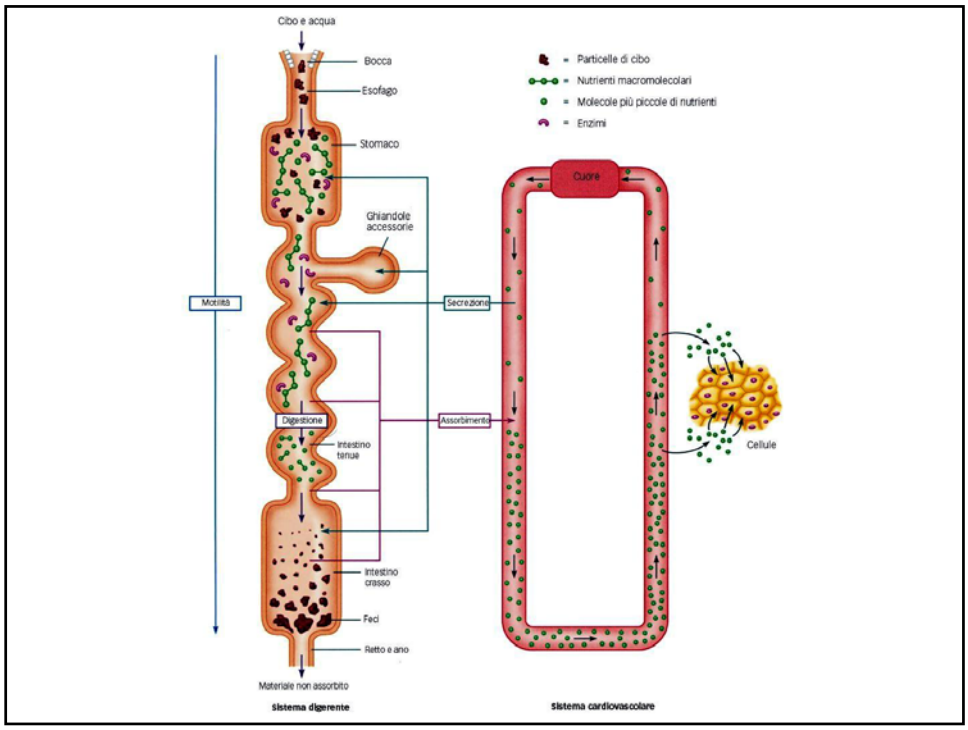
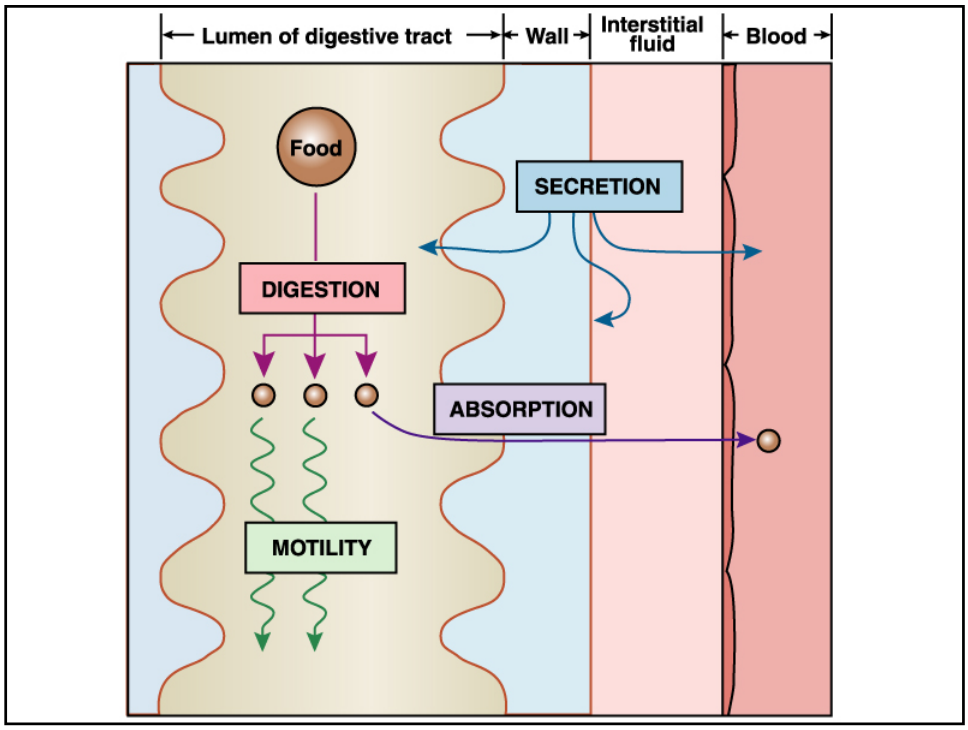
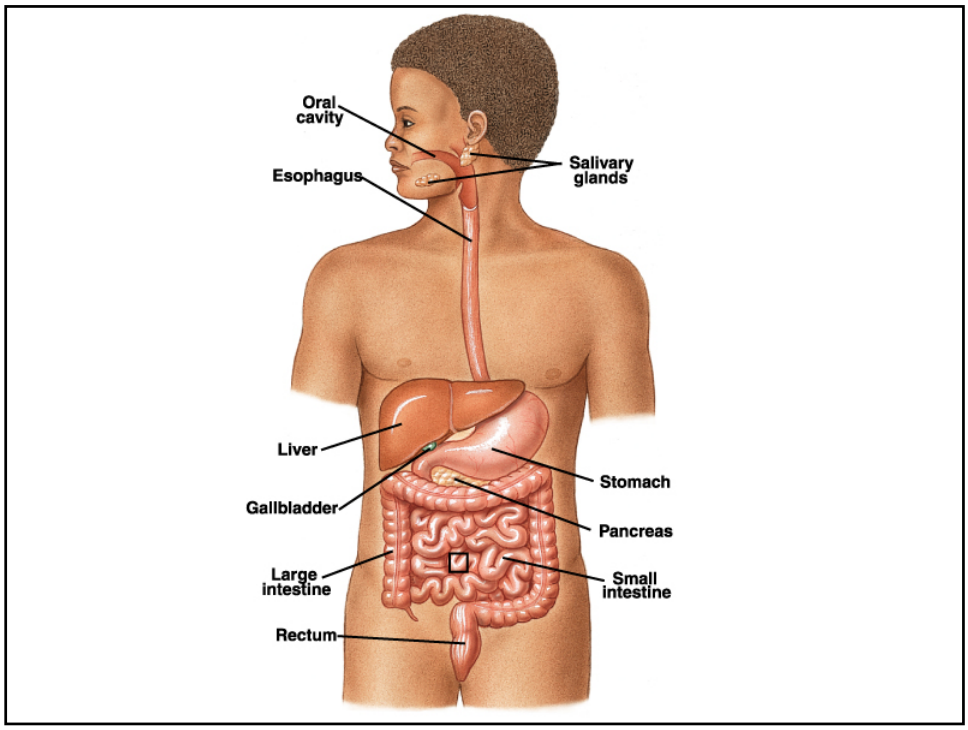
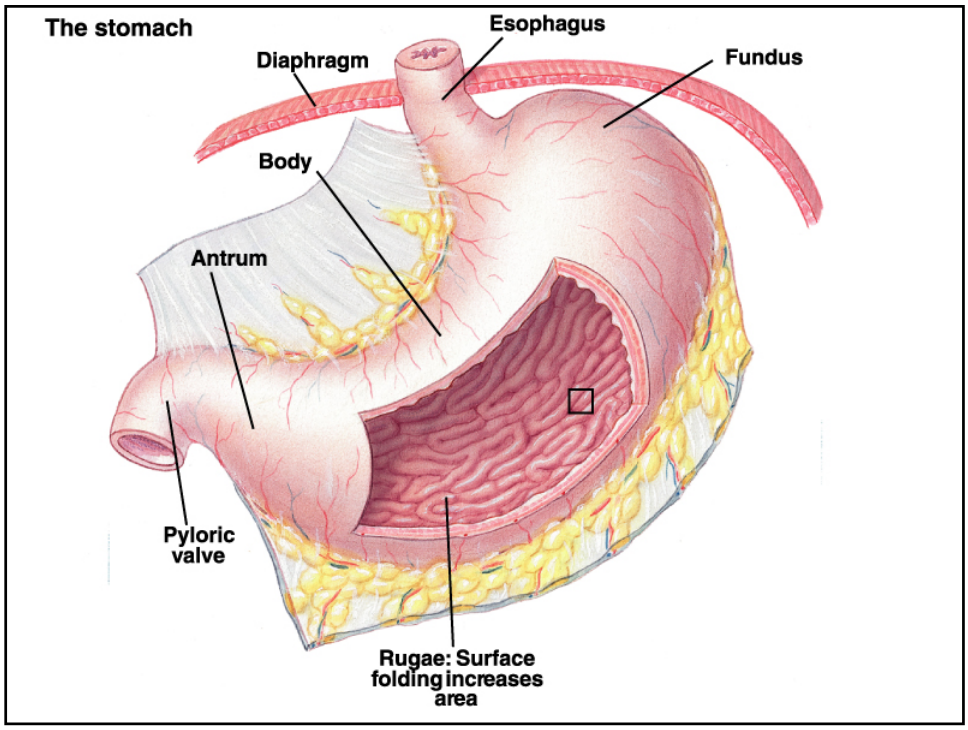
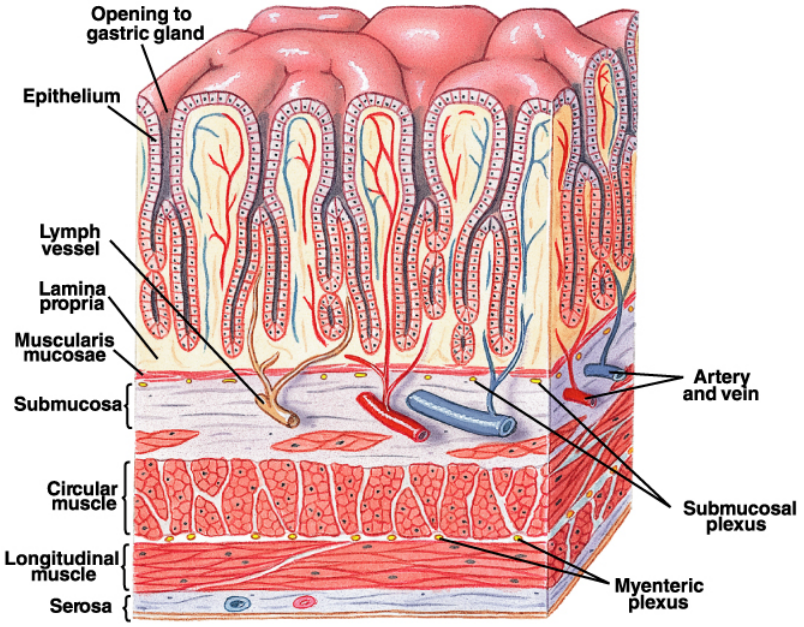

