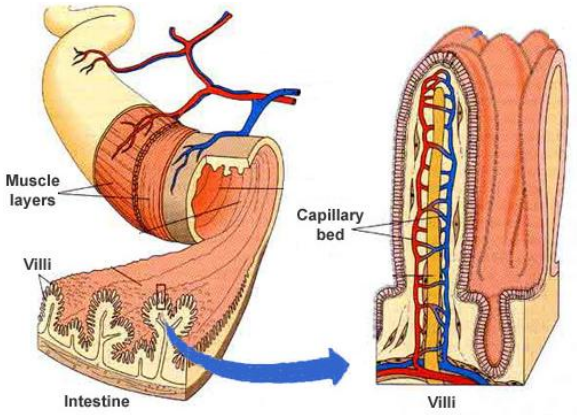
Absorption in the Small and Large Intestine

Virtually all food is digested in the duodenum and the jejunum. Once food molecules are digested, they must be absorbed. In other words, they must be transported across the epithelium lining of the small intestine into the bloodstream.

The lining of the small intestine is thrown into folds which increase the overall surface area. On the surface of the folds, are many fingerlike projections known as **villi**, which also increase the surface area available for the absorption of food molecules.



The intestinal surface area is further increased by microvilli, tiny protrusions of the plasma membrane of the epithelial cells lining the villi.

As shown in the figure, each villus is endowed with a rich supply of capillaries. These tiny vessels are responsible for the absorption of the nutrients that have passed the lining of the small intestine.

Numerous mechanisms are involved in absorption. Three of the most common are:

1) **Diffusion**: the movement of molecule from an area of higher concentration to an area of low concentration

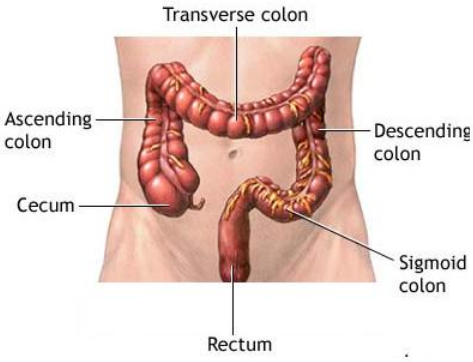
2) **Osmosis**: the diffusion of water molecule across a selectively permeable membrane.

3) **Active transport**: the uses of cell energy to move materials across a cell membranes against a concentration gradient.

The Large Intestine

The large intestine is about 1.5 meters long and consists of four regions that, contrary to the small intestine, consist of three relatively straight portions:

a. The cecum
b. The appendix
c. The colon
d. The rectum



Most of the large intestine consists of the colon. The material entering the large intestine consists of a mixture of **water**, **undigested or unabsorbed food molecules** and **undigested food residue such as cellulose** (fiber).

The colon absorbs approximately 90% of the water, the sodium and potassium that passes through it. Once these have been removed, the remaining content is referred to as **feces**. Bacteria account for approximately one third of the dry weight of feces.