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Detection of Antibody Titers Against New-Castle Disease Virus (ND) and Monocyte Profile in Free-Range Chickens (*Gallus domesticus*) at a Farm in Permata Village, Tilongkabila Sub-district, Bone Bolango District

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***Abstract**: Infectious diseases such as Newcastle Disease (ND) can disrupt the poultry business. This study aims to determine the presence of Newcastle Disease (ND) virus antibody titers and the percentage of monocyte cells in native chickens (*Gallus domesticus*) at a farm in Permata Village, Tilongkabila Subdistrict, Bone Bolango Regency. The method used in this research is qualitative descriptive. Antibody titer data were obtained from the results of the HI (Haemagglutination Inhibition) test, while the percentage of monocyte cells was determined using 10% Giemsa staining with parallel track counting.The results showed that out of 50 samples, 10 samples tested positive for antibody titers (20%), while 40 samples tested negative (80%). For positive antibody titer samples, leukocyte count totaled 3,310, with 250 monocytes, yielding a percentage of 7.55%. For negative samples, total leukocyte counted 10,560, with 360 monocytes, resulting in a percentage of 3.20%, which falls within the normal range of monocyte cell values.*

***Keywords:** Antibody titer, monocyte, new castle disease, Gallus domesticus, Haemaglutination Inhibition*

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1. INTRODUCTION

Free-range chickens (*Gallus domesticus*) are a type of poultry with high farming potential, offering rapid capital turnover for both small- and large-scale farming operations. This is due to the increasing demand for free-range chicken in the market, driven by rising income levels and population growth. According to livestock and animal health statistics for 2021, the production of free-range chickens in Bone Bolango District increased to 358,114.68 kg, making it the highest production area after Gorontalo City. Gorontalo Province significantly contributes to poultry production, as evidenced by the 2021 production figures of 2,585,694.65 kg of poultry, originating from Gorontalo District (776,305.53 kg), North Gorontalo District (466,224.22 kg), Pohuwato District (415,607.53 kg), Boalemo District (436,506.07 kg), Bone Bolango District (358,114.68 kg), and Gorontalo City (132,936.65 kg). This data highlights that poultry production in Bone Bolango District not only serves as a profitable business but also plays a vital role in supporting the availability of chicken meat in Gorontalo Province (Central Statistics Agency, 2021). However, this trade and supply cycle can be disrupted if poultry health is neglected, particularly concerning the spread of infectious diseases such as Avian Influenza (AI), Newcastle Disease (ND), Infectious Bursal Disease (IBD), and Chronic Respiratory Disease (CRD). These diseases, especially Newcastle Disease (ND), caused by a paramyxovirus genus, remain prevalent in Indonesia. One method to assess chicken health status is through haematological examinations, including total leukocyte counts. In general, total leukocyte and differential leukocyte counts

provide insight into an animal's health status , immune status can be determined by analyzing blood variables, including total and differential leukocyte counts. White blood cells (leukocytes) play a crucial role in the immune system. These leukocytes are divided into two groups: the first group functions in innate immunity, including macrophages, neutrophils, eosinophils, and dendritic cells, collectively known as antigen-presenting cells (APCs).

2. MATERIALS AND METHODS

Disposable syringe 1 mL dan 3 mL tubes (EDTA), coolbox, *Centrifuge, microtube, mikropipet single channel, mikropipet multichannel, mikropipet tip, microplate* V, *mikroshaker, stopwatch timer,* Preparat glass, mikroskop, masker dan *hand gloves*, Camera.

The serum and blood samples from free-range chickens, as well as the ND antigen, were obtained from the Veterinary Farma Center (BBVF Pusvetma). PBS *(phosphate buffered saline),* PBS, RBC, Giemsa 10%, methanol.

Methods: A total of 50 samples were collected from a poultry farm in Permata Village, Tilongkabila Sub-district, Bone Bolango District. The samples were taken from free-range chickens aged 2–4 months by drawing blood from the pectoral vein using 1 cc and 3 cc disposable syringes. The samples were then transported to the laboratory for Haemagglutination (HA), Haemaglutination Inhibition (HI), and white blood cell (monocyte) analysis.

3. RESULTS AND DISCUSSION

Based on the results of the HI (Haemaglutination Inhibition) test conducted on 50 serum samples from free-range chickens (*Gallus domesticus*) collected from a farm in Permata Village, Tilongkabila Sub-district, Bone Bolango District, and tested at the Animal, Fish, and Plant Quarantine Laboratory in Gorontalo, the following results were obtained:

No.	Antibody titer value	Number of samples	Description
1.	2^0 - 2^3	40 (80%)	Antibody titer negative
2.	2^4 – 2^7	10 (20%)	Antibody titer positive
Total		50 Samples	

Table 4.2 Data on the Percentage of White Blood Cells (Monocytes)

Table 4.1 Data on the Percentage of Antibody Titers Against Newcastle Disease Virus

No.	ND Antibody titer	Leucocytes (cells)	Monocytes (cells)	Monocytes (%)
1.	Positive	3.310	250	7,5
2.	Negative	10.560	360	3,2

Based on the data presented in Table 4.1, of the 50 samples collected from a poultry farm in Permata Village, Tilongkabila Sub-district, Bone Bolango District, 10 samples (20%) of the total chicken serum exhibited ND antibody titers and tested positive, while 40 samples (80%) tested negative for ND antibody titers. The ND antibody titers from the serum samples of free-range chickens (*Gallus domesticus*) showed varied results in the HI test, with 18 samples having a titer of 20, 6 samples with a titer of 21, 11 samples with a titer of 22, 5 samples each with titers of 23 and 24, 3 samples with a titer of 25, and 2 samples with a titer of 27.

This research indicates that the prevalence of ND-positive chickens on the farm in Permata Village, Tilongkabila Sub-district, Bone Bolango District, is very low, with the majority showing negative results. This condition may be due to several factors, such as the chickens having never been exposed to the ND virus, resulting in no detectable antibodies, or the antibody levels being too low to yield positive results in the HI test. Another possibility is that an infection occurred a long time ago, causing the antibody levels to decrease or diminish over time.

Furthermore, as shown in Table 4.2, the average percentage of monocyte cells in free-range chickens (*Gallus domesticus*) on the farm in Permata Village was 3.20% in ND antibody-positive preparations and 7.55% in ND antibody-negative preparations. The results indicate that the monocyte cell counts in both ND antibody-positive and ND antibody-negative blood smears remain within the normal range for chicken monocytes. This finding aligns with the normal monocyte distribution range in broiler chickens, which is between 5% and 10%. According to [12] Fransdson et al. (2009), the normal range of monocytes in chicken blood is 3%-10%. Monocytes are capable of phagocytizing up to 100 pathogenic bacterial cells and play a regulatory role during inflamma-

tion, responding to the immune system. Monocytes are mobilized alongside heterophils, forming the second line of defense against inflammation.

4. CONCLUSION

Based on the research findings, it can be concluded that out of 50 serum samples from free-range chickens (*Gallus domesticus*) in a farm located in Permata Village, Tilongkabila Sub-district, Bone Bolango District, 10 samples tested positive for ND antibody titers, representing 20%, while 40 samples tested negative for ND antibody titers, representing 80%. Furthermore, the monocyte cell profile showed a percentage of 3.20% in ND antibody-positive samples and 7.55% in ND antibody-negative samples.

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