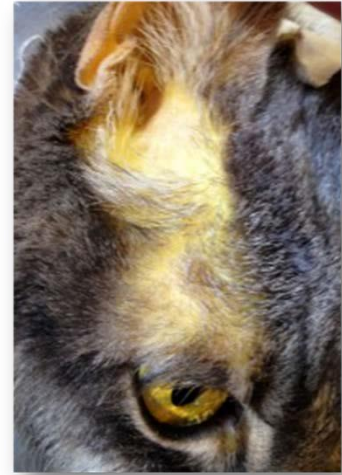


## Laboratory Investigation of the Liver and Biliary System Workshop

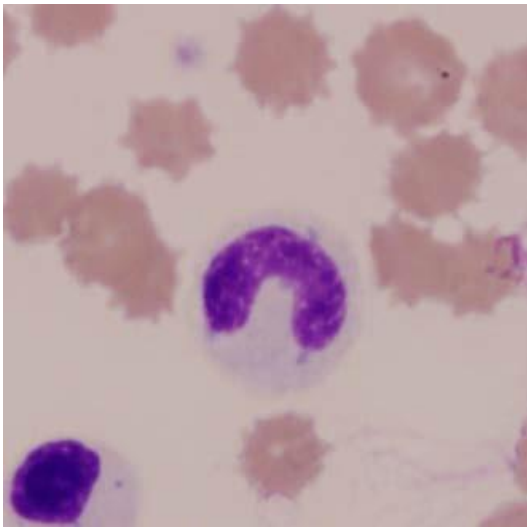
### Case 1: Lola

Lola is a 10-year-old, female spayed domestic short hair cat. She presented with decreased appetite, weight loss, lethargy and intermittent vomiting over the last few weeks. On physical exam, she looked overweight, jaundiced, had tacky mucous membranes and mild hyperthermia.



| CBC         | Units              | Result      | Reference interval |
|-------------|--------------------|-------------|--------------------|
| Haemoglobin | g/L                | 117         | 77-156             |
| RBC         | $\times 10^{12}/L$ | 7.2         | 4.9-10.0           |
| Haematocrit | L/L                | 0.36        | 0.25-0.48          |
| MCV         | fL                 | 52          | 43-55              |
| MCH         | pg                 | 16          | 13-17              |
| MCHC        | g/L                | 321         | 282-333            |
| WCC         | $\times 10^9/L$    | <b>25.1</b> | 5.5-19.0           |
| Neutrophils | $\times 10^9/L$    | <b>20.7</b> | 2.0-13.0           |
| Lymphocytes | $\times 10^9/L$    | 3.9         | 0.9-7.0            |
| Monocytes   | $\times 10^9/L$    | 0.5         | 0-0.7              |
| Eosinophils | $\times 10^9/L$    | 0           | 0-1.1              |
| Basophils   | $\times 10^9/L$    | 0           | <0.1               |
| Platelets   | $\times 10^9/L$    | 326         | 300-800            |

## DVM1 – Veterinary Bioscience: Metabolism



Blood film 100x

| Biochemistry         | Units  | Result      | Ref interval |
|----------------------|--------|-------------|--------------|
| Urea                 | mmol/L | <b>16.3</b> | 5.0-15.0     |
| Creatinine           | mmol/L | 0.14        | 0.08-0.20    |
| Glucose              | mmol/L | 4.8         | 3.2-7.5      |
| Cholesterol          | mmol/L | 4.0         | 2.2-5.5      |
| Total Bilirubin      | μmol/L | <b>74</b>   | 0-7          |
| Conjugated Bilirubin | μmol/L | <b>33</b>   | <3           |
| ALT                  | U/L    | <b>437</b>  | 19-100       |
| AST                  | U/L    | <b>181</b>  | 2-62         |
| ALP                  | U/L    | <b>239</b>  | 5-50         |
| GGT                  | U/L    | <b>83</b>   | <12          |
| CK                   | U/L    | <b>570</b>  | 73-510       |
| Total protein        | g/L    | 79          | 60-84        |
| Albumin              | g/L    | 36          | 23-38        |
| Globulin             | g/L    | 43          | 31-52        |

## DVM1 – Veterinary Bioscience: Metabolism

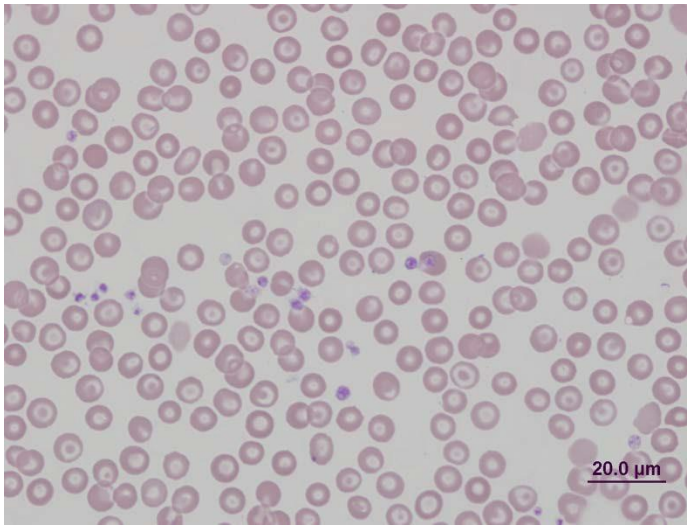
### Case 2: Betty

Betty is a 7-month-old, female Maltese Terrier. The owner mentioned that she is a picky eater, she vomits occasionally and that she gets lethargic after a meal. She was thin, looked small for her age and breed and had slightly pale mucous membranes.

