

Game Birds And Other Poultry – A Review of Management Practices
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In the past several years, there has been a resurgence of interest in rearing game birds, both commercial and ornamental type game birds. This is a very broad subject, and beyond the scope of this book. However, several good references have been listed at the end of the chapter to assist in your successful managing and breeding of game birds.

Why do people raise game birds? Many people raise them for release in wildlife coverts near their homes, others for the gourmet food market, some just for the enjoyment of watching the colorful, unique birds. However, the majority of game birds are reared for restocking on private hunting and conservation areas and some public areas. Private hunting preserves are licensed in 48 of the United States. The size of any particular game bird enterprise can range from a small, backyard hobby flock to several thousand birds on a commercial game farm. The common thread is that no matter what size the operation, it takes knowledge and skill to successfully rear game birds.

Before starting your game bird flock, do more of what you are doing right now, your homework! Get the basic information from the books and other references listed, and then contact a successful game bird breeder in your area and pick his brain. Prepare for your birds in advance. Make sure the habitat you have chosen is the right one for the type of bird you are rearing. Find out about nutrition and possible health issues. Only after you have properly prepared should you place birds on your facility. It is probably best to start with some breeding stock purchased from a reliable, pullorum free source.

For many years the greatest obstacles to rearing ornamental game birds were disease and feeding problems. However, the development of new drugs and vaccines has pretty much solved the disease problem. Meeting the individual birds' nutritional requirements is another critical area of management. Although each species of game bird is different it has been found that, in general, ornamental game birds have similar diet requirements and can all be fed the same. There are some exceptions to this and these will be noted below.

Guinea Fowl

There has been an increasing demand for guinea fowl recently. The meat of a young guinea is tender and of especially fine flavor, resembling that of wild game, and therefore has been substituted for game birds such as grouse, partridge, quail and pheasant. Guinea fowl has a taste similar to other game birds and has many nutritional qualities that make it a worthwhile addition to the diet. It is second only to turkey in calories, having 134 Kcal (Calories) per 100 grams (turkey has 109 Kcal). The meat is lean and is rich in essential fatty acids.

Why raise guinea fowl? There are many reasons. The guinea has been used in protecting the farm flock from intruders because of its loud, harsh, cry and its pugnacious disposition. Since

one of the main sources of food for wild guineas is insects, they have gained popularity for use in reducing insect populations in gardens and around the home, especially because, unlike chickens, they do not scratch the dirt much and do very little damage to the garden. Recently, guineas have been used to reduce the deer tick population, associated with Lyme disease. Many people raise them for their unique ornamental value.

Many species of wild guinea fowl are found in Africa and they derive their name from Guinea, on the west coast of Africa. There are 38 natural species and subspecies of guinea fowl that are currently recognized and these are divided into four general and seven subspecies. The Vulturine is the only species in the genus *Acryllium* which is in the Numididae family. This is to say that there are no other species which closely resemble this striking bird. The common domestic guinea fowl are a descendent from one of these wild species (*Numida meleagris*). Guineaes were domesticated thousands of years ago and were raised for meat by the ancient Greeks and Romans.

There are three principle varieties of helmeted guinea fowl reared in the United States at this time, the Pearl, White and Lavender. The head and neck are bare, but there may be some wattles. The wattles on the male guinea are much larger than on the female. The Pearl is the most popular variety and the one most people recognize. The Pearl has purplish-gray plumage regularly dotted or "pearled" with white spots and its feathers are often used for ornamental purposes. The next most common variety is the White Guinea (also called African White). The White Guinea has pure-white feathers and its skin is lighter than the other two varieties. These birds are not albino and are the only solid white bird that hatches solid white and not yellow. Lavender guineas are similar to the Pearl, but with plumage that is light gray or lavender dotted with white. Crosses of Pearl or Lavender with White produces what is called a "splashed" guinea, the breast and flight feathers being white and the remainder of the plumage pearl or lavender. Selective breeding by fanciers have produced other well-established colors such as: purple, coral blue, buff, and buff dundotte.. Newer colors include chocolate, brown, sky blue, powder blue, slate, violet, opaline, porcelain, pewter and bronze.

