Organic Production and Bird Health

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The production of poultry for food dates back thousands of years. Small flocks were kept around the farm for eggs and meat and allowed to range freely over the farm or were kept in some degree of confinement. Today poultry production has become an industry with large flocks of thousands of birds being kept in controlled environments in large poultry houses. Diseases and other conditions affected the health of the birds has always been a concern whether the flock numbers a few or several thousand.

Currently, a growing number of consumers desire to have poultry produced under natural or organic methods and conditions. Poultry produced under these conditions are at greater risk of certain diseases and problems and at lesser risk of other diseases. There can also be various challenges placed upon the organic producer from various regulations and/or codes associated with organic production. This paper includes information on poultry **health status determination**, **challenges** associated with free range poultry, common poultry **diseases** and problems seen, and preventative practices for diseases.

Health Status Determination/Disease Recognition: Disease is defined as any departure from the normal state of health. The determination of the health status of any avian species depends upon careful **observations** and following a systematic procedure of **examination** The key to early detection of disease is knowing what to look for. It is therefore important to recognize disease early to prevent devastating mortality, lost egg production, or poor weight gains.

Observations are made of three areas to help determine the health of the birds. First observe the area(s) where the poultry are kept. Check for signs of outside influence such as rodent droppings, wild birds, etc. These can be sources of disease entry into the flock. Also observe the feed and water sources, check for evidence of vermin, height and availability of feeders and/or watering devices in relation to bird size and number. Check feed containers for evidence of wetting and mold growth and make sure all feed containers and watering devices are in working order. Sick birds may only seek out feed and water on a limited basis, and if the sources are not working correctly, the condition of the birds will worsen due to dehydration and malnutrition. Carefully observe any litter used in the pen for wet areas or if litter is not used check the soil and/or pasture for areas of standing water or poor drainage. If roosts are used the area under them should be checked for cleanliness and condition of the manure. Wet manure can be a breeding ground for flies which can transmit disease. Watery feces usually indicates diarrhea which may be a result of parasites such as coccidiosis or a gastrointestinal infection.

Observe records of any measured parameters of production such as egg production, hatchability of eggs, feed consumption, weight gain, mortality, etc. A careful observation of these parameters may allow an individual to "catch" a disease in the birds in it's early stages before it becomes serious.

Lastly, observe the birds themselves. Observing the behavior of the birds before you catch them is extremely important. It allows an individual to make a general assessment of their condition without any addition of the stress of catching them. Some points to observe are eating and drinking behavior, general attitude of the bird, gait (walking) of individual birds, overall appearance (is the bird huddled, fluffed, etc.) and the personality of the bird to the flock (ie. is it

fearful, aggressive, alert). After close observations of the flock and individual birds in the flock, and checking for indications of possible problems it is time to perform an examination of the bird(s).

To accurately determine the health of a bird it has to be examined carefully. The first step in the examination is to catch and restrain the bird. As a rule, if the bird is extremely difficult to catch there is most likely nothing wrong with it. Sick birds will usually huddle, with ruffled feathers away from the flock and are usually very easy to catch. Once caught the bird is examined in an orderly fashion to be sure and check each anatomical system for variance from normal. For example, the eyes should be examined for areas of discoloration, accumulations to the eyelids, scars, and discharges. A healthy bird will have bright eyes that are wide open and free of discharge or accumulation. A chicken or turkey with an upper respiratory disease may have a dry brown accumulation on the eyelids and the eyelids may be adhered together. The skin around the eye should also be checked for swelling and/or discoloration. The nostrils should be checked for discharge, accumulation, and ease of air flow. Birds with a respiratory disease such as Infectious Bronchitis or Mycoplasma may have a watery nasal discharge and the air flow is raspy or gurgling. Occasionally, the nostril will be plugged. An enlarged nostril may indicate a long term respiratory infection. The beak is easily examined while checking the nostrils. A healthy bird will keep it's beak free of accumulations. One with a nasal discharge may have feed, soil, or litter, etc adhered to the surface. While examining the beak it is easy to check the mouth cavity by holding the beak open or use a wooden dowel or spoon to assist in keeping the beak open. Check the mouth for accumulations, unusual growths, odors, or discolorations. The top of the mouth is where the cleft palate is located (choana) which is a direct communication with the respiratory tract. Any accumulation or discharge in this region may be from the respiratory tract. The ears are located on either side of the head and are covered with fine feathers. Although few diseases cause ear problems, they can be easily checked for discharges, swelling, and evidence of feather destruction from rubbing or scratching. Respiration is barely noticeable in a healthy bird. However, it should increase in rapidity immediately after catching the bird. After a few minutes for the bird to calm it should return to normal. Check for tail bobbing and open mouth breathing both of which indicate difficult breathing and a possible respiratory infection. If tail bobbing or open mouth breathing are present an infection is likely in both the lungs and air sacs of the bird. The rapidity of the heart rate of a chicken is such that it is very difficult to assess. Most birds have a rate of at least 250 beats per minute. However, the heart beat can be felt through the chest wall and the rate does increase with catching. Usually it returns to normal shortly after being caught.

