

The Synbiotics ProFLOK®PLUS **Newcastle Disease Virus (NDV) ELISA kit** is a rapid and specific USDA-licensed test for the detection of NDV antibodies in chicken serum.

NDV causes a range of disease states from mild respiratory disease to severe diarrhea and death. The severity of the disease is determined by the infecting strain of NDV. Highly pathogenic strains (velogenic NDV) can cause swelling of the tissues around the eyes, diarrhea and death within 8 days after exposure<sup>1,2</sup>. Moderately pathogenic strains (mesogenic NDV) produce acute respiratory tract infections and reductions in egg production<sup>3</sup>. Milder strains (lentogenic NDV) produce an inapparent respiratory infection. The Synbiotics NDV+ ELISA kit is designed for monitoring NDV vaccination programs and detecting NDV infected flocks. The Synbiotics NDV+ ELISA kit offers the following benefits:

- Reliable, consistent results
- Long shelf-life. All Synbiotics kits have an 18-month shelf-life.
- High-volume (450 tests/kit), easy to use format
- Powerful database management software system
- Excellent technical support

## Suggested Uses

### 1. NDV Vaccination Evaluation:

- Randomly collect and assay 30 or more serum samples per flock immediately prior to NDV vaccine administration (pre-vaccination) and 14 to 18 days post vaccination.

### 2. Routine NDV Flock Profiling:

- Collect and assay 30 or more serum samples per flock, particularly breeder hen flocks, on a routine basis (i.e. every four to six weeks).

## Test Features

### 1. Specificity

The Synbiotics NDV+ ELISA kit has been extensively tested for the following:

The results shown in Table 1 below indicate that the Synbiotics NDV+ ELISA kit demonstrated excellent specificity (i.e. no false positive reactions) to reference sera for numerous infectious agents of poultry and killed vaccine components. The NDV+ ELISA kit, like all Synbiotics ELISA kits, is highly specific to provide valid, reproducible test results.

**Table 1. Specificity.**  
Average sample-to-positive (SP) ratio values, SP ranges, and titer values for a specificity serum panel assayed with the SBIO NDV+ ELISA kit.

Reference Serum	Average SP <sup>A,B</sup> Ratio Values	SBIO NDV+ ELISA SP Range <sup>C</sup>	SBIO NDV+ ELISA Titer Values <sup>D</sup>
Normal Control Serum (NCS)	0.001	-	0
Infectious bursal disease virus (IBD)	0.002	-	0
Infectious bronchitis virus - Mass (IBV)	0.000	-	0
Avian reovirus (REO)	0.000	-	0
Newcastle disease virus (NDV)	<b>1.420</b>	<b>+</b>	<b>9182</b>
Avian encephalomyelitis virus (AE)	0.020	-	0
Infectious bronchitis virus - Ark (IBV)	0.010	-	0
Infectious bronchitis virus - Con (IBV)	0.010	-	0
Infectious bronchitis virus - JMK (IBV)	0.010	-	0
Mycoplasma gallisepticum (Mg)	0.000	-	0
Mycoplasma synoviae (Ms)	0.000	-	0
Hemorragic Enteritis Virus (HEV)	0.000	-	0
Chick Anemia Virus (CAV)	0.010	-	0

<sup>A</sup>Values are the arithmetic mean of 15 replicate samples (3 replicates / 5 ELISA plates)

<sup>B</sup>Sample SP Ratio =  $\frac{\text{Optical Density (OD) sample} - \text{Avg. OD Normal Control}}{\text{Avg. OD Positive Control} - \text{Avg. OD Normal Control}}$

<sup>C</sup>SBIO NDV+ ELISA SP threshold ranges: Negative (-) =  $\leq 0.150$   
Positive (+) =  $> .150$

<sup>D</sup>Log<sub>10</sub> titer =  $(1.464 \times \text{Log}_{10} \text{SP}) + 3.740$

### 2. Sensitivity

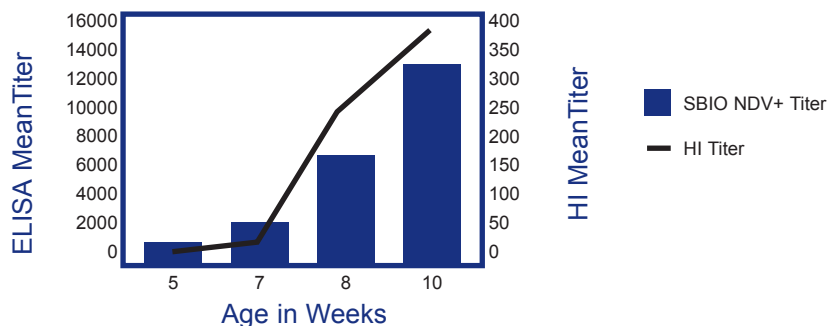
The data shown in Chart 1 (see reverse side) demonstrate the sensitivity of the Synbiotics NDV+ ELISA kit as compared to the conventional HI test. Broiler breeder flocks were vaccinated with a typical NDV program and bled at 5, 7, 8, and 10 weeks of age after the second vaccination. All sera were tested for NDV antibodies with the Synbiotics NDV+ ELISA and the HI.

