Appendix B: Study Questions

Chap. 1. Nutrition Myths and Tests of Reality

1. Why was the 18th century revelation that “life is a chemical function,” such a milestone in nutrition science?

2. Jay tells Danit that without a vitamin pill with his morning coffee, he lacks energy the whole day. Danit looks doubtful. What might she be doubtful about, and how could she go about testing whether the vitamin pill has the effect Joe says it has?

3. What are some reasons for the persistence of some myths about diet and health?

Part 1: Energy and the Human Machine

Chap. 2. Food Power—Use and Storage

1. Thinness is a part of our cultural concept of womanly beauty. Yet, in many cultures throughout history and in some cultures today, obese women are the beautiful ones. What are some explanations?

2. Where in our bodies do we store most of our fat? Besides fuel storage, what other purposes are served by these fat deposits?

3. When a slice of bread is said to contain 70 calories, what does this mean, and how is calorie content measured?

4. Ruben would like to know exactly how many calories he uses when working out for a half hour. A scientist will use one of two methods to make this measurement. Describe the two methods.

5. Jay and Juan are the same in age and weight. Yet, Jay has a higher basal (minimum) energy requirement. What are some likely explanations?

6. Brad set the toaster way too high when he put in a slice of bread. He burned it! The label says a slice of bread is 70 calories. How many calories does it have now?
Chap. 3. Putting the Laws of Energy to Work

1. What are some ways of measuring body fatness? Discuss the accuracy of these methods.
2. We eat for many reasons besides satisfying physical hunger. Discuss some of these.
3. Explain why so many weight-loss diets are successful only in the short term. What are the components of a sensible diet program for long-term weight control?
4. Sue has been off and on “crash” diets since she was 20 years old. She would usually go off these diets by binging. She now finds, 25 years later, that she is having a harder and harder time losing weight. Explain the probable reasons for this.
5. Many of us are having trouble keeping off the extra pounds and would like to increase our basal metabolism so that we could eat more without having to exercise more. What are some ways to increase our basal metabolism?

Part 2: Carbohydrates and the Foundations of Food

Chap. 4. The Trapping of the Sun

1. What is the connection between photosynthesis and metabolism? How does this explain the statement that the energy our body uses comes ultimately from the sun?
2. Which single sugars make up the common double sugars sucrose, lactose, and maltose? Which double sugar is common table sugar?
3. In what form do we store carbohydrate in our liver and muscles? What aspect of its structure is very important to its function as a storage form of carbohydrate?
4. Why does a banana get sweeter as it ripens?
5. Food companies use a lot of high-fructose corn syrup in food products. Why might they prefer to use this rather than regular table sugar? How is high-fructose corn syrup made?
6. NutraSweet is not a sugar (it is made of two amino acids linked together). Why is it sweet?
7. A small acorn can grown into a huge oak tree. Where does the acorn get all that mass to become such a tree?

Chap. 5. Of Carbohydrates and Health

1. How might fiber help prevent diverticulosis, constipation, colon cancer?
2. What is the role of sugar in tooth decay?
3. Describe the two main types of diabetes? Which is related to obesity?
4. It is popularly believed that sugar causes hyperactivity. Carefully controlled studies, however, suggest that sugar has a calming effect. Explain this effect in terms of the amino acid tryptophan and the neurotransmitter serotonin.

Part 3: Proteins—The Masters of Life

Chap. 6. The Protein Confusion

1. What is meant by “essential” and “non-essential” amino acids?
2. Only 20 different amino acids are used to make a seemingly endless variety of proteins. How can this be?
3. What does it mean to denature a protein? Does this change its nutritional value?

4. Tien takes an amino acid supplement that contains 22 amino acids. Ruben boasts that his supplement is superior because it contains 25. Tien asks you if Ruben is right. What would you say?

5. Explain why eating two sources of plant proteins together can improve the quality of protein.

6. In developing countries, protein deficiency is more common in young children than in adults, even when both eat the same diet. Why is this?

**Chap. 7. Putting Amino Acids to Work**

1. List the steps of protein synthesis, beginning with DNA.

2. Kim eats a “typical American diet,” and is thinking of switching to a strictly vegetarian diet. What are the nutritional advantages and disadvantages of this switch?

3. Zuri’s diet contains about four times the amount of protein he needs. In addition, he takes amino acid supplements. He complains of excessive urination and thirst. What is a possible explanation?

