

# Package 104, Item 1

Type: Issue pack

**Chicken diseases**

1. **Introduction and how to use this issue pack**

This issue pack is designed to give radio broadcasters the information needed to create effective and entertaining radio programs about chicken diseases and how to deal with them.

It talks about chickens in Mali, but you can easily adapt the information to other sub-Saharan African countries.

The issue pack begins with this introduction, then **Section 2** presents two true stories of farmers dealing with chicken diseases in Mali.

**Section 3** presents background information on the production part of the chicken value chain. (Please see Resource Pack 95, Item 9 – [An introduction to value chains](http://www.farmradio.org/radio-resource-packs/package-95-researching-and-producing-farmer-focused-programs/an-introduction-to-value-chains/) – for a definition of “value chain,” and for a better understanding of why value chains are important to both broadcasters and farmers.)

Finally, in **section 4**, we list sources for further information on dealing with chicken diseases. We include resource organizations, online radio programs, online videos, and online documents.

You can use the information in this issue pack in many ways. For example:

* You could use the stories in section 2 as a starting point for creating your own local programming on dealing with chicken diseases. You could interview farmers who raise chickens, and experts with specialized knowledge on dealing with chicken diseases.
* You can use the information in section 3 as background material for any program on in chicken diseases.
* You could contact one or more of the organizations listed in section 4 for further information, or to interview experts.
* You could use the audio and video resources and online documents in section 4 to help you create programs on dealing with chicken diseases.

*Note: This issue pack uses some technical terms. When a technical term—for example, virulent\*—is used, it is followed by an asterisk. All terms followed by an asterisk are defined in the Glossary at the end of the issue pack.*

1. **Story about dealing with chicken diseases**

Sogodogo Sarata Berthé is a 65-year-old widow living in Bougouni, 165 kilometres from Bamako, the capital of Mali. After retiring from the Malian postal service, Sarata completely shifted to raising poultry. But like any woman wanting to become an entrepreneur, she faced challenges.

She started by successfully raising local chickens at home, despite difficulties with her husband, who accused her of messing up their courtyard with chicken droppings.

With the support of her father-in-law, she built a better henhouse, and embarked on her poultry business, buying her first stock of layers. Unfortunately, she didn’t know exactly when to vaccinate her chicks, and they became sick. Her contacts advised her that her chickens had Gumboro disease. In all, she lost about 250 birds.

But Sarata didn’t lose heart. One day, she met N’gola, the head of a farmer group, who invited her to a training on how to introduce breeding roosters to small-scale poultry farming. With N’golo’s support and advice, Sarata started over. She got back on her feet, and with a business plan, she received a loan from a bank, which enabled her to buy 1,000 layers and 1,000 broilers. She regularly renews her stock and now earns a healthy income.

She bought a delivery tricycle (a three-tire motorbike with a platform to transport luggage and goods) with the chicken money. Today, Sarata’s henhouse runs on solar energy, parts of the roof are covered, and she has many other projects underway.

1. **Background information on chicken diseases**

##### **Introduction**

Chickens are very important to rural African households. More than 80% of the total poultry population in Africa are chickens. Households usually keep small flocks of between 5 and 20 chickens. Farmers usually raise chickens in a free-range system, where they scavenge around the household compound and feed on locally available foods such as insects, earthworms, household refuse, and harvest residues. Women and children play a key role in managing the birds.

Farmers often feed agricultural by-products such as rice bran, maize, and millet bran, or pito mash, etc. to free-range chickens, especially during seasons when it is harder for chickens to find sufficient food by themselves. At night, farmers often shelter chickens in basic coops, often raised above the ground. These protect the birds against bad weather and night predators. Thus, farmers can raise chickens with very few inputs of land, labour, or capital, and even the poorest rural families can keep a small flock.

Raising chickens in rural Africa has generally been neglected by extension and research organizations, and farmers frequently consider it an insignificant occupation compared to other agricultural activities. But outside urban centres, especially where fish are unavailable, chickens provide a vital source of protein and income, and play a key role in many social and religious ceremonies.

One of the major challenges to raising chickens is diseases. A 15-year study of indigenous chickens in Nigeria found that the most common causes of death in chickens were: Newcastle disease, infectious bursal disease, fowl pox, external parasites such as lice and mites, and internal parasites such as worms.

Young chicks can be severely affected by disease. Research has estimated that mortality of indigenous chickens is:

* 53% up to four weeks of age in Cameroon
* 31% up to four weeks of age in Mali
* 68% at six weeks in Nigeria
* 50% up to eight weeks of age in Burkina Faso and northern Ghana, and
* 66% at twelve weeks in Senegal.

***Traditional medicine***

Resource-poor farmers often do not have money for or access to chemical medicines. In rural areas of sub-Saharan Africa, birds are almost never vaccinated; they may occasionally receive an antibiotic tablet originally intended for human use.