The other two varieties of any significance found in the U.S. are the Crested and Vulturine. The Crested guinea fowl - *Guttera pucherani* are chicken-sized birds with small white spots surrounded by a black spot on a dark chestnut background. The head is topped with a crown of black, curly feathers. The bare skin of the chin, throat, and down the front of the neck, around the eyes and behind the crest is red. The rest of the bare skin and the neck are cobalt blue. The sexes look alike. The flight feathers have white edging and spots and the outer secondary feathers have broad white edges. Their individual feathers are half black with white spots and half striped.

The Vulturine is the largest and most striking member of the guinea family at 24-in. (60-cm) in height. The Vulturine guinea fowl is a native of sub-Saharan Africa, from Uganda south into eastern Kenya. They travel in flocks of 20-50 and their voices have been likened to creaking wagon wheels.(A front view Photo courtesy of Linda Enger) Captive-bred Vulturines become very tame. The hens lay a clutch of 8-15 eggs. Although they do very well in captivity, they do require protection from colder weather and where temperatures reach freezing they need heated quarters.

Although guineas are not recognized by the American Poultry Association, they are exhibited at many shows and judged for prizes. In judging guineas, the points regarded as most important are good size and uniform color. Presence of white feathers is the most common defect in Pearl and Lavender varieties. At maturity both male and female guineas range from 3 to 4 pounds in weight.

Basic Management of Guinea Fowl

If you already have other poultry, you will soon discover that guineas are not chickens. They are much more active than chickens and not as easily tamed. They seem to retain some of their wild behavior and will remind you of this whenever they get spooked.

Guineas require a dry environment with plenty of room. Guinea fowls are extremely good runners and use this method, rather than flying, to escape predators. Since most people raise guineas with the intention of letting them run loose after reaching adulthood, space is usually not a problem. If you are confining your birds for any length of time, give them as much room as possible outside and a minimum of 2-3 square feet per bird inside. The more room they have, the less likely they will become overly stressed. Guineas tolerate weather extremes fairly well after they are fully feathered and have reached adult size.

Guineas begin to fly at a very early age and can be confined only in covered pens. It is not unusual to find adults roosting 20-30 feet above the ground complaining about everything they see. They are very strong fliers and the birds will often fly 400-500 feet at a time when moving around the farm, especially if startled.

The laying season will vary depending on your latitude and local weather patterns. The Pearl and Purple usually have the longest laying season and the lighter colors have the shortest.

Keet brooding and management

Young Guinea are called keets. They are very active birds right from the start and will amaze you with just how active and fast they are. At hatch and early on they are smaller than full size chicks and precautions should be taken to contain them as they will go right through 1" poultry mesh.

Being native to dry areas of Africa, the keets do not tolerate being wet. If you are raising keets with a guinea hen or foster hen, keep them in the pen until the dew is off the grass each morning. Guineas make poor mothers and often abandon keets that get separated during their daily trips through tall grass. It is not unusual for a hen to lose 75% of her brood during the first two weeks because of this. It is therefore recommended that you use a chicken as your brood hen for caring for your keets. A large chicken hen can brood up to 25 guinea keets.

Keets can also be brooded on the floor or in cages, either way works well for guineas, similar to facilities used for chickens or turkeys. The surface of the floor and feed pans should provide good traction for the newly hatched keets. Clean dry litter should be set down prior to the keets

arrival. Guineas have weaker legs than chickens and should never be brooded on newspaper or any slick surface. On smooth surfaces, they have a tendency to go "spraddle-legged" in an extremely short time. Once a leg gets twisted out from under them, it is almost impossible to get the bird to walk normal again. It is recommended placing keets on 1/4" or 3/8" hardware cloth because the small holes allow the birds to get traction, but do not let them fall through or catch their legs, as might happen with 1/2" wire. Start brooding temperatures at between 95 and 100 degrees F for the first two weeks and then decrease the temperature 5 degrees each week. Depending on the temperature in the brooding area and the number of birds you have together, you can usually discontinue the heat after 6-8 weeks. As with other brooded birds, watch the behavior of the birds to determine if the brooder temperature is too hot or cold.

