



Diagnositics 101 - The CBC



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For many horse owners, the only time they run into “routine blood work” is in a situation that is anything but routine. An emergency, where the horse is hurt or sick, or a prepurchase examination, for which the sale depends on the outcome of the blood work. In all cases, an understanding of exactly what those blood values are and what they might mean to your horse is important for any horse owner. Blood work is not just done on sick or injured horses, but as a part of wellness care, for monitoring of response to treatment, as a screening before surgery, or a requirement for prepurchase or insurance examinations.

The abbreviation, CBC, stands for “Complete Blood Count”, and looks at the kinds and numbers of cells in the blood, especially the red blood cells (RBC), the white blood cells (WBC) and the platelets. Next to the physical examination, the CBC is one of the most basic tools available to a veterinarian

to assess the physical well being of your horse. Because blood is basically a fluid “tissue” that circulates throughout the body, it comes into contact with virtually every other tissue that the horse possesses. It should not surprise us, then, that the blood can tell us so much about the horse’s overall health status. Blood functions to deliver oxygen, to remove waste, to provide necessary nutrients and to carry other cells throughout the body. The fluid part of blood is called plasma, which contains electrolytes, enzymes, vitamins, gases, pigments and hormones. Serum is the fluid that remains when fibrinogen and fibrin are removed. The CBC is, therefore, a way to assess the RBC, which provide information about anemia, and the WBC that can tell us about infection, inflammation, cancer, parasitism, and the general response of the immune system.

How is the CBC performed? The blood is drawn, typically from the jugular vein in the horse’s neck, into a special tube that contains EDTA, a substance that keeps the blood from clotting such that the automated CBC machine at the lab is able to count the cells. This tube is called a “purple top tube” and is also used for blood samples collected for DNA testing.

On the following pages, you will find a table that I hope provides a quick look and handy reference for all horse owners and caretakers. At the Fenway Foundation For Friesian Horses, we have come to realize just how important it is for us to become familiar with the blood values of the Friesian horse. Through our blood study, we hope to provide insight into how Friesians are alike and different from the general horse population. For more information on how to become a part of the blood work research project, please contact The Fenway Foundation For Friesian Horses via phone, fax, our website or our Facebook page.

**Look for the next article of this series....
Diagnositics 101 - The Blood Chemistry**



Abbreviation	What it Means:	What Does it Tell Us?
CBC	Complete Blood Count	Looks at the kinds and numbers of cells in the blood. It includes the RBC, HGB, HCT, WBC, differential, MCV, MCHC and platelet values. Collected in a "purple topped" tube that contains EDTA to keep the blood sample from clotting.
RBC	Red Blood Cell Count	These are the cells that carry oxygen to all tissues of the body and return to the lungs with carbon dioxide that is exhaled. If low - anemia if high - erythrocytosis. Can be influenced by breed, age, and level of stress/excitement at the time of the blood sampling.
HGB	Hemoglobin	This is the molecule in the RBC that carries oxygen and gives the RBC its characteristic red color. This value can be a good indicator of the blood's ability to deliver oxygen throughout the body.
MCV	Mean Corpuscular Volume	Average volume of one RBC. This measurement of RBC volume is important because RBCs become smaller as they mature. If a horse's MCV is increased, this means that young RBCs are being put into circulation in response to a need by the horse for more RBCs. Example: hemorrhage.
MCHC	Mean Corpuscular Hemoglobin Concentration	Looks at the average concentration of hemoglobin within the average RBC. If increased, it can mean that RBCs are being destroyed within the blood stream, decreased values can indicate anemia due to chronic blood loss (iron deficiency).
MCH	Mean Corpuscular Hemoglobin	This value represents the total amount of hemoglobin in one average RBC. This value is less often used in the horse.
RDW	Red Cell Distribution Width	This value is obtained from automated blood analyzers and tells us about the variation in size of the RBCs in the blood sample. Example: It can help determine if a horse is responding correctly in the case of anemia by naturally producing more RBCs.
PCV	Packed Cell Volume	Also called HCT or Hematocrit. Measures the "space" or volume the RBC take up in the blood and is expressed as a percentage. A PCV of 40% means that approximately 40% of the blood's volume is made up of RBCs. When PCV is low, this can indicate anemia; when PCV is high, this can indicate dehydration.



Abbreviation	What It Means:	What Does it Tell Us?
WBC	White Cell Count	These are the different cells that protect the body from infection. WBCs are larger than RBCs. With bacterial infection, for ex., the WBC rises very quickly and can be used to help detect the infection. WBCs can also be used to monitor therapy, as this number should decrease if treatment is effective.
WBC Diff.	White Blood Cell Count Differential	Gives the actual number and percentages of the different types of WBCs in the blood sample. Types of WBCs include neutrophils, lymphocytes, monocytes, basophils and eosinophils. An increase can mean an infection or a normal physiologic change in response to excitement. A decrease in neutrophils or lymphocytes always indicates that presence of disease.
	Neutrophils	First line of defense against infection and the most numerous WBC. The ability of the horse to respond to an infection is measured by the number of these cells and the "intensity" of the response (the presence of immature neutrophils).
	Lymphocytes	Another type of immune cell, second most numerous. Acute viral infections can decrease the lymphocyte count, as can stress, immune disease, severe malnutrition or administered steroids. The lymphocyte count can be increased excitement and chronic infections.
	Monocytes	Typically seen in very low numbers. Monocytes come from the same cell lines as neutrophils. Increases can be seen with stress or disease. A decrease is not typically considered significant.
	Eosinophils	Usually seen in low numbers. An increase in eosinophils can indicate internal parasites or allergic conditions (esp. those affecting the skin, lungs and GI tract). A decrease is not typically considered significant.
	Basophils	Present in very low numbers. Increases in basophils will sometimes be seen with the same conditions that cause eosinophils to be increased. A decrease is not typically considered significant.
Platelets		The smallest type of blood cells, are also called "thrombocytes". Important for clotting. Too few platelets can lead to uncontrolled bleeding. Too many can lead to clot formation in small blood vessels.



Chart may be clipped from magazine and laminated for reader's personal use.