



# Poultry Health Handbook

FOR YUKON FARMERS

**Yukon**  
Government

## The Yukon Livestock Health Program

The Yukon Livestock Health Program is a collaboration between the Government of Yukon's Animal Health Unit (AHU) and Agriculture Branch, and local Yukon veterinarians. The program provides support to Yukon farmers by producing educational publications and workshops on livestock health, biosecurity, and food safety. The program will also support access to livestock health services through private veterinarians.

Yukon farmers with livestock health and disease concerns can contact the AHU for advice, and are encouraged to get in touch any time there is an unexpected change in the health of their poultry flock.

## Government Contacts

### Animal Health Unit, Yukon Government

Environment Yukon, 10 Burns Road, Whitehorse, YT Y1A 4Y9

**Chief Veterinary Officer:** (867) 456-5582

**Program Veterinarian:** (867) 667-8663

**Email:** animalhealth@gov.yk.ca

### Agriculture Branch, Yukon Government

Room 320, Elijah Smith Building, 300 Main Street, Whitehorse, YT

**Phone:** (867) 667-5838

**Toll Free:** 1-800-661-0408 ext. 5838

**Email:** agriculture@gov.yk.ca

### Canadian Food Inspection Agency (CFIA) District Office

2008 - 8<sup>th</sup> Street, Unit 2, Dawson Creek, British Columbia

**Phone:** (250) 719-6855

**Email:** dawsoncreek@inspection.gc.ca

## Yukon Veterinary Clinics

### All Paws Veterinary Clinic

9 Metropolit Lane  
Whitehorse, YT  
(867) 667-7387

### Copper Road Veterinary Clinic

128B Copper Road  
Whitehorse, YT  
(867) 633-5184

### Oakley Vet Services

Haines Junction, YT  
(867) 335-5894

### Alpine Veterinary Medical Center

107 Copper Road  
Whitehorse, YT  
(867) 633-5700

### Dawson Veterinary Clinic

Dawson City, YT  
(867) 993-5205

## Useful Websites

**CFIA: How to Prevent and Detect Disease in Backyard Flocks**  
[www.inspection.gc.ca/animals/terrestrial-animals/diseases/bird-health-basics/eng/1323643634523/1323644740109](http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/bird-health-basics/eng/1323643634523/1323644740109)

**British Columbia Ministry of Agriculture: Poultry Health**  
[www.agf.gov.bc.ca/ahc/poultry/index.htm](http://www.agf.gov.bc.ca/ahc/poultry/index.htm)

**Ontario Ministry of Agriculture and Food: Poultry Health Management and Biosecurity**  
[www.omafra.gov.on.ca/english/livestock/poultry/health.html](http://www.omafra.gov.on.ca/english/livestock/poultry/health.html)

**Government of Saskatchewan: Poultry Health and Disease Fact Sheet**  
[www.agriculture.gov.sk.ca/Poultry\\_Health\\_Disease](http://www.agriculture.gov.sk.ca/Poultry_Health_Disease)

**Cornell University College of Veterinary Medicine: Atlas of Avian Diseases**  
<http://partnersah.vet.cornell.edu/avian-atlas/>

**University of Florida: Poultry Health and Nutrition**  
[https://edis.ifas.ufl.edu/topic\\_poultry\\_health\\_and\\_nutrition](https://edis.ifas.ufl.edu/topic_poultry_health_and_nutrition)  
<https://edis.ifas.ufl.edu/ps044>

**Best Practices Guide to Open Air Poultry Slaughter**  
[http://smallfarms.oregonstate.edu/sites/default/files/small-farms-tech-report/bestprxopenairpoultryslaughter\\_september\\_2012.pdf](http://smallfarms.oregonstate.edu/sites/default/files/small-farms-tech-report/bestprxopenairpoultryslaughter_september_2012.pdf)

**Intervet Schering-Plough Animal Health: Important Poultry Diseases**  
[www.canadianpoultry.ca/cms\\_pdfs/Important%20Poultry%20Diseases%20060058%20-%20CPC%20website.pdf](http://www.canadianpoultry.ca/cms_pdfs/Important%20Poultry%20Diseases%20060058%20-%20CPC%20website.pdf)

**The Poultry Site**  
[www.thepoultrysite.com/diseaseinfo/](http://www.thepoultrysite.com/diseaseinfo/)

## A Note About the Poultry Icons

Diseases and conditions described in this book may affect different types of poultry, including laying hens (layers), meat birds (broilers), and turkeys. Some of these conditions may also affect other types of birds such as geese or ducks.

Poultry icons are found along the edge of each page, indicating which type(s) of poultry are most commonly affected by a specific condition or disease.



### Layers:

Refers to hens raised for the purpose of laying eggs for consumption or hatching. Also includes pullets prior to laying age and diseases which affect the egg.



### Broilers:

Refers to chickens raised for meat, including birds that are slaughtered after six weeks, and heavy birds (roasters) raised to older ages.



### Turkeys:

Refers to domestic turkeys raised for meat or egg production.

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## A Note About Disease Symptom Icons

Diseases and conditions described in this book will have a variety of symptoms and signs of illness that you may notice. Disease symptom icons can be found next to the “What will I see?” section of each condition, indicating key symptoms that may be seen with a specific condition or disease.

### Skin, Feathers, Beak, Legs



- ▶ Feathers are ruffled, misplaced or damaged, and may see birds scratching
- ▶ Recent wounds will be red, open and oozing
- ▶ Older wounds may become enlarged, crusty, and scab-like

### Bones, Joints, Muscles



- ▶ Swollen or enlarged hocks and joints or thickened bones
- ▶ Reluctant to walk, one leg held up constantly, or may sit on hocks
- ▶ Birds are lying down but are alert and watchful
- ▶ Birds may use their wings to “walk” around

### Respiratory



- ▶ Birds may have open gaping beaks (“mouth breathing”), and may or may not have a cough, often “snicking” when they breathe
- ▶ Birds may have a swollen head, discharge from nose, eyes or mouth
- ▶ Birds are frequently laying down, and are depressed and dull

### Reproductive



- ▶ This may involve the hen or the eggs/chicks; chicks may be small or weak after hatching
- ▶ In laying hens there is a drop in egg production, eggs may be soft-shelled or deformed

### Diarrhoea and Intestines



- ▶ May be off feed and have an empty crop, or have a swollen crop
- ▶ Wet litter is often an early and common sign of diarrhoea
- ▶ Diarrhoea can be red (bloody), green or white, or see pasted vent with feces smeared on feathers

### Nervous System



- ▶ Some birds use their wings to “walk” around
- ▶ Birds may be paralyzed and unable to move
- ▶ Birds that are able to move may have poor balance, fall over to one side, or walk in a circle to one side or have a head tilt

### Dead



- ▶ Birds are found dead, some near-dead birds may be convulsing
- ▶ Birds may be seen to “flip over” and die
- ▶ The position of a dead bird (back or side) may indicate cause of death

## What is Biosecurity?

Biosecurity is how you separate poultry from anyone or anything that could carry disease. These actions will reduce the chances of your birds getting sick and can reduce the impact disease will have on your flock.

## How Do You Practice Biosecurity?

**Avoid visitors to your barn:** The single most important step you can take to protect your poultry flock is to limit the number of visitors to your barns, especially people who have contact with other poultry.

Bacteria, viruses and parasites that cause disease in poultry can be brought onto the farm by:

- ▶ **People:** attached to shoes and clothing
- ▶ **Vehicles:** in the mud or manure on tires
- ▶ **Objects:** on tools, wire cages, bedding and litter
- ▶ **Poultry:** poultry can carry bacteria, viruses and parasites but may not show signs of disease
- ▶ **Wildlife:** rodents and wild birds can carry bacteria, viruses and parasites that can make your birds sick

Take these steps to prevent bacteria, viruses and parasites from entering your property and being transmitted to your birds:

- ▶ Divide your farm or property into different areas with respect to where poultry are kept.
- ▶ Minimize entry of people, vehicles and wildlife into the area/barns where poultry are kept—allow only essential movement into this secure area.
- ▶ While entry doesn't need to be restricted to the rest of the farm, it is a good idea to keep a record of visitors to the farm—especially those people who come from other farms with livestock.

Take these steps to prevent bacteria, viruses and parasites from spreading throughout your property:

- ▶ Tend to young and healthy birds that are more vulnerable before tending to older or sick birds.
- ▶ Place sick or poor-doing birds into quarantine, away from healthy birds, until they either improve or are culled.
- ▶ Remove and replace all bedding and litter material, and clean visible feces, dust and debris from walls, nests, roosts and floor of barn before introducing new birds to the barn.
- ▶ After cleaning the barn, spray down all surfaces with a disinfectant before introducing new birds.

Leaving a barn vacant and exposing it to fresh air and sunshine for several weeks between flocks is helpful to reduce the amount of bacteria in the barn. Freezing temperatures can actually preserve bacteria, parasites, and viruses though, so it is important to clean your barns and remove all feces, old bedding, and debris before closing barns up for winter.

