Immunogenicity Evaluation of Recombinant Hemagglutinin-Neuraminidase Protein (HN) from Newcastle Virus in Animal Model as a Novel Alternative to the Newcastle disease virus Vaccine

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Abstract

Newcastle disease virus (NDV) has severely affected the poultry industry in recent years. One of the best ways to protect yourself from this virus and lower your chance of a pandemic is by vaccination. The commercial vaccine does not adequately respond to pandemic strains. This study examines the potential function of formulated Haemagglutinin neuraminidase (HN) with Freund's adjuvant against Newcastle disease virus. To this end, a recombinant Haemagglutinin neuraminidase (rHN) gene of the Newcastle disease virus was designed and expressed used by *B.subtiles* expression system. Four groups of mice were immunized by rHN in combination with Freund's adjuvant, and commercial vaccine. The humoral immune test was then performed on the vaccinated mice, and the outcomes were compared to those of untreated animals (negative group). NDV was also administered through intranasal drop to the treated and control mouse groups. Body weight, survival, temperature variation, and the medical conditions of the samples were assessed. Mice that received the recombinant protein vaccination showed humoral reactions to the NDV. Also, co-administration of rHN with Freund's adjuvant might increase the survival rate of the immunized mice by 92 percent. Two weeks after infection, the Freund's adjuvant-treated group had a slight weight loss and a high body temperature. Additionally, compared to the group that received a commercial vaccination, this group had a greater HI antibody titer. Altogether, the results showed that the recombinant protein with the Freund's adjuvant created better safety than the Commercial vaccine produced in Iran, thereby can be considered as a safe and reliable vaccine candidates against the Newcastle virus for further investigations.

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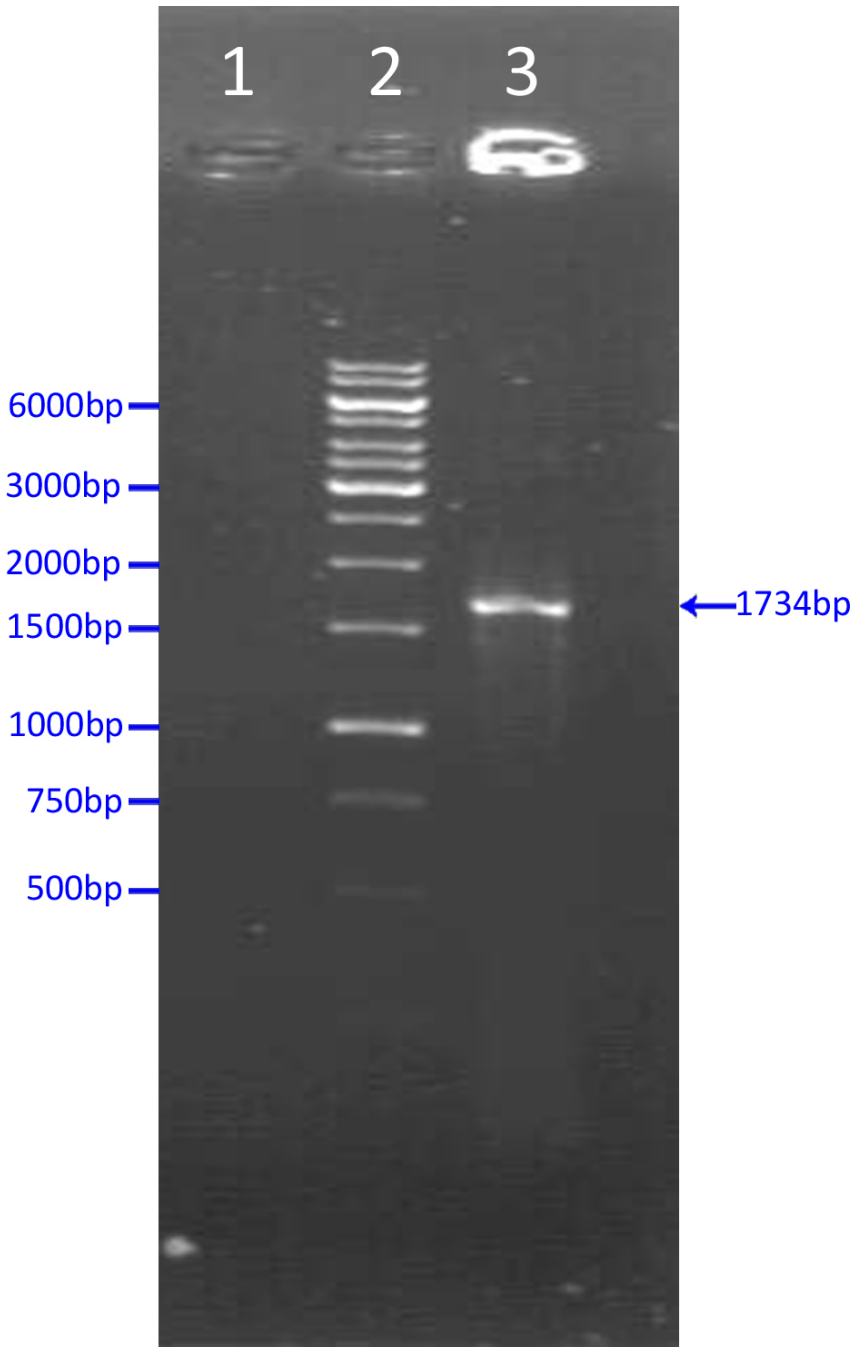

