Lecture 6 – Amniotes (*Additional notes*)

Embryo: (**Ask Class**)

Amnion: (**Ask Class**)

Amniotes Are made up of reptiles, birds and mammals. These are species whose embryos develop within an amnion.

Structure of Amniote Egg

- **Amnion** is the outer layer surrounding and protecting the embryo.
- Within the egg exists a liquid known as **amniotic fluid** to provide a stable fluid environment.
- The **allantois** serves two roles;
    1. Assists in gas exchange.
    2. Waste Removal.
- Food intake chamber is known as the **yolk sac**.
- The **chorion** provides the overall enclosed structure.

Body Temperature

Ectothermic

- Require an external source of heat to maintain body temperatures.
- Most reptiles are ectothermic.

Endothermic

- Can self-regulate body temperatures by changing *basal metabolic rate*.
- Most mammals and birds are endothermic.

Reptiles

Herbivorous

- Species that only eat plants.
- Structure of certain organs adapt to such dietary behaviours.
- **Not** limited to mammals!
- Examples: Cow, Goat, Deer, Horse.

Carnivorous

- Species that only eat meat.
- Structure of certain organs adapt to such dietary behaviours.
- **Not** limited to mammals!
- Examples: Bears, Great white Sharks, Hyenas, Seals.

Omnivorous

- Species that eat both meat and plants.
- Organs enable them to digest/consume both types of food.
- **Not** limited to mammals!
- Examples: Lobsters, Dogs, Humans, Bears.

Body Structure

- Reptiles have scales made of **keratin** to help retain and regulate their bodies' moisture and heat.
- Undergo molting whereby they adapt to shade in order to do so.
- **Keratin:** Structural proteins that serve important structural and protective roles, as well as cell development in some cases.

Birds

- The wings are shaped precisely weighted to one side to help generate lift and also help with CG balancing.
- The main bone known as the **humerus** is hollow instead of solid to reduce their overall weight while preserving their skeleton structure.
- Digestive system allows them to eat on the fly and digest later.

- Contrasting to other mammals, birds lay eggs. This makes as nesting eggs is far easier than carrying their offspring in their bodies.

Mammals

- Bodies wrapped in fur, produce milk to feed their offspring.
- Have a four-chambered heart, limbs/fins.
- **Diaphragm:**
  - Contracts during inhalation to create a vacuum effect to enable air intake.
  - Expands during exhalation to release air.
- **Mammary Glands:**
  - Ducts that female mammals use to feed milk to their offspring.

Modern Mammals

Monotremes

- Lay eggs instead giving birth.
- Examples: Platypus, Echidnas.

Marsupials

- Give birth to underdeveloped embryos that continue to mature and develop inside the pouch of their mother.
- Examples: Koala, giraffe, wombat.

Eutherians

- AKA **Placentals**.
- Develop their offspring within the **placenta**.
- **Placenta:** An organ that connects the mother to her embryo.
- **Umbilical Cord:** A cord which carries food, water and oxygen to the embryo and returns waste back to the mother. (Belly button was the connecting point).