

Nutrition for Nurses

Nutrition and Human Welfare

by

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What happens to the Food we eat

The Course of Food through the Digestive Tract

The digestive apparatus consists of the alimentary tract, a tube about 30 feet long in an adult, and the glands whose secretions are poured into the alimentary tract and assist in the changes taking place there. The organs of digestion are specifically fitted for both the mechanical functions of grinding, shaking and moving the food masses and also for the chemical functions of providing digestive enzymes. All these functions are regulated and coordinated partly by the hormones and partly by the nervous system.

The Mouth

In the mouth food is softened, lubricated and chewed to mix with saliva. When food is thus reduced to small particles, the different digestive juices can act upon it to best advantage. While food is in the mouth, the salivary glands pour their secretions on it. The saliva, active in neutral solutions, digests starches and dextrin by means of its enzyme—ptyalin. The saliva has no action upon proteins or fats. Although relatively little chemical change takes place in the mouth, under favourable conditions, the salivary enzyme can act on the carbohydrates in the stomach before the gastric secretions make the medium acidic.

The Stomach

In the stomach, food is stored for a longer or shorter time depending largely upon the size and character of the meal. The food eaten first lies next to the wall

of the stomach and fills that part of the stomach which connects with the intestines. The food eaten last lies in the interior of the stomach. Near the pyloric end of the stomach, there is a copious secretion (2-3 quarters daily) of strongly acidic gastric juice during digestion. The salivary digestion ceases and the digestion of protein by pepsin begins. Food becomes a creamy mass called "chyme" at the pyloric end. The fat splitting enzyme lipase is also active in gastric juice. Milk is curdled in the stomach. The flow of gastric juice is influenced by various factors such as: appetite for food, pleasurable sensations while chewing food, freedom from emotional tension, presence of certain substances like water, dilute acids, fruit juices, meat extracts and other food constituents in the stomach. Beginning a meal with soup or fruit juice is therefore beneficial in stimulating gastric secretion. The presence of free hydrochloric acid in the gastric juice has digestive and anti-septic functions.

At intervals the pyloric end opens and permits the passage of chyme into the small intestine. As the food in the pyloric region is gradually pressed out of the stomach, fresh portions of the food mass from the fundus end are pressed into the emptied regions (antrum) by the muscular tension of the stomach walls.

The stomach thus serves four main functions: (1) as a storage reservoir receiving food in relatively large quantities, three to four times a day, and passing it on to the intestines in small portions at frequent intervals, (2) as a

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I should like to express my indebtedness to my several hostesses for their co-operation in planning my programme of visits, and for their hospitality and the many thoughtful little deeds that made my tour a pleasant and profitable one.

The next issue of the *Journal* will carry a report of my tour.

LAKSHMI DEVI
General Secretary

place for continuation of the salivary digestion of starches ; (3) as the starting point of the digestion of proteins ; and (4) as a disinfecting station. Excepting a small portion of substance like alcohol, water, sugar, water soluble minerals and vitamins, very little absorption of food takes place in the stomach. The length of time food remains in the stomach depends on the proportions of carbohydrates, proteins and fats taken in. Fat stays in the stomach for the longest time and carbohydrates, the least. For this reason fats are said to possess a high satiety value. Excessive fat may retard digestion unduly and lead to discomfort. On the other hand too little fat will result in quick emptying of the stomach leading to frequent hunger.

The following table gives the average time taken by different foods to pass through the stomach.

	<i>Hours and Minutes</i>
Milk	1:00
Fruit	2:00
Sugar and sweets	2:00
Bread	2:30
Eggs	2:30
Fish	3:00
Vegetables	3:00
Meat (beef and mutton)	3:00
Pork	3:30

The Small Intestine : In the small intestine food in the form of liquid chyme is acted on by bile, pancreatic juice and the intestinal juices. All the three secretions are alkaline and therefore neutralise the acidity of the chyme. The bile secreted by the liver and concentrated and released from the gall bladder assists in the splitting of fats by the lipases, emulsifies them and facilitates their absorption. The pancreatic juice contains all the three enzymes, the amylases, the lipases and the proteases. The intestinal juices take part in the digestion of both proteins and carbohydrates. In the wall of the small intestine, numerous tiny projections called 'villi' increase the area of surface for the absorption of the digested food mixture by the blood ; 85 per cent of the food is absorbed before leaving the small intestine.

The large Intestine : In the large intestine, the digestive juices continue to act on the remaining foodstuffs and a vast amount of water is absorbed. The material remaining unabsorbed gradually becomes more solid in the form of faeces. About 18 hours elapse between the entrance of the digestion mixture into the large intestine and the elimination of the residual material from the body.

(to be continued)