Adults

Adult guineas require little care and do very well on their own. Clean water and a regular laying mash is basically all you need to rear them. They enjoy a little scratch feed mixed in with their feed and scattered on the ground. If your birds are allowed to roam freely they will eat very little during the summer months. If you have plenty of bugs and seeds you will start wondering if they are even touching their feed at all!

Feeding Guineas

Keets need a 24% - 26% protein ration such as turkey starter or gamebird feed. It is recommended using an un-medicated feed to avoid potential problems with keets getting over-medicated. Reduce the protein to about 18% - 20% for the fifth through eighth weeks. After that they will do well on regular laying mash that is usually 16% protein. If you can't find feed with different amounts of protein, mix the higher protein feed with laying mash to get the proper protein mix. The guineas' natural diet consists of a high protein mix of seeds and insects. If your birds have a large area to roam they will usually get enough to eat on their own, but you can train the birds to stay closer to home by providing supplemental feed in a regular location. Guineas need a higher protein feed than chickens, but do quite well on regular poultry mash or crumbles. It is recommended that they be given only mash or crumbles instead of pelleted feed. Adult guineas can usually handle pellets without much difficulty, but due to differences in pellet size, some birds may scratch a lot out of the feeder and waste more than they eat. They will not eat much supplemental feed if they are finding plenty to eat on their own, but it has been found that they really like wheat, milo, and millet and will clean up every kernel. However, only give whole or cracked grains as a treat or supplement, but not too much. The protein content is too low and the fat content too high to be much value. They don't care for the larger grains and will ignore whole corn kernels.

Make sure they have access to clean water. Give keets warm water only! They don't tolerate cold water well.

Sexing Guineas

One of the most often asked questions about guineas is how to tell the hens from the cocks. Young guineas cannot be sight-sexed like other poultry or fowl. The hens and cocks look exactly the same except for some of the newer colors where the hens are darker, as both keets and adults. The only precise way to tell the sexes apart is to listen for the two-syllable call the hen makes. This sound has been described as sounding like "buckwheat, buckwheat", "put-rock, put-rock" or "qua-track, qua-track". This is the only sound that the hen makes that the rooster doesn't. The young birds start making these sounds at 6-8 weeks, but some hens do not start calling till much later.

Incubation

Incubation for guinea eggs is from 26 to 28 days and they are incubated similar to turkey eggs.

Raising Ornamental Quail, Partridge and Pheasants

Many people raise game birds simply because they like the way they look or act or just for the simple enjoyment of the company of the birds. Because these are not reared strictly for meat or egg production, they are classified as ornamental birds. All of the species listed are available from aviculturists with the possible exception of the Barred Quail of Mexico. Rare varieties are hard to find and that is why they remain rare varieties and command a high price. They are hard to find usually because they are more difficult to rear and breed in captivity. However, if healthy, strong breeding stock is found, they can be successfully reared in captivity.

In the quail family there are several interesting species. The Barred Quail of Mexico, the Benson Quail (also called the Elegant or Douglas), the Blue Scale (also called the Blue racer, Blue Quail, Top-Knot Quail and Zollin), Bobwhite family of quails, California Valley Quail, The Coturnix Quail family, Gambel's Quail, Mearns Quail, and the Mountain Quail.

In the Partridge Family (no, not the actor/singers) there are 47 different species identified. Of the 47, only 12 are reared in captivity, of which about 4 are not found in the United States. The ones available in the United States include the Bamboo Partridge, also called the Mountain Bamboo Partridge, the Ferruginous Wood Partridge, the Common Hill partridge, the Himalayan Snowcock, the Hungarian Partridge, the Madagascar Partridge and the Rock Partridge family, which includes the Chukar, Barbary and Red Legged Partridge. Of these the Chukar are probably the most popular. However, the Hungarian Partridge is starting to grow in popularity in game bird circles.

Pheasants are not native to North America but have become a popular game bird found in many areas of the country. One of the most familiar breeds is the Ringneck. Other popular breeds are the Golden Pheasant, Lady Amherst's Pheasant, Reeve's Pheasant, Silver Pheasant, the Jumbo Ringneck and the Mongolian Pheasant.

Housing and Managing Game Birds

Many successful game bird breeders have developed their own particular management methods for breeding and rearing particular game bird species. However, to go into detail on each species is beyond this book and the reader is referred to one of the many books and other resources on game bird rearing for more detailed descriptions of game bird management.

