Functions of the large intestine -I

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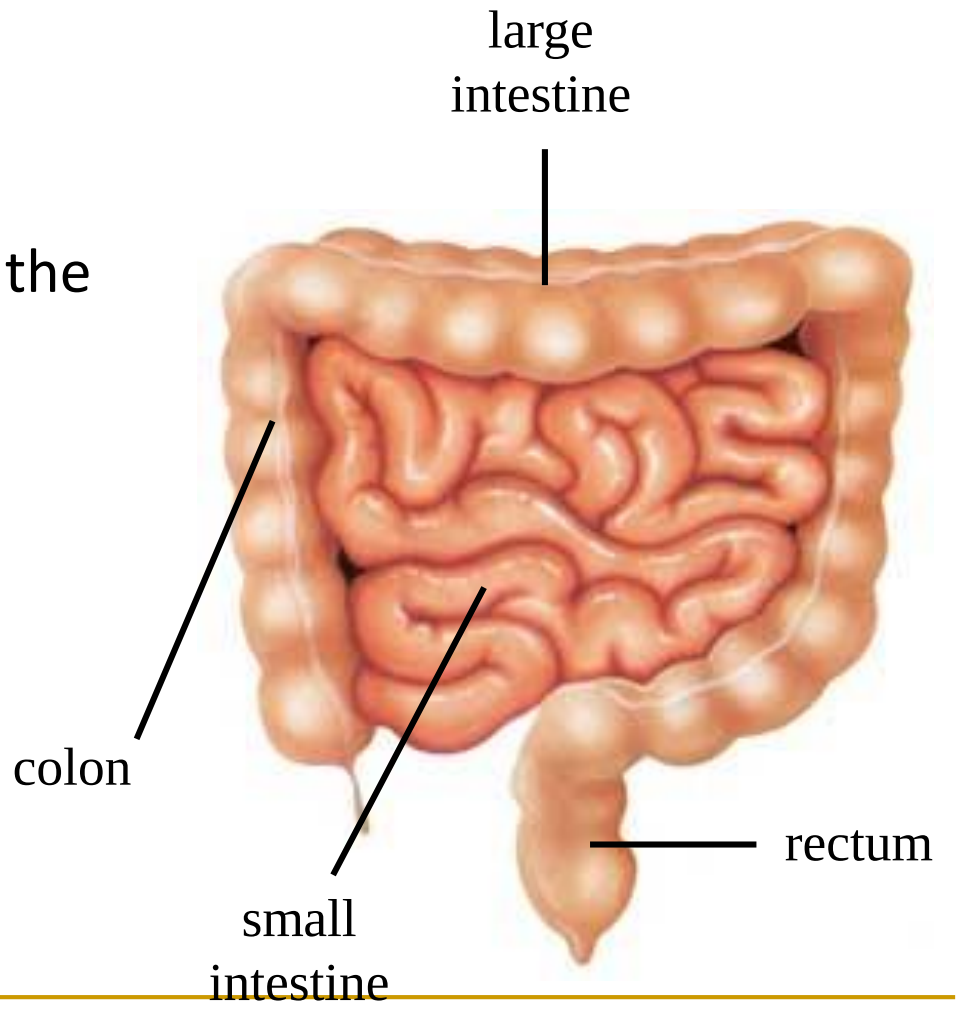
2018

