SEROPREVALENCE AND RISK FACTORS FOR THE OCCURRENCE OF NEWCASTLE DISEASE IN GUINEA FOWLS IN THE UPPER EAST REGION OF GHANA

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Disease outbreaks pose a major threat to poultry production globally. Newcastle disease (ND) is among the diseases that mitigate against poultry production, especially in developing countries. Guinea fowl production constitutes 7% of the poultry population in Ghana, serving as the main source of livelihood in rural Ghana. However, information on Newcastle disease in guinea fowls is scanty in Ghana. This study was conducted in the Upper East region of Ghana to detect circulating antibodies against ND and the risk factors for its occurrence in guinea fowls.

Sera was obtained from guinea fowls from households, live bird markets and slaughter points in different locations in the Upper East region. The sera were evaluated for antibodies against Newcastle disease using the haemagglutination inhibition (HI) test. Questionnaire was administered to the farmers to assess risk factors such as vaccination status, management system and contact with wild birds.

Almost half, 213/431 (49.4%, 95% CI=44.6-54.2) of the guinea fowls were seropositive. The prevalence rate was 46.2% in live bird markets, 36.63% in households and 52.7% at slaughter points. A prevalence rate of 49.7% was observed in adults and 45.7% growers. There was a 53.4% prevalence in males and 43.9% in females.

Antibodies to ND was found circulating in guinea fowls in the Upper East region. We recommend that guinea fowls be made an important component element in the ND surveillance for an effective monitoring and control in the region. Households, slaughter points and live bird markets were not found to be associated with the prevalence of Newcastle disease ($p>0.05$).

Keywords: Newcastle Disease, Guinea Fowl, Seroprevalence, Haemagglutination Inhibition, Upper East Region

ANTIMICROBIAL RESISTANCE PROFILES OF BACTERIAL SPECIES FROM *ENTEROBACTERIACEAE* FAMILY OF LAYING CHICKEN PRODUCTION IN IBADAN, SOUTHWESTERN NIGERIA

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Antibiotics are significant for improving the health and productivity of the laying chickens. However, overuse of antimicrobial drugs has led to antimicrobial resistance (AMR), resulting into ineffective treatment of infectious diseases, and death in laying chicken. The study evaluated prevalence, and antibiotic susceptibility of several bacteria species from *Enterobacteriaceae* family in laying chickens in Ibadan, South -Western Nigeria.

A cross-sectional study was used to collect fecal samples from 200 apparently healthy laying hens from 10 local government areas in Ibadan. The Fecal stool samples were taken to the University of Ibadan microbiology laboratory for culture, isolation, and biochemical identification of species from the *Enterobacteriaceae* Family, and later antibiotic susceptibility testing on Mueller-Hinton agar using the Kirby-Bauer disk diffusion method was undertaken. Statistical and Data was used for data analysis ($P<0.05$ was considered significant).

It showed that, out of 200 samples, at least 95% of the samples tested positive, while 5% tested negative. 287 isolates that belongs to 4 species such as *Escherichia* coli, 59.6%, *Enterobacter* spp., 22.3%, *Klebsiella pneumoniae*, 12.5%, and *Pseudomonas* spp., 5.6% were identified ($P<0.05$). For antibiotic susceptibility, *Escherichia* coli spp. has sensitivity rate of 78.2% to Ciprofloxacin, 73.4% to Tarivid, 71.8% to Sparfloxacin, and 70.9% to pefloxacin, and resistant to Septrin, 73.4%, Streptomycin, 65.4%, and other antibiotics 63.7%. *Klebsiella pneumoniae* was sensitive to; Gentamicin, 33.3%; Tarivid, 33.3%; Ciprofloxacin, and resistant to other antibiotics. *Pseudomonas* spp. was sensitive to Amoxillin, Pefloxacin, Gentamycin, Chloramphenicol, Streptomycin, and Ciprofloxacin in 100%, 100%, 87.5%, 68.8%, 75%, 62.5%, and 62. 5% whereas resistant to Augmentin, 93.8%, Tarivid, 87.5%, Sparfloxacin, 75.0%. *Enterobacter* spp. was sensitive to Augmentin, 93.8%, Pefloxacin & Streptomycin, 70.3% whereas resistant to Tarivid, 100%, Septrin, 84.5%, Chloramphenicol, 68.8%, Gentamycin, 64.1%, and Ciprofloxacin, 60.9%, and 76 multi-drug resistance patterns were recorded.

