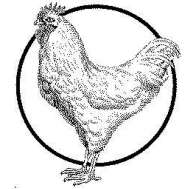




Small Flock Poultry Management Series

Disease

According to Webster, “Disease is a condition of the living animal or plant body or of one of its parts that impairs normal functioning and is typically manifested by distinguishing signs and symptoms.”



Disease results when one or more of a variety of direct and indirect causes reduces an organism’s resistance to infection. Direct causes of disease can be either infectious or non-infectious. Infectious causes of disease include pathogenic viruses, bacteria, parasites, fungi, and protozoa. Indirect, non-infectious, causes of disease include nutritional imbalance, injury, toxins, and excessive stress. Effective control of disease requires an understanding of how diseases are introduced and spread.

Infectious disease is caused by pathogenic microbes. The majority of microbes found in the environment and in the bodies of poultry are nonpathogenic (they don’t cause disease). Beneficial microbes live in and on poultry to aid in many bodily functions, including digestion.

Pathogenic microbes vary in their ability to cause disease and in the severity of the disease they cause. Some microbes known as opportunists will infect only an animal with a suppressed immune system. Differences among strains of the same pathogenic microbes can cause different symptoms and differences in severity of a disease.

Bacteria

Bacteria were first discovered in the 17th century when the microscope was invented. Bacteria reproduce by different means, some by producing spores, others by cell division. Under ideal conditions a single bacterium can become millions in just a few hours.

Pathogenic bacteria enter the body of the chicken in several ways; through the digestive system, the respiratory system, and through cuts and wounds. Depending on where the bacteria settle and the conditions they encounter, the infection they cause can either be chronic (long term), or acute (short term, frequently resulting in death).

Bacteria produce disease by causing mechanical damage to the body, by generating toxins that poison the body, or both. Common characteristics of bacterial diseases include: A flock-management program involving thorough cleaning and disinfection of the coop will help control the spread of bacterial pathogens.

Viruses

Viruses are much smaller and simpler than bacteria. Like bacteria, they can be pathogenic or nonpathogenic. Viral disease can range from mild to severe and tends to be host-specific. Outside the cells of another living creature, viruses have no ability to grow or reproduce on their own. They survive by invading the cells of a host organism and making copies of themselves.

Viruses are so small that millions can fit on a speck of dust. This makes it very easy to unknowingly transport viruses from one location to another on a shoe, a piece of shared equipment, or on a farm visitor’s clothing. Although they don’t replicate outside of another’s cells, they can survive in the environment for a very long time.

Viral pathogens generally enter a chicken’s body through the respiratory or digestive system, but can also gain

access through the eye or a wound, including an injection site. They may be present for months or years before the proper conditions are present for the infection to result in disease.

Viruses cause disease in several ways:

Once a bird is infected with a virus and the immune response is triggered, antibodies are produced against the disease organism; if the bird survives, it should be immune to the disease. These recovered birds may still continue to shed the virus even if they appear healthy and they can infect other birds that do not have immunity.

Viruses can also weaken the immune system, making the bird more vulnerable to opportunistic infection by bacteria and other microbes.

They produce carriers (animals that don't get sick themselves, but that harbor the disease organisms and can spread the disease to other animals).

- They can spread from egg to chick.

- They are spread by rodents and wild birds.

- They can survive in poultry housing for extended periods of time.

- By disrupting and destroying cells.

- By invading and disrupting the immune system, triggering the immune system to produce fever and inflammation, thus triggering antibodies that produce tissue damage.

- By damaging chromosomes, leading to the growth of harmful tumors

Parasites

A parasite is defined as “an organism living in, with, or on another organism.” Parasites can be internal or external. Internal parasites of poultry include: roundworms, flatworms, tapeworms, flukes and protozoa. External parasites include: lice, mites, fleas, mosquitoes, flies and in some areas of the US, ticks. Generally parasites and poultry co-exist without substantial damage to the host. Poultry can develop resistance to some parasites and a low level of parasitism is normal. Parasites become a problem when the balance between host and parasite is tipped in the parasite's favor resulting in parasitic overload. Parasitic overload manifests as reduced feed efficiency, reduced growth rates, gradual or rapid decline in health, depression, anorexia and in severe cases, death.