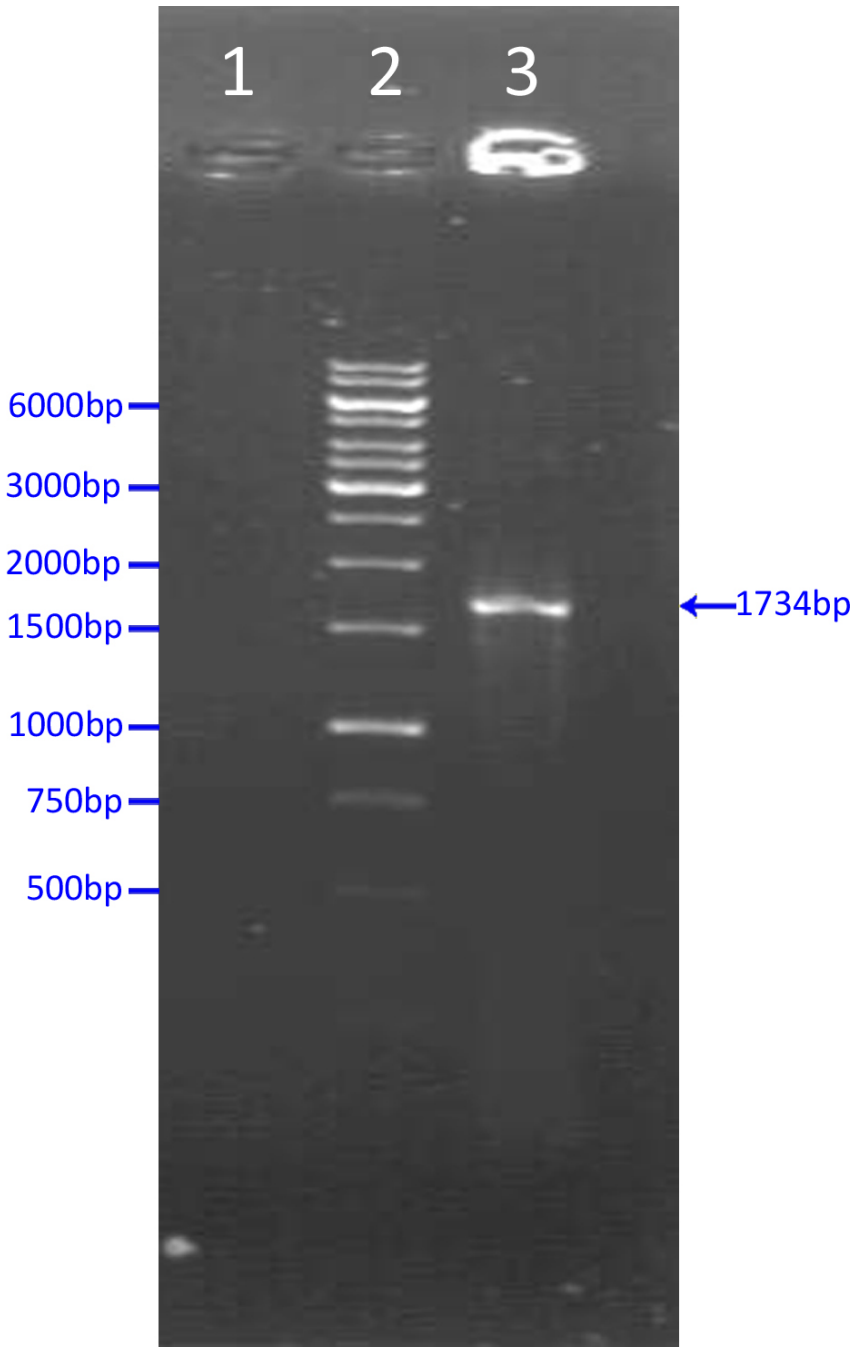

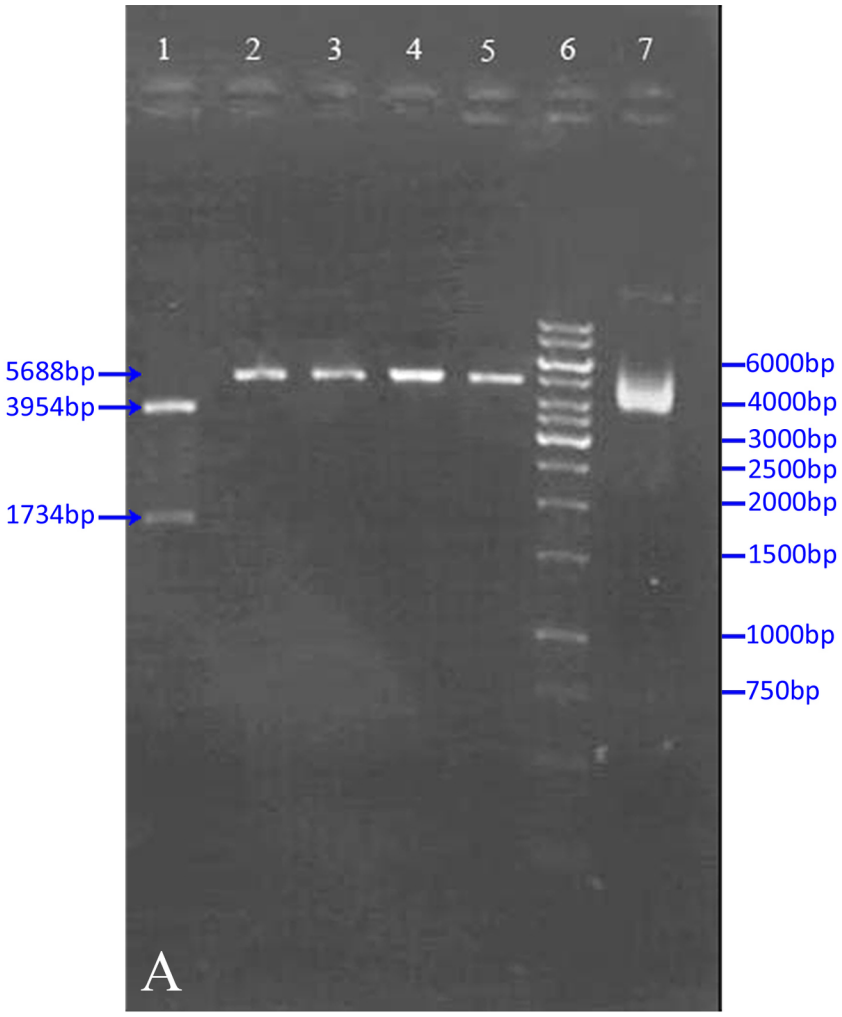

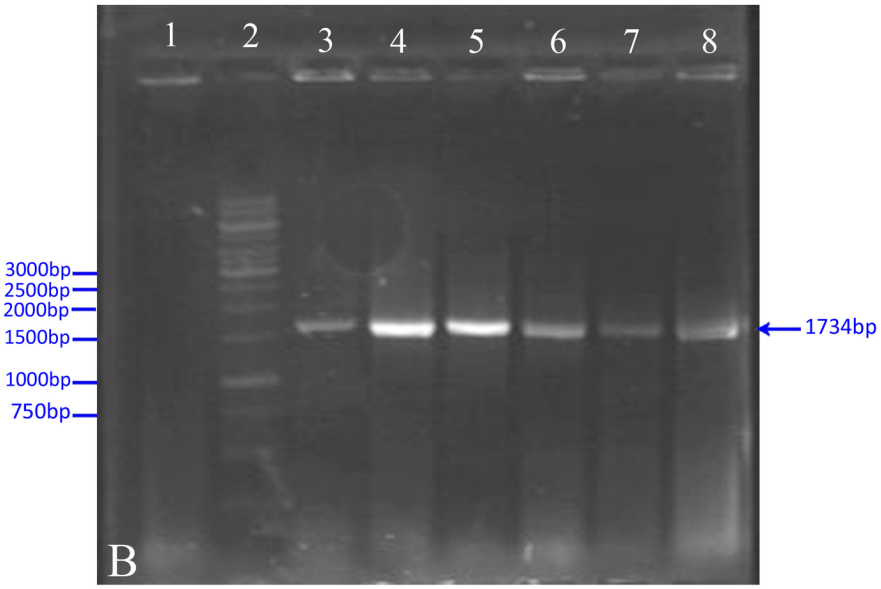