Cibo e acqua
Bocca
Esofago
Stomaco
Ghiandole accessorie
Motilità
Digestione
Intestino tenue
Intestino crasso
Feci
Retto e ano
Materiale non assorbito
Sistema digerente
= Particelle di cibo
= Nutrienti macromolecolari
= Molecole più piccole di nutrienti
= Enzimi
Cuore
Secrezione
Assorbimento
Cellule
Sistema cardiovascolare

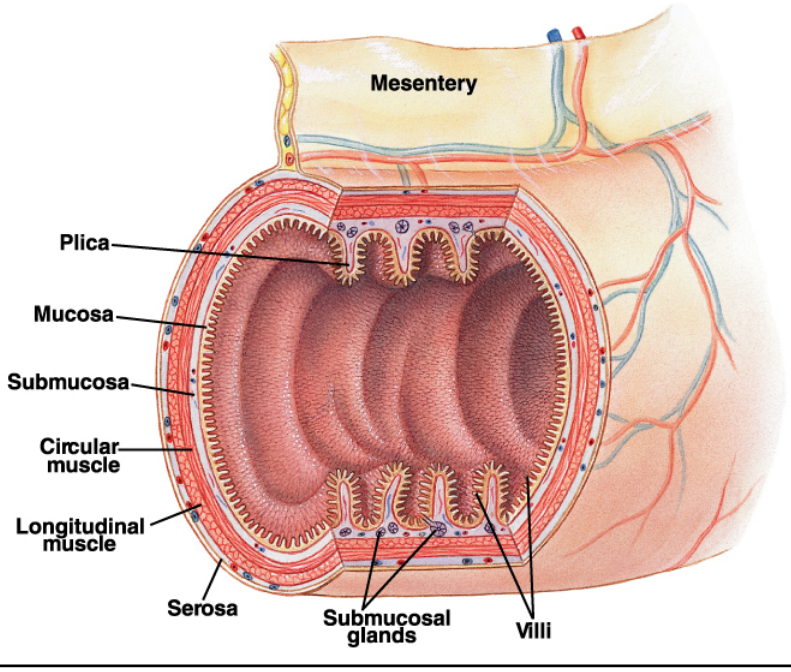

Lumen of digestive tract
Wall
Interstitial fluid
Blood
Food
SECRETION
DIGESTION
ABSORPTION
MOTILITY


Oral cavity
Salivary glands
Esophagus
Liver
Stomach
Gallbladder
Pancreas
Large intestine
Small intestine
Rectum

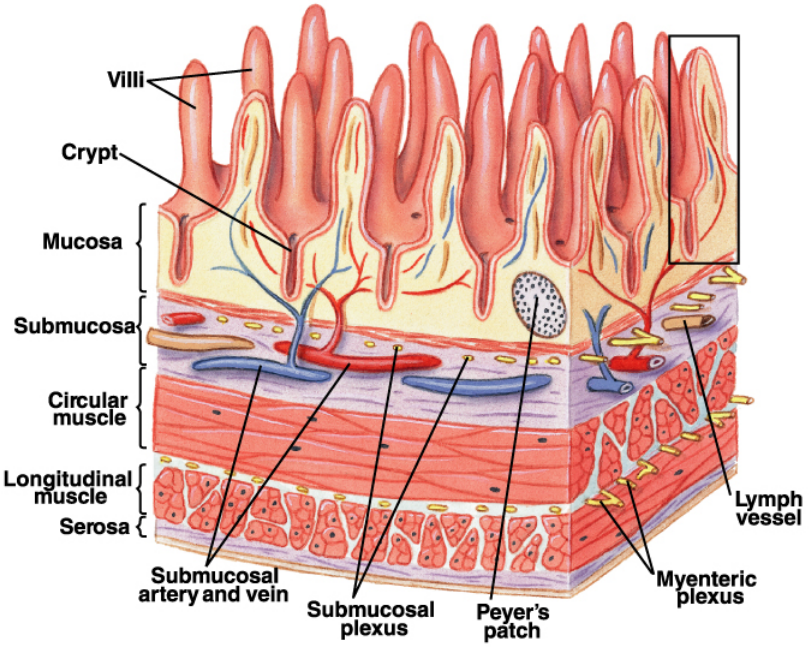

The stomach
Esophagus
Diaphragm
Fundus
Body
Antrum
Pyloric valve
Rugae: Surface folding increases area

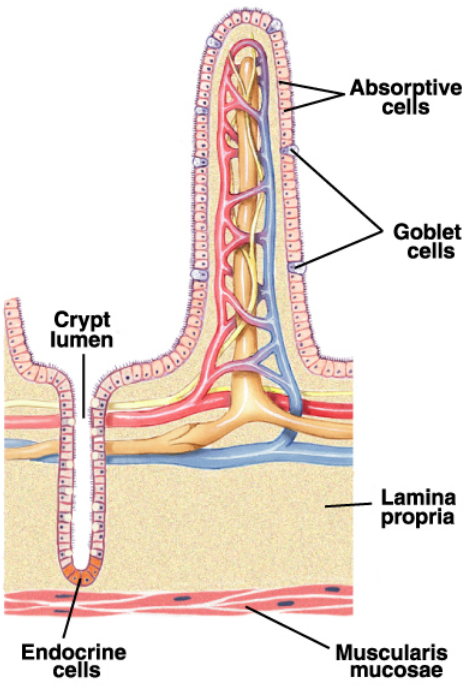
In the stomach, surface area is increased by invaginations called gastric pits.

