

Common Chicken Diseases in Smallholder Farming: A Review

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ABSTRACT

Smallholder chicken farming is an important source of food and income for millions of people around the world as well as in rural areas. However, chicken diseases can cause significant losses to smallholder farmers. The objective of this review is to discuss the most common chicken diseases in smallholder farming, and to discuss the challenges that smallholder farmers face in preventing and controlling chicken diseases. As methodology, this paper summarizes and synthesizes the existing research on the common chicken diseases in smallholder farming. The results showed that there are a variety of chicken diseases, which can be caused by viruses, bacteria, parasites, and fungi. One of the biggest challenges in preventing and controlling chicken diseases is the lack of access to veterinary care and vaccines for smallholder farmers. Another challenge is the lack of knowledge about chicken diseases among many smallholder farmers. However, chicken diseases can be prevented and controlled through a variety of measures, including: vaccination, biosecurity, and good management practices. For recommendation, farmers should avoid selecting seeds in the nest for breeding, and farmers should use animal feed that is self-produced and composed of existing raw materials in the village or district, especially farmers who should be adequately vaccinated against chicken disease

INTRODUCTION

Smallholder chicken farming is an important source of food and income for millions of people around the world. Most small-scale chicken farming systems are located in rural, resource-constrained locations where food insecurity is a common occurrence. Accessible to the society's most vulnerable sections, they give households sources of income and food that is high in nutrients (Wong et al., 2017). However, chicken diseases can cause significant losses to smallholder farmers, both in terms of mortality and productivity. These are just a few of the many diseases that can affect chickens. Smallholder farmers are particularly vulnerable to chicken diseases because they often lack access to veterinary care and other resources (Conan et al., 2012). In this paper, the objective is to discuss the most common chicken diseases in smallholder farming, and to discuss the challenges that smallholder farmers face in preventing and controlling chicken diseases, and how these challenges can be addressed.

This paper will provide smallholder farmers with the information they need to protect their chickens from disease and improve their livelihoods.

METHODOLOGY

This study is a review paper which summarizes and synthesizes the existing research on the common chicken diseases in smallholder farming. The data comes from journal articles, books, laws, rules, reports, and news from online publications. Finding, acquiring, and reviewing the aforementioned textual documents are examples of information collection strategies. The phases involved in the information analysis technique are arranging the information, reading (and taking notes), describing, clarifying, and forming conclusions.

RESULTS

Chicken Diseases Caused by Viruses

Fowl Pox

Fowl pox is a viral disease that affects birds of all ages. It is caused by a virus of the genus *Avipoxvirus*, which is related to the viruses that cause smallpox and cowpox in humans. Fowl pox is found all over the world and is most common in chickens and turkeys (Roy et al., 2013).

Transmission of Fowl Pox

Fowl pox is spread through contact with infected birds, their droppings, or their scabs. Mosquitoes can also spread fowl pox by biting an infected bird and then biting a healthy bird. Through the blood and bark of ill chickens as well as through mosquitoes, the disease can spread from one animal to another. The sickness can return since the virus can survive in the soil for over a year. Older chicks from pigeons or other birds infect chickens that are between one and two months old. The disease typically does not result in significant losses, but it makes the chickens continue to deposit eggs for weeks, which are useless for hatching. The chickens can recover in two to four weeks, even if the sickness can last the herd for months (Roy et al., 2013).

Signs and Symptoms of Fowl Pox

The signs and symptoms of fowl pox vary depending on the form of the disease. The two main forms of fowl pox are (Roy et al., 2013):

- **Cutaneous form:** This form of fowl pox affects the skin and is characterized by wart-like lesions on the unfeathered parts of the body, such as the comb, wattles, eyelids, and feet. The lesions may start out as small blisters, but they eventually develop into scabs.
- **Diphtheritic form:** This form of fowl pox affects the mucous membranes of the mouth, throat, and trachea. It is characterized by yellow canker lesions in the mouth and difficulty breathing.

