choice for housing laying hens in a semi-intensive poultry grazing system. A 30ft x 40ft pole building, which can be insulated, will house 600 hens. These 600 layers will produce an average of 245 dozen eggs per week (70% rate of lay). The hens can be allowed outside to graze during the day when temperatures are above 20⁰ F. Plans for pole buildings can be found on the Web or at the Extension office in your county.

In a semi-intensive poultry grazing system, a predator-proof fence around outer edge of the pasture area surrounding the pole building will be needed. The pasture should be subdivided into at least four paddocks, which will be grazed one at a time. A best management practice recommendation is to have the chickens rotationally graze each paddock, which requires them to be moved to a fresh paddock after they have grazed down the forage in the current paddock. This helps to prevent the chickens from over grazing the paddocks around the



building; without good grazing management, the chickens would quickly turn the area around the building into a barren, dusty, or a muddy mess.

Important chicken coop design needs include:

- Easy to clean
- Has good drainage
- Protects from wind and sun
- Keeps out rodents, wild birds, and predators
- Provides adequate space for flock size
- Is well ventilated
- Includes sanitary feed and water stations
- Is free of drafts
- Maintains uniform temperature
- Has a place for birds to roost
- Has nests that entice hens to lay indoors
- Offers plenty of light, natural and artificial

Feeding

Aside from housing, feed accounts for 70% of the cost of raising chickens. Some knowledge of the nutrient requirements of poultry and applicable feedstuffs is needed before producers should try mixing their own poultry feeds. Grains and other feed ingredients need to be milled and mixed to an exact formulation, and are best pelletized for efficient feeding. For these reasons, it is best to start out by buying commercially available feeds until more experience has been gained.

Use a balanced, pelletized ration, which will most likely contain corn for energy, soybean meal for protein, and vitamins and minerals. Typical commercial feeds will contain medications, so ask for feed without it, if it is not wanted in the feed. The reason for having the feed pelletized is because chickens are nibblers, usually making several trips to the feed trough for small meals, wasting energy in the process. Making them eat pellets forces them to eat more at each meal. However, there are some producers who want their birds to get more exercise by requiring them to walk more; they believe that it makes a better meat product.



It is important that pastured birds get plenty of grit, since their diet of forages, seeds, and bugs contains a lot of fiber. Grit helps them to grind these feedstuffs up, so it can be digested. Supplemental grit is needed, because most commercial feeds are low in grit.

Producers will use different feed rations depending on the production stage of their birds. Starter rations are high in protein, while grower and finisher rations are typically lower in protein. Starter is usually 24% protein, grower 20% protein, and finisher 18% protein. Layer rations are typically about 16% protein. It is not recommended to feed more protein than is necessary, since it is an expensive feed component.

If a producer has a home poultry flock, it is okay to provide the birds with leftover treats from the dinner table. Leftover vegetables can provide a good variety in their diet, but care should be taken not to overdo it. Some important don'ts here include not feeding raw potato peels; they should be cooked first, because the birds cannot digest them. Also don't feed spoiled or rotten stuff, strong-tasting foods like onions, garlic, or fish; this can flavor eggs and meat. Don't feed table scraps to a commercial flock.

Pasture Needs

Much the same with any other farm animal, producers want a good grass and legume mixture in the pasture; the forage species is not that important. The quality of the forage would also be the same as what is needed for other grazing animals. Chickens do like to eat weeds, they are preferred next to legumes, so do not get too caught up with the overall condition of the field. Monocultures (pasture with only one forage species) are not recommended. One acre of good pasture is needed for every 400 chickens on pasture.

Chickens prefer pasture plants shorter than other grazing animals, so producers will need to either mow or graze the pasture down to between two to six inches in height before putting the chickens on the pasture. This provides an opportunity for producers to get multiple uses out of the pasture by having chickens follow grazing livestock. The livestock will graze down the height of the pasture plants and deposit manure piles that the chickens love to pick through. In fact livestock manure provides essential vitamins and other nutrients to chickens.

There are some plants that are poisonous to poultry. These plants include poison hemlock, monkshood, privet, yew, nightshade, and horse radish. Producers will notice that some of these are wild plants and others are cultivated; pictures of these plants can be found on the Web, so become familiar with what they look like, and see if any of them are on the farm near the birds.



