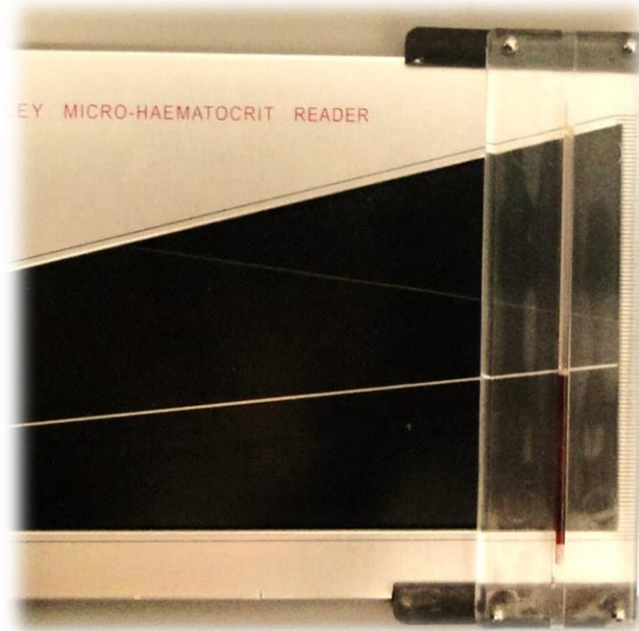


# Packed Cell Volume (PCV)



## Disclaimer

A series of booklets has been developed by the Clinical Skills Lab team (staff, recent graduates and students) from the School of Veterinary Sciences, University of Bristol, UK.

Please note:

- Each booklet illustrates one way to perform a skill and it is acknowledged that there are often other approaches. Before using the booklets students should check with their university or college whether the approach illustrated is acceptable in their context or whether an alternative method should be used.
- The booklets are made available in good faith and may be subject to changes.
- In using these booklets you must adopt safe working procedures and take your own risk assessments, checked by your university, college etc. The University of Bristol will not be liable for any loss or damage resulting from failure to adhere to such practices.

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Year Group: BVSc3 +



## Equipment for this station:

- Centrifuge
- Whole blood in heparin or EDTA tube
- Microhaematocrit (capillary) tubes
  - *N.B. There are prefilled microhaematocrit tubes in the Southwell Street CSL to practise using the microhaematocrit reader*
- Plasticine tray
- Paper towel or tissue
- Microhaematocrit reader
- Gloves

## Considerations for this station:

- Wear gloves
- Microhaematocrit tubes should be disposed of in a sharps bin
- Anything contaminated with blood must be disposed of in a clinical waste bin (unless it is sharp)
- Ensure you use the centrifuge as instructed; they can be dangerous
  - Always use the centrifuge on a flat, stable surface
  - Do not try to open the centrifuge while it is in operation
  - For more information please refer to the general risk assessment form 'Centrifuge CSL\_R04' (in the CSL)
- Handle glass capillary tubes with care. Instructions for handling capillary tubes can be found in 'CSL\_R01 Microscope slides' (in the CSL)
- Refer to 'CSL\_L01 Total Solids' to measure total solids (total proteins) in a blood sample from a microhaematocrit tube using a refractometer
- Make sure you are familiar with 'CSL\_I02 Lab Area Rules' and wear a correctly fastened lab coat/scrub top, mop up any spills and spray work surface with 1% Virkon and wash hands in the hand wash sink

Anyone working in the Clinical Skills Lab must read the 'CSL\_I01 Induction' and agree to abide by the 'CSL\_I00 House Rules' & 'CSL\_I02 Lab Area Rules'

Please inform a member of staff if equipment is damaged or about to run out.



# Clinical Skills: Packed Cell Volume (PCV)



1  
Switch on the centrifuge at the wall. Some centrifuges also have a switch on the machine. Open the lid – some centrifuges have a button while others have a catch.



2  
Unscrew the metal cover.



3  
Check that the centrifuge is clean and free from debris or previous samples.



4  
Gently invert the tube to mix the sample.

Hold the tube at an angle and introduce the microhaematocrit (capillary) tube. Allow blood to track up the tube. Continue until the tube is about 3/4 full.



5  
Put your index finger over the top of the capillary tube before removing it from the sample or blood will leak! Keeping your finger over the end of the tube, wipe the outside of the capillary tube clean with a piece of tissue.



6  
Make sure there is an area of the plasticine that is clear from previous holes. Place the capillary tube onto the plasticine then remove your index finger from the top. Having removed your finger then gently press the capillary tube into the plasticine and then withdraw the tube. Wipe the tube clean with a tissue.



7  
Check there is a sufficient plasticine plug. If not, then discard the capillary tube into a sharps bin and start again.