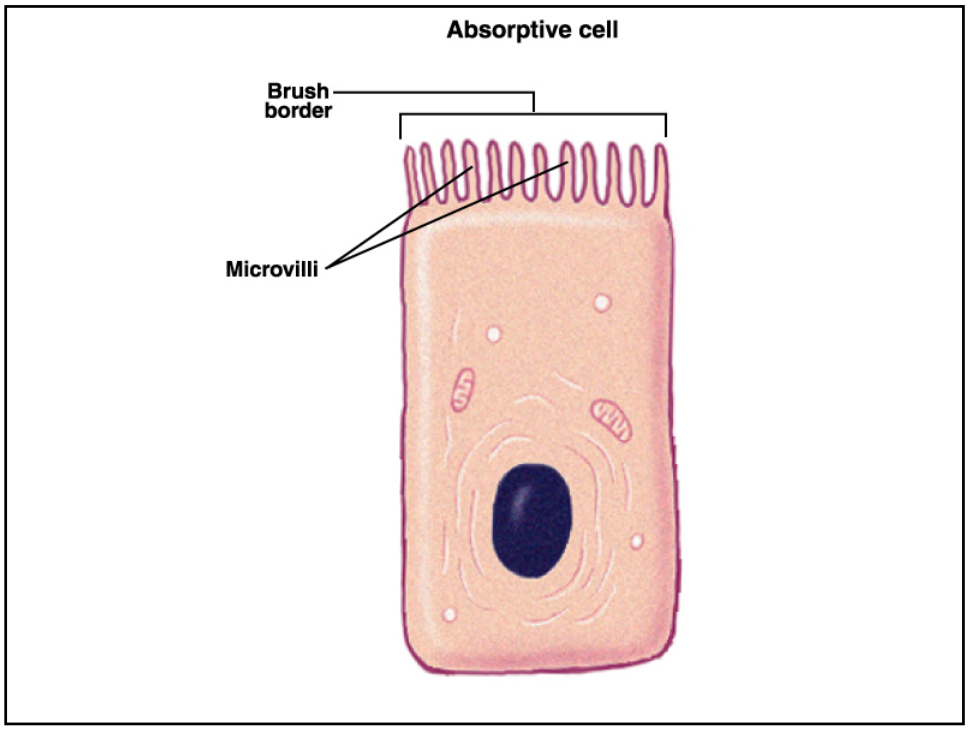


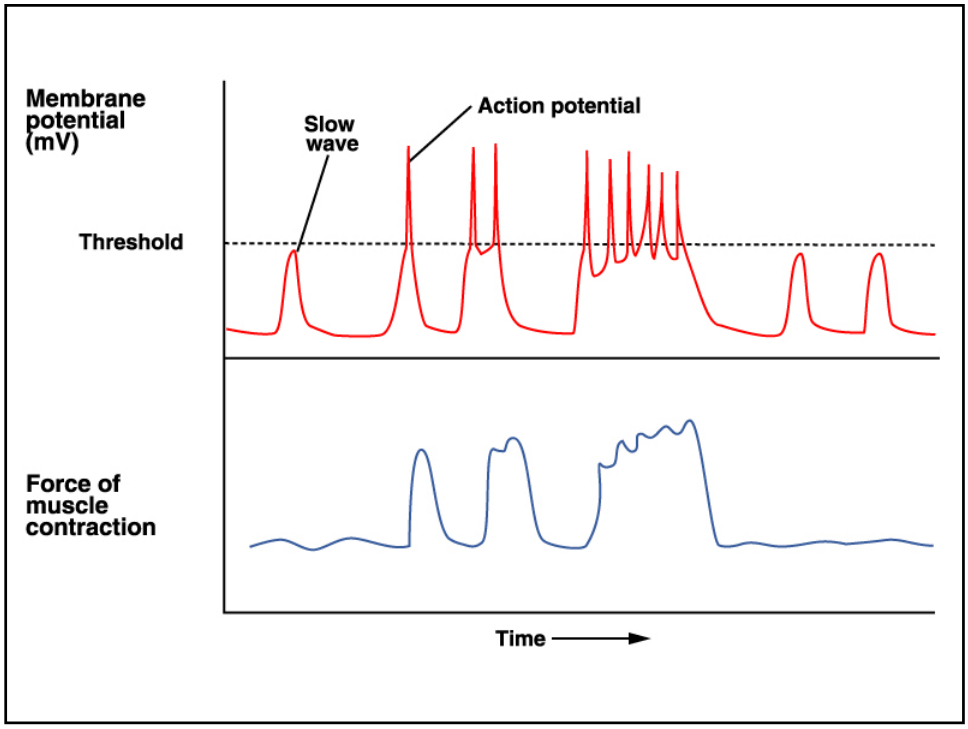


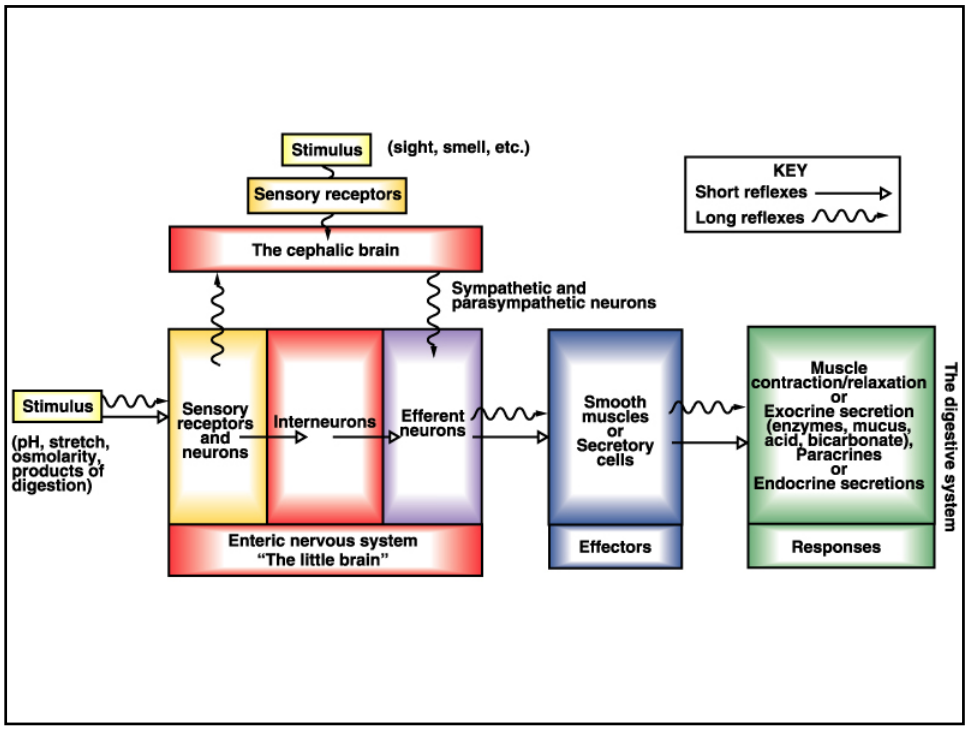
Intestinal surface area is enhanced by finger-like villi.