## Biosecurity is Cleanliness

This means: **Clean BOOTS**

- ▶ Visitors can use disposable shoe and boot covers.
- ▶ Visitors can bring their own boots as long as they scrub them with disinfectant before and after entering the area where poultry are kept.
- ▶ Keep a boot dip filled with disinfectant (e.g. 10% bleach water) and a scrub brush beside the door of the barn.
- ▶ Ensure that all visitors, owners and staff step into the boot dip and scrub their boots with the disinfectant before entering and after leaving the barn.
- ▶ Change the boot dip disinfectant regularly, as organic material such as feces, litter and feathers can deactivate the disinfectant.

### Clean CLOTHES

- ▶ After you supply visitors with coveralls, ensure they are laundered between visitors.
- ▶ Both visitors and farm owners or staff should put on clean (or washed) boots and clothes/coveralls before entering the barn.

### Clean PEOPLE

- ▶ Keep the number of visitors to your poultry barns to a minimum.
- ▶ Wash your hands with soap and water before entering the barn, and particularly before handling birds. This minimizes the possibility of introducing bacteria or viruses to your birds that may have been on other animals or objects around your farm.
- ▶ Wash your hands with soap and water after leaving the barn. This minimizes the spread of bacteria or viruses from poultry to other animals or people.

### Clean BIRDS

- ▶ Know the source of any new birds that you bring onto the farm by inquiring about the health status and vaccination program of the source flock.
- ▶ Avoid introducing new chicks to an established flock. If possible, practice “all-in, all-out” management.
- ▶ If you do add new birds to an existing flock, isolate the new birds in a separate barn for at least 30 days and observe their health closely. Since stress may occur from transport, new birds may be more likely to get sick. If they are separated, you can treat the new birds without risk of getting the rest of your flock sick.

## Top 10 Poultry Health Tips

### 1. Have an isolation/quarantine area

- ▶ Have a separate barn or separate room in your barn, ideally with a separate entrance, that can be used as an isolation and quarantine area.
- ▶ Isolate new birds for 30 days before introducing them to your existing flock.
- ▶ Quickly isolate any sick birds and put them into the quarantine area to limit the spread of disease to other birds.
- ▶ Sick birds should stay in isolation for two weeks AFTER they STOP showing signs of being sick.

### 2. Inspect your flock daily

- ▶ Healthy birds will move out of the way when you enter the barn.
- ▶ Assess if feed and water consumption each day is what you would expect for the number and type of birds you have.
- ▶ Assess the attitude of the flock; all birds should be active, bright and alert. Examine any individuals that seem depressed or dull, and separate them from the rest of the flock for treatment and to prevent illness from spreading to healthy birds.
- ▶ Sick birds are unlikely to eat their feed, and are more likely to stay in one spot, looking depressed and sleepy.
- ▶ **Contact your veterinarian or the Animal Health Unit (Yukon government) if you see an increase in death rate, unusual behaviour, or unexpected decreases in feed consumption or egg production.**



### 3. Disinfecting is different than cleaning

- ▶ Your barn should be cleaned regularly, but should also be disinfected before introducing a new group of birds to the barn.
- ▶ Disinfectants are chemicals that destroy or inactivate bacteria, fungi, and viruses. Not all disinfectants have the same effectiveness, but if used properly most will kill the potentially harmful bugs in your barn.
- ▶ A common disinfectant is a 10% bleach solution which is effective against a wide range of bacteria, fungi, and viruses.
- ▶ Disinfectants cannot kill bacteria until all the organic materials (feces, litter, mud, feathers) have been washed away.
- ▶ Most soaps work as both a cleanser and a disinfectant, so cleaning with soap and water is essential.

### 4. Clean your barns regularly

- ▶ Clean your barns regularly and remove organic materials (feces, litter, mud, wet bedding) from the barn on a regular basis.
- ▶ Check the area around feeders and waterers daily, and remove soiled, wet, or packed bedding. Wet bedding can lead to fungal growth that can cause pneumonia.
- ▶ Before introducing a new flock to your barn and before closing up the barn for winter, wash all surfaces with warm soapy water and rinse to clean away organic materials.
- ▶ Once the surface looks clean, spray the surfaces with a disinfectant such as 10% bleach water.

### 5. Have a “clean period” between flocks

- ▶ This is called an “all-in, all-out” system.
- ▶ To reduce the chance of introducing disease, do not add new birds to an existing flock—treat each flock as a separate group, and replace the entire flock at the same time.

- ▶ When a flock is sold or culled for any reason, and before you introduce a new flock to the property, wash surfaces of barn or room with soap and water, wash surfaces of barn or room with soap and water, disinfect the surfaces with a disinfectant such as 10% bleach water, and allow time for the surfaces to thoroughly air-dry (3–5 days up to 2 weeks).

### 6. Change food and water every day and keep feed and water containers clean

- ▶ Check that your birds are eating all of the feed you provide each day, and adjust the amount you are feeding so all food in the feeders is eaten by the end of the day.
- ▶ Do not add fresh feed to feeders that are caked with old food and/or feces without cleaning the feeders first.
- ▶ Wash and disinfect waterers regularly (i.e. on a weekly basis, or more frequently). Always provide plenty of fresh water for your birds. Snow is not a sufficient source of water for poultry in production.

### 7. Feed the right food

- ▶ Poultry have unique diet requirements, and the correct diet for poultry depends on the age of birds and the stage of production.
- ▶ Ensure that you are feeding the appropriate diet for the types of birds you are raising.
- ▶ Proper diet is important, and correct calcium/phosphorus balance in feed is essential for growing birds and layers. Provide green feed/vegetable scraps for your birds to ensure they get adequate vitamin A.
- ▶ Ensure that your birds are getting the appropriate mineral supplements in their feed. Grains must be balanced with minerals and supplements.
- ▶ Always provide abundant fresh water for your birds.

### 8. Slaughter your birds with care

- ▶ Designate a site for slaughter and processing poultry that is clean, well-drained, and free of pests and trash.
- ▶ Separate your processing site into one area for killing, scalding, and plucking; a second area for evisceration; and another area for chilling and final packaging.
- ▶ People who are processing poultry should wash their hands often during processing and wear clean clothes and boots. Smoking, eating, and drinking should be done in a different area away from the processing site.
- ▶ Prevent contamination of equipment and carcasses through attention to cleaning and sanitation of equipment, and by only processing healthy birds.
- ▶ Chill poultry carcasses to 4°C within 4–6 hours after processing. The larger the bird, the longer it will take to cool.

### 9. Do not let wildlife near your birds

- ▶ Wild birds can carry diseases that will make your birds sick (such as avian influenza and Newcastle's disease).
- ▶ Make sure that bird houses are completely closed off to wild birds.
- ▶ Use fences and electric fence outriggers to keep predators away from your flock, and chicken wire to keep your flock in a designated area. Chicken wire will keep poultry in, but it will not keep predators out.
- ▶ Keep grass around the outside of the poultry area short to deter predators that could hide in tall forage, and feed the mowed grass/weeds to your birds.

### 10. Keep good records

Records on flock health allow you to better understand or recognize changes in your flock.

Keep records on:

- ▶ How many birds you have
- ▶ Where they came from
- ▶ When new birds are introduced and their source flock
- ▶ How many die each week
- ▶ How many eggs are produced each day
- ▶ Who you have sold birds or products to
- ▶ Any visitors to your barns, for tracking movements in case of a disease outbreak

#### ***Remember...***

**Flock owners are legally required to notify government authorities about serious bird diseases like influenza to help prevent spread. You can meet this obligation by contacting the Animal Health Unit for advice if you suspect any serious infection.**

**Government contact information can be found on page 1 of this handbook.**



## Healthy Poultry, Healthy People

### Food-borne disease

Poultry can carry bacteria such as *E. coli*, salmonella, campylobacter, clostridium, listeria, staphylococcus and streptococcus, among others.

- ▶ Sometimes these bacteria make birds sick, but in some cases poultry may shed bacteria but appear healthy.

These bacteria can also make you sick if:

- ▶ You eat undercooked poultry or eggs.
- ▶ You prepare raw meat on the same kitchen surface as uncooked foods (e.g. salad) without cleaning with soap and water in between.
- ▶ You handle dead or live birds, litter, feces, or feathers then eat food without washing your hands first.

Children and immunocompromised people (elderly people, or those living with a chronic disease such as tuberculosis, AIDS, or cancer) are most at risk of becoming sick after handling or eating raw or improperly cooked poultry products.

You can prevent getting sick with these bacteria by keeping healthy poultry. This means:

- ▶ Only purchasing chickens and turkeys from reputable sources with a good vaccination history and with disease-free status.
- ▶ Practicing good biosecurity.
- ▶ Cleaning out your barn on a regular basis.
- ▶ Practicing good pest control, as rodents and other pests can carry bacteria like salmonella that can contaminate your birds or their feed.
- ▶ Washing your hands thoroughly with soap and water for at least 20 seconds (the time it takes to sing “Happy Birthday” twice) after handling your birds or their eggs.

