

# reviewfooddigestiondigestivetractusedvitromodels-sensoy

## Backlinks

- [Medical papers](#)
- [A review on the food digestion in the digestive tract and the used in vitro models](#)

## Abstract

It is crucial to replicate or mimic the human digestive system conditions closely in model systems to have the food digestion-related data as accurate as possible. Thus, the data obtained could contribute to studies like those on the relationship between health and nutrition. This review aims to express the human digestion system's role in food digestion and compare the capability of the models used in simulations, especially the dynamic in vitro models. Activities of the human digestive system governing food digestion and the food matrix's disintegration mechanism in the digestive system were discussed. Dynamic in vitro models and their relevance to the human digestive system were described. Advancements in the last 20 years, as well as limitations of those artificial systems, with prospects, were discussed. Extensive use and improvement on these models will extend our knowledge of the food matrix and digestive system's complex interaction. Thus, it will be possible to design next-generation foods with improved health benefits.

## Introduction:

- Purpose of the study is to review the current state of knowledge about food digestion in the human digestive tract.
- Emphasis on in vitro models used for studying digestion processes.
- In vitro models are essential tools for understanding and predicting human digestion.
- The review aims to provide an overview of the existing literature and identify gaps in knowledge.

## Food Digestion:

- Stages of food digestion: ingestion, mechanical breakdown, chemical breakdown, absorption, and egestion.
- Major organs involved in digestion: mouth, stomach, small intestine, large intestine, and rectum.
- Enzymes and microorganisms play a crucial role in the process of food digestion.
- Factors affecting digestion include dietary habits, individual differences, and health conditions.

## In Vitro Models:

- Different types of in vitro models used for studying digestion processes: static, dynamic, and continuous culture systems.
- Advantages of using in vitro models: controlled environment, reproducibility, cost-effectiveness, and ethical considerations.
- Limitations of in vitro models: lack of complexity, difficulty in mimicking the human digestive system, and variability between studies.
- Examples of in vitro models used for studying food digestion: Caco-2 cell line, simulated gastric fluid, and artificial small intestine.

## Applications of In Vitro Models:

- In vitro models are useful for understanding the effects of dietary components on digestion and absorption.
- They can be used to study the impact of food processing techniques on nutrient availability.
- In vitro models help in evaluating the efficacy of pharmaceuticals, probiotics, and prebiotics on gut health.
- These models are also employed for toxicity testing and risk assessment of food contaminants.

## Key Takeaways:

1. Food digestion involves a series of stages, including mechanical and chemical breakdown, absorption, and egestion.
2. In vitro models are essential tools for studying human digestion processes, with advantages and limitations.
3. Examples of in vitro models include Caco-2 cell lines, simulated gastric fluid, and artificial small intestine.
4. Applications of in vitro models include understanding dietary effects on digestion, evaluating pharmaceuticals, and assessing food contaminants.