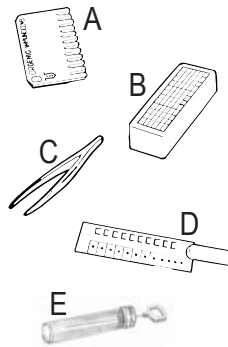


## XI. STORAGE & HANDLING

1. Store the kit under normal refrigeration (2° – 8° C or 36° – 46° F). Do not freeze the kit.
2. Before conducting the test maintain all kit elements and specimen at room temperature – preferably for 60 – 120 minutes (or incubate only the developing plate for 22 minutes at 37° C / 98.6° F). Perform assay at room temperature 20° – 25° C / 68° – 77° F.
3. Avoid spillage and cross-contamination of solutions.
4. Mix reagents by inverting the developing plate several times prior to use.
5. Do dot mix reagents from different kits or from different compartments of the same kit.
6. **Do not touch the teeth of the ImmunoComb® card.**
7. When using developing plate, pierce the cover of each compartment according to the test procedure instructions. **Do not remove the aluminum cover of developing plate all at once.**
8. The ImmunoComb® kit contains inactivated biological material. The kit must be handled and disposed off in accordance with accepted sanitary requirements. It is recommended to incinerate the kit after use.

## XII. KIT CONTENTS

Components	12 Test Kit (50CPD201)	120 Test Kit (50CPD210)
A. ImmunoComb® card (wrapped in aluminum foil)	1	10
B. Developing plate	1	10
C. Disposable tweezers	1	1
D. Calibrated CombScale	1	1
E. Unit of 12 capillary tubes & one piston	1	May be purchased upon request.
Instruction manual	1	1



## XIII. REFERENCES

- AAHA Vaccine Task Force. (2006). *JAAHA*, **42**, 80-89.  
Dudley et al. (1998). *JAVMA*, **213(1)**, 72-75.  
Pollock & Carmichael. (1982). *JAVMA*, **180(1)**, 37-42.  
Waner et al. (2006). *J. Vet. Dia. Invest.*, **18(3)**, 267-270.

For further assistance please contact your local Distributor, or Biogal Galed Laboratories directly by E-mail: [info@biogal.co.il](mailto:info@biogal.co.il) or by tel: 972-4-9898605 / fax: 972-4-9898690.

**Biogal's**  
**ImmunoComb®**

# ImmunoComb®

## CANINE PARVOVIRUS & DISTEMPER

IgG

## ANTIBODY TEST KIT

### INSTRUCTION MANUAL

Sufficient for 12/120 assays

15.11.08



Biogal Galed Laboratories, tel: 972-4-9898605. fax: 972-4-9898690, e-mail:[info@biogal.co.il](mailto:info@biogal.co.il)

[www.biogal.co.il](http://www.biogal.co.il)

## I. INTENDED USE OF THE KIT

The ImmunoComb® Canine Parvovirus and Distemper IgG Antibody Test Kit is designed to determine dog serum antibody titers to Canine Parvovirus (CPV) and Canine Distemper Virus (CDV). The main purpose of this kit is to provide a useful tool for assessing immunity status of dogs concerning these two pathogens. As such, it can either determine the IgG titer before and following vaccination or infection.

## II. GENERAL INFORMATION

Canine Parvovirus (CPV) and Canine Distemper Virus (CDV) are recognized as important causes of illness and death in dogs. Puppies are most susceptible to CPV and CDV, especially after weaning when protective maternally derived antibody (MDA) levels decrease. Sometimes MDA may actually interfere with vaccinations that are given for immunization.

In many countries, vaccination programs have significantly curtailed, but not eliminated the incidence of these diseases. Thus, CPV and CDV continue to be of great clinical concern among veterinarians worldwide and still present a diagnostic challenge.

## III. WHAT IS THE IMMUNOCOMB® ASSAY?

The ImmunoComb® test is a modified ELISA, which can be described as an enzyme labeled "dot assay", that detects antibody levels in serum or whole blood.

The kit contains all the necessary reagents for developing the test. Results for the IgG CPV and CDV tests are obtained within 25 minutes.

## IV. HOW DOES THE IMMUNOCOMB® WORK?

■ The ImmunoComb® Kit contains 2 main components: a comb shaped plastic card, hereafter referred to as the Comb and a multi compartment developing plate.