If you develop a food-borne illness due to improper handling of poultry, signs of illness may include:

- ▶ Vomiting and diarrhea which may or may not have blood in it
- ▶ Extreme stomach cramps
- ▶ Fever, chills and lack of appetite
- ▶ Delirium and death in very rare cases
- ▶ Always see your doctor if you become sick after handling or eating poultry products

### Principles of food safety

- ▶ Use soap and water to thoroughly wash any surface touched by raw meat before placing other food onto the same surface.
- ▶ Cook raw meat to an internal temperature of 74°C (for pieces) or 85°C (for whole bird) to kill any bacteria.
- ▶ Collect eggs the day they are laid and wipe them with a dry cloth to remove large pieces of dirt.
- ▶ Eggs that require further washing due to excessive soiling should be used within 1–2 days of washing because of damage to the shell that can occur with washing.
- ▶ Keep all meat and eggs refrigerated until ready for use.
- ▶ Frozen meat should be thawed in the refrigerator and not at room temperature to help limit bacterial growth.

### Good Poultry Slaughter Practices

- ▶ Animals that are obviously diseased or injured should never be sold or used for human consumption.
- ▶ Poultry slaughtered on-farm for own use or farm gate sales must be killed humanely. Humane slaughter must quickly and effectively make an animal unconscious and unable to feel pain before they are bled out.
- ▶ Options for humane slaughter in poultry include neck dislocation, beheading with a sharp axe or hatchet, or stunning followed by bleeding out. The person responsible for killing birds should be experienced and confident to ensure a humane death.

Meat spoilage or contamination can occur if good processing techniques are not followed. Meat contamination can occur with:

- ▶ Incorrect handling of carcasses during processing
- ▶ Careless butchering and contamination of carcass with fecal material or intestinal contents
- ▶ Infrequent cleaning and sanitation of processing equipment, cleaning water/solutions, and chill tubs or tanks
- ▶ Failing to chill carcasses to the correct temperature within an appropriate time frame

It is important to prevent meat contamination and spoilage in order to reduce the risk of illness in people who consume the meat.

#### Keep it CLEAN—Prevent bacterial contamination

- ▶ Butcher poultry in a clean area that is free of pests (rodents and insects) and trash, and does not have standing water, mud, soil or leaves, which can carry bacteria.
- ▶ Wash your hands before and after butchering birds and wear disposable gloves if possible.
- ▶ Avoid contact between your clothes and carcasses while processing, because clothes can carry bacteria. Consider having personnel wear vinyl or plastic aprons that can be easily cleaned.

- ▶ Wash and sanitize knives regularly during processing. Any knives that cut into intestines must be washed and sanitized before using again.
- ▶ If fecal material or intestinal contents contaminate a carcass, use a sharp clean knife to trim off the affected meat or skin. Do not spray with water because that will spread the contamination.

#### Keep it COOL—Prevent bacterial growth

- ▶ Meat spoilage results from bacterial growth, which occurs with increasing temperature and length of time before carcasses are chilled. Defeather, process, and chill birds immediately after slaughter. Have as many people as required to ensure each bird is processed quickly.
- ▶ Poultry carcasses should be chilled to 4°C in the following time frames: 2 kg carcass in 4 hours or less, 2–4 kg carcass in 6 hours or less, and 4 kg or larger carcass in 8 hours or less.
- ▶ Replace ice water in chill tank often to maintain correct temperature.

#### Keep it SAFE

- ▶ Protect meat from intestinal contents or fecal contamination, which contain bacteria and parasites.
- ▶ Wash and sanitize knives frequently, but only sanitize knives that are clean of debris, feathers, and blood. Keep a bucket or tub of sanitizing solution handy throughout processing. Sanitizing solution can be made of 200 ppm of bleach in cool water (e.g. 1 tablespoon of bleach into 1 gallon (or 3.8 litres) of cool potable water).
- ▶ Trim contaminated meat from rest of carcass and wash the knife after trimming.
- ▶ Label meat packages with the date and freeze. Use within 12 months for best meat quality.

# Aspergillosis

## What will I see?

- ▶ Silent gasping and rapid, laboured breathing
- ▶ Off feed but may have increased thirst causing wet litter
- ▶ Drowsiness, depression, huddled or isolated behaviour
- ▶ Loss of body condition and general weakness in individual birds

Respiratory



Dead



## Commonly affected ages?

- ▶ All ages may be affected.
- ▶ Mortality spike by 14 days if infected in hatchery or during brooding on moldy bedding.
- ▶ Occurs in turkeys at onset of sexual maturity when males are strutting and stirring up fungus spores in moldy bedding.

## What should I do if I suspect it?

- ▶ There is no treatment and birds do not recover.
- ▶ Severely affected birds should be culled for humane reasons.
- ▶ Ideally replace all bedding (down to the soil or floor) from the affected poultry house when pneumonia is suspected. At minimum replace visibly moldy or damp bedding (especially from around waterers) because this is most likely to contain mold spores.

## How can I prevent it?

- ▶ Purchase birds from a good, clean hatchery.
- ▶ Use clean, dust and mold-free, good quality litter and feed.
- ▶ Remove bedding completely between flocks.
- ▶ Ensure that litter stays dry.
- ▶ Do not let feed accumulate and develop mold in feeders.

## What else should I know about it?

It is also called fungal pneumonia, but actually affects the bird's air sacs as well as the lungs. Fungal spores are found naturally in the environment, and are highly resistant to common disinfectants so complete cleaning is required to prevent young birds from being in contact with heavily contaminated bedding. Barn conditions, and especially litter conditions, must be kept optimum with proper heat and ventilation to prevent growth of the mold.

Death losses can be up to 50% of birds in a flock if it occurs due to contamination at hatchery.

Birds are infected when they breathe in fungal spores, often from moldy litter. Straw is more often a problem than shavings so shavings may be preferable bedding for mature turkeys since they are more likely to develop the disease due to their behaviour.



LAYERS



BROILERS



TURKEYS

# Arthritis

Bones, Joint, Muscles



## What will I see?

- ▶ Lameness, reluctant to walk
- ▶ Swollen joints, often the hocks but also the toes (older breeding birds)
- ▶ May be litter caked on toes (especially turkey poults)

## Commonly affected ages?

- ▶ All ages may be affected.

## What should I do if I suspect it?

- ▶ Cull birds that have very swollen joints or that are unable to move their joints as they are unlikely to recover.
- ▶ Birds with hot, swollen or red leg joints may respond to antibiotic treatment for a bacterial infection or should be culled. These infections may spread to other body tissues.
- ▶ Seek veterinary advice to determine whether treatment is required.

## How can I prevent it?

- ▶ Dirty or caked litter can cause arthritis, so keep the bedding clean and remove wet bedding from around waterers regularly.
- ▶ Ensure the birds have appropriate nutrition, especially Vitamin D, since rickets will predispose to arthritis.

- ▶ Ensure chicks and poults have an ideal environment at placement to prevent generalized bacterial infection or navel ill that can become localized as arthritis.
- ▶ Always remove and replace all bedding between flocks of poultry. Turkey poults are especially prone to developing arthritis of their toes from dirty bedding.
- ▶ Ensure that birds cannot injure themselves on sharp objects like nails or rough perches.

## What else should I know about it?

Arthritis is often a result of a generalized bacterial infection (septicemia) in chicks or poults. Bacteria from a blood infection tends to settle in joints and does not respond well to drug treatment. These birds are often infected near the time of placement, remain poor-doing and may be condemned at slaughter.

Viruses (reovirus, adenovirus) can cause arthritis and birds will often recover from this, but the virus infection does predispose them to bacterial infections, especially if they are housed on damp litter with lots of feces accumulation. Viral arthritis can also lead to ruptured Achilles tendons in heavy chickens.



LAYERS



BROILERS



TURKEYS

# Avian Tuberculosis (TB)



### How can I prevent it?

- ▶ Avoid introducing older birds (especially of exotic species) to the flock unless you know they come from a TB-free farm.
- ▶ Avoid keeping laying hens in production for more than one year (slaughter as soup hens) because older birds can be a source of TB infection to younger pullets.
- ▶ Maintain good barn management and hygiene, with regular clean-out of nest boxes, replacing nest litter or pads.
- ▶ Ensure poultry feed and bedding is stored to protect it from contamination by feces of rodents, wildlife and wild birds.
- ▶ Clean and disinfect all cages before and after they are used to house or transport birds.

### What else should I know about it?

Other bird species, including ducks, pheasants, and game birds, are at risk for this infection.

Infected birds will shed large numbers of the bacteria in their feces throughout their life.

It is not the same as TB in people or cattle but is caused by a related bacterium, *Mycobacterium avium*.