Environment

Extremes in the environment; cold, heat, humidity, crowding, access to toxins and rodents can all contribute to diseases and disorders in the flock. Awareness of these problems and good management practices can reduce or eliminate environmental disease in the small flock. Disorders caused by environment include cannibalism, heat stress, predation, frostbite and poisoning.

Bumblefoot

Bumblefoot, also known as plantar pododermatitis, is a common disorder of maturing males of the heavy breeds. Bumblefoot is characterized by lameness, swelling, heat, reluctance to walk, and a hard, pus-filled abscess on the pad of the foot covered by a black scab.

Bumblefoot results from injury or abrasion to the lower surface of the foot, which allows for the introduction of staphylococcus bacteria. Lesions can occur on toes, hocks and the pads of the feet. Bumblefoot is a chronic disease that if left untreated can result in a 50 percent mortality rate.

Staphylococcus bacteria are present wherever there are chickens. Infection occurs when a rough perch, splinter, wire floor, or a heavy bird's jump from a perch more than 18 inches off the floor causes a small break in the skin, allowing bacteria to enter. Improper litter management can also cause skin irritation and skin breaks that allow staph bacteria into the wound.

If Bumblefoot is detected while the lesion is soft and pliable, chances for successful treatment are higher than if treatment is delayed until the lesion becomes rock hard. Early Bumblefoot infections can be successfully treated with

antibiotics, separating the affected bird from the flock and providing deep bedding to limit stress on the sore foot.

Administer the antibiotic according to label directions for the specified number of days. Staph bacteria can be transmitted to humans, so if you treat the bird, make sure to protect yourself by wearing gloves when handling the bird or the lesion. Wash hands, clothes and equipment after handling affected birds.

Draining the lesion promotes healing. Soak the foot in warm water and Epsom salts. When the scab has softened, remove it to expose the pus-filled cavity. Flush the cavity with hydrogen peroxide to clean out the pus and debris. Pack the cavity with antibiotic ointment, and then wrap the foot to keep the cavity clean.

Keep the treated bird separate from the rest of the flock on deep bedding, flush the cavity and re-wrap the foot at least every other day until completely healed. Pus and debris from the abscess are contagious to humans and other animals, so gather all contaminated materials for proper disposal by incineration or deep burial.

To prevent Bumblefoot, keep perches less than 18 inches off the floor. Repeated jumping from high perches by heavy birds can cause irritation and damage to the bottom of the foot and lead to Bumblefoot. Practice proper litter management; keep bedding clean, dry and deep in the coop to limit irritation to the foot. Check roosts, floors and other surfaces for rough and sharp edges. Puncture wounds and scrapes can become infected with staph bacteria and lead to abscesses.

Cannibalism

“Henpecked” seems innocent enough, unless you’re on the receiving end!

Feather-pecking is a natural expression of dominance in poultry flocks. The severity of the damage associated with feather-pecking can be influenced by management factors and the breed of hens. Pecking behavior leads to feather damage, feather loss, reduced ability to regulate body temperature and reduced egg production in affected birds.

In some cases, feather-pecking leads to bleeding at the feather site. Bleeding attracts more pecking, not only by the dominant hen but by all members of the flock. Severe injury, resulting in culling or death may result. If left in the coop a severely injured or dead bird will be cannibalized by the flock.

Vent-picking is usually a problem when birds begin to lay, either for the first time or returning to egg production after molting. Vent-picking occurs immediately after an egg is laid while the mucus membrane is exposed. It’s more prevalent in overcrowded floor systems with birds laying eggs on the floor.

