**A**

**RESEARCH PROJECT**

**EVALUATION OF INDIGENOUS METHODS OF DISEASES CONTROL AMONG POULTRY FARMERS IN EKET AGRICULTURAL ZONE**

**BY**

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**ABSTRACT**

*The study was to determine the evaluation of indigenous methods of diseases control among poultry Farmers in Eket agricultural zone. Multi-stage random sampling techniques was used to randomly select 120 respondents for the study. Primary data was obtained through the use of a well-structured questionnaire for the selected poultry farmers. Descriptive statistics such as (mean, frequency and table) was used as analytical technique for the study. The result of socioeconomic characteristics showed that greater proportion (52.5%) of the sampled respondents in the study area were female. The mean age, flock size and farming experience of the sampled respondents were 49.12 years, 120 and 6 years, respectively. The result of prevalent poultry disease in Eket Agricultural zone revealed that coccidiosis (90.8%), Newcastle disease (90.8%), fowl cholera (77.5%), fowl pox (75.8%) and chronic respiratory disease (64.2%) were highly prevalence in the study area. The result of the level of awareness in the use of indigenous methods of poultry disease control revealed that majority of the respondents were highly aware of the use of Garlic and Ginger (90%) to control coccidiosis. Conclusively, the result also showed that poultry farmers in the study area were highly aware of indigenous methods of controlling prevalent disease but did not effectively utilize these methods in their poultry production.*

**CHAPTER ONE**

**INTRODUCTION**

* 1. **Background of the Study**

A disease is a medical condition that affects the normal functioning of an organism, leading to symptoms, impairments, or abnormal physiological processes. Diseases can be caused by various factors, including infections, genetic mutations, lifestyle choices and environmental factors. Diseases can affect humans, animals, and plants, and they can range from mild and self-limiting to severe and life-threatening. Some diseases are communicable or infectious, meaning they can be transmitted from one person to another, while others are non-communicable, arising from factors like genetics or lifestyle and are not transmissible between individuals. Dante G. Scarpelli (2022).

Poultry farming holds significant economic importance in Nigeria, It plays a crucial role in the country's agricultural sector and overall economy, it provides employment opportunities to a large number of people, both directly and indirectly for poultry farmers and farm workers to feed suppliers, veterinarians, transporters, and retailers. This industry serves as a source of income for many households in both rural and urban areas, the sector contributes significantly to Nigeria's Gross Domestic Product (GDP). The production, processing, and distribution of poultry products add value to the national economy. Poultry products, such as chicken and eggs, are essential sources of protein for the Nigerian population.

Nigeria has the potential to export poultry products to other countries, generating foreign exchange earnings. The poultry sector can help stabilize the economy by providing a steady supply of affordable protein-rich food, especially during periods of food insecurity or commodity price fluctuations, the growth of the poultry industry in Nigeria attracts investment in related sectors, including feed mills, hatcheries, processing plants, and cold storage facilities.

The global livestock industry is still faced with the challenges from endemic disease outbreaks and inefficient production management (WOAH, 2019). According to WOAH (2019), the economic impact of parasites and disease outbreaks is inimical to the future growth of the livestock industry by further worsening the challenge of feeding the over nine billion world population by 2050. Thus, rescuing over 11% and 21% of the undernourished people in the world and Africa, respectively, by rising to the needs of per capita consumption and the welfare of animal production, necessitates efficient and goal-oriented healthcare to control the disease spread and contaminations, and minimize the use of antibiotics (WOAH, 2018). Poultry diseases refers to a wide range of illnesses that affect domesticated birds, including chickens, turkeys, ducks, geese, and other poultry species. These diseases can be caused by viruses, bacteria, fungi, parasites, nutritional deficiencies, environmental factors, or a combination of these factors (Um *et al.,* 2020). Understanding and effectively managing poultry diseases are crucial for maintaining the health and productivity of poultry flocks. Some common poultry diseases include; Avian Influenza, Newcastle Diseases, Infectious Bursal Disease, Marek Diseases, Coccidiosis, among others (WOAH, 2018).

Avian Influenza is caused by several strains of influenza viruses. AI poses significant risks to both poultry and humans, becoming a global health concern due to its potential to cause severe diseases or even death (FAO, 2019). Avian influenza is also known as bird flu, is a highly infectious viral disease that primarily affects birds. It can cause severe illness and high mortality rates in domestic poultry, as well as wild birds. Avian influenza viruses belong to the family *Orthomyxoviridae* and are further classified into subtypes based on the presence of two surface proteins, hemagglutinin (H) and neuraminidase (N) (WOAH, 2019). Avian influenza is a significant concern due to its potential for zoonotic transmission, meaning it can infect humans. Avian influenza though not all strains are capable of infecting humans, some have caused severe illness and fatalities when transmitted to humans. Therefore, Avian influenza outbreaks pose a risk to both animal and public health. The transmission of Avian influenza occurs through direct contact with infected birds, their secretions, or contaminated environments. It can spread rapidly within and between poultry farms, leading to devastating economic losses within the poultry industry. Wild birds, particularly waterfowl, serve as natural reservoirs of Avian influenza viruses and can transmit them to domestic poultry (CDC, 2022). Clinical signs of Avian influenza in poultry vary depending on the virus subtype and host species. The disease can manifest as mild respiratory symptoms, drop in egg production, severe systemic illness, or even sudden death in susceptible species. In some cases, infections may be asymptomatic, making it challenging to detect and control the disease (WOAH, 2018). Newcastle Disease is another highly contagious viral disease affects many bird species, causing respiratory, digestive, and nervous symptoms. Newcastle Disease can result in high mortality rates, leading to significant economic losses up to 40% mortality rate (FAO, 2018). Newcastle Disease is also known as *avian paramyxovirus* type 1 (APMV-1), is a highly contagious viral disease that affects various species of birds, particularly poultry. The disease is caused by Newcastle disease virus (NDV), which belongs to the *Paramyxoviridae* family. Newcastle disease virus strains can range from being mild to highly virulent and cause a wide range of clinical signs. Infected birds may exhibit respiratory, gastrointestinal, or nervous system symptoms, including; respiratory distress, coughing, sneezing, diarrhea, depression, and nervous signs (FAO, 2018; Agunos*et al.,* 2016). The transmission of Newcastle disease can occur through direct contact with infected birds, their secretions, or contaminated objects, as well as through airborne particles. Wild birds can also carry the virus without showing any symptoms, making it difficult to control the disease in outdoor or free-range poultry (Campbell*et al.,* 2018). Infectious Bursal Disease (IBD), also known as Gumboro disease, is a highly contagious viral disease that affects domestic poultry, especially chickens. It primarily targets young chicks, particularly between 3 and 6 weeks of age, but can also infect older birds. It can result in immuno-suppression, making the birds more susceptible to secondary infections (Jackwood, 2018). Gumboro disease is caused by the Infectious Bursal Disease Virus (IBDV), this disease primarily affects the bursa of Fabricius - an organ involved in the development and maturation of B-lymphocytes, a crucial component of the immune system in birds (Musa *et al.,* 2015).Infectious Bursal Disease Virus (IBDV) is shed through the feces, nasal discharges, and other bodily secretions of infected birds which spreads mainly through direct contact with contaminated materials or surfaces, contaminated feed or water, as well as through vertical transmission from infected hens to their offspring. Additionally, certain strains of Infectious Bursal Disease Virus may persist in the environment, leading to indirect transmission (Jackwood, 2018; Musa *et al.,* 2015). Clinical Signs of this disease includes; Depressed growth rate, general weakness and lethargy, decreased feed consumption, watery or foamy diarrhea, dehydration, immunosuppression, making the birds susceptible to secondary infections and in severe cases, high mortality rates can occur (Musa et al., 2015; WOAH, 2019) Diagnosing of Gumboro Disease involves several methods, including clinical signs, necropsy examination, viral isolation, serological tests, and molecular detection techniques (WOAH, 2018; Sapats, 2019).

Marek's Disease is another highly contagious viral disease that primarily affects poultry especially, chickens, causing tumors in various organs. It primarily affects young birds between the ages of 3 to 25 weeks, although older birds can also be affected. Marek's disease is caused by the Marek's disease virus (MDV), which belongs to the Herpesviridae family. Marek's disease is caused by an *alphaherpesvirus* known as MDV serotype 1 (MDV-1). It is a DNA virus that has the ability to infect and proliferate within lymphoid cells, causing tumors and immunosuppression (MVM, 2018). MDV-1 is primarily transmitted horizontally through respiratory droplets, feather dander, and contaminated fomites. It can also spread vertically from infected hens to their offspring through the egg. The virus can persist in the environment for several months, making it difficult to eradicate (MVM, 2018). Marek’s disease exhibits various clinical signs depending on the affected organs and the immune status of the bird. Common signs include; paralysis or lameness, weight loss, anorexia, respiratory distress, enlarged feather follicles, and tumors in various organs such as the internal organs, skin, and nerves. Nervous signs like ataxia and tremors may also be observed (Osterrieder, 2016; Schat, 2018). Diagnosis of Marek's disease involves a combination of clinical signs, histopathology, serology, and molecular techniques. Detection of characteristic lymphoid tumors or infected cells through histopathology is one of the definitive diagnostic methods. Serological tests like enzyme-linked immunosorbent assay (ELISA) can detect antibodies against MDV-1. PCR-based methods are also used to detect viral DNA in tissues or blood samples (Osterrieder, 2016; MVM, 2018).

Coccidiosis is the commonest parasitic disease caused by various species of protozoa, known as coccidia. Coccidiosis affects the bird's digestive tract, leading to diarrhea, decreased feed conversion, and impaired growth. The poultry disease is caused by various species of the protozoan parasite called *Eimeria spp.* Several species of *Eimeria* can infect poultry, including; *E. tenella, E. acervulina, E. maxima, E. necatrix,* and *E. brunetti.* Each species has a predilection for a specific part of the bird's intestine and causes characteristic pathological lesions (WOAH, 2018, 2019). Coccidiosis affects the intestinal tract of chickens, turkeys, and other poultry species, leading to reduced growth, decreased feed efficiency, increased mortality, and compromised flock health. Coccidiosis is a widespread disease that affects the poultry industry worldwide. It is estimated to cause billions of dollars in losses due to poor performance, increased medication costs, and increased mortality. The disease mainly targets young birds, as they are more susceptible to infection. Infected birds exhibit symptoms such as diarrhea, reduced appetite, poor growth, dehydration, and increased mortality rates (Shirley & Smith, 2020). Diagnosis of coccidiosis is typically based on clinical signs, fecal examination, and microscopic identification of coccidia oocysts. Various laboratory techniques, such as the McMaster technique and PCR-based methods, can assist in determining the species and intensity of the infection (Swai & Shitu, 2021).

Poultry diseases remain one of the major threats to boosting poultry production in Nigeria affecting the health and productivity of poultry and the economic viability of farmers. However, in many communities, indigenous methods of treating poultry diseases exist, but their adoption is relatively low. The use of indigenous methods of poultry disease treatment has been a common practice for decades, especially in communities where modern veterinary care is scarce or expensive (Swai & Shitu, 2021). These methods comprise of traditional knowledge and practices passed down through generations and are based on animal husbandry. Indigenous control of poultry diseases describes the total sum of the knowledge, skills, practices and different cultures have been used over time to maintain health and prevent, diagnose and treat physical illness of poultry (Swai & Shitu, 2021). This methods of treatments include; using plant extracts, herbs, and other natural remedies have been passed down through generations. These methods are perceived to be effective and affordable, especially by small-scale farmers who may not have access to conventional medicines (Mwale *et al.*, 2018). Using indigenous methods of poultry diseases treatment can have numerous advantages, including reduced reliance on synthetic drugs, increased sustainability, and preserving cultural traditions. However, the level of adoption of these methods among poultry farmers calls for evaluation.

