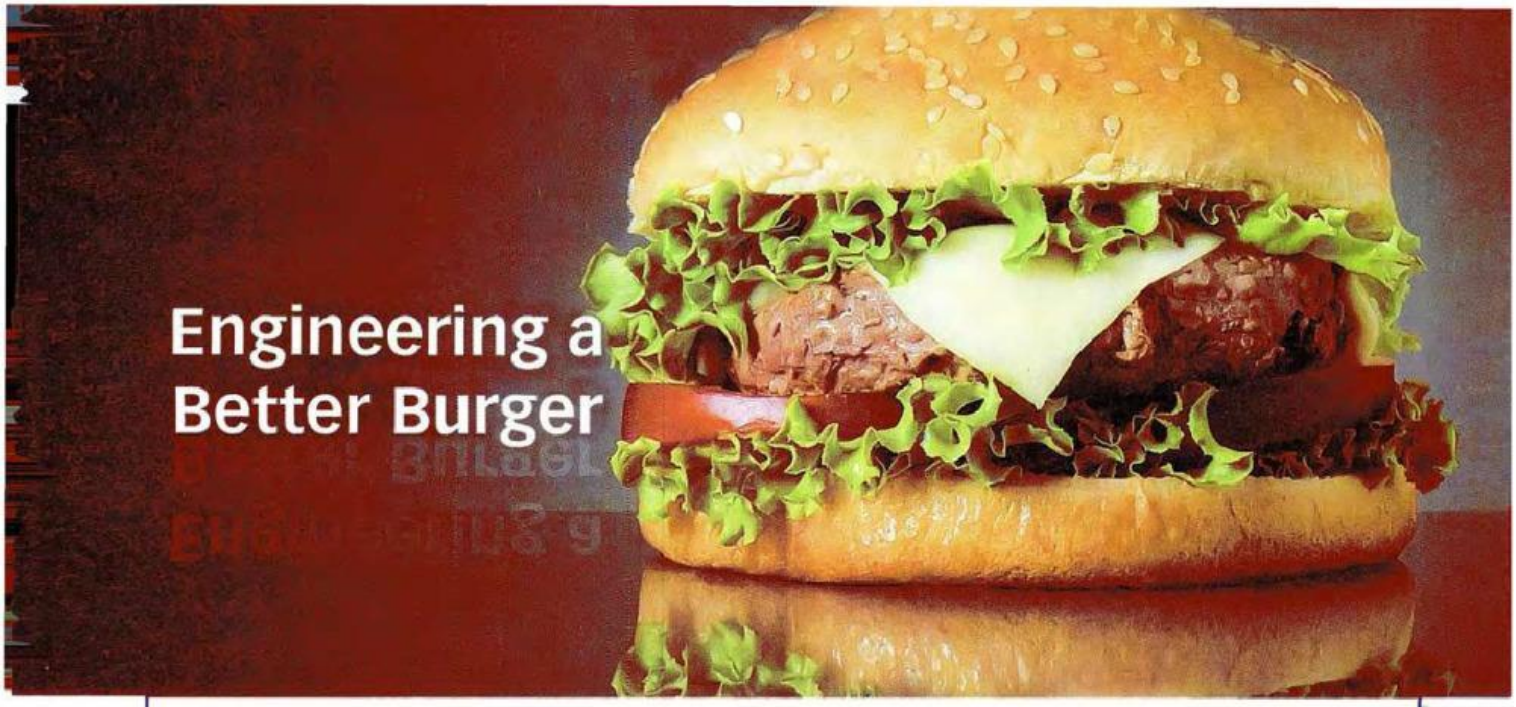

Engineering a Better Burger

1 Humans have traditionally been omnivores, with a diet of both meat and vegetables. But lately it seems we've become a society of meat eaters. According to the United Nation's Food and Agriculture Organization (FAO), global demand for meat has increased over 500 percent in the past 50 years. Two things explain this: the Earth's population is rising rapidly, and people with higher incomes tend to consume more meat. With the population expected to reach nine billion people around 2050, and with developing countries getting richer, this trend won't stop any time soon.

2 If meat production rises to match demand, the **consequences** could be **devastating** for the planet. Thirty percent of Earth's entire land surface—a massive 70 percent of all land available for agricultural use—is used for raising livestock. And more land is required each year as farmers **struggle** to meet the rising demand, which comes at the cost of rain forests and other valuable land. Reports by FAO show that meat production is responsible for 70 percent of the Amazon deforestation in South America. Large factory farms are also big consumers of energy and cause a lot of pollution. It's clear that our hunger for meat, and the way we produce it, is not **sustainable** in the long run.