A basic method has been developed by Leland and Melba Hayes which they call the *Assembly Line Method* for the rearing of chicks to breeders. A condensed version is offered here.

As chicks pass through different stages of maturity, their environmental requirements change and you must meet these requirements. If you are hatching up to 20 chicks at a time, then the box method is used. A series of boxes are used, each modified to meet the needs of different age chicks. The boxes can be regular corrugated cardboard or wooden. However, if you have a much larger hatch, then you may want to use floor pens and brooders.

The first box (environment) is the nursery box. It is used to house chicks right from the incubator up to two weeks of age. A box of about 15" x 20" and at least 20" in height works best. It has a cloth floor made out of an old towel that can easily be washed, disinfected and reused. The towel should be changed at least once a day, more if it gets wet or really soiled. A 40 or 60 watt red (or regular bulb painted red) incandescent lamp, depending upon heat requirements and the temperature of the room the box is in, placed about 1-2 inches above the chicks heads near one end of the box provides the heat. Cover the box with hardware cloth to keep active chicks from jumping out and cover part of the top with newspaper to control the heat in the box. Watch the chicks carefully. If they start to pant, they are too hot and more heat must be let out. If they are scattered evenly then they have enough heat.

To get the birds to start feeding, starter feed is scattered around on the towel. A 28% - 30% protein medicated turkey starter or game bird starter is preferred. It is alright to let the chicks eat off the floor for the first few days to get them used to eating. After that feeders should be used. Keep the waterers at the end opposite the heat source. Special molded plastic water bases that fit standard canning jars (available from game bird supply companies) are good waterers for quail and other small chicks. If open lids are used, then place some rocks or marbles into the lid so the birds will not be able to fall into the water and get wet and chilled. The water should be at room temperature to prevent chilling the birds. Many producers add Bacitracin, Terramycin or other water soluble antibiotics to the water of the baby chicks for the first two weeks to help them get a proper start.

After the chicks are two weeks old, it is time to move them to the next box, the baby box. It can be about the same size or slightly larger than the nursery box. The difference is to make a raised floor out of 1/4 inch hardware cloth for small breeds and out of 1/2 inch for the larger partridge and pheasant chicks. This floor should be raised about 2 inches from the bottom of the box, allowing the droppings to fall below. You can use litter on the bottom of the box, under the wire,

to absorb the manure and moisture. The heat lamp can be moved up as needed and a lower wattage bulb used to prevent overheating of the chicks. At this age the rocks or marbles can be removed from the waterers.

By this time chick feeders should be in use; flat lids with a wire guard to keep them from scratching the feed out and all over work well. The birds will also be feathered at this time and may fly out when you remove the wire top to add feed or water, so take care. It is recommended that the wings be clipped each time the birds are moved from one environment to another if they are to be kept in pens higher than three times their height. The primary flight feathers are clipped on one wing.

The third box is the juvenile box, which is the same as the baby box, except with $\frac{1}{2}$ mesh hardware wire on the floor. Several of these boxes will be needed to divide the birds into to prevent overcrowding. When the bird's feet are large enough to fit the new wire floor it is time to move them into the juvenile box. At this time mixing of different ages of chicks can be done if you follow a few simple rules. It is generally not good to mix species. Never put chicks of other species in with Bobwhites. They will most likely be killed. However, mixing can be done among compatible species if done when you move birds from one box to another. The new environment is new to all the birds and they adapt to each other as well as the new box. It is for this reason that each box in the "assembly line" be arranged a little different from the others, so it appears to be totally new environment to the birds. Another rule is to never add a new batch of chicks to a box already occupied. The current residents of the box will not take kindly to the intruders.

The fourth "box" or environment is the intermediate pen. This is used when the birds have feathered out enough that they do not require supplemental heat at night. It is much larger than the previous boxes, providing the birds with much more room.