In Mali, there are efforts to teach farmers appropriate vaccination techniques. But these have had little impact, because of:

* inadequate equipment or lack of equipment in villages to store avian vaccines
* the fact that small bottles of vaccines contain between 100 and 1,000 doses, which is inconvenient for farmers with smaller numbers of poultry
* farmers’ lack of knowledge of hygiene and treatment procedures

Traditional medicines are usually far more accessible and available, and cost little or nothing. These medicines rely on plant products which are effective against some diseases.

Further research is needed to understand in which cases traditional medicines are effective and when modern medicines offer a better alternative.

In this issue pack, we mention some of the traditional medicines which have been scientifically tested against specific diseases and found to be effective. This does not imply that other traditional remedies are ineffective; in most cases, they have not been carefully tested.

**Part A: Individual diseases: Causes, symptoms, and management**

##### **Newcastle disease**

###### Causes

###### Newcastle disease is caused by a virus which infects the respiratory\* and nervous systems. In both chicks and adult birds, mortality rates vary from 0 to 100%, depending on the virulence\* of the virus.

###### diagram of a chicken: hen and rooster

***Diagram showing hen (top) and rooster/cock (bottom) anatomy***

###### Symptoms

###### Chicks cough, gasp, and sneeze. Birds may sit on their back hock joints (see diagram); others may walk backwards or in circles, or hide their head between their legs.

In adult birds, symptoms include respiratory\* distress, loss of appetite, and birds are “droopy.” There can be a sudden decrease in egg production, which can drop to zero within four days of infection. When hens start laying again, they produce misshapen eggs with rough and sometimes bleached shells.

###### Management

There are three general approaches to managing Newcastle disease:

* *Hygiene:* This is always important, especially in semi-intensive systems where birds are confined within a fenced yard or house. Hygiene includes cleaning, disinfecting, limiting access to wild birds, and personal hygiene of farm staff.
* *Slaughter of infected flocks:* This is a drastic measure, which has been successfully used in isolated regions or islands that are essentially free of the disease.
* *Vaccination* in combination with appropriate hygiene measures: This is the most effective way of managing Newcastle disease. Vaccinate chicks at 3-4 weeks of age, and repeat at 16 and 24 weeks. After that, vaccinate when there is an outbreak in the area.

The low success rate of vaccination for Newcastle disease in sub-Saharan Africa is almost entirely because the vaccine fails to work because it has not been kept at the right (cold) temperature. Other difficulties include the widespread distribution of flocks, bad road conditions, and lack of transport.

*Traditional management*

* A study in Nigeria found that an extract of the bark of the baobab tree was effective in reducing Newcastle disease infection in eggs when used at 250 mg per millilitre.
* A study in Pakistan found that adding 7 grams of neem leaves daily to the diets of commercial broilers increased their resistance to Newcastle disease.

*For further information on Newcastle disease*

1. World Organisation for Animal Health (OIE), *What is Newcastle disease?* General Disease Information Sheets. <http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Disease_cards/NEWCAS-EN.pdf> (300 KB)
2. World Organisation for Animal Health (OIE), *Newcastle disease*. Technical disease card. <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/NEWCASTLE_DISEASE.pdf> (220 KB)
3. World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.14: Newcastle disease <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.14_NEWCASTLE_DIS.pdf> (495 KB)
4. Farm Radio International, 2009. [*Adventures of Neddy: A community animal health worker helps a village manage Newcastle disease*](http://www.farmradio.org/radio-resource-packs/package-88/adventures-of-neddy-a-community-animal-health-worker-helps-a-village-manage-newcastle-disease/). Resource Pack 88, Script 3. <http://www.farmradio.org/radio-resource-packs/package-88/adventures-of-neddy-a-community-animal-health-worker-helps-a-village-manage-newcastle-disease/>
5. University of New Hampshire Cooperative Extension, 2008. *Newcastle Disease*. <http://extension.unh.edu/resources/files/Resource000792_Rep815.pdf> (360 KB)
6. NobiVet, non daté. *Aviculture familiale – Introduction au contrôle durable de la maladie de Newcastle.* <https://www.nobivet.fr/maladies/maladie-newcastle.aspx>

**Avian influenza**

*Causes*

Avian influenza is a virus-borne disease found naturally in ducks and other waterfowl, and which may spread in a highly contagious and potentially dangerous form to chickens. Avian influenza is spread through direct contact with secretions from infected birds, especially through faeces. It is also spread through contaminated feed, water, equipment, and human clothing.

*Symptoms*

Symptoms may include:

* Blue and swollen comb and wattles (*see diagram*)
* Coughing or sneezing
* Fluid coming from the eyes and nose
* Legs streaked with red
* Loss of appetite
* Diarrhea

*Management*

The disease is a virus, so there is no treatment. The best prevention is strict hygiene and slaughter of sick birds. Avian influenza cannot currently be prevented through vaccination.