Health

Be a good listener, as well as visual observer of the birds. Chickens should walk erect and tall and routinely stretch; producers should hear happy chirping birds, if they are quiet, something is wrong. Health issues have not typically been a problem in most free-range poultry operations despite not using antibiotics and vaccines. Birds are healthier in this system, because they are not being crowded together, get plenty of fresh air and sunshine, eat a good, well-balanced diet, and are not stressed. It is important that good pasture rotation is practiced, so that the birds do not graze behind another flock for at least two years. Another critical point is to practice the “all-in” and “all-out” (closed flock) philosophy of moving out an entire group of birds before bringing in new replacement group of birds.

The closed flock philosophy centers on the belief that each flock is exposed to a unique set of disease-causing organisms, so they develop their own set of immunities. Birds from two healthy flocks can therefore give each other diseases for which the other has no defenses. Once the flock is established, the best advice is to keep it closed.

Maintaining a closed flock means that producers don't:

- Mix birds from various flocks
- Bring in new birds
- Return birds to the property once they have been elsewhere
- Visit other flocks
- Let owners from other flocks visit yours
- Borrow or lend equipment
- Hatch eggs from other flocks
- Allow wild birds free access

Producers will have some sick birds, so have a hospital pen available to house them. This quarantined area, with its special attention, proximity to feed, water, and pasture is needed to help sick birds to recover. The hospital pen can also be an area in a stationary house if there is space.



Predators

Predators should be one of the most serious concerns of a free-range poultry producer. Prevention is the best course of action against this problem. Building an effective perimeter fence around the property where producers have birds is a good start. Exactly what constitutes an effective fence is debatable, but the fence should be at least 6ft high and have a small enough mesh that predators cannot squeeze through. It is also recommended that the fence be buried at least 6 inches in the soil to prevent predators from digging under the fence; this can also be enhanced by placing an electric fence-wire near the base of the fence. In addition, placing an electrified wire at the top of the fence will help to prevent predators from climbing over the fence.

Another good preventative practice is to keep pastures mowed or grazed down. This practice eliminates much of the cover preferred by predators that are more comfortable approaching prey unseen in the tall grass. Pens moved up close to the edge of the woods adjacent to a pasture are more likely to be attacked by predators. Boards can be used to plug depressions in the pasture along the edge of a cage greater than one inch to prevent a predator from gaining leverage. If there is a sign of predators around a pen, for example, you find birds having been maimed through the cage; traps can be set around the cage the next night to catch them.

Rats are serious predators of very young birds, while foxes, opossums, and raccoons are the most serious overall predators of free-range poultry. If you find headless birds, this indicates that a raccoon was involved and gutted birds are a sign of an opossum attack. Foxes generally won't come around pens, because of the human scent, however if they do, they will find it easier than hunting and will continue to prey upon your birds. They like to carry off the bird and eat it in a safe place; they will dig their way into a pen.



Other predators that can pose problems to poultry in this region include weasels, coyotes, and birds of prey, so be alert to them; the birds of prey are owls and hawks. Also be sure to keep an eye out for neighborhood dogs; they can become very effective predators of the birds.

Weather

Most free-range poultry producers say that rain is their biggest weather problem. Wet birds get cold and this is especially dangerous for young birds. Cold birds will instinctively snuggle together for warmth; however as a consequence, birds in the middle of the pile can suffocate. Older birds tend not to snuggle as much as younger birds; they will hunker down, won't eat, or drink, and just slowly freeze to death, if the conditions last long enough. They should be forced to stay active.

It is not the brief thunderstorm that is the problem; it is the cold, rainy period over several days that could be deadly to the birds. It is the saturated ground with water running through it or with puddles forming that is the real problem; producers need to take action immediately under these conditions. Action strategies include: taking some dry hay or straw and spreading it out over the area under the pen, gently pushing the birds up onto the dry material as it is spread out. If there is a cold breeze as well, wind blocks should

be placed against the side of the pen. Cold dry weather is not a problem for adult birds down to 20⁰; below 20⁰ can be a problem. Heat above 90⁰ is dangerous for adult birds.

Dealing with Dead Birds

No matter how good a producer is, there are going to be some dead birds to deal with in the operation. There are various ways to handle this problem, such as paying someone to haul them away, but burying them on the farm is not acceptable for a number of reasons. The best way to solve this problem is to compost the dead birds.

