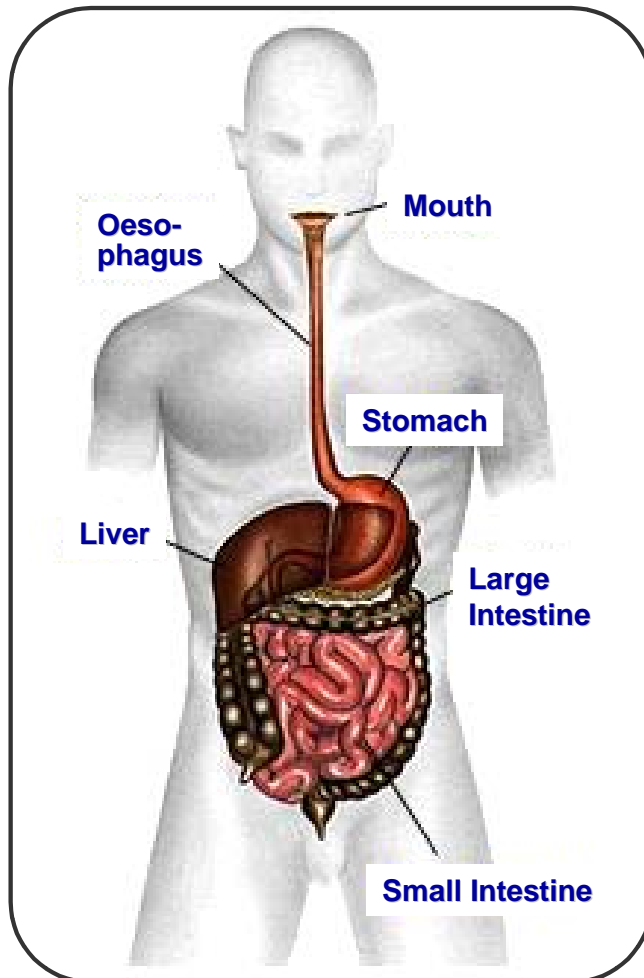


## SPECIAL TESTS

### DIGESTIVE TRACT MODEL

The digestive process breaks down **food** by mechanical and chemical action into substances which can pass into the bloodstream and be processed by body cells. More-over, orally applied **beneficial active agents/ingredients** are created to be absorbed in specific compartments of the digestive tract. **Hazardous substances** which are taken up by oral or inhalative exposure may also be absorbed leading to a systemic distribution and toxification.



#### Mouth

The first step results in a mechanical breakdown of the food which is then mixed with amylase-containing saliva (pre-digestion) and transported via oesophagus into the stomach.

#### Stomach

The stomach as a large muscular hollow organ has three mechanical tasks such as storage, mixing up of the food, liquid and digestive juices (hydrochloric acid and pepsin) and, finally, to empty its contents into the small intestine.

#### Intestine

As the food is digested in the small intestine and dissolved into the juices from the pancreas, liver and intestine, the con-tents of the intestine are mixed and pushed forward to allow further digestion. All of the digested nutrients are absorbed through the intestinal walls; the waste products are propelled into the colon for excretion.

The **DIGESTIVE TRACT MODEL** is the simulation of the three main consecutive compartments of the human digestive tract.

**(1) Mouth ⇒ Synthetic Saliva**

Inorganic components: NaCl, NaSCN, Na<sub>2</sub>SO<sub>4</sub>, NaHCO<sub>3</sub>, KCl, KH<sub>2</sub>PO<sub>4</sub>, CaCl<sub>2</sub>