These pens are made out of $\frac{1}{4}$ or $\frac{1}{2}$ in plywood. Construction can be modified, as long as the pen supplies enough room and is usable. First cut two pieces of 4' x 8' plywood in half (lengthways) making four 2' x 8' pieces. Cut one of these in half to make two 2' x 4' foot pieces, which will be the ends of your pen. Cut out 6" by 36" windows in the center of each of the long pieces and cover on the outside with $\frac{1}{4}$ inch wire mesh. This will provide light and air for your birds. Cut a door in one or both ends, and make a sliding door from it. The door can be 8" x 8" or 10" x 10". Cut two strips of 1" x 2" stock twice the height of the door, and cut a 1" wide by $\frac{1}{2}$ " (or whatever thickness plywood you are using) thick out of one long edge of each board. This will be the guide for your sliding door. Nail or screw the pen together using 2" x 2" stock in the corners. Place strips of the 2" x 2" stock along the bottom inside edges so there will be a nailing place for the wire bottom. Cover the bottom with $\frac{1}{2}$ inch wire hardware cloth. This is usually sold in 48" widths so a piece 8 feet long should fit the pen area just right. Staple the wire across the bottom on the inside on top of the 2" x 2" strips. This will provide a 2" space between the bottom of the pen and the ground or top of another pen if stacked. If the pen is not placed outside where it may get wet from rain, then for the top of the pen, use heavy duty cardboard, from discarded shipping cartons used for furniture or appliances. This can be used like a dropping board if these pens are stacked on top of each other, by placing a 2' to 3" spacer in each

corner between stacked pens and slipping newspaper over the cardboard to catch the droppings. The cardboard is also softer than wood and it doesn't hurt the birds heads as much when they fly up and hit it. **If you are using the pen outside, then cover with another sheet of 4' x 8' plywood.**

List of Materials for Box 4 (intermediate Pen)

2 - 4' x 8' x 1/2" (or 1/4") plywood

80" of 1" x 2" stock

4 - 96" pieces of 2"x 2" stock.

96" length of 48" wide 1/2" mesh hardware cloth

16" length of 36" wide 1/4 mesh hardware cloth

1" drywall screws or nails

1/2" Staples for attaching hardware cloth

A low wattage light (5 watt CFL) placed in one end over the feeding and drinking area will act as an attraction light at night. It encourages the birds to eat and drink at night and helps keep the birds calmer. This pen can be used until the birds are fully feathered and mature and will hold about 40 quail (fewer for partridge and pheasants) so long as care is taken to prevent picking. Some people put fresh alfalfa hay on the bottom to help prevent picking.

When the birds are fully feathered with adult plumage and able to withstand the outside climate without any supplemental heat they are placed in outside pens. At this time both wing primaries are clipped to prevent unbalanced flying, which may cause injury to the birds.

The next step in the "assembly line method" is to place the birds in an outside growing pen. This is a large screen pen. If you live in a humid, wet climate, then you need to keep the birds on wire off the wet ground. If you live in a dry climate, then the birds can be grown on the ground. The dimensions of this outside pen can be almost anything the breeder is comfortable in. Leland Hays uses one that is 8' x 24'. The idea is to make the pens longer than wide, so the birds have plenty of room to run up and down and get the exercise they need and provide a place to retreat if they are threatened. Never put a bird into a pen where they can be backed up against a wall. If you do they will panic and fly up. Provide a shelter in one of the pen for birds to sleep in and where feed and water can be kept out of the weather. Place the feeders and waterers on a platform made of 2x4's covered with wire mesh to keep the spilled feed and water off the ground were the birds could get to it.

The birds may not sleep in the shelter and prefer to be in the open. If this is so, then put some branches in the open area. It is preferred that the open area have bare ground, since ground wet enough to support vegetation, can also support disease agents, earthworms and other creatures.

The final pen is for breeders only. This is the same pen described above for growing birds, but with different furnishings. Brush, logs, and branches are added to make the environment as natural as possible and to provide plenty of hidden nesting places. If the nesting places are places so they can be reached easily from the outside then the eggs can be collected with very little disturbance of the birds. The less the birds are disturbed, the more chance of egg production.

Your own personal experience will guide you in modifying the above *assembly line system* of Leland and Melba Hays to fit your particular species and needs. The size, shape, furnishings and feed and water are flexible. You just need to be meeting the needs of the birds you are rearing. The old adage of “if it ain’t broke, don’t fix it” works best with game bird management and housing. If you are successfully breeding and rearing birds, don’t change it unless there is a real need to.