This bacterium can cause illness in many species including pigs, sheep, rabbits and cattle and can infect people.

It can be spread to other farms on clothing, boots and equipment. Illness and death rates can exceed 50% of a flock over time.

### What will I see?

- ▶ Gradual weight loss despite a good appetite, loss of breast muscle
- ▶ Ruffled feathers, depressed
- ▶ Sporadic deaths in an older flock
- ▶ Lameness, reluctant to walk
- ▶ Pale comb
- ▶ White to yellow lumps on internal organs of slaughtered birds

Bones, Joint, Muscles



Diarrhoea and Intestines



### Commonly affected ages?

- ▶ Older birds, laying hens over a year old

### What should I do if I suspect it?

- ▶ There is no treatment. Affected birds die and should be culled to prevent transmitting infection to others.
- ▶ Consult a veterinarian to confirm a suspected diagnosis.
- ▶ To eliminate tuberculosis it is essential to cull all birds in the flock and dispose of the carcasses appropriately.
- ▶ Before restocking all bedding must be removed, the barn thoroughly cleaned and all barn surfaces disinfected.
- ▶ Can persist in soil for an extended period, from months to years
- ▶ Be aware that the strain of bacteria that causes TB in poultry can infect people if they inhale bacteria in dust or dander, so if the diagnosis is confirmed, it is important to take precautions when cleaning a barn.

# Blackhead/Histomoniasis

## What will I see?

- ▶ Depression and emaciation
- ▶ Off feed and poor growth
- ▶ Sulphur-yellow diarrhoea
- ▶ Cyanosis (blue/black colour) of head
- ▶ Swollen, spotty livers at slaughter; sections of gut (cecal pouches) filled with yellow debris

Dead



## Commonly affected ages?

- ▶ All ages of turkeys may be affected.
- ▶ Chickens are only rarely affected but do carry the parasite.

## What should I do if I suspect it?

- ▶ There is no treatment—no drugs are currently available to treat this parasite.
- ▶ Separate sick birds from healthy birds to provide supportive care. They may recover enough to reach slaughter weight.
- ▶ Cull birds if they are severely depressed and emaciated.
- ▶ Decontaminate the environment before introducing new birds.

## How can I prevent it?

- ▶ The parasite that causes Blackhead is carried in the eggs of a cecal worm that is present in both chickens and turkeys. Chickens don't develop illness from the parasite as severely as turkeys but can heavily contaminate pastures so keep turkeys separate from mature chickens (laying hens).
- ▶ Encourage turkeys to roost on elevated perches—heritage breeds take to this behaviour readily. It prevents them from huddling on the floor or ground and being exposed to parasite eggs in feces.
- ▶ Use concrete flooring in the barn so it can be disinfected.
- ▶ De-worming poultry may be helpful for long-lived flocks.



TURKEYS

## What else should I know about it?

The histomonas parasite (*Histomonas meleagridis*) is passed in feces of affected birds and also in the eggs of the cecal worm (*Heterakis gallinarum*). These are highly resistant and can survive up to three years in the environment.

Cecal worms occur in mature poultry, but are less likely in most broiler chickens that are slaughtered by four months of age.

Wild pheasants and grouse may carry the parasite.



# Breast Blisters

Skin, Feathers, Beak, Legs



### What will I see?

- ▶ A visible cyst on the keel bone over the breast of the bird

### Commonly affected ages?

- ▶ All ages may be affected, but frequency increases as birds age.

### What should I do if I suspect it?

- ▶ This is most often seen at slaughter and the cyst is trimmed. It is not cause for condemnation of the carcass.

### How can I prevent it?

- ▶ Avoid overfeeding because heavy birds are more prone to this condition.
- ▶ Prevent conditions that cause lameness and difficulty walking, such as rickets, arthritis or twisted legs, since birds that spend time squatting are more prone to developing blisters.
- ▶ Ensure that birds have clean dry bedding.

### What else should I know about it?

This condition is associated with leg weakness and there may be infection with bacteria such as *Staphylococcus spp.* Caked or wet litter conditions may cause this condition and up to 50% of a flock may be affected. It is more common in meat birds raised to roaster size than those slaughtered as broilers.

Affected birds will have this area trimmed at slaughter, but unless there are other signs of disease, the carcass will be acceptable for consumption.



LAYERS



BROILERS



TURKEYS

# Cage Layer Fatigue / Osteoporosis



### What will I see?

- ▶ Thin-shelled eggs initially, then eggs without shells
- ▶ Drop in egg production after thin shelled eggs
- ▶ Lameness or reluctance to move, squatting
- ▶ Fragile bones—fractures occur with routine handling of birds

*Bones, Joint, Muscles*



*Reproductive*



### Commonly affected ages?

- ▶ Laying hens, occasionally turkeys
- ▶ Typically near peak egg production (30 weeks of age)
- ▶ More common in high-production strains of hens (e.g. white leghorn)
- ▶ More common in hens that are confined to cages

### What should I do if I suspect it?

- ▶ Provide vitamin D3 in water.
- ▶ Provide free choice oyster shell as top-dressing on feed.

### How can I prevent it?

- ▶ Provide free choice oyster shell to pullets during growth and to hens while in egg production.
- ▶ Provide vitamin D3 in water.
- ▶ Ensure hens have opportunity for exercise as pullets and when in egg production.
- ▶ Provide a proper developer diet during the pullet rearing period.

### What else should I know about it?

Egg production places high demands on the body for calcium to produce shells. Hens that are producing an egg a day will draw on calcium in bones to form eggshell if the diet is not adequate. This weakens the bones and results in fractures. Hens may die when rib fractures interfere with breathing.

Hens may recover if diet is supplemented, but egg production may not return to normal if it has dropped significantly.

# Cannibalism

## What will I see?

- ▶ Birds are often found dead, with entrails picked out.
- ▶ Individual birds may be seen pecking others on the vent, limbs or head.
- ▶ Affected birds will appear weak and may be pale from loss of blood.

*Skin, Feathers, Beak, Legs*



*Reproductive*



*Dead*



## Commonly affected ages?

- ▶ All ages may be affected, but it is rare in broiler chickens.
- ▶ In turkeys it is typically in poults—toe picking.
- ▶ In older laying hens it occurs after laying, there may be partial vent prolapse when a hen lays an egg.

## What should I do if I suspect it?

- ▶ Remove or cull injured birds from the flock—they will continue to be picked on.
- ▶ Reduce bird density—crowding can lead to increased pecking.
- ▶ Provide enough feeding space to reduce competition.
- ▶ Control barn temperature to avoid overheating.
- ▶ Provide roughage (greens, brightly coloured vegetables) for distraction.
- ▶ Feed a balanced diet fortified with salt, vitamins and amino acids.

## How can I prevent it?

- ▶ Practice good flock management to reduce stress and allow birds lots of space.
- ▶ Commercial chicks (layers) have their upper beak trimmed at the hatchery to reduce their ability to pinch.
- ▶ High light intensity or constant light can make pecking worse.
- ▶ Feed at an appropriate level to keep laying hens from getting overly fat. This is especially important in hens kept through a moult to a second lay cycle. Their nutrition needs drop during moult and if they continue to get full feed, they can gain a lot of weight.
- ▶ Birds that seem to be constantly cannibalizing other birds may need to be culled.



## What else should I know about it?

Turkeys are easily stimulated to peck by bright colours and shiny surfaces as part of their search for food. They will peck shiny toenails of others or peck the vent area when another bird defecates.

Laying hens selected for high egg production tend to be high strung and are more likely to peck others.

If hens are allowed to get overweight, they are more likely to prolapse the vent when they lay eggs, and the red colouration attracts other hens to peck them.

Once an area of the body is pecked and inflamed, it is more attractive and stimulates more pecking—a vicious cycle.

# Coccidiosis

## What will I see?

- ▶ Depressed, huddled, ruffled feathers, closed eyes
- ▶ Diarrhoea with wet litter
- ▶ May be blood or mucus in feces
- ▶ Loss of appetite
- ▶ Weak with pale comb or beak
- ▶ Poor egg production

*Diarrhoea and Intestines*



*Dead*



## Commonly affected ages?

- ▶ Young birds—most often between 4–16 weeks of age
- ▶ Laying hens may show signs when they start egg production—20 weeks

## What should I do if I suspect it?

- ▶ Drugs called “coccidiostats” (like Monensin® or Lasalosis®) added to feed or water are effective for controlling the parasite, but are only effective as a preventative medication, and must be given before symptoms are seen.
- ▶ Use these medications on the advice of a veterinarian and carefully follow label instructions.
- ▶ Coccidia develop drug resistance so you must rotate the drug type that is used every 4–6 months.
- ▶ Thoroughly clean the barn, removing and disposing of all used litter before placing a new flock of birds.