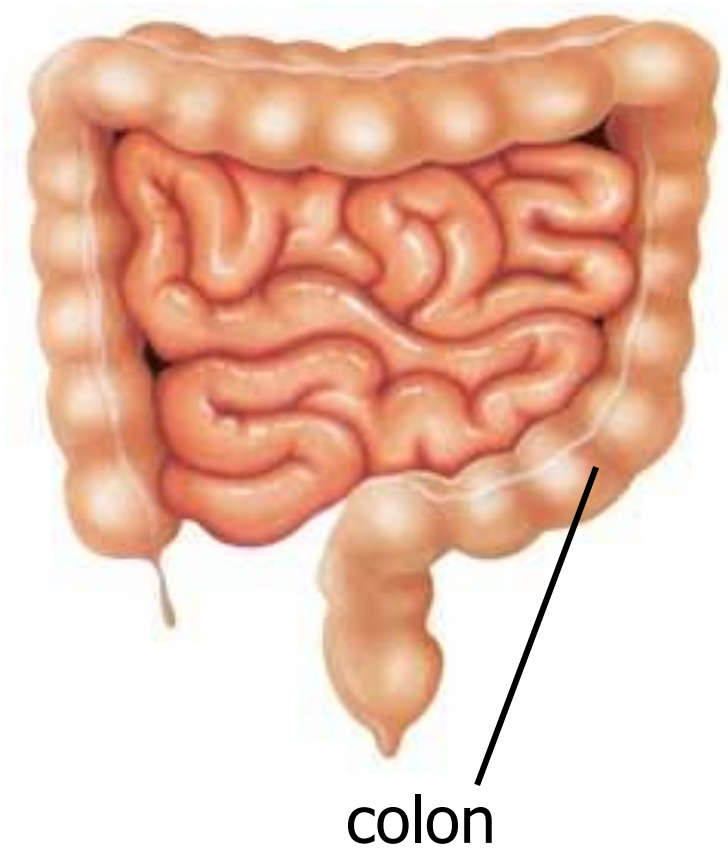
Large Intestine

- The large intestine is about 1.5 m long
  - Shorter and wider than the small intestine
- Consists of 2 parts:
  - Colon
  - Rectum



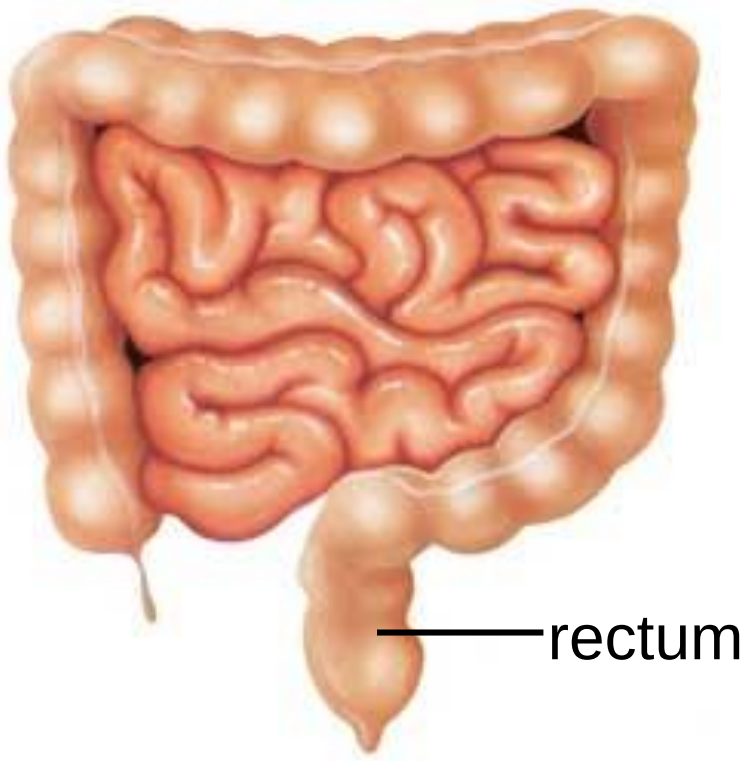
Functions – Large Intestine

- Only undigested food enters the colon.
- No digestion occurs in the colon.
- It absorbs water and mineral salts from the food (mainly proximal ½)