After a disease outbreak, it is important to destroy all birds in the flock and carefully clean chicken houses. Always call a veterinarian if you suspect an outbreak. *Do not eat infected birds.*

*For further information on avian influenza:*

1. World Organisation for Animal Health (OIE), 2015. *Questions and answers on avian influenza*. <http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Q_A_influenza_may2015.pdf> (300 KB)
2. World Organisation for Animal Health (OIE), undated. *Avian influenza portal*. <http://www.oie.int/en/animal-health-in-the-world/web-portal-on-avian-influenza/>
3. World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.4: Avian influenza <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.04_AI.pdf> (570 KB)
4. Peter Sykanda, 2006. *Avian influenza spots*. Farm Radio International. <http://www.farmradio.org/radio-resource-packs/package-79/avian-influenza-spots/>
5. CJRD-CIAH, 2007. *Grippe aviaire et maladie de poulet*. <http://www.latitudesciences.ird.fr/images/photos/CIAH/Cahier_CIAH_bd.pdf> (379 KB) (available only in French)

##### **Fowl pox**

###### Causes

Fowl pox is a common and highly infectious, virus-borne skin disease. There are two forms of the disease. The first (dry pox) is spread by biting insects, especially mosquitoes, and by contaminated wounds. Birds affected by this form usually recover within a few weeks. The second form (wet pox) is spread by inhalation of the virus and causes a thin layer of animal tissue to form in the mouth and throat. Wet pox is more serious and can lead to suffocation and death.

*Symptoms*

Symptoms of dry pox are wart-like scabs on the featherless parts of chickens, especially the face, comb, and wattles. Dry pox causes a temporary drop in egg production, and results in a reduced growth rate in young birds.

In wet pox, the trachea\* can appear reddened and thickened with inflamed, often patchy lesions\* on the inside. Death occurs if these lesions totally block the larynx or the upper part of the trachea. Lesions can also occur in the mouth or the corners of the eye.

*Management*

* Prevention:
  + Provide footbath with disinfectant.
  + Limit visitors.
  + Workers should move from young to old flocks in housing units.
  + Clean and disinfect housing and equipment at the end of each crop and do not use for 1-2 weeks.
  + Managing the mosquito population can help reduce outbreaks.
  + Vaccination is not usually required unless the mosquito population is high or infections have occurred previously. Chicks can be vaccinated as young as one-day old. Vaccinate all replacement chickens against fowl pox at 6-10 weeks of age. One application of fowl pox vaccine results in permanent immunity.
* Treatment:
  + There is no treatment for fowl pox once a bird is infected. As long as the bird continues eating and drinking, dry pox lasts about two weeks with little risk of death. Successful recovery results in immunity, though birds may catch a mild form of dry pox. Infected birds should be quarantined or slaughtered.

*For further information on fowl pox:*

1. Backyard poultry website, undated. *Fowl pox*. <http://forum.backyardpoultry.com/viewtopic.php?f=5&t=7971445>
2. Hy-Line International, 1982. *Hy-Line Redbook: Management and Disease Control*. Fowl Pox Prevention. <http://www.hyline.com/aspx/redbook/redbook.aspx?s=5&p=35>
3. World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.10: Fowl pox. <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.10_FOWLPOX.pdf> (65 KB)

##### **Fowl cholera**

###### Causes

Fowl cholera is caused by *Pasteurella avicida*, a microorganism that multiplies very rapidly in the blood and very rapidly in a flock, causing poisoning. Fowl cholera comes in acute and chronic forms. Acute infections are more serious, with high morbidity\* and mortality. Adult birds are more susceptible.

Chronically-infected birds and carriers\* who show no symptoms are major sources of infection. Fowl cholera is mostly spread through contact with mucus, blood, or other excretions from the mouth, nose, and eyes of diseased birds, including wild birds. It is also transmitted via mosquitoes, humans, and other animals. *Pasteurella avicida* survives in the environment for long enough to be spread by contaminated crates, feed bags, shoes, and other equipment.

###### Symptoms

Common symptoms of acute cholera are anorexia\*, ruffled feathers, oral and nasal discharge, cyanosis (a bluish tinge to the skin because of insufficient oxygen in the blood), and white or greenish diarrhea. Symptoms of chronic cholera are swelling in the wattles and sinuses.

###### Management

Fowl pox outbreaks in confined birds can be controlled by spraying to kill mosquitoes. If fowl pox is endemic in the area, vaccination is recommended. You can vaccinate chickens at 4-6 weeks of age.

Birds with acute fowl cholera should be destroyed and burned, and housing should be thoroughly cleaned and disinfected. There is no treatment for chronic cholera, but birds may be treated with recommended sulfa drugs for secondary infections.\*

##### *For further information on fowl cholera:*

1. Poultry Hub, undated. Fowl cholera (or pasteurellosis) <http://www.poultryhub.org/health/disease/types-of-disease/fowl-cholera-or-pasteurellosis/>
2. The Merck Veterinary Manual, 1982. *Overview of fowl cholera*. <http://www.merckvetmanual.com/mvm/poultry/fowl_cholera/overview_of_fowl_cholera.html?qt=&sc=&alt>=
3. World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.9: Fowl cholera. <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.09_FOWL_CHOLERA.pdf> (519 KB)

##### **Fowl typhoid**

###### Causes

The disease is caused by a bacterium called *Salomonella gallinarum*. It can be introduced into a flock by infected birds, and by infected materials such as shoes and litter. It can be spread by oral contact with faeces, and by eating eggs, in both chicks and adults. The bacterium survives for months in the environment, but normal disinfectants will kill it.