## How can I prevent it?

- ▶ Drugs to prevent coccidiosis (coccidiostats) are routinely used in commercial poultry until 10 weeks of age and can be added to the feed.
- ▶ Though there is no withdrawal period for these drugs, they are potentially toxic to other species and care must be used if they are administered.
- ▶ Vaccines are available for layers or breeding flocks. Appropriate farm hygiene, especially thorough clean-out between a previous flock and new chicks can help to prevent coccidiosis by reducing parasite numbers.



## *What else should I know about it?*

There are many species of coccidian parasites that damage different parts of the intestine and cause varying severity of disease.

Different coccidia species affect turkeys and chickens.

Even birds that survive coccidiosis will have damage to the intestine, making it difficult for affected birds to absorb nutrients from their feed.

The coccidia shed eggs in poultry feces, which can survive a long time in the litter until they infect another bird.

Coccidia eggs are very hardy and can be difficult to destroy.

Coccidiosis can pre-dispose poultry to necrotic enteritis which will also cause death.

# Flip-Over/ Sudden Death Syndrome

## What will I see?

- ▶ Sudden death of large, well-grown birds
- ▶ Found dead lying on their back
- ▶ Dead birds with swollen, fluid-filled belly (water-belly)
- ▶ Birds in convulsions prior to death

Respiratory



Dead



## Commonly affected ages?

- ▶ Young, healthy and fast-growing birds are most commonly affected.

## What should I do if I suspect it?

- ▶ There is no treatment.
- ▶ Birds in convulsions or severe respiratory distress should be culled immediately.

## How can I prevent it?

- ▶ Feed a restricted carbohydrate diet and/or restrict the quantity of feed, especially when birds are young and growing most rapidly.
- ▶ Use low intensity light and dawn-to-dusk simulation to prevent very rapid growth at a young age.
- ▶ Select birds from genetic lines that are not bred for very rapid growth rates.

## What else should I know about it?

Sudden Death/Flip-Over occurs in broilers from lines selected for rapid growth rate. Similar sudden death can occur from heart failure in turkeys. The rapid growth, especially of breast muscle, exceeds the ability of the heart to function.

Ascites (water-belly) occurs for similar reasons but is not as sudden, and the failure of the heart over time results in fluid buildup in the abdomen. This may be complicated by cold temperatures, high altitude, diets high in carbohydrates, or poor air quality (lack of ventilation) in the barn.

Though death is not due to an infectious cause, carcasses of birds with terminal heart failure are condemned at slaughter, so even if these birds are close to market size when culled, they would not be suitable for consumption.



BROILERS



TURKEYS



LAYERS



BROILERS

## What else should I know about it?

Fowlpox is a slow-spreading virus.

This virus can survive in the scabs that form over the skin lesions.

This virus can survive for long periods of time in the environment.

The virus can be spread by insects, so insect control may be helpful.

Birds that develop respiratory signs frequently end up with severe disease and can die.

*Skin, Feathers, Beak, Legs*



*Respiratory*



## What will I see?

- ▶ Wart-like scabs on comb and wattle
- ▶ Depressed, off feed, poor growth
- ▶ Poor egg production

## Commonly affected ages?

- ▶ All ages may be affected.

## What should I do if I suspect it?

- ▶ There is no treatment for this virus.
- ▶ Antibiotics and local treatment may help in cases of severe trauma to the skin or where there are open sores.
- ▶ Cull severely affected birds if sores interfere with feeding or breathing.

## How can I prevent it?

- ▶ Consult with a veterinarian to obtain a vaccine if this is a persistent problem in a flock that will have a long life.
- ▶ Chickens should be vaccinated at 12–16 weeks of age, before egg production.
- ▶ Since the vaccine produces a mild form of the disease, all birds in the flock should be vaccinated at the same time.



# Gangrenous Dermatitis/ Cellulitis

### What will I see?

- ▶ Birds are rarely seen sick; they are found dead
- ▶ Green skin under the wings and on the hips, breast or neck of sick or freshly dead birds

### Commonly affected ages?

- ▶ Typically broiler chickens at 4–8 weeks of age
- ▶ Not as common in turkeys, but when it does occur it is in older birds—12–20 weeks of age and often on the back and tail area
- ▶ May occur in breeding flocks due to damage to the hen's back by the rooster during breeding activity

### What should I do if I suspect it?

- ▶ Reduce stress to the flock, ensure there is plenty of individual space.
- ▶ Ensure predators cannot threaten birds (may need to provide shaded areas of outdoor enclosures to help poultry feel secure from avian predators).
- ▶ Ensure there are enough hens for the number of roosters, so the males are not excessively breeding females.
- ▶ Severely affected birds will not recover (without extensive antibiotic treatment) and should be humanely culled.
- ▶ This is a cause for carcass condemnation if found at slaughter.

Skin, Feathers, Beak, Legs



Dead



### How can I prevent it?

- ▶ May occur after a stressful event, something that causes birds to pile up such as a thunderstorm, predator threat or power outage. Scratches from crowding allow bacteria to enter and cause infection.
- ▶ More likely to occur when litter is deep or has been re-used between flocks, so replace litter for each flock—don't allow the bacteria to accumulate.
- ▶ Keep litter clean and dry, and keep humidity in poultry house under control with adequate ventilation—even in winter.
- ▶ Culled birds and carcasses should be disposed of quickly to prevent contamination of the barn.



BROILERS

### What else should I know about it?

It occurs when the bacteria *Clostridium septicum*, *Staphylococcus spp.*, or *E. coli* enters the body through small injuries to the skin and infection progresses very quickly. As many as 50% of all birds in a flock can die from this disease.

A suppressed immune system can predispose birds to this bacterial infection, especially viruses such as chicken anemia virus and infectious bursal disease. Breeder flocks are often immunized against these viruses, so chicks usually have immunity when they are purchased from most hatcheries.

# Inclusion Body Hepatitis



- ▶ Practice good sanitation and barn hygiene to help prevent hepatitis from spreading if it occurs.
- ▶ Good management and husbandry to minimize stress on the birds may help

### *What else should I know about it?*

Caused by a virus that infects young chickens and can cause very high death rates very quickly.

Birds that survive may have reduced immune function, therefore they may be more susceptible to other infections.

The virus is usually spread from hens to chicks. The disease typically appears at around 10 days of age and, if it starts to spread from chick to chick, it may go on to four weeks of age or more.

The virus is resistant to most disinfectants and to high temperatures. It is essential to remove bedding and wash surfaces and equipment well in barn before disinfection to prevent infection of a new flock.

### What will I see?

- ▶ Depressed with ruffled feathers, closed eyes, isolated, huddled
- ▶ Pale comb and wattle
- ▶ Off feed
- ▶ Found dead—death losses may be 10% or more in young birds

Dead



### Commonly affected ages?

- ▶ Chicks as young as five days of age but more commonly three to eight weeks

### What should I do if I suspect it?

- ▶ There is no treatment for this virus, and infection will run its course in an affected flock.
- ▶ Supplementing with water soluble vitamins may support recovery.
- ▶ Cull severely affected birds as they are unlikely to recover.

### How can I prevent it?

- ▶ Wild birds may carry the virus so prevent contact with them.
- ▶ Chicks from highly selected, high health status flocks may be more susceptible to infection.

# Infectious Laryngotracheitis (ILT)

## What will I see?

- ▶ Gaspings, open-mouth breathing
- ▶ Rasping cough, with neck extended
- ▶ Coughing up mucus and blood
- ▶ Discharge from the nose and eyes
- ▶ Sinusitis—swollen face
- ▶ Severe drop in egg production

## Commonly affected ages?

- ▶ All ages may be affected.
- ▶ The whole flock will often develop severe signs very quickly.
- ▶ Often occurs after introduction of new birds (especially bantam fowl or guinea fowl) to the flock. The introduced birds are more resistant but can infect the existing flock.

## What should I do if I suspect it?

- ▶ You are encouraged to contact the Animal Health Unit any time there is an unexpected change in the health of your flock.
- ▶ Isolate birds showing signs of illness from the rest of the flock immediately if possible.
- ▶ Cull severely infected birds—they are not suitable for slaughter.
- ▶ Provide optimal barn conditions for affected birds, warmer than normal barn temperatures may help.

Respiratory



Reproductive



Dead



## Infectious Laryngotracheitis (ILT)

- ▶ This is a virus infection, so antibiotics do not help.
- ▶ There is no treatment; the infection needs to run its course.
- ▶ Birds that recover are immune but may still shed the virus and infect others.



## How can I prevent it?

- ▶ It is essential to quarantine new additions to a flock separately for 30 days to be sure they are not showing signs of disease.
- ▶ If possible, practice an “all-in-all-out” operation; introduce whole flocks at the same time and do not add new birds to an established flock.
- ▶ Vaccines are available but some types produce a low level of disease, and may cause symptoms.
- ▶ Vaccinated flocks must be kept separate from non-vaccinated birds.

## What else should I know about it?

Infectious laryngotracheitis (ILT) is caused by a very contagious herpes virus.

The virus does not survive well in the environment and is killed by sunlight and most disinfectants.

