"Bug Appe'tit!"

Directions: The following are two excerpts on eating bugs for nutritional purposes. One is from *The New York Times* and the other from *Time*. First, read both excerpts. Next, list the key points cited by the authors to support the idea of eating bugs as part of a nutritious, wholesome, environmentally friendly diet. If more than one author mentions the same key point, list it only once. Next, write a paragraph summarizing the key points covered in both excerpts. Finally, give your opinion on the issue. Would you be willing to adapt your diet to include bugs if they were proven to be both nutritious and environmentally friendly?

Florence Dunkel, an entomologist and editor of *The Food Insect Newsletter*, says: "For most Americans, fear of insects is a social aversion. It's not rational. People in other societies were introduced to bugs at an early age. It's just not the way we grew up." Which is true, but most of us associate insects with disease. Mosquitoes cause encephalitis; deer ticks bring Lyme disease; and we regard cockroaches as unclean.

But how dirty are they? As it turns out, not very. While insects carry an abundance of microbial flora, they do not regularly harbor human pathogens like salmonella and E. coli. Put another way, insects don't seem any more prone to disease than cows, pigs, chicken, or fish, all of which need to be raised and cooked properly. It can also be argued that these insects boost the nutritional content of what we already eat. Bugs compare favorably to traditional livestock in available protein and fatty acids; for some vitamins and minerals, they better them by a wide margin.

David Gracer, who teaches at the Community College of Rhode Island, feels that consuming insects is both pleasing to the palate and good for the planet. He says: "Insects can feed the world. Cows and pigs are the S.U.V.'s; bugs are bicycles." Why douse fields with pesticides if the bugs we kill are more nutritious than the crops they eat?

Provocative as that sounds, insects do meet the test of environmental sustainability; they create far more edible protein per pound of feed than cattle. Moreover, scientists warn that given current consumption, a complete collapse of global fish stocks is possible in the next 40 years.
(*The New York Times*, Man Bites Insect by Sam Nejame, February 10, 2008.)

In the U.S., we're more accustomed to exterminating insects than to eating them, but in scores of countries around the world--including Thailand, where food markets are stocked with commercially-raised water beetles and bamboo worms--bugs have long been a part of a well-balanced meal. Insect lovers like David George Gordon, the author of *The Eat-A-Bug Cookbook*, argue that entomophagy--the scientific term for consuming insects--could also be a far greener way to get protein than eating chicken, cows or pigs. With the global livestock sector responsible for 18% of the world's greenhouse-gas emissions

and grain prices reaching record highs, cheap, environmentally low-impact insects could be the food of the future--provided we can stomach them. "This is an idea that shouldn't just be ridiculed," says Paul Vantomme, an officer at the U.N.'s Food and Agriculture Organization, which recently held an entomophagy conference in Bangkok.

The very qualities that make bugs so hard to get rid of could also make them an environmentally friendly food. "Nature is very good at making insects," says David Gracer, the founder of future bug purveyor Sunrise Land Shrimp. Insects require little room and few resources to grow. For instance, it takes far less water to raise a third of a pound (150 g) of grasshoppers than the staggering 869 gal. (3,290 L) needed to produce the same amount of beef. Since bugs are cold-blooded invertebrates, more of what they consume goes to building edible body parts, whereas pigs and other warm-blooded vertebrates need to consume a lot of calories just to keep their body temperature steady. There's even a formula, called the efficiency of conversion of ingested food to body substance (ECI), that can be used to compare the weight different animals gain after eating a certain quantity of feed. Beef cattle have an ECI of 10. Silkworms range from 19 to 31. German cockroaches max out at 44.

Incredibly efficient to raise, insects are also crawling packets of nutrition. A 100-gram (3.5 oz.) portion of cooked Usata terpsichore caterpillars--commonly eaten in central Africa--contains about 28 grams (1 oz.) of protein, slightly more than you'd get from the same amount of chicken. Water bugs have four times as much iron as beef.

Bugs can be tasty too--Gordon swears by his white chocolate and waxworm cookies--but Americans first need to overcome the "eww" factor. We think bugs are dirty, disease-laden or otherwise dangerous to eat--though they're not, as long as you cook them properly, are not allergic to shellfish (which, like insects, are arthropods) and aren't collecting bugs from fields that have been hit with pesticides. We're revolted by their alien appearance, but then again, lobster could hardly be described as cute and cuddly. And food taboos are not eternal; think of how unlikely it would have seemed 50 years ago that there would be more than 9,000 sushi restaurants in the U.S. There's also the possibility that someday the exploding global population and the damage of climate change could bring about the collapse of our resource-intensive food supply. "At that point," notes Gracer, "insects could become a pretty attractive option."

(*Time*, Eating Bugs, by Bryan Walsh, May 29, 2008)

Nutritional Value of Various Insects
(per 100 grams)

	Protein(g)	Fat(g)	Carbohydrate(mg)	Calcium(mg)	Iron(mg)
Crickets	12.9	5.5	5.1	75.8	9.5
Grasshoppers (large)	14.3	3.3	2.2	27.5	3.0
Red ants	13.9	3.5	2.9	47.8	5.7
Termites	14.2	N/A	N/A	0.050	35.5
Weevils	6.7	N/A	N/A	0.186	13.1
For comparison:					
Ground Beef (lean)	24.0	18.3	0.00	9.00	2.09
Fish - cod (broiled)	22.95	0.86	0.00	0.031	1.0

(from data collected by Jared Ostrem and John VanDyk for the Entomology Department of Iowa State University)

Chirpy Chex Party Mix
Yield: 6 servings

6 tablespoons margarine or butter
2 tablespoons Worcestershire sauce
4 tablespoons of Tony Chachere's Creole Seasoning, plus extra for dusting
(or 1 tablespoon Lawry's Seasoned Salt, 2 teaspoons garlic powder, 2 teaspoons onion powder, 1 teaspoon freshly ground pepper, 1/2 teaspoon chili powder)
8 cups assorted Chex cereals (corn, wheat, and rice), or other dry unsweetened cereals
2 cups Crispy Crickets (recipe follows)
1 cup pretzels
1 cup dry-roasted Spanish peanuts

1. Preheat oven to 250 degrees.

2. In an open roasting pan, melt the margarine. Stir in the Worcestershire sauce and other seasonings.

3. Add remaining ingredients and stir until each piece is evenly coated with seasoning mixture.

4. Bake one hour at 250 degrees, stirring every 15 minutes.

5. Pour the mix into a brown grocery bag, dust liberally with seasoning mixture, and shake.

Crispy Crickets

1. To make one cup of Crispy Crickets, preheat the oven to 225 degrees. Strip the antennae, limbs, and wings (if any) from 20 to 30 clean, frozen adult crickets or 40 to 60 cricket nymphs. The actual number may vary, depending on the life stages of the crickets being used, but best cooking results are obtained if all the crickets are roughly the same size.

2. Spread the stripped crickets on a lightly oiled baking sheet and place in oven. Bake until crickets are crisp, around 20 minutes.

(Gordon, David, George, *The Eat-A-Bug Cookbook*, Berkeley, California: Ten Speed Press, 1998, p. 11)