Treatment and Prevention of Fowl Pox

There is no specific treatment for fowl pox. The disease usually clears up on its own within a few weeks. However, it is important to keep infected birds isolated from healthy birds to prevent the spread of the disease.

The best way to prevent fowl pox is to vaccinate your birds. There are vaccines available for both the cutaneous and diphtheritic forms of fowl pox. Vaccines should be given to chickens and turkeys at a young age. Other things farmers can do to prevent fowl pox include (Roy et al., 2013):

- Keep your birds' coop clean and dry
- Control mosquitoes and other biting insects around your coop
- Avoid introducing new birds to your flock without first quarantining them for at least two weeks.

Newcastle Disease (ND)

Newcastle disease is a highly contagious viral disease that affects all types of poultry. It is caused by the avian paramyxovirus type 1 (APMV-1) virus. Newcastle disease can be mild in some cases, but it can also be fatal, especially in young chickens (Dimitrov, 2023).

Signs and Symptoms of Newcastle Disease in Chickens

The signs and symptoms of Newcastle disease in chickens vary depending on the strain of the virus and the age of the chicken. However, some of the most common signs and symptoms include (Dimitrov, 2023):

- Respiratory signs, such as coughing, sneezing, and gasping for air
- Nervous signs, such as tremors, paralysis, and head twisting
- Digestive signs, such as diarrhea and loss of appetite
- Reduced egg production
- Soft-shelled or misshapen eggs

Transmission of Newcastle Disease in Chickens

Newcastle disease is a highly contagious virus that can be transmitted through contact with infected birds, their droppings, or their respiratory secretions. The virus can also be transmitted through contaminated food, water, or equipment (Dimitrov, 2023).

Prevention and Control of Newcastle Disease in Chickens

There is no cure for Newcastle disease, so prevention is key. The best way to prevent Newcastle disease in chickens is to vaccinate them. There are a number of different Newcastle disease vaccines available, and your veterinarian can help you choose the right one for your flock. In addition to vaccination, there are a number of other things you can do to prevent Newcastle disease in chickens, including (Dimitrov, 2023):

- Keep your coop and run clean and dry
- Control pests and rodents around your coop
- Avoid introducing new birds to your flock without first quarantining them for at least two weeks
- Practice good biosecurity measures, such as disinfecting your shoes and hands before entering your coop

In short, Newcastle disease is a serious disease, but it can be prevented with proper vaccination and biosecurity measures.

Avian Influenza (AI)

Avian influenza, also known as bird flu, is a viral respiratory disease that can affect all types of birds. It is caused by the influenza A virus, which can mutate into new strains that can spread easily among birds and, in some cases, to humans (WHO, 2023).

Signs and Symptoms of Avian Influenza in Chickens

The signs and symptoms of avian influenza in chickens vary depending on the strain of the virus and the age of the chicken. However, some of the most common signs and symptoms include (WHO, 2023):

- Respiratory signs, such as coughing, sneezing, and gasping for air
- Digestive signs, such as diarrhea and loss of appetite
- Lethargy
- Decreased egg production
- Sudden death

Transmission of Avian Influenza in Chickens

Avian influenza is a highly contagious virus that can be transmitted through contact with infected birds, their droppings, or their respiratory secretions. The virus can also be transmitted through contaminated food, water, or equipment (WHO, 2023).

Prevention and Control of Avian Influenza in Chickens

There is no cure for avian influenza, so prevention is key. The best way to prevent avian influenza in chickens is to vaccinate them. There are a number of different avian influenza vaccines available, and your veterinarian can help you choose the right one for your flock.

In addition to vaccination, there are a number of other things you can do to prevent avian influenza in chickens, including (WHO, 2023):

- Keep your coop and run clean and dry.
- Control pests and rodents around your coop.
- Avoid introducing new birds to your flock without first quarantining them for at least two weeks.
- Practice good biosecurity measures, such as disinfecting your shoes and hands before entering your coop.

Avian influenza is a serious disease, but it can be prevented with proper vaccination and biosecurity measures.

Avian influenza is also a zoonotic disease, which means that it can be transmitted from animals to humans. Although this is rare, it is important to take precautions to protect ourselves from infection.