**1.2 Problem Statement**

Poultry diseases remain one of the major threats to boosting poultry production in Nigeria. Parasitic diseases are of particular importance because of their high incidence in poultry occasioned by the tropical environmental condition under which the farmers operates (Seifert, 2006).

Diseases seriously affect poultry and constitute one of its threats, Morekiet *et. al* (2010) ascribed losses in poultry to diseases (36.7%) disease and parasites (11.1%), predation (8.89%). In order of prevalence, the common diseases of poultry are coccidiosis, infectious coryzse, fowl pox, infectious bursal disease (IBD) and Newcastle disease(NCD) Morekiet *et al* (2011).

Diseases are the major constraints in poultry production, they lower productivity, decreases the rate of regeneration and increase the rinks of transfer to final consumers. The menace of disease in poultry has caused drastic reduction in number of animal protein available for human consumption. The high cost has made the protein intake of Nigeria to fall behind the log per capital consumption recommended by the Food and Agricultural Organization (FAO, 2006).

Poultry diseases are responsible for a number of adverse economic and social impacts, their occurrence depends on various factors including geo-climatic condition, population density, management practices, and immunization status (AI Mamun and Mehetazul, 2019). These diseases lead to high mortality and morbidity of chickens, high medication costs, loss in production and market, and can pose a risk to public health through zoonoses (Wubet *et al.,* 2019). Disease outbreaks were recently reported as major constraints of poultry producers and high chick mortality caused by disease and predation in Ethiopia has been reported earlier (Habte *et al.* (2017). Newcastle disease, salmonellosis, fowl cholera, coccidiosis, and fowl pox were reported as main infectious diseases causing high morbidity and mortality both in village and in large-scale poultry farms (Wubet *et al.* (2019). Coccidiosis in chickens is estimated to cause global financial losses of up to 3 billion USD per annum (Dalloul and Lillehoj, 2006; Pawestri *et al.,* 2020). Infestation by the parasite in chickens also increases financial loss. In Tanzania, it has been reported that endo-parasites and ecto-parasites may potentially devastate chicken production significantly. For instance, a study indicated that the mixed worm infestation rate in Tanzania ranges between 10 and 38.5% in scavenging village chickens, ducks, and pigeons (Rukambile *et al.,* 2020), the introduction of drugs into the food chain through the treatment of sick chickens has a negative impact on human health (Ngongolo *et al.,* 2020). However, in Dodoma and other parts of Tanzania, few studies have been conducted to understand the extent of losses caused by mortality owing to diseases and improper management of chickens.

In Nigeria where poultry farming is less developed, the diseases is more serious and causes heavy economy losses, although the exact losses due to diseases are not well known due to lack of statistical indices but these could be in the region of million naira.

The major concerns of poultry farmers are to produce optimally hence any effort at controlling effect of controlling of disease will be very desirable.

The practice of complementary and alternative medicine should be increase in Nigeria in responsible to World Health Organization (WHO) directive culminating in several pre-scientific tests for the efficacy of many plants used in folk medicine to treat infections (Dafivang *et al* 2010).

Gueyc (2002) maintained that indigenous method is the only option for most of the village poultry farmers in Africa because there are almost no veterinarians in African rural areas the usage is sustainable and ecologically sound. Often time the imported drugs or development programs have been to appropriate to African local conditions due to differences in physical, social, political, economic, technological and cultural environment. Thus failing to propel the much needed solution to agricultural problems encountered by rural farmers.

Although there are several studies on poultry diseases control but much emphasis is on the conventional methods of treatment that are costly, not accessible follow with the emergence of multiple drug resistant bacteria (MDR) that has become a major cause of drugs failure.

Udousung, (2015) research of the traditional and orthodox methods of poultry diseases, but the studies did not dwelled much on locally available materials for treatment of poultry diseases.

This study is necessary to provide information on locally available materials for the treatment of poultry diseases. Hence, the study on Evaluation of Indigenous Methods of Poultry Diseases Control among Poultry Farmers In Eket Agricultural Zone.

**1.3 Objectives of the Study**

Broad objective of this study is to determine the evaluation of indigenous methods of diseases control among poultry Farmers in Eket agricultural zone.

**The Specific objectives of this study are to:**

1. identify the socioeconomic characteristics of poultry Farmers in the study area.
2. identify the prevalent poultry diseases in the study area.
3. assess the level of awareness of indigenous methods of poultry diseases control in the study area.
4. assess the level of utilization of indigenous methods of poultry diseases control among poultry farmers in the study area.
5. determine factors militating against adoption of indigenous methods of poultry diseases control in the study area.

**1.4 Research Questions**

1. What are the socioeconomic characteristics of poultry farmers in the study area?
2. Which poultry disease is prevalent in the study area?
3. What are the level of awareness of indigenous methods of poultry diseases control in the study area?
4. What are the level of utilization of these indigenous methods of poultry diseases control among poultry farmers in the study area?
5. What are the factors militating against the adoption of indigenous methods of poultry diseases control in the study area?

**1.5 Significance of Study**

1. This study will be significant in many aspects as the findings will add to the existing knowledge on the resilience of Indigenous methods for poultry diseases control.
2. The result of this study will also be useful to policy makers in designing strategies to promote adoption of indigenous methods of poultry diseases control.
3. It will improve the farmers understanding on the use of indigenous methods of poultry diseases control
4. This study will not only boost farmers economic and financial status, it will boost the general poultry production and consumption among the populace.

**1.6 Scope of Study**

This study focused on determining the level of adoption of indigenous methods of poultry diseases control among poultry farmers in Eket agricultural zone. It covered the commonly used indigenous methods, socioeconomic characteristics of the farmers, awareness of farmers on these methods, prevalent poultry diseases, level of utilization of indigenous methods of controlling poultry diseases and factors militating against the adoption of these indigenous methods of poultry diseases control.

**1.7 Definition of terms**

**Indigenous methods:** refers to the use of locally available materials and knowledge in treating poultry diseases.

**Adoption:** refers to the acceptance and use of a new practice or technology.

**Determinant**: this is a factor which decisively affects the nature or outcome of something.

**Diseases**: this is an abnormal condition that negatively affects the structure or function of all or part of an organism, and that is not immediately due to any external injury. Diseases are often known to be medical conditions that are associated with specific signs and symptoms. A disease may be caused by external factors such as pathogens or by internal dysfunctions. For example, internal dysfunctions of the immune system can produce a variety of different diseases, including various forms of immunodeficiency, hypersensitivity, allergies and autoimmune disorders.

**CHAPTER TWO**

**LITERATURE REVIEW**

**2.1 An Overview of Poultry Diseases**

The term disease in its broadest sense means any deviation from the normal. Consequently, any factor that interferes with the fullest performance of the normal functions of growth, development, or egg production (WOAH, 2019). Poultry diseases refer to a wide range of illnesses that affect various species of domesticated birds such as chickens *(Gallus gallus domesticus*), ducks, turkeys, and geese. These diseases can have significant economic implications for the poultry industry, causing reduced production, poor growth, decreased egg production, and even mortality (WOAH, 2019; FAO, 2018). Therefore, it is crucial for poultry farmers, veterinarians, and researchers to have a comprehensive understanding of these diseases in order to effectively prevent, diagnose, and control them.

Poultry production has suffered from different pathogenic microorganisms that cause devastating economic losses in poultry industries worldwide. The diseases caused by pathogens are contagious or infectious diseases because they can be passed from poultry to poultry via direct and indirect routes. According to their biological nature, pathogenic microorganisms which causes diseases can be classified into viruses, mycoplasma, bacteria, fungi, protozoa, and parasites (WOAH, 2018). According to prevalence, transmission, zoonotic potential, morbidity, and mortality properties, the world Organization for Animal Health makes and updates a list of diseases for the poultry industry to monitor. Therefore, the most common poultry diseases as per the list reported by OIE include avian influenza (high or low pathogenicity), Newcastle disease, avian mycoplasmosis, avian infectious laryngotracheitis, avian infectious bronchitis, fowl typhoid, infectious bursal disease, Marek’s disease, infectious coryza, pullorum disease, and coccidiosis (WOAH, 2019, CDC, 2022). It is important to note that the symptoms, severity, and effects of these diseases vary depending on the specific pathogen involved, the age and breed of the bird, environmental factors, and management practices (FAO, 2018).From CDC, (2022), Avian Influenza which is a highly contagious viral disease affects various bird species, including poultry; Newcastle Disease which causes respiratory, digestive, and nervous system problems, leading to high mortality rates in unvaccinated or susceptible flocks. Infectious Bronchitis is a highly contagious viral respiratory disease primarily affects chickens and is characterized by respiratory distress, coughing, sneezing, and reduced egg production.

Another common poultry disease is infectious Bursal Disease (IBD): Also known as Gumboro disease, which is caused by a viral infection targeting the immune system of young chickens. It can lead to immunosuppression, increased susceptibility to secondary infections, and subsequent economic losses (Jackwood, 2018). Marek's Disease is another highly contagious viral disease primarily affects young chickens. Merek’s disease causes tumors in various organs, leading to paralysis, weight loss, and increased mortality rates (MVM, 2018).

Coccidiosis is another commonest parasitic disease is caused by protozoan parasites of the genus Eimeria. Coccidiosis primarily affects the digestive tract of chickens, causing diarrhea, reduced growth, and increased susceptibility to other diseases (Shirley & Smith, 2020). Salmonellosis which is caused by bacteria of the genus Salmonella, this zoonotic disease can be transmitted to humans through contaminated poultry products. Salmonellosis can lead to severe gastrointestinal infections, posing a public health concern (Prescott, 2020). It is important to recognize that diseases are due not only to specific infections, but also to lack of some necessary element or substance in the diet; to an improper balance between the necessary substances; or occasionally to a marked excess of some food factor. These diseases lower the bird productivity, giving rise to less meat or eggs of lesser quality. This offers lower-quality food and fiber. In terms of economics, output falls, costs rise, and profits fall, the estimated annual financial burden of livestock diseases in Nigeria is 29.2 billion Naira. Furthermore, the economic losses suffered by poultry farmers from 2009 to 2011 totaled more than three billion Nigerian currencies due to infectious bursal disease outbreaks alone (FAO, 2018; 2021). Standard health management measures are critical in protecting poultry birds from the disease. Poultry health management entails ensuring a hygienic environment and boosting cleanliness standards, as well as containment, to decrease the probability of introducing disease into a flock.

**2.2 Newcastle Disease**

Newcastle Disease is another highly contagious viral disease affects many bird species, causing respiratory, digestive, and nervous symptoms. Newcastle Disease can result in high mortality rates, leading to significant economic losses up to 40% mortality rate (FAO, 2018). Newcastle Disease is also known as *avian paramyxovirus* type 1 (APMV-1), is a highly contagious viral disease that affects various species of birds, particularly poultry. The disease is caused by Newcastle disease virus (NDV), which belongs to the *Paramyxoviridae* family. Newcastle disease virus strains can range from being mild to highly virulent and cause a wide range of clinical signs. Infected birds may exhibit respiratory, gastrointestinal, or nervous system symptoms, including; respiratory distress, coughing, sneezing, diarrhea, depression, and nervous signs (FAO, 2018; Agunos *et al.,* 2016).

The transmission of Newcastle disease can occur through direct contact with infected birds, their secretions, or contaminated objects, as well as through airborne particles. Wild birds can also carry the virus without showing any symptoms, making it difficult to control the disease in outdoor or free-range poultry (Campbell *et al.,* 2018).

