

# **RapidVet<sup>®</sup>-H GEL Feline**

## **One-Tube Gel Test**

### **For Identifying Feline A, B and AB Blood**

**For *in vitro* use**

#### **Description and Intended Use:**

**RapidVet<sup>®</sup>-H GEL Feline Blood Typing Test** is intended for use to classify cats as blood group Type A, Type B or Type AB.

The importance of identifying blood groups in cats has increased in recent years, particularly in transfusion medicine, because only by predetermining the blood type of the transfusion recipient can potentially fatal transfusion mistakes be avoided.

One blood group system consisting of two antigens expressed either alone or in combination has been described in cats: Type A, Type B and Type AB. The antigens are unrelated to human A B O antigens and are defined by feline alloimmune sera. Blood group incidence varies among breeds.

Blood groups in cats are inherited as simple autosomal traits, with Type A being dominant over Type B. Most cats possess the A antigen, and about one-third of those have naturally occurring, low-titered, anti-B antibody. Type B cats all have a naturally occurring, high-titered anti-A antibody. A recent survey in the United States showed that the percentage of cats with the B antigen varied depending on the breed. Type AB cats are rare and such cats have both A and B antigens on the erythrocyte membrane but do not have naturally occurring antibodies to either type.

Other feline blood types are being identified, such as the MIK type. These are not yet sufficiently defined to develop a blood typing test for them.

#### **Principle and Explanation of the Assay:**

The RapidVet-H GEL Feline Blood Typing Test is an agglutination system based on a tube containing a gel of special composition and porosity and having dispersed within it various other substances, including an antibody reactive to varying degrees with Types A, B and AB blood. When run on a fixed-angle centrifuge at a specific aggregate centrifugal force, three visually distinctive results based on the degree of agglutination are obtained for Types A, B and AB blood.

A diluted blood sample is pipetted into the gel tube and the tube centrifuged for a period of time, the time and speed depending on the model centrifuge used.

## Reagents and Materials

The RapidVet-H GEL Feline test kit consists of 5 work stations, each containing various tubes, and 10 disposable plastic pipettes, 2 for each test. Pipettes accurately dispense 50  $\mu$ L. Instructions, centrifuge guide, photo interpretation guide and report cards are also included in each kit.

Each work station contains:

- one **blood prep tube** pre-filled with the amount of diluent required to prepare a properly diluted blood sample
- one gel tube which contains a substance positive for feline erythrocytes and which acts as the **positive control**
- one gel tube which acts as the **reaction** tube.

**Storage and Stability:** Store upright. Refrigerate kits at 2 to 7 °C. Shelf life is 24 months from date of manufacture. Each test is labeled with an expiration date. DO NOT FREEZE.

**Caveat:** In the case of an auto-agglutinating patient, it will not be possible to definitively type the patient without separating the serum and serially washing the remaining red cells prior to performing the test. Refer to [rapidvet.com](http://rapidvet.com) under “Downloads” tab for Cell Wash procedure.

## Test Procedure:

1. Test is designed to be run on a centrifuge with a fixed-angle rotor.
2. Test should be stored upright and remain refrigerated until just prior to use. If the gel tubes have not been stored upright, allow them to sit in refrigerator for 10 minutes before use.
3. Obtain EDTA anticoagulated whole blood. The collection tube or syringe **MUST** be filled to ensure a proper concentration of EDTA. If blood type is not to be immediately determined, anticoagulant preservatives such as CPDA should not be added. Packed red blood cells may be used but should be diluted 1:1 with saline before use.
4. Remove 1 work station and 2 pipettes from the box.
5. Remove cap from blood prep tube. Using 1 pipette provided, add 1 drop (50  $\mu$ L) of blood to the tube. Replace cap. Gently invert several times to ensure mixing. Replace blood prep tube into work station and remove cap.

**Use the remaining clean pipette for the following two steps. Avoid touching pipette to either tube when transferring drops from blood prep tube.**

6. Remove cap from positive control tube. Transfer 1 drop (50  $\mu$ L) of diluted blood from blood prep tube to the positive control tube. Replace cap without mixing. **IMPORTANT:** Increase to 3 drops (150  $\mu$ L) if the animal's PCV is less than 15.
7. Remove cap from reaction tube. Transfer 1 drop (50  $\mu$ L) of diluted blood from blood prep tube to the reaction tube. Replace cap without mixing. **IMPORTANT:** Increase to 3 drops (150  $\mu$ L) if the animal's PCV is less than 15
8. Allow positive control tube and reaction tube to incubate undisturbed at room temperature for 5 minutes.
9. Centrifuge the tubes at the speed and time specified on the enclosed chart.

**While a fixed rotor centrifuge is recommended, any centrifuge can be used, although a swing rotor may make interpretation difficult. If you do not have one of the listed centrifuges, refer to [rapidvet.com](http://rapidvet.com) under "Downloads" tab for a more complete GEL test centrifuge list; or call toll-free in US and Canada: (800) 567-4367; or (908) 782-3353.**

10. Remove and examine the tubes.

**Results:** Use included photo interpretation guide to interpret results.

1. The positive control tube should have a red line of agglutinated cells at or near the top of the gel column. At times, there may be some slight dispersal below the top. If the control does not react as stated, **DO NOT** proceed with the interpretation of the test.
2. Interpret result in reaction tube as follows:
  - If the vast majority of the RBCs are found at or near the very top of the gel, usually in a tight line, the cat is Type A. At times there might be a slight dispersal below the top.
  - If the vast majority of the RBCs are found at the bottom of the gel or in a bell-shaped curve, the cat is Type B.
  - If the RBCs are found evenly dispersed throughout the length of the gel (although there may be a concentration at the top and/or bottom), the cat is Type AB. **NOTE:** It is currently the predominant view that all AB results should be confirmed by "back-typing."

## Limitations of the Procedure:

It is becoming recognized that the A antigen on the red cells of Type AB cats can differ in its characteristics. Thus, the result noted as indicative of a Type AB cat may vary slightly. Although cats with Type AB blood theoretically do not have alloantibodies, if an AB donor is not available, it is recommended that these cats receive Type A blood to prevent minor incompatibility reactions.

## Performance Characteristics:

A total of 86 feline samples were run a total of 394 times on various centrifuges and were tested for both within-day and day-to-day repeatability. Of the total, 17 Type A, 17 Type B and 16 Type AB samples were obtained from a source that maintains healthy cats of established blood types. An additional 34 Type A, 1 Type B and 1 Type AB samples were obtained from the laboratory of a university small animal hospital, the samples being a portion of all samples arriving within a defined period of time (only 1 being presented for an annual checkup). The blood types deemed correct for the samples from the laboratory were determined by other established methodologies.

	Type A	Type B	Type AB
Sensitivity	98.0	100.0	94.8
Specificity	97.4	100.0	98.7
Accuracy	97.7	100.0	97.7

The overall accuracy of the test is 98.5%.<sup>1</sup> This is higher than that reported for other methodologies available.<sup>2</sup>

**Quality Control:** All reagents and materials incorporated into this kit have been quality controlled by standard testing procedures using a routine quality control program during manufacture.

**Disposal:** Dispose of all biological materials, pipettes and tubes in a biohazard container.

<sup>1</sup> The data for sensitivity and specificity on the individual A, B and AB segments is available from DMS.

<sup>2</sup> Seth, M., Jackson, K.V., & Giger, U. (2011) Comparison of five blood-typing methods for the feline AB blood group system, *American Journal of Veterinary Research*; 72(2): 203-209.

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