There may be a genetic component to feather-pecking, since the light breeds are more prone to the behavior than the heavier breeds. Feather-pecking can also be a learned behavior; once one bird starts the practice in your coop, the others quickly learn to join in. Once feather-pecking and cannibalism have occurred in your flock, it is a difficult habit to break. While there is no agreement on the exact causes of feather pecking and cannibalism, there are things you can do to limit or prevent pecking in your flock.

If an outbreak of feather-pecking and cannibalism occurs in your flock, evaluate management practices in your flock. Alter or correct anything that may be causing stress, as stress has been shown to lead to pecking and cannibalism. Remove injured birds from the flock or treat wounds with pine tar to discourage pecking. Implementing enrichment or entertainment will distract the birds long enough to break the habit.

Oil of ipecac or some of the Bitter Apple products applied to the feathers also might reduce the incidence of feather-picking.

Provide adequate floor space for the age, number and size of the birds.

Provide adequate space at food and water, provide free-choice feed and water at all times. A little too much is better than not enough.

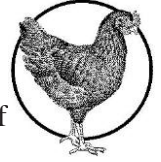
Provide enough nesting sites. Nest boxes should be 12" x 12" x 12", fairly private and dark inside. You should

provide 1 nest box for every 5 hens in the flock. Again, too many is better than not enough.

Moderate the light intensity. High light intensity and continuous lighting cause stress that can lead to pecking.

Provide proper nutrition. Feather-pecking may have a nutritional component. Feed a diet balanced for the age and stage of production of your flock.

Remove injured and dead birds from the flock. Injured and dead birds, regardless of the cause, may be pecked and cannibalized by the flock. This may not only cause the spread of disease in your flock, but may also promote pecking and cannibalism.



Provide enrichment or entertainment for the birds. Birds confined to a coop or pen with all of their food and water needs met, may become bored. Enrichment could be as simple as an enclosed run where the birds can hunt insects, peck the soil, and eat grass and seeds. Some flock owners give hens a small amount of fresh greens daily or hang a head of cabbage at bird's-eye height. Other enrichment devices include white and yellow strings hung for the birds to peck. This will direct the pecking in a less destructive direction.

Consider beak-trimming. Beak-trimming makes the beak blunt by removing the tip of the beak and is common in commercial flocks. It is intended to reduce pecking and cannibalism. A portion of the beak is removed before the chicks are 5 weeks old. Public concern over beak-trimming has made this practice less common for the home flock.

Apply blinders or specs. Applied to the beak, these devices prevent the birds from seeing directly ahead and make it difficult to aim a peck at another bird. They have been used in game-bird production, but aren't practical in layer flocks.

External Parasites

All birds are susceptible to infestation by external parasites. In the Northeast the most common external parasites of poultry are lice and mites. There are two common types of lice, the Head Louse and the Body Louse, as well as four types of mites, the Northern Fowl Mite and the Common Chicken Mite and the less common Depluming Mite and Scaly Leg Mite.

External parasites in large commercial poultry flocks have been all but eliminated due to the bird's limited contact with wild birds and other parasite vectors. In small flocks it is more difficult to control contact with wild birds and rodents that may be carrying external parasites that can infest chickens. Because this isn't a significant problem of large commercial poultry production, there are few control materials registered for use. On the other hand, because of their limited use, the products registered to control external parasites have maintained their effectiveness, as the pests haven't developed resistance to the active ingredients in these products.

Lice

There are two types of lice: biting and sucking. Blood-sucking lice attack mammals only, while biting lice can infest both birds and mammals. The biting lice that infest chickens feed on skin flakes, feathers and scabs, and fresh blood if it is available on the skin surface. Poultry lice are specific to poultry and will not bite humans.

