

The Digestive System

1. Introduction

- A. Gastrointestinal (GI) Tract or Alimentary canal
- B. Digestive Processes
 - i. Mechanical Digestion
 - ii. Chemical Digestion
- C. Tissue Structure
 - i. Mucosa
 - Membrane
 - a. Epithelia
 - b. Lamina Propria
 - ii. Submucosa
 - a. Aggregated Lymphatic Nodules
 - iii. Muscularis Externa
 - a. Circular Muscle
 - b. Longitudinal Muscle
 - iv. Serosa or Adventitia

2. Mouth

- A. Buccal Cavity
- B. Oral Cavity Proper
 - i. Fauces
 - Deglutition or Gag Reflex
- C. Mastication (“Chewing”)

D. Lips and Cheeks

- Trigeminal Nerve

i. Lingual Frenulum

ii. Tissue of Cheeks

- a. Mucous Membrane:

Stratified Squamous Epithelium

E. Teeth and Gums

i. Types of Teeth

- a. Incisors

- b. Canines

- c. Premolars

- d. Molars

- Wisdom Teeth

ii. Deciduous Teeth

iii. Permanent teeth

iv. Dentition

	Deciduous Teeth	Permanent Teeth
Incisors	4	4
Canines	2	2
Premolars	0	4
Molars	4	6

v. Periodontal Ligaments

vi. Tooth Anatomy

- | | |
|-------------------|------------|
| a. Root | g. Enamel |
| b. Crown | h. Dentine |
| c. Neck | i. Cement |
| d. Apical Foramen | j. Pulp |
| f. Root Cavity | |

vii. Mastication

viii. Gums or Gingivae

- Firm Connective Tissue
- Mucous Membrane
- Stratified Squamous Epithelium

F. Tongue

- Mucous Membrane

i. Function

ii. Anatomy of Oral Part

- a. Body
 - Taste Buds
- b. Pharyngeal Part
 - Lingual Tonsil

iii. Skeletal Muscle and Fine Motor Control

G. Palate

- i. Hard Palate
- ii. Soft Palate
 - a. Uvula

H. Salivary Glands

- i. Saliva
 - a. Composition
 - Mucin
 - b. Salivary Amylase
 - c. Bicarbonate
- ii. Glands
 - a. Parotid Glands
 - b. Submandibular Glands
 - c. Sublingual glands
- iii. Control of Salivary Secretion
 - a. Autonomic Nervous System
 - Parasympathetic Stimulation
 - * Watery Secretion
 - Sympathetic stimulation
 - * Thick Mucus

3. Pharynx (Same as in Respiratory System)
 - A. Nasopharynx
 - B. Oropharynx
 - C. Laryngopharynx
4. Esophagus
 - A. Sphincter
 - i. Lower Esophageal Sphincter
 - B. Histology
 - i. Mucosa
 - ii. Submucosa
 - iii. Muscularis Externa
 - iv. Adventitia
5. Swallowing or Deglutition
 - Bolus
 - A. Voluntary Oral Phase
 - B. Pharyngeal Phase
 - Peristalsis
 - Epiglottis
 - C. Involuntary Esophageal Phase
 - i. Peristalsis
 - Circular and Longitudinal Muscle Coordination

6. Abdominal Cavity and Peritoneum

A. Abdominal Cavity

i. Abdominal Viscera

ii. Peritoneum

a. Parietal peritoneum

b. Visceral peritoneum

c. Peritoneal cavity

d. Serous fluid

e. Mesenteries

- Intraperitoneal and Retroperitoneal Organs

B. Abdominopelvic Cavity

i. Pelvic Viscera

7. Stomach

A. Anatomy

i. Greater Curvature

ii. Lesser Curvature

iii. Lower Esophageal Orifice

iv. Pyloric Orifice

B. Regions

i. Cardiac Region

ii. Body

iii. Pyloric Canal

vi. Fundus

C. Histology of Stomach

i. Muscularis Externa

- a. Longitudinal Layer
- b. Circular Layer
- c. Oblique

ii. Rugae

iii. Epithelia and Gastric Pits (*See handout on Protein Digestion*)

- a. Mucous Cells
- b. Parietal Cells
- c. Chief Cells
- d. Enteroendocrine Cells

D. Functions of Stomach (*See handout on Protein Digestion*)

- Chyme

E. Digestive Movements

- i. Peristaltic Mixing Waves (Stomach Churning)
- ii. Pyloric Pump

- F. Regulation and Secretion of Gastric Juices
(Pull out handout on Digestive Regulation)
 - i. Means of Control:
 - a. Neural Control
 - b. Hormonal Control
 - Secretin
 - Cholecystokinin
 - ii. Phases
 - a. Cephalic Phase
 - b. Gastric Phase (and feedback mechanisms)
 - c. Intestinal phase (and feedback mechanisms)

8. Small Intestine

- A. Anatomy
 - i. Duodenum
 - ii. Jejunum
 - iii. Ileum
- B. Small Intestine: Adaptations to Increase Absorptive Surface Area
 - i. Plicae circulares
 - ii. Villi
 - Intestinal Glands (Crypts of Lieberkühn)
 - Lacteal
 - iii. Microvilli

- C. Aggregated Lymph Nodules
- D. Digestive movements of the small intestine
 - i. Segmenting Contractions
 - ii. Peristaltic Contractions
- E. Digestive Enzymes in the Small Intestine
 - Disaccharidases



