

Chapter 8

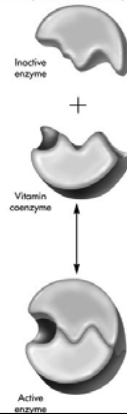
Vitamins

Vitamins

- Essential organic substances
- Produce deficiency symptoms when missing from diet
- Yield no energy
- Basic functions
 - Facilitate energy-yielding chemical reactions
 - Function as co-enzymes
- Fat-soluble vitamins
- Water-soluble vitamins

Coenzymes

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Fun Facts

- Vitamins were named in order of discovery (A, B, C, D, ...)
- Other substances found not to be essential were dropped (e.g., vitamin P)
- B-vitamins were thought to be one vitamin; turned out to be many (e.g., B1, B2, B3,...)

Vital Dietary Components

- Megadose (>3-10x needs as a starting point)
 - Proved useful in treating certain conditions
- Plant and animal foods provide vitamins
- Most synthesized vitamins work equally well in the body
- Scientists believe they have discovered all the vitamins

Storage of Vitamins in the Body

- Fat-soluble
 - Not readily excreted (except vitamin K)
- Water-soluble
 - Generally lost from the body (except vitamins B-6 and B-12)
 - Excreted via urine
- Vitamins should be consumed daily
 - Occasional lapse is harmless

Vitamin Toxicity

- Fat-soluble vitamins
 - Can accumulate in the body
- Water-soluble vitamins
 - Some can cause toxicity
- Mostly likely due to supplementation

Preservation of Vitamins

- Decreased vitamin content
 - Improper storage
 - Excessive cooking
 - Exposure to light, heat, air, water, and alkalinity
- Eat foods soon after harvest
- Freeze foods not consumed within a few days
- Blanching destroys enzymes
 - Slows down vitamin degradation

Fat-Soluble Vitamins Overview

- Dissolve in organic solvents
- Not readily excreted
 - Can cause toxicity
- Absorbed along with fat
- Fat malabsorption
 - May cause deficiency
- Transported with fat
 - In lipoproteins

Chapter 9

- Water and Minerals

Water

- 50%-70% of body weight
- Muscle contains 73% water
 - Fat contains ~20%
- Intracellular fluid
 - Fluid within the cells
- Extracellular fluid
 - Fluid outside the cells

Fluid Balance

- Water shifts freely in and out of cells
- Controlled by electrolyte concentration
- Osmosis
- Intracellular water volume
 - Depends on intracellular potassium and phosphate concentrations
- Extracellular water volume
 - Depends on extracellular sodium and potassium concentrations

Functions of Water

- Body temperature regulation
 - Water absorbs excess heat
 - Body secretes fluid via perspiration
 - Skin is cooled as perspiration evaporates
- Removal of body waste via urine
 - Urea excretion
 - Sodium excretion
 - Avoid concentrated urine
- Amniotic fluid, joint lubricants, saliva, bile

Are You Drinking Enough?

- Recommend 9 cups for women and 13 cups for men as a starting point



Nutrient Supplements

Dietary Health Supplement and Education Act of 1994

- Supplements must have one or more of these dietary ingredients:
 - A Vitamin
 - A Mineral
 - An herb or botanical
 - An amino acid
 - A substance to supplement the diet

Regulation

- Products are not closely regulated
- FDA will investigate a product if any illegal claims are made

Health Claims

- Manufacturers can make very broad health claims without doing thorough testing or having supporting evidence

Reasons for Taking Supplements

- Reduce susceptibility to health problems
- Prevent heart attacks
- Prevent cancer
- Reduce stress
- Increase energy

People Most Likely to Need Supplements

- Women of childbearing age
- Women with excessive menstrual bleeding
- Pregnant and breastfeeding women
- People with low calorie intakes
- Strict vegans
- People who do not drink milk
- People with lactose maldigestion

- Adults over 50
- People with low fat diets
- Children who are picky eaters
- People with certain medical conditions

Choosing A Supplement

- A nationally recognized brand
- One that contains 100% of the daily values of the nutrients present
- Make sure it breaks down in an appropriate time frame

Taking Supplements

- Taking supplements with meals or right after meals maximizing absorption