Head lice are very common in all parts of North America, including the Northeast. As the name implies, the head louse is found on the head and neck of the bird. Usually found at the base of the feathers, they are oblong, grayish in color, and about 1/10th-inch long. They attach their eggs to the down or base of the feathers. Head lice spread from hen to chicks, especially in the heavily feathered breeds like Polish and Cochin. A young bird with a heavy infestation will be lethargic and droopy and may die before reaching one month of age.

The body louse is found on the body of the bird. Body lice are straw-colored, fast movers and scatter when the feathers are spread to examine for parasites. Body lice will chew through the skin to reach growing, blood-rich quills. Evidence of body lice includes numerous scabs and pearl-colored egg masses at the base of the feathers. Body

lice are commonly found around the vent, breast, head, and under the wings. They are located close to the skin in sparsely feathered areas.

Life cycle

A louse lives for several months; it completes its entire life cycle on the body of the bird. Off a host bird's body, a louse can survive for a few days. Upon reaching maturity, a female louse lays eggs, called *nits*, and attaches them to the feathers with a glue-like substance. A single female louse will lay about 300 eggs in her lifetime. The nits remain attached to the feather until hatching in 4-7 days. Young lice, called *nymphs*, look like miniature adults, except they are transparent. As they grow and molt they develop the adult color. Just before reaching maturity, nymphs mate on the bird and begin to produce nits. One generation takes about 3 weeks.

Lice are transmitted from bird to bird by crawling from infested feathers, equipment, or infested wild birds. Louse infestation is usually worse in the fall and winter. Birds will be so irritated by the biting of the lice that they scratch themselves incessantly. Stress from lice infestation can lead to reduced feed intake, reduced egg production, increased susceptibility to other disease and, in severe cases, even death.

Mites

Mites belong to the same family as spiders; they have a single-segmented body and four pairs of legs. Mites are very small and can be difficult to see, as they are about 1/25-inch long. Mites have piercing and chewing mouth parts; depending on the species, they eat blood, skin cells and feathers.

The ***common mite*** (also called chicken mite, or red mite) is the most common mite. It is most active during the warm months, making it more of a problem during the summer. The chicken mite lives and lays its eggs in cracks and crevices of the coop. They are more common in floor birds than in caged birds, as cages have few cracks and crevices for them to live in.

Red mites get their name because they turn red from ingesting chicken's blood. They can live for 6 months off a host bird, so an infested coop remains infested long after the birds have left. Red mites feed at night, so inspect the birds and coop at night. You may see mites crawling along perches or on the birds. Severe infestations may lead to death of chicks and brooding hens. Red mites can infest the roof of the hen's mouth, leading to severe anemia.

Red mites are best controlled by cleaning up the environment, treatment of individual birds is not effective as the mites live off the birds. If warranted treat the cracks and crevices of the coop to eliminate this pest. Repeat treatment in 5 to 7 days to control newly hatched mites.

The ***northern fowl mite*** is the most serious pest of chickens in cool climates. These mites are most active in cooler weather and are more of a problem in the fall and winter. The northern fowl mite completes its lifecycle in less than a week, so infestation spreads rapidly. The northern fowl mite can live for only about a month off a host bird. Because it spends its entire life on the bird, it does more damage than the red mite. During severe infestations of northern fowl mites you may see large numbers of mites on the birds during the day, or have mites running up your arms when you handle the birds and crawling on your hands when you gather eggs from the nest boxes. The skin around the vent of an infested bird may be dark and scabby; on light-colored birds the vent feathers will be dark.

Treat individual birds with an approved pesticide and repeat in 5 to 7 days.

The ***scaly leg mite*** is much smaller than the other mites, about 1/100-inch long. It crawls under the scales on the chickens' legs and chews the tissue under the scales. The legs of infested chickens get thick and crust over; in severe cases the swelling gets so bad that blood supply to the toes of the bird is compromised and it may lose toes. More frequently a problem of older birds, scaly leg mite can also affect young birds kept with infested older birds. The scaly leg mite spends its entire life on the bird. Once a bird is infested it is difficult to impossible to eliminate the infection. You have to cull severely affected birds. To treat, one day one of treatment, dip the affected legs in gasoline for 30-45 seconds then coat the bird's legs with A&D ointment, or Vaseline, or mineral oil several times each day to smother the mites. Then on day three of treatment do one more dip in gasoline and continue with the A&D until the scales look normal again. Treat all birds in the flock to prevent re-infestation from other birds. Then

you must treat all the roosts and nest boxes to remove any remaining mites.