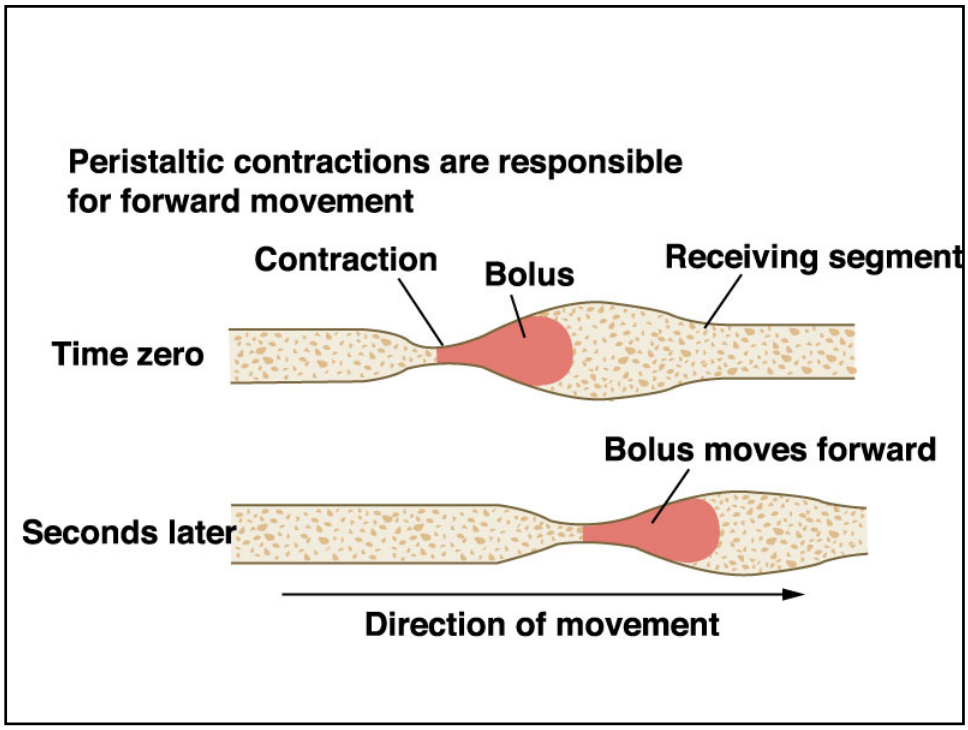




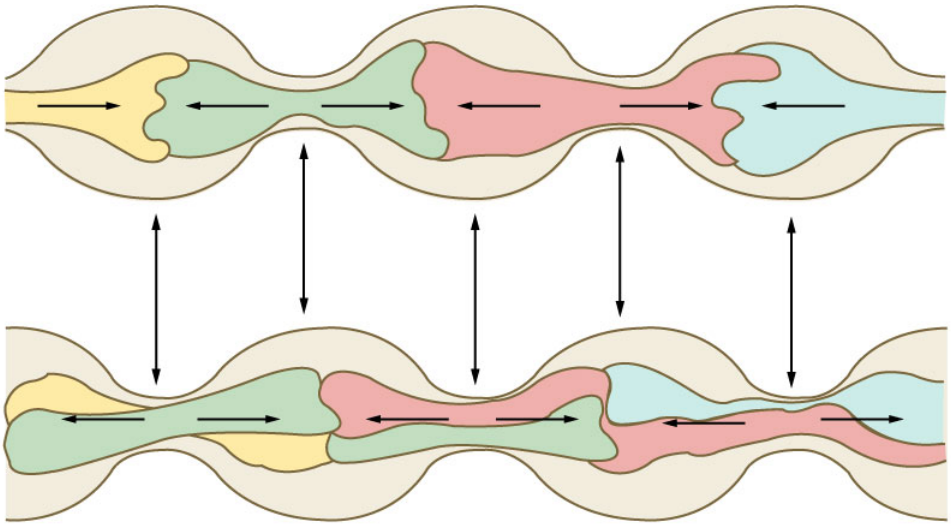

Absorptive cell
Brush border
Microvilli


Membrane potential (mV)
Slow wave
Action potential
Threshold
Force of muscle contraction
Time

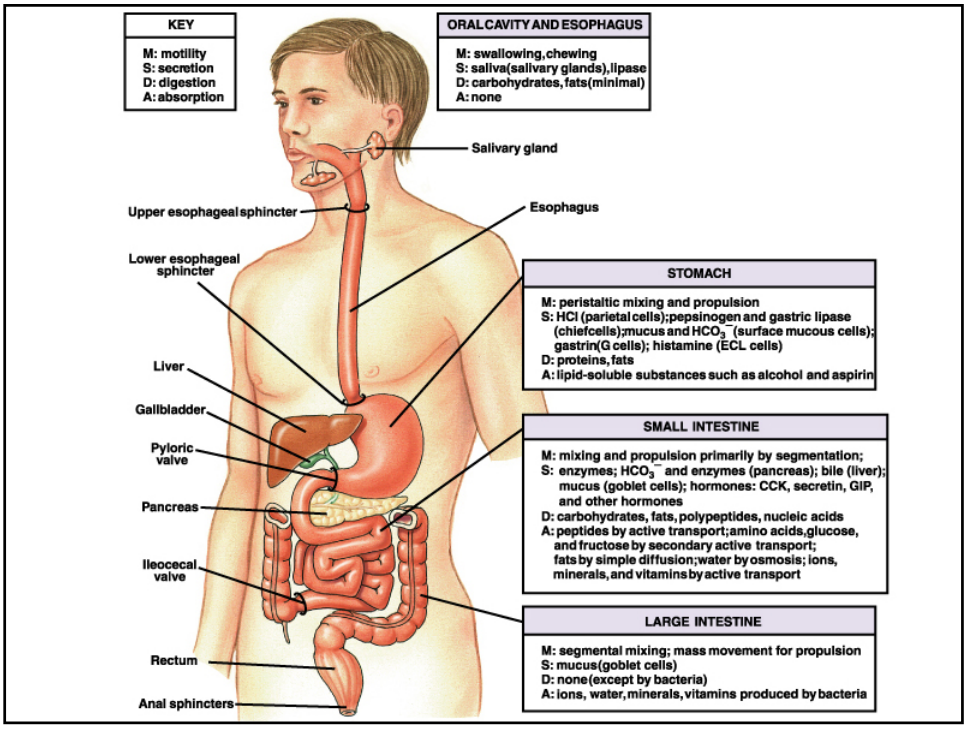

Stimulus
(sight, smell, etc.)
Sensory receptors
The cephalic brain
Sympathetic and parasympathetic neurons
KEY
Short reflexes
Long reflexes
Stimulus
(pH, stretch, osmolarity, products of digestion)
Sensory receptors and neurons
Interneurons
Efferent neurons
Enteric nervous system "The little brain"
Smooth muscles or Secretory cells
Effectors
Muscle contraction/relaxation or Exocrine secretion (enzymes, mucus, acid, bicarbonate), Paracrines or Endocrine secretions
Responses
The digestive system

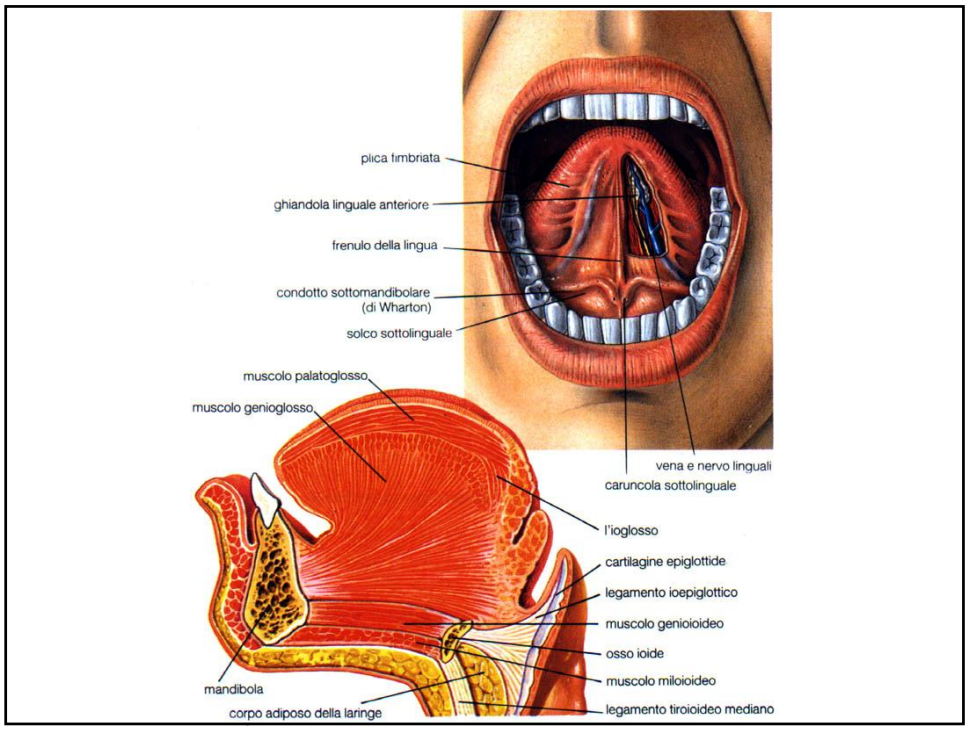

Peristaltic contractions are responsible for forward movement
Contraction
Bolus
Receiving segment
Time zero
Bolus moves forward
Seconds later
Direction of movement