The skeletal system should be checked for bone twisting, lumps and swellings. Twisting can be from poor nutrition, an infection in the bone, or an improperly healed fracture. The joints should be palpated for swollen areas. The bones and joints of the wing, leg and feet are easily examined. The wing should be extended fully and allowed to return to normal position to better assess the overall wing health. The points one is checking are nerve function in the wing, joint health, and freedom from fractures. The legs are similarly checked. In addition, the scales should be examined for evidence of scaly leg mites which will cause the scales to be somewhat lifted and with a dry crusty accumulation. The skin and feathers of the bird should be examined. Examine the general condition of the feathers looking for evidence of soiling, fraying, parasites and/or parasite damage. The feathers should be gently parted to check the skin for areas of damage, bruises, etc. Lice and/or mites may be found on the feathers or skin. Lice lay eggs which appear as white masses at the base of feathers and the adults may be seen running on the skin or tightly adhered to feather barbs. Two species of mites the red mite and the Northern fowl mite are common in poultry. The Northern fowl mite may be found in large numbers near the tail or vent and appear as grey black spots on the skin or feathers. Affected feathers may appear oily from the numbers of mites present. Birds that are sick usually have unkempt feathers which may be soiled with feces (especially if a gastrointestinal disease is present) or nasal discharges. Most often a bird with a respiratory infection has feathers on the head or shoulders soiled with the discharge.

The last region to examine is the vent. This region is examined to make an assessment of the lower gastrointestinal tract. In this area, check for lice and mites, soiling of feathers, diarrhea, swelling, reddening, abnormal protrusions, and blood. These points of observation and examination are useful as a beginning point in determining the health of a single bird or flock. A knowledge of some of the diseases affecting poultry and their associated signs will allow an individual to better determine when their poultry are sick.

Diseases. The number of scientific reports in the literature on research studies of disease prevalence in both organic and free-range poultry is limited. Many hobby flock owners that free range their poultry report only a few disease instances in their birds, while others report numerous problems and diseases in their flocks. There are two somewhat unique problems seen in free range and pastured poultry. The first problem is predation by various animals such as foxes, skunks, raccoons, weasels, bears, bobcats, mountain lions, coyotes, feral or stray dogs, hawks, eagles, owls, etc. These animals, once they find a flock of under protected poultry, may make daily and/or nightly visits for meals. In addition to death losses, these predators may cause stress or injury as well as carry diseases into a flock. The second somewhat unique problem is the lack of control over the birds' environment. Most commercial poultry are kept confined in houses in which the temperature, airflow, lighting, etc. are controlled. Pastured and free-range poultry are at the mercy of the elements and as such may suffer problems from chilling, over-heating or getting wet. Any of these conditions may also result in the birds being more susceptible to diseases. There are several diseases that could potentially affect free range or pastured poultry. A few common diseases, along with their causes and signs, are listed in the tables below.

