

KEY LEARNING POINTS

HEPATOTOXINS AND HEPATOBILIARY TUMOURS

Veterinary Bioscience: Metabolism

The materials provided (lecture notes, annotated lecture images and wet specimen Question and Answer sheets) should allow you to answer the following questions.

- Why is the liver the organ most often damaged by toxins?
- What is the major purpose of hepatic biotransformation reactions? What substances does the liver biotransform?
- What happens during **phase 1** and **phase 2** of **hepatic biotransformation reactions**?
- What role does **glutathione** play in liver metabolism? What can happen if an animal's glutathione reserves are depleted?
- What is meant by **primary poisoning**? What is **secondary poisoning**? Which is more common in domestic animals?
- What is a **predictable hepatotoxin**?
- What is an **idiosyncratic hepatotoxin**? Why might some individuals have an idiosyncratic reaction to an ingested toxin or an administered drug?
- What factors (other than the dose of toxin absorbed) influence the response of an individual animal to exposure to a hepatotoxin?
- In what circumstances are large domestic animals likely to consume fatal doses of hepatotoxins?
- What clinical signs might you see in an animal with acute hepatotoxicity? What gross lesions might you see during post mortem examination of an animal that has died as a result of acute hepatotoxicity?
- What is the most common hepatic lesion seen in animals that have died from an acute hepatotoxic insult?
- Why are periacinar (zone 3) hepatocytes so vulnerable to toxic injury?
- What clinical signs might you see in an animal with chronic hepatotoxicity?
- What are some non-specific gross or microscopic changes that you might find in a liver that has been exposed long term to a cumulative hepatotoxin? Why are these changes likely to be present, irrespective of the specific toxin involved?

- Provide some examples of common toxins that can cause acute hepatotoxicity in domestic animals.
- Why are **cats** particularly prone to poisoning by **paracetamol**? What cell type other than the hepatocyte can be injured by paracetamol poisoning in a cat and why?
- What are some common species of plants that contain **pyrrolizidine alkaloids**?
- How do pyrrolizidine alkaloids cause liver damage? Which domestic animal species are most susceptible to pyrrolizidine alkaloid poisoning? Which are more resistant? Why is acute poisoning by pyrrolizidine alkaloids far less common than chronic poisoning?
- What clinical signs might you observe in an animal with chronic pyrrolizidine alkaloid poisoning?
- What is the most diagnostically useful microscopic lesion that can be found in the liver of an animal with chronic pyrrolizidine poisoning? Why does this lesion develop? Is it pathognomonic of pyrrolizidine alkaloid poisoning?
- What are **aflatoxins**? How do they cause injury to the liver?
- Which animals are most susceptible to aflatoxicosis? Which domestic animal species is most often affected by **acute aflatoxicosis** and why?
- What is **phomopsin**? How does it cause liver damage? Which domestic animal species are susceptible to hepatotoxicity induced by phomopsin?
- How does **lantana** (*Lantana camara*) cause jaundice? Which domestic animal species are commonly poisoned by this plant?
- Outline the aetiopathogenesis of **chronic copper poisoning** in **sheep**. Which sheep breeds are most commonly affected? What gross lesions might you find in a sheep that has died because of chronic copper poisoning?
- Name a common incidental finding in the liver of older dogs. What do these lesions look like grossly? How are these distinguished from regenerative nodular hyperplasia of hepatocytes?
- Name a common incidental finding in the gall bladder of older dogs.
- In domestic animals, metastatic tumours are more common in the liver than primary hepatobiliary tumours. **TRUE or FALSE?**
- Which tumours commonly metastasise to the liver in domestic animals?
- What are the most common **primary** tumours of the liver and biliary tree in domestic animals? Are there any gross features that might help in distinguishing these? How do they behave?

- **Lymphoma** (a malignant neoplasm of lymphocytes) commonly involves the liver of domestic animals. What gross changes might be seen in a liver colonised by neoplastic lymphocytes?

VETERINARY BIOSCIENCE: METABOLISM
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