Digestion of carbohydrate

By
Ram Balak Mahto
Guest faculty
Zoology department
V.S.J College Rajnagar Madhubani

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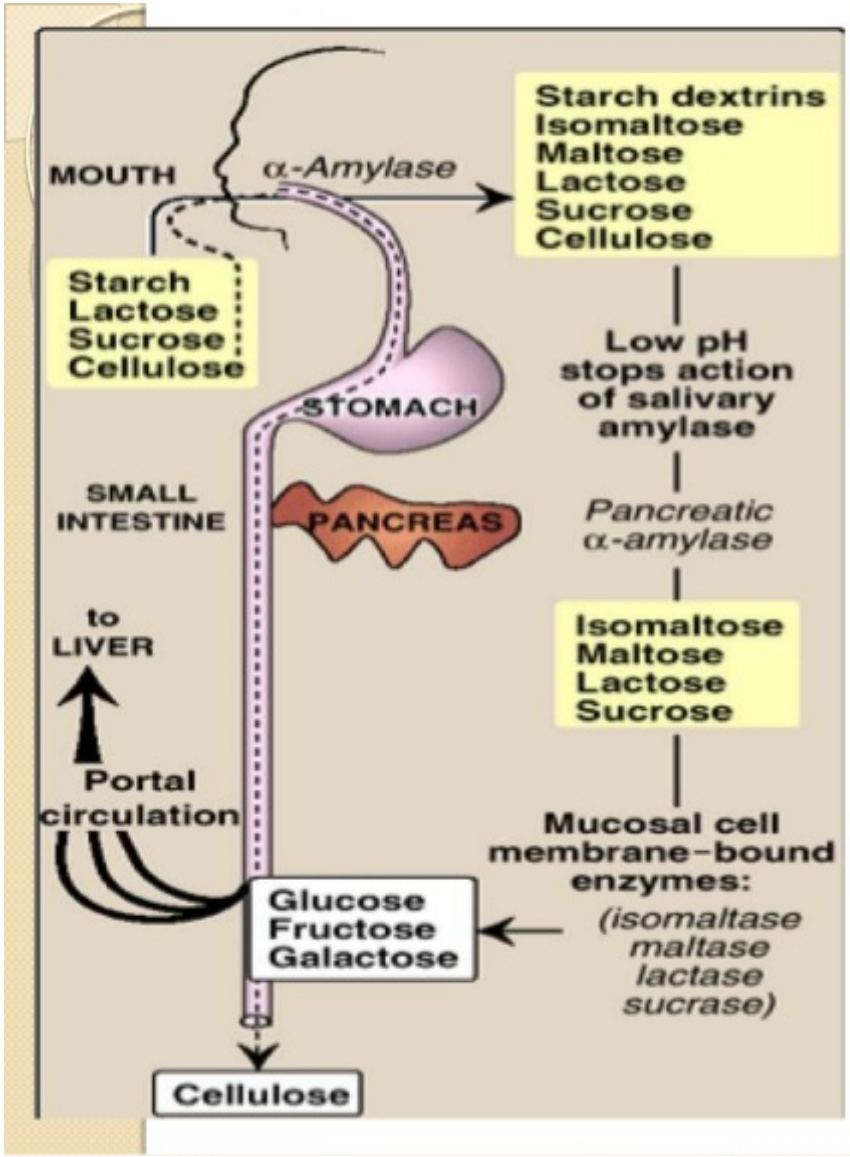

