

# Fisiologia Umana Silverthorn

Fisiologia Umana Silverthorn The Amazing Journey of a Meal From Mouth to Muscle Have you ever wondered what happens to the food you eat after you swallow it The journey of a meal through your body is a complex and fascinating process orchestrated by a symphony of physiological systems This article inspired by the insights from Human Physiology An Integrated Approach by Dee Unglaub Silverthorn will guide you through this incredible adventure exploring the key steps involved in digestion absorption and the ultimate utilization of nutrients by your body

## 1 The Grand Entrance From Mouth to Stomach

### Mechanical Digestion

Your journey begins in the mouth where chewing mastication breaks down food into smaller pieces increasing its surface area for digestion Saliva secreted by salivary glands moistens the food and contains enzymes like salivary amylase which starts the breakdown of carbohydrates

### The Peristaltic Push

The rhythmic contractions of smooth muscle called peristalsis propel the food bolus down the esophagus and into the stomach This process is regulated by the autonomic nervous system

### Stomach Churning

The stomach acts as a churning mixer mixing the bolus with gastric juice This acidic concoction contains Hydrochloric acid HCl Activates pepsinogen the precursor to pepsin and denatures proteins making them easier to digest

### Pepsin

An enzyme that breaks down proteins into smaller peptides

### Gastric Lipase

An enzyme that begins the breakdown of fats

## 2 The Small Intestine

### The Nutrient Absorption Highway

#### The Role of the Duodenum

The duodenum the first part of the small intestine receives chyme from the stomach and mixes it with digestive secretions from the pancreas and liver

### Pancreatic Power

The pancreas releases

- Pancreatic lipase Breaks down fats into fatty acids and monoglycerides
- Pancreatic amylase Continues the breakdown of carbohydrates into disaccharides
- Pancreatic proteases Break down proteins into smaller peptides and amino acids

### Bicarbonate

Neutralizes the acidic chyme from the stomach

## 2 Liver Assistance

The liver contributes bile a fluid that emulsifies fats breaking them into smaller droplets making them more accessible for lipase activity

**Absorption Efficiency**

The small intestine is lined with tiny fingerlike projections called villi which further increase surface area for nutrient absorption Within each villus there are even smaller projections called microvilli amplifying the absorptive capacity even further

**Nutrient Transport** The absorbed nutrients are transported to the bloodstream through the capillaries within the villi ready for use by various cells in the body

**3 The Large Intestine The Final Frontier Waste Management** The large intestine mainly absorbs water and electrolytes from the remaining undigested food It also houses a vast population of bacteria which play a crucial role in digesting fibers synthesizing some vitamins like vitamin K and protecting against harmful bacteria

**The Journey Ends** The undigested waste now in the form of feces is stored in the rectum and eliminated from the body through the anus

**4 Fueling the Body From Nutrients to Energy Cellular Respiration** The nutrients absorbed from the small intestine are transported to cells throughout the body These nutrients are used as fuel in a process called cellular respiration which involves a series of chemical reactions that generate ATP the primary energy currency of cells

**Building Blocks** Besides energy the nutrients also provide building blocks for the body such as amino acids for proteins fatty acids for cell membranes and sugars for DNA and RNA

**5 The Power of Hormones Regulating Digestion Hormonal Symphony** The digestive process is finely regulated by hormones chemical messengers that travel through the bloodstream influencing the activity of various organs involved in digestion

**Gastrin** Stimulates the secretion of gastric juice in the stomach

**Secretin** Stimulates the secretion of pancreatic juice and bicarbonate

**Cholecystokinin CCK** Stimulates the release of bile from the gallbladder and pancreatic enzymes

**6 Factors Affecting Digestion Stress** Stress can affect digestion by increasing the release of the fight or flight hormone 3 adrenaline which can slow down the digestive process

**Diet** A balanced diet rich in fiber fruits and vegetables promotes healthy digestion

**Exercise** Regular physical activity can improve digestion by stimulating muscle contractions in the gastrointestinal tract

**The Final Word** The digestion and absorption of food is a

remarkable feat of physiological coordination From the mechanical breakdown in the mouth to the final absorption of nutrients in the small intestine the journey of a meal showcases the incredible efficiency and complexity of the human body Understanding the intricacies of this process can empower us to make informed choices about our diet and lifestyle promoting optimal digestive health and overall well being

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