■ The Comb has 12 teeth – sufficient for 12 tests. Each tooth will be developed in a corresponding column of wells in the developing plate. Individual or multiple tests are processed by breaking off the desired number of teeth from the Comb.

■ Test spots of, CPV and CDV are attached to each tooth on the Comb. The upper most spot is a Positive Reference. Purified CPV antigen is attached at the middle spot and purified CDV antigen is attached at the lowest of the 3 spots (see figure in section X).

■ The first step of the test is to deposit a serum, plasma or whole blood specimen in a well in row A of the multi-compartment developing plate.

■ Next, the Comb is inserted into the well(s) with the sample(s) and transferred to the remaining wells (B-F) at timed intervals, according to the step by step instructions (see p. 4). Specific IgG antibodies from the specimen, if present, bind to the antigen at the test spots.

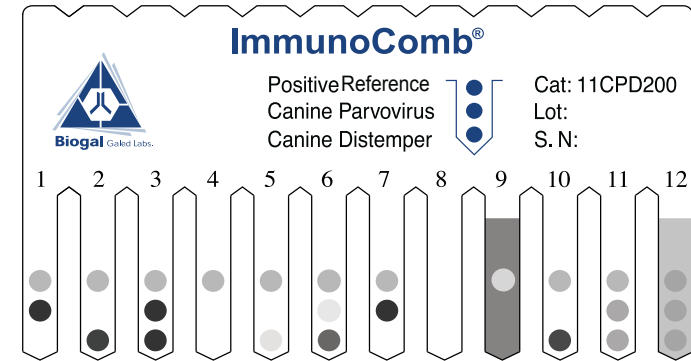
■ The Comb is transferred to the next well (row B) where non-bound antibodies are washed off.

■ The Comb is inserted into the following well (row C) which contains an enzyme labeled anti-dog IgG antibody which will bind to the antigen-antibody complexes at the test spots.

■ After 2 more washes (rows D & E) the Comb is moved to the next well (row F), where a color result develops via an enzymatic reaction.

■ The intensity of the color result corresponds directly to the antibody level in the test specimen. Results are scored using the Positive Reference spot and CombScale (see section IX).

## X. EXAMPLE OF A DEVELOPED COMB



Tooth No.	Results of Parvovirus		Results of Distemper Virus	
1	≥S5	High Positive	S0	Negative
2	S0	Negative	≥S5	High Positive
3	≥S5	High Positive	≥S5	High Positive
4	S0	Negative	S0	Negative
5	S0	Negative	S1-2	Inadequate immunity
6	S1-2	Inadequate immunity	S4	Positive
7	≥S5	High Positive	S0	Negative
8*		Invalid		Invalid
9**		Invalid		Invalid
10	S0	Negative	≥S5	High Positive
11	≥S3	Positive	≥S3	Positive
12***	≥S3	Positive	≥S3	Positive

### Remarks:

\* No Positive Reference. Repeat test.

\*\* High background. Repeat test.

\*\*\* High background with positive results.

## VIII. READING AND INTERPRETING THE IgG ANTIBODY RESULTS

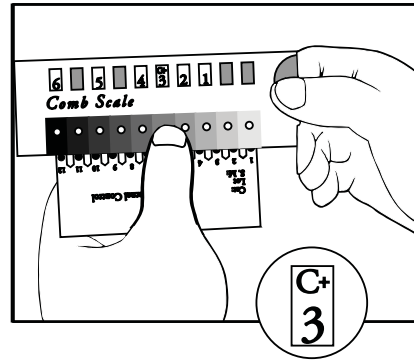
- The upper most spot is the Positive Reference spot and it should give a distinct purple-grey color. This is the same color tone that is generated by a significant positive response of anti CPV antibodies at 1:80 titer of H.I. test or of anti CDV antibodies equal to 1:80 V.N. When using the CombScale, this spot should be read as S3 (see section IX).
- The middle spot on the Comb gives the result of CPV IgG antibodies in the specimen.
- The bottom spot on the Comb gives the result of CDV IgG antibodies in the specimen.
- Compare the color tone of CPV and CDV test spots with the Positive Reference spot (separately).
- A color tone that is equal or darker than the reference spot is considered a positive response.
- A faint color tone of S1 or less is considered a negative result.
- To evaluate the antibodies score use the CombScale provided in the kit (see section IX).