If farmers are working with chickens or other poultry, it is important to wear gloves and other protective clothing. Farmers should also wash their hands thoroughly after handling birds or their droppings. If farmers become ill after working with birds, be sure to tell the doctor that those farmers have been exposed to poultry.

Infectious Bursal Disease (IBD)

Infectious bursal disease (IBD), also known as Gumboro disease, is a highly contagious viral disease that affects young chickens. It is caused by the infectious bursal disease virus (IBDV), which attacks the bursa of Fabricius, an organ that plays a vital role in the development of the chicken's immune system (Lasher & Shane, 2019).

Signs and Symptoms of IBD in Chickens

The signs and symptoms of IBD in chickens vary depending on the age of the chicken and the severity of the infection. However, some of the most common signs and symptoms include (Lasher & Shane, 2019):

- Lethargy
- Ruffled feathers
- Reduced appetite
- Diarrhea
- Dehydration
- Pale comb and wattles
- Death

Transmission of IBD in Chickens

IBD is a highly contagious virus that can be transmitted through contact with infected birds, their droppings, or their respiratory secretions. The virus can also be transmitted through contaminated food, water, or equipment (Lasher & Shane, 2019).

Prevention and Control of IBD in Chickens

The best way to prevent IBD in chickens is to vaccinate them. There are a number of different IBD vaccines available, and your veterinarian can help you choose the right one for your flock. In addition to vaccination, there are a number of other things you can do to prevent IBD in chickens, including (Lasher & Shane, 2019):

- Keep your coop and run clean and dry.
- Control pests and rodents around your coop.
- Avoid introducing new birds to your flock without first quarantining them for at least two weeks.
- Practice good biosecurity measures, such as disinfecting your shoes and hands before entering your coop.

IBD is a serious disease, but it can be prevented with proper vaccination and biosecurity measures. IBD is also an immunosuppressive disease, which

means that it can weaken the chicken's immune system and make it more susceptible to other infections.

Chicken Diseases Caused by Bacteria

Fowl Cholera

Fowl cholera is a highly contagious bacterial disease that can affect all types of poultry, including chickens, turkeys, ducks, and geese. It is caused by the bacterium *Pasteurella multocida*, which can be found in the environment, including soil, water, and manure (Sander, 2022).

Signs and Symptoms of Fowl Cholera in Chickens

The signs and symptoms of fowl cholera in chickens can vary depending on the severity of the infection. However, some of the most common signs and symptoms include (Sander, 2022):

- Sudden death
- Lethargy
- Ruffled feathers
- Reduced appetite
- Diarrhea
- Greenish or bloody droppings
- Swollen comb and wattles
- Difficulty breathing
- Cyanosis (bluish discoloration of the skin and mucous membranes)

Transmission of Fowl Cholera in Chickens

Fowl cholera is a highly contagious disease that can be transmitted through contact with infected birds, their droppings, or their respiratory secretions. The bacteria can also be transmitted through contaminated food, water, or equipment (Sander, 2022).

Prevention and Control of Fowl Cholera in Chickens

The best way to prevent fowl cholera in chickens is to vaccinate them. There are a number of different fowl cholera vaccines available, and your veterinarian can help you choose the right one for your flock.

In addition to vaccination, there are a number of other things you can do to prevent fowl cholera in chickens, including (Sander, 2022):

- Keep your coop and run clean and dry.
- Control pests and rodents around your coop.
- Avoid introducing new birds to your flock without first quarantining them for at least two weeks.
- Practice good biosecurity measures, such as disinfecting your shoes and hands before entering your coop.

Fowl cholera is a serious disease, but it can be prevented with proper vaccination and biosecurity measures. Fowl cholera is also a zoonotic disease, which means that it can be transmitted from animals to humans. Although this is rare, it is important to take precautions to protect yourself from infection.