8  
Fill 2 tubes and place them opposite each other in the centrifuge. This is to balance the centrifuge; every tube must have another tube opposite it. Place the plasticine plug end of the tube against the rubber (outer) edge to stop the contents spilling out when spun.



9  
Screw the metal cover (plate) on firmly. Close and secure the centrifuge lid.

**Centrifuges are dangerous if used incorrectly so ensure that steps 8 & 9 are followed carefully.**

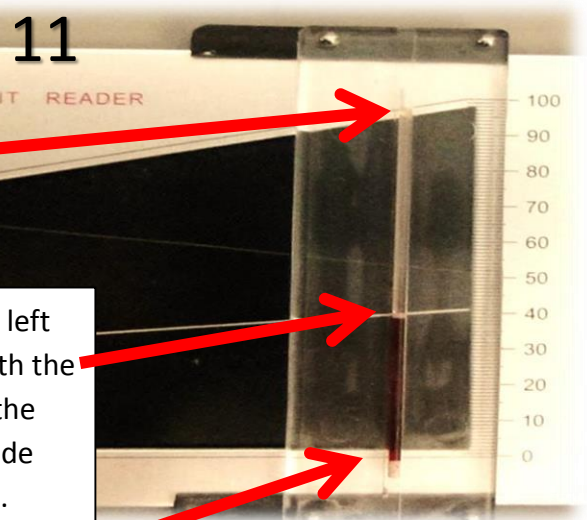


10  
Set the time to 5 minutes then start the centrifuge spinning. Once the centrifuge has come to a complete stop, open the lid and remove the metal cover (plate).

2) Adjust the tube on the slider so that the top of the plasticine is level with the bottom line (0%).

3) Move the slider so the top of the plasma fraction is level with the top line (100%).

4) Use the adjuster on the left to align the middle line with the top of the red cells. Read the PCV from the right hand side scale. In this case it is 41%.



1) Place the capillary tube onto the haematocrit reader. It should be positioned as shown above.

N.B. Refer to 'CSL\_L01 Total Solids' to measure total solids (total proteins) in a blood sample from a microhaematocrit tube using a refractometer.

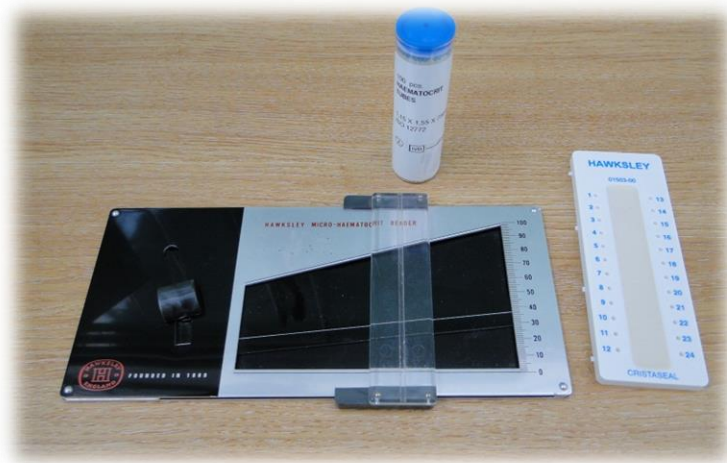


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# Resetting the station: PCV

1. Dispose of any glass in a sharps bin
  - *If using prefilled microhaematocrit tubes in the Southwell Street CSL return the tubes to the pot*
2. Dispose of any consumables contaminated with blood in the clinical waste bin
3. Clean any equipment contaminated with blood e.g. a disinfectant wipe
4. Return any reusable blood to the blood storage section of the fridge if no one else is waiting to use the station
5. Clean inside the centrifuge with e.g. a disinfectant wipe
6. Return all equipment to its storage container

*Station ready for the next person:*



Please inform a member of staff if equipment is damaged or about to run out.





# I wish I'd known: PCV

- Don't forget to mix the blood sample (gently invert the tube); if the sample has been sitting for a while the cells will have settled towards the bottom. If the microhaematocrit tube is inserted into an unmixed sample there is a risk that the reading will be incorrect (higher than the true reading).
- Make sure there is enough blood in the microhaematocrit tube – ideally it should be 3/4 full. If the tube is less full e.g. 1/2, the reading is likely to be inaccurate.
- If the blood isn't tracking up the microhaematocrit tube try increasing the angle of tilt (slightly more horizontal).
- Double check there is enough plasticine in the microhaematocrit tube so the blood won't leak.
- Make sure the plasticine is against the outer rim when placing the capillary tube in the centrifuge, otherwise there will be a mess to clear up!
- Recognising an abnormal PCV depends on knowing normal ranges. Do you know the normal ranges for PCV in different species?
- PCV is typically decreased in cases of anaemia and elevated if an animal is dehydrated.