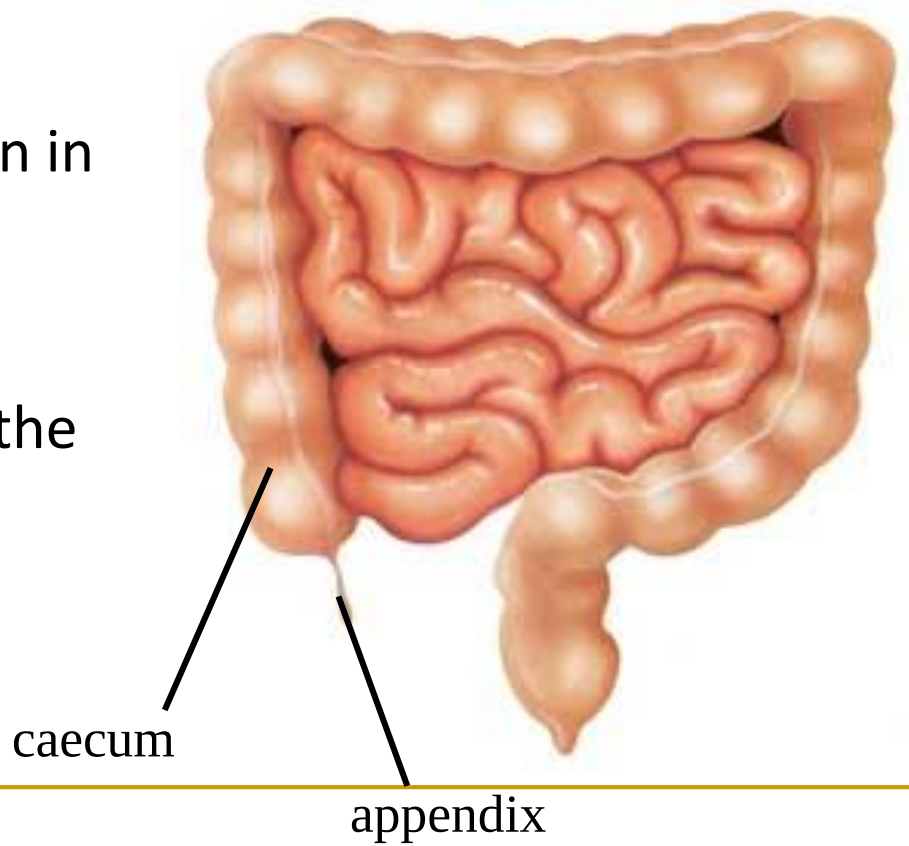
Functions – Large Intestine

- The distal ½ of colon and rectum temporarily stores faeces.
- During defecation, faeces is expelled through the anus.



Large Intestine

- Between the small and large intestines lie the caecum and appendix.
- The caecum has no function in humans.
- The appendix contains bacteria that are useful to the body.



Objectives

- List the main functions of large intestine
- State the importance of
  - Colonic bacteria
  - Dietary fibre
- Describe the defecation reflex
- Mention the physiological basis for disorders related to defecation

Functions of large intestine

- After absorption is complete in the small intestine, peristalsis move the remaining material on to the large intestine.

- The large intestine, or colon, is the final organ of digestion
  - Water and salts are absorbed leaving behind a more solid material.
  - Absorb 90% of water in chyme.
  - 1-2L of chyme converted to 200-250mL of faeces

Functions of large intestine

- Large intestine secretes mucus to lubricate the intestinal wall. This lubrication makes the passing of feces less abrasive. Mucus also binds together the fecal matter.
- Anaerobic bacteria in the large intestine synthesizes some B vitamins and vitamin K
- These bacteria stop harmful bacteria from colonizing

The Rectum

- The rectum is the last part of the digestive system
- Faeces are eliminated from the rectum through the anus.
- Normal frequency of defecation is 3/day to 3/week

Motility of the large intestine

Ileo-caecal valve

- Ileo-caecal valve is closed at rest due to colonic pressure – prevent reflux of colonic contents to small intestine
- Open when ileal peristaltic contraction wave reaches the valve
- Parasympathetic stimulation opens the valve while sympathetic stimulation closes it

Contraction of the colon

- Motility of the colon regulated by BER
- Frequency of BER vary
  - 2/min at ileo-caecal valve
  - 6/min at sigmoid colon

- Main types of movements
  1. Segmentation (Haustrations) –storage of contents
  2. Peristalsis – propagate feces

     Weak anti-peristalsis sometimes seen in colon
  3. Mass contractions – propagate feces

Mass contraction

- Simultaneous contraction of large confluent area
- Occur 1-3 per day, especially after meals
- Repetitive contractions last for 10-30min
- Propagate – move faeces towards rectum – gives rise to the desire to defecate

Colonic motility video

https://www.youtube.com/watch?v=GdNtRom-Pvs

Colonic transit

- First part of ingested food reaches
  - Caecum - 4 hours
  - Hepatic flexure – 6 hours
  - Splenic flexure – 9 hours
  - Pelvic colon – 12 hours

- All undigested portions each caecum in 8-9 hours
- About 70% of markers appear in faeces in 72 hours
- Total expulsion takes more than a week

Intestinal bacteria

- From oesophagus to jejunum – sterile
- Some bacteria present in ileum
- Colon large number of bacteria
  - At birth gut is sterile
  - Intestinal flora establish very quickly (few days)

- Three main types
  1. Commensals – no effect on host and vice versa
  2. Symbionts – benefit the host and vice versa
  3. Pathogens – cause diseases

Bacterial overgrowth

- Excessive growth of bacteria

- Causes
  - Blind loope syndrome
  - Diverticula
  - Slow intestinal transit

- Can give rise to
  - Macrocytic anaemia – malabsorption of B12
  - Steatorrhoea – excessive hydrolysis of bile salts
  - Metabolic disturbances

Read

- Probiotics
- Prebiotics