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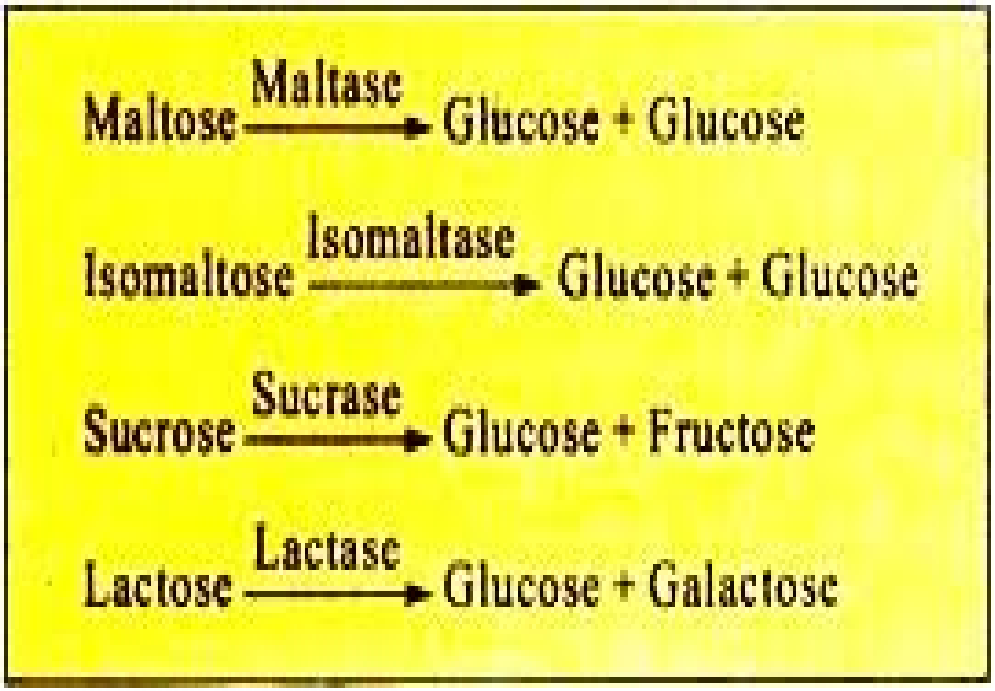
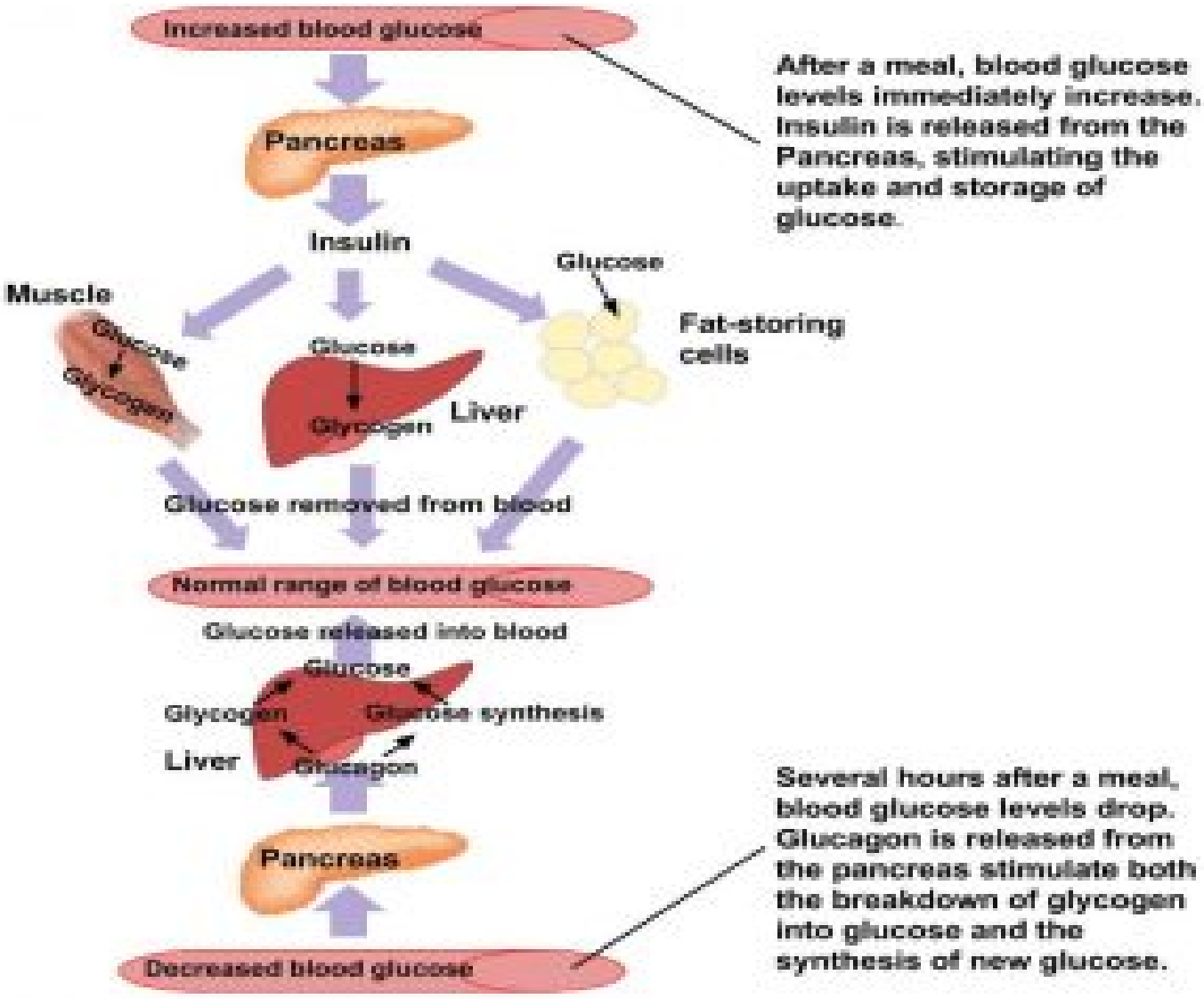


