

CHAPTER 12--FOOD, SOIL, AND PEST MANAGEMENT

Student: _____

1. The human population continues rapid growth. Each day, how many more people must be fed?
 - A. 50,000
 - B. 76,000
 - C. 121,000
 - D. 224,000
 - E. 353,000
2. In Australia and New Zealand about one-third of all cultivated land is used to raise organic crops and beef. In the United States what percentage of our crop land grows organic foods?
 - A. 0.6%
 - B. 1.5%
 - C. 4%
 - D. 11%
 - E. 18%
3. Which of the following is *not* a characteristic of organic agriculture?
 - A. emphasizes use of animal manure and compost as fertilizer
 - B. employs crop rotation and biological pest control
 - C. uses genetically modified seeds
 - D. is regionally and locally oriented
 - E. uses no antibiotics or growth hormones to produce meat
4. The root cause of food insecurity is
 - A. war
 - B. political upheaval
 - C. poverty
 - D. corruption
 - E. climate change
5. Food experts report there is more than a 90% chance atmospheric warming and climate change will result in what percentage of the world's population facing serious food shortages by the year 2100?
 - A. 5%
 - B. 10%
 - C. 25%
 - D. 50%
 - E. 75%

6. The term *undernutrition* refers to people who consume
- A. less than the basic number of daily calories
 - B. unbalanced meals
 - C. the wrong kinds of food
 - D. poor quality foods
 - E. too much protein
7. Many of the world's poor only have access to a low-protein, high-carbohydrate, vegetarian diet and suffer from
- A. chronic undernutrition
 - B. famine
 - C. hunger
 - D. chronic malnutrition
 - E. food security
8. A severe shortage of food leading to mass starvation, many deaths, economic chaos, and social disruption, is called
- A. chronic undernutrition
 - B. famine
 - C. hunger
 - D. chronic malnutrition
 - E. food security
9. One in ____ people worldwide suffers from a deficiency of one or more vitamins and minerals.
- A. 3
 - B. 5
 - C. 10
 - D. 25
 - E. 100
10. Anemia may be the result of a deficiency in
- A. cobalt
 - B. iodine
 - C. iron
 - D. calcium
 - E. phosphorus
11. Each year, approximately 250-500,000 children under six years of age go blind from lack of
- A. iron
 - B. calcium
 - C. vitamin A
 - D. vitamin B
 - E. vitamin C

12. Approximately 26 million children each year suffer irreversible brain damage from lack of which of the following?
- A. cobalt
 - B. iodine
 - C. iron
 - D. calcium
 - E. phosphorus
13. The term *overnutrition* refers to
- A. obtaining too few calories per day
 - B. when energy use is less than energy intake
 - C. eating unbalanced meals
 - D. eating poor quality foods
 - E. eating too much protein
14. Overnutrition and undernutrition both face all of the following health problems, *except*
- A. lower productivity
 - B. lower life quality
 - C. lower life expectancy
 - D. greater susceptibility to disease
 - E. higher rates of malaria
15. Today in America, four of the top ten causes of death are diseases related to diet including all of the following *except*
- A. Down's syndrome
 - B. type 2 diabetes
 - C. some forms of cancer
 - D. heart disease
 - E. stroke
16. Of the estimated 50,000 plant species that people can eat, only ____ of them supply an estimated 90% of the world's food calories.
- A. 24
 - B. 20
 - C. 14
 - D. 9
 - E. 3

17. Three grain crops provide 48% of all the food calories. Which of the following includes those three grains?
- A. rice, wheat, corn
 - B. oats, rice, wheat
 - C. corn, wheat, oats
 - D. corn, rice, maize
 - E. oats, maize, rice
18. The major goal of industrialized agriculture for any crop has been to steadily increase its
- A. tolerance to weeds
 - B. tolerance of drought
 - C. yield per unit of land
 - D. purity
 - E. aesthetic qualities
19. All of the following are commonly grown in plantation agriculture, *except*
- A. bananas
 - B. corn
 - C. soybeans
 - D. coffee
 - E. sugarcane
20. Which of the following types of agriculture is most characteristic of developing countries?
- A. plantation agriculture
 - B. monocultural agriculture
 - C. industrialized agriculture
 - D. high-input agriculture
 - E. traditional subsistence agriculture
21. Slash and burn agriculture is a type of
- A. high-input agriculture
 - B. industrialized agriculture
 - C. monoculture agriculture
 - D. plantation agriculture
 - E. traditional subsistence agriculture
22. Industrialized agriculture requires large inputs of all of the following, *except*
- A. draft animals
 - B. financial capital
 - C. commercial inorganic fertilizers
 - D. water
 - E. fossil fuels