4. Why is the promotion of breast-feeding particularly important in developing countries?

5. If the typical American diet (diet A) could be “mixed with” a diet typical of a developing country (diet B) to form a composite diet (diet C), diet C would be a healthier diet for both countries. Do you agree with this statement? Why or why not?

**Part 4: Fats—The Mysteries and Simplicities**

**Chap. 8. Fats Seen and Unseen**

1. Explain why an ounce of salad oil has almost 10 times more calories than an ounce of cooked brown rice.

2. How is margarine made?

3. Caleb learned that cholesterol is necessary to make some hormones and cell membranes. As a strict vegetarian, he is concerned that he is not getting enough cholesterol in his diet. Does his diet provide much cholesterol? Should he be concerned?

4. Maria thinks that fat is really bad, and has decided to cut fat out of her diet. Explain how this might be good and/or bad for her.

5. What is a partially hydrogenated oil? Why would it be an ingredient in packaged cookies, for example?

6. What is meant by the statement that lecithin is essential in the body but not in the diet?

7. An advertisement heralds corn oil as “Cholesterol-free!” Why is this misleading?

8. How do saturated fatty acids differ chemically from unsaturated fatty acids? Which kind is found mostly in animal fats? In plant oils? What are some exceptions?

**Chap. 9. Fat and the Doctor’s Dilemma**

1. What is atherosclerosis; why can it cause more than one disease?

2. What changes in our diet and lifestyle can we make to lower our risk of atherosclerosis? Explain how these changes lower risk.

3. What’s the difference between LDL-cholesterol and HDL-cholesterol?
4. Although extraordinarily high amounts of nicotinic acid (a B-vitamin) can lower LDL-cholesterol, why is it unwise to take such high doses on one’s own?

5. Al had a heart attack at age 55 even though he ate a low-fat diet his entire life. List possible risk factors that could have contributed to his heart attack.

6. When the rate of cancer increases in the United States, it’s popularly believed that this is due to more cancer-causing substances in our food and environment. What are other reasonable explanations for an increase in cancer?

7. Explain why lowering the amount of animal fat in the diet may lower risk of both heart disease and cancer.

8. The label states that 1 serving of mixed nuts (1 oz.) has 180 calories and 16 gm fat. What % of the calories come from fat?

Part 5: Fueling the Body

Chap. 10. The Digestive System

1. Why is the top part of the small intestine (the duodenum) a susceptible site for developing an ulcer?

2. What is the cause of lactose intolerance and its symptoms? In which ethnic groups is this condition more common?

3. In what form are carbohydrates, protein, and fat absorbed from the digestive tract?

4. What is the function of bile in digestion? Where is it made, and where is it stored?

5. What is “heartburn”? How might it be prevented?

Chap. 11. Metabolism and the Vitamin Key

1. Why are low-carbohydrate diets popular?

2. What is the difference between aerobic and anaerobic metabolism? Which is used predominantly in which type of exercise? Explain why.

3. What role do B-vitamins have in metabolism?

4. Why is it that glucose can be made into fat, but fat cannot be made into glucose?

5. A crocodile spends most of its time being very still. Small animals (and children) become meals when they come to the water edge and don’t see the hungry crocodile with its eyes barely above the water line. When the crocodile makes its move, it moves extremely fast. It can’t run fast for long, but can probably outrun you for the first 20 yards. Ordering a crocodile burger in Australia, would you expect the meat to be dark meat or white meat?

Chap. 12. Water—The Body’s Inner Sea

1. On a summer day, why do we feel hotter when the air is more humid?

2. How does body water content change with age?

3. A weight loss of 5 pounds during an endurance event represents about how many pints of water loss?

4. Discuss several major functions of body water.
Part 6: Micronutrients

Chap. 13. Some Practical Realities of Vitamins

1. What is meant by the statement that vitamins in massive doses function as drugs rather than vitamins?
2. Although Oscar eats a good diet and is generally in very good health, he takes large doses of vitamin C because his gums have a tendency to bleed. Why is it doubtful that his gums bleed because of a vitamin C deficiency?
3. Why is it preferable to get vitamins from food, rather than dietary supplements?
4. Do you think dietary supplements should continue to be classified as "food," or should they be classified as drugs?

