

Chapter 15

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- ___ 1. Which of the following farm practices have been used by farmers only in recent years?
- a. fertilizing crops
 - b. irrigation
 - c. pest control
 - d. None of the above
- ___ 2. Farmland may become desertified if
- a. domestic animals are allowed to overgraze the land.
 - b. too many crops are grown on the land and the land gradually loses its fertility.
 - c. as a result of erosion, there is no fertile soil left to grow plants.
 - d. All of the above
- ___ 3. Land where it is possible to grow crops is called
- a. organic land.
 - b. arable land.
 - c. vegetative land.
 - d. All of the above
- ___ 4. Which of the following best describes why many people in the world go hungry?
- a. Food production has not been increasing as fast as the human population.
 - b. There is plenty of food produced for everyone to have more than enough, but it is not distributed equally.
 - c. In recent years, the human population has been growing, while food production has been falling.
 - d. Global warming has contributed to crop failures.
- ___ 5. Which of the following actions contributes to soil erosion?
- a. using compost as fertilizer
 - b. allowing land to lie fallow
 - c. driving farm machinery over fields
 - d. all of these practices contribute to soil erosion
- ___ 6. Which of the following agricultural products requires the least amount of energy?
- a. beef cattle
 - b. Wheat
 - c. dairy cows
 - d. Both (b) and (c)
- ___ 7. When a farmer uses no-till farming methods,
- a. seeds are planted among the roots of the previous crop.
 - b. more erosion is likely.
 - c. only organic fertilizers are used.
 - d. All of the above
- ___ 8. One potential way to deal with the problem of seafood overharvesting is by intensifying _____ efforts.
- a. genetic engineering
 - b. subsistence farming
 - c. aquaculture
 - d. integrated pest management
- ___ 9. Which of the following is a good way to reduce salinization?
- a. use ocean water instead of groundwater to irrigate crops
 - b. increase the use of synthetic pesticides
 - c. using rainwater instead of groundwater on crops
 - d. adopt no-till farming methods
- ___ 10. DDT is harmful to the environment because it
- a. does not break down quickly into harmless chemicals.
 - b. concentrates in the bodies of animals high in the food chain.
 - c. causes some birds to lay eggs so thin that they break when the birds sit on them.

- d. All of the above
- ___ 11. A true statement about nutritional requirements in humans is that
- vitamins are of limited importance in growth and development.
 - humans need to get eight essential amino acids from the proteins they eat.
 - carbohydrates are mainly used to make membranes and hormones.
 - Both (a) and (b)
- ___ 12. All of the following factors can cause famines *except*
- the failure of food production to keep pace with population growth.
 - distribution problems caused by political turmoil.
 - new, higher-yield crops.
 - crop failure brought on by sustained drought.
- ___ 13. The results of the green revolution were not entirely positive because
- there were too few subsistence farmers.
 - use of pesticides and fertilizers increased the risk of pollution.
 - substantial resources were no longer required to grow the new grain varieties.
 - All of the above
- ___ 14. Soil formation
- is an inorganic process.
 - occurs more quickly in arid regions.
 - is hindered by frequent temperature changes.
 - usually involves the decomposition of bedrock.
- ___ 15. It is true that soil loss caused by wind and water
- occurs more slowly in dry areas because the soil sticks together.
 - is reduced by incorporating strips of vegetation into plowed land.
 - only slightly exceeds the rate of soil formation on a global basis.
 - is always the result of dramatic events such as floods and mudslides.
- ___ 16. No-till farming helps to conserve soil fertility because
- remnants of the previous crop are left to slowly decay.
 - deep ridges are cut across, not down, the slopes of hills.
 - the ground is carefully turned to mix soil nutrients.
 - only organic fertilizers and natural pesticides are used.
- ___ 17. Irrigation water usually comes from
- rainwater collection.
 - rivers and groundwater.
 - salty sources.
 - All of the above
- ___ 18. Pest populations that damage plants
- breed more slowly in hot climates.
 - become resistant to pesticides via natural selection.
 - include only insects and small rodents.
 - attack wild plants with greater success than crops.
- ___ 19. Persistent pesticides are those that
- require repeated high-dose use for optimum effect.
 - retain their popularity among U.S. farmers.
 - become concentrated in organisms high on the food chain.
 - possess the greatest chemical toxicity.
- ___ 20. Biological mechanisms of pest control include all of the following *except*
- making male insects infertile with X rays.
 - releasing *Bacillus thuringiensis* to control insect larvae.
 - breeding plants with natural defenses.
 - applying an organophosphate chemical with a short half-life.

