

A WHO'S WHO OF VACUTAINERS

The following are basic guidelines only – for specific or unusual tests, or if there is any doubt as to which sample to send, it is easier to call the lab first to confirm what sample is required, than have to re-sample an animal; or worse, a flock or a herd of animals!



BIOCHEMISTRY/ENDOCRINOLOGY

Serum (red top): The vast majority of biochemistry, endocrinology and serology tests require serum samples. Red top tubes contain no additive, and therefore there is no “correct” amount of blood required to fill them. A minimal requirement for most of our sick animal panels would be 1ml of whole blood, and we would prefer at least 2ml or more if possible. For very small animals (e.g. birds) or in other cases where only a limited amount of blood is available, it is sometimes a good idea to prioritize the tests requested, so that if there is insufficient blood for all, the most important tests are performed first.

Lithium heparin (green top): We have found that some clinicians routinely send a heparin sample as well as a serum sample for biochemistry tests – in these cases the serum will be used preferentially, and the heparin placed on hold. In some instances, only a very sample of each is provided, and these cannot be mixed together. As serum is the preferred sample, if only a small amount of blood can be drawn, it is better to send it all in a red top tube. There are some biochemistry tests that cannot be performed on or are not validated for heparin samples too, limiting the usefulness of submitting a heparin sample routinely. One exception is the test for Relaxin (for pregnancy testing in the bitch) in which a heparin tube is the required sample.

Fluoride oxalate (grey top): Recommended for testing glucose levels - note that glucose can be tested in serum or plasma if these are processed or separated from the blood clot within an hour of sample collection. If there is any longer delay, then the glucose in the blood will be utilized causing rapid decrease in glucose levels. Collection of blood into a fluoride oxalate tube inhibits this process.

HAEMATOLOGY

EDTA (purple top): EDTA is the preferred anticoagulant for almost all routine haematologic tests, including CBC assays. Note that EDTA tubes come in different sizes and require differing amounts of blood to provide the correct sample to anticoagulant ratio. This can be misleading as some tubes that appear the same size physically do vary in the amount of anticoagulant they contain – it is therefore important to check the tube you are using for the recommended blood volume (e.g. 1.5ml, 2ml, or 3ml) or for the “fill line” on the label; allowing a vacutainer to fill based on the vacuum in the tube should also ensure the correct ratio. The correct ratio is important, as too much blood for the amount of EDTA increases the probability of the sample clotting; and too little blood for the amount of EDTA can lead to “EDTA artefact”, or shrinkage of the red blood cells with distortion of the red cell morphology.

2.7ml 4.5ml 2ml



CITRATE (blue top): Citrate samples are required for coagulation profiles. Similar to the EDTA tubes, different sized citrate tubes contain differing amounts of anticoagulant, and it is if anything even more important to fill these tubes with the correct blood volume – citrate tubes contain a volume of anticoagulant equivalent to 10% of the total volume required i.e. the final sample should be a 1:9 dilution. If only a small amount of blood is added, the dilution effect of the anticoagulant on the results obtained can make a considerable difference to the clotting times. Our reference ranges are determined taking the dilution factor of a properly filled tube into account.