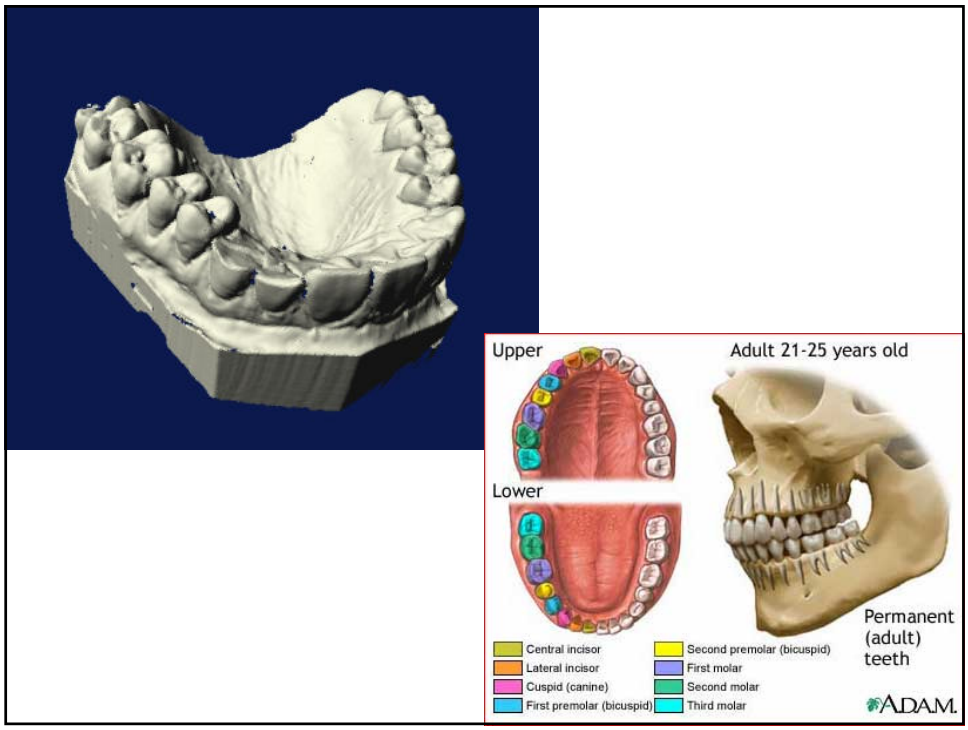
Segmental contractions are responsible for mixing

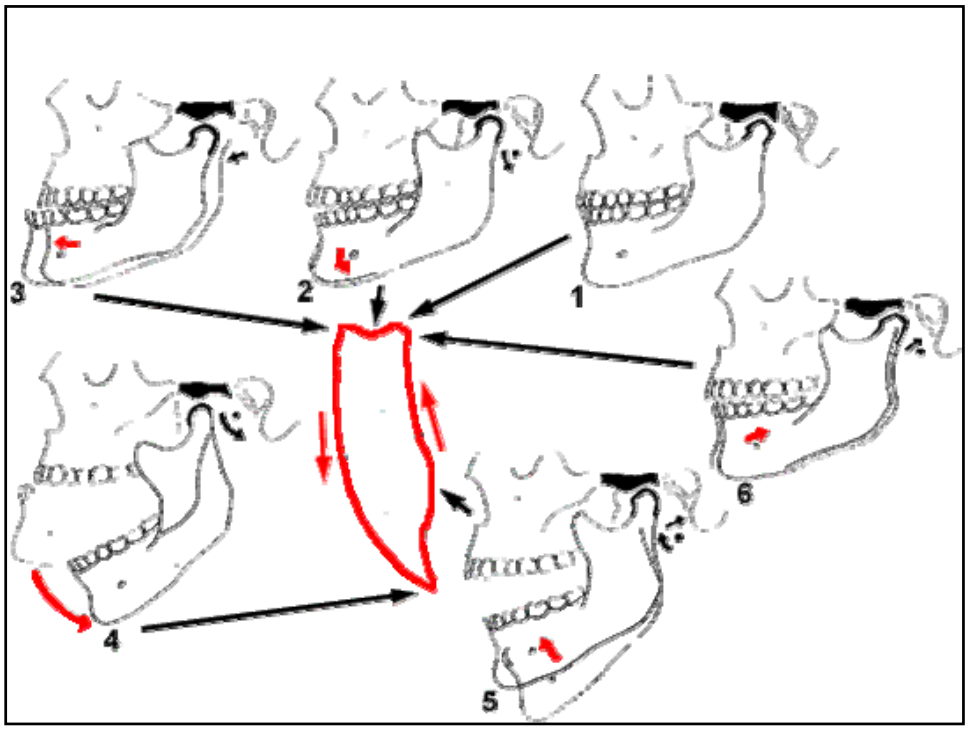


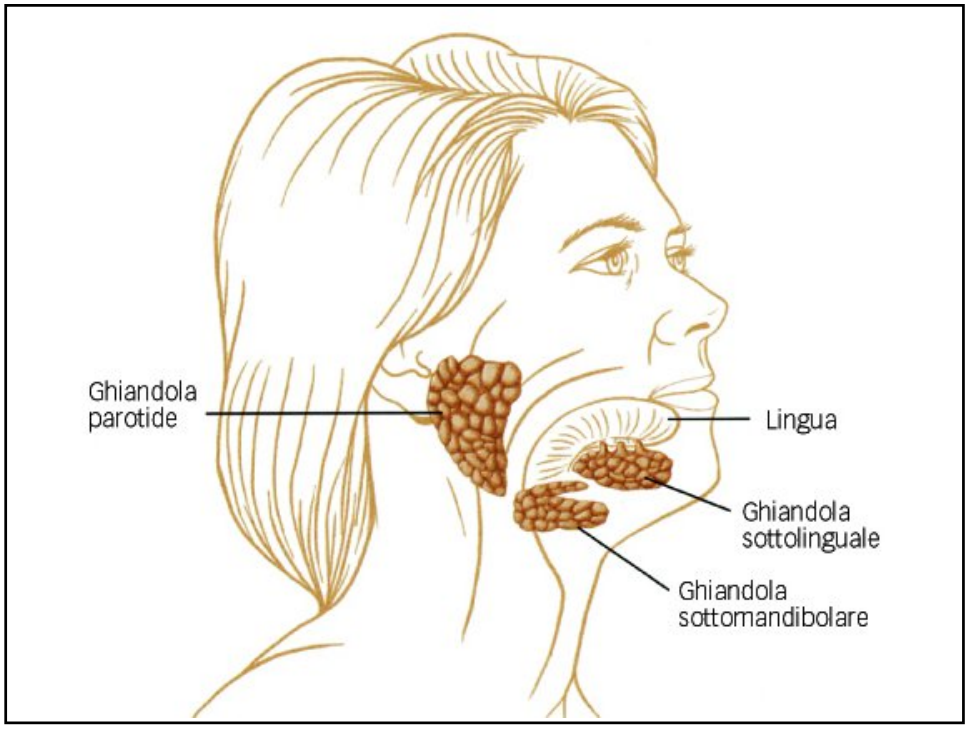
No net forward movement

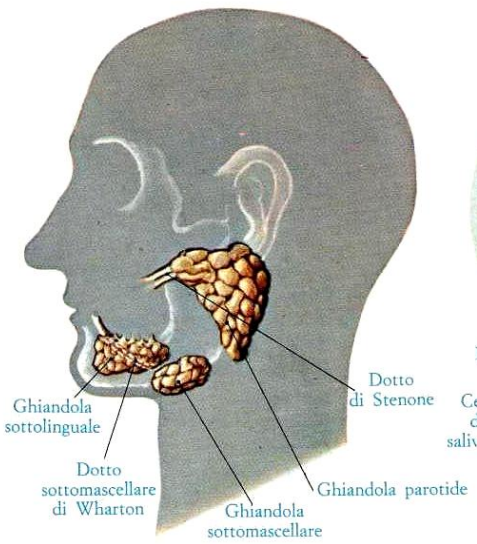



plica fimbriata
ghiandola linguale anteriore
frenulo della lingua
condotto sottomandibolare (di Wharton)
solco sottolinguale
muscolo palatoglosso
muscolo genioglosso
vena e nervo linguali
caruncola sottolinguale
l'ioglosso
cartilagine epiglottide
legamento ioepiglottico
muscolo genioioideo
osso ioide
muscolo miloioideo
legamento tiroioideo mediano
mandibola
corpo adiposo della laringe

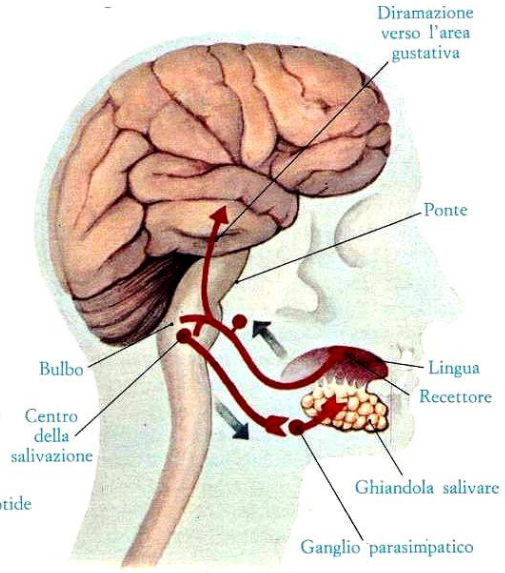

Upper
Adult 21-25 years old
Lower
Permanent (adult) teeth
Central incisor
Lateral incisor
Cuspid (canine)
First premolar (bicuspid)
Second premolar (bicuspid)
First molar
Second molar
Third molar
A.D.A.M.