###### Symptoms

Symptoms include dullness, ruffled feathers, fever, paleness of the head, drooping comb, loss of appetite, and pale orange-coloured diarrhea. Symptoms appear 3-4 days after infection and death occurs in two weeks. The percentage of birds in a flock that become sick ranges from 10-100%; mortality is stressed birds or birds with weak immune systems may be up to 100%.

###### Management

Prevention:

* Vaccinate the birds at seven weeks of age.
* Destroy all dead birds by burning.
* Do not allow visitors to enter the poultry unit without being disinfected.

Treatment:

* Can be treated with antibiotics
* Recovered birds are resistant to infection but may remain carriers.\*

*For further information on fowl typhoid:*

## The Poultry Site, undated. Salmonella Gallinarum, Fowl Typhoid. <http://www.thepoultrysite.com/diseaseinfo/130/salmonella-gallinarum-fowl-typhoid/>

1. University of New Hampshire Cooperative Extension, undated. 2008. *Pullorum disease and fowl typhoid*.<http://extension.unh.edu/resources/files/Resource000793_Rep817.pdf> (372 KB)
2. World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.11: Fowl typhoid <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.11_FOWL_TYPHOID.pdf> (239 KB)

##### **Pullorum disease**

###### Causes

Pullorum disease is caused by a bacterium called *Salmonella pullorum*, which infects the hen’s ovary. The microorganism can also be found in a chick’s intestine. The disease is usually spread by eggs laid by birds which carry the bacterium, and by chicks hatched from those eggs. A high percentage of infected birds will be carriers\* when mature.

###### Symptoms

Soon after hatching from infected eggs, chicks may sicken and die. Infected birds will be weak and stunted, with little appetite. They will make shrill chirping and peeping sounds and try to eliminate white droppings from their vents (anuses). In some cases, signs of the disease do not occur until 5-10 days after hatching, and then increase for 7 -10 days. Most deaths occur by the second to third week of life. There are no external symptoms in adult birds.

###### Management

Prevention:

* Destroy all confirmed carriers\* of the disease.
* Clean and disinfect all housing and other areas, including incubators.
* Obtain chicks from hatcheries with a good disease management program.

Treatment:

* Treatment is not desirable, as recovered birds usually become carriers.

*For further information on pullorum disease:*

1. University of New Hampshire Cooperative Extension, undated. 2008. Pullorum disease and fowl typhoid. <http://extension.unh.edu/resources/files/Resource000793_Rep817.pdf> (372 KB)
2. The Poultry Site, undated. *Salmonella Pullorum, Pullorum Disease, 'Bacillary White Diarrhoea.* <http://www.thepoultrysite.com/diseaseinfo/131/salmonella-pullorum-pullorum-disease-bacillary-white-diarrhoea/>
3. World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.11: Fowl typhoid and pullorum disease. <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.11_FOWL_TYPHOID.pdf> (239 KB)

**Coccidiosis**

###### Causes

The disease is caused by *coccidian*, which are tiny parasites that multiply very rapidly in birds’ intestines. Coccidiosis usually occurs when birds are 8-10 weeks old and comes in both acute and chronic forms. In the acute type, death occurs in 5-7 days. The chronic type does not kill immediately, but persists for a long time.

###### Symptoms

Infected birds or chicks become droopy, weak and listless, may have little appetite, do not groom themselves or keep themselves clean, and usually have ruffled feathers, pale beaks, and pale shanks. In some types of coccidiosis, birds have bloody droppings. Mortality can be high and sudden.

###### Management

Prevention:

* For birds living outside, keep the bedding in the house clean and dry.
* Clean waterers and feeders every time you refill them.
* Vaccinate at one-day-old, but do not use medicated feed if your chicks have been vaccinated against coccidiosis. This will neutralize the vaccine.

Treatment:

* Add sulfa drugs to feed to treat for the first month after infection.

*Traditional management*

* A study in Pakistan found that giving 14-day-old chicks a daily dose of 6 grams of an herbal mixture of neem leaves, tobacco leaves, flowers of *Calotropis procera*, and seeds of *Trachyspermum ammi* was just as effective as the standard veterinary medicine at controlling coccidiosis.
* Another study found that adding 0.3% of ground neem fruit to the broiler diet was as efficient at reducing coccidiosis as a standard veterinary drug.
* A study in Cameroon found that extracts of papaya seeds in water helped reduce coccidiosis in broiler chickens.