23. Indoor hydroponic farming has a number of advantages over conventional outdoor growing systems, including all of the following, *except*
- A. crops can be grown under controlled conditions almost anywhere
 - B. crops require considerably more land than traditional methods
 - C. yields and availability are increased because crops are grown year around
 - D. fertilizer and water use are reduced through recycling
 - E. there is little or no need for pesticides
24. A second green revolution has been taking place since 1967, based on
- A. fast-growing cattle
 - B. extra heavy hogs
 - C. sheep that fatten quickly
 - D. fast-growing rice and wheat
 - E. vitamin enriched soybeans
25. Which of the following soil horizons is considered topsoil?
- A. O
 - B. A
 - C. B
 - D. C
 - E. E
26. What percentage of the world's grain production is used to make biofuels such as ethanol for cars?
- A. 31%
 - B. 48%
 - C. 35%
 - D. 17%
 - E. 52%
27. U.S. agriculture produces 17% of the world's grains with how much of the world's farm labor force?
- A. 0.3%
 - B. 1.2%
 - C. 3.6%
 - D. 4.5%
 - E. 6.1%
28. People in the United States spend how much of their disposable income on food?
- A. more than 40%
 - B. more than 30%
 - C. less than 20%
 - D. less than 10%
 - E. less than 2%

29. In less-developed countries, the poor, those making less than \$2.25 a day, typically spend how much of their income on food?
- A. 20%
 - B. 35%
 - C. 40%
 - D. 58%
 - E. 70%
30. What percentage of the food products currently on U.S. supermarket shelves contains some form of genetically engineered food or ingredients?
- A. 60%
 - B. 70%
 - C. 80%
 - D. 90%
 - E. 100%
31. If China needed to import only 20% of the grain it needs, it would take up how much of the grain exported by all the countries of the world?
- A. 10%
 - B. 20%
 - C. 30%
 - D. 40%
 - E. 50%
32. With industrialized food production, for every one unit of energy put on the table, how many units of nonrenewable fossil fuel energy are required to produce it?
- A. 5
 - B. 100
 - C. 10
 - D. 0.5
 - E. 0.001
33. Irrigating crops creates a number of problems. Which of the following is *not* one of those problems?
- A. boosts productivity on farms
 - B. salinization
 - C. depletes groundwater
 - D. waterlogging
 - E. depletes surface water

34. What is the largest cause of soil erosion?
- A. moving water
 - B. still water
 - C. wind
 - D. sink holes
 - E. mountain avalanches
35. When the productive potential of soil, especially on arid or semiarid land, falls by 10% or more because of prolonged drought and human activities, it is called
- A. salinization
 - B. desertification
 - C. soil erosion
 - D. overgrazing
 - E. waterlogging
36. Repeated irrigation in dry climates leads to accumulation of salts in the upper layers of the soil, a process called
- A. salinization
 - B. desertification
 - C. soil erosion
 - D. overgrazing
 - E. waterlogging
37. Adding water until the water table rises and envelops the deep roots of plants resulting in a loss of productivity, ultimately killing them, is called
- A. salinization
 - B. desertification
 - C. soil erosion
 - D. overgrazing
 - E. waterlogging
38. Industrialized livestock production generates 18% of the world's climate-changing greenhouse gases, more than all the world's cars, buses, and planes. Most of this comes from
- A. pig manure
 - B. rotting livestock food
 - C. cattle belching
 - D. chicken manure
 - E. cattle flatulence