3
2
1
6
4
5


Ghiandola parotide
Lingua
Ghiandola sottolinguale
Ghiandola sottomandibolare



1. Ghiandole salivari.



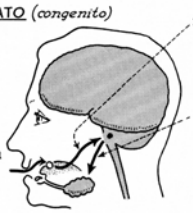
2. Riflesso salivare.

CONTROLLO della SECREZIONE SALIVARE

L'incremento della secrezione durante i pasti è RIFLESSO *(involontario)*.

I Riflessi Salivari sono di due tipi :—

(a) INCONDIZIONATO *(congenito)*

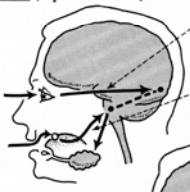


Il CIBO stimola le terminazioni nervose nella bocca

messaggi IN ARRIVO lungo i nervi GUSTATIVI al Centro SALIVARE di Controllo nel BULBO

messaggi DI RISPOSTA dal Centro del SISTEMA NERVOSO AUTONOMO, lungo i nervi SECRETOMOTORI diretti alle ghiandole, provocano secrezione di SALIVA.

(b) CONDIZIONATO *(dipende dall'esperienza)*

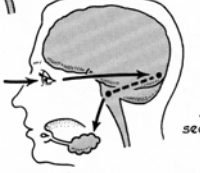


La VISTA del cibo viene associata con il SAPORE del cibo

messaggi IN ARRIVO ai Centri VISIVI

messaggi IN ARRIVO al Centro SALIVARE

Si instaurano collegamenti ASSOCIATIVI tra i centri nell'Encefalo

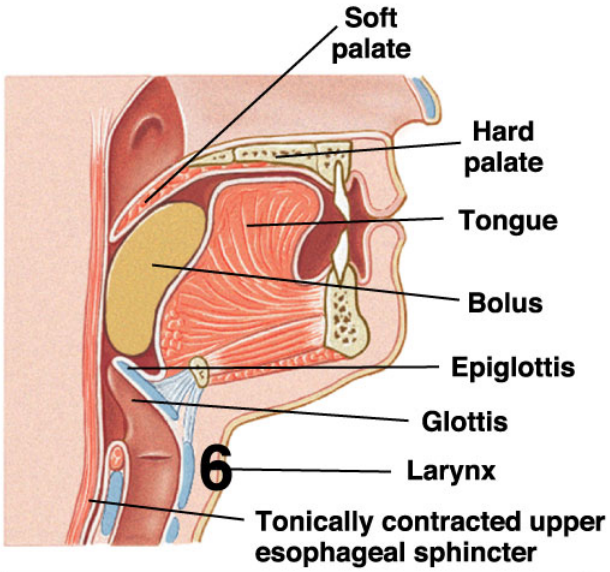


Infine la sola VISTA del cibo.....

..... provoca la secrezione SALIVARE

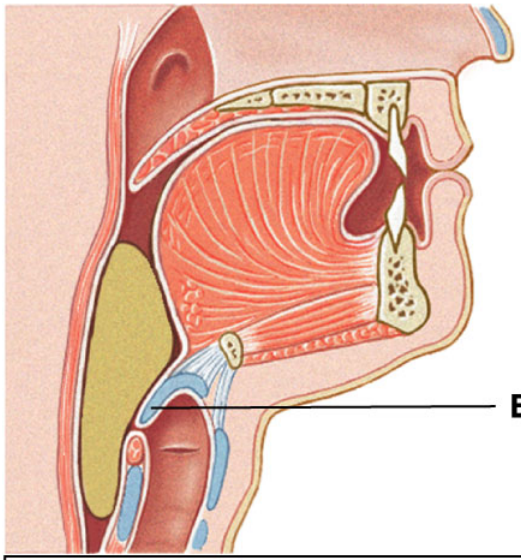
Riflessi condizionati del genere si instaurano per l'odore, il pensiero del cibo e persino per i rumori connessi con la preparazione di esso.

Step 1



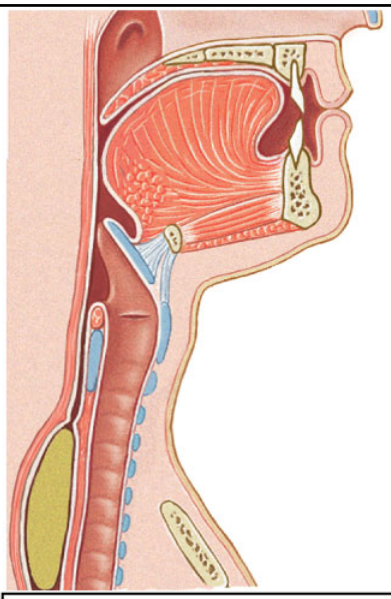
1. Tongue pushes bolus against soft palate and back of mouth, triggering swallowing reflex.