Chronic Respiratory Disease (CRD)

Chronic Respiratory Disease (CRD) in chickens is a contagious bacterial infection caused by *Mycoplasma gallisepticum*. It is one of the most common diseases of poultry worldwide, and can cause significant economic losses in commercial flocks. CRD can affect chickens of all ages, but it is most severe in

young birds and laying hens. The bacteria can be transmitted through the air, through contact with infected birds or their droppings, or through contaminated feed and water (Sato & Wakenell, 2022).

Symptoms of CRD in Chickens

The symptoms of CRD can vary depending on the severity of the infection. Some common symptoms include (Sato & Wakenell, 2022):

- Sneezing
- Coughing
- Wheezing
- Nasal discharge
- Difficulty breathing
- Open-mouth breathing
- Drooping wings
- Lethargy
- Weight loss
- Reduced egg production

Treatment and Prevention of CRD

There is no cure for CRD, but antibiotics can be used to control the infection and relieve symptoms. It is important to note that antibiotics will not eliminate the bacteria from the flock, and the birds may remain carriers of the disease even after they appear to recover. The best way to prevent CRD is to vaccinate all chickens against the disease. Vaccination is most effective when done at a young age, but it can also be done on older birds.

Other preventive measures include (Sato & Wakenell, 2022):

- Practicing good biosecurity measures to prevent the introduction of the disease into the flock.
- Providing chickens with clean, fresh feed and water.
- Keeping the coop and run clean and dry.
- Avoiding overcrowding in the coop and run.
- Reducing stress on the chickens.

Chicken Diseases Caused by Parasites

Internal and External Parasites

Chickens are susceptible to a variety of internal and external parasites, which can cause a range of health problems, including weight loss, reduced egg production, and even death (Ghaffar, 2015).

Internal Parasites

Internal parasites live inside the chicken's body, such as in the intestines, blood vessels, or respiratory system. Some common internal parasites in chickens include (Ghaffar, 2015):

- Roundworms are long, thin worms that live in the intestines. They can cause weight loss, diarrhea, and reduced egg production.
- Tapeworms are flat, segmented worms that live in the intestines. They can cause weight loss, diarrhea, and reduced egg production.
- Cecal worms are small, round worms that live in the ceca, which are two blind pouches at the end of the intestine. They can cause weight loss, diarrhea, and reduced egg production.

- Hairworms are long, thin worms that live in the esophagus and crop. They can cause difficulty swallowing, weight loss, and reduced egg production.
- Coccidia are microscopic protozoa that live in the intestines. They can cause diarrhea, weight loss, and reduced egg production.
- Ascarids are roundworms that live in the small intestine of chickens. These parasites can cause stunted growth and lower egg production.
- Heterakis are roundworms that live in the ceca of chickens. These parasites can cause weight loss, diarrhea, and reduced egg production.
- Capillaria are threadworms that live in the lining of the small intestine. These parasites can cause enteritis, a condition that can lead to dehydration, weight loss, and death.
- Trichuris are whipworms that live in the ceca of chickens. These parasites can cause weight loss and reduced egg production.

External Parasites

External parasites live on the outside of the chicken's body, such as on the feathers or skin. Some common external parasites in chickens include (Hinkle & Corrigan, 2020):

- Mites are tiny, eight-legged creatures that live in the feathers or skin. They can cause feather loss, itching, and anemia.
- Lice are small, wingless insects that live on the feathers. They can cause feather loss, itching, and anemia.
- Ticks are small, blood-sucking parasites that attach to the skin. They can cause anemia and transmit diseases such as Lyme disease.
- Fleas are small, wingless insects that live on the skin and feathers. They can cause itching and anemia.

Prevention and Control

There are a number of things that can be done to prevent and control parasites in chickens, including (Hinkle & Corrigan, 2020):

- Provide chickens with a clean, dry environment. This will help to reduce the risk of parasites.
- Practice good biosecurity measures. This includes preventing contact with other chickens that may be infected with parasites.
- Use pesticides to kill parasites. This should be done under the supervision of a veterinarian.
- Deworm chickens regularly. This is especially important for young birds and laying hens.

If farmers suspect that their chickens have parasites, it is important to contact a veterinarian immediately. They will be able to diagnose the problem and recommend the best course of treatment.