Feeding Game Birds

Game birds, like other poultry require a balanced diet consisting of all the essential nutrients. This means a balance of protein (amino acids), carbohydrates, fats, minerals, and vitamins, in addition to plenty of fresh water. It is not easy to make a complete balanced diet unless you have access to sources of many different types of feedstuffs. Because of this it is recommended that you purchase feed from a commercial source. There are many good commercial game bird feeds available today. One main point is to match the protein and energy requirement to the needs of the birds. The weather, size of pen, type and age of bird and time of year are all factors that influence how much to feed and what protein and energy level should be fed. The following are some general minimum protein (CP) and energy (ME, kcal/lb) requirements for specific types of birds.

BOBWHITE		
	CP	ME
0-4 wks	28%	1350
4-9 wks	24%	1375
9-18 wks	18%	1375
Breeders	19%	1250

COTURNIX		
	CP	ME
0-3 wks	25%	1350
3-6 wks	23%	1350
6+ wks	18%	1350
Breeders	18%	1250

PHEASANTS		
	CP	ME
0-4 wks	30%	1150
4-9 wks	24%	1150
9-18 wks	18%	1240
Breeders	19%	1150

It is recommended that commercially formulated and mixed feeds be used if at all possible, rather than grains fed alone which might not supply all the required nutrients. A good Turkey starter and then turkey grower rations usually will suffice for starting your birds and growing them to maturity if other feeds are not available.

Starter feed

During the first five to six weeks of life, quail, partridges and pheasants should receive only high protein starter feed (28 to 30 percent) with no additional grain. For best results and the least feed wastage, the starter feed should be in mash form the first two weeks, small crumble form the third and fourth weeks, and small pellets thereafter.

Grain feeding

One thing you can do is to feed just a little grain by hand to your birds every day. This gives you a good chance to look your birds over and provides a little personal contact each day. A little extra corn during periods of stress such as during cold weather or when the birds are moved will help provide the energy needed for extra heat or to get through the stressful period.

Feeding grain by hand daily will provide you with a good chance to check your birds for signs of disease and to study their habits. This will also somewhat tame your birds and make them easier to catch and handle. When whole grain feeding is begun and grain is fed in combination with pellets, be sure to provide grit at all times in separate hoppers. If cracked, crushed or milled Brains are utilized, Grit is not necessary.

DON'T OVERFEED GRAIN or your game birds may not get a proper balance of the essential nutrients contained in the complete feed. After the 10th week, grain may be fed in the morning and the evening.

Quail nutritionists at Purina say that quail will consume an average of 0.8 lbs. of starter from 0-6 weeks of age; and consume 0.25 lbs. per-bird per week of flight conditioner from 6-16 weeks. Total feed consumption from one-day through 8 weeks would be 1.3-1.5 lbs. per bird. From 8 through 16 weeks, Purina estimates that quail might consume 2.5-3.0 pounds per bird.

Quail breeder-layers might consume 0.3 pounds of ration per-bird per week (one month before start of egg production throughout the laying season). Quail might consume 0.25 pounds of a maintenance ration per-bird per week after 16 weeks.

Some breeders will supplement the feed with fresh vegetables. Quail and partridge like apples. Chopped carrots are also readily eaten by some species. Fresh greens are good for the birds. This provides extra nourishment and keeps them occupied for a while. Only feed what the birds can clean up in 5-7 minutes each day to avoid diluting the nutrients of your bag feed.

Many breeders also like to feed mealworms to their birds. These can be grown by you or purchased from pet stores or from sources listed in the *Game Bird and Conservationist's Gazette* or *Wildlife Harvest*. Be sure these come from a clean, trusted source to prevent introduction of diseases from the mealworms.

Game Bird Vices

Almost every species of animal, including game birds, kept in captivity, develops some bad trait, or vice, that must be dealt with. The best way to deal with these is prevention whenever possible. An experienced breeder will try to adjust the conditions to suit the bird rather than force the birds to adjust to the conditions the breeder dictates.

