



**FACULTY OF AGRICULTURE AND ANIMAL  
SCIENCES**

**PREVALENCE OF NEWCASTLE DISEASE AMONG CHICKEN  
IN NAMAYEMBA TOWN COUNCIL, BUGIRI DISTRICT**

**By**

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## DECLARATION

I KAIRANIA GEOFREY, declare that everything contained herein was out of my tireless efforts in data collection, recording, analysis and presentation under supervision of the university academic supervisor and that it has never been sub-mitted to any academic institutions abroad or within Uganda for any academic qualifications except recitations which are clearly quoted. I am therefore directly concerned and responsible for any queries that may arise thereafter.

Signature.....

Date.....

## APPROVAL

This is to certify that the dissertation entitled "Prevalence of Newcastle Disease among Chicken in Namayemba Town Council, Bugiri District has been submitted with the approval of the university Supervisor.

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## **LIST OF ABBREVIATIONS**

**COVAB**-College of Veterinary Medicine, Animal Resources and Bio-security (Makerere University)

**ELISA**- enzyme-linked immunosorbent assay

**FAO**- Food and agriculture organization

**HI**-Haemagglutination Inhibition

**IBV**-Infectious Bronchitis Virus

**MAAIF**- Ministry of agriculture animal industries and fisheries.

**MFPED**- Ministry of finance, planning and economic development

**NCD** - Newcastle Disease

**NDP**- National development plan

**NDV**-Newcastle Virus

**OIE**-Office International des Epizooties

**PCR**-Polymerase chain reaction

**PMV**-Paramyxo Virus

**UBOS**-Uganda Bureau of Statistics

**WOAH**- World organization for animal health

## ABSTRACT

This study determined the prevalence of Newcastle disease among live chicken in Namayemba town council, Bugiri district. The objectives of this study were; to determine the prevalence of Newcastle disease in chicken of different production systems and to assess the prevalence of Newcastle disease in different types of chicken in Namayemba town council, Bugiri district. Cross-sectional study design was used to examine the relationship between NCD and other variables of interest. Blood samples were collected from birds (from the wing vein of the humeral region) in the different wards of Namayemba town council, Bugiri district. The serum samples were detected for Newcastle disease virus antibodies using Enzyme Linked Immunosorbent Assay (ELISA). Prevalence of Newcastle in different parishes indicated that Bukonde had the highest (91.7%) level of prevalence, followed by Gulimwoyo (76.9%), Kasule (69.2%), Namabugo (66.7%), Isagaza (55.6%) whereas Kafufu registered the least level of prevalence (50%). The ( $P=0.9043$ ) showed that there was no significant differences in the prevalence of Newcastle disease in all parishes investigated. The highest prevalence of Newcastle in different chicken types was identified with layers (76.9%) followed by kuroilers (73.3%), broilers (66.7%) and least prevalence was identified with local birds (35.7%). The ( $P=0.1581$ ), that is to say  $p>0.05$  indicated no significant difference among the chicken types with chi-square value of (5.195). The highest prevalence of Newcastle in different production systems was detected in the commercial system (deep litter system) with (73.5%) followed by backyard system (free range) (35.7%). Furthermore, the prevailing Newcastle disease seropositivity in the chicken production system indicates the importance of Newcastle disease in poultry industry of the studied areas, therefore to effectively control the disease, more attention should be given to those areas by adopting prophylaxis through the use of heat resistant ND vaccines for the chickens.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background

The livestock sector is a major component of the agriculture industry in Uganda generating at least 9% of gross domestic products and 17% of agricultural gross domestic products (MAAIF, 2005). The livestock sector contributes to the world's economy as it is a source of income, food, draught animal power for animal traction, manure, and raw materials like hides and skin (IAHA, 2017). It also generates a livelihood for 1 billion people worldwide (Koroma & Economist, n.d.). It helps in alleviating poverty from rural people as well as other people who are involved in the value chain (FAO, 2002). The sector contributes 30% of the agricultural gross domestic product of sub-Saharan Africa. 60% of the edible livestock product is generated from cattle (University of & Mayaguez, 2012).