## IX. READING RESULTS WITH THE COMBSCALE

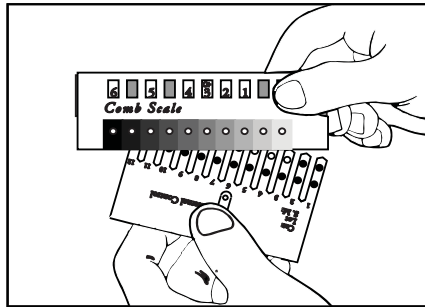
The CombScale S value is the number that appears in the yellow window corresponding to the color tone, when Positive Reference color is calibrated to S3.

When the Comb is completely dry, align it with the calibrated color CombScale provided in the kit. Find the tone of purple-grey on the CombScale that most closely matches the **Positive Reference spot** (upper spot). Slide the yellow ruler until the C+ mark appears in the window above that color you just found.

**Hold the slide in this position during the entire reading.** This step actually calibrates the C+ to S3, which is the “cut-off” point to which test spots will be compared.



**While holding the slide,** find the tone of purple-grey on the CombScale that most closely matches the desired **test result spot** (one of the lower spots). The number that appears in the window above is the CombScale score (S0-S6). Repeat this step with every test spot separately.



Another way to read the results is by using the CombScan. This is a software program that utilizes a computer and a TWAIN compatible scanner. When a Comb is placed on the scanner, the program translates the color results into numerical values. The CombScan assists labs in reading ImmunoComb® results and conserving the data, and is supplied free of charge upon request.

## V. DESCRIPTION OF DISEASES

### CPV

Canine Parvovirus spread of infection can occur via exposure to contaminated surroundings. The clinical signs of CPV include lethargy, depression, inappetence, fever, vomiting and diarrhea (sometimes with blood). Mortality is high in puppies.

### CDV

Canine Distemper Virus is naturally transmitted from dog to dog by aerosol route. Natural CDV infection may cause transient fever that can pass unnoticed. In some cases, when illness develops it is characterized by intermittent fever, depression, oculo-nasal discharge and anorexia. Respiratory and/or gastrointestinal signs may follow. In dogs that survive the acute stages of the disease, many (but not all) will develop central nervous system (CNS) signs, including optic neuritis and retinal lesions. The best known CNS signs are ataxia, paresis and seizures.

## VI. DIAGNOSIS

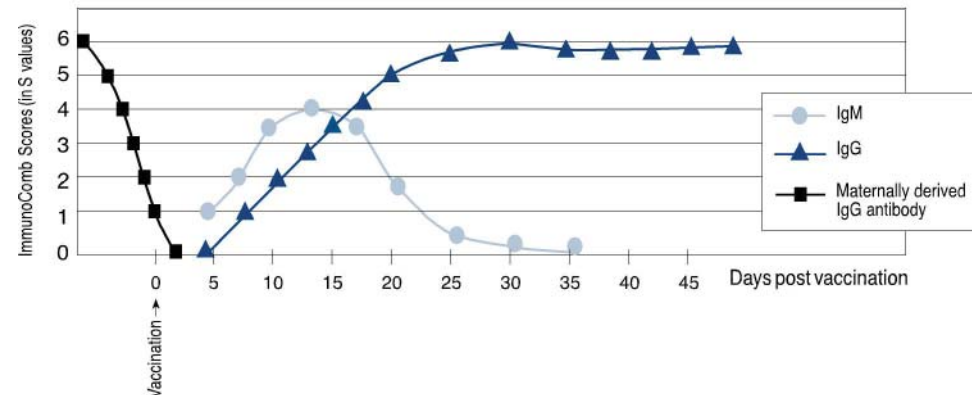
Veterinarians typically make a presumptive diagnosis of CPV and CDV based on clinical signs which range in severity from mild to severe.

Laboratory tests can be helpful for confirming the diagnosis. In addition to hematology and blood chemistry, serology is becoming a more widely accepted diagnostic tool.

Serology provides a broader picture of the dog's immunologic status. The humoral immune response is largely composed of 2 classes of immunoglobulins (antibodies), IgM and IgG. In the initial days following infection or vaccination, IgM antibodies are produced in large amounts. Later, IgM titers decline while IgG levels increase. Therefore, in dogs that are capable of mounting an immune response, elevated levels of IgM indicate recent infection.