The *feather or de-pluming mite* is also very small and difficult to control. It burrows into the skin at the base of the feather, where the irritation causes the bird to scratch and pull out its own feathers in an attempt to eliminate the source of the irritation. Because this mite is difficult to control it may be best to cull affected birds to reduce the spread of this parasite.

Prevention and treatment

Prevention is always better than cure. Many parasites can be controlled by good management, including good sanitation, proper housing, and optimum nutrition. Inspect your birds monthly for external parasites. It is best to inspect birds after they have roosted for the evening. Birds will be calm and easy to catch when they are roosting, and you will cause less distress and loss of egg production that might result from chasing hens around the coop or yard.

Examine around the vent and under the wings for body lice and mites; examine the head and neck for head lice. Also examine the roosts and nesting boxes for mites. Remember, body lice move quickly, so work fast. You can also examine the feathers for evidence of nits. If one bird has lice or mites, chances are they all do. Unfortunately, once a flock is infested the only way to eliminate a parasite problem is with pesticides.

Effective treatment may involve treating all the birds or the coop with an insecticide approved for poultry. *Be sure to read and follow all label instructions including attention to detail regarding protective equipment and possible withholding time for consumption of meat and eggs from treated birds.*

A pinch of pesticide dust under each wing and near the vent, as well as dusting the litter and bath sites, will help to keep parasites in check. No insecticide will kill nits, so if treatment is warranted, it should be repeated in 7 days and again in 14 days to remove all of the newly hatched nits.

Organic pyrethrum (derived from chrysanthemums) is fairly safe for humans and birds but highly toxic to insects. Powder the vent area and under the wings, using a puff bottle; treat cracks and crevices in the coop as well. Allowing the birds to dust themselves in diatomaceous earth is a common organic treatment. Diatomaceous earth has sharp edges reported to pierce the parasite's body, leading to desiccation and death. One drawback: diatomaceous earth is very harmful if inhaled (by bird or human) and may pose a threat to your flock's respiratory health. Research is still divided as to the efficacy of this product for parasite control.

Internal Parasites

Internal Parasites can be classified into two basic groups, worms and protozoa. Parasitic disease differs from bacterial and viral disease in specific ways:

- Parasites have a complex lifecycle.
- Parasites are transmitted from bird to bird differently than viruses or bacteria.
- Serology (blood analysis) doesn't work for diagnosing parasites.
- Quarantine and disinfection are of little use in controlling parasites.

Modern commercial confinement systems have significantly reduced the incidence of worm infestation by limiting the bird's access to many parasites' alternate hosts. On the other hand, confinement systems and high-density stocking rates have led to an increase in the incidence of protozoan parasitic disease in these flocks.

Intestinal parasites - worms - are common in backyard and free-range flocks. Low levels of parasitism don't usually cause a problem. If the infestation becomes severe, however, worms can lead to significant losses of production, feed efficiency, and overall health.