However, the livestock industry is threatened by several diseases which affect livestock growth and even result into death of livestock and later reduce food production, accessibility, and its stability of supply ("World Livestock. Dis. Atlas," 2011). Livestock diseases account for up to 30% loss of livestock output per year in the developing world (Tambi et al., 2017) thus reducing household income. Diseases majorly compromise animal health and productivity (Nabukenya et al., 2014). The Uganda government national development plan (NDP) has highlighted the constraint to growth in the livestock sector as related to diseases, lack of breeding stock, lack of quality feeds, and pasture (MFPED, 2010). In Uganda there are 14.2 million cattle, 16 million goats, 4.5 sheep, 47.6 million poultry and 4.1 million pigs (UBOS, 2018).

Livestock diseases are one of the major constraints to the development of the livestock sector in Uganda (MAAIF, 2005). They cause an estimated loss of 33250 Uganda shillings per tropical livestock unit (MAAIF, 2017). Newcastle disease is one of those diseases threatening the livestock sector. Newcastle disease is an acute, rapid spreading contagious disease that affects chicken, geese, ducks, guinea fowl, ostriches, turkey extra caused by a para-myxo virus. It has high morbidity and mortality rates (can cause 100% mortality rate especially in susceptible flocks) and makes a significant economic impact due to the high mortality rates, high cost of supportive treatment, prevention and control, eradication programs and has serious consequences for the movement of birds and their products, biodiversity and public health (Jemal, 2016).

## REFERENCES

- Abraham-Oyiguh, J., Sulaiman, L. K., Meseko, C. A., Ismail, S., Suleiman, I., Ahmed, S. J., & Onate, E. C. (2014). Prevalence of Newcastle Disease Antibodies in Local Chicken in Federal Capital Territory, Abuja, Nigeria. *International Scholarly Research Notices*, 2014, 1–3. <https://doi.org/10.1155/2014/796148>
- Brown, V. R., & Bevins, S. N. (2017). A review of virulent Newcastle disease viruses in the United States and the role of wild birds in viral persistence and spread. *Veterinary Research*, 48(1), 1–15. <https://doi.org/10.1186/s13567-017-0475-9>
- Caupa. (2009). Avian Influenza and Newcastle Disease. *Avian Influenza and Newcastle Disease*. <https://doi.org/10.1007/978-88-470-0826-7>
- Fakhrul Islam, K. M. (2016). Investigation of Proportionate Prevalence of Newcastle Disease in Chicken, Pigeon and Duck at Selected Veterinary Hospitals in Bangladesh and India. *Obstetrics & Gynecology International Journal*, 4(2), 284–291. <https://doi.org/10.15406/jdvar.2016.04.00118>
- FRANCIS, J. (2016). Newcastle disease. *The Veterinary Record*, 59(34), 437. <https://doi.org/10.1002/0471743984.vse5102>
- Geresu, M. A., Elemo, K. K., & Kassa, G. M. (2016). Newcastle disease: Seroprevalence and associated risk factors in backyard and small scale chicken producer farms in Agarfa and Sinana Districts of Bale Zone, Ethiopia. *Journal of Veterinary Medicine and Animal Health*, Vol. 8(8)(8), Pp. 99-106. <https://doi.org/10.5897/JVMAH2015.0427>
- Getachew Derbew, B. G. and B. H. (2016). Sero-Prevalence Of Newcastle Disease And Its Associated Risk Factors In Village Chickens At. *International Journal of Engineering Development and Research (Www.Ijedr.Org)International Journal of Engineering Development and Research (Www.Ijedr.Org)*, 4(3), 747–752.
- IAHA. (2017). *Role of Livestock in Sustainable Agriculture*. 6–8.
- JR, L., AD, E. Y., & UI, I. (2017). Survey on Prevalence of Newcastle Disease Antibodies in Village Poultry at Live Birds Markets in Gombe, Nigeria. *Journal of Animal Sciences and*