- _____ 21. Products obtained from livestock include
- leather, wool, eggs, meat, and manure.
 - cotton, linen, and nylon.
 - wood and plastic.
 - All of the above
- _____ 22. Earth's available arable land is being reduced by
- fast-growing human populations.
 - soil erosion.
 - desertification.
 - All of the above
- _____ 23. Erosion is most likely when the soil is
- bare and exposed to wind and rain.
 - plowed along the contour of the land.
 - covered with grass.
 - planted to forest.
- _____ 24. Plowing with machines, irrigating with drip systems, and _____ are all modern agricultural methods.
- using manure
 - applying chemical fertilizers
 - irrigating with ditches
 - Both (a) and (b)
- _____ 25. Integrated pest management can include chemical pest control, _____, and a mix of farming methods.
- frequent tilling
 - Aquaculture
 - biological pest control
 - All of the above
- _____ 26. Genetic engineering of food crops
- continues to be debated among scientists.
 - is only used with corn.
 - must be disclosed on food ingredient labels.
 - Both (a) and (c)

Completion

Complete each sentence or statement.

27. The amount of a crop produced per hectare (or acre) is called the _____.
28. A modern method of controlling pests on crops that seeks to reduce but not eliminate pest populations is called _____.
29. The health problem caused by not eating enough necessary nutrients is known as _____.
30. The name for a widespread food shortage that results in many people not having enough food is called a(n) _____.
31. The upper layer of soil consisting of rock particles, water, air, and organic matter is the _____.
32. The loss of fertile soil when it is blown away by wind or washed away by water is called _____.
33. Land on which crops can be grown is called _____ land.
34. Crop production that is limited to meeting one family's needs is known as _____ farming.
35. The diets of people in developed countries tend to be higher in _____ than diets of people in developing countries.
36. More energy, water, and land are needed to produce a gram of _____ than to produce a gram of food from plants.

37. A(n) _____ is a prolonged period during which no rain falls in a particular region.
38. Increases in crop yields during the green revolution resulted in part from the development of new crop _____.
39. Soil that can support the growth of healthy plants is called _____.
40. Agriculture that is _____ would likely depend on mules for plowing, fertilizer such as manure, and irrigation through ditches.
41. Soil-retaining terraces and contour plowing are both examples of _____.
42. The technology of _____ allows desirable traits in crop plants to be transferred through the direct manipulation of genes for those traits.
43. No-fishing zones are created as an effort to reduce the effects of _____.
44. The raising of aquatic organisms for human use and consumption is called _____.
45. Cattle, goats, pigs, sheep, and chickens are all types of _____.
46. Animal species bred and managed for human use are referred to as _____.
47. The accumulation of salts in the soil, which can be caused by irrigation and low rainfall, is called _____.
48. In farming, a(n) _____ is any organism that occurs where it is not wanted, or in large enough numbers to cause economic damage.
49. A(n) _____ pesticide is one that does not break down quickly or easily in the environment.
50. The most common form of aquaculture, the _____, consists of many different individual ponds.
51. Goats, sheep, cattle and other _____ are cud-chewing mammals with multi-chambered stomachs.

Short Answer

52. What are the major types of organic molecules that our bodies need from food? Name two ways our bodies use these substances.
53. What is arable land and why is it decreasing?
54. Explain how pests develop a resistance to pesticides.
55. Explain how living organisms help to maintain soil fertility.
56. Describe two farming practices that can help reduce erosion caused by water.
57. Explain how biological insect control kills only the target insects while chemical insecticides kill many different kinds of animals.
58. People have been farming for at least 10,000 years. If erosion had been going on at the current rate for all that time, we would have reached bedrock long ago. Why has erosion become a serious problem only recently?
59. Explain why political problems, as well as agricultural yields, can also affect hunger.
60. What happens to fishery populations that have been overharvested? How have some governments curbed this trend?

61. Name at least three examples of livestock and describe three or more functions that they provide. How does the role of livestock differ in developing and developed countries?
62. Describe the goals of integrated pest management and discuss the various steps involved in the method.

Problem

63. The approximate energy yield of carbohydrates is 4 Cal/gram; fats yield about 9 Cal/ gram, and proteins about 4 Cal/gram. Assume the following about the food that Brad and Jenny consumed for lunch: Brad—100 grams protein, 20 grams fat, 75 grams carbohydrates; Jenny—75 grams protein, 10 grams fats, 75 grams carbohydrates. How many Calories each did Brad and Jenny consume? What was the percentage of fat Calories in the meal for each person?
64. If Brad eats the same number and ratio of Calories for breakfast and supper as for lunch, what is his total intake of Calories for the day (with no snacks)? What percentage of his day's Calories come from protein and from carbohydrates?
65. For breakfast on that same day, Jenny eats 40 grams protein, 15 grams fats, and 150 grams carbohydrates. For lunch, she eats 50 grams protein, 10 grams fat, and 75 grams carbohydrates. For supper she consumes 40 grams protein, 15 grams fats, and 75 grams carbohydrates. What is Jenny's total intake of Calories for the day (with no snacks)? If she decides to cut by half the number of fat grams she eats in a day, what would her day's total of Calories be equal to then?

Essay

66. Some people feel that the green revolution is a wonderful example of twenty-first-century technology that benefits millions of people. Others believe that the problems caused by the green revolution outweigh its benefits. Explain the advantages and drawbacks of the green revolution, and then state your own opinion.