***2.*3 *Avian Influenza***

*Avian Influenza* is caused by several strains of influenza viruses. AI poses significant risks to both poultry and humans, becoming a global health concern due to its potential to cause severe diseases or even death (WOAH, 2019). *Avian influenza* is also known as bird flu, is a highly infectious viral disease that primarily affects birds. It can cause severe illness and high mortality rates in domestic poultry, as well as wild birds. *Avian influenza* viruses belong to the family *Orthomyxoviridae* and are further classified into subtypes based on the presence of two surface proteins, hemagglutinin (H) and neuraminidase (N). The H protein has 18 subtypes, and the N protein has 11 subtypes, resulting in different combinations and thus different subtypes of Avian influenza. The most common subtypes that affect poultry are H5, H7, and H9 (WOAH, 2019).

*Avian influenza* is a significant concern due to its potential for zoonotic transmission, meaning it can infect humans. *Avian influenza* though not all strains are capable of infecting humans, some have caused severe illness and fatalities when transmitted to humans. Therefore, *Avian influenza* outbreaks pose a risk to both animal and public health. The transmission of *Avian influenza* occurs through direct contact with infected birds, their secretions, or contaminated environments. It can spread rapidly within and between poultry farms, leading to devastating economic losses within the poultry industry. Wild birds, particularly waterfowl, serve as natural reservoirs of *Avian influenza* viruses and can transmit them to domestic poultry (CDC, 2022). Clinical signs of Avian influenza in poultry vary depending on the virus subtype and host species. The disease can manifest as mild respiratory symptoms, drop in egg production, severe systemic illness, or even sudden death in susceptible species. In some cases, infections may be asymptomatic, making it challenging to detect and control the disease (CDC, 2022).

***2*.4 *Coccidiosis***

*Coccidiosis* is the commonest parasitic disease caused by various species of protozoa, known as coccidia. *Coccidiosis* affects the bird's digestive tract, leading to diarrhea, decreased feed conversion, and impaired growth (Shirley & Smith, 2020). The poultry disease is caused by various species of the protozoan parasite called *Eimeria spp.* Several species of *Eimeria* can infect poultry, including; *E. tenella, E. acervulina, E. maxima, E. necatrix,* and *E. brunetti.* Each species has a predilection for a specific part of the bird's intestine and causes characteristic pathological lesions. *Coccidiosis* affects the intestinal tract of chickens, turkeys, and other poultry species, leading to reduced growth, decreased feed efficiency, increased mortality, and compromised flock health. *Coccidiosis* is a widespread disease that affects the poultry industry worldwide. It is estimated to cause billions of dollars in losses due to poor performance, increased medication costs, and increased mortality. The disease mainly targets young birds, as they are more susceptible to infection. Infected birds exhibit symptoms such as diarrhea, reduced appetite, poor growth, dehydration, and increased mortality rates (Shittu, 2020; Shirley & Smith, 2020). The diagnosis of *coccidiosis* is typically based on clinical signs, fecal examination, and microscopic identification of coccidia oocysts. Various laboratory techniques, such as the McMaster technique and PCR-based methods, can assist in determining the species and intensity of the infection (Shittu, 2020).

**2.5. Marek Disease**

Marek's Disease is another highly contagious viral disease that primarily affects poultry especially, chickens, causing tumors in various organs. It primarily affects young birds between the ages of 3 to 25 weeks, although older birds can also be affected. Marek's disease is caused by the Marek's disease virus (MDV), which belongs to the Herpesviridae family. Marek's disease is caused by an *alphaherpesvirus* known as MDV serotype 1 (MDV-1). It is a DNA virus that has the ability to infect and proliferate within lymphoid cells, causing tumors and immunosuppression (MVM, 2018). MDV-1 is primarily transmitted horizontally through respiratory droplets, feather dander, and contaminated fomites. It can also spread vertically from infected hens to their offspring through the egg. The virus can persist in the environment for several months, making it difficult to eradicate. Marek's disease exhibits various clinical signs depending on the affected organs and the immune status of the bird. Common signs include; paralysis or lameness, weight loss, anorexia, respiratory distress, enlarged feather follicles, and tumors in various organs such as the internal organs, skin, and nerves. Nervous signs like ataxia and tremors may also be observed (MVM, 2018). The Diagnosis of Marek's disease involves a combination of clinical signs, histopathology, serology, and molecular techniques. Detection of characteristic lymphoid tumors or infected cells through histopathology is one of the definitive diagnostic methods. Serological tests like enzyme-linked immunosorbent assay (ELISA) can detect antibodies against MDV-1. PCR-based methods are also used to detect viral DNA in tissues or blood samples (MVM, 2018; CDC, 2022).

**2.6 Infectious Bursal Diseases *(Gumboro)***

Infectious Bursal Disease (IBD), also known as Gumboro disease, is a highly contagious viral disease that affects domestic poultry, especially chickens. It primarily targets young chicks, particularly between 3 and 6 weeks of age, but can also infect older birds. It can result in immuno-suppression, making the birds more susceptible to secondary infections (Jackwood, 2018). Gumboro disease is caused by the Infectious Bursal Disease Virus (IBDV), this disease primarily affects the bursa of Fabricius—an organ involved in the development and maturation of B-lymphocytes, a crucial component of the immune system in birds. Infectious Bursal Disease Virus (IBDV) is shed through the feces, nasal discharges, and other bodily secretions of infected birds which spreads mainly through direct contact with contaminated materials or surfaces, contaminated feed or water, as well as through vertical transmission from infected hens to their offspring. Additionally, certain strains of Infectious Bursal Disease Virus may persist in the environment, leading to indirect transmission (Musa *et al.,* 2015; Sapats, 2019). Clinical Signs of this disease includes; Depressed growth rate, general weakness and lethargy, decreased feed consumption, watery or foamy diarrhea, dehydration, immunosuppression, making the birds susceptible to secondary infections and in severe cases, high mortality rates can occur. The diagnosing of Gumboro Disease involves several methods, including clinical signs, necropsy examination, viral isolation, serological tests, and molecular detection techniques (Jackwood, 2018; WOAH, 2018). Bursal atrophy and hemorrhages are characteristic post-mortem findings in infected birds (WOAH, 2018).

**2.7 *Salmonellosis***

*Salmonellosis* is a significant poultry disease caused by the bacteria belonging to the genus *Salmonella*. It is a major concern for the poultry industry due to its impact on both animal health and human safety (Shah, 2018). Etiologically, *Salmonellosis* in poultry is caused by various serotypes of *Salmonella,* with the most common being *Salmonella* enterica. Several serotypes, including *S. Typhimurium* and *S. Enteritidis*, have been implicated in poultry outbreaks. These bacteria can survive in the poultry environment for prolonged periods, leading to recurrent infections (Kozakiewicz*et al.,* 2018). The primary route of transmission of *Salmonella* in poultry is through the ingestion of contaminated feed, water, or environment. Vertical transmission from breeder hens to their offspring also occurs. Additionally, the introduction of infected birds or contaminated equipment can act as sources of infection. Clinical signs of *salmonellosis* in poultry vary depending on the age and immune status of birds. In chicks, symptoms include diarrhea, depression, dehydration, weakness, and high mortality rates. In older birds, clinical signs may be less severe and can include decreased egg production, weight loss, respiratory distress, and lameness (CDC, 2022; Davies, 2021).

Diagnosing salmonellosis in poultry relies on a combination of clinical signs, pathological lesions, and laboratory tests. Post-mortem examination often reveals lesions in the gastrointestinal tract, liver, spleen, and reproductive organs. Isolation and identification of *Salmonella* from samples such as feces, organs, or feed can be achieved through bacteriological culture, followed by serotyping and molecular techniques like polymerase chain reaction (PCR) (Shah, 2018). Preventing and controlling *salmonellosis* in poultry requires a multi-faceted approach. Good management practices, including proper biosecurity measures, clean and disinfected facilities, and rodent control, are essential. Vaccination, especially with live attenuated or inactivated vaccines, helps in modern days to reduce *Salmonella* shedding and associated clinical signs. Strategic control programs may involve the use of competitive exclusion products, prebiotics, and organic acids as feed additives (Shah, 2018; CDC, 2022).

**2.8 Footborne Diseases**

Footborne diseases in poultry refers to infections and conditions that primarily affect the feet and legs of birds. These diseases can have a significant impact on bird health and welfare, leading to reduced mobility, pain, and decreased productivity (Awad*et al.,* 2017). Some of these foot-borne diseases includes;

* **Pododermatitis (Bumblefoot):** Pododermatitis, commonly known as bumblefoot, is a bacterial infection that occurs when the skin on the foot becomes damaged, allowing bacteria to enter. Staphylococcus aureus is the primary bacterial agent involved. It causes swelling, lameness, and the formation of abscesses on the footpad. Poor litter quality, rough surfaces, and excessive body weight are factors contributing to bumblefoot. Proper litter management, maintaining clean and dry surfaces, and providing appropriate footpad conditions can help prevent bumblefoot (Cook *et al.,* 2016; Awad *et al.,* 2017).
* **Infectious Footpad Dermatitis (IFD):** IFD, also known as hock burn or footpad dermatitis, is characterized by lesions, ulcers, and scabs on the footpads or hocks of poultry. It is primarily caused by opportunistic bacteria, including Escherichia coli and Proteus spp. Risk factors include wet litter, poor hygiene, high stocking densities, and inadequate ventilation. Improved hygiene, litter management, and good ventilation are essential measures for preventing IFD (Awad*et al.,* 2017).
* **Tarsal Dermatitis:** Tarsal dermatitis, also called "scaly leg," occurs when a microscopic mite *(Knemidocoptes mutans)* burrows into the scales of the legs and feet. The mite infestation leads to the formation of crusty lesions, swollen legs, reduced mobility, and discomfort. Proper prevention involves regular monitoring, quarantine procedures, and treatment with acaricides (Cook *et al.,* 2016).
* **Gout**: Gout is a metabolic disorder caused by the accumulation of uric acid crystals in joints, including the feet and legs. It can result from an imbalanced diet, genetics, or renal dysfunction. Gout causes lameness, swollen joints, and discomfort. Proper nutritional management, including balanced diets and sufficient drinking water, is crucial for preventing gout in poultry (Cook *et al.,* 2016).

**2.9 Indigenous Methods of Poultry Diseases Control**

According to the World Health Organization (WHO), at least 80% of people in developing countries depend largely on indigenous practices for the control and treatment of various diseases affecting both human beings and animals. It was not until recently that more attention was drawn to these practices. Increased attention on ethnoveterinary medicine (EVM) is justified because; it is accessible, easy to prepare and administer at little or no cost at all. These practices may be the only option in areas where conventional services are economically unavailable or some ineffective. Many indigenous practices do work and make veterinary sense. These methods comprise of traditional knowledge and practices passed down through generations and are based on animal husbandry. Indigenous control of poultry diseases describes the total sum of the knowledge, skills, practices and different cultures have been used over time to maintain health and prevent, diagnose and treat physical illness of poultry (Swai & Shitu, 2021).

This methods of treatments include; using plant extracts, herbs, and other natural remedies including management practices passed down through generations (Swai & Shitu, 2021). These methods are perceived to be effective and affordable, especially by small-scale farmers who may not have access to conventional medicines (Mwale *et al.*, 2018). Using indigenous methods of poultry diseases treatment can have numerous advantages, including reduced reliance on synthetic drugs, increased sustainability, and preserving cultural traditions. However, conventional drugs are either unavailable or too expensive for these resource poor farmers, hence their dependence on indigenous methods of poultry disease control which majorly involves the use of herbs and other medicinal plants.