Composting is the most efficient and cost effective method of disposing of dead birds and processing waste. Research has shown that bird carcasses will breakdown quickly with no odors and can then be spread onto a crop field after the decomposition process is finished. Best results have been obtained when using materials that soak up liquids and pack down like sawdust. Straw and other loose materials will form air pockets and thereby develop a really bad odor. Composting can be effective with other animals on the farm including larger animals such pigs, sheep, and cattle. Check with your local University of Maryland Extension office for recommendations on how to compost dead farm animals.



Alternative Free-Range Poultry Enterprises

Layers: This is a year-around poultry enterprise, with the market especially strong during the winter months. It is important to note that egg production drops off as day-length shortens into the fall and winter months unless supplemental light is added. This is difficult to do in free-range systems, but the income from the egg business is enough to justify the expense of adding lights. Layers need 14 hours of light each day to prevent a drop in production, so supplemental lighting with a time clock is required. Set the time clock to come on at 5:30 am and to go off at 9:30 pm.

Purchasing started pullets, young layers less than one-year old, is a quick way to get started with a laying enterprise; pullets are at an age where they will begin egg-laying, although their eggs will initially be small. There are some breeds that produce white eggs and others which produce brown eggs; a decision should be made to either produce white

or brown eggs, or both. While there is no difference in the egg itself other than color, some customers do have a preference. If producers are willing to raise their own pullets, there are more options, such as raising a dual purpose breed, which can be marketed both for egg and meat. If this is the option, a non-hybrid, purebred breed of chicken will be needed.



Until enough experience has been gained as a poultry producer to confidently mix poultry feed rations on the farm, it is a good idea to purchase pre-mixed commercial feeds for layers. Attention should be paid to the added ingredients in the feed mix, if feeding an all natural ration to the birds is a goal of the enterprise. How eggs and birds are marketed will affect how birds are fed.

Calcium is essential in layer feed rations, since it is necessary for healthy, strong egg shell formation. Limestone can be built into the feed ration as a source of calcium as an alternative to the more expensive oyster shell. However if it is decided to try limestone, be sure not to use dolomite, which is a high magnesium type of limestone; this will adversely affect egg production.

Molting is the process where a bird's old feathers are lost and are replaced by new ones; this is a natural process, which can take between one and two-months in some egg-laying breeds and longer in other breeds. Egg production significantly drops off during the molting process, however once egg production resumes after molting is completed, egg production can be better than before molting.

Some direct market selling points for egg enterprises include telling customers that the enterprise produces a better quality egg that is fresher than those sold in large grocery stores, where the eggs could be months old. The egg whites are thicker and the yolks are richer in color than in stores, since hens are raised in a less stressful environment and have an all natural diet. Producers can go the organic route; this will require Organic Certification through the Maryland Department of Agriculture. If a natural diet is used, let customers know this, since this will help to justify the higher price for eggs.

Free-Range Turkey production: Turkey production is more seasonal than chickens; otherwise much of the management is the same as chickens. Producers will need one acre of good pasture per year for every 100 turkeys. The recommendation is that turkeys should be rotated to new pasture yearly in a three-year rotation to avoid disease and parasites; the rotation should never follow chickens.

Fifty turkeys is a good number to start with; 15% more birds should ordered than needed to allow for mortality. As with most young birds when they arrive, there are usually

some weaklings that do not make it. Turkeys are more fragile than chickens until their immune system develops at about 22-weeks.

Poults (young turkeys) purchased from a hatchery can be a good way to begin the turkey enterprise. There are several breeds of turkeys to select from; the Broad Breasted Bronze is a breed that has performed well in free-range systems, however success within breeds can vary between hatcheries. If producers decide to brood their own turkeys, it is done the same way as chickens. Poults should be kept indoors until they are eight-weeks of age. The same mobile pen used for chickens can be used for turkeys, holding about 30 birds; as with chickens, the pens should be moved to a fresh area of the pasture every day or as needed.