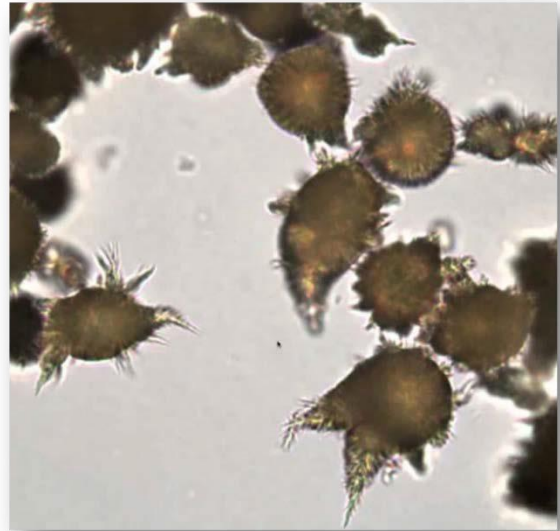


| CBC           | Units              | Result      | Reference interval |
|---------------|--------------------|-------------|--------------------|
| Haemoglobin   | g/L                | <b>98</b>   | 100-206            |
| RBC           | $\times 10^{12}/L$ | <b>4.8</b>  | 4.9-8.2            |
| Haematocrit   | L/L                | <b>0.33</b> | 0.35-0.58          |
| MCV           | fL                 | <b>62</b>   | 64-76              |
| MCH           | pg                 | 25          | 21-26              |
| MCHC          | g/L                | 312         | 310-360            |
| Reticulocytes | $\times 10^9/L$    | 25          | 0-81               |
| WCC           | $\times 10^9/L$    | 12.0        | 4.5-17.0           |
| Neutrophils   | $\times 10^9/L$    | 7.5         | 3.5-12.0           |
| Lymphocytes   | $\times 10^9/L$    | 4.0         | 0.9-3.5            |
| Monocytes     | $\times 10^9/L$    | 0.5         | 0-1.2              |
| Eosinophils   | $\times 10^9/L$    | 0           | 0-1.5              |
| Basophils     | $\times 10^9/L$    | 0           | <0.1               |
| Platelets     | $\times 10^9/L$    | 210         | 200-500            |

## DVM1 – Veterinary Bioscience: Metabolism



Blood film 100x



Urine sediment 40x

| Biochemistry    | Units  | Result     | Reference interval |
|-----------------|--------|------------|--------------------|
| Urea            | mmol/L | <b>2.8</b> | 3.0-7.5            |
| Creatinine      | μmol/L | 100        | 40-140             |
| Glucose         | mmol/L | <b>2.8</b> | 3.0-7.0            |
| Cholesterol     | mmol/L | <b>2.9</b> | 3.6-9.0            |
| Total Bilirubin | μmol/L | 1          | 0-10               |
| ALT             | U/L    | 22         | 5-95               |
| ALP             | U/L    | <b>354</b> | 40-100             |
| GGT             | U/L    | 9          | 1-10               |
| CK              | U/L    | 243        | 50-400             |
| Amylase         | U/L    | 900        | <2000              |
| Lipase          | U/L    | 80         | <200               |
| Total protein   | g/L    | 60         | 60-84              |
| Albumin         | g/L    | 28         | 23-38              |
| Globulin        | g/L    | 32         | 24-44              |

**Case 3: Abacus**

Abacus is an 11-year-old Thoroughbred horse that presented with history of weight loss over the past month and mild diarrhoea. He was quieter than normal for the past week and noticed pressing his head against the gate today. Abacus lives in a paddock with two cows and both seem fine.



| Biochemistry    | Units  | Results    | Reference Interval |
|-----------------|--------|------------|--------------------|
| Urea            | umol/L | <b>3.2</b> | 5.0 – 9.7          |
| Creatinine      | umol/L | 99         | 97 – 176           |
| Total Protein   | g/L    | <b>84</b>  | 55 – 80            |
| Albumin         | g/L    | 30         | 30 – 45            |
| Globulins       | g/L    | <b>54</b>  | 25 – 50            |
| GGT             | IU/L   | <b>251</b> | 7 – 17             |
| ALP             | IU/L   | <b>601</b> | 40 – 400           |
| GLDH            | IU/L   | <b>54</b>  | 0 – 12             |
| AST             | IU/L   | <b>580</b> | 185 – 300          |
| CK              | IU/L   | 340        | 130 – 470          |
| Glucose         | mmol/L | <b>3.1</b> | 3.6 - 7.7          |
| Total Bilirubin | umol/L | <b>132</b> | 10 – 36            |