Worms

Ascarids: Large Roundworms

Large roundworms or ascarids are the most damaging of the worms common to backyard flocks. Mild infections of ascarids often go unnoticed, but severe infestations can cause a reduction in nutrient absorption, intestinal blockage and death. Severe infestation not only makes the birds less efficient, it also makes them more susceptible to other disease organisms. Large roundworms are about the thickness of a pencil lead and grow up to four and one-half inches long. They are easily seen with the naked eye and occasionally migrate up the hen's reproductive tract and become encased in a newly forming egg. Signs of ascarid infestation include lethargy, weight loss and diarrhea. Large roundworms can be controlled by strict sanitation, complete cleaning of housing between groups of birds, and segregation of younger birds. Use of clean range for each group of birds will help to reduce the level of Ascarid infestation in a flock. The life cycle of the large roundworm is direct, meaning that the parasite eggs are found in the droppings of infected birds and are passed directly to birds who consume contaminated feed, water or feces. Signs of ascarid infestation include lethargy, weight loss and diarrhea. Large roundworms can be controlled by strict sanitation, complete cleaning of housing between groups of birds, and segregation of younger birds. Use of clean range for each group of birds will help to reduce the level of Ascarid infestation in a flock.

Piperazine, is pretty effective in the control of adult large roundworms only. It isn't effective against other internal parasites of poultry. The use of any other de-wormer in poultry requires a prescription from a licensed veterinarian.

Cecal Worms

The Cecal worm is a common parasite of backyard poultry flocks. As the name implies, the cecal worm inhabits the cecum of the bird. Cecal worms cause little or no damage to chicken flocks but the cecal worm can carry the organism that causes blackhead disease in turkeys.

Earthworms ingest the infected cecal worm egg from poultry litter; turkeys that consume the earthworms become infected with the blackhead organism. Turkeys can also become infected with the blackhead organism from direct oral contact with the infected cecal worms. Turkeys and chickens shouldn't be housed together and turkeys shouldn't range where chickens have ranged.

Levamisole and Ivermectin are both effective in the control of cecal worms, though both require a veterinarian's prescription for use in poultry.

Capillaria: Capillary or Thread Worms

There are several species of capillaria in poultry; they affect different parts of the bird and cause a variety of symptoms. Species that occur in the crop and esophagus cause thickening and inflammation of the mucus membranes. Turkeys and game birds may suffer severe losses due to these parasites. Other species of capillaria are prevalent in the lower intestinal tract and cause inflammation, hemorrhage and erosion of the intestinal lining. Severe infestation can lead to death.

Some species of thread worms have a direct life cycle and some an indirect lifecycle. Control of threadworms that have an intermediate host can be achieved by the control of the alternate host.

Capillaria are a common problem of deep litter houses; heavy infestations result in reduced growth, reduced egg production and reduced fertility. If present in large numbers thread worms can be seen during necropsy; eggs are difficult to find in bird droppings as they are very small.

Levamisole and fenbendazole are effective, though both require a vet's prescription for use in poultry.

Tapeworms

Several species of tapeworms affect poultry. They range in size from very small (not visible with the naked eye) to 13 inches long. Each species of tapeworm attaches to a different section of the digestive tract using four pairs of suckers located on their heads. Most tapeworms are host-specific, with chicken tapeworms affecting only chickens.

Tapeworms require an alternate host to complete their lifecycle. Hosts include ants, beetles, houseflies, slugs, snails and termites. The system for raising the birds determines the likely alternate host, with caged birds being infected by houseflies, litter-raised birds being infected by termites and beetles, and free-ranged birds infected by snails and earthworms.

Tapeworms are made up of multiple flat sections, shed in groups of two to three on a daily basis. Each section of tapeworm contains hundreds of eggs and each tapeworm is capable of shedding millions of eggs in its lifetime.

Control of tapeworms can be achieved by controlling the alternate host. Different housing situations can make this difficult, impractical or impossible. Although there are no approved drugs to control tapeworm, Valbezen is commonly used to control tapeworm and is also effective against roundworms. A veterinarian's prescription is required.

Protozoa

Protozoa are single celled organisms, found in most all habitats, and include some important parasitic pathogens of humans and domestic animals. There are seven phyla or families of protozoa, two of which are of importance to the poultry industry; these include intercellular protozoa, flagellates and amoebas. Fortunately the worst protozoan parasites aren't found in North America.