Turkeys require a higher protein feed than chickens; cannibalism problems can develop if protein is too low. A commercial Game Bird Starter ration is recommended for young growing birds. Turkeys consume more feed than chickens; it takes about 3.6 pounds of feed to get a pound of weight gain with turkeys. Weight gain can be controlled by the type of feed used; for example Starter is used for weight gain, Finisher is used in the last 10 days of feeding before marketing, and Holding Diets are used if the birds are too heavy. A holding diet typically consists of a 50-50 mix of whole corn and wheat.



Most customers will want birds averaging 16-17 pounds; however overall orders for birds will range between 10-26 pounds. The typical turkey production period is about 24 weeks. Producers will need to regularly check the weight of the turkeys in October, so that they can be at the correct weight by Thanksgiving.

Grazing turkeys will usually stay within 150 feet of the roost. They prefer forage height to be about four to five inches tall; a typical pasture mixture of grass and legumes works fine for them. Predator prevention practices are the same with turkeys as with chickens.

Free-Range Game Birds, Ducks, and Geese: There are restaurants that would like to offer free-range game birds such as pheasant and quail on their menus. The production of these birds isn't too different than for chickens; chicks can be purchased through a hatchery, but are more expensive. In addition, the production period for game birds is longer than chickens, which contributes to their being more costly to produce. Game birds, being wild species, will need more open space than domestic birds. They are also more fragile than domestic birds and are more prone to health problems and cannibalism. Their skin is more delicate than a chicken's, so they are more difficult to process.



An important note here is that game bird production is regulated by the government. In order to raise game birds, a permit from the Maryland Department of Natural Resources

will have to be obtained. This is not an impossible task, but it will be needed before production begins.

Ducks and geese are very good grazers and will do well in a free-range system. One point to note with these birds is that they are more difficult to process than other birds, because the oil in their feathers makes them more difficult to remove.

Marketing

The enterprise's marketing message should promote that you have a clean, natural product that has been raised without antibiotics in a stress-free environment. Promoting this message will help to sell not only chickens, but also eggs, turkeys and game birds. Restaurants, grocers, and caterers will pass this message on to their customers as well; direct market customers will also let others know about the enterprise's products.

The key to marketing is to differentiate a product (make it stand out) from the competition. Here are a few ideas that can be used to make the farm-raised poultry product stand out from the typical grocery store product:

- Your poultry is raised on all-natural feed
- Your poultry is raised in a stress-free natural environment
- Your birds have firmer muscle tone, which means textured meat
- Your birds have more flavor
- Your eggs are fresher
- You are a local business enterprise
- You are knowledgeable about your product and will answer questions



Another way to differentiate a farm-raised product from the local grocer is to get it certified organic. This process can be done through the Maryland Department of Agriculture, which usually takes about three-years. This will require producers to use certified organic feeds, feedstuffs, and ingredients, and to raise their birds in accordance with accepted organic standards. This will most likely increase production costs, but these costs can be justified and passed on to customers. Recent history has shown that customers are willing to pay more for eggs, meat and other products they believe are safer and healthier to eat.

There are different methods available to market poultry products. As a small farm producer, direct marketing will be the most profitable. In direct marketing producers do not sell to middlemen, so that they keep all of the profit. Direct marketing gives immediate feedback on a product's performance. One of the keys to marketing is successfully promoting, advertising the product; the enterprise's promotional message should tell prospective customers why they should buy its product over someone else's.

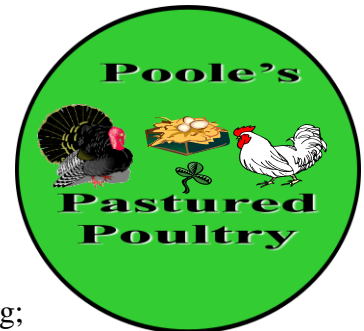
Direct marketing can be done in several different ways. For example products can be sold direct through a farmers market, roadside stand, subscription market, community

supported agriculture (CSA), buyers club, or mail order. Contact the local University of Maryland Extension office for more detail on each of these direct marketing styles. It should be mentioned here that producers will need to check with the state health department concerning any health regulations related to poultry marketed at any of these direct markets.

Another marketing option is selling to restaurants. This can be a rewarding way to market your products, since a good restaurant can move a lot of product per week. However, producers will need to be able to meet their demand for both quantity and quality. A few key points to remember here are that the products will need to be USDA inspected; also the liability issue needs to be considered, because a lawsuit involving the restaurant over a product will find its way to the farm. One last point of caution is to be careful of commitments to a restaurant, because restaurants have a tendency to go in and out of business.