The study concluded that four species from *Enterobacteriaceae* family found as result of antibiotic misused, which leads to multi drug resistance causing ineffective treatment of infectious diseases and death.

Keywords: Antimicrobial resistance pattern, *Enterobacteriaceae*, Laying chickens production, Economic implications, Ibadan, Nigeria

EFFICACY OF CONCURRENT ADMINISTRATION OF HYPER IMMUNE EGG YOLK AND VIRUS CHALLENGE IN NEWCASTLE DISEASE INFECTION IN MALI

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Newcastle disease (ND) is an infectious disease. ND affects domestic and wild birds. ND causes significant losses in these birds. In Mali, the development of poultry farming is faced with this scourge. The only method of combating this disease is vaccination. Unfortunately, in village poultry farms, vaccination coverage is very low.

This study aims to determine the effectiveness of hyper immune egg yolk in protecting against Newcastle disease in poultry, as a cheaper and more accessible means of prophylaxis. The laying chickens of the leghorn strain were raised together under the same conditions. They were feeding ad libitum (food and water).

They received no treatment to have seronegative chickens. All chickens were raised until 45 days of age. Then, they were divided into three (3) groups (1, 2 and 3). Each group was in a separate room and included 5 seronegative chickens. The chickens of groups 1 and 2 were inoculated with the virulent Newcastle strain (Ml029/07) titrating 106 EID50/ml intramuscularly at a rate of 100 µl per chicken. After inoculation of the virus, the chickens of group 1 received treatment with hyper immune egg yolk Obtained from hyper immune poultry intramuscularly at the rate of 2 ml per subject for 3 days. The chickens in group 3 received neither virus nor treatment. All groups were placed under clinical observation for 14 days. All chickens in group 2 showed clinical signs of Newcastle disease and died. While all chickens in groups (1 and 3) remained healthy and did not die during the entire period.

In this study, the effectiveness of hyper immune egg yolk against Newcastle Disease was evaluated in Central Veterinary Laboratory and was found to be effective in protecting (titer upper than 993) poultry against the clinical manifestations and mortality of Newcastle disease. Hyper immune egg yolk was able to protect poultry against the ML029/07 strain isolated in Mali. This may be a novel method of protecting chickens against Newcastle disease using hyper immune egg yolk.

Keywords: Hyper Immune Egg Yolk, Newcastle disease virus, immunoprotection, Mali.

PATHOGENICITY OF NEWCASTLE DISEASE VIRUS ISOALATED FROM ETHIOPIA

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A research study conducted at the National Veterinary Institute of Ethiopia investigated the effects of a recent circulation Newcastle disease virus.

The activities undertaken were to isolate and identify NDV from the suspected outbreak cases of NDV in chicken, to determine the pathogenicity of isolated NDV circulating in Ethiopia, and to evaluate the different effects of the thermostable NDV vaccine (I2) against the isolated NDV circulating in Ethiopia.

The three-month study used an experimental, double-blind sampling process where 50 chicks were observed for challenging purposes. Then, 40 chicks were divided into two groups, and each group was challenged for one of two virus samples. The group was also divided into vaccinated and unvaccinated sub-groups. Non-parametric statistical methods were used: Fisher's method, Mann-Whitney U test, and survival analysis.

The isolated viruses were classified as velogenic virus strains with a score of 1.67 for BOG strains and 1.55 for HAR strains. The vaccinated chicks showed good herd immunity, with one vaccination failure. The mortality in the challenged group was 55% (22/40), and this group contained 20/20 unvaccinated chicks and 2/20 vaccinated chicks. The analytical statistic showed that the virus generated a general inflammation, associated with the BOG group, $p = 0.04$, with a proportion of 87.50% ($n = 7/8$) and 12.50% ($n = 1/8$) for the HAR group. Flock vaccination decreased the appearance of the general affliction and the clinical symptoms, as well as gross lesions, such as inflammation, in the respiratory and gastrointestinal tracts, head, heart, and other systems.

The study showed the presence of velogenic strains. It was not evident that the two samples were different strains. A sequencing study should be pursued to see if the two samples are two different strains or not.