Cannibalism

One thing that can easily creep up on the bird raiser is cannibalism. Game birds are naturally aggressive, to help them survive in the wild. Cannibalism usually begins as feather picking, when the birds are only a few weeks old. Poultry scientists have found that any number of stress factors can trigger picking and lead to more serious cannibalistic outbreaks and behavior. Some of these stress factors include; overcrowding, high light intensity, inadequate ventilation, too high

temperature, too high humidity, insufficient feeding and watering space per bird, external parasites, trace nutrient and/or salt deficiencies, nervous and excitable birds (normally inherited traits characteristic of the flight strains of ringnecks) and boredom.

Preventing cannibalism is far easier and cheaper than curing it. Provide ample space for birds at feeders, waterers and in pens to help alleviate cannibalism. Provide good, nutritious feed, lots of leafy green alfalfa and fresh, cool water at all times. Keep the brooder area well ventilated and under subdued light. Red lights and a dark box also seems to help. Cover in the grow out pens, will give birds a place to escape if necessary. Beak trimming helps reduce the injuries from pecking.

Watch for the early signs of cannibalism. Vent pecking of birds at their own vent or others. Vent pecking can also be a sign of enteric infections. Feather pulling, is frequently seen in birds too closely confined, especially young flocks crowded during brooding periods.

Toe pecking is common among juvenile birds and is reported to begin due to hunger. Head pecking usually follows an injury. Nose pecking is seen often in 2 to 7 week old quail. Stemmy alfalfa hay on the floor of the pens seems to discourage toe picking. The hay stems break up the outline of the toes and makes it hard for the birds to distinguish toes from alfalfa.

A head of lettuce or cabbage hung on a string gives the birds something else to pick at and seems to help reduce cannibalism. A brightly colored soda can with a couple pebbles in it hung at head height also gives them something different to peck at. If all else fails, specs or peepers can be fitted to the birds.

Egg Eating

Some game birds are egg eaters. This is a difficult habit to break. Some have tried using stones shaped and colored like eggs. The birds peck at them, can't break them and ignore real eggs too. Another remedy that may work is to coat a few eggs with Ipecac Syrup, obtained from your pharmacist. After the birds eat the eggs, they will regurgitate, something not normal for them. They remember being sick after eating eggs and never break and eat them again. This might even work for feather picking. However, it may also stop normal feather grooming.

Game Bird Health

The best way to maintain the health of your game birds is prevention. As stated earlier bio-security is your best weapon and the two major aspects of this are sanitation and isolation. The same elements of disease that cause problems in other birds apply to game birds. Refer to Chapter 11 on Flock Health for further information.

Many of the disease of poultry, such as Pullorum, Paratyphoid, Streptococcus, Aspergillosis, Coccidiosis and Fowl pox are also common to all game birds. In addition to these, some of the more commonly diagnosed diseases of pheasants, quail and partridge are listed.

Some diseases commonly diagnosed in pheasants are: Mycoplasmosis, Paratyphoid, Botulism, Marble spleen, internal parasites (worms) , Coccidiosis, New Castle Disease and Gapeworm.

Quail are commonly diagnosed with Ulcerative Enteritis, Enteritis, Blackhead, Bronchitis, Colibacillosis and internal parasites.

Chickens are diagnosed with Histomoniasis (blackhead), Mycoplasmosis, Fowl Pox, Paratyphoid, Ameobic Dysentery, Mycosis and internal parasites.

A few diseases that are particularly problems in game birds will be discussed in a little more detail. .

Ulcerative enteritis, also called quail disease, is the most common disease of quail. It is a bacterial infection of the intestines and death losses of young birds maybe as high as 100% if the disease is not controlled. The addition of zinc bacitracin or bacitracin methylene disalicylate at 20 grams per ton of complete feed helps control this disease. Streptomycin can also be used. Prevention is best accomplished by good sanitary conditions and raising young birds on wire.

Quail Bronchitis can quickly destroy a commercial quail business. It is caused by an Avian Adenovirus and appears to mainly affect Bobwhite Quail. It is highly contagious and spreads quickly through the flock. It affects the respiratory and intestinal tract. It usually starts in birds 2-3 weeks old and works back with subsequent hatches to where signs start at 7 to 10 days. Mortality can run from 40 to 100% if not treated quickly. Tylosin helps in most cases.

