

# Food and Symptom Generation in Functional Gastrointestinal Disorders: Physiological Aspects

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## Abstract

The response of the gastrointestinal tract (GIT) to ingestion of food is a complex and closely controlled process, which allows optimization of propulsion, digestion, absorption of nutrients, and removal of indigestible remnants. This review summarizes current knowledge on the mechanisms that control the response of the GIT to food intake. During the cephalic phase, triggered by cortical food-related influences, the GIT prepares for receiving nutrients. The gastric phase is dominated by the mechanical effect of the meal volume. Accumulation of food in the stomach activates tension-sensitive mechanoreceptors, which in turn stimulate gastric accommodation and gastric acid secretion through the intrinsic and vago-vagal reflex pathways. After meal ingestion, the tightly controlled process of gastric emptying starts, with arrival of nutrients in the duodenum triggering negative feedback on emptying and stimulating secretion of digestive enzymes through the neural (mainly vago-vagal reflex, but also intrinsic) and endocrine (release of peptides from entero-endocrine cells) pathways. Several types of specialized receptors detect the presence of all main categories of nutrients. In addition, the gastrointestinal mucosa expresses receptors of the T1R and T2R families (taste receptors) and several members of the transient receptor potential channel family, all of which are putatively involved in the detection of specific tastants in the lumen. Activation of nutrient and taste sensors also activates the extrinsic and intrinsic neural, as well as entero-endocrine, pathways. During passage through the small bowel, nutrients are progressively extracted, and electrolyte-rich liquid intestinal content with non-digestible residue is delivered to the colon. The colon provides absorption of the water and electrolytes, storage of non-digestible remnants of food, aboral propulsion of contents, and finally evacuation through defecation.

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