39. Genetically modified crops and foods have all of the following advantages, except
- A. need less fertilizer
 - B. needs less water
 - C. increases yields
 - D. grows faster
 - E. may reduce energy needs
40. Since 1900, how much of the genetic diversity of agricultural crops have we lost?
- A. 25%
 - B. 33%
 - C. 50%
 - D. 67%
 - E. 75%
41. India once planted 30,000 varieties of rice; now most of the rice comes from how many varieties?
- A. 1
 - B. 3
 - C. 5
 - D. 10
 - E. 25
42. All of the following are disadvantages to raising animals in feedlots, *except*
- A. Antibiotic use can increase antibiotic resistance in microbes.
 - B. Less land use.
 - C. Requires large input of fish meal and water.
 - D. Needs large amounts of water.
 - E. Produces large amounts of animal wastes.
43. What percentage of all antibiotics used in the United States are added to animal feed?
- A. 15%
 - B. 25%
 - C. 40%
 - D. 50%
 - E. 70%
44. Four of the following are advantages of using aquaculture to produce fish; one is a disadvantage. Choose the disadvantage.
- A. high yield in small volume of water
 - B. reduces overharvesting of fisheries
 - C. uses grain for feed for some species
 - D. low fuel use
 - E. high profits

45. One of the most important characteristics of a pesticide is how long it will stay deadly in the environment, a characteristic called
- A. lethal dose
 - B. history
 - C. usefulness
 - D. impact
 - E. persistence
46. The advantages of modern synthetic pesticides include all of the following, *except*
- A. increase food supplies
 - B. save human lives
 - C. increase profits for farmers
 - D. work slowly
 - E. low health risks if used properly
47. Modern synthetic pesticides have several disadvantages including all of the following, *except*
- A. increase profits for farmers
 - B. increase development of genetic resistance to pesticides
 - C. can harm wildlife
 - D. can kill natural predators and parasites of the pest
 - E. can move around the environment
48. All of the following are alternatives to using pesticides, *except*
- A. rotating crops planted in a field each year
 - B. provide homes for pest enemies
 - C. use sex attractants to lure pests into traps
 - D. bring in natural enemies
 - E. freeze the pests
49. UNICEF suggests that as many as two-thirds of nutrition-related childhood deaths could be prevented, at an average annual cost of \$5-10 per child, using all of the following *except*
- A. immunizing against childhood diseases
 - B. encouraging bottle feeding
 - C. preventing blindness by giving children a vitamin A capsule twice a year
 - D. providing family planning services so mothers space children by two years
 - E. increasing education for women
50. Compared to the traditional tillage, conservation tillage
- A. reduces fuel and tillage costs
 - B. accelerates water loss from the soil
 - C. causes soil compaction
 - D. requires increased use of herbicides
 - E. reduces the amount of carbon stored in the ground

51. In alley cropping
- A. Crops are planted in strips between trees and shrubs.
 - B. Terraces are built to prevent swift water runoff.
 - C. Crops are planted across slopes.
 - D. Special tillers are used so the topsoil is not disturbed.
 - E. A row crop alternates in strips with another row crop.
52. In the United States, how much of the original topsoil is gone?
- A. 50%
 - B. 33%
 - C. 25%
 - D. 15%
 - E. 10%
53. The best way to maintain soil fertility is through
- A. applying animal manure
 - B. applying commercial inorganic fertilizer
 - C. applying organic fertilizer
 - D. soil conservation
 - E. using low till planting
54. Americans waste what percentage of their food?
- A. 10-20%
 - B. 25-35%
 - C. 35-45%
 - D. 45-55%
 - E. 65+%
55. The world's population increase between now and 2050 will likely be 8 times the current U.S. population.
- True False
56. The United States leads the world in the amount of its cropland dedicated to growing organic food.
- True False
57. Organic farming is more labor intensive than traditional farming and therefore costs more.
- True False
58. Today we produce more than enough food to meet the basic nutritional needs of every person on the earth.
- True False

59. Most of the children who suffer from undernutrition are in the developed countries.

True False

60. In 2009, rising food prices and a sharp drop in international food aid resulting in more than 1 billion people being hungry and malnourished.

True False

61. Six million children, under the age of 5, die each year from normally nonfatal diseases because of their weakened condition.

True False

62. Hundreds of thousands of children under six years of age go blind each year because of a lack of iron.

True False

63. Twenty six million children suffer irreversible brain damage each year because of a lack of iodine in their diet.

True False

64. Canada has the highest overnutrition rate in the world.

True False

65. The amount Americans spend each year to lose weight is twice what the world needs to end undernutrition and malnutrition.

