

C2S Haematology Prac Answers

Q (1) Why does the vein need to be occluded to be visible?

The occlusion of the vein prevents the blood flowing towards the heart and causes the vein to fill with blood and thus bulge. This makes it easier to see where the vein lies.

Q (2) Would you expect a pulse to be visible normally?

Not in a vein and not in a normal artery.

Q (3) Why should you remove the needle from the syringe when expelling the blood sample into the tube?

The force required to push the blood back through the needle will damage the blood cells and may cause haemolysis which will affect the blood results.

Task 4 Differentials

Sheep

Total WBC count 5.1 x10 ⁹ /L			
Cell Type	Number counted	% of total	Absolute differential count x10 ⁹ /L
Lymphocytes		55	2.8
Neutrophils		33	1.7
Monocytes		12	0.6
Eosinophils		0	0
Basophils		0	0

Cow

Total WBC count 7.7 x10 ⁹ /L			
Cell Type	Number counted	% of total	Absolute differential count x10 ⁹ /L
Lymphocytes		65	5.0
Neutrophils		21	1.6
Monocytes		8	0.6
Eosinophils		5	0.4
Basophils		1	0.1

Dog

Total WBC count 15.3 x10 ⁹ /L			
Cell Type	Number counted	% of total	Absolute differential count x10 ⁹ /L
Lymphocytes		22	3.4
Neutrophils		69	10.6
Monocytes		7	1.0
Eosinophils		2	0.3
Basophils		0	0

Cat

Total white cells counted: _____

Total WBC count 13.8 x10 ⁹ /L			
Cell Type	Number counted	% of total	Absolute differential count x10 ⁹ /L
Lymphocytes		17	2.3
Neutrophils		52	7.2
Monocytes		1	0.1
Eosinophils		30	4.2
Basophils		0	0

What process/es could cause an eosinophilia in this cat?

Parasitism, allergies/hypersensitivities, immune-mediated disease, neoplasia

Horse

Total WBC count 7.9 x10 ⁹ /L			
Cell Type	Number counted	% of total	Absolute differential count x10 ⁹ /L
Lymphocytes		43	3.4
Neutrophils		51	4.0
Monocytes		4	0.3
Eosinophils		1	0.1
Basophils		1	0.1

Task 5 Case study

5-year old female Japanese Chin dog with a history of 3 days of lethargy, increased thirst and occasional vomiting. She has a fever and a tense caudal abdomen.

Haematology		Manual differential %	Manual absolute count	Analyser Results	Reference Values
Red cell count	x 10 ¹² /L			4.5	5.5 – 8.5
Haemoglobin	g/L			100	120 – 180
Haematocrit	L/L			0.28	0.37 – 0.55
Platelets	x 10 ⁹ /L			500	200 – 500
White cell count	x 10 ⁹ /L		135.0	135.0	6.0 – 17.0
Metamyelocytes	x 10 ⁹ /L	4	5.4		0
Bands	x 10 ⁹ /L	21	28.4		0 – 0.3
Neutrophils	x 10 ⁹ /L	56	75.6	108.4#	3.0 – 11.5
Lymphocytes	x 10 ⁹ /L	6	8.1	8.1#	1.0 – 4.8
Monocytes	x 10 ⁹ /L	13	17.5	17.5#	0.2 – 1.4
Eosinophils	x 10 ⁹ /L	0	0	0	0.1 – 1.3
Basophils	x 10 ⁹ /L	0	0	0	< 0.1
Total protein (ref.)	g/L			102	60 - 80
# Potential differential error due to suspect bands/toxic change					

The bands and metamyelocytes are immature neutrophils, released early from the bone marrow.

What process do the blood smear findings and haematology results suggest is going on in this bitch? Justify your answer

The neutrophilia with immature neutrophils (left-shift) supports inflammation, most likely a bacterial infection. Given she is an entire female a pyometron (infected uterus) is a major concern. Other possibilities (differentials) include pancreatitis, perforated GIT and septic peritonitis.

Task 6 Haematology Questions:

1. Why would a veterinarian wish to measure the total numbers and types of cells in blood?

Looking at the absolute counts and the morphology will assist with identifying potential causes of disease e.g. inflammation, neoplasia such as leukaemia, bone marrow disease.

2. What might cause a decline in the numbers of erythrocytes?

RBC can be reduced (anaemia) through inadequate RBC production (e.g. inflammation, chronic disease, marrow disease), or loss of RBC e.g. bleeding or RBC destruction/haemolysis. A low RBC count can also occur with plasma volume expansion e.g. IV fluid therapy, pregnancy, congestive heart failure.

3. What might cause an increase in the percentage of neutrophils?

An increased neutrophil count (neutrophilia) can occur with acute or chronic inflammation e.g. bacterial or fungal infections, immune-mediated disease, or neoplasia.

4. What might cause an increase in the percentage of eosinophils?

Eosinophilia can occur with intestinal parasites, such as roundworms and tapeworms, allergies or hypersensitivities (you will learn about these in DVM2), immune-mediated disease, and with some neoplasms (cancers) e.g. mast cell tumours, lymphoma.