

U.N. Urges Eating Insects; 8 Popular Bugs to Try

From beetles to stinkbugs, people in dozens of countries eat insects.

by Jennifer Holland for *National Geographic*

May 14, 2013

Ants are sweet, nutty little insects, aren't they? I'm not talking about their personalities, but how they taste. Stinkbugs have an apple flavor, and red agave worms are spicy. A bite of tree worm apparently brings pork rinds to mind. This information will come in handy for those of us following the latest recommendation from the United Nations: Consume more insects.

A report released Monday by the U.N. Food and Agriculture Organization reminds us that there are more than 1,900 edible insect species on Earth, hundreds of which are already part of the diet in many countries. In fact, some two billion people eat a wide variety of insects regularly, both cooked and raw; only in Western countries does the practice retain an "ick" factor among the masses.

Why eat something that we usually swat away or battle with insecticides? For starters, many insects are packed with protein, fiber, good fats, and vital minerals—as much or more than many other food sources. One example: mealworms, the larval form of a particular species of darkling beetle that lives in temperate regions worldwide. Mealworms provide protein, vitamins, and minerals on par with those found in fish and meat. Another healthful treat: small grasshoppers rank up there with lean ground beef in protein content, with less fat per gram.

And raising and harvesting insects requires much less land than raising cows, pigs, and sheep. Insects convert food into protein much more efficiently than livestock do—meaning they need less food to produce more product. They also emit considerably fewer greenhouse gases than most livestock (think gassy cows).

Entomophagy, the consumption of insects as food, is also a safe and healthy way to help reduce pest insects without using insecticides. Plus, gathering and farming insects can offer new forms of employment and income, especially in developing tropical countries where a lot of "edibles" live.

That helps to explain why 36 African countries are "entomophagous," as are 23 in the Americas, 29 in Asia, and even 11 in Europe. With so many species swarming the globe it's difficult to parse out the specific ones most often eaten, so we'll go a little broader—to the top edible insect groups.

According to my favorite cookbook, *Creepy Crawly Cuisine* by biologist Julieta Ramos-Elorduy, a leading proponent of the entomophagy movement, here are the eight critters most often ingested worldwide.

1. Beetles

The most commonly eaten beetles are the long-horned, June, dung, and rhinoceros varieties. These are munched by people living in the Amazon basin, parts of Africa, and other heavily forested regions, both tropical and temperate, as diverse species are easily found in trees, fallen logs, and on the forest floor. (Native Americans, I've heard, would roast them over coals and eat them like popcorn.) They are efficient at turning cellulose from trees (indigestible to humans) into digestible fat. Beetles also have more protein than most other insects.

2. Butterflies and Moths

They do more than look pretty fluttering across a meadow; these winged insects, during their larval and pupal stages, are succulent and full of protein and iron. They're very popular in African countries, and are an excellent supplement for children and pregnant women who may be deficient in these nutrients. In Central and South America, fat and fleshy agave worms, which live between the leaves of the agave plant and turn into butterflies, are highly sought after for food and as the famed worm dropped into mescal, a Mexican liquor. Cultivation of these worms could help protect them from overharvesting.

3. Bees and Wasps

We love bees for their honey, but they have more to give. Indigenous people in Asia, Africa, Australia, South America, and Mexico commonly eat these insects when they are in their immature stages. Stingless bees are most commonly munched, with wasps a distant second. Bee brood (bees still in egg, larval, or pupal form tucked away in hive cells) taste like peanuts or almonds. Wasps, some say, have a pine-nutty flavor.

4. Ants

You're probably thinking that it takes a lot of ants to make a meal. True. But they pack a punch: 100 grams of red ant (one of thousands of ant species) provide some 14 grams of protein (more than eggs), nearly 48 grams of calcium, and a nice hit of iron, among other nutrients. All that in less than 100 calories. Plus, they're low in carbs.

5. Grasshoppers, Crickets, and Locusts

Grasshoppers and their ilk are the most consumed type of insect, probably because they're simply all over the place and they're easy to catch. There are a lot of different kinds, and they're a great protein source. The hoppers have a neutral flavor, so they pick up other flavors nicely. Cricket curry, anyone? Meanwhile, locusts move in swarms that devastate vegetation in countries where people are already struggling to eat—one of several reasons to turn them into dinner.

6. Flies and Mosquitoes

Not as popular as some of the others, these insects—including edible termites and, yes, lice—still have a place at some tables. Flies that develop on various types of cheese take on the flavor of their host, and the species from water habitats may taste like duck or fish.

7. Water Boatmen and Backswimmers

Easy to cultivate and harvest, these cosmopolitan little guys deposit eggs on the stems of aquatic plants, in both freshwater and saltwater environments—even in stagnant water. The eggs can be dried and shaken from the plants to make Mexican caviar (tastes like shrimp), or eaten fresh for their fishy flavor.

8. Stinkbugs

If you can get past the funky smell, these insects apparently add an apple flavor to sauces and are a valuable source of iodine. They're also known to have anesthetic and analgesic properties. Who would have thought?

Crickets: The Other White Meat

Justin D'Ancona for Philly.com

Posted: Thursday, October 23, 2014

Chirp, chirp, crunch.

Could that be the sound sequence heard at your dinner table in the near future? Probably not, but crickets are gaining a ton of attention recently as being surprisingly nutritious.

A study done last year by the United Nations Food and Agricultural Organization noted that crickets are high in protein, iron, B12, essential amino acids and contain about as much calcium as a glass of milk. They are rich in fat for their serving size, but some of that percentage is attributed to the healthier, unsaturated variety.

The macronutrients per 100 grams of cricket are 12.9 grams of protein, 5.5 grams of fat and 5.1 grams of carbohydrates according to research done by Iowa State University.

Start-ups are taking notice of the potential booming bug business, but are opting to take a more conservative approach to consuming these six-legged insects by offering them in the form of cricket flour.

"Insects are probably the most sustainable form of protein we have on Earth," Bitty Foods founder Megan Miller said at a TedX conference earlier this year. "The only real barrier to Americans eating insects is a cultural taboo."

Bitty is one company that uses the ground crickets as the basis for baked goods like their chocolate cardamom cookies. All of their products are grain and sugar free. You can also order the cricket flour and create your own insect infused treats.

Cricket protein bar company Exostarted as a way to separate their product in an otherwise saturated market. Two students backed by a dream and 2,000 crickets created products like the cricket flour peanut butter and jelly protein bar. Each bar contains the powder of about 40 crickets and offers 10g of protein.

The method for turning a chirping, leaping cricket into a finely pulverized powder is pretty basic. The bugs are cleaned then roasted to remove moisture before being milled.

Apparently crickets have a toasted, nutty flavor that is actually quite tasty, but before you grab a net and go hunting in your back yard, maybe your first bite should come from one of these companies.

World Food Programme: Hunger Statistics (2012)

Hunger kills more people every year
than **AIDS, malaria & tuberculosis** combined.



Every year, authors, journalists, teachers, researchers, schoolchildren and students ask us (Wfp.org) for