True False

66. Since 1960 there has been only a slight increase in global food production from all systems.

True False

67. Industrialized agriculture is often associated with a single crop, called monoculture agriculture.

True False

68. The only form of agriculture that is sustainable in the long run is industrialized agriculture.

True False

69. Slash and burn polyculture may be a sustainable alternative to traditional monoculture agriculture.

True False

70. Just 1 centimeter of topsoil (0.4 inch) can take a century to form.
True False
71. Agriculture is just behind the housing industry in total annual sales.
True False
72. Americans spend more of their household income on food than they did in 1966.
True False
73. Genetically modified organisms (GMOs) have genes from organisms with which they can not breed in nature.
True False
74. Genetically modified food does not have to be labeled.
True False
75. Unless the overexploitation of ocean fisheries is reduced, most of the world's major ocean fisheries could collapse sometime during this century.
True False
76. Large scale, industrialized fishing fleets use 12.5 times more energy catching fish than the fish provide to the people who eat them.
True False
77. The green revolution continues to increase the amount of available food, meeting the needs of the increasing human population for the foreseeable future.
True False
78. Wind is the largest cause of soil erosion.
True False
79. Projected climate is expected to greatly increase severe and prolonged drought, and expand desertification in this century.
True False
80. Accumulation of salts as a result of continual irrigation is called waterlogging.
True False

81. The methane that cattle produce each year in the U.S. has an atmospheric warming effect equal to that of 33 million automobiles.

True False

82. Three-fourths of the genetic diversity of agricultural crops is still available to produce food.

True False

83. There are no limits to expansion of the green revolutions.

True False

84. Spiders kill far more insects every year than humans do by using chemicals.

True False

85. Broad spectrum pesticides are toxic only to pests, not to beneficial insects.

True False

86. The overall aim of integrated pest management is to reduce crop damage to an economically tolerable level.

True False

87. Government subsidies to farmers and fishing fleets promotes the overexploitation of natural capital.

True False

88. There is no clear cut evidence that organic foods are nutritionally healthier to eat than conventional foods.

True False

89. Supporters of more sustainable agricultural systems point out we have all of the components needed to shift to these systems.

True False

90. By 2050 the world will have _____ more people on the planet.

91. Having _____ means that every person in a given area has daily access to enough nutritious food to have an active and healthy life.

92. One in every _____ people in less-developed countries is chronically undernourished or malnourished.

93. More than _____ children suffer brain damage each year from lack of iodine.

94. Some _____ children younger than age 6 go blind each year from lack of _____.

95. Food specialization, which is depending on a small number of food crops for the majority of our food, puts us in a(n) _____ position.

96. _____ agriculture is a form of industrialized agriculture often used in tropical developing countries.

97. _____ is a method of growing plants with their roots in troughs of water inside a greenhouse.

98. Some traditional subsistence farmers grow several crops on the same plot simultaneously, a practice known as _____.

99. About 88% of the increase in global food production has come from using high-input industrialized agriculture to increase yields in a process called the _____.

100. In 2006, 43% of the fish and shellfish consumed were produced through _____, which includes raising marine and freshwater fish in ponds and underwater cages.

101. Soil is eroding faster than it can be formed on _____% of the world's cropland.

102. Adding, deleting, or changing segments of DNA in an organism to produce desirable traits or eliminate undesirable ones, is called _____.

103. _____ percent of all antibiotics used in the United States are added to animal feed.