**2.10 Medicinal Plant Extracts**

Indigenous methods of poultry disease control involve the use of practices and remedies that have been passed down through generations in various communities. These methods often rely on natural and locally available resources to prevent and treat diseases in poultry (Nworgu*et al.,* 2018). Herbal remedies have been used as indigenous methods of poultry disease control for many years. These remedies involve the use of various plant-based materials and extracts, which are believed to possess medicinal properties that can combat different types of poultry diseases. While it is important to note that scientific evidence for the effectiveness of herbal remedies in poultry disease control is limited, anecdotal evidence and traditional knowledge suggest that certain herbs may have beneficial effects. Here are some commonly used herbal remedies used indigenously for poultry disease control:

* **Garlic (*Allium sativum*):** Garlic is known for its antimicrobial and immunostimulant properties. It may help in preventing and treating respiratory diseases and intestinal infections in poultry (Nworgu*et al.,* 2018).
* **Turmeric (*Curcuma longa****):* Turmeric contains curcumin, which has antimicrobial, antioxidant, and anti-inflammatory properties. It is believed to boost the immune system and promote overall health in poultry (Gharaibeh, 2020; Khan, 2018).
* **Neem (*Azadirachta indica*):** Neem has antimicrobial properties and is used to control external parasites such as mites and lice. It is also believed to have immune-enhancing effects (Ogunlade*et al.,* 2018).
* **Echinacea (*Echinacea purpurea*):** Echinacea is known for its immunostimulatory effects. It may help in boosting the immune response and preventing infections in poultry (Morales-Erasto*et al.,* 2016).
* **Aloe vera *(Aloe barbadensis):*** Aloe vera is used for its wound-healing properties. It may help in treating skin infections, burns, and injuries in poultry (Mashaly, 2019).
* **Oregano (*Origanum vulgare):***Oregano contains compounds like carvacrol and thymol, which have antimicrobial properties. It is believed to have positive effects on gut health and may help in controlling intestinal diseases in poultry (Gharaibeh, 2020; Giannenas; 2016).
* **Plantain Leaves *(Musa species):*** Plantain leaves are known for their antimicrobial properties and may help in maintaining healthy gut function in poultry (Ebeye*et al.,* 2020)
* **Scent Leaf (*Ocimum gratissimum*):** Scent leaf, also known as basil, is rich in antioxidants and has been suggested to have antibacterial and antifungal properties. Some poultry owners believe it can benefit overall health (Igbasan *et al.,* 2019)
* **Pawpaw *(Carica papaya):*** Different parts of the pawpaw plant, including the leaves, seeds, and fruits, are used in poultry nutrition. Pawpaw leaves contain enzymes, vitamins, and phytochemicals that aid in digestion, prevent coccidiosis, and enhance weight gain in poultry (Audu*et al.,* 2019).
* **Ginger *(Zingiberofficinale):*** Garlic is a potent herb with various health-promoting properties. Including garlic in poultry diets improves feed utilization, prevents gastrointestinal diseases, and enhances growth performance (Nworgu *et al.,* 2018).
* **Bitterleaf *(Vernonia amygdalina):*** Vernonia leaves are commonly used in poultry nutrition due to their high protein and fiber content. They possess anthelmintic properties, which help in controlling parasitic infections in poultry. Including *vernonia* in diets results in improved growth, feed conversion efficiency, better reproductive ability and better carcass characteristics (Ali *et al.,* 2020).
* **Moringa *(Moringa oleifera):*** Moringa is a highly nutritious herb that is widely cultivated in Nigeria. Its leaves are rich in proteins, vitamins, minerals, and antioxidants. Including Moringa leaves in poultry diets can enhance growth rates, immune function, and reproductive performance. It also helps in reducing mortality rates in poultry (Umaru*et al.,* 2017).

**2.11 Management Practices**

Prophylactic measures in indigenous methods of poultry disease control involve practices aimed at preventing diseases rather than treating them (Mpendulo, 2020). This includes the utilization of management practices in the farm to prevent disease infection.

* **Biosecurity measures** are crucial for protecting poultry flocks from various diseases, including traditional or indigenous methods. These methods often rely on practices and techniques that have been developed and passed down through generations by indigenous communities. While scientific advancements have introduced modern biosecurity practices, traditional methods can still have significant value in certain contexts (Mpendulo, 2020).
* **Isolation of Poultry Flock:** Indigenous communities often practiced keeping poultry flocks in isolated areas to reduce exposure to external pathogens and prevent disease spread. Isolation can be achieved by ensuring physical barriers, such as fences or enclosures, to separate poultry from other animals or potential sources of infection (Ritter *et al.,* 2017).
* **Cultural Practices and Rituals:** Some indigenous cultures incorporate specific rituals and practices into poultry husbandry, which indirectly contribute to biosecurity. These practices can include cleansing or purifying the poultry house and surrounding areas using natural materials with known antimicrobial properties, such as plant extracts or smoke generated from certain herbs. These traditional practices might impart biosecurity benefits, although scientific studies validating their efficacy are limited (Ritter *et al.,* 2017; Sharma, 2016).
* **Selection of Hardy Breeds:** Indigenous communities often raise poultry breeds well-adapted to local environments and resistant to prevalent diseases. These breeds, developed over generations, possess genetic resilience to specific challenges and might require fewer interventions or medications, indirectly reducing disease risks (Sharma *et al.,* 2017).
* **Traditional housing design**: Traditional poultry housing often incorporates designs that aim to minimize disease transmission. For instance, separate houses for different bird age groups, proper ventilation to reduce humidity, and predator-proof structures can all contribute to disease prevention (Shittu, 2020).

**2.12 Factors affecting Adoption of Indigenous methods of Poultry Diseases Control**

The adoption of indigenous methods of poultry disease control by poultry producers or farmers can be influenced by several factors. Here are some key factors that can affect the adoption of indigenous methods of poultry disease control:

* **Cultural beliefs and practices:** Traditional methods of disease control often have deep roots in the cultural beliefs and practices of a community. The adherence to these beliefs and practices can significantly influence the adoption of such methods. For example, in some regions, traditional rituals or herbal remedies may be considered effective in preventing or treating poultry diseases (Lesosky *et al.,* 2016).
* **Knowledge and awareness:** Farmers' level of knowledge and awareness about traditional methods of disease control can impact their willingness to adopt them. Lack of information or misconceptions about the effectiveness of traditional methods may discourage farmers from utilizing them. On the other hand, well-informed farmers who understand the benefits and limitations of traditional approaches may be more inclined to adopt them (Abdela, 2020).
* **Availability and accessibility of modern alternatives**: The availability and accessibility of modern veterinary medicines, vaccines, and biosecurity practices can affect the adoption of traditional methods. If affordable and effective modern alternatives are easily accessible, farmers may be more likely to opt for those instead of traditional methods (Mekoya *et al.,* 2018).
* **Economic considerations:** The economic aspects, such as the cost-effectiveness and profitability of adopting traditional methods, play a significant role. Farmers may choose to adopt traditional methods if they are cost-effective in terms of reducing disease occurrence and treatment expenses. Conversely, if modern methods are more economically feasible, farmers may prefer them over traditional approaches (Mbuthia *et al.,* 2019).
* **Community support and social networks:** Community support and social networks can influence the adoption of traditional methods. If a community collectively values and promotes traditional practices, farmers may be more inclined to adopt them due to peer pressure and social norms (Ogunlade *et al.,* 2018).

**Medicinal Plants Used In Treating Various Poultry Diseases**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/N** | **Health Problems** | **Scientific Name of Medicinal plants** | **Local names** | **Plant parts used** |
| 1 | *Eimeria tenella* | *Sophora flavescens* | Shrubby sophora | Decoction |
| 2 | *Coccidial species* | *P. nigrumand U. dioica* | Black pepper and nettle | Ethanolic extract |
| 3 | *Eimeria tenella,* | *Artemisia afra* | Mugwort | Acetoneextract |
| 4 | *Eimeria tenella, E. acervulina, E. maxima* | *Q. infectoria, R. chinenses and T.chebula* | Aleppo Oak, Chinese Rose, black/chebulic Myrobalan | Ground Powder |
| 5 | *Eimeria columbae and capillaria obsignata* | *Allium sativum and piper nigrum* | Garlic and black pepper | Garlic cloves and black pepper kernels |
| 6 | *Oocyst* | *C. swynnertonii* | Guggul | Ethanolic resinous extract |
| 7 | Red bird mites | *Thuja Plicata Donn Ex. D. Don* | Western Red Cedar | Shaving |
| 8 | Red Bird Mites | *Nicotiana rustica* | Wild tobacco | Chopped dried sterms |
| 9 | External Parasites of poultry | *Nicotiana rustica* | Wild tobacco | Chopped stem, seed pods, and leaves |
| 10 | *Filariasis* | *Azadirachta indica* | Neem | Neem oil |
| 11 | Endoparasites in poultry | Nicotiana rustica | Wild tobacco | Handful of crumbled dry leaves or decoction |
| 12 | *Ascaridia galli* | *Mentha longifolia* | Horsemint | Leaves |
| 13 | *Helminths* | *Nigella sativa* | Black cumin plant extract | Plant extract |
| 14 | Endoparasites | *Arctium lappa* | Common burdock | Whole plant |
| 15 | Coccidiosis | *Aloe barbadensis miller* | Aloe vera | Polysaccharides (maltose, glucose, sucrose) |
| 16 | Coccidial infection | *L. stoechas* | Spanish lavander | Essential oil |
| 17 | Coccidial infection | *M.oleifera* | moringa | Acetone leave extract |
| 18 | Newcastle disease | *Aloe spp.* | Aloe vera | leaves |
| 19 | Newcastle, diarrhea | *Capsium annum* | Chillies | fruits |
| 20 | Respiratory disease, parasitic | *Aromatic Ginger* | ginger | rhizome |
| 21 | Watery diarrhea | *Verinonia amygdalin del* | Astraceae | Leaves ( crushing leaves) |
| 22 | Bloody diarrhea | *Allium astavium* | Allicaceae | Bulbs(crushing it and mix with katical) |
| 23 | Ecotoparasise | *Citrus sinesi* | citrus | Fruits (squeezing and collecting the juice) |

Source: Wiseman Ndlouv *et.all*

**2.2 Empirical Framework**

**Socioeconomic Characteristics of poultry farmers**

Nancy *et al.* (2022) studied perceptions and practices of farmers of indigenous poultry towards Salmonella infections in North-Central, Nigeria. The study revealed that respondents had a poor level of perception toward Salmonella infection as the majority did not know that Salmonella affects poultry (89.3%) and that Salmonella infections are zoonotic (94.5%). This studies showed significant as perception affected their adoption of the poultry disease control practices.

Bolanle *et al.* (2020) studied perception of ethno-veterinary medicine among poultry farmers in Oyo State. The study revealed that majority (84.0%) of the respondents had low level of awareness of ethno-veterinary medicine. Lack of standardisation (2.9±0.2) ranked first among the constraint to the use of ethno-veterinary medicine. The study revealed that poultry farmers had favourable disposition (65.5%) towards ethno-veterinary medicine despite the constraints associated with its use and their low level of awareness.

**Extent of Awareness**

Udousung *et al.,* (2015) studied the awareness of traditional and orthodox method of poultry diseases control among farmers in Akwa Ibom State and Cross River State revealed that low awareness of traditional method of poultry disease control was recorded within Cross River and Akwa Ibom State with a mean score of 1.399 and 1.441 respectively. On the use of orthodox method, the overall awareness level was high in the two States with mean scores of 1.515 and 1.594. Hence, awareness was key to adoption of either traditional or orthodox method of poultry control.

Mathialagan and Senthilkumar (2012) studied the extent of awareness and adoption of diseases prevention and control among poultry Farmers. It was revealed that majority of the farmers were aware and also had adopted most of the technologies as the impact of non-adoption of technology will be tremendous which might be compelled them to adopt the technologies as 98% of the households relied on ethno veterinary interventions only, in treating poultry diseases.