*For further information on coccidiosis:*

1. Poultry Hub website. *Coccidiosis*. <http://www.poultryhub.org/health/disease/types-of-disease/coccidiosis/>
2. The Merck Veterinary Manual, 1982. <http://www.merckvetmanual.com/mvm/poultry/coccidiosis/overview_of_coccidiosis_in_poultry.html>

##### **External parasites (Ectoparasites)**

These are mainly lice, fleas, mosquitoes, and other flies.

*Symptoms*

Irritation, nuisance, loss of appetite, anemia\*, loss of weight, decreased production.

###### Management

Prevention:

* Good hygiene and adequate nutrition.
* Inspect birds monthly for external parasites. It is best to inspect birds after they have roosted for the evening and are calmer. Examine around the vent and under the wings for body lice and mites; examine the head and neck for head lice. Examine the roosts and nesting boxes for mites. If one bird has lice or mites, it is likely they all do.

Treatment:

* Treat all the birds in a flock and in the coop with an insecticide approved for poultry. Follow all label instructions, including protective equipment and withholding time for consumption of meat and eggs from treated birds.
* Organic pyrethrum (derived from chrysanthemums) is fairly safe for humans and birds but highly toxic to insects. Powder the vent area and under the wings, and treat cracks and crevices in the coop.

*For further information on external parasites:*

* M.S.K. Mashishi, 1996. *External parasites of chickens*. Directorate Agricultural Information Services, Department of Agriculture in cooperation with ARC-Onderstepoort Veterinary Institute (South Africa). <http://www.nda.agric.za/docs/Infopaks/parasites1.pdf> (473 KB)
* Carol Cardona and Peter L. Msoffe, editors, undated. *Handbook of poultry diseases important in Africa*. <http://afghanag.ucdavis.edu/c_livestock/poultry/Man_Poultry_Diseases_GLCRSP.pdf> (pages 31-38) (1.388 KB)

**Internal parasites (Endoparasites)**

Internal parasites include roundworms and tapeworms. These parasites cause damage directly by disturbing chickens and affecting their growth and egg production. They also spread some diseases.

With severe roundworm infection, an animal can die before any symptoms are observed. Tapeworms do not cause much physical damage to the birds, but absorb the nutrients that the animal needs for growth.

###### Symptoms

Depending on the particular parasite, there may be few symptoms, or there can be severe diarrhea, extreme thinness, anemia,\* and death.

###### Management

Prevention:

* Proper hygiene measures.
* Separate birds according to species and age groups whenever possible.

Treatment:

* Treat the flock with recommended drugs from a veterinarian. For some internal parasites, it is recommended to treat housing or surrounding areas.

*Traditional management*

* A study in Zambia found that adding a 20% solution of papaya latex to birds’ water at a rate of 0.7 ml per kg of live weight per bird reduced worm infestation and increased weight gains in 5-6 month-old birds.
* A study in Benin found that administering a solution of 4 grams per litre of papaya seeds was almost as efficient as the standard veterinary drug in managing an important roundworm.

*For further information on internal parasites:*

* Mississippi State University. *Poultry production in Mississippi: Parasitic diseases (internal)*. <http://msucares.com/poultry/diseases/disparas.htm>
* Department of Agriculture and Environmental Affairs, Province of Kwazulu-Natal, South Africa, 2013. *Household Chicken Production*. <http://www.heifer.org.za/assets/attachments/5.%20Household%20Chicken%20Production.pdf> (2,395 KB)
* Carol Cardona and Peter L. Msoffe, editors, undated. *Handbook of poultry diseases important in Africa*. <http://afghanag.ucdavis.edu/c_livestock/poultry/Man_Poultry_Diseases_GLCRSP.pdf> (pages 39-47). (1,388 KB)

**Marek’s disease**

*Causes*

Marek's disease is a highly contagious viral disease caused by a virus which can survive for a long time in the environment. Infected birds can be lifetime carriers\* and spreaders of the virus. Newborn chicks are protected by maternal antibodies\* for a few weeks. The virus is spread in dander\* from feathers and transmitted by inhalation.

*Symptoms*

Marek’s disease can occur at 3–4 weeks of age or older, and is most common between 12-30 weeks of age, though particularly virulent\* strains of the disease may cause increased mortality in 1–2 week-old birds. Many chickens carry the infection throughout their lives, often without developing symptoms of the disease.

The signs and symptoms depend on the type of Marek’s disease:

*Cutaneous form*:

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

*Neural form*: (all or none of the following symptoms)

* Progressive paralysis, usually of the leg or wing.
* Weight loss
* Laboured breathing
* Diarrhea
* Starvation and death due to an inability to reach feed and water and to trampling by pen mates.

*Ocular form:*

* Gray eye colour
* Misshapen iris
* Weight loss
* Blindness
* Death

*Visceral Form*: Tumours of internal organs, including heart, ovary, liver and lung.