104. A(n) _____ is any species that interferes with human welfare.

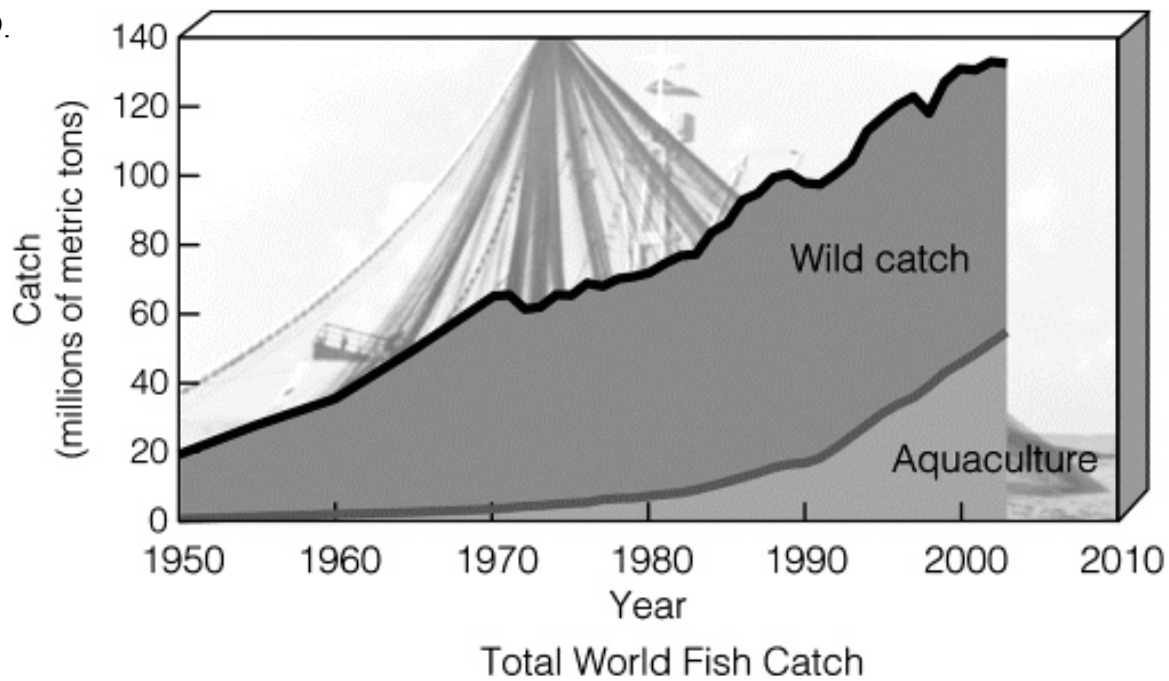
105. In 1962 Rachel Carson published a book entitled _____, which warned of the potential loss of birds because of their exposure to pesticides.

106. Government programs that reduce _____ also improve food security.

107. According to the Natural Resources Conservation Service, _____ percent of American farmland is losing topsoil 17 times faster than new topsoil is being formed.

108. If everyone in the world today had the average U.S. meat-based diet, the world's current annual grain harvest could feed only about _____ billion people.

109.

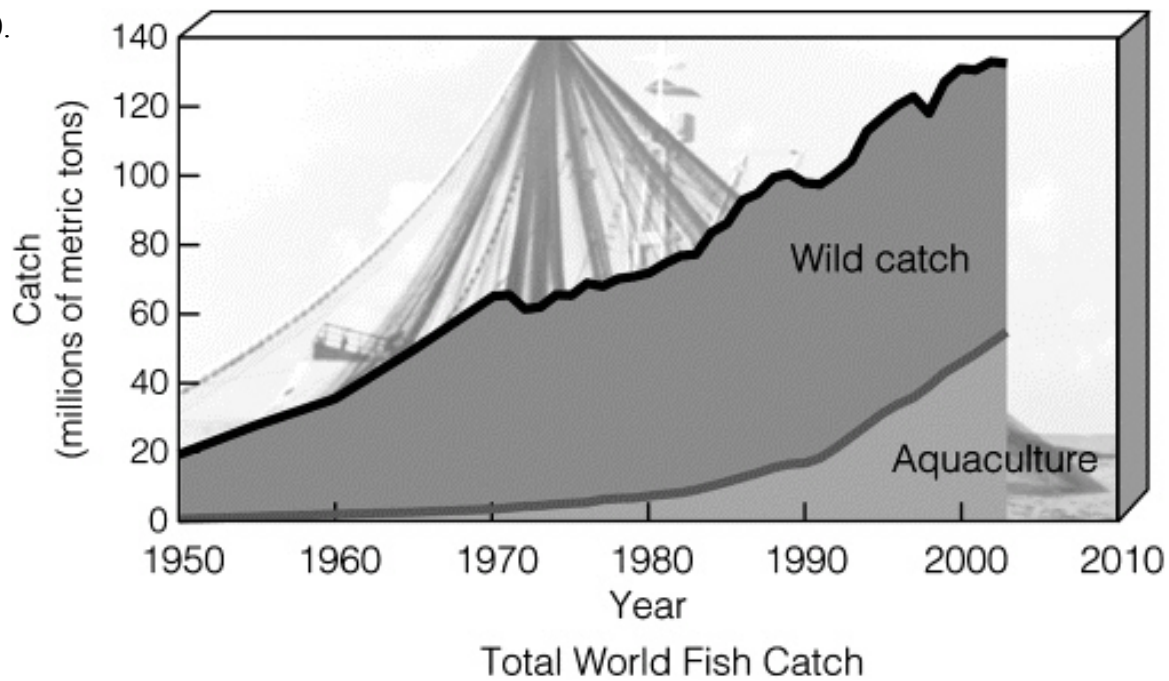


The graph indicates the world fish catch from 1950 until 2004

Use the Figure above to answer the following question(s).