Chukwuma *et al.* (2016), studied combined Orthodox and Traditional Medicine Use among Households in Orlu in Imo State, Nigeria: Prevalence and Determinants. The prevalence of traditional medicine use and orthodox-traditional medicine combination was 77.5% and 63.7% respectively. 86.3% of the respondent preferred orthodox medicine over traditional medicine based on its effectiveness. The study indicated high use of both traditional medicine and the combination of both.

Wiseman *et al.,* (2022) studied ethnoveterinary practices for indigenous Poultry Health Management by Smallholder Farmers. The study showed that majority of remedies used to treat poultry ailments were majorly traditional and plant derived.

**Prevalent Poultry Diseases**

Ermias and Yehualashet (2019) conducted a cross-sectional study from November 2018 to April 2019 in Gondar town, Ethiopia, on prevalence of coccidiosis and associated risk factors. The floatation technique was used for isolation of coccidian oocysts obtained from 384 fecal samples of chicken, and the prevalence revealed was 42.2%. The result showed 43.6% of male and 41.2% female chickens found infected with Eimeria. From the examined chickens, higher degree of infection was observed in the younger age group (51.0%) than adult chickens (36.7%). The difference was statistically significant (p < 0.05). The study showed relatively higher prevalence in poor body condition chickens (72.6%) than medium (36.1%) and good body condition (30.5%) with statistically significant difference (p < 0.05). The result also showed higher prevalence of coccidiosis in the floor system (50.4%) than in the cage system (19.0%), and the difference was statistically significant (p < 0.05). The prevalence based on the management system was 63.7%, 39.4%, and 29.3% in poor, medium, and good management, respectively. Significant difference was seen in the prevalence of poultry coccidiosis, between poorly and properly managed chickens (p < 0.05). The study also reported 46.1%, 36.7%, and 26.3% prevalence in Bovan Brown, White Leg Horn, and Rhode Red Island chicken breeds, respectively.

Olu-Igbanibo *et al.,* (2018) studied the Impact of Poultry Diseases on the Economics of Broiler Production in Obio-Akpor Local Government Area of Rivers State, Nigeria. The study revealed that the incidence of Newcastle disease (ND) was found as the highest (7.85%) in broiler, fowl typhoid (6.58%), mycoplasma (5.68%), Escherichia coli infection (5.52%), coccidiosis (4.59%), mycotoxicosis (4.56%), infectious bursal disease (IBD; 2.84%), infectious coryza (2.50%), hydro - pericardium syndrome (HPS; 1.67%) and infectious bronchitis (IB. 1.59%) respectively which was season based.

**Factors militating against the level of adoption of indigenous poultry diseases control**

Makanjuola and Adeoye (2020) studied the factors affecting the adoption of the independence method of poultry treatment among smallholder farmers in Oyo State, Nigeria. The results showed that 72% of the farmers had heard about the independence method, but only 37% had adopted it. The factors that significantly influenced adoption were; education level (48%), access to information, income, social capital, and perceived benefits and costs. Specifically, farmers with higher levels of education, better access to information, higher income, and stronger social capital were more likely to adopt the independence method. Also, those who perceived higher benefits and lower costs of using the method were more likely to adopt it. The study's findings have several implications for smallholder poultry farmers, policymakers, and extension agents. The study recommended that Farmers should be encouraged to improve their education, networks, and access to information to enhance their knowledge and awareness of the benefits of the independence method. Policymakers should support programs that promote sustainable agriculture and encourage farmers to adopt eco-friendly practices like the independence method. Extension agents should design and implement effective communication and training programs that cater to the diverse needs and preferences of farmers.

**2.3 Theoretical Framework**

This study is based on the Diffusion of Innovation Theory (DOI), technology adoption model and random utility theory.

* Diffusion innovation theory by Everest Rogers, who defined diffusion as the process by which an idea is communicated through certain channels over time among members of a social system (Rogers, 1995). The theory, however, predicts that an innovation will initially be adopted by a small group of innovative farmers and later diffuse to other farmers within the social system (Stephenson, 2003). The theory suggests that the adoption of any new technology or innovation depends on the characteristics of the innovation, the adopter, and the communication channels through which the information about the innovation is disseminated.

According to this theory, adoption of new ideas or practices follows five stages: awareness, interest, evaluation, trial, and adoption.

1. **Awareness:** At the awareness stage, individuals become aware of the new idea or practice, such as indigenous methods of poultry treatment, through various channels such as word of mouth, media, or education. Awareness can vary by region, community, or individual.

2. **Interest:** At this stage, individuals become interested in the new idea or practice and seek more information, often through communication with early adopters or opinion leaders. Individuals with a higher level of education and access to information may be more likely to show interest.

3. **Evaluation:** At the evaluation stage, individuals assess the new idea or practice against their existing knowledge, values, and beliefs. They may consider the potential benefits, risks, and costs of adoption. Socioeconomic status and cultural norms may influence the priority given to poultry treatment.

4. **Trial:** At the trial stage, individuals try the new idea or practice on a limited basis to test the effectiveness and feasibility. They may seek advice from peers or experts and experiment with different approaches. Resource constraints and availability may limit the ability to try the indigenous methods.

5. **Adoption:** At the adoption stage, individuals fully adopt the new idea or practice and integrate it into their daily lives. Adoption may be influenced by perceived benefits, social norms, and availability of resources such as time, money, and materials.

* Technology Adoption Model, according to technology adoption model (TAM), the level of adoption of a technology is influenced by two main factors: perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness refers to the extent to which the technology is seen as beneficial to the user, while perceived ease of use refers to the degree to which the technology is perceived as easy to use.

Perceived usefulness: This is influenced by several factors, including the perceived effectiveness of the technology, compatibility with existing knowledge and practices, and social norms (Rogers, 2003). The perceived effectiveness of indigenous methods of poultry diseases treatment refers to the extent to which the method is seen as effective in treating poultry diseases. One study found that farmers who perceived traditional medicine to be effective were more likely to adopt it (Sabiiti *et al*., 2015).

Compatibility with existing knowledge and practices refers to the degree to which the method aligns with the farmer's existing knowledge and practices. For example, if a farmer has a strong belief in traditional medicine, they may be more likely to adopt indigenous methods of poultry diseases treatment. Social norms refer to the beliefs and attitudes of the farmer's social network towards the use of traditional medicine. A farmer who is surrounded by peers who use traditional medicine may be more likely to adopt it themselves (Gebresenbet *et al.,* 2017).

Perceived Ease of Use: This is influenced by several factors, including complexity, trialability, and observability (Davis, 1989). Complexity refers to the perceived difficulty of using the technology, while trialability refers to the degree to which the technology can be tested before adoption. Observability refers to the extent to which the benefits of using the technology can be observed.

According to technology adoption model theory, the adoption of indigenous methods of poultry diseases treatment is influenced by perceived usefulness and perceived ease of use. Perceived usefulness is influenced by the perceived effectiveness of the technology, compatibility with existing knowledge and practices, and social norms. Perceived ease of use is influenced by complexity, trialability, and observability. In Indigenous methods of poultry diseases treatment, complexity may refer to the perceived difficulty in preparing and using traditional medicine. Farmers who find the process of preparing indigenous methods of poultry treatment too complex may be less likely to adopt it.

Trialability refers to the extent to which the benefits of indigenous methods of poultry diseases treatment can be tested before adoption. Farmers who are able to test indigenous methods of poultry diseases treatment before adopting it may be more likely to adopt it.

Observability refers to the extent to which the benefits of using indigenous methods of poultry treatment can be observed. Farmers who can observe the benefits of indigenous methods of poultry treatment in others may be more likely to adopt it (Gebresenbet *et al.,* 2017). Understanding these factors can help policymakers and researchers develop strategies to promote the adoption of indigenous methods of poultry diseases treatment.

* The random utility theory is a model of choice also referred to the random utility maximization (RUM) model. This theory has verified to be useful for gauging access value and the impact of change. It has the possibility to easily handle many sites and substitution at simultaneously (McFadden, 1973). The theory suggests that farmer’s choices are influenced by random factors and that utility of choice is encompasses deterministic and mistakes part. This means it’s not possible to envisage farmers’ choices with confidence but can express probability that the adoption of an option is greater than alternatives. If U stand for utility that a person represented as i earn from good consumption, j evident deterministic component, V utility function and E random component.

Utility theory is specified as follows:

Uij = VtJ + Eij

Utility is described as U a dependent of choices taken relies upon on alternatives made from j CSA options is presumed to have a utility function as follows;

Ull = V(Xj,Zi)

McFadden, (1973) further explains that a farmer’s judgment to implement certain CSA practices is mainly based on the handiness and advantage of using that specific practice. If a choice is not convenient for a farmer, then they are unlikely to adopt it. In the case of this study, socio-economic characteristics and awareness are some of the factors that determine the handiness of a specific strategy to a farmer.

**2.4 Gap of literature Review**

In this empirical analysis, several scholar's works have given consistent results of inverse relationship on results of studied autonomous variables in regard to indigenous methods on reliant variable which is poultry diseases; others have also shown positive relationship on same phenomenon. The impact of socio-economic factors on the use of these methods for poultry disease control has been established by quite several studies. However, many studies exist on how socio-economic aspects influence farmers’ adoption of indigenous methods of poultry disease control. Awareness also has significant impact on the adoption and effectiveness of indigenous methods with regard to poultry disease control. Poultry farmers are more vulnerable to the impacts of poultry diseases and it's impact on economics of the farmers has been evaluated. Empirically, the level of utilization of these methods has been evaluated in different regions and areas of the Nation and there is needed to evaluate the use of indigenous methods of the control of poultry diseases in Eket Agricultural Zone, Akwa Ibom State, Nigeria. In terms of awareness, level of utilization and its adoption by small scale poultry farmers, their gender and it effect on their farm's economics and productivity. Hence, the objectives of this study.

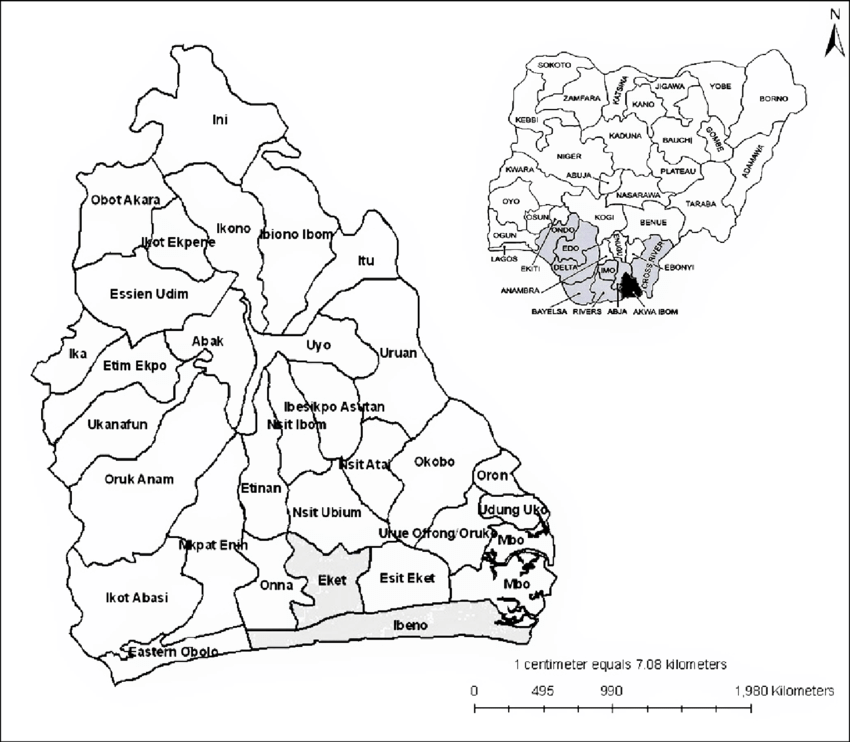
**CHAPTER THREE**

**METHODOLOGY**

**3.1 Study Area**

The study was conducted in Eket agricultural zone of AkwaIbom State, Nigeria. The main economic activities of the people are farming, trading, fishing from riverine and coastal dwellers and white-collar services. AkwaIbom State is made up of 31 local government areas (LGAs) with six (6) agricultural zones namely: Uyo, Oron, Ikot Ekpene, Eket, Abak and Etinan. Eket Agricultural Zone consists of five (5) Local Government Area, which are: Eket, Esit Eket, Onna, Ikot Abasi, Mkpat Enin, Ibeno and Eastern Obolo. Eket as the headquarter of the zone is located at latitude 4039’N and longitude 7056’E with a population of over 250,000 in 2019 but updated using 2.50% annual growth rate. The annual rainfall ranges between 2000mm and 3000mm with a temperature between 27 and 28 degrees Celsius. Some of the common food crop cultivates in the area are maize, cassava, cocoyam, okra, plantain, banana, waterleaf, fluted pumpkin, white yam and melon. In addition, some micro-livestock are usually raised at backyard of most homesteads and others fishermen in the riverine areas.