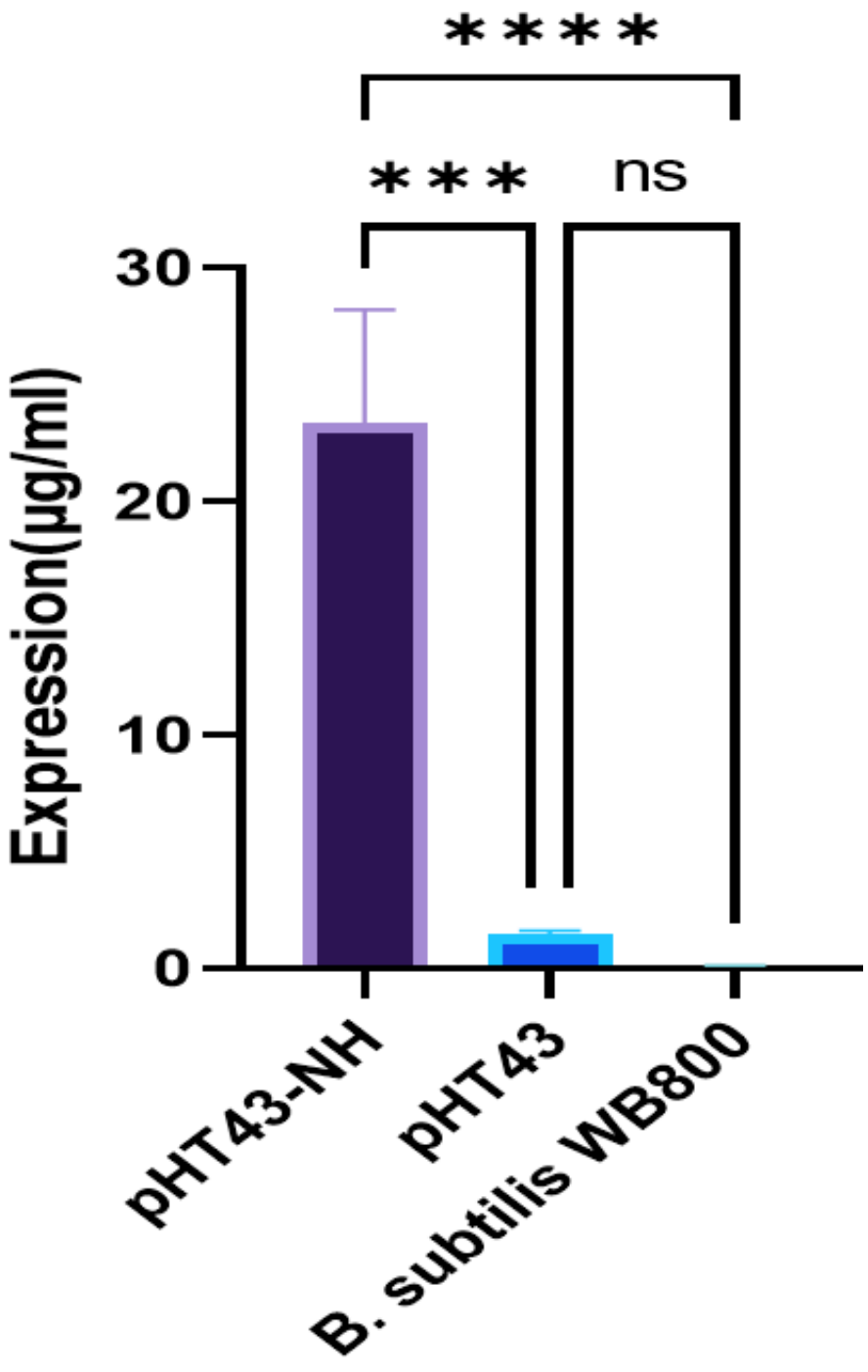

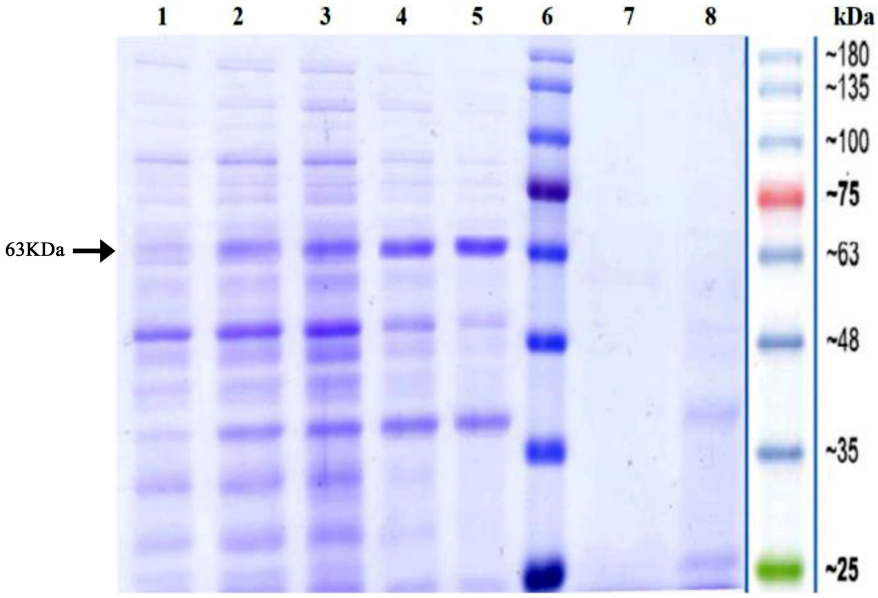

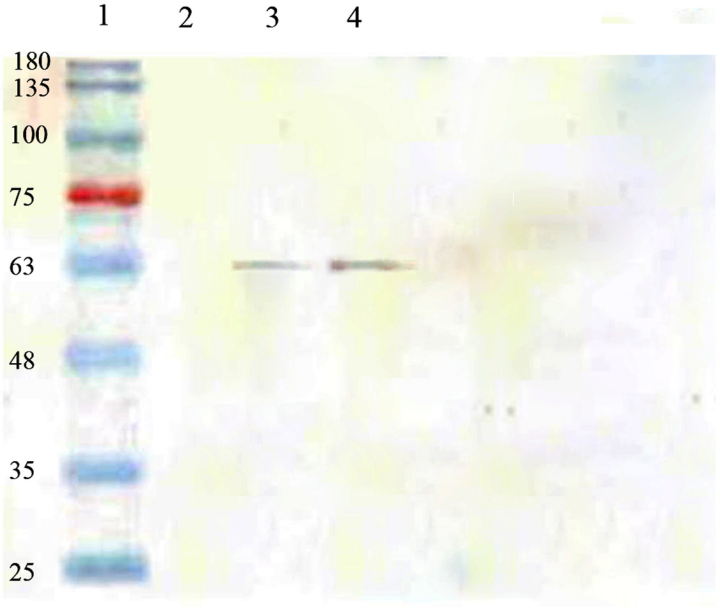