Organic components: urea, uric acid, mucin from pancreas, alpha-amylase

pH-value: 5,6

Extraction time: 2 min at 37°C

**(2) Stomach ⇒ Gastric Juice**

Inorganic components: NaCl, KCl, KH<sub>2</sub>PO<sub>4</sub>

Organic components: pepsin from gastric mucosa, mucin from pancreas

pH-value: 1,0 to 2,0

Extraction time: 2-8 h at 37°C

**(3) Intestine ⇒ Intestinal Juice**

Inorganic components: KCl, CaCl<sub>2</sub>, MgCl<sub>2</sub>, NaHCO<sub>3</sub>

Organic components: trypsin and pancreatin from pancreas, bile extract

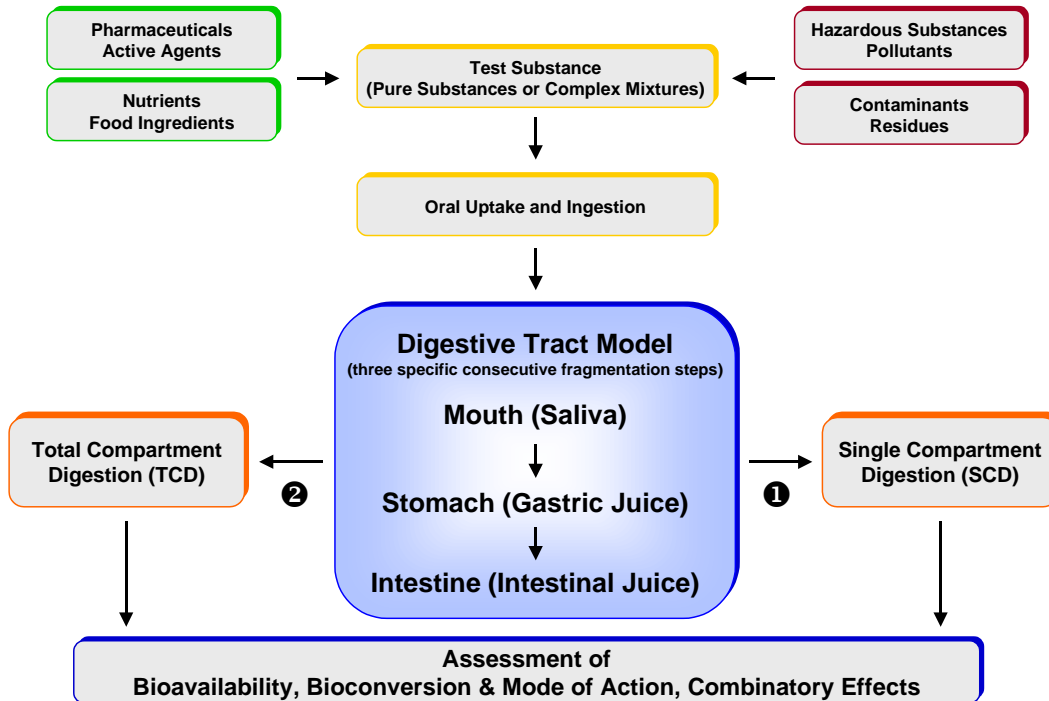
pH-value: 7,4 to 7,6

Extraction time: up to 16 h at 37°C

**The main advantages of the DIGESTIVE TRACT MODEL**

- Realistic simulation of physiological conditions of the gastrointestinal tract for humans
- Total digestion as well as specific fragmentation steps possible (saliva, gastric juice, intestine juice)
- Completely process-controlled and standardized
- Accurate and reproducible results including cellular, molecular and chemical analysis
- Use for tests in a very early stages of development of new products or pharmaceutical compounds in order to reduce total development period
- Ability to investigate beneficial, allergenic and toxic effects (acute, subchronic, chronic)
- Only a limited amount of the sample material is needed (about 5-10 gram complex test material, only about 1 to 2 g in the case of pure substances)
- A convincing alternative to experimental animals which is free of individual variations
- No ethical and time-consuming limitations as usual for animal experiments
- Quick results - within 2 weeks

Which questions can be solved by the DIGESTIVE TRACT MODEL?



Where and which efficacy can you evaluate after total compartment digestion?