Level of glucose in the blood is maintained




Starch
alpha-
amylase
Disaccharides:
e.g. maltose
Dextrines
alpha-
dextrinase
Glucose
maltase
Disaccharides
Sucrose
Lactose
invertase
lactase
Intestinal
lumen
Glucose
transporter
Fructose
transporter
Glucose
transporter
Galactose
transporter
Brush
border
Epithelial
cell
Glucose
Fructose
Glucose
Galactose

Digestion of protein

Proteins of ingested food are broken down into amino acids by proteases (peptidases). Proteases are secreted in inactive forms called proenzymes which are converted into active forms at site of their action. Protein digestion starts in the stomach and is completed in the small intestine. Saliva contains no protease.

Digestion of proteins in stomach : Chief cells of gastric gland secrete pepsinogen and prorennin, which act as follows:

$$\text{Pepsinogen} \xrightarrow{HCl} \text{Pepsin}$$

$$\text{Proteins} \xrightarrow{\text{Pepsin}}$$

$$\text{Prorennin} \xrightarrow{HCl} \text{Rennin}$$

$$\text{Casein (Milk protein)} \xrightarrow{\text{Rennin}} \text{Paracasein + Whey proteins}$$

$$\text{Paracasein + Calcium} \rightarrow \text{Calcium paracaseinate}$$

$$\text{Calcium paracaseinate} \xrightarrow{\text{Pepsin}} \text{Peptones}$$

Digestion of proteins in small intestine: In small intestine, peptones and proteoses are acted upon by enzymes of pancreatic juice and intestinal juice.

Pancreatic juice contains 3 inactive proteases; trypsinogen, chymotrypsinogen and pro-carboxypeptidase. Their action is as follows:

follows:

Trypsinogen $\xrightarrow{\text{Enterokinase of intestinal juice}}$ Trypsin

Peptones + proteoses $\xrightarrow{\text{Trypsin}}$ Large peptides

Chymotrypsinogen $\xrightarrow{\text{Trypsin}}$ Chymotrypsin

Proteoses + Peptones $\xrightarrow{\text{Chymotrypsin}}$ Large peptides

Procarboxypeptidase $\xrightarrow{\text{Trypsin}}$ Carboxypeptidase

Large peptides $\xrightarrow{\text{Carboxypeptidase}}$

Dipeptides + Amino acids Intestinal juice contains two digestive pro-teases; aminopeptidases and dipeptidases and a nondigestive enterokinase (enteropep- tidase).

Large peptides $\xrightarrow{\text{Aminopeptidases}}$ Dipeptides + Amino acids

Dipeptides $\xrightarrow{\text{Dipeptidases}}$ Amino acids

Amino acids are the end products of protein digestion which are absorbed by intestinal cells.

Digestion of Proteins

- **Small intestine:** Further digestion in intestine is carried out by pancreatic proteases
- HCO_3^- maintains opt. alkaline pH for proteases
- Amino-, di- & tri-peptidase secreted from/present inside the epithelial cells complete the last step of digestion
- Free AAs are then absorbed and transported by portal circulation