3 Fortunately, food scientists have been **anticipating** this need for change. They are working on some interesting **alternatives** to current methods of meat production. A group of Dutch scientists are engineering meats that can be grown in laboratories. This involves using cells taken from cows to grow "muscle" that can be mixed with other things to make beef. They say that this process could reduce the amount of energy and land needed to raise cattle by about 40 percent. Other scientists from the United States and China are working to create "meaty" flavors from mushrooms, which could be used to flavor foods. They feel people can detect **chemical** flavors, and that natural flavors are better for the body.

4 For now, lab-grown meat is not a threat to traditional farming. Although scientists say that their beef could be ready for testing (and eating) soon, large-scale manufacturing won't be possible for another ten years. It's far too expensive to develop in large quantities—the Dutch team will spend over $200,000 making enough meat for one burger—and not everyone will be **keen** on the idea of eating lab-grown meat. While the general public isn't quite ready to accept "fake" meat, the day will come when we may not have a choice.

LIVEWORKSHEETS

Reading Comprehension
Check Your Understanding

A **Read the following sentences. Check (✓) true (*T*) or false (*F*).**

	T	F
1 People with more money usually eat less meat.		
2 Most of Earth's usable land goes to livestock farming.		
3 Some scientists are trying to make mushrooms taste like meat.		
4 Lab-grown meat costs more than normal meat.		
5 Lab-grown meat will be sold in supermarkets very soon.		

B **Complete the following summary with words or phrases from the passage.**

Global demand for meat has risen by **(1)**_____ in the last 50 years, partly because the population has grown, and also because people are generally getting **(2)**_____. This rising demand has a huge effect on the environment. Livestock farms already occupy **(3)**_____ of all agricultural land, and **(4)**_____ are being destroyed to create even more land for this purpose. Raising large numbers of livestock also consumes a lot of **(5)**_____ and causes a lot of **(6)**_____. But science may have a solution. Some scientists are trying to make meat in a **(7)**_____ by taking **(8)**_____ from cows to grow **(9)**_____. However, it will take at least ten years to produce meat in large quantities, because it is **(10)**_____ to manufacture. Other scientists are creating "meaty" flavors from **(11)**_____; they believe these **(12)**_____ flavors taste better and are healthier. In the end, though, a lot depends on whether the public can accept these meat alternatives.

Critical Thinking

C **Discuss the following questions with a partner.**

1 Would you rather eat foods that are created in a lab or grown naturally? Why?
2 Can you think of any meat alternatives that are already available to the public?

Vocabulary Comprehension
Odd Word Out

A **Circle the word or phrase that does not belong in each group. The words in blue are from the passage.**

1	struggle	relax	rest	calm down
2	ask	consequence	demand	request
3	attracting	polluting	damaging	
4	anticipation	feeling	emotion	mood
5	limitation	choice	alternative	option
6	support	keep up	limit	
7	interested	curious	keen on	disgusted
8	chemical	fake	manufactured	natural

LIVEWORKSHEETS

B **Complete the following sentences with the words in blue from A. You might have to change the form of the words.**

1 He does not have enough customers to _____ his business.
2 Many people _____ to lose weight. The problem is they are _____ to diet and exercise but never really follow through.
3 Cycling is a good _____ to driving.
4 The boxer _____ his opponent's punch and moved out of the way.

A **Look at some examples of where adverbs are placed in a sentence.**

Many adverbs can be placed either before or after the verb they describe.

She spoke *confidently* about her new project.
She *confidently* spoke about her new project.

Some adverbs appear at the very beginning of a sentence and describe the entire sentence. Some adverbs describe a clause within the sentence.

Suddenly, it started raining, but *luckily* I had my umbrella with me.

Sometimes adverbs appear at the end of a sentence. If a sentence has more than one verb, we avoid putting the adverb at the end.

✗ The boys sang the songs that they had prepared in class *loudly*.
✓ The boys *loudly* sang the songs that they had prepared in class.

Vocabulary Skill
Adverbs

In this chapter, we saw the words *traditionally* and *easily*. These are examples of adverbs. Adverbs can be used to describe verbs in a sentence; they tell us how something is done. An adverb usually appears right before or after the verb it describes, but it can also appear at the beginning or the end of a sentence.

B **Write the adverb form of these adjectives.**

Adjective	Adverb	Adjective	Adverb
1 tradition		6 sincere	
2 aggressive		7 passionate	
3 virtual		8 persuasive	
4 previous		9 loyal	
5 essential		10 natural	

C **Read the sentences below. Circle the adverb. Then, underline the word, phrase, clause, or sentence that the adverb describes.**

1 The lion in the cage roared aggressively.
2 Frankly, I'm not bothered about what he thinks.
3 The president argued for lower taxes very persuasively.
4 Many dogs follow their owner loyally and listen to their commands.
5 The James family traditionally go to France for Christmas.

LIVEWORKSHEETS