- Livestock Production*, 01(01), 1–9. <https://doi.org/10.21767/2577-0594.100001>
- Kasozi, K. I., Ssuna, P., Tayebwa, D. S., & Alyas, M. (2014). Newcastle Disease Virus Isolation and Its Prevalence in Uganda Poultry Farms. *Open Journal of Veterinary Medicine*, 04(01), 1–5. <https://doi.org/10.4236/ojvm.2014.41001>
- MAAIF. (2005). *The national animal feeds policy*. March, 8–17.
- MAAIF. (2017). PERFORMANCE REPORT. *MAAIF Annual Performance Report*, August, 200.
- Mathias, A. (2010). LESIONS AND PREVALENCE OF NEWCASTLE DISEASE IN CHICKEN PRESENTED FOR NECROPSY AT FACULTY OF VETERINARY MEDICINE, MAKERERE UNIVERSITY. BY. *Undergraduate Thesis*, 2005, 1–12.
- Mngumi, E. B., & Bunuma, E. (2022). Seroprevalence and risk factors of Newcastle disease virus in local chickens in Njombe and Bahi districts in Tanzania. *Tropical Animal Health and Production*, 54(1), 1–14. <https://doi.org/10.1007/s11250-022-03052-7>
- Nabukenya, I., Rubaire-Akiiki, C., Olila, D., Ikwap, K., & Höglund, J. (2014). Ethnopharmacological practices by livestock farmers in uganda: Survey experiences from mpigi and gulu districts. *Journal of Ethnobiology and Ethnomedicine*, 10(1). <https://doi.org/10.1186/1746-4269-10-9>
- Napit, R., Poudel, A., Pradhan, S. M., Manandhar, P., Ghaju, S., Sharma, A. N., Joshi, J., Tha, S., Dhital, K., Rajbhandari, U., Basnet, A., & Rajbhandari, R. M. (2022). *Newcastle disease burden in Nepal and efficacy of Tablet I-2 vaccine in commercial and backyard poultry production*.
- Perttula, L. (2009). *Epidemiology and Characterization of Newcastle Disease in Smallholder Poultry in Mozambique*.
- Ravishankar, C., Ravindran, R., John, A. A., Divakar, N., Chandy, G., Joshi, V., Chaudhary, D., Bansal, N., Singh, R., Sahoo, N., Mor, S. K., Mahajan, N. K., Maan, S., Jindal, N., Schilling, M. A., Herzog, C. M., Basu, S., Radzio-Basu, J., Kapur, V., & Goyal, S. M. (2022). Detection of Newcastle disease virus and assessment of associated relative risk in backyard and commercial poultry in Kerala, India. *Veterinary Medicine and Science*, 8(3),

1146–1156. <https://doi.org/10.1002/vms3.747>

Saif, Y. M. a. M. F., Glisson, J. r., Nolan, l. r. M. l. K., & Swayne, D. e. (2009). Diseases of Poultry, 12th Edition. In *Journal of Wildlife Diseases* (Vol. 45, Issue 1).

<https://doi.org/10.7589/0090-3558-45.1.251>

UBOS. (2018). Annual Agriculture Survey, 1999(December), 1–6.

Unigwe, C. R., Shobowale, O. M., Enibe, F., Ajayi, J. O., & Koleosho, S. A. (2020). Sero-prevalence of newcastle disease in apparently healthy normal feathered local chickens in Ido and Atiba Local Government Areas, Oyo State, Nigeria. *Agro-Science*, 19(4), 37–42.

<https://doi.org/10.4314/as.v19i4.7>

Zerihun Mesfin and Temesgen Bihonegn. (2018). Newcastle Disease in Ethiopia: A Review Article. *Int. J. Adv. Res. Biol. Sci*, 5(11):95-1(6), 1–5. <https://doi.org/10.22192/ijarbs>

Tambi, N. E., Maina, W. O., & Ndi, C. (2006). An estimation of the economic impact of contagious bovine pleuropneumonia in Africa. *Revue scientifique et technique (International Office of Epizootics)*, 25(3), 999–1011.

Abah, H. O., Abdu, P. A., & Assam, A. (2017). Assessment of biosecurity measures against Newcastle disease in commercial poultry farms in Benue state , Nigeria. 15(3), 32–37.

Geresu, M. A., Elemo, K. K., & Kassa, G. M. (2016). Newcastle disease : Seroprevalence and associated risk factors in backyard and small scale chicken producer farms in Agarfa and Sinana Districts of Bale Zone , Ethiopia. 8(August), 99–106.

<https://doi.org/10.5897/JVMAH2015.0427>

Hailu Mazengia. (2012). Review on major viral diseases of chickens reported in Ethiopia. *Journal of Infectious Diseases and Immunity*, 4(1), 1–9. <https://doi.org/10.5897/jidix11.001>

Myers, M. L. (2014). Chapter 70 Livestock Rearing *LIVESTOCK REARING : ITS EXTENT AND HEALTH EFFECTS*. Caras 1996, 1–40.

Yang, H., Dey, S. K., Buchanan, R., & Biswas, D. (2014). Pests in Poultry, Poultry Product-Borne Infection and Future Precautions. *Practical Food Safety: Contemporary Issues and Future Directions*, 9781118474600, 535–552. <https://doi.org/10.1002/9781118474563.ch26>