*Management*

Prevention:

* Vaccinate chickens at one-day-old. Vaccination greatly reduces symptoms, but does not prevent persistent infection, and the virus continues to be present and shed. Vaccination does not prevent transmission, but it does reduce the amount of virus shed by infected birds, which reduces the spread of the disease.

Treatment:

* There is no treatment for infected birds.

*For more information on Marek’s Disease:*

* Carol Cardona and Peter L. Msoffe, editors, undated. *Handbook of poultry diseases important in Africa*. <http://afghanag.ucdavis.edu/c_livestock/poultry/Man_Poultry_Diseases_GLCRSP.pdf> (Page 63) (1,388 KB)
* University of New Hampshire Cooperative Extension, 2008. *Marek’s Disease*. <http://extension.unh.edu/resources/files/Resource000791_Rep813.pdf> (368 KB)
* World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.13 : Marek’s Disease <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.13_MAREK_DIS.pdf> (93 KB)

**Infectious bronchitis**

*Causes*

Avian infectious bronchitis is caused by a virus. The disease is transmitted by the air-borne route, direct chicken-to-chicken contact, and indirectly through contaminated poultry equipment or egg-packing materials, manure used as fertilizer, farm visits, etc.

*Symptoms*

The main symptoms are respiratory,\* but often include decreased egg production and quality. Coughing and rattling are common, are most severe in young birds, and rapidly spread in confined chickens. In non-vaccinated flocks, all birds will be infected.

The rate of mortality varies according to the virus strain, reaching 60% in non-vaccinated flocks. Respiratory signs pass within two weeks but, for some strains, a kidney infection may follow, causing death. Younger chickens can die through blockage of the airway or kidney failure.

*Management*

Prevention:

* Vaccines are available, and may produce mild respiratory problems. Vaccines are initially given to 1-14-day-old chicks, and birds are commonly revaccinated with a booster dose seven days after receiving the first vaccination.
* To control the spread of the disease, it’s important to follow hygiene measures such as ensuring that infected flocks are isolated, and disinfecting all housing.

Treatment:

* No treatment is available, but antibiotics can prevent secondary infections.\*
* Reducing the protein concentration in feed and providing electrolytes\* in drinking water may help reduce the severity of outbreaks caused by some strains.

*For further information:*

* Carol Cardona and Peter L. Msoffe, editors, undated. *Handbook of poultry diseases important in Africa*. <http://afghanag.ucdavis.edu/c_livestock/poultry/Man_Poultry_Diseases_GLCRSP.pdf> (Page 57-58) (1,388 KB)
* Poultry Hub. *Infectious bronchitis*. <http://www.poultryhub.org/health/disease/types-of-disease/infectious-bronchitis/>
* World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.2: Infectious Bronchitis <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.02_AIB.pdf> (140 KB)

**Infectious bursal disease (also known as Gumboro disease)**

*Causes*

Infectious bursal disease (also known as *Gumboro disease* or *infectious bursitis*) is a highly contagious disease of young chickens caused by a virus. It suppresses the immune system and results in mortality, generally at 3-6 weeks of age.

*Symptoms*

The disease may appear suddenly, and typically infects all birds in a flock. In the acute form, birds lie down, have ruffled feathers, and are weak and dehydrated. They produce watery diarrhea and may have a swollen feces-stained vent (anus). The acute form is more painful, and leads to high mortality.

The most critical impact of the disease is that it suppresses the immune system of chickens less than three weeks old. Infected birds may not show symptoms, but can be susceptible to infections which kill them because of reduced immunity to disease.

*Management*

Prevention:

* Prevention measures include restrictions on farm visits and isolation from other flocks.
* Using hygiene measures after an outbreak may not be effective because the virus can survive for long periods in both housing and water.
* Breeder flocks can be vaccinated, and will transfer immunity to their offspring.
* Vaccination may not be effective in an outbreak because the infection spreads so quickly.

Treatment:

* There is no treatment available for infected birds. However, birds may be immune because of maternal antibodies\* or previous infection with non-virulent\* strains of the virus.

*For more information on infectious bursal disease:*

* Carol Cardona and Peter L. Msoffe, editors, undated. *Handbook of poultry diseases important in Africa*. <http://afghanag.ucdavis.edu/c_livestock/poultry/Man_Poultry_Diseases_GLCRSP.pdf> (Page 58) (1,388 KB)
* NobiVet, non daté. *Gumboro (Bursite Infectieuse).* <https://www.nobivet.fr/maladies/gumboro.aspx> (available in French only)
* Washington State University, Washington Animal Disease Diagnostic Lab, undated. *Infectious Bursal Disease*. <http://waddl.vetmed.wsu.edu/animal-disease-faq/infectious-bursal-disease>
* World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. Chapter 2.3.12 : Infectious Bursal Disease <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.12_IBD.pdf> (160 KB)

**CAUTION ON USING INSECTICIDES**

Birds are susceptible to poisoning from most insecticides if they are used too frequently or at too high a concentration. *Follow directions on the container carefully.* Do not use insecticides that are not labelled for poultry.