Coccidiosis

By far the most common protozoan parasite of the chicken is the Eimeria family of protozoa, commonly referred to as coccidia. Nine types of coccidia affect chickens; seven affect turkeys.

Coccidia are host-specific; this means the coccidia that affect your chickens won't affect your turkeys or other livestock. Coccidia live and reproduce in the digestive tract, where they cause tissue damage. The damage to the digestive tract can reduce nutrient and fluid absorption and cause diarrhea and blood loss. Coccidiosis can increase a bird's susceptibility to other important poultry diseases, such as salmonella.

Coccidia are found everywhere there are chickens. Chicks develop immunity over time, with most severe disease occurring between 3-6 weeks of age. Signs of coccidiosis include bloody diarrhea, watery diarrhea, weight loss, lethargy, ruffled feathers and other signs of general malaise. Outbreaks range from mild to severe and may predispose your flock to other opportunistic organisms.

Medicated feeds control but don't eliminate coccidia, allowing young birds to develop resistance to the coccidia most prevalent in their environment. If exposed to a different species of coccidia, they won't have immunity and disease symptoms may result.

Coccidiosis can be controlled, but not eliminated, with good sanitation, adequate nutrition, clean water and dry litter. Chickens housed in a floor-based system are exposed to coccidia all their lives. Properly fed and managed, they will develop resistance. If they are stressed, depending on the level of infective oocysts in the environment, they may develop symptoms.

Cage-raised birds aren't exposed to the infective materials and develop no resistance. Changing their housing system can result in severe disease and losses due to a lack of resistance in conjunction with exposure.

Vaccines are currently available that give newly-hatched birds a small amount of exposure to coccidia, allowing them to develop immunity without developing disease. With proper vaccination and management, routine anti-coccidial medications are no longer absolutely necessary.

Cryptosporidiosis is a form of coccidia caused by *C. baileyi*. Cryptosporidia aren't specific to chickens and can infect other birds. *C. baileyi* is frequently spread from flock to flock on the feet of animals and people, and can be carried by wild birds.

Intestinal cryptosporidiosis is common and symptoms are usually mild. Frequently the only symptom is pale skin in the yellow-skinned breeds. Cryptosporidiosis can also spread by inhalation, resulting in respiratory infection that is more severe than the intestinal form. Birds 4-17 weeks of age are more susceptible to the respiratory form of the disease. There is no treatment. Supportive therapy and guarding against secondary opportunistic infection are the only courses of action. Once recovered, birds are immune to future infection.

Histomoniasis

Histomoniasis is also known as blackhead disease, and is a serious disease of turkeys. Chickens carry and pass the parasite but are generally immune. Blackhead is most common in range-raised birds.

A chicken may eat an earthworm carrying the eggs of the cecal worm, which has been infected with the histomonad protozoa parasite. The blackhead parasite infects the cecum of the chicken and eventually the parasites are shed in the eggs of the cecal worm. Turkeys raised in close proximity to chickens or on range infected with the cecal worm eggs will pick up the parasite and develop the disease.

Histomonads won't survive long in the environment unless they are protected within the body of an earthworm or within a cecal worm egg.

There is no effective treatment for blackhead disease. Control involves controlling cecal worms to reduce the spread of the blackhead parasite. Turkeys shouldn't be housed or ranged in areas that previously contained chickens.

Parasite prevention and control

A few internal parasites don't cause significant harm and may even be of value to the health of your flock. With proper attention to housing, nutrition and insect control parasite infestation can be kept to a minimum. Monitor your flock for signs of parasite infestation and identify the parasite likely to be the cause before determining the proper treatment for the most effective control. Blanket application of de-wormers is expensive and can contribute to the development of parasite resistance to approved treatments.

ALL extra-label use requires a prescription from a licensed veterinarian.