Keywords: Newcastle disease, velogenic strains, pathogenicity, vaccination, Ethiopia

HAEMOPARASITISME, RISK FACTORS HAEMATO-BIOCHEMICAL CHANGES IN POULTRY IN IBADAN, NIGERIA

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Nigeria has Africa's most significant annual egg production and second-largest chicken population; the Nigerian poultry industry comprises about 180 million birds. Of these, 80 million chickens are raised in extensive systems, 60 million in semi-intensive systems, and 40 million in intensive systems.

The presence of haemoparasites in birds causes serious health problems, affects their well-being and reduces their production; this study aimed to ascertain the incidence of blood parasites and their effect on birds' haematological and biochemical profiles in Ibadan, Nigeria. A total of 390 poultry birds (Layers, Broilers, Local chickens, Turkeys, Duck and pigeons) were randomly chosen from different farm locations such as Lagelu, Akinyele, Akufo, Rainbow, Ibadan North and Inside University of Ibadan teaching and research farm.

Haemocytometry was used for haematological parameters to measure haemoglobin concentration, packed cell volume, red blood cell, and total white blood cell counts. Serum biochemicals, including albumin, asparate aminotransferase, blood urea nitrogen, glucose, protein, and creatinine, were determined by spectrophotometer. Of 390 samples analysed, only 174 were infected with haemoparasites. These were plasmodium, Haemoparoteus, Leucocytozoon, Babesia and Microfilaria. Plasmodium spp was the most prevalent haemoparasite (51.72%), followed by Haemoproteus (3.44%), Babesia (3.44%) and Microfilaria (1.72%) in a single form of infections. For the mixed infections, the highest record was in plasmodium and Haemoproteus (19%) followed by Plasmodium and Microfilaria (8.62%), Babesia and Plasmodium (6.89 %), Babesia and Haemoproteus (1.72%), Plasmodium and Leukocytozoon (1.72 %) also Babesia, Haemoproteus and Plasmodium was (1.72 %), in triple form of infections).

The haematological findings such as PCV, PP, HB, platelet, RBC, Eosinophil and MCHC were significantly higher in non-infected but lower in infected ones, unlike MCHC. Implementing strict biosecurity protocols or controlling vectors like mosquitos, ticks, and flies is recommended, as well as practising an intensive poultry management system focusing on vector control.

Keywords: Poultry, haemoparasites, haematology, serum biochemistry, Ibadan, Nigeria

CHARACTERIZATION AND ANTIBIOGRAM OF *E. COLI* ISOLATED FROM INDIGENOUS FREE-RANGE CHICKENS IN IBADAN, NIGERIA

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Escherichia coli is a leading cause of bacterial disease in poultry and food-borne illness in humans, worldwide. There are reports on the changing trends in antimicrobial resistance patterns of animal pathogens with very limited information available on *E coli* from free-range chickens in Ibadan. This study was therefore designed to investigate the characterization and antibiogram of *E. coli* isolated from indigenous chickens in Live Bird Markets (LBMs) in Ibadan, Nigeria.

In a cross-sectional survey, 100 cloacal swabs were obtained from indigenous chickens from three LBMs in Ibadan, namely Oje (n=34), Moniya (n=34), and Bode (n=32). The labelled samples were transported on ice to the laboratory for analysis. *E. coli* was isolated using standard procedures. Initial identification of *E. coli* was by morphological, biochemical, and gram staining characteristics. Molecular characterization was performed by PCR amplification of the 16S rRNA gene of *E. coli* using standard primers. Sequences were analyzed, and deposited in the Genbank, and Phylogenetic trees were constructed using MEGA 11.0 software.

Antibiotic susceptibility of the isolates was calculated using the disc diffusion technique, and the CLSI 2020 recommendations were followed for interpretation. Descriptive statistics were used to evaluate the data at $p<0.05$. *Escherichia coli* colonized 43% of the samples with a higher frequency of isolation from male chickens (46%), and those from the Oje market (52.9%). There was close phylogenetic relatedness with other strains from Egypt, Portugal, and Iraq. Several strains were multi-drug resistant with leading resistance to Metronidazole (100%), Doxycycline (81.40%), and Streptomycin (76.74%) and in various combinations. Isolates were mostly sensitive to enfloxacin (100%) and Gentamicin (88.37%).

Free-range indigenous chickens in Ibadan harbor multi-drug resistant *Escherichia coli* strains which may be a source of food contamination. Improved hygiene while handling chickens is recommended.

Key Words: Poultry infection, *Escherichia Coli*, Indigenous Chickens, Antibiogram