Some insecticides which are suitable for treating housing and yards are not suitable for treating the birds themselves, and birds should not even be nearby when they are being applied. Even when insecticides do not appear to affect birds, they may be absorbed and appear in eggs or meat, making them unsuitable for human consumption. This can happen from treating the birds themselves or from birds’ exposure to treated housing or yards. If exposure to insecticides is temporary, the effect will wear off, and eggs and meat will be safe again after a “withholding period.” The withholding period for a particular insecticide is stated on the label and must be followed.

**Part B: General disease prevention**

Beyond the more specific measures mentioned above for individual diseases, chicken diseases can be prevented through the following good management and good hygiene practices.

***Management***

* Use appropriate methods for raising young chicks: correct temperature, good quality and correct quantity of food and water, correct bedding, etc.
* Maintain correct stocking density. Avoid overcrowding.
* Use bedding that is not dusty. Dust can cause respiratory\* infections.
* Ensure regular cleaning and ventilation.
* Manage rats and flies.
* Ensure that nobody from outside your farm visits the chicken house.
* Build bird-proof houses to exclude wild birds that eat food and can spread diseases.
* Fix leaky water troughs.
* Clean feed and water containers daily; supply fresh, good quality food and clean water daily.
* Ensure that houses are warm in cold weather, cool in hot weather, and well-ventilated.
* Avoid housing with sharp edges.
* Purchase only first-grade chicks from a good, reliable supplier.
* Vaccinate chicks against important diseases.
* Keep chickens of the same age together in one house.

***Hygiene***

* Disinfect poultry houses or baskets every two months.
* Droppings, feathers, and dead birds are sources of infectious organisms and should be removed from overnight housing and the free-range compound, and properly disposed of by burying the carcasses 1.5-2 metres deep, or by incineration. This will not only reduce spread of disease, but also the presence of external parasites.
* Isolate new arrivals to the flock in a basket or cage for at least 15 days. If they remain healthy, they can then join the flock.
* Treat all new arrivals for external and internal parasites and, if possible, vaccinate.
* Isolate or quickly slaughter sick birds, and bury dead birds.
* Turn poultry house litter frequently and change when wet.
* Sun-dry overnight baskets, or suspend near a fire during the rainy season.
* Before refilling, heat broken pots used as drinkers over a fire.
* If poultry baskets are used for overnight housing, do not cover with cloths or sacks.
* Do not place coops or baskets near dunghills or pit latrines.
* Keep weaned chicks and growers in separate overnight housing. Do not disturb laying and brooding nests.
* It is better to keep only one species of poultry. If this is not possible, house species separately overnight to avoid spreading disease.

1. **Further resources on chicken diseases in Mali and sub-Saharan Africa**

***Resource organizations***

Here are some of the organizations that are involved with managing chicken diseases in Mali:

1. Poultry Farming Development Programme in Mali (PDAM): BPE 1529 Sotuba, Tel: 20 24 11 47, Fax: 20 24 09 60. Email: [pdam.mali@yahoo.fr](mailto:pdam.mali@yahoo.fr); Website: [www.developpementrural.gouv.ml](http://www.developpementrural.gouv.ml)

2. National Veterinary Services Directorate: Tel. (223) 20 22 61 93, 20 22 20 23, 20 22 52 29, 20 22 20 22.

3. National Animal Product and Industry Directorate: Tel. +223 20 22 20 22, 20 23 12 27; Fax: +223 20 23 12 17; Website: [www.mep.gov.ml](http://www.mep.gov.ml)

4. Rural Economics Institute (IER) Research Department: BP 258, Rue Mohamed V, Bamako, Mali, Tel: (+223) 20 22 26 06 / 20 23 19 05, Fax: (+223 20 22 37 75), Email: [direction@ier.ml](mailto:direction@ier.ml); Website: [www.ier.gouv.ml](http://www.ier.gouv.ml)

5. OIE (World Organisation for Animal Health) Regional Representative for Africa:  Dr. Karim Tounkara, BP 2954, Bamako, Mali. Tel/Fax: +223 2024 15 83. Email: [rr.africa@oie.int](mailto:rr.africa@oie.int); Website: [www.rr-africa.oie.int](http://www.rr-africa.oie.int)

***Videos***

# The Crawford Fund, 2012. *African communities vaccinate against Newcastle Disease*. <https://www.youtube.com/watch?v=Nr5e0HMn7l4>

# FAO, 2014. *Family poultry production - Introduction to the sustainable management of Newcastle disease*. <https://www.youtube.com/watch?v=CmZmJJe3gdc>

* Livestock Lab, 2015. *Newcastle disease and vaccinations*. <https://www.youtube.com/watch?v=M44JKfL3aas>
* Organisation des Nations unies pour l'alimentation et l'agriculture, 2014. Aviculture familiale – Introduction au contrôle durable de la maladie de Newcastle. <https://www.youtube.com/watch?v=aR8m2y9p-n0> (in French)