**3.2 Map of Study Area**

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* **Eket Agricultural Zone**

**Fig 3.1**: Map of Nigeria Showing AkwaIbom State and AkwaIbom State Map Showing Eket Agricultural Zone

**Source:** [www.researchgate.com](http://www.researchgate.com)

**3.3 Sample Size and Sampling Technique**

Multi-stage random sampling techniques well be use in selecting the respondents for this study. Firstly, 3 blocks was randomly selected in Eket agricultural zone and will use as sampling frame. Secondly, four (4) villages was randomly selected in each block, and this would give a total of 12 villages. Lastly, in each of the 12 villages, 10 farm household was randomly selected to give a total number of respondents (poultry farmers) 120 which was use for the study.

**3.4 Sources and Types of Data**

Primary data was obtained through the use of a well-structured questionnaire for the selected poultry farmers. The questionnaire was adequately structured to suit the objectives and was administered to the intended respondents to ensure consistency and accuracy of data that was collected. Information that was collected include Socio-economic characteristics of the respondents such as age, gender, level of education, household size. Also indigenous methods of poultry diseases treatment available for them, prevalent poultry disease, types indigenous methods of poultry diseases treatment adopted by the farmers and information on factors that affect their adoption level.

**3.5 Method of Data Collection**

Primary data was obtained through the field survey by using a well-structured questionnaire which was administered to each of the selected poultry farmers to meet the objectives of the study. This was complimented with personal interview schedules to those who cannot read and write. The poultry farmer was visited either in their farm or home by the researcher.

* 1. **Analytical Techniques**

Descriptive statistics such as (mean, frequency and table) and the *logit* model was used for this study. Descriptive statistics was used to address objectives 1, 3 and 4 while the *logit* model was use to address objective 2 and 5. The logit regression model is a unit or multivariate technique which allows for estimating the probability that an event occur or not by predicting a binary dependent outcome from a set of independent variables. This was used to determine the factors militating against the level of adoption of indigenous methods of poultry diseases treatment and to assess the level of awareness of farmers on the adoption of indigenous methods of poultry diseases treatment in the study area.

Logit model ensures production of probability of choice within (0,1) range. This is an advantage over linear probability model and it is easier and more convenient to compute than probit model. The logit model is based on cumulative logistic probability function and it is computationally tractable. According to Gujurati and Porter (2009), it is expressed as:

Pi = E(Y=1/X1) = β + β2X2 + β 3X3 ………………………………………….(1)

For ease of estimation, equation (1) was further expressed as:

Pi 1 = e2

1 + e 1+ e2 ……………………………………………….(2)

Where Pi = Probability of an event occurring

Zi = β1 + β2X2

The empirical model of the logistic regression for this study assumed that the probability of the farmers’s to adopt indigenous methods of poultry diseases treatment expressed as;

Pi = e (βo + β1X1 + β2X2 + β3X3 + β4X4 + … β10X10)

1 + e (βo + β1X1 + β2X2 + β3X3 + β4X4 + … β10X10) …………………………..(3)

Pi range between zero and one and it is nonlinear related to Zi.Zj is the stimulus index which range from minus infinity to plus infinity and it is expressed as:

Zi = In (Pi)

1 – Pi = βo + β1X1 + β2X2 + β3X3 + β4X4 + … β10X10

Where Pi = Probability of poultry farmers adopting indigenous methods of poultry diseases treatment.

1-P1 = Probability of not adopting indigenous methods of poultry diseases treatment.

B0 = intercept.

B1 (1, 2, 3…10) = regression coefficients

X1 (1, 2, 3…10) = independent variables

e = error term

The independent variables specified as factors affecting the level of adoption of indigenous methods of poultry diseases treatment and are defined thus:

X1 = Age (years)

X2 = Gender

X3 = Marital status

X4 = Level of Education (Years)

X5 =Household size (Number)

X6 = Farming experience (Years)

X7 = Cooperative membership (Number)

X8 = Monthly income

X9 = Flock size (number)

X10 =Level of awareness on the methods

**CHAPTER FOUR**

**RESULTS AND DISCUSSION**

**4.1 Socioeconomic Characteristics of the Respondents**

This chapter presents the results of the findings from the field data. It also presents the analysis of the data and discussion of the results.

**Gender**

Gender distribution based on gender as shown in Table 4.1 revealed that greater proportion (52.5%) of the sampled respondents in the study area were female and male respondents (47.5%). This implies that female dominated poultry production activities in the study area just as reported by Bolanle *et al.,* (2020).

**Age**

Age distribution of respondents is presented in Table 4.1; the result showed that the mean age and majority of the sampled respondents were above the age of 40 years (41.7%). These results imply that those involved in farming in the study area are in the prime age of strength and vigour that is required to perform many of the farm operations. This has a positive implication for poultry production in the area, because the farmers are still energetic, rational decision makers and can effectively withstand the rigors, strain and stress involved in poultry production. The result agrees with the findings of Nancy *et al.,* (2022) that the younger the farmer is, the higher the zeal into more lucrative income generating activities.

**Marital Status**

Distribution of respondents according to marital status presented in Table 4.1 showed that majority (62.5%) of the sampled respondents were married. This means that poultry production farming in the area is majorly practiced by married people. The result implies that most of the farmers would derive their labour from household members. Farmers who are married would tend to have access to family labour supply, this would reduce the cost of hiring labour for some production activities, thereby increasing farm net returns. This result is in agreement with Bolanle *et al.,* (2020) and Udousung *et al.,* (2015).

**Education**

The result presented in Table 4.1 shows that the majority of the respondents had secondary education (43.3%) in the study area which implies that most of the respondents are literate enough to adopt indigenous method of controlling prevalent disease control brought to them by extension agents to increase output and revenue. Udousung *et al.,* (2015) affirmed that education could positively influence farmers' efficiency level. It is expected that a higher level of education will contribute significantly to decision making of a farmer and the ability to adopt new technology.

**Farming Experience**

Distribution of respondents according to their production experience as presented in Table 4.1 revealed that on the average, the respondents spent about 6 years in production and majority has been in poultry production for about 5-10 years (60.8%). The findings correspond with those of Nancy *et al.,* (2022) as they noted that the number of years of farming experience of a farmer may give an indication of the practical knowledge acquired on how to overcome certain inherent production problems and could impact positively on the use of disease control techniques.

**Monthly Income**

Distribution of respondents according to monthly income is presented in Table 4.1; the result showed that the majority of the sampled respondents monthly income was ₦31,000 – ₦50,000 (41.7%). This implies that the farmers were earning above minimum wage (₦30,000) which could be due to their level of experience and knowledge on poultry production. Another implication would be that their monthly income may be inadequate to afford some basic farm inputs required for optimum production. As a result of this, poultry producers in the study area would tend to operate on a small scale of production.

**Membership of Cooperative**

Distribution of respondents based on membership of cooperative presented in Table 4.1 revealed that majority (64.2%) were not members of farmer’s association. The result simply explains that greater proportion of the respondents were not aware of the benefits of joining farm cooperatives in the study area. Membership of cooperatives provides basic production information required by farmers for better performances. Since majority of the poultry producers were not member of cooperatives, they did not share knowledge and experience with other farmers to improve production.

**Flock Size**

Distribution of respondents based on flock size presented in Table 4.1 revealed that majority (98.3%) of the respondents in the study area had above 100 flock size. The mean flock size was 120 birds indicating that the poultry producers were into small scale production. These results indicated that the respondents were small scale producers as usually characterized with majority of the poultry keepers in Nigeria and these findings is in-line with Mekoya *et al.,* (2018).

**Labor Type**

Distribution of respondents according to labor employed is presented in Table 4.1. Majority (79.2%) of the respondents employed family and hired labor. This implies that since majority of the respondent are married, they tend to employ more family labour and hire labor in much tedious activity. This finding supports the result of Udousung *et al.*, (2015).

**Access to Extension Services**

Distribution of respondents based on access to extension services presented in Table 4.1 revealed that majority (55%) had no access to extension services in the study area. Poultry producers by virtue of having access to extension services, have access to new innovations to improve production, acquire needed skills for disease control as well as gaining relevant marketing information.

**Table 4.1 Distribution of Respondents Based on their Socio-economic Characteristics**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Frequency**  **(n=120)** | **Percentage (%)** |
| **Sex** |  |  |
| Male | 57 | 47.5 |
| Female | 63 | 52.5 |
| **Total** | 120 | 100.0 |
| **Age** | **(Mean = 49.12 years)** |  |
| 18-28 | 0 | 0.00 |
| 29-39 | 31 | 25.8 |
| 40-50 | 50 | 41.7 |
| Above 51 | 39 | 32.5 |
| **Total** | 120 | 100.0 |
| **Marital Status** |  |  |
| Single | 16 | 13.3 |
| Married | 75 | 62.5 |
| Widowed | 18 | 15.0 |
| Widower | 11 | 9.2 |
| Divorced | 0 | 0.00 |
| **Total** | 120 | 100.0 |
| **Education** |  |  |
| No formal education | 8 | 6.7 |
| Primary | 21 | 17.5 |
| Secondary | 52 | 43.3 |
| Tertiary | 39 | 32.5 |
| **Total** | 120 | 100.0 |
| **Farming Experience** | **Mean = 6** |  |
| Below 5 years | 17 | 14.2 |
| 5-10 years | 73 | 60.8 |
| Above 10 years | 30 | 25.0 |
| **Total** | 120 | 100.0 |
| **Monthly Income from Business** |  |  |
| ₦11,000-₦30,000 | 12 | 10.0 |
| ₦31,000- ₦50,000 | 50 | 41.7 |
| ₦50,000- ₦70,000 | 37 | 30.8 |
| Above ₦80,000 | 21 | 17.5 |
| **Total** | 120 | 100.0 |
| **Membership of Cooperative** |  |  |
| Yes | 77 | 64.2 |
| No | 43 | 35.8 |
| **Total** | 120 | 100.0 |
| **Flock Size** | **Mean = 120** |  |
| Below 50 | 0 | 0.00 |
| 50-100 | 2 | 1.7 |
| Above 100 | 118 | 98.3 |
| **Total** | 120 | 100.0 |
| **Type of Labor** |  |  |
| Family | 23 | 19.2 |
| Hired Labor | 2 | 1.7 |
| Family and Hired | 95 | 79.2 |
| Sheared Labour | 0 | 0.00 |
| **Total** | 120 | 100.0 |
| **Extension Agent visit** |  |  |
| None | 66 | 55.0 |
| Occasionally | 39 | 32.5 |
| Frequently | 2 | 1.7 |
| Most frequently | 13 | 10.8 |
| **Total** | 120 | 100.0 |

**Source:** Field Survey Data, 2023.

**4.2 Prevalent Diseases in the study area**

Table 4.2 shows prevalent poultry disease in Eket Agricultural zone. The findings revealed that coccidiosis (90.8%), Newcastle disease (90.8%), fowl cholera (77.5%), fowl pox (75.8%) and chronic respiratory disease (64.2%) were highly prevalence in the study area. Additionally, Gumboro disease (47.5%) was also prevalence in the study area. The prevalence of these diseases could be due to the favorable climatic condition in the study area. This results are in-line with Ermias and Yehualashet (2019) and Olu-Igbanibo *et al.,* (2018) who posited that these diseases are prevalence in the tropics due to high humidity among other favorable climatic conditions.