Coccidiosis

Coccidiosis is a protozoal disease that affects the intestines of chickens. It is caused by parasites of the genus *Eimeria*, which are microscopic organisms that live inside the cells of the intestinal lining. Coccidiosis is highly contagious and can cause significant economic losses in commercial chicken flocks (Abebe & Gugsu, 2018).

Signs and Symptoms of Coccidiosis in Chickens

The signs and symptoms of coccidiosis in chickens vary depending on the severity of the infection. Some common signs and symptoms include (Abebe & Gugsu, 2018):

- Bloody diarrhea
- Lethargy
- Weight loss
- Reduced appetite
- Ruffled feathers
- Pale comb and wattles

In severe cases, coccidiosis can lead to death.

Diagnosis and Treatment of Coccidiosis in Chickens

Coccidiosis can be diagnosed by examining the chicken's feces for oocysts, which are the eggs of the coccidia parasites. Oocysts can be detected using a fecal flotation test. There is no cure for coccidiosis, but antibiotics can be used to control the infection and relieve symptoms. It is important to note that antibiotics will not eliminate the parasites from the chicken's body, and the chicken may remain a carrier of the disease even after it appears to recover (Abebe & Gugsu, 2018).

Prevention of Coccidiosis in Chickens

The best way to prevent coccidiosis is to vaccinate all chickens against the disease. Vaccination is most effective when done at a young age, but it can also be done on older birds.

Other preventive measures include (Abebe & Gugsu, 2018):

- Practicing good biosecurity measures to prevent the introduction of the disease into the flock.
- Providing chickens with clean, fresh feed and water.
- Keeping the coop and run clean and dry.
- Avoiding overcrowding in the coop and run.
- Reducing stress on the chickens.

The Outbreak of Chicken Diseases

Chicken diseases can cause significant economic losses to poultry farmers, and can also pose a risk to public health. Outbreaks of chicken diseases can be caused by a variety of factors, including (Helou, Berlaer, & Yammine, 2021):

- *Introduction of new diseases into the flock.* This can happen through contact with infected birds or their droppings, or through contaminated feed and water.
- *Poor biosecurity measures.* This can make it easier for diseases to spread within the flock and to other flocks.
- *Overcrowding and stress.* These conditions can make chickens more susceptible to disease.
- *Environmental factors.* Some diseases are more common in certain climates or during certain times of year.

Some of the most common chicken diseases that can cause outbreaks include (Helou, Berlaer, & Yammine, 2021):

- *Avian influenza (AI)*, also known as bird flu, is a highly contagious viral disease that can affect all types of birds, including chickens. AI can cause severe illness and death in chickens, and some strains of the virus can also infect humans.
- *Newcastle disease* is another highly contagious viral disease that can affect all types of birds. Newcastle disease can cause a variety of symptoms in chickens, including respiratory distress, neurological problems, and death.
- *Fowl cholera* is a bacterial disease that can affect chickens of all ages. Fowl cholera can cause a variety of symptoms in chickens, including fever, lethargy, and death.
- *Coccidiosis* is a protozoal disease that affects the intestines of chickens. Coccidiosis is highly contagious and can cause significant economic losses in commercial chicken flocks.

Outbreaks of chicken diseases can be prevented by implementing good biosecurity measures, vaccinating chickens against common diseases, and providing chickens with a clean, dry, and stress-free environment. If you suspect that your chickens have a disease, it is important to contact a veterinarian immediately.

Challenges in Preventing and Controlling Chicken Diseases

Smallholder farmers face a number of challenges in preventing and controlling chicken diseases. These challenges include (Hafez & Attia, 2020):

- Lack of access to veterinary care. Smallholder farmers often live in remote areas and do not have easy access to veterinary care. This can make it difficult to diagnose and treat chicken diseases promptly.
- Lack of knowledge about chicken diseases. Many smallholder farmers do not have the knowledge or training to identify and prevent chicken diseases. This can lead to outbreaks of diseases that could have been easily avoided.
- High cost of vaccines and medications. Vaccines and medications for chicken diseases can be expensive, especially for smallholder farmers who have limited resources.
- Poor biosecurity measures. Smallholder farmers often lack the resources to implement good biosecurity measures, such as fencing their flocks and disinfecting their equipment. This can make it easier for diseases to spread within the flock and to other flocks.
- Overcrowding and stress. Smallholder farmers often keep their chickens in overcrowded and stressful conditions. This can make the chickens more susceptible to disease.