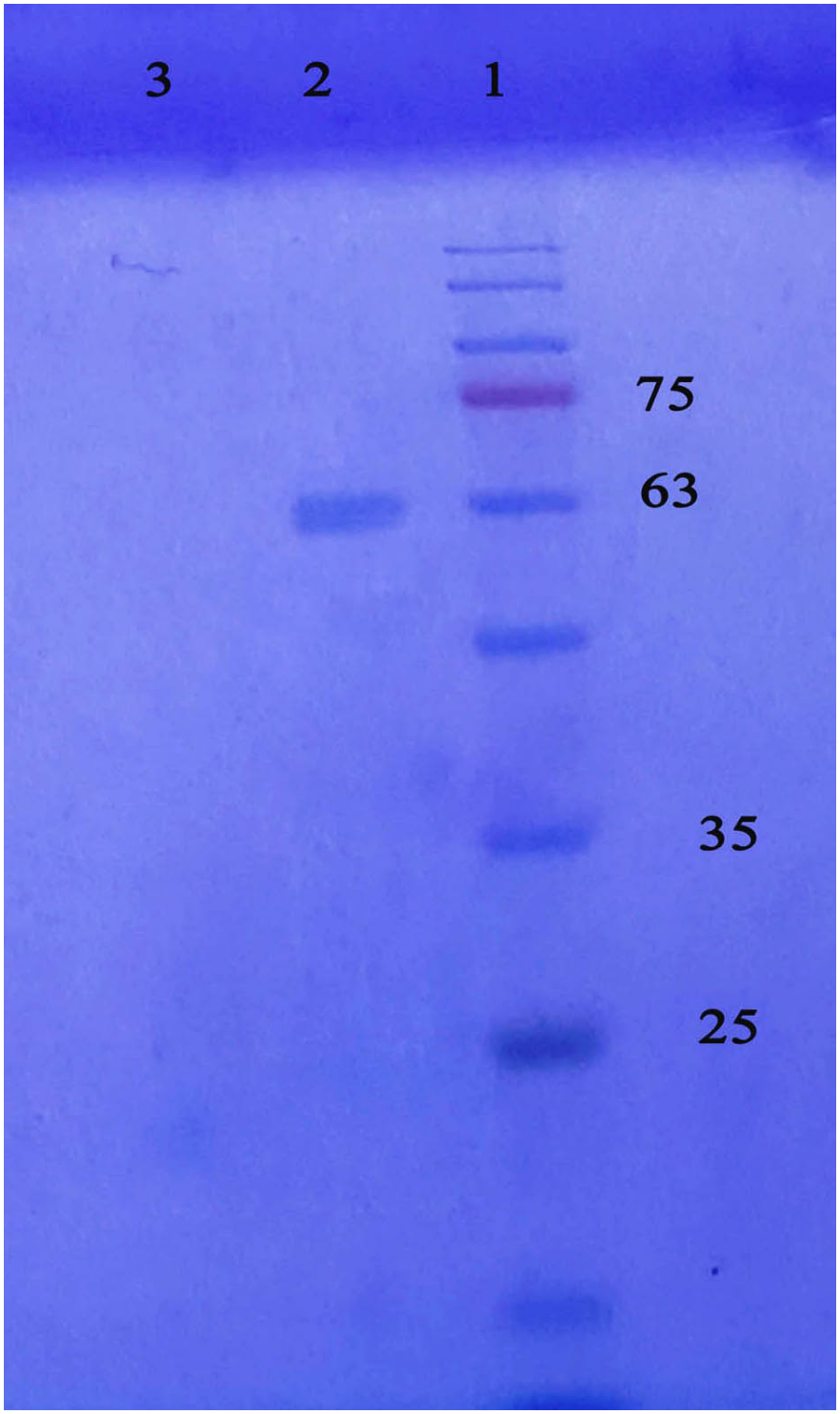

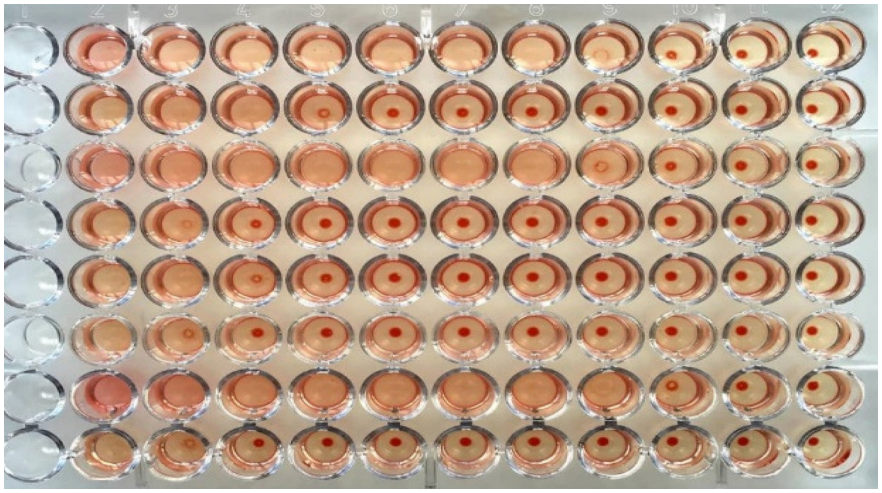