What was the approximate increase in catch (in millions of metric tons) from 1950 to 1970?

110.

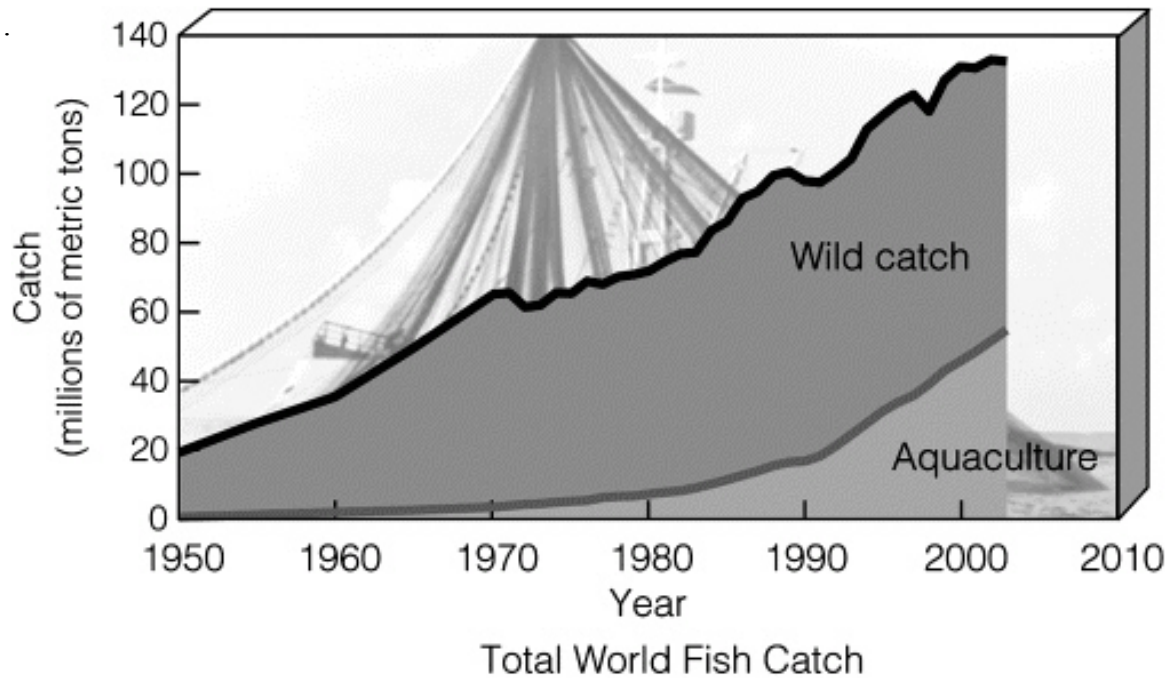


The graph indicates the world fish catch from 1950 until 2004

Use the Figure above to answer the following question(s).

By what percentage did the catch increase from 1950 to 1970?

111.



The graph indicates the world fish catch from 1950 until 2004

Use the Figure above to answer the following question(s).

What was the approximate increase in catch (in millions of metric tons) from 1960 to 2000?

112.How many kilograms of grain does it take to produce one kilogram of beef?

113.Describe why vitamin A is important to human health and what relationship it has to the so-called "golden rice."

114.Compare and contrast chronic undernutrition, chronic malnutrition, and overnutrition.

115. What are the three food systems that supply most of our food? What concerns are there that the majority of the world's food calories are supplied by a very small number of plant and animal species?
116. Why is the green revolution unlikely to be the final answer in terms of feeding the billions of people that are, and will be, living on earth?
117. Governments have three basic approaches to influencing food production. One of those approaches is to "let the marketplace decide." Do you think it would be wise to let the market set prices and availability of food? Explain your answer.

118. Would you be willing to eat less meat in order to reduce the destructive ecological footprint of modern affluent societies? Explain your answer.

