Flatus Encyclopedia Article

Flatus

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Flatus

Flatus describes gas from the intestinal tract that is expelled from the body via the rectum and anus.

The total volume of gas excreted by rectum varies greatly among individuals, ranging from approximately 500mL/day to 1500mL/day, with a mean of 700mL/day. Volumes also vary within individuals depending on their diet. Diets high in the non-absorbable disaccharide lactulose significantly increase the volume and frequency of passed flatus. The average frequency of passage of flatus for adults is 10 times per day with an upper normal limit of 20 times per day.

Flatus is composed of nitrogen, oxygen, carbon dioxide, hydrogen, and methane gas with percent composition being highly variable.

Sources of bowel gas may be from **swallowing** air (aerophagia), production from inside the gut (intraluminally) and diffusion from the **blood**. Most swallowed air is eructated (burped). A small proportion of air may be forced into the duodenum if the person is lying down and the stomach liquids act as a gas trap at the gastroesophageal sphincter.

Most bowel gas is produced in the intestinal lumen. Carbon dioxide, hydrogen, and methane are produced here in appreciable quantities. Carbon dioxide is generated intraluminally from the interaction of hydrogen ions plus bicarbonate ions. This reaction is catalyzed by carbonic anhydrase. Carbon dioxide may also be liberated from the **digestion** of **triglycerides** to fatty acids. Most of this carbon dioxide is produced in the duodenum and is absorbed into the blood as it travels toward the colon. The majority of carbon dioxide in flatus comes from bacterial fermentation.

Hydrogen production in the bowel occurs during bacterial fermentation of **carbohydrates** in the colon. Specifically, oligosaccharides found in fruits and legumes produce hydrogen gas when fermented by colonic **bacteria**. Hydrogen gas may also be produced by fermentation of mucoproteins by fecal bacteria.

Hydrogen gas is also consumed by methane producing bacteria (methanogens). If methanogens are the predominant intestinal flora, virtually all the gas is consumed intraluminally and does not appear in the flatus. The major methanogen in the human colon, *Methobrevibacter smithii,* produces methane through the reaction:

$4H_2 + CO_2\ CH_4 + 2H_2O$.

Approximately one third of adults have large concentrations of methanogens in their colons and produce significant quantities of methane in their flatus.

The majority of gases in flatus are non-odoriferous. The noxious odor of flatus is due to trace amounts of hydrogen sulfide. This gas gives a smell similar to rotten eggs.