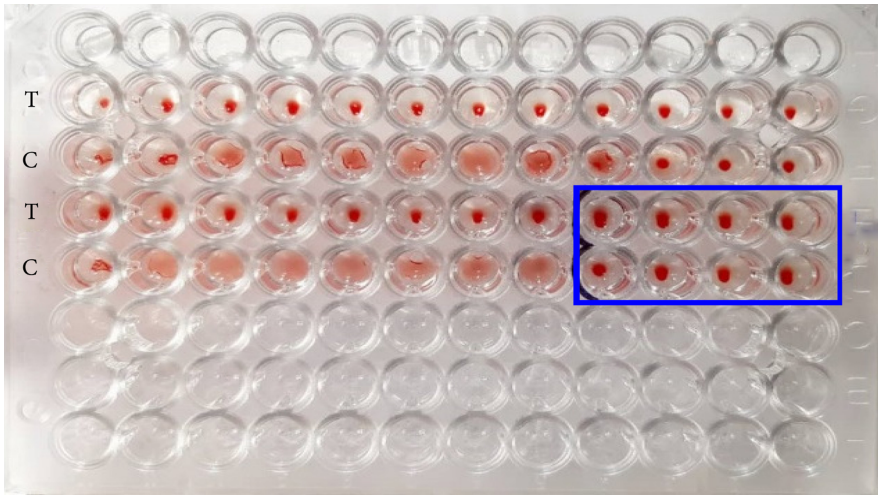

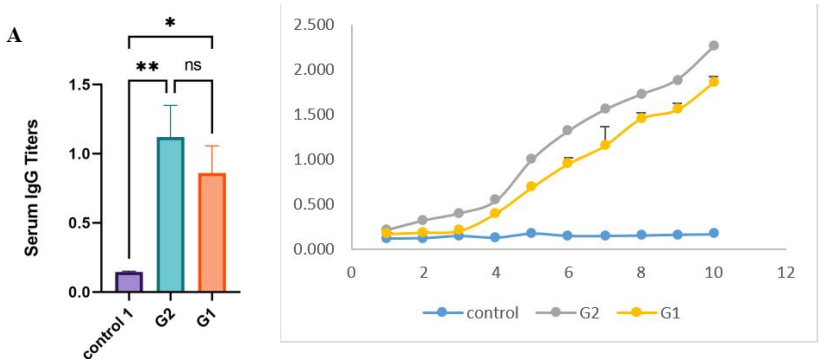

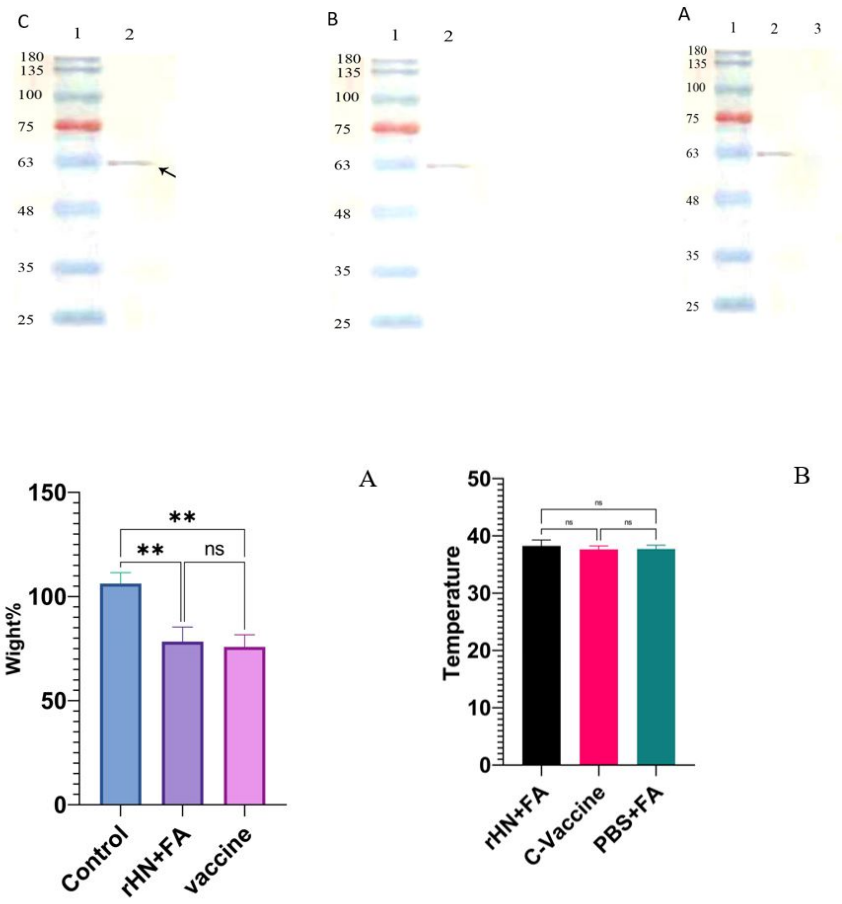

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Table 1. Purification of recombined HN protein.docx available at https://authorea.com/users/498805/articles/579512-immunogenicity-evaluation-of-recombinant-hemagglutinin-neuraminidase-protein-hn-from-newcastle-virus-in-animal-model-as-a-novel-alternative-to-the-newcastle-disease-virus-vaccine