In addition to these challenges, smallholder farmers may also be faced with unique challenges depending on their location and the type of chickens they raise. For example, smallholder farmers in developing countries may be more likely to face challenges such as (Hafez & Attia, 2020):

- Limited access to information about chicken diseases.
- Lack of government support for poultry production.
- Climate change. Climate change can make chickens more susceptible to disease by increasing the prevalence of vectors such as mosquitoes and ticks.

Despite these challenges, there are a number of things that smallholder farmers can do to prevent and control chicken diseases. These include (Hafez & Attia, 2020):

- Vaccinating chickens against common diseases. Vaccines are the most effective way to prevent chicken diseases. Smallholder farmers can often obtain vaccines from government agencies or non-profit organizations.
- Implementing good biosecurity measures. This includes fencing the flock, disinfecting equipment, and isolating sick birds.
- Providing chickens with a clean, dry, and stress-free environment. This will help to keep the chickens healthy and less susceptible to disease.
- Monitoring chickens for signs of illness. Smallholder farmers should inspect their chickens regularly for signs of illness, such as lethargy, weight loss, and respiratory distress. If they see any signs of illness, they should contact a veterinarian immediately.

By taking these steps, smallholder farmers can reduce the risk of chicken diseases in their flocks and protect their livelihoods.

DISCUSSION

There are a variety of chicken diseases, which can be caused by viruses, bacteria, parasites, and fungi. One of the biggest challenges in preventing and controlling chicken diseases is the lack of access to veterinary care and vaccines for smallholder farmers. Smallholder farmers often live in remote areas and do not have easy access to veterinary care. This can make it difficult to diagnose and treat chicken diseases promptly. Additionally, vaccines for chicken diseases can be expensive, especially for smallholder farmers who have limited resources.

Another challenge is the lack of knowledge about chicken diseases among many smallholder farmers. Many smallholder farmers do not have the knowledge or training to identify and prevent chicken diseases. This can lead to outbreaks of diseases that could have been easily avoided.

Despite these challenges, there are a number of things that can be done to improve the prevention and control of chicken diseases in smallholder flocks. One important step is to increase access to veterinary care and vaccines for smallholder farmers. This can be done by establishing mobile veterinary clinics or by providing subsidies for vaccines. Additionally, educational programs can be developed to teach smallholder farmers about chicken diseases and how to prevent them. Another important step is to improve biosecurity measures on smallholder farms. This can be done by providing smallholder farmers with fencing, disinfectants, and other biosecurity materials. Additionally, training programs can be developed to teach smallholder farmers how to implement good

biosecurity practices. By taking these steps, we can help to reduce the risk of chicken diseases in smallholder flocks and protect the livelihoods of smallholder farmers.

CONCLUSIONS AND RECOMMENDATIONS

Chicken diseases are a major challenge for poultry farmers, both small and large. They can cause significant economic losses, reduced productivity, and even death. Some chicken diseases can also pose a risk to public health. However, chicken diseases can be prevented and controlled through a variety of measures, including: vaccination, biosecurity, and good management practices.

Farmers should avoid selecting seeds in the nest for breeding, and farmers should use animal feed that is self-produced and composed of existing raw materials in the village or district, especially farmers who should be adequately vaccinated against chicken disease. And correctly according to the age of the chickens, on the other hand, farmers should not throw away the chickens that died from the disease and control the chickens that are sick to avoid the spread of the disease.

FUTHER STUDY

This research still has limitations, so it is necessary to carry out further research related to the topic Common Chicken Diseases in Smallholder Farming: A Review in order to perfect this research and increase insight for readers.

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