Signs of disease resolve after two to four weeks in birds that recover, but in most outbreaks many birds will die.

Birds that recover will continue to shed the virus and will infect new birds. Do not mix birds of different backgrounds and ages if possible.

Some forms of the virus cause a mild version of the disease that flocks will recover from, but egg production will not return to normal.

### What will I see?

- ▶ Sudden loss of appetite, depression
- ▶ Sudden, sharp drop in egg production
- ▶ Coughing, gasping for air, sneezing
- ▶ Swollen head, eyes or neck
- ▶ Sudden death of multiple birds
- ▶ Tremors, lack of coordination, nervous system signs
- ▶ Comb/wattle may appear swollen and purple

### Commonly affected ages?

- ▶ Meat birds and layer pullets may be affected and will show respiratory system signs and poor production.
- ▶ Laying hens with influenza show drop in egg production along with respiratory symptoms.

### What should I do if I suspect it?

- ▶ You are encouraged to contact the Animal Health Unit any time there is an unexpected change in the health of your flock.
- ▶ Avian influenza can infect other farm animals and people, so early diagnosis and control is important.
- ▶ There is no treatment for this virus, the infection will run its course and death losses may be high.

Respiratory



Nervous System



Reproductive



Diarrhoea and Intestines



Dead



### How can I prevent it?

- ▶ Avian influenza is spread to poultry from other birds, so do not add new birds to an existing flock, if possible.
- ▶ Keep new birds separate from main flock for quarantine period (at least 30 days) to ensure they adapt to the farm and are not ill.
- ▶ Discourage wild birds from using water sources that are used for poultry. Especially wild waterfowl, which can carry influenza viruses without showing signs of illness.
- ▶ Store poultry feed securely to prevent contamination by wild birds.
- ▶ Have feeders protected as well as possible from wild waterfowl; vary feeding times (wild birds will actually learn feeding schedules).
- ▶ If you use surface water for poultry, consider a disinfection system.

### What else should I know about it?

Avian Influenza is very contagious and spreads quickly among birds.

People can spread human strains of influenza to poultry.

Some strains may have no to mild symptoms and other strains cause severe disease.

Strains can mutate quickly when they circulate within a population.

Wild birds can carry avian influenza, shed the virus in their feces and not show any illness.

People can be vaccinated to prevent human strains of influenza, and poultry producers may wish to discuss this with their doctor.



LAYERS



BROILERS



TURKEYS

# Internal Layer/ Egg Yolk Peritonitis

## What will I see?

- ▶ Individual hens will stop producing eggs, appear depressed and off feed
- ▶ Affected birds tend to be heavier than breed standard
- ▶ Damaged vents
- ▶ Distended abdomen and prolapsed cloaca (vents) are common sequelae
- ▶ Some birds may “lay” a mass of pus instead of a normal egg
- ▶ Mature hens may be found dead

## Commonly affected ages?

- ▶ Older laying hens (over 45 weeks)

## What should I do if I suspect it?

- ▶ Affected birds should be isolated from the flock to prevent others from picking at them.
- ▶ There is no effective treatment once illness develops. If the hen does not recover rapidly when given supportive care, it should be culled.

Reproductive



Dead



## How can I prevent it?

- ▶ This is typically an individual bird situation and not a flock problem.
- ▶ If more than one bird is affected, clean all nest boxes and replace litter or liners.
- ▶ Ensure that the floor litter is cleaned and replaced when contaminated by excess manure.
- ▶ Increase the number of roosts available to encourage roosting rather than resting on the floor or in nests.
- ▶ Allow hens the opportunity for exercise, as pullets and once they are in egg production, to maintain fit body condition.

## What else should I know about it?

Egg peritonitis may be caused by infection with bacteria that enter through the oviduct from contact with contaminated nest boxes or from hens sitting or huddling on the floor in manure.

It may occur from internal laying when the yolk is released into the belly cavity and not into the oviduct. This yolk will deteriorate and cause inflammation. Often many yolks are present in the belly and the bird will be quite swollen, but have a prominent keel due to loss of condition and not eating.

# Leg Deformities

Bones, Joint, Muscles



## What will I see?

- ▶ Legs angled at incorrect positions
- ▶ Difficulty walking, wing-walking
- ▶ Lameness, not using affected leg
- ▶ Swollen, warm and red skin over joints if there is a bacterial infection (arthritis)

## Commonly affected ages?

- ▶ Young, rapidly growing birds are most commonly affected with bone deformities—these are not usually painful or reddened but there may be swelling.
- ▶ Birds of any age can develop a bacterial infection in the joints of the legs (arthritis).

## What should I do if I suspect it?

- ▶ There is no treatment, some birds will manage to feed and grow even with leg deformities.
- ▶ Severely affected birds should be culled if required for humane reasons.
- ▶ Provide more access to feed and water and low perches to accommodate birds that have difficulty moving.

## How can I prevent it?

- ▶ Dual purpose and heritage meat breeds of chickens and turkeys have fewer problems than commercial meat breeds, so select slower-growing poultry.

- ▶ Limit the amount of high nutrient feed (e.g. poultry feed or grain) and supplement with vegetation and more plant material to slow growth rate.
- ▶ Ensure adequate vitamin D and access to a source of balanced calcium/phosphorous supplement.
- ▶ Spread feeders around the pen or barn to encourage exercise.
- ▶ Provide perches to encourage activity and support bone development.



BROILERS



TURKEYS

## What else should I know about it?

Leg deformities occur because the rapid growth rate and heavy muscling of meat type poultry puts excess strain on young, soft, developing bones.

Some strains of poultry are more predisposed to leg problems.

Severe deformities may result in condemnation at slaughter due to damage to surrounding muscles.

Rickets can be an underlying cause or can contribute to leg deformities and there is a genetic predisposition to some of the leg abnormalities. Specific deformities include valgus and varus deformity of the hock joint, rotated tibia, and tibial dischondroplasia.



# Marek's Disease

## What will I see?

- ▶ Paralysis of legs or wings due to damage to the nerves, usually in pullets
- ▶ Blindness with cloudy eyes in older birds
- ▶ Lumpy skin, swollen feather follicles, usually in broilers
- ▶ Death losses persisting for weeks, up to 50% in a flock
- ▶ Swollen, pale liver and lumpy tumors on internal organs

## Commonly affected ages?

- ▶ Infection with this virus occurs in very young birds, usually within the first week after hatch.
- ▶ Paralysis commonly appears at 12 weeks of age but can appear as early as 6 weeks.
- ▶ The tumor form occurs in older birds, usually layers after the start of egg production and during the first part of the lay period (20–24 weeks).

## What should I do if I suspect it?

- ▶ You are encouraged to contact the Animal Health Unit any time there is an unexpected change in the health of your flock.
- ▶ Cull affected birds, they will not recover and there is no treatment.

Nervous System



Dead



- ▶ The tumors in the body cavity of affected birds will result in them being condemned at slaughter.
- ▶ DO NOT SELL affected birds or birds from an infected flock.

## How can I prevent it?

- ▶ Purchase vaccinated birds—most hatcheries will vaccinate day-old chicks.
- ▶ Vaccines may not prevent infection, but they do minimize the risk of severe illness and death.
- ▶ Thoroughly clean out your barn before introducing a new flock of birds.
- ▶ This virus does not survive freeze-thaw cycles, so having the barn vacant over winter will reduce the amount of virus present.

## What else should I know about it?

This virus produces tumors in a wide variety of body tissues including liver, eye, brain and nerves.

The virus can survive in infected dander for up to a year and is very contagious between birds.

Infected birds can still spread the virus even if they do not appear to be sick.

Chickens also get lymphoid leucosis—a very similar tumor disease. You may see depressed birds with tumors in the abdomen and slightly increased mortality (1.5% above normal). There is no treatment and the vaccine for Marek's disease does not prevent lymphoid leucosis.



# Necrotic Enteritis

## What will I see?

- ▶ Wet litter indicating diarrhea
- ▶ Depression, ruffled feathers
- ▶ Weight loss, swollen belly, pasted vent
- ▶ Dark-coloured diarrhoea
- ▶ Unable or unwilling to move
- ▶ Sudden death, found dead

Diarrhoea and Intestines



Dead



## Commonly affected ages?

- ▶ Chickens: aged 2–5 weeks
- ▶ Turkeys: aged 7–12 weeks

## What should I do if I suspect it?

- ▶ In most cases this disease occurs as a result of a sudden change in feed to a more highly digestible ration, often with a higher level of grain. If this is the case, reduce feeding of concentrate or grain.
- ▶ Seek veterinary advice on possible treatment with antibiotics, since they may be effective in reducing death losses and help the flock recover.
- ▶ If coccidiosis is the primary cause, it can be treated with anticoccidial drugs in the water.