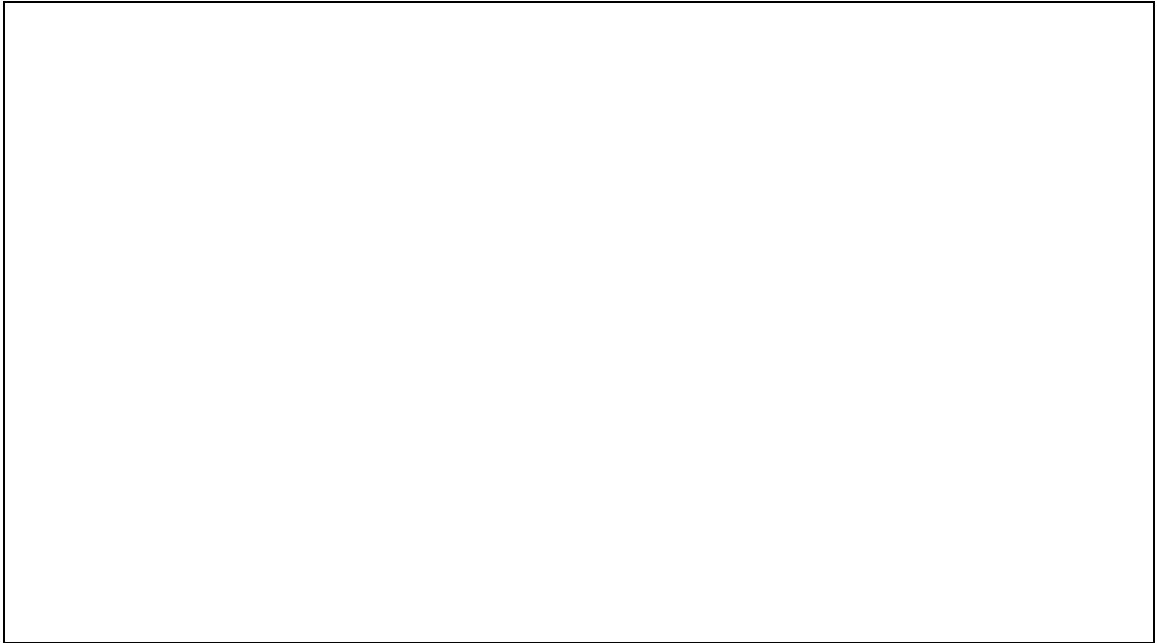
- a. Lactase and Lactose Intolerance
- iii. Peptidases (*Pull out hand out on **Protein Catabolism***)

This handout consists of TWO sections. The section on protein catabolism you are responsible for. The section on Amino Acids and protein structure, is for review, if you like.

- F. Absorption from the Small Intestine
 - i. Carbohydrates
 - ii. Proteins
- G. LIPID DIGESTION AND TRANSPORT ESSAY !!!

(Pull out your handout on Lipid Digestion and Transport)

9. Pancreas as a Digestive Organ



A. Gross Anatomy

- i. Head
- ii. Body
- iii. Tail

B. Microscopic Anatomy and Ducts

- Main Pancreatic Duct (Duct of Wirsung)
- Hepatopancreatic Ampulla (Ampulla of Vater)
- Accessory Pancreatic Duct (Duct of Santorini)

C. Select Pancreatic Enzymes

- i. Pancreatic Lipase
- ii. Pancreatic Amylase
- iii. Pancreatic Proteolytic Enzymes

10. The Liver as a Digestive Organ

A. Anatomy

- i. Falciform Ligament
- ii. Right lobe
 - a. Quadrate Lobe
 - b. Caudate Lobe
- iii. Left Lobe

B. Vessels of the Liver

- i. Hepatic Artery
- ii. Hepatic Portal Vein
- iii. Hepatic Vein
- iv. Bile Canaliculi
 - Right and Left Hepatic Ducts
 - Cystic Duct
 - Common Bile Duct

C. Microscopic anatomy

- i. Lobules
- ii. Hepatocytes
- iii. Portal Area
- iv. Sinusoids

D. Functions of the Liver

i. Metabolic Functions

a. Deamination

b. Urea Formation

c. Bilirubin Removal

d. Nonessential amino acid synthesis

e. Monoglyceride Conversions

f. Beta Oxidation

g. Lipid Synthesis

h. Heat Production

ii. Storage Functions

a. Glucose

b. Fat soluble Vitamins

c. Minerals

iii. Bile Secretion

11. Gallbladder and Biliary System

A. Biliary System and Enterohepatic Circulation

12. Large Intestine

A. Gross Anatomy

- | | |
|-----------------------|----------------------|
| i. Cecum | iv. Descending Colon |
| ii. Ascending Colon | v. Sigmoid Colon |
| iii. Transverse Colon | |

B. Functions of the Large Intestine

- i. Bacterial Activity
- ii. Composition of Feces
- iii. Movements of the Large intestine

- a. Houstral Contractions
- b. Gastrocolic Reflex and Mass Movements
- c. Gastrocolic Reflex → Defecation Reflex
- d. Duodenocolic Reflex

E. Rectum

- i. Anal Canal
- ii. Internal Anal Sphincter
- iii. External Anal Sphincter

F. Defecation Reflex