CHAPTER 12--FOOD, SOIL, AND PEST MANAGEMENT

Key

1. D
2. A
3. C
4. C
5. D
6. A
7. D
8. B
9. A
10. C
11. C
12. B
13. B
14. E
15. A
16. C
17. A
18. C
19. B
20. E
21. E
22. A
23. B
24. D
25. B
26. D
27. A
28. D
29. E

- 30. B
- 31. E
- 32. C
- 33. A
- 34. A
- 35. B
- 36. A
- 37. E
- 38. C
- 39. C
- 40. E
- 41. D
- 42. B
- 43. E
- 44. C
- 45. E
- 46. D
- 47. A
- 48. E
- 49. B
- 50. A
- 51. A
- 52. B
- 53. D
- 54. C
- 55. TRUE
- 56. FALSE
- 57. TRUE
- 58. TRUE
- 59. FALSE
- 60. TRUE
- 61. TRUE
- 62. FALSE
- 63. TRUE

- 64. FALSE
- 65. TRUE
- 66. FALSE
- 67. TRUE
- 68. FALSE
- 69. TRUE
- 70. TRUE
- 71. FALSE
- 72. FALSE
- 73. TRUE
- 74. TRUE
- 75. TRUE
- 76. TRUE
- 77. FALSE
- 78. FALSE
- 79. TRUE
- 80. FALSE
- 81. TRUE
- 82. FALSE
- 83. FALSE
- 84. TRUE
- 85. FALSE
- 86. TRUE
- 87. TRUE
- 88. TRUE
- 89. TRUE
- 90. 2.4 billion
- 91. food security
- 92. 6 *or* six
- 93. 26 million
- 94. 250,000-500,000; vitamin A
- 95. vulnerable
- 96. Plantation
- 97. Hydroponics

98. polyculture

99. green revolution

100. aquaculture

101. 38

102. gene splicing

103. Seventy *or* 70

104. pest

105. Silent Spring

106. poverty

107. ninety *or* 90

108. 2.5

109. about 40 million metric tons

110. a 200% increase in this time period

111. about 60 million metric tons

112. 7 kg

113. Vitamin A is a fat-soluble vitamin that is involved in growth and development, vision, immune system, and reproduction. Without enough vitamin A, children are susceptible to infectious diseases and blindness. The golden rice has been genetically engineered to provide, among other things, vitamin A in sufficient amounts to prevent blindness and susceptibility to infectious diseases.

114. Undernutrition is not receiving food in sufficient quantities to provide the basic energy needs of daily life. Malnutrition results from having food sources that do not provide the necessary nutrients and proteins. Both of these leave persons susceptible to disease and hinder the normal physical and mental development of children. Overnutrition is having a surplus of food energy, which gets stored as fat. The results of overnutrition are very similar to those of undernutrition and malnutrition, that is, lower life expectancies, susceptibility to disease, and lower productivity.

115. Croplands provide 77% of the world's food, mostly in the form of grains.

Rangelands/pastures/feedlots provide 16% of the world's food in the form of meat.

Ocean fisheries supply 7% of the world's food in the form of seafood.

Of the tens of thousands of possible plant and animal species, we rely on only a few species for the majority of our food. This leaves us vulnerable to the collapse of our food supply if disease or natural disaster strikes. It also reduces the genetic variation available for overcoming such problems.

116. The green revolution is based on very high input levels. That includes input of fossil fuels, fertilizers, pesticides, and water. In addition, the green revolution crop varieties are not providing yields that justify the significant input required. This style of farming is too expensive for most subsistence farmers in developing countries. As the non-renewable fossil fuels continue to get more expensive, this type of farming will become less and less tenable.

117. There are problems with any of the usual approaches to influencing food production. The idea of letting market forces make the decisions has several problems. The United States has, at least since the Great Depression of the 1930s, manipulated the prices of commodities in order to keep the prices low. To allow market forces to set the prices would likely cause dramatic increases in food prices. We would need to be careful to subsidize food supplies for the poor, and perhaps part of the middle class. Farmers might prosper, at least for a while, as prices for their products would rise. So too would the prices they pay for other goods and services as the market adjusted.

118. Answer should explore the high carbon footprint of modern agriculture and the potential risks it brings with it. The answer might also consider some reflection of the responsibility the present generations have in terms of future generations.