## How can I prevent it?

- ▶ It can be prevented by use of antibiotics in feed, if this is consistent with desired production practices.
- ▶ May use anticoccidials to prevent coccidiosis which can predispose birds to necrotic enteritis.
- ▶ Avoid sudden changes in ration, especially a change from a low-nutrient density ration to a higher one. This can upset the bacteria in the gut and produce this infection.
- ▶ Probiotics may be of some benefit, but this is not fully established.



BROILERS



TURKEYS

## What else should I know about it?

Necrotic enteritis is caused by the bacteria *Clostridium perfringens*, bacteria that are normally present in the environment and in the intestines of poultry. It causes disease when intestines are damaged from parasites (e.g. coccidia) or the normal gut bacteria are upset by a rapid change in diet to a more highly digestible or more viscous ration.

Mortality can be as high as 50% in a flock but rapid treatment with antibiotics can stop death losses.

# Respiratory Tract Infections/ Airsaculitis/Pneumonia

## What will I see?

- ▶ Coughing, snicking, sneezing
- ▶ Off feed, depression, ruffled feathers
- ▶ Discharge from the eyes and nose
- ▶ Swollen nose and head
- ▶ Slow growth, stunting, reduced egg production
- ▶ Symptoms and severity vary greatly and depend on the cause

Respiratory



Reproductive



## Commonly affected ages?

- ▶ All ages may be affected.
- ▶ Mature birds often have only mild illness.
- ▶ Bacterial infections or infection of young birds can produce death losses.
- ▶ Viral infections of breeder flocks may decrease hatchability and chick survival.

## What should I do if I suspect it?

- ▶ Increase ventilation in the barn to improve air quality.
- ▶ Check air quality at the level of the bird; ammonia from dirty litter will be more noticeable at bird level.
- ▶ Remove and replace litter more often in winter months.
- ▶ Seek veterinary advice if symptoms are severe; antibiotics may help reduce symptoms if the cause is a bacterial infection.

## Respiratory Tract Infections/Airsaculitis/Pneumonia

### How can I prevent it?

- ▶ Avoid dusty or moldy litter and provide roosts to encourage birds to rest off the floor.
- ▶ Remove and replace all floor litter between flocks to eliminate bacteria and viruses that may persist in litter.
- ▶ Impervious floors (like concrete) in the barn are desirable since they can be disinfected between flocks, but removing litter is the most critical step.
- ▶ Vaccination will be effective to prevent some infections such as Infectious bronchitis.
- ▶ Heated barns in winter often have high humidity and ammonia levels because ventilation is reduced. It is essential to have fresh air circulation in all seasons to reduce the chance of respiratory infections.



LAYERS



BROILERS



TURKEYS

### What else should I know about it?

In most cases, respiratory viruses like infectious bronchitis spread rapidly between birds, but often cause only mild disease. These infections may cause a drop in egg production.

Some viruses like Newcastle's disease can come from wild birds.

When poultry have a viral infection, the damage to the airways makes it possible for bacteria, such as *E. coli*, to invade the lungs. This often results in more severe illness. Some bacteria may cause respiratory tract infections without an underlying viral infection.

*Mycoplasma gallisepticum* infection can cause severe disease in turkeys, resulting in swollen sinuses, eye infections, pneumonia, and airsaculitis. Mortality rates may be low, but growth rates are reduced.

# Rickets

Bones, Joint, Muscles



## What will I see?

- ▶ Birds are lame but alert and will still eat if they can get to feed
- ▶ Reluctant to walk and spend time squatting
- ▶ Swollen leg joints
- ▶ Stunted birds—they stop growing at two weeks of age
- ▶ Soft bones and beak

## Commonly affected ages?

- ▶ Young birds from two weeks of age

## What should I do if I suspect it?

- ▶ Add Vitamin D3 in drinking water. The sooner this is started, the better the chance of recovery.
- ▶ Test the complete ration to determine how to supplement.
- ▶ Provide a complete prepared ration until birds show signs of recovery.
- ▶ Provide a free choice balanced source of calcium/phosphorous.

## How can I prevent it?

- ▶ Feed your birds a diet with correct calcium/phosphorous balance and adequate Vitamin D.
- ▶ Provide Vitamin D3 supplement that is water soluble.
- ▶ Access to sunlight can support natural Vitamin D production.

## What else should I know about it?

Rickets occurs when the diet is not balanced for calcium and phosphorus or is deficient in Vitamin D.

Take care not to over supplement with calcium or phosphorus since excess amounts can also produce bone weakness.

The correct ratio of calcium to phosphorus is 2:1.

“Kinky Back” is a disorder seen in fast-growing broiler chickens that may be confused with rickets, but may have a genetic cause. Birds with kinky back sit on their hocks with their legs forward and use their wings to move.



LAYERS



BROILERS



TURKEYS

# Salmonellosis

(disease caused by infection with salmonella bacteria)

## What will I see?

- ▶ Off feed
- ▶ Depressed with ruffled feathers, closed eyes, isolated, huddled
- ▶ White diarrhoea, pasted vent
- ▶ Loud chirping, gasping or difficulty breathing
- ▶ Found dead—entire flock may die
- ▶ Adult birds may show no signs of illness

Diarrhoea and Intestines



Dead



## Commonly affected ages?

- ▶ Any age may be affected.
- ▶ In flocks under four weeks of age, many chicks may die (septicemia).
- ▶ Older chicks may recover but will never thrive and will still shed bacteria.
- ▶ Adult birds may show no signs of illness but carry the bacteria in their body.

## What should I do if I suspect it?

- ▶ Consult a veterinarian for advice on testing to confirm the cause of illness and on possible treatments.
- ▶ You are encouraged to contact the Animal Health Unit any time there is an unexpected change in the health of your flock.
- ▶ Other bacterial infections can look similar to salmonellosis but may not be as severe.
- ▶ Antibiotics given in water may help to stop death loss in broilers or turkeys. However sick birds are often not drinking, so treatment is difficult.
- ▶ Recovered birds may still have the salmonella bacteria in the gut.
- ▶ Recovered birds will need special precautions when they are slaughtered to ensure the meat is not contaminated.

- ▶ If laying flocks are treated and recover from illness, they may still be shedding the bacteria in their feces and in eggs.

## How can I prevent it?

- ▶ Salmonella can be spread to poultry from wild birds and rodents.
- ▶ Store poultry feed and bedding where it cannot be contaminated by wild bird and rodent feces.
- ▶ Exclude wild birds and rodents from poultry houses.
- ▶ Take steps to control litter beetles if they are present in high numbers.
- ▶ Wash and disinfect feeders and waterers regularly and especially between flocks.
- ▶ Purchase poultry from salmonella-free flocks if possible.

## What else should I know about it?

There are many different types (species) of salmonella and they vary in how they affect poultry—some cause minimal or no illness.

The most important impact of salmonella is the potential to cause illness in people.

Some salmonella can be transmitted from infected hens to the egg yolk.

Infected eggs are contaminated when they are laid and bacteria are inside the egg, so washing these eggs will not remove the bacteria. When washing eggs, it is critical that it be done properly to prevent further contamination of the eggs.

Infected eggs can cause severe illness in people and some types of salmonella will infect chicks if they are incubated.



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# Septicemia

(whole body bacterial infection)

## What will I see?

- ▶ Off feed
- ▶ Depressed with ruffled feathers, closed eyes, isolated, huddled
- ▶ Diarrhoea, wet litter
- ▶ Older birds may have a swollen, purple comb and wattles
- ▶ Difficulty breathing
- ▶ Swollen joints and lameness
- ▶ Found dead—death losses may be very high in young birds
- ▶ Green belly occurs rapidly after death

Respiratory



Dead



## Commonly affected ages?

- ▶ Chicks and poults under two weeks of age show sudden death or depression.
- ▶ Older birds may be any age, often occurs after a period of stress such as hens beginning to lay eggs.

## What should I do if I suspect it?

- ▶ Consult a veterinarian for advice on testing to confirm the cause of illness.
- ▶ You are encouraged to contact the Animal Health Unit any time there is an unexpected change in the health of your flock.
- ▶ Antibiotics given in water may help to stop death loss, but sick birds may not be drinking.
- ▶ Recovered birds may never thrive.
- ▶ When joints are involved, birds often don't recover fully.

## Septicemia (whole body bacterial infection)

### How can I prevent it?

- ▶ Septicemia in young poults and chicks often comes from contaminated bedding so ensure bedding is free of rodent and wild bird droppings.
- ▶ Start poults and chicks in confined areas with very clean surfaces and use very clean bedding. (Clean shavings or shredded newspaper are often less contaminated than straw).
- ▶ Wash and disinfect feed and water containers, especially before using for new chicks and poults.



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### What else should I know about it?

Septicemia is a whole body (blood) infection that can be caused by a variety of different bacteria. In most cases, it will be due to an underlying problem including other bacterial or viral conditions or environmental stressors, with the invading bacteria taking advantage of the compromised birds.

In younger chicks and poults, it is most often due to bacteria from the environment like *E. coli*.

