

Feedback circuits regulate digestion energy storage, and appetite

Enteric division: Branch of the nervous system that is dedicated to the digestive organs and regulates these events as well as peristalsis in the small and large intestine

Endocrine system also plays a critical role in controlling digestion. Hormones released by the stomach and duodenum help ensure that digestive secretions are present only when needed.

- Hormone gastrin (secreted by stomach) circulates via the bloodstream and back to the stomach where it stimulates the production of gastric juices
- Duodenum responds to the amino acids or fatty acids in chyme by releasing the digestive hormone (CCK and secretin). CCK stimulates the release of digestive enzymes from the pancreas and of the bile from the gallbladder and Secretin stimulates the pancreas to release HCO_3^- which neutralizes chyme
- If the chyme is rich in fat, high levels of CCK and secretin inhibit peristalsis and secretion of gastric juices.

Regulation of energy storage

First places used for excess energy storage are liver and muscle cells.

Stored in glycogen. Once full stored in fat in adipose cells

Human generally expends liver glycogen first and then draws on muscle glycogen

Glucose is a major fuel for cellular respiration and key source of carbon skeletons for biosynthesis, maintaining blood glucose concentrations near 70-100 mg / 100 mL is critical

Glucose homeostasis relies mostly on the opposing effects of two hormones, insulin and glucagon

1. When blood glucose levels rise above normal, the secretion of insulin triggers the uptake of glucose from the blood into body cells, decreasing BG conc
2. When blood glucose drops below normal range, the secretion of glucagon promotes the release of glucose into the blood
3. Both hormones are produced in the pancreas. Throughout the pancreas are pancreatic islets. Each pancreatic islet has alpha cells, which make glucagon, and beta cells which make insulin ---> make up only 1-2% of the mass of the pancreas. Other cells in the pancreas produce and secrete