Step 2

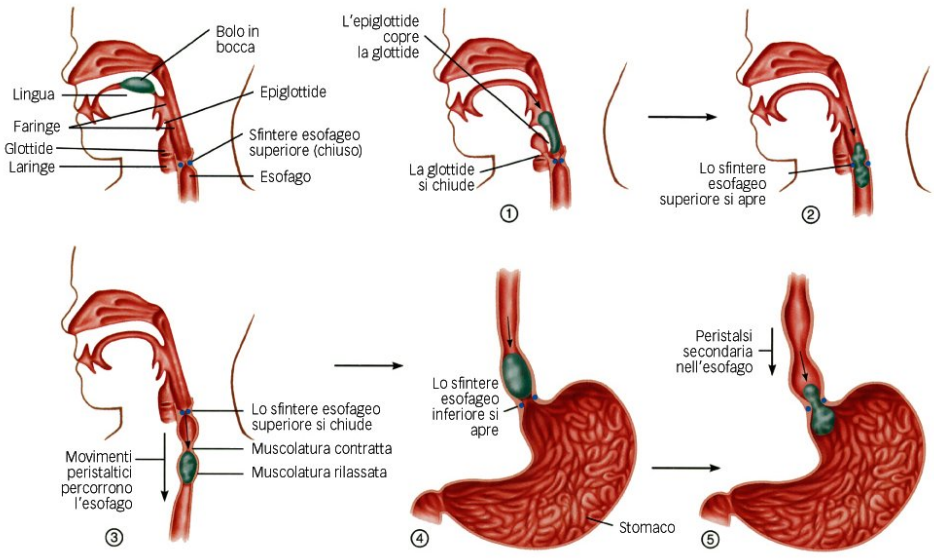


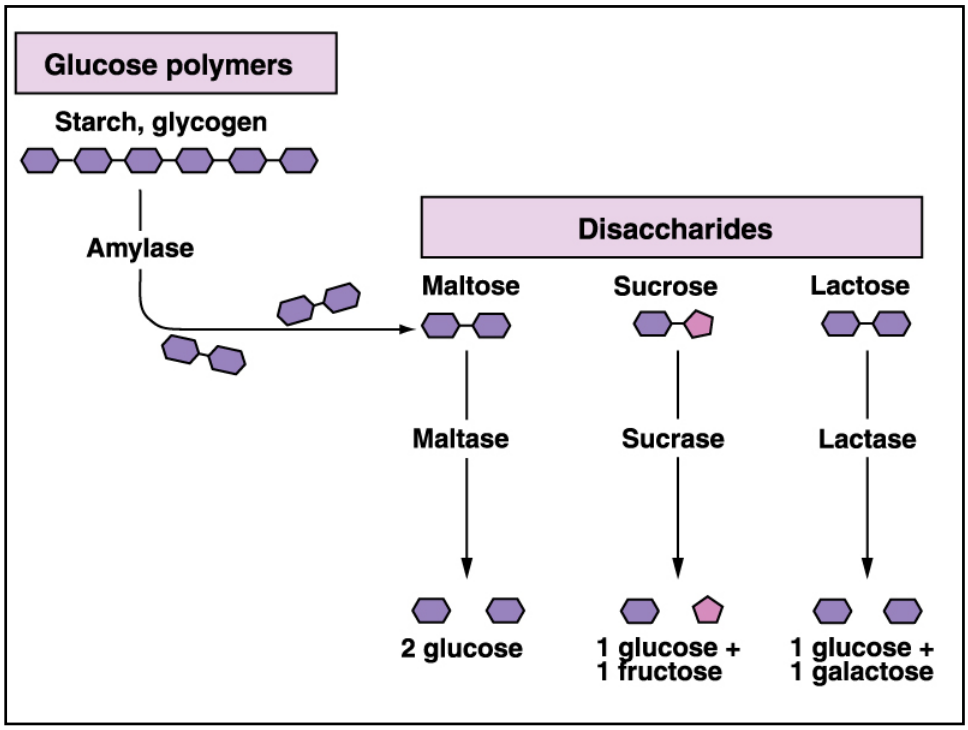
2. Upper esophageal sphincter relaxes while epiglottis closes to keep swallowed material out of the airways.

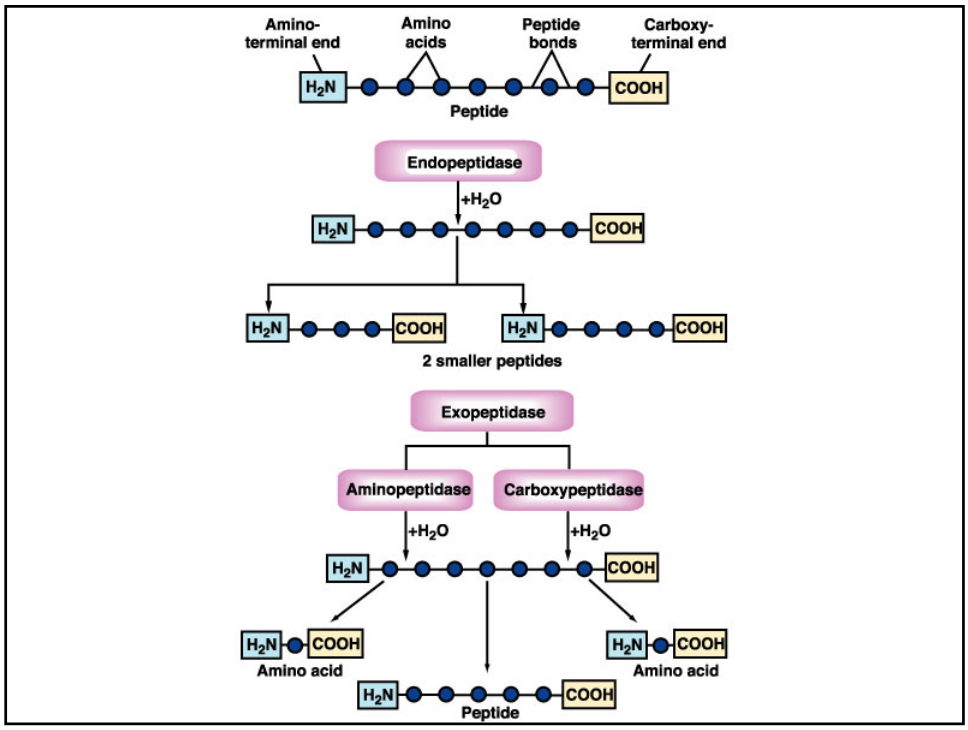
Step 3

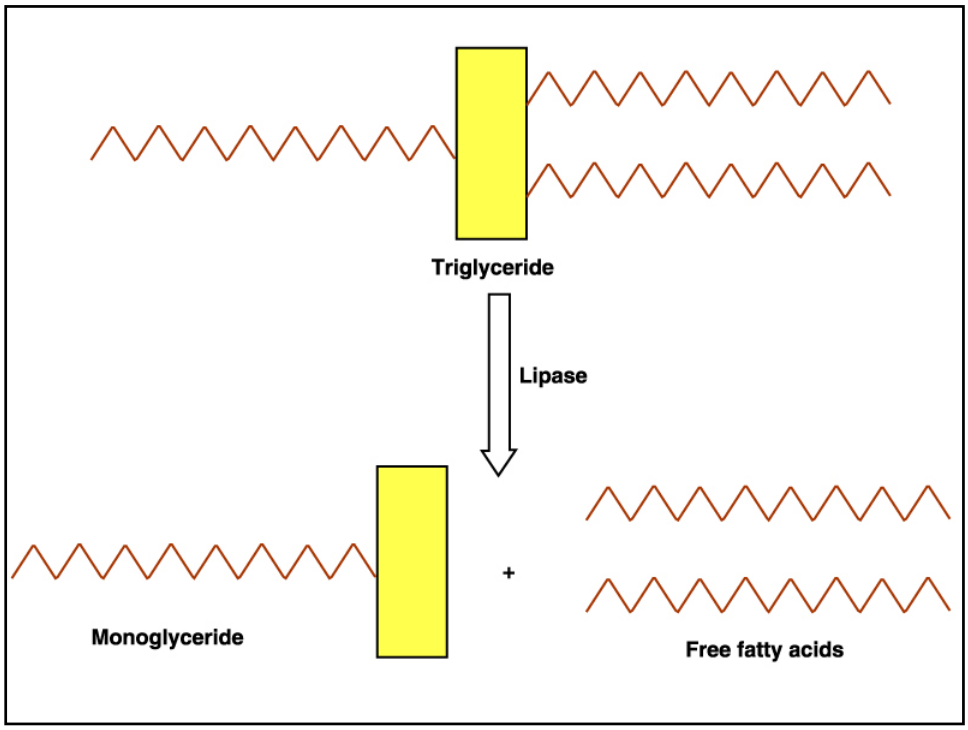


3. Food moves downward into the esophagus, propelled by peristaltic waves and aided by gravity.




Glucose polymers
Starch, glycogen
Amylase
Disaccharides
Maltose
Sucrose
Lactose
Maltase
Sucrase
Lactase
2 glucose
1 glucose + 1 fructose
1 glucose + 1 galactose


Amino-terminal end
Amino acids
Peptide bonds
Carboxy-terminal end
H_2N
COOH
Peptide
Endopeptidase
$+H_2O$
2 smaller peptides
Exopeptidase
Aminopeptidase
Carboxypeptidase
Amino acid
Amino acid
Peptide



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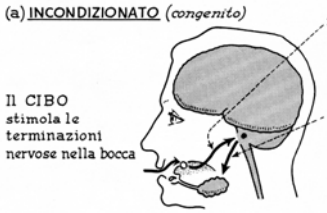

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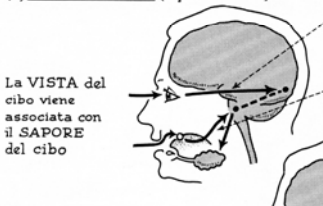

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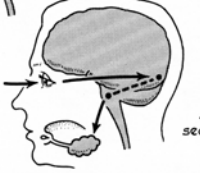

Infine la sola VISTA del cibo.....