Gapeworms primarily affects young pheasants and turkeys. Gapeworm larvae can be picked up from contaminated soil directly or through earthworms infected with the larvae eaten by the bird. They live in the trachea, bronchi and bronchioles (lungs) of birds, causing the birds to gasp for air, "gapes". Many infected birds die from a lack of oxygen. Gapeworms are primarily a problem in young birds reared on the ground. Keeping the ground dry and tilling the soil helps control the earthworms and the gapeworm larvae. Fenbendazole is the current drug of choice. New medications may soon be approved for use in game birds. Extra vitamin A also helps.

Coccidiosis affects all avian species. It usually occurs in birds reared on litter or dirt. Wet, humid conditions are ideal for the propagation of this protozoan parasite. All chicks should be started on medicated feeds to help build immunity, or vaccinated with coccivac at the hatchery. If an outbreak occurs then Amprolium in the water is the recommended treatment.

Pullorum is found around the world in just about all poultry producing areas. This refers to *Salmonella pullorum*, a disease commonly spread by egg transmission from one generation to another, and then from infected chicks to non-infected chicks. There is no cure for pullorum and it is recommend that only birds from certified pullorum free flocks be purchased. Your local extension specialist has the latest National Poultry Improvement Plan (NPIP) listing of pullorum free hatcheries and breeders.

If you have sick birds or birds showing signs of disease it is best to bring a few with the symptoms to the nearest diagnostic laboratory and have them properly diagnosed. If birds die, put them in plastic bags, keep them cool, but not frozen, and take them to the lab for necropsy. A few dollars spent on diagnosis will save you a lot more later.

It is easy to fall into the trap of asking a friend what they think or what drug you should treat your birds with, but you are much better off with a proper diagnosis by a trained professional.

For more information on Game birds or poultry in general, check out some of the material listed below.

WEB Sites with information on game birds:

You can access the National Agricultural Library online at www.nalusda.gov and request this bibliography of articles written about gamebirds. Articles on all aspects of managing and rearing gamebirds are listed.

www.poultryconnection.com

<http://home.att.net/~DanCowell/personal.html>

<http://www.guineas.com/>

<http://www.guineafowl.com/GFBA.html>

A couple of sites for the guinea fowl enthusiast.

<http://www.manzanodragon.com/manzanovalley/cyberlibrary.html>

National Poultry Improvement Plan web site. <http://www.aphis.usda.gov/vs/npip>

Books and Magazines and other Resources

Game Bird and Conservationists Gazette
Allen Publishing LLC,
P. O. Box 171227-W, Salt Lake City, Utah 84117.

Wildlife Harvest
Wildlife Harvest Publications
PO Box 96
Goose Lake, IA 52750

Guinea Fowl
by Van Hosen & Stromberg
available from Smith Poultry and Gamebird Supplies

Gardening with Guineas
by Jeannette S. Ferguson
ISBN 0-7392-0250-2
available from FFE Media
First printing 1999.

Upland Game Birds, Their Breeding and Care
By Dr. Leland B. Hayes
Leland Hayes' Gamebird Publications; 360 pages (September 1, 1997)
ISBN 0-9633196-2-0

Raising Guineafowl
Leaflet No. 519, Revised April 1976
United States Department of Agriculture

Game Bird Propagation
by John Mullin and Peggy Mullin Boehmer
Sixth Edition

Raising quail, partridge, pheasant, bobwhites, and ostriches : January 1987 - January 1991
by Jean A. Larson.
Publisher: Beltsville, Md. : National Agricultural Library, [1991] 21 p.

The pheasants of the world : biology and natural history /
by Paul A. Johnsgard.
Publisher: Washington, D.C. : Smithsonian Institution Press, c1999. 2nd ed. xviii, 398 p

Bobwhite thesaurus
by Thomas G. Scott.
Publisher: Edgefield, S.C. : International Quail Foundation, c1985.306 p.
ISBN: 0935868089

Poultry Health and Management : Chickens, Turkeys, Ducks, Geese and Quail
by David Sainsbury
Paperback - 216 pages 4th edition
Blackwell Science Inc;
ISBN: 0632051728

Raising Game Birds
Paperback 7th edition (December 1995)
Farmers Digest
ISBN: 0944079202