SNS COLLEGE OF TECHNOLOGY

Coimbatore-35.

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COURSE NAME : 19GET277 - Biology for Engineers

IV YEAR/ VII SEMESTER

UNIT – II - BIODIVERSITY

Topic: Animal System elementary study of digestive-respiratory

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- Animals obtain their nutrition from the consumption of other organisms.
- Depending on their diet, animals can be classified into the following categories: plant eaters (herbivores), meat eaters (carnivores), and those that eat both plants and animals (omnivores).
- The nutrients and macromolecules present in food are not immediately accessible to the cells.
- There are a number of processes that modify food within the animal body in order to make the nutrients and organic molecules accessible for cellular function.
- As animals evolved in complexity of form and function, their digestive systems have also evolved to accommodate their various dietary needs.
- Herbivores, Omnivores, and Carnivores

- **Herbivores** are animals whose primary food source is plant-based.

Herbivores, like this (a) mule deer and (b) monarch caterpillar, eat primarily plant material. (credit a: modification of work by Bill Ebbesen; credit b: modification of work by Doug Bowman)

- **Carnivores** are animals that eat other animals. The word carnivore is derived from Latin and literally means “meat eater.”

(a) (b)

Carnivores like the (a) lion eat primarily meat. The (b) ladybug is also a carnivore that consumes small insects called aphids.

- **Omnivores** are animals that eat both plant- and animal-derived food. In Latin, omnivore means to eat everything.

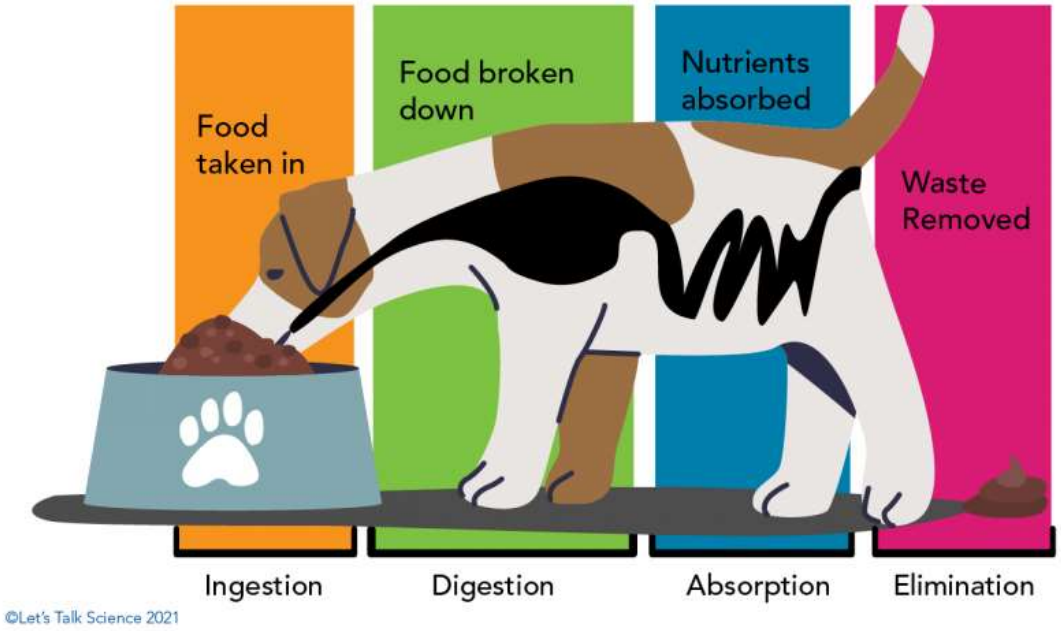
(a) (b)

Omnivores like the (a) bear and (b) crayfish eat both plant and animal based food.

Function of the Digestive System in Animals

- The primary functions of the GI tract include prehension of food and water; mastication, salivation, and swallowing of food; digestion of food and absorption of nutrients; maintenance of fluid and electrolyte balance; and evacuation of waste products. These functions can be broadly characterized as:
- motility
- secretion
- digestion
- absorption
- blood flow
- metabolism