# NDV+

ProFLOK<sup>®</sup> PLUS

Chart 1. Sensitivity. Comparison of SBIO NDV+ ELISA titer values, and titer values to the conventional NDV HI test.

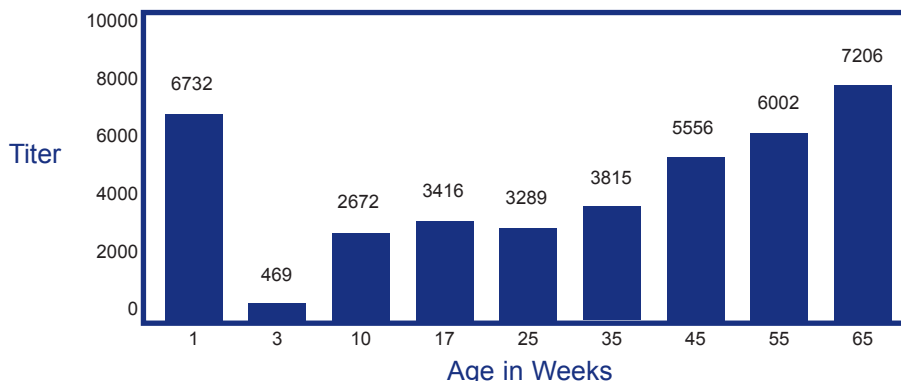
Correlation between HI and NDV+ ELISA



The data presented in Chart 2 indicate a typical antibody profile obtained with the Synbiotics NDV+ ELISA kit for breeder flocks following a typical vaccination program. All Synbiotics ELISA kits are optimized to provide valid, reproducible results test after test, day after day.

Chart 2. Typical antibody profile. Each data point represents the antibody response to a typical NDV vaccination program of approximately 350 flocks. Measured using the SBIO NDV+ ELISA test.

Temporal Response to NDV Vaccination



## Interpreting Results

Evaluate Synbiotics NDV+ ELISA results for the following:

### 1. Uniformity

- Measured by the coefficient of variation value (CV%).
- the lower the CV% value for a flock tested, the better the titer value uniformity.
- Strive for the best 1-3 day old, pre-vaccination, and post-vaccination NDV titer value uniformity (i.e. CV of less than 45%).

### 2. Titer Values

SP Threshold: Each Synbiotics ELISA kit has a sample-to-positive (SP) value threshold that clearly separates positive samples from negative samples. A negative sample is one that is not significantly different from the kit normal control serum. The SP threshold for the NDV+ ELISA is as follows:

SP Range	Titer Range
0.150 or less	0
0.151 and greater	345 and greater

Vaccination Evaluation: Compare pre- and post-vaccination ELISA average mean titers, geometric mean titers and %CV values. A flock geometric mean titer following vaccination of 1800 is considered to be "protective". Note: Postvaccinal NDV+ ELISA values depend on a variety of factors such as NDV vaccine strain, route of administration, age of bird, etc. The goal of any vaccination program should be to achieve as uniform postvaccinal titer values for each vaccinated flock (i.e. %CV 45 or less) as possible.

Flock Profiling: Review ELISA flock profiles and correlate NDV+ ELISA titer levels to vaccination program, flock economic performance data (body weight gain, feed conversion, mortality, etc.) and presence or absence of field infection.

## References

1. Spalatin, J., R.P. hanson and T.D. Joes. Edema of the eyelid and face of chickens exposed to viscerotropic type Newcastle virus. Avian Diseases: 17:623-628. 1973.

2. Utterback, W.W. and Schwartz, J.H., Epizootiology and velogenic viscerotropic Newcastle disease in Southern California, 1971-73. Am. Vet. Med. Assoc. 163:1080. 1973.

3. Hanson, R.P., Newcastle disease. In Diseases of Poultry, 7th edition. Edited by M.S. Hofstad, et. al. Ames, Iowa State University Press, 1978.



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