The absence of IgM antibodies with an elevated IgG titer suggests that exposure to the virus occurred earlier, and the dog is currently immune. Elevated IgG levels are typically found in dogs that survive the acute phase of infection, or following vaccination (Fig. 1).

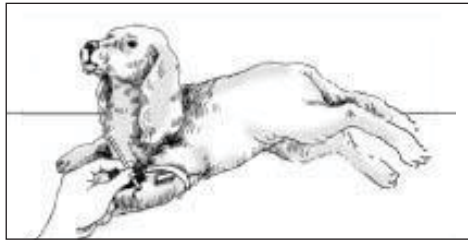
Fig. 1 - Post-Vaccination Antibody Levels to CPV & CDV in Healthy Dogs



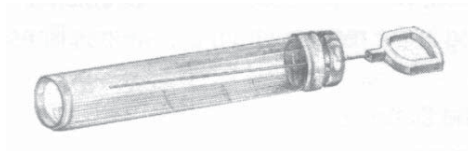
## VII. STEP BY STEP WITH IMMUNOCOMB®

Perform assay at room temperature of 20°-25° C (68° - 77°F).

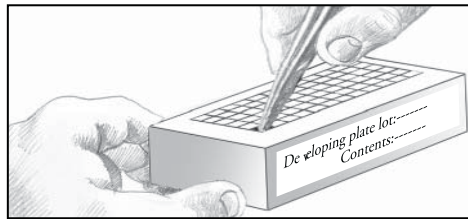
(1) Obtain blood sample from dog.



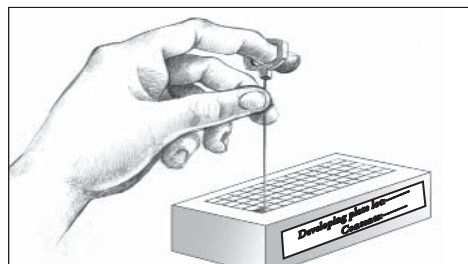
(2) Use a pipette or a capillary tube\*.  
For testing whole blood use 10µl.  
For testing serum/plasma use 5µl.



(3) Use the tweezers to pierce the protective aluminum cover of row A. One well for each specimen.



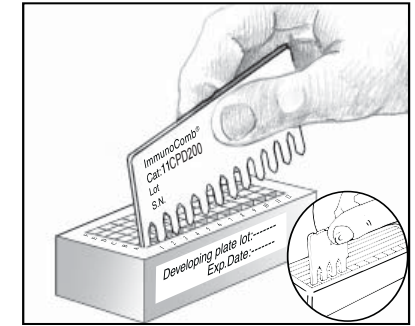
(4) Deposit a sample into a well in row A. Raise and lower pipette/piston plunger several times to achieve mixing.



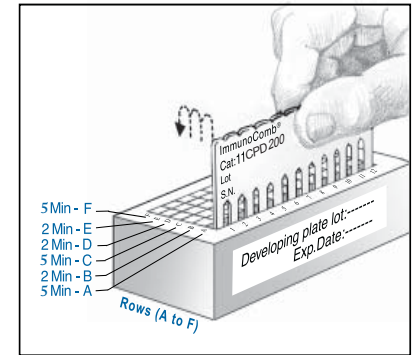
Do not open any well of row A or other rows which you do not intend to use.

\* Unit of 40 capillary tubes & one piston may be purchased upon request.

(5) Remove the Comb from its protective envelope. For testing less than 12 samples, cut or break the Comb by folding in allocated notches for the number of tests required. Insert the Comb into the open well(s) in **row A** (printed side facing you) and incubate for **5 minutes**. To improve mixing, gently dip Comb **up and down** at the start of each incubation (each row). Repeat this motion at least twice in all of the remaining rows.



(6) Use tweezers to pierce the foil of the next well (**row B**), and insert Comb for **2 minutes**. Before transferring Comb from one well to the next, pierce the foil of the next well. Gently shake off excess liquid from Comb teeth onto a tissue. Insert Comb into the next well (**row C**) for **5 minutes**. Place Comb into the remaining wells (**row D & E**) for **2 minutes** each and the last well (**row F**) for **5 minutes**.



(7) Upon completion of the color development in **row F**, **move the Comb back to row E** for **2 minutes** for color fixation. Take the Comb out and let it dry for 1-10 minutes.