Selling products to an independent or “mom and pop” type grocery store is another way to move a lot of product. For this to be most successful, the farm should have a logo or some other product identification label. It is important for customers to be able to remember the product, so that they can look for it again when they shop. It would also be necessary in this type of market to advertise and to develop a unique message; look how effective Frank Perdue’s message was for his product. Again in this market USDA inspection will be needed for these products.

To really be successful at marketing through restaurants, grocers, and caterers, year around production may be necessary. It will be costly to do this; this is a big decision, so begin by doing some research and then develop a business plan.



One last point to remember is that people skills are necessary at all levels of marketing. This is especially true with direct marketing; if a producer hates being around people and interacting with them direct marketing is not a good idea. It is also important to remember that maintaining a quality product is essential; restaurants, grocers, and caterers will demand it, since their reputation is on the line. Direct market customers will also always demand a quality product; repeat customers and their “word-of-mouth” advertising are critical to the enterprise’s growth and sustainability.

Glossary

Acre: The standard unit of measurement for land area in agriculture; an acre of land is equivalent to 43,560 square feet.

Cannibalism: The habit of some animals, or poultry of biting at, pecking, or eating body parts of pen-mates.

Capon: A male chicken castrated before reaching sexual maturity.

Cockerel: A young rooster not more than a year old.

Cull: Refers to animals, or poultry being eliminated from the enterprise operation due to production or management reasons.

Forage: Vegetable matter in a fresh, dried, or ensiled state, which is feed to animals, or poultry. Forage includes pasture, hay, green chop, haylage, and silage.

Hen: An adult female chicken, turkey, or game bird.

Legume: A broadleaf plant which has a symbiotic relationship with nitrogen-fixing bacteria, which live in nodules on the plant's roots. Some legume species include clover, alfalfa, vetch, lespedeza, and soybeans.

Over-grazing: Refers to the poor pasture management practice of allowing animals, or poultry to graze re-growth of previously grazed pasture plants, which have not been given an adequate rest period to recover root reserves. This practice results in the loss of pasture plants and barren, muddy areas in the field.

Paddock: A subdivided section of a pasture used to more effectively graze a larger field; a pasture can be divided up into several different paddocks depending on its size and the number of animals or poultry.

Poult: A young turkey of either sex, usually less than two months of age.

Pullet: A female chicken less than a year old.

Rooster: An adult male chicken, also known as a cock.

Tom: A male turkey.

Under-grazing: The poor pasture management practice of allowing pasture plants to become over mature, which reduces palatability and nutritional value. This usually occurs when the number of animals or poultry is not high enough for the size of the pasture field being grazed.

Resources on the Web

ATTRA National Sustainable Agriculture Information Service

Poultry Publications and Resources

<http://attra.ncat.org/livestock.html#Poultry>

Chicken Resources on the Web

<http://www.google.com/Top/Science/Agriculture/Animals/Birds/Poultry/Chickens/>

Poultry Help.Com

A Source for Online Poultry Raising Information

<http://www.poultryhelp.com/home.html>

Mississippi State University Extension Service

Poultry Publications

<http://www.msstate.edu/dept/poultry/msupubs.htm>

The Ohio State University Extension

Veterinary Preventive Medicine Fact Sheet Index

<http://ohioline.osu.edu/vme-fact/>

The University of Georgia Cooperative Extension
Poultry Publications
<http://www.poultry.uga.edu/extension/tips/index.htm>
University of Florida IFAS Extension
Livestock and Poultry Publications
http://edis.ifas.ufl.edu/TOPIC_Poultry

Virginia Cooperative Extension
Small Specialty Flock
<http://www.ext.vt.edu/cgi-bin/WebObjects/Docs.woa/wa/getcat?cat=ir-lpd-pou-ssf>

References

Damerow, Gail.1995. *A Guide to Raising Chickens*. Pownal, VT: Storey Publishing.
Damerow, Gail.2002. *Barnyard in Your Backyard*. Pownal, VT: Storey Publishing.
Salatin, Joel. 1993. *Pastured Poultry Profits*. Swoope, VA: Polyface, Inc.

Equal access programs/equal opportunity employers