

Bordetella avium Antibody ELISA

The Synbiotics **Bordetella avium Antibody (BA) ELISA Kit** is a rapid, specific and sensitive USDA-licensed immunoassay for the detection of BA antibodies in turkey serum samples.

Bordetella avium is the causative agent of bordetellosis which is commonly referred to as turkey coryza¹. Bordetellosis is a highly contagious disease of the upper respiratory tract of turkeys characterized by abrupt onset of sneezing, oculonasal discharge, stunted growth and predisposition to other infectious disease². High morbidity and low mortality has also been reported³.

Plate Antigen

The BA test plates have been coated with inactivated, non-pathogenic, vaccine strain of *Bordetella avium*.

Kit Performance

The Synbiotics BA ELISA kit has been extensively tested for the following parameters:

1. Stability

The Synbiotics BA ELISA kits have a shelf-life of 18 months from the date of manufacture. The expiration date for each kit is clearly marked on the kit box label.

2. Specificity

The results shown in Table 1 below indicate that the Synbiotics BA ELISA kit demonstrates excellent specificity to BA antibody samples, but does not react significantly to other infectious agent antibodies. The Synbiotics BA 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 for an antigen specificity panel assayed with the SBIO BA ELISA test.

Antigen	Average SP ^{A,B} Ratio Values	SBIO IBD ELISA SP Range ^C
Infectious bronchitis virus (IBV) Mass.	0.030	-
Infectious bronchitis virus (IBV) Ark.	0.010	-
Infectious bronchitis virus (IBV) Conn.	0.040	-
Reovirus (REO)	0.010	-
Infectious laryngotracheitis virus (ILT)	0.010	-
Newcastle disease virus (NDV)	0.000	-
Infectious bursal disease virus (IBD)	0.010	-
<i>Bordetella avium</i>	3.291	+

^AValues are the arithmetic mean of 15 replicate samples (3 replicates / 5 ELISA plates)

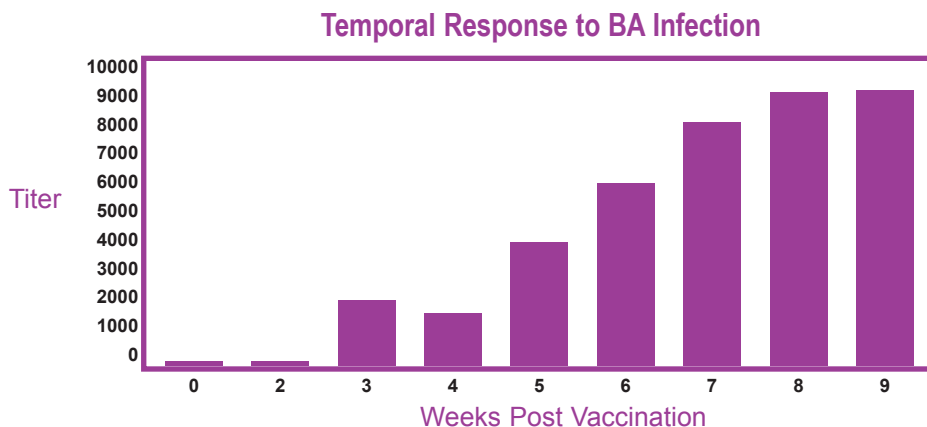
^BSample SP Ratio = $\frac{\text{Optical Density (OD) sample} - \text{Avg. OD Normal Control}}{\text{Avg. OD Positive Control} - \text{Avg. OD Normal Control}}$

^CSBIO BA ELISA SP threshold ranges: Negative (-) = ≤ 0.299
Positive (+) = > 0.299

3. Sensitivity

A study was conducted to view the relative sensitivity of the Synbiotics BA ELISA. A turkey flock was vaccinated at 3 weeks of age and again at 6 weeks of age. All birds were bled weekly. The temporal vaccine response is exhibited in Chart 1 below.

Chart 1. Sensitivity.
Temporal response to inoculum with *B. avium* measured using the SBIO BA ELISA test.



Suggested Uses

1. BA Vaccination Evaluation:
 - Randomly collect and assay 30 or more serum samples per flock immediately prior to BA vaccine administration (pre-vaccination) and 14 to 18 days post vaccination.
2. Routine BA 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).

Interpreting Results

Evaluate SBIO BA 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 BA 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 BA ELISA is as follows:

SP Range	Titer Range
0.299 or less	0
0.300 and greater	270 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 2000 is considered to be “protective”. Note: Postvaccinal BA ELISA values depend on a variety of factors such as BA 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 BA 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. Kersters, K., K.H. Hinz, A. Hertle, P. Segers, A. Lievens, O. Siegmann and J. De Ley. 1984. *Bordetella avium* sp. nov. isolated from the respiratory tracts of turkeys and other birds. *Int J Syst Bacteriol* 34:55-70.
2. Arp, L.H. and J.K. Skeels. *Bordetellosis (Turkey Coryza)*. In: *Diseases of Poultry*. 9th edition (edited by B.W. Calnek, et al.) Iowa State University Press, Ames, Iowa, 1991.
3. Saif, Y.M., P.D. Moorhead, R.N. Dearth and D.J. Jackwood. 1980. Observations on *Alcaligenes faecalis* infection in turkeys, *Avian Dis* 24: 665-684.