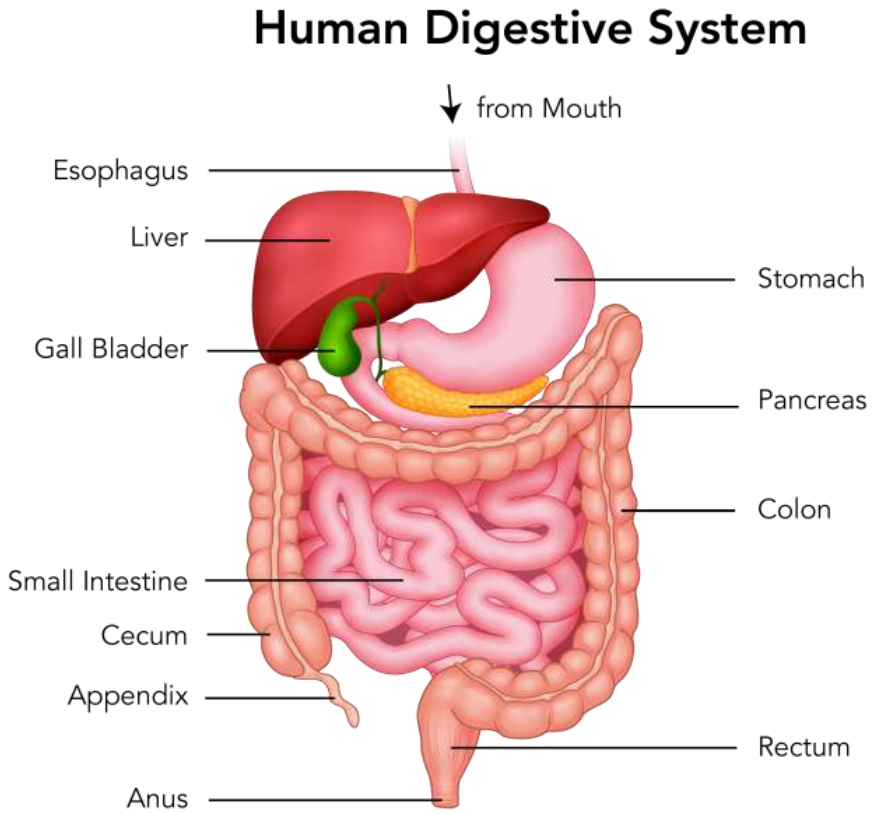
- A complete digestive system has a **gastrointestinal tract** (GI tract). This tract is a one-way system that starts at the mouth and ends at the anus. A GI tract is a much more efficient system than a gastrovascular cavity because it prevents the mixing of waste and food.



Digestive Systems of Vertebrate Animals

- Vertebrates are a group of animals that includes fish, amphibians, reptiles, mammals and birds.
- All vertebrates have a complete digestive system with a similar design. The system starts at the mouth.
- The mouth connects via a tube, called the esophagus, to the stomach. The stomach is usually an acidic environment where food is broken down into smaller molecules.
- These molecules then travel to the small intestine where most of the nutrients are absorbed.
- What remains then travels to the large intestine where water and salts are absorbed and wastes are readied for removal.
- The length of the digestive tract is related to the diet of the animal.
- Carnivores and animals that feed only on fruit, have the shortest GI tracts.
- Herbivores that consume a lot of fibrous plant matter tend to have the longest tracts.
- This is because the cellulose in plants takes a lot of time to be digested inside the GI tract.
- Omnivores, like humans, are in between those two extremes.

- Parts of the human digestive system include:



Clinical Findings of GI Disease in Animals

Signs of GI disease include:

- anorexia
- excessive salivation
- regurgitation
- vomiting
- diarrhea
- constipation
- tenesmus
- melena/hematochezia
- abdominal pain and distention
- shock and dehydration
- suboptimal performance

Human Digestive System

Part	Description	Location	Function
Mouth	Contains teeth and tongue	Head	Breaks down food through chewing in a process called **mastication**. During mastication, saliva containing enzymes is mixed with the food to start the process of digestion.
Esophagus	Transport tube	Connects mouth and stomach	Moves food to the stomach. Muscular contractions called **peristalsis** push the food through the esophagus.
Stomach	Muscular organ where food is broken down	Between esophagus and small intestine	**Physical digestion** of food is done in a process called **churning**. Chemical digestion is done by the stomach's acidic **gastric juices** and enzymes. The gastric juices are also useful in destroying the majority of microorganisms that come into our bodies with food.
Small Intestine	Narrow muscular tube	Between stomach and large intestine	Absorption of the majority of nutrients. Absorption is increased by the many folds in the tissues and by the millions of intestinal villi. **Villi** are finger-like extensions that line the intestine. The villi make the surface area for nutrient absorption hundreds of square meters!
Appendix	Finger-shaped pouch on the right side of the body	Near where the small intestine and large intestine meet	Scientists once thought this was a useless organ inherited from our ancestors. The current theory is that it may act as storage for our bacterial flora.
Large Intestine	Wider muscular tube; made up of the **cecum**, **colon** and **rectum**	Between small intestine and anus	The pouch-like cecum is involved in the absorption of salts. It also adds a coating to the solid waste, making it easier to move. The colon absorbs water, salt and some vitamins. The rectum is the final part of the large intestine. The rectum acts as a temporary storage area for **feces**.
Anus	Opening the outside of the body	End of the digestive tract	Elimination of food wastes


THANK
YOU!