Chicks and poults develop resistance to these bacteria as they mature. They are most vulnerable when they are first placed in the poultry house.

Septicemia may be an extension of infection of the navel, so it is important that newly arrived chicks have a clean environment until the navel is fully healed.

In older birds, bacteria often affect the lungs most severely, and are passed from other infected birds.



# Skin parasites

Skin, Feathers, Beak, Legs



## What will I see?

- ▶ Scabby, crusty wounds on skin, often the legs
- ▶ Thickened, misshapen comb and wattles
- ▶ Black, dirty-appearing vent area (Northern Fowl Mite); mites may be visible on close inspection
- ▶ Mites or lice on skin or feathers, sometimes on roosts
- ▶ Poor growth and egg production in severely affected birds
- ▶ Birds are restless, fidgety, scratching and dust bathing more often

## Commonly affected ages?

- ▶ All ages of bird may be affected.

## What should I do if I suspect it?

- ▶ Pesticide dusts, sprays and impregnated bars will kill mites and lice, however, these may not be consistent with organic production practices.
- ▶ Wood ash provides a good dust bath that will help control external parasites.
- ▶ Thorough cleaning and then bleaching the poultry house/barn combined with annual whitewashing all inner house/barn surfaces will help break the cycle of external parasites.

## How can I prevent it?

- ▶ Thoroughly clean the barn before bringing in new birds.
- ▶ Remove and dispose of all bedding and litter between flocks.
- ▶ Chemical pesticides can be sprayed on all surfaces of the barn before bringing in a new flock.
- ▶ Always read label instructions before applying chemicals in the barn or on the birds.

## What else should I know about it?

Some parasites feed on blood but many species feed on skin, dander, feathers and scales.

Lice are small and pale tan, and are specific to poultry. Many spend their whole life on a single bird. They do not bite people or transfer to other animals

Mites are tiny and dark (or red) and many species will bite people (very itchy bite) and other animals as well as birds. They may originate from wild birds and may spend time hidden in cracks in the poultry house/barn.



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### What will I see?

- ▶ Chicks huddle under heat, may eat litter, scratch floor but not feed
- ▶ Small, weak, runty chicks with empty crops—very light weight
- ▶ Dehydration—chicks look shrunken and skin is tight, body is dark
- ▶ Death loss over two percent in first seven days of life

Dead



### Commonly affected ages?

- ▶ Chicks or poults that don't start on feed will die within three to five days of placement.
- ▶ There may be a second peak in death loss at seven to 10 days of age.
- ▶ Poults are harder to get started than chicks and death losses from starveout may be higher than two percent if they don't have an ideal environment.

### What should I do if I suspect it?

- ▶ Identify weak chicks when the group arrives and ensure they have ideal conditions for the first week of life. Separate them from vigorous chicks and provide heat, food, and water that is easily accessible.
- ▶ Poults tend to be attracted to movement of other poults. Feeder arrangements that result in the poults 'tripping over feeders' as they move about can encourage them to feed.
- ▶ Shiny objects can attract chicks or poults to investigate food or water dishes.
- ▶ Ensure that lighting is bright enough at the bird level to stimulate activity, investigation and feeding.
- ▶ If beaks were trimmed too severely (laying hens or some turkeys are done at hatchery), chicks may have more difficulty feeding—so check the beaks and contact the hatchery if this is a problem.

### How can I prevent it?

- ▶ Ensure the chicks or poults are confined no more than one meter from feeders and waterers during first 10 days after placement.
- ▶ Ensure the brooder is warm enough where food is so chicks don't have to leave warmth to find food or water. If chicks or poults are huddling, then they are too cold and the temperature should be elevated.
- ▶ Ensure bedding is not slippery and is not packed down so much that birds cannot reach food in feeders. Bedding will often compress as it settles and birds may not be able to reach food.
- ▶ Add food and water frequently and visibly—drizzle it into the dishes to attract chicks to the location.
- ▶ Ensure the water source is pure and that any disinfectant in the waterers has been thoroughly rinsed off. Birds will refuse to drink water that tastes bad.



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### What else should I know about it?

The yolk sac has enough nutrients to sustain the life of a chick for three to four days after hatch, but they must learn to eat and drink within four days in order to thrive. Chicks and poults must also be eating to ensure the gut is moving, in order to benefit from the nutrients in the yolk.

Stress from shipping and placement in new environments may prevent chicks from finding the feeders and drinkers right away.

Chilling (even mild and temporary) can stop birds from starting on feed and water. Avoid drafts and ensure a temperature gradient in the brood area—with the hot spot at 35°C (95°F) in the first week. It should drop by about 1–2°C (5°F) per week and there should always be a gradient from the cooler area to allow chicks to choose the right temperature.

With turkeys, you may have to dip their beaks into the water to show them where it is located.

# Vitamin A Deficiency

## What will I see?

- ▶ Incoordination, twisted head, staggering
- ▶ Poor growth and poor feathering
- ▶ Difficulty breathing, snicking
- ▶ Cheesy material in the nostrils and eyes
- ▶ Pale comb and wattles
- ▶ Eyelids stuck shut with cheesy material

Nervous System



Respiratory



## Commonly affected ages?

- ▶ All ages of bird may be affected.
- ▶ Chicks are not affected unless the parent flock was deficient.
- ▶ Adult birds have reserves of Vitamin A in the liver and show signs of deficiency after several months of a deficient diet.

## What should I do if I suspect it?

- ▶ Add Vitamin A to the water.

## How can I prevent it?

- ▶ Access to plenty of green forage/feed will prevent Vitamin A deficiency. Feed a properly formulated diet.

## What else should I know about it?

Birds get their Vitamin A from eating green feed during the summers.

If they do not get enough green feed or if they have no access to it during the winter, they can become Vitamin A deficient unless they are fed a complete diet that is properly formulated.

Vitamin A is required for normal cell growth and replacement in all body tissues, so deficiency causes widespread organ damage, especially to the lining of airways and the gut.

Vitamin A deficiency can predispose birds to infections that can result in neurological and respiratory disease, poor growth, and poor performance.



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# Vitamin E Deficiency

### What will I see?

- ▶ Imbalance, falling backward
- ▶ Staggering, progressing to paralysis
- ▶ Uncontrolled movements, spasms
- ▶ Waterbelly
- ▶ Green wings (from muscle damage)

Nervous System



Bones, Joint, Muscles



### Commonly affected ages?

- ▶ Typically chicks between two to four weeks of age, occasionally up to four months of age
- ▶ Reduced hatchability of eggs from deficient parent flocks.

### What should I do if I suspect it?

- ▶ Add Vitamin E and/or selenium to the diet.
- ▶ Obtain veterinary advice about use of antibiotics if there are extensive skin lesions.
- ▶ Cull severely affected birds because they will not recover. They are usually affected before normal slaughter age, but even if older, the carcass would often not be suitable for consumption.

### How can I prevent it?

- ▶ Feed good-quality feeds and store feed so that it is not overheated.
- ▶ Overheating feed will result in production of rancid fats which will destroy the Vitamin E that is present in the feed.
- ▶ Fortify or supplement with Vitamin E, selenium, and antioxidants.

### What else should I know about it?

Sometimes called “Crazy Chick Disease” because of the damage to the nervous system.

Vitamin E requirements are related to selenium and deficiency of these two nutrients often occurs together.



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# Yolk Sac Infection

## What will I see?

- ▶ Depressed with ruffled feathers, closed eyes, isolated, huddled
- ▶ Not eating but swollen abdomen
- ▶ Crusty navel
- ▶ Diarrhoea and pasted vent

Diarrhoea and Intestines



Dead



## Commonly affected ages?

- ▶ Very young birds (three to five day old chicks)
- ▶ Most affected birds die by 10 days of age

## What should I do if I suspect it?

- ▶ There are no available treatments, and antibiotics do not usually work.
- ▶ Cull affected birds and dispose of carcasses rapidly to prevent contamination of barn.
- ▶ Contact the hatchery that was the source of the birds to advise them of the problem.
- ▶ Use photographs to document some of the dead birds, including pictures of the open body cavity.
- ▶ Send some birds to a veterinarian for confirmatory testing.
- ▶ The hatchery will typically replace affected chicks if the diagnosis is confirmed.

## How can I prevent it?

- ▶ Buy chicks and poults from a reputable hatchery. Good hygiene and sanitation during hatching are essential to prevent this because the infection happens at the hatchery.
- ▶ If you are producing hatching eggs, regularly clean nest boxes and replace nest liners or bedding and remove soiled litter. Collect hatching eggs regularly and do not set heavily soiled or floor eggs.

## What else should I know about it?

Bacterial infection occurs during incubation/hatching of the eggs—before the navel is healed.

In some cases, chicks or poults are hatched with the infection.

Excess humidity in the incubator or hatcher and poor barn conditions including high humidity, high levels of ammonia, and wet spots that favor dirty eggs can all contribute to development of this condition.







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