***Documents***

# Agronomes et Vétérinaires Sans Frontières, 2011. *Développement de l’aviculture villageoise en Afrique de l’Ouest. Vingt ans d’expérience au Togo, au Mali et au Sénégal : bilan et perspectives*. <https://www.avsf.org/public/posts/665/developpement-de-l-aviculture-villageoise-en-afrique-de-l-ouest.pdf> (2,871 KB) (available only in French)

* CABI Animal Health and Production Compendium on WikiVet. <https://en.wikivet.net/CABI_AHPC_Pages> (various diseases, some of poultry)
* Carol Cardona and Peter L. Msoffe, editors, undated. *Handbook of poultry diseases important in Africa*. <http://afghanag.ucdavis.edu/c_livestock/poultry/Man_Poultry_Diseases_GLCRSP.pdf> (1,387 KB)
* Department of Agriculture (South Africa), 2000. *Poultry diseases*. <http://www.nda.agric.za/docs/poultry/poultrydisease.htm>
* Department of Agriculture and Environmental Affairs, Province of Kwazulu-Natal, South Africa, 2013. *Household Chicken Production*. <http://www.heifer.org.za/assets/attachments/5.%20Household%20Chicken%20Production.pdf> (2,395 KB)
* Dr. [El Hadji Fallou Gueye,](http://www.agriculturesnetwork.org/persons/28115) Diseases in village chickens: Management through ethno-veterinary medicine. *ILEIA Newsletter*, Volume 13, Number 2, July 1997. <http://www.agriculturesnetwork.org/magazines/global/rejuvenate-local-knowledge/diseases-in-village-chickens-control-through-ethno>
* Hy-Line International, 1982. *Hy-Line Redbook: Management and Disease Control*. <http://www.hyline.com/aspx/redbook/redbook.aspx?s=2>
* Peter Kamau, 2014. Disease prevention important in chicken rearing. *The Organic Farmer*, #8, May 2014, page 4. <http://www.infonet-biovision.org/res/res/files/4335.TOF%20May%202014red.pdf> (3,558 KB)

# Mathilde Lyon, 2015. *Poules : prévenir les maladies au poulailler.* [http://www.gerbeaud.com/animaux/basse-cour/poules-prevenir-maladies-poulailler,1109.html (available](http://www.gerbeaud.com/animaux/basse-cour/poules-prevenir-maladies-poulailler,1109.html%20(available) only in French)

* Linda Loos Scarth, 2005. *The Merck Veterinary Manual online*, 8th edition. <http://www.merckvetmanual.com/mvm/index.html>
* National Farmers Information Service, undated. *Poultry diseases: Diseases, parasites, and other Vices*. <http://www.nafis.go.ke/poultry-chicken/general-information/poultry-diseases/>

# SECAAR, non daté. *Les maladies des poules*. <http://www.secaar.org/documents/documentation/E2_POUL2.pdf> (668 KB) (Available only in French)

* E.B. Sonaiya and S.E. J. Swan, 2004. *Small-scale poultry production*. Food and Agriculture Organization of the United Nations. <http://www.fao.org/docrep/008/y5169e/y5169e00.htm#Contents>
* The PoultrySite Quick Disease Guide. <http://www.thepoultrysite.com/diseaseinfo/>
* The Beehive Nigeria. *Specific Poultry Diseases That You Need to Know*. <http://nigeria.thebeehive.org/content/765/1931>

# WIKIVET, non daté. *Maladies des Oiseaux*. <https://fr.wikivet.net/Cat%C3%A9gorie:Oiseaux> (available only in French)

* World Organisation for Animal Health (OIE), 2015. *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2015*. <http://www.oie.int/international-standard-setting/terrestrial-manual/access-online/>

**Glossary**

Anemia: A deficiency of one component of red blood cells that causes a lack of oxygen in the blood, leading to weakness and unnatural paleness.

Anorexia: loss of appetite or inability to eat

Antibody: molecules created by the immune system which create immunity to diseases. Maternal antibodies are passed from the mother to her offspring.

Carrier: Animal that shows no symptoms of a disease but harbours the infectious organism that causes the disease and can transmit the disease to others.

Dander: Loose scales formed on the skin from the coat or feathers or animals.   
Electrolytes: Substances such as sodium, potassium, or chloride which are required by the body for all cellular activities, and which are typically given to treat symptoms such as diarrhea in which animals lose these substances.

Endemic: prevalent in a particular geographic location or population.

Follicle: Capsule that holds individual feathers.

Lesion: wound

Larynx: the upper part of the windpipe, where the vocal cords are

Morbidity (rate): the percentage of animals that are infected by a disease

Respiratory: related to the organs used for breathing

Secondary infection: an infection that sets in during or immediately following treatment for another infection or disease

Trachea: windpipe

Virulent: capable of causing disease symptoms which are severe

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