**Table 4.2: Prevalent Diseases Distribution in the study area**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Poultry Diseases** | | **Yes** | **No** | **Not at all** | **Means** | **Remark** |
| Coccidiosis | 109(90.8%) | | 0(0.00%) | 11(9.2%) | 2.82 | **Highly Prevalence** |
| Newcastle Disease | 109(90.8%) | | 0(0.00%) | 11(9.2%) | 2.82 | **Highly Prevalence** |
| Gumboro | 57(47.5%) | | 52(43.3%) | 11(9.2%) | 2.38 | **Prevalence** |
| Fowl Cholera | 93(77.5%) | | 17(14.2%) | 10(8.3%) | 2.69 | **Highly Prevalence** |
| Chronic Respiratory Disease | 77(64.2%) | | 30(25%) | 13(10.8%) | 2.53 | **Highly Prevalence** |
| Fowl Pox | 91(75.8%) | | 23(19.2%) | 6.0(5.0%) | 2.71 | **Highly Prevalence** |

**Source:** Field Survey Data, 2023.

**4.3 Level of Awareness of Indigenous methods of poultry Diseases Control in the study area**

Table 4.3 shows the level of awareness of indigenous methods of poultry diseases control in the study area.

**Coccidiosis**

From Table 4.3, majority of the respondents were highly aware of the use of Garlic and Ginger (90%), moderately aware of the use of bitterleaf (78.3%) and not aware of the use of Mahogamy (85%) and African Locust bean (60%) for the control of coccidiosis disease in the study area. This implies that poultry producers in the study area are mostly aware of the use of Garlic, ginger and bitterleaf for the control of coccidiosis and these findings is in-line with Udousung *et al.,* (2015) who reported high level of awareness in the use of indigenous methods to control this disease.

**Newcastle Disease**

From Table 4.3, majority of the respondents were highly aware of the use of scentleaf (84.2%) and mixture of red and yellow capsule (67.5%) for the control of Newcastle disease. Additionally, (59.2%) were moderately aware of the use of red pepper and (53.3%) were not aware of the use of aloe vera for the control of Newcastle disease in the study area. This implies that poultry producers in the study area are mostly aware of the use of scentleaf, mixture of red and yellow capsule and red pepper for the control of Newcastle disease and these findings are not in-line with Bolanle *et al.,* (2020) and Nancy *et al.,* (2022) who reported low level of awareness among farmers.

**Fowl Cholera**

From Table 4.3, majority of the respondents were highly aware of the use of bitterleaf (100%) and onion (61.7%) for the control of Fowl Cholera. Additionally, (77.5%) were not aware of the use of coconut for the control of Fowl Cholera in the study area. This implies that poultry producers in the study area are mostly aware of the use of bitterleaf, and onion for the control of Fowl Cholera and these findings are not in-line with Bolanle *et al.,* (2020) and Nancy *et al.,* (2022) but it is in-line with Methialagan and Senthilkumar, (2012).

**Chronic Respiratory Disease**

From the results of Table 4.3, majority of the respondents were highly aware of the use of scentleaf (81.7%), mixture of garlic and ginger (65.8%) and onion (57.5%) for the control of chronic respiratory disease. Additionally, (60.8%) were not aware of the use of citrus juice for the control of the disease in the study area. This implies that poultry producers in the study area are mostly aware of the use of scentleaf, garlic and ginger mix and onion for the control of chronic respiratory disease and these findings is in-line with Methialagan and Senthilkumar, (2012).

**Fowl Pox Disease**

From the results of Table 4.3, majority of the respondents were highly aware of the rubbing of palm oil (51.7%) for the control of fowl pox disease. Additionally, (69.2%) and (52.5%) were moderately aware of rubbing of the affected part with salt and rubbing palm kernel oil respectively for the control of the disease respectively. Furthermore, (56.7%), (50%) and (44.2%) were not aware of the rubbing of blended bitterleaf, blended turmeric and massaging of the affected area with hot sand respectively for the control of the disease in the study area. This implies that poultry producers in the study area are mostly aware of the rubbing of the affected part with palm oil, salt and palm kernel oil for the control of fowl pox disease in the study area and these findings is in-line with Udousung *et al*., (2015) and Methialagan and Senthilkumar, (2012).

**Fowl Tyhoid**

From the results of Table 4.3, majority of the respondents were highly aware of the use of scent leaf (70%) for the control of fowl typhoid. Additionally, (87.5%), (55%) and (69.2%) were not aware of the use of aloe vera, ash and pepper and the use of dry garri and red pepper respectively for the control of fowl typhoid in the study area. This implies that poultry producers in the study area are mostly aware of the use of scent leaf for the control of Fowl typhoid these findings are in-line findings is in-line with Udousung *et al*., (2015) and Methialagan and Senthilkumar, (2012) but not in-line with Bolanle *et al.,* (2020).

**Table 4.3: Level of Awareness of Indigenous methods of poultry Diseases Control in the study area**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disease Prevalence** | **Indigenous methods** | **Highly aware** | **Moderately aware** | **Not aware** | **Means** | **Remarks** |
| Coccidiosis | Mahogamy | 0(0.00%) | 18(15%) | 102(85%) | 1.15 | **Not Aware** |
| Bitterleaf | 26(21.7%) | 94(78.3%) | 0(0.00%) | 2.22 | **Moderately Aware** |
| African Locust Bean | 16(13.3%) | 32(26.7%) | 72(60%) | 1.53 | **Not Aware** |
| Garlic and Ginger | 108(90%) | 12(10%) | 0(0.00%) | 2.90 | **Highly Aware** |
| Newcastle Disease | Scentleaf | 101(84.2%) | 11(9.2%) | 8(6.7%) | 2.78 | **Highly Aware** |
| Red pepper | 36(30%) | 71(59.2%) | 13(10.8%) | 2.19 | **Moderately Aware** |
| Aloe vera | 12(10%) | 44(36.7%) | 64(53.3%) | 1.57 | **Not Aware** |
| Mixture of Red and yellow Capsule | 81(67.5%) | 23(19.2%) | 16(13.3%) | 2.54 | **Highly Aware** |
| Fowl Cholera | Bitterleaf | 102(85%) | 18(15%) | 0(0.00%) | 2.85 | **Highly Aware** |
| Coconut water | 2(1.7%) | 25(20.8%) | 93(77.5%) | 1.24 | **Not Aware** |
| Onion | 74(61.7%) | 17(14.2%) | 29(24.2%) | 2.38 | **Highly Aware** |
| Chronic Respiratory Disease | Garlic and ginger mix | 79(65.8%) | 41(34.2%) | 0(0.00%) | 2.66 | **Highly Aware** |
| Onion | 69(57.5%) | 36(30%) | 15(12.5%) | 2.50 | **Highly Aware** |
| Citrus Juice | 11(9.2%) | 36(30%) | 73(60.8%) | 1.48 | **Not Aware** |
| Scent leaf | 98(81.7%) | 22(18.3%) | 0(0.00%) | 2.82 | **Highly Aware** |
| Fowl pox | Rubbing of palm oil | 62(51.7%) | 42(35%) | 16(13.3%) | 2.38 | **Highly Aware** |
| Rubbing of palm kernal oil | 57(47.5%) | 63(52.5%) | 0(0.00%) | 2.48 | **Moderately Aware** |
| Rubbing of blended bitterleaf | 29(24.2%) | 23(19.2%) | 68(56.7%) | 1.68 | **Not Aware** |
| Massaging of the affected area with hot sand | 31(25.8%) | 36(30%) | 53(44.2%) | 1.82 | **Not Aware** |
| Scraping and rubbing of salt on the affected part | 10(8.3%) | 27(22.5%) | 83(69.2%) | 1.86 | **Not Aware** |
| Rubbing of the affected area with blended turmeric | 8(6.7%) | 52(43.3%) | 60(50%) | 1.57 | **Not Aware** |
| Fowl Typhoid | Aloe vera | 0(0.00%) | 15(12.5%) | 105(87.5%) | 1.13 | **Not Aware** |
| Ash and pepper | 0(0.00%) | 54(45%) | 66(55%) | 1.45 | **Not Aware** |
| Scentleaf | 84(70%) | 36(30%) | 0(0.00%) | 2.70 | **Highly Aware** |
| Dry garri and red pepper | 0(0.00%) | 37(30.8%) | 83(69.2%) | 1.31 | **Not Aware** |

**Source:** Field Survey Data, 2023.

**4.4 Level of utilization of Indigenous Methods of poultry Diseases control**

Table 4.4 shows the level of utilization of indigenous methods of poultry diseases control in the study area.

**Coccidiosis**

From Table 4.4, majority of the respondents always utilize Garlic and Ginger (50.8%), mostly utilize Bitterleaf (36.7%), occasionally utilize African locust bean (48.3%) and never utilize Mahogamy (100%) for the control of coccidiosis disease in the study area. This implies that poultry producers in the study area are always utilize Garlic and ginger for the control of coccidiosis and these findings are not in-line with Bolanle *et al.,* (2020).

**Newcastle Disease**

From Table 4.4, majority of the respondents always utilize scentleaf (62.5%), and never utilize aloe vera (56.7%) for the control of Newcastle disease in the study area. This implies that poultry producers in the study area are always utilize scentleaf for the control of Newcastle Disease and these findings are in-line with Makanjuola and Adeoye, (2020).

**Fowl Cholera Disease**

From Table 4.4, majority of the respondents always utilize bitterleaf (55%), and never utilize coconut water (49.2%) for the control of fowl cholera disease in the study area. This implies that poultry producers in the study area are always utilize bitterleaf for the control of fowl cholera these findings are in-line with Makanjuola and Adeoye, (2020).

**Chronic Respiratory Disease**

From the results Table 4.4, majority of the respondents always utilize the mixture of garlic and ginger (65.8%) and scent leaf (55%) in the control of chronic respiratory disease. The respondents in the study area, never utilize citrus juice (55%) for the control of chronic Respiratory Disease in the study area. This implies that poultry producers in the study area are always utilize ginger and garlic mixture and scent leaf for the control of Chronic Respiratory Disease and these findings are not in-line with Bolanle *et al*., (2020).

**Fowl Pox Disease**

From the results Table 4.4, majority of the respondents always utilize the palm oil (70.8%), palm kernel oil (51.7%) and bitter leaf (33.3%) for the control of fowl pox disease. The respondents in the study area, never utilize hot sand (67.5%), salt (39.2%) and blended turmeric (53.3%) for the control of fowl pox Disease in the study area. This implies that poultry producers in the study area are always utilize the rubbing of palm oil, palm kernel and blended bitterleaf for the control of fowl pox and these findings are not in-line with Bolanle *et al*., (2020).