De-Wormers

Active Ingredient	Brand Name	Effective Against				Dosage
		Roundworm (ascarids)	Cecal Worms	Capillaria (threadworms)	Tapeworms	
Albendazole	Valbazen	yes	yes	yes	yes	4.5 mg/lb, orally
Ivermectin	Ivomec	yes	yes	yes	no	1/4cc Standard* 6-7 drops, Bantams
Levamisole	Prohibit	yes	yes	yes	no	10 ml/gal drinking water for 1 day
Piperazine	Wazine	yes	no	no	no	follow label, repeat in 7-10 days

*1 mm square of Ivermectin paste (large end of a flat toothpick) will de-worm a standard bird. Ivermectin is also effective against many external parasites.

Marek's Disease

Marek's Disease is a viral tumor-causing disease of chickens. Marek's is distributed worldwide and is so common that if you have birds, they have been exposed to Marek's, regardless of whether they show symptoms or not. There are 4 different forms of Marek's:

Marek's Disease is caused by 6 different herpes viruses that primarily affect young birds. The virus concentrates in feather follicles and is shed in dander. Marek's disease-causing virus particles can survive for months in chicken-house dust and litter.

Transmission

Marek's is highly contagious and spreads by bird-to-bird contact, by contact with infected dust and dander, and by darkling beetles and mealworms that live in the chicken house, although the virus has no effect on the beetles or mealworms.

Other organisms common to chicken houses such as free-living mites, mosquitoes and coccidia do not transmit the disease. Chickens are most commonly exposed to Marek's by contact with residual dust and dander in previously infected houses, by aerosol (air) contamination from a nearby house, or by virus particles carried by personnel and equipment. The virus doesn't survive the incubation process well and is not spread by hatching eggs. Immune transfer from the hen to the chick provides some protection to the chick for the first few days of life.

Signs

The signs and symptoms of Marek's Disease vary depending on the form of disease present.

Cutaneous form: Enlarged reddened feather follicles and white bumps on the skin that form brown crusty scabs.

Neural form: Characterized by one, all, or none of the following symptoms -

- Progressive paralysis, usually of the leg or wing, a typical leg-paralysis victim will have one leg extended forward and one leg extended back. A swelling of the sciatic nerve is the cause.
- Weight loss
- Labored breathing
- Diarrhea
- Starvation and death due to an inability to reach feed and water and to trampling by penmates.

Ocular form:

- Gray eye color
- Misshapen iris
- Weight loss
- Blindness
- Death

Visceral Form: Tumors on internal organs including heart, ovary, liver and lung.

Morbidity and mortality

Morbidity (number affected) in unvaccinated flocks can reach 60 percent. Vaccinated flocks fare better with less than 5 percent affected. Mortality is high in affected birds reaching nearly 100 percent over a 10-week period. Pullets are more likely to be affected than cockerels.

Diagnosis

Diagnosis is derived from the flock history, symptoms and necropsy findings.

Prevention

- Breed for resistance.
- Good sanitation and ventilation.
- Brood chicks separately from adults until 5 months of age.
- Keep turkeys with chickens (this may help the chickens with Marek's, but can lead to black head disease in the turkeys).
- Vaccinate all chicks at 1 day old; keep chicks from exposure until immunity has developed,

about 7 days.

Treatment

None. Cull affected birds. Some birds develop temporary paralysis that disappears after 1-2 days. They appear to return to normal, but frequently die from internal tumors a short time later.

- Cutaneous (skin form)
- Neural (nerve form)
- Ocular (eye form)
- Visceral (internal-organ form)

For more fact sheets in the small flock poultry management series return to:
<http://extension.unh.edu/Agric/AGDLEP.htm>

For more information in
New Hampshire:

Family, Home & Garden Education Center

Toll free Info Line in New Hampshire

1-877-398-4769

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or visit:

<http://extension.unh.edu/FHGEC/FHGEC.htm>

For more information in
Connecticut:

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Toll free Info Line in Connecticut

1-877-486-6271

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or visit:

<http://www.ladybug.uconn.edu/index.html>

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