

# Biology 10 - Introduction to Biology

West Valley College - Norris

## Nutrition and Digestion

### I. Definitions

- A. Digestion
- B. Absorption
- C. Nutrition

### II. Nutrition

#### A. Macronutrients - required in large amounts

1. Carbohydrates (starch, glycogen = complex carbohydrates) (recommended 60-80%)

2. Lipids (fats & oils (triglycerides), cholesterol) (recommended 10-30%)

3. Proteins (recommended 10%)

#### B. Micronutrients - required in only small amounts

##### 1. Vitamins

a. water soluble

b. fat soluble

##### 2. Minerals

### III. Nutrition and Metabolism

#### Basic:

Fuel (food) -----anabolism-----> structure / storage -----catabolism----> work, heat, H<sub>2</sub>O, CO<sub>2</sub>

#### More Specific:

Food (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) ---anabolism---> Fat, Protein, Glycogen --catabolism--->work, heat, H<sub>2</sub>O, CO<sub>2</sub>

(1 kilocalorie = 1 dietary Calorie = energy required to heat 1 kilogram of water 1°C)

### IV. Digestion - role of the digestive system (gut, gastrointestinal tract, GI tract, alimentary canal)

1. incomplete

2. complete

## V. Anatomy and Physiology of the Digestive Tract

### A. Mouth

### B. Esophagus

### C. Stomach

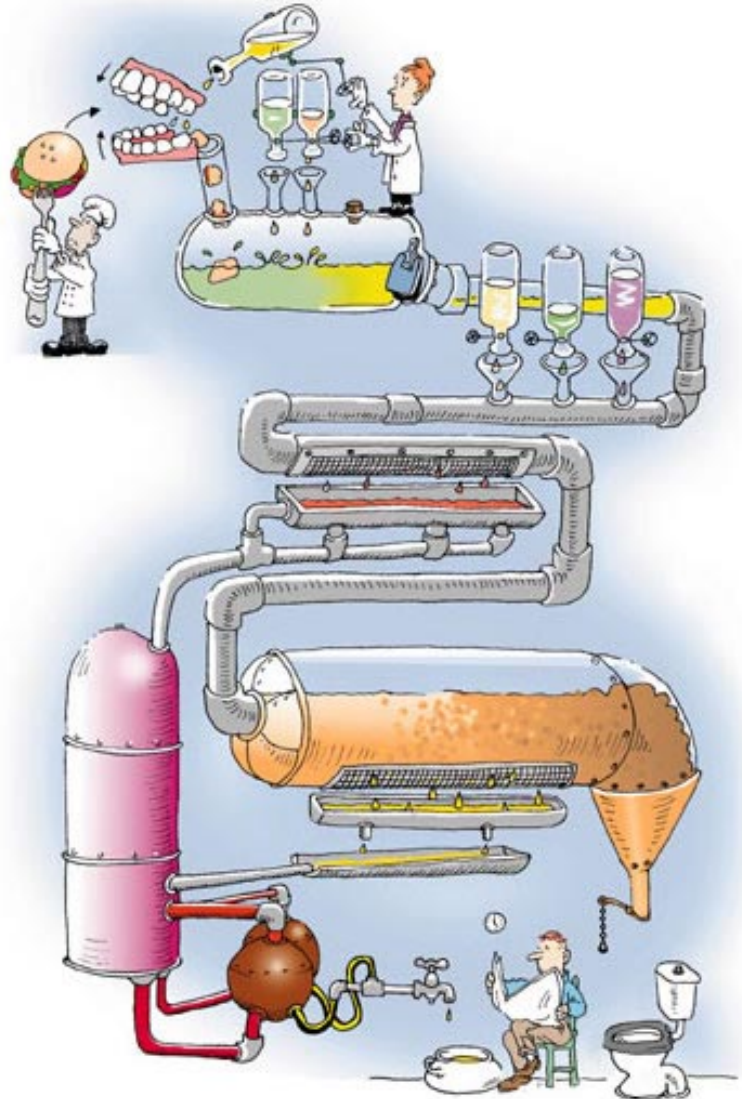
### D. Small Intestine

#### 1. digestion

#### 2. absorption

### E. Large Intestine

### F. Rectum & Anus



## VI. Utilization of the Products of Digestion

### A. Pancreas Function

#### 1. During digestion

#### 2. After digestion

### B. Liver Function

#### 1. During digestion

#### 2. After digestion

## VII. Additional Selected Key Terms

acidity (pH)

emulsification

enzyme

essential amino acid

essential fatty acid

gland

gut

kilocalorie

lumen

micelle

mineral

obesity

peristalsis

sphincter

vitamin

## **Study Questions – Nutrition & Digestion:**

1. Define “digestion”, “absorption” and “nutrition”.
2. Nutrients in the diet may be used as a fuel source (and “burned” for energy) or as “building blocks” in the production of a new structure. Primarily, how are carbohydrates in the diets used? Lipids? Proteins?
3. What is a Calorie?
4. Which contains more Calories per gram: sugar, fat or protein?
5. What is the difference between a simple and a complex carbohydrate? Which is healthier? Why?
6. Is it unhealthy to eat fat? Explain.
7. What is an “essential nutrient”, what does this mean?
8. Many nutrients can be synthesized from other nutrients within human cells. Certain fats and amino acids cannot be synthesized by humans. How does this fact effect the composition of a healthy diet?
9. In general, what is the significance of the different micronutrients in the diet?
10. Compare and contrast “incomplete” and “complete” gut digestive systems.
11. What is the difference between “chemical” and “mechanical” digestion?
12. What is the significance of the carbohydrate digesting enzyme “amylase” in saliva?
13. What prevents food from entering the airways during swallowing?
14. How does food move through the digestive sytem?
15. What is the name used to describe the “chewed” food as it is swallowed? What is it called when it is found in the stomach?
16. Is the stomach an important site of absorption? How about digestion? What is the primary role of the stomach?
17. The lining of the small intestine is covered with villi and microvilli. What benefit is gained from this structural adaptation?
18. Where does the majority of chemical digestion take place?
19. Where does the majority of nutrient absorption take place?
20. What is the primary function of the large intestine (aka colon)?
21. Where are the enzymes necessary for chemical digestion in the small intestine produced?
22. Where is bile produced? Where is it stored? What does it do?
23. Both the liver and the pancreas are important to the function of the digestive system during digestion and after nutrients have been absorbed into the blood stream. What role do these organs play after nutrient absorption?

*“What some call health, if purchased by perpetual anxiety about diet, isn't much better than tedious disease.”*  
George Dennison Prentice

*“We are indeed much more than what we eat, but what we eat can nevertheless help us to be much more than what we are.”*  
Adelle Davis