Table 1. Bacterial Diseases

Disease	Cause	Signs
Fowl Cholera	*Pasteurella multocida*	Swollen face, wattle, sinuses. Pneumonia. Sudden death. Twisted head and neck. Swollen joints.
Mycoplasma (CRD) MG	*Mycoplasma gallisepticum*	Swollen face and sinus. Coughing. Eye and nose discharge.
Coryza. (Roup)	*Hemophilus paragallinarum*	Sticky eyelids. Eye and Nose discharge. Eye exudates. Respiratory sounds (rales).
Botulism	*Clostridium botulinum* toxin	Limp paralysis of the neck, wings, legs.
Gangrenous dermatitis	*Clostridium perfringens*	Blue/black discolored skin areas. High mortality.

Table 2. Viral Diseases

Disease	Cause	Signs
Fowl Pox	Poxvirus	Two forms: 1. Dry pox or skin form: Blisters or dry crusty areas on unfeathered skin. Growths around eye. 2. Wet pox: Growths in throat. Difficult breathing, eating, or drinking. Mortality
Laryngotracheitis	Herpes virus	Coughing, Blood on beak, feathers, mouth. Severe difficulty breathing.
Infectious Bronchitis	Coronavirus	Coughing, sneezing. Poor egg quality. Drop in egg production.
Mareks Disease	Herpes virus	Paralysis of legs, wings, neck. Usually birds less than 6 months of age.

Table 3. Internal Parasites

Condition	Organism	Symptoms
Coccidia	*Eimeria* species	Weight loss. Unthrifty. Huddling. Blood in feces. Anemia.
Blackhead	*Histomonas*	Weight loss. Listless. Yellow diarrhea
Gapeworm	*Syngamus trachea*	Gasping. Open mouth breathing (gaping)
Tapeworms	Numerous species	Possible weight loss. May see segments (appear as rice gains) in feces.
Roundworms	*Ascaridia sp.*	Weight loss. Ruffled feathers. Unthrifty.
Hairworms/ threadworms	*Capillaria sp.*	Weight loss. Diarrhea. Thickened crop wall.

Table 4. External parasites

Condition	Organism	Symptoms
Lice	Numerous species	Feather damage. Feather picking. Irritation.
Mites	Northern Fowl mite	Irritation. Feather damage or picking. Loss of feathers. Anemia. Dirty or oily looking feathers. This mite stays on the bird.
	Red mite	Irritation. Feather damage or picking. Loss of feathers. Anemia. Red spots on feathers. Birds restless at night. This mite only gets on the bird at nigh.
	Scaly leg mite (Knemidocoptes mutans)	Thick dry yellow-white crusts on the leg scales and under scales.

Disease Prevention: The best treatment for any disease is prevention. This is done through Biosecurity, which can be defined as any and all procedures done to reduce the exposure of animals to disease. A Biosecurity program includes many avenues to prevent entry of potential diseases threats into a flock. Since vermin (rodents, insects, etc.) and wildlife may introduce diseases into a flock, it is important to limit or prevent exposure of the poultry to these threats. Visitors should have restricted access to the poultry since the footwear and clothing of individuals are vectors that could introduce disease organisms into a flock. Any vehicle used to gain entry to the farm should also be considered a potential threat and as such should be cleaned and disinfected before entering the farm. Equipment should never be borrowed since it could be contaminated. If equipment must be borrowed, it should be properly and thoroughly cleaned and disinfected before use. Other aspects of Biosecurity include clean feed and water and proper disposal of all dead birds, litter and manure. Vaccinations are usually not prohibited in organic poultry and can be a significant factor in reducing and/or eliminating many viral diseases and some bacterial diseases. In addition, the parasite coccidia can be prevented via vaccination. Keeping wild birds away from poultry may prevent infestation by external parasites such as lice and mites. Pyrethrum dusts may be used under certain conditions or dust bathes containing sulfur or wood ashes may also be of benefit in controlling them. Internal parasites may be reduced or prevented by good husbandry and pasture management to prevent the build up of parasite eggs in the area. Some bacterial diseases may be prevented by the use of autogenous vaccines, sanitation,

disinfection, avoiding overcrowding, etc. Since organic poultry producers may be very limited in possible choices of treatment for many diseases due to restrictions associated with organic labeling, Biosecurity may be the only weapon against some diseases.