

PHYSIOLOGY OF DIGESTION

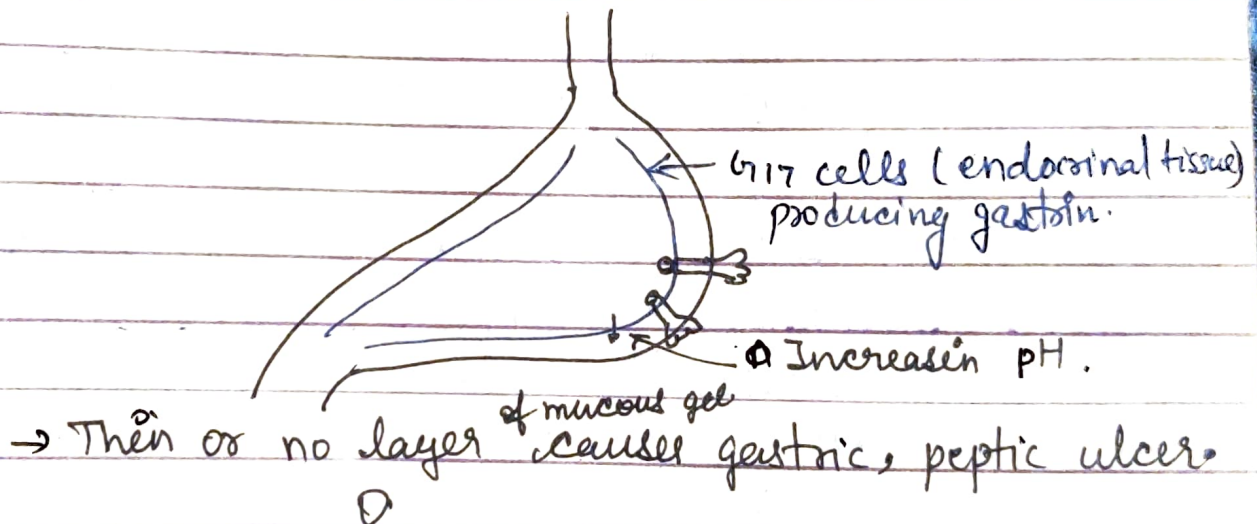
* Water is not food it is nutrient and vitamin also.

Main constituent of food - carbohydrates, protein and fat.

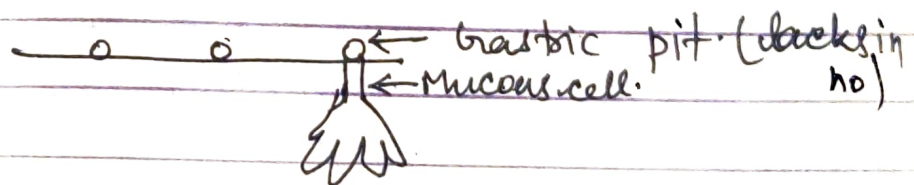
pH of ptyaline should be $\rightarrow 6.8$

* Ptyaline is totally inactive at pH 4.

* Regulation is under will but not the peristalsis.



Oxyntic cells - Parietal cells.



* Gastrin stimulates the oxyntic cells mainly but all other also stimulated and all as whole produces gastric juice.

= Gastric juice contain

(1) Water.

(2) HCl

= function of HCl

(1) Neutralisation of food.

(2) Preservation of food.

(3) Makes medium suitable for action of enzymes (acidic) Priority function.

Enzymes -

(1) Pepsinogen

It is an inactive proteolytic enzyme. It becomes active pepsin at pH 2 which acts upon protein and digests it into proteoses and peptones (dipeptides).

* Insulin 51 amino acid chain (30+21) amino acids

(2) Rennin -

→ It acts on milk protein, casein and converts it into curd (paracasein) in presence of calcium.

→ Its main purpose is longer stay of casein in stomach so that pepsin can work upon.

(3) Gastric lipase -

It is lipolytic enzyme.

It simply dissolves away the unwanted tissue surrounding food molecule which is made naked.

* Simultaneous to the above chemical actions, mechanical action also occurs in form of

churning movement, brought about by circular, longitudinal and oblique muscles. The food is well churned in form of a paste called as chyme (acidic in nature).

Intrinsic factor (IF)

It helps in formation of haemoglobin that avoids anaemia.

Duodenum

→ In these endocrinal tissues ^(in mucosa lining) which are histologically unknown secrete 3 hormones

- (1) Cholecystokinin - Stimulate gall bladder for bile juice production
- (2) Secretin
- (3) Pancreozymin

} Secretes stimulate pancreatic acini for exocellular secretion.

Chyle is form of food (liquid) in duodenum.

→ In duodenum pH 7.8 or 8 is needed (alkaline) for digestion.

(1) → Cholecystokinin (Cck), stimulates gall bladder and hepatic cell for production of bile juice.

Bile contains —

1. Water
2. Excess of cholesterol
3. Excess of lecithin (phospholipid)
4. Bile pigment
5. Bile salts.

Secretion 0.5 - 0.8 litres in 24 hours

Waste substance

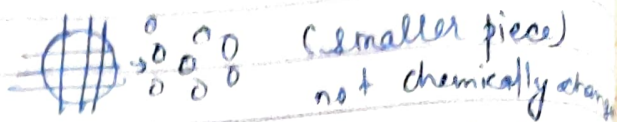
Somewhat make alkaline.

Bile salt

(A) NaHCO_3 (It make chyme basic). - It also help in emulsification.

(B) Na-glycocholate } Emulsification of fat
(C) Na-taurocholate - 2 }

emulsification is mechanical breakdown of fat molecules.



In very recent an enzyme called as alkaline phosphatase is discovered ~~cause~~ which acts on phosphate.

(2) Pancreozymin & secretin both stimulate acinii of pancreas for secretion of pancreatic juice.

Content of pancreatic juice.

1. Water

2. Enzyme

(A) Amylase — This is strong amylolytic enzyme (stronger than ptyaline).
It acts on both boiled & unboiled food Carbohydrate amylase → glucose

(B) Lipase — Lipolytic enzyme acting upon emulsified fat to convert it into fatty acid & glycerol.

(C) Trypsinogen — Inactive form.

Trypsinogen activate → Trypsinogen to convert it into active trypsin.

(D) Chymotrypsinogen → both activated by trypsin

(E) Pro carboxy peptidase and converted into

Chymotrypsin and Carboxy peptidase both are actives.

These both convert peptides in amino acid

(A) Maltase :- Maltase acts upon maltose to form it in glucose. (Amyolytic)

(G) Nuclease :- Acts upon nucleic acid to convert into nucleotide (proteolytic)

⇒ Chyle is very much ready to absorbed in intestine.

→ Duocsinin and Enterocinin (from unknown tissue) from mucosa epithelial lining (intestinal gland). These are amyolytic.

Intestinal juice contain (0.5 litres)

1. Water

2. Enzymes

(A) Amyolopsin

(B) Lipase

(C) Amino peptidase } Proteolytic.

(D) Dipeptidase

(E) Maltase

(F) Nuclease

(G) Sucrase/ (very much exclusive in mammal)

Invertase - it acts on cane sugar and convert it into fructose.

= Very much use of sucrose causes obesity (fatty). (Recent research.)

(H) Lactase - acts upon lactose and converts it in glucose (exclusive to mammal)

~~to~~ (I) Enterokinase (to activate trypsinogen)

= These all comes for rest food of digestion.

= Partly duodenum, jejunum & Ileum is site for absorption of food.