Chap. 14. Water-Soluble Vitamins

1. What are some general characteristics of water-soluble vitamins?
2. Why would including citrus fruits in a meal increase iron absorption?
3. Why do deficiencies of several of the B-vitamins cause similar symptoms?
4. A deficiency of either of two B-vitamins can cause anemia. What are these two B-vitamins? Describe the most common circumstances in which each deficiency occurs.
5. Why is it that a diet low in niacin and rich in animal protein does not cause a niacin deficiency?

Chap. 15. Fat-Soluble Vitamins

1. What are some general characteristics of fat-soluble vitamins?
2. Food composition tables show carrots to contain large amounts of vitamin A. Why, then, don't we get vitamin A toxicity from eating a lot of carrots?
3. Why are vitamin D and calcium deficiencies intertwined?
4. Why is vitamin K deficiency uncommon, even among those who have low levels of vitamin K in their diet?
5. Why are drugs that interfere with vitamin K activity used to treat someone with a previous heart attack?

Chap. 16. The Major Minerals

1. Fatima is 13 years old and has a grandmother with osteoporosis. Fatima wants to know if there is anything she can do now to lower her own risk of osteoporosis. What recommendations might you give her? Explain.
2. Why can't we assess a dietary deficiency of calcium by measuring the amount of calcium in the blood?
3. Milk is the main source of calcium in the typical American diet. What are some other good sources of calcium?
4. Our typical diet is quite salty. Why is this a health concern?
5. Which foods are rich in potassium?

Chap. 17. The Trace Minerals

1. How do heme iron and non-heme iron differ in terms of their distribution in foods and their absorption from the digestive tract?
2. Why is it that iron deficiency is uncommon among adult men?
3. Why does iron deficiency cause anemia?
4. Why is it that iron deficiency and lead toxicity often go hand in hand, particularly among U.S. children living in poverty?
5. Why is iron overload more common among men than women?
6. Why does an iodine deficiency cause an enlarged thyroid gland?
7. Milk is not naturally rich in iodine, yet milk as purchased in the grocery store can be. Why is this?
8. How does fluoride help prevent tooth decay?

Part 7: Balance—Science and the Art of Eating

Chap. 18. Between Food and Health

1. What are the RDAs? What was their original purpose, and how are they used today?
2. What are the food groups of ChooseMyPlate? How many daily servings from each group are recommended for you?
3. What are dietary guidelines relating to chronic diseases? For each, which disease(s) might be affected, and how might following the guideline help in prevention?
4. One dietary guideline is: If you drink alcoholic beverages, do so in moderation. What is a moderate amount?
5. What are some changes you can make to improve your own diet, considering your own likes and dislikes, lifestyle, etc.?


1. What effects can alcohol have on the developing fetus?
2. What are some advantages of breast-feeding, as compared to infant formula?
3. Explain why encouraging the use of infant formulas in developing countries can seriously downgrade infant health.
4. Why is it that a low-fat, high-fiber diet is not recommended for children under age 2?
5. Why is it that children can generally get away with eating more "junk food" than their parents?
6. What general changes in nutrient requirements occur from birth to old age?
7. Continual dieting and obsession with thinness are most common in young women. In raising a daughter, what might you do to avoid this? Anorexia nervosa and bulimia are also common among these women. Describe these disorders.

Part 8: From Farm to Table

Chap. 20. Agriculture—Realities of Leaf and Soil

1. Are crops grown on “depleted soil” nutritionally inferior? Why or why not?
2. Why is it that for some minerals, plant content varies according to local soil content?
3. What are some alternatives to pesticide use in controlling crop pests and disease?
4. How is biotechnology used in agriculture, and what is its advantage over traditional plant crossbreeding?
Chap. 21. Food Processing and Food Safety

1. What is meant by: “The dose determines the poison”?
2. What are some functions of food additives?
3. What are some general rules for preventing or avoiding microbial hazards in foods?
4. Why is nitrite added to foods such as frankfurters, bacon, and ham? What are nitrosamines, and why are they of concern? How can we lessen the formation of nitrite into nitrosamines?
5. A basic tenet of good nutrition is to eat a varied diet. Why does a varied diet also tend to be a less hazardous diet?
6. How does the public perception of food hazards differ from that of the experts?

Chap. 22. Food Labeling

1. What are Daily Values? Why is fiber, for example, given as a % of Daily Value, instead of only in gram amounts?
2. What nutrients have been added to enriched flour?
3. Prior to the implementation of the 1990 food-labeling regulations, what were some of the ways in which food labels misled consumers?
4. What are your own suggestions for improving the presentation of nutrition information on food labels?