**Fowl Typhoid**

From the results of Table 4.3, majority of the respondents always utilize scent leaf (42.5%) for the control of fowl typhoid. Additionally, (50%), (48.3%) and (91.7%) were not aware of the use of aloe vera, ash and pepper and the use of dry garri and red pepper respectively for the control of fowl typhoid in the study area. This implies that poultry producers in the study area are mostly aware of the use of scent leaf for the control of Fowl typhoid and these findings are in-line with Makanjuola and Adeoye, (2020).

**Table 4.4: Level of utilization of Indigenous Methods of poultry Diseases control in the study Area**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Disease Prevalence** | **Indigenous methods** | **Always Utilize** | **Mostly Utilized** | **Occasionally Utilized** | **Not Utilized** | **Means** | **Remarks** |
| Coccidiosis | Mahogamy | 0(0.00%) | 0(0.00%) | 0(0.00%) | 120(100%) | 1.00 | **Not Utilized** |
| Bitterleaf | 22(18.3%) | 44(36.7%) | 44(36.7%) | 10(8.3%) | 2.65 | **Mostly**  **Utilized** |
| African Locust Bean | 0(0.00%) | 13(10.8%) | 58(48.3%) | 49(40.8%) | 1.70 | **Occasionally Utilized** |
| Garlic and Ginger | 61(50.8%) | 39(32.5%) | 20(16.7%) | 0(0.00%) | 3.34 | **Always**  **Utilized** |
| Newcastle Disease | Scentleaf | 75(62.5%) | 35(29.2%) | 10(8.3%) | 0(0.00%) | 3.54 | **Always**  **Utilized** |
| Red pepper | 20(16.78%) | 29(24.2%) | 39(32.5%) | 32(26.7%) | 2.31 | **Occasionally Utilized** |
| Aloe vera | 10(8.3%) | 19(15.8%) | 23(19.2%) | 68(56.7%) | 1.76 | **Not Utilized** |
| Fowl Cholera | Bitterleaf | 66(55%) | 16(13.3%) | 14(11.7%) | 24(20%) | 3.03 | **Always Utilized** |
| Coconut water | 11(9.2%) | 18(15%) | 32(26.7%) | 59(49.2%) | 1.84 | **Not Utilized** |
| Onion | 50(41.7%) | 33(27.5%) | 13(10.8%) | 24(20%) | 2.91 | **Always Utilized** |
| Chronic Respiratory Disease | Garlic and ginger mix | 79(65.8%) | 27(22.5%) | 11(9.2%) | 3(2.5%) | 3.52 | **Always Utilized** |
| Onion | 35(29.2%) | 26(21.7%) | 38(31.7%) | 21(17.5%) | 2.63 | **Occasionally Utilized** |
| Citrus Juice | 23(19.2%) | 3(2.5%) | 28(23.3%) | 66(55%) | 1.86 | **Not Utilized** |
| Scent leaf | 66(55%) | 37(30.8%) | 4(3.3%) | 13(10.8%) | 3.30 | **Always Utilized** |
| Fowl pox | Rubbing of palm oil | 85(70.8%) | 18(15%) | 10(8.3%) | 7(5.8%) | 3.51 | **Always Utilized** |
| Rubbing of palm kernal oil | 62(51.7%) | 55(45.8%) | 3(2.5%) | 0(0.00%) | 3.49 | **Always Utilized** |
| Rubbing of blended bitterleaf | 40(33.3%) | 38(31.7%) | 27(22.5%) | 15(12.5%) | 2.86 | **Always Utilized** |
| Massaging of the affected area with hot sand | 0(0.00%) | 10(8.3%) | 29(24.2) | 81(67.5%) | 1.41 | **Not**  **Utilized** |
| Scraping and rubbing of salt on the affected part | 47(39.2%) | 11(9.2%) | 44(36.7) | 18(15%) | 2.89 | **Always Utilized** |
| Rubbing of the affected area with blended turmeric | 0(0.00%) | 20(16.7%) | 36(30%) | 64(53.3%) | 1.63 | **Not**  **Utilized** |
| Fowl Typhoid | Aloe vera | 0(0.00%) | 16(13.3%) | 44(36.7%) | 60(50%) | 1.63 | **Not**  **Utilized** |
| Ash and pepper | 0(0.00%) | 30(25%) | 32(26.7%) | 58(48.3%) | 1.77 | **Not**  **Utilized** |
| Scentleaf | 51(42.5%) | 47(39.2%) | 22(18.3%) | 0(0.00%) | 3.24 | **Always Utilized** |
| Dry garri and red pepper | 0(0.00%) | 0(0.00%) | 10(8.3%) | 110(91.7%) | 1.08 | **Not Utilized** |

**Source:** Field Survey Data, 2023.

**4.5 Factors influencing the use of indigenous methods of poultry diseases control**

Table 4.5 shows the factors affecting the use of indigenous methods of poultry diseases control in Eket Agricultural zone. From the results as shown in Table 4.5, majority of the respondents strongly agreed that; lack of information (71.7%), improper dosage (67.5%), inadequate knowledge of usage (57.5%), no documentation about their use (73.3%), lack of preservation of herbal concoction (60.8%), lack of improper diagnosis (77.5%), complexity in herbal concoction preparation (79.2%), lack of standardization (72.5%) and side effects (79.2%) from the use of these methods are the major factors influencing the use of indigenous control methods of poultry diseases in the study area. Respondents also agreed that lack of storage facilities (54.2%), wrong belief (58.3%), inconsistent usage (66.7%), plants seasonality (58.3%) are also factors influencing the use of indigenous control methods of poultry diseases in the study area. These findings are in-line with the reports of Abdela, (2020), Mekoya *et al.,* (2018), Lesosky *et al.,* (2016) and Makanjuola and Adeoye, (2020).

**Table 4.5: Factors influencing the use of indigenous methods of poultry diseases control in the study area**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Factors influencing the use of indigenous methods** | **Strongly Agreed** | **Agreed** | **Disagreed** | **Strongly Disagreed** | **Means** | **Remarks** |
| Insufficient plant materials | 18(15%) | 68(56.7%) | 29(24.2%) | 5(4.2%) | 2.83 | Agreed |
| Lack of information | 86(71.7%) | 31(25.8%) | 3(2.5%) | 0(0.00%) | 3.69 | Strongly Agreed |
| Improper dosage | 81(67.5%) | 39(32.5%) | 0(0.00%) | 0(0.00%) | 3.68 | Strongly Agreed |
| Inadequate Knowledge of usage | 69(57.5%) | 47(39.2%) | 4(3.3%) | 0(0.00%) | 3.54 | Strongly Agreed |
| No documentation | 88(73.3%) | 32(26.7%) | 0(0.00%) | 0(0.00%) | 3.72 | Strongly Agreed |
| Lack of storage facilities | 55(45.8%) | 65(54.2%) | 0(0.00%) | 0(0.00%) | 3.46 | Agreed |
| Wrong belief | 50(41.7%) | 70(58.3%) | 0(0.00%) | 0(0.00%) | 3.42 | Agreed |
| Inconsistent usage | 30(25%) | 80(66.7%) | 10(8.3%) | 0(0.00%) | 3.17 | Agreed |
| Plants seasonality | 29(24.2%) | 70(58.3%) | 21(17.5%) | 0(0.00%) | 3.07 | Agreed |
| Lack of preservation of herbal concoction | 73(60.8%) | 41(34.2%) | 6(5%) | 0(0.00%) | 3.56 | Strongly Agreed |
| Lack of proper diagnosis | 93(77.5%) | 24(20%) | 3(2.5%) | 0(0.00%) | 3.75 | Strongly Agreed |
| Complexity in herbal concoction preparation | 95(79.2%) | 23(19.2%) | 2(1.7%) | 0(0.00%) | 3.78 | Strongly Agreed |
| Lack of standardization | 87(72.5%) | 33(27.5%) | 0(0.00%) | 0(0.00%) | 3.73 | Strongly Agreed |
| Side effects | 95(79.2%) | 22(18.3%) | 3(2.5%) | 0(0.00%) | 3.77 | Strongly Agreed |

**Source:** Field Survey Data, 2023.

**CHAPTER FIVE**

**SUMMARY, CONCLUSION AND RECOMMENDATION**

* 1. **SUMMARY**

The study was to determine the evaluation of indigenous methods of diseases control among poultry Farmers in Eket agricultural zone. The Specific objectives of this study were to: identify the socioeconomic characteristics of poultry Farmers, identify the prevalent poultry diseases, assess the level of awareness of indigenous methods of poultry diseases control, assess the level of utilization of indigenous methods of poultry diseases control among poultry farmers, determine factors militating against adoption of indigenous methods of poultry diseases control in the study area.

The result of socioeconomic characteristics showed that greater proportion (52.5%) of the sampled respondents in the study area were female. The mean age, flock size and farming experience of the sampled respondents were 49.12 years, 120 and 6 years, respectively.

The result of prevalent poultry disease in Eket Agricultural zone revealed that coccidiosis (90.8%), Newcastle disease (90.8%), fowl cholera (77.5%), fowl pox (75.8%) and chronic respiratory disease (64.2%) were highly prevalence in the study area.

The result of the level of awareness in the use of indigenous methods of poultry disease control revealed that majority of the respondents were highly aware of the use of Garlic and Ginger (90%) to control coccidiosis, the use of scent leaf (84.2%) to control Newcastle Disease, the use of bitterleaf (100%) to control fowl cholera, the use of scentleaf (81.7%) to control chronic respiratory Disease, rubbing of palm oil (51.7%) to control fowl pox Disease, the use of scentleaf (70%) to control fowl typhoid.

The result of the level of utilization of indigenous methods of poultry disease control revealed that majority of the respondents always utilize Garlic and Ginger (50.8%) to control coccidiosis, scent leaf (62.5%) to control Newcastle Disease, bitterleaf (55%) to control fowl cholera, the mixture of ginger and garlic (65.8%) to control chronic respiratory Disease, rubbing of palm oil (70.8%) to control fowl pox Disease, scentleaf (42.5%) to control fowl typhoid.

The results also showed that the major factors affecting the use of indigenous methods of poultry diseases control in Eket Agricultural zone were; lack of information (71.7%), improper dosage (67.5%), inadequate knowledge of usage (57.5%), no documentation about their use (73.3%), lack of preservation of herbal concoction (60.8%), lack of improper diagnosis (77.5%), complexity in herbal concoction preparation (79.2%), lack of standardization (72.5%) and side effects (79.2%) from the use of these methods are the major factors influencing the use of indigenous control methods of poultry diseases in the study area.

**5.2 Conclusion**

The study was to determine the evaluation of indigenous methods of diseases control among poultry Farmers in Eket agricultural zone. The result of the study showed that coccidiosis, Newcastle disease, fowl cholera, fowl pox and chronic respiratory disease were the major prevalent diseases in the study area. The result also showed that poultry farmers in the study area were highly aware of indigenous methods of controlling prevalent disease but did not effectively utilize these methods in their poultry production. In spite of the constraints faced by farmers in the use of indigenous method of poultry disease control in the study area, the result from the analysis of this study showed that a high percentage of the farmers utilized the indigenous method of poultry disease control and farmers still have the potential to improve their performance in the study area.

**5.3 Recommendations**

Based on the findings of the study, the following recommendations are suggested;

1. Effective agricultural policies and programmes should focus on granting farmers information regarding the use of indigenous methods of poultry disease control as these would enable them increase their production efficiencies positively in the area.
2. There is need therefore for training and re-training of extension agents on the use and effects of these practices to enable them disseminate same to farmers on the need to use available resources efficiently.

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