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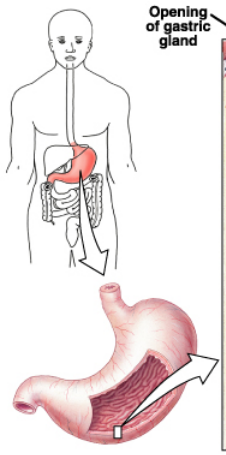
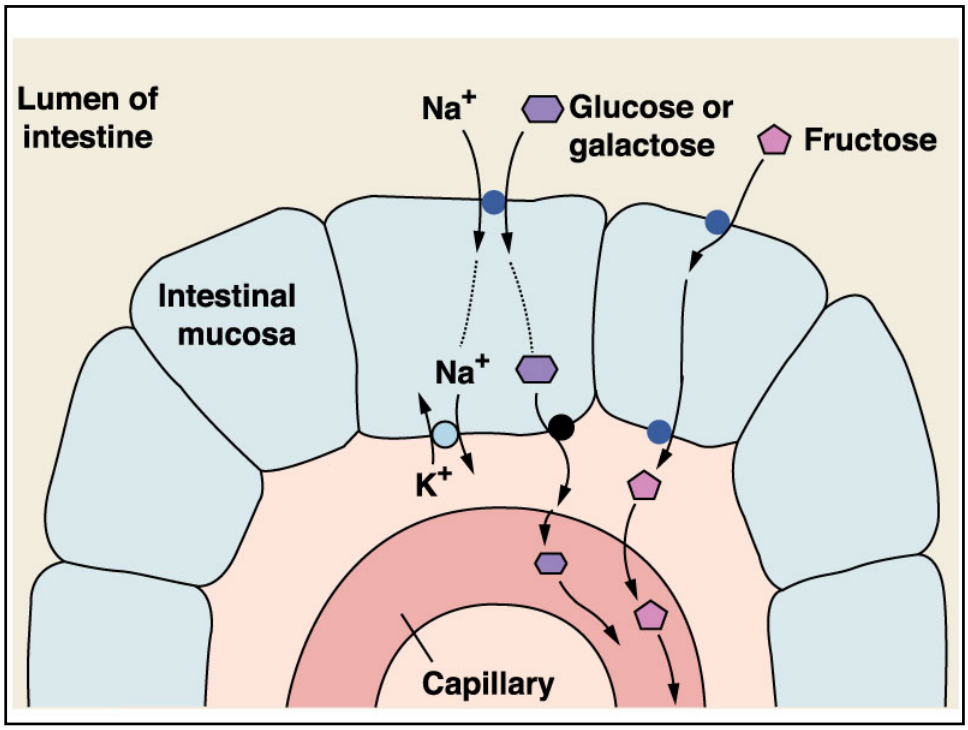
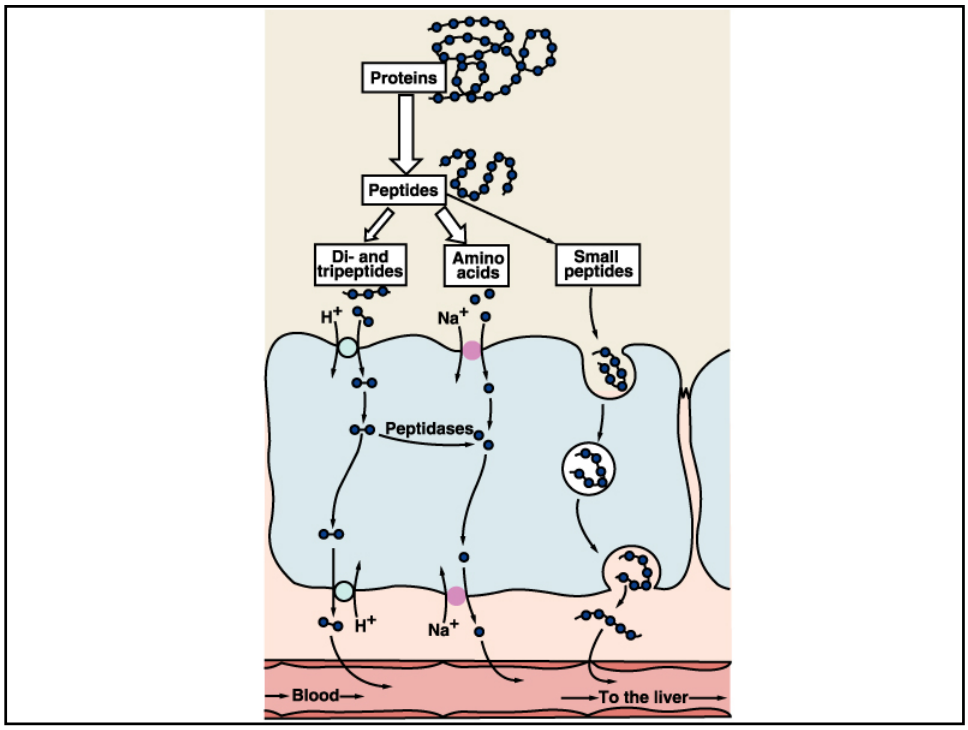
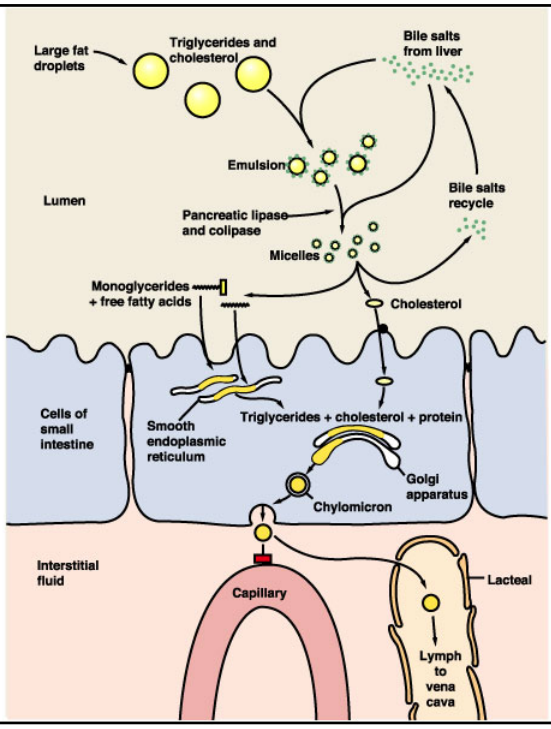


Source	Substance Secreted	Stimulus for Release	Function
Mucous neck cell	Mucus	Tonic secretion; increased with irritation of mucosa	Physical barrier between lumen and epithelium
	Bicarbonate	Secreted with mucus	Buffers gastric acid to prevent damage to epithelium
Parietal cells	Gastric acid (HCl)	Acetylcholine, gastrin, histamine	Activates pepsin; kills bacteria
	Intrinsic factor		Complexes with vitamin B_{12} to permit absorption
Enterochromaffin-like cell	Histamine	Acetylcholine, gastrin	Stimulates gastric acid secretion
Chief cells	Pepsin(ogen)	Acetylcholine, acid, secretin	Digests proteins
	Gastric lipase		Digests fats
D cells	Somatostatin	Acid in the stomach	Inhibits gastric acid secretion
G cells	Gastrin	Acetylcholine, peptides, and amino acids	Stimulates gastric acid secretion

Succo	Enzimi	Substrato	Prodotti finali
Saliva	Ptialina	Amido	Destrine maltosio
Succo gastrico	Pepsina	Proteine	Proteasi, peptoni
	Caglio	Caseino-geno	Caseina
Succo pancreatico	Tripsina	Proteine	Ammino-acidi
	Lipasi	Grassi	Ac. grassi, glicerina
	Amilasi	Amido	Maltosio
	Disacca-rasi	Disacca-ridi	Monosac-caridi
Succo enterico	Entero-chinasi	Tripsino-geno	Tripsina
	Peptidasi	Poli-peptidi	Ammino-acidi
	Amilasi	Amido	Maltosio
	Lipasi	Grassi	Ac. grassi, glicerina


Lumen of intestine
Na+
Glucose or galactose
Fructose
Intestinal mucosa
Na+
K+
Capillary


Proteins
Peptides
Di- and tripeptides
Amino acids
Small peptides
H+
Na+
Peptidases
H+
Na+
Blood
To the liver


Large fat droplets
Triglycerides and cholesterol
Bile salts from liver
Emulsion
Lumen
Bile salts recycle
Pancreatic lipase and colipase
Micelles
Monoglycerides + free fatty acids
Cholesterol
Cells of small intestine
Smooth endoplasmic reticulum
Triglycerides + cholesterol + protein
Golgi apparatus
Chylomicron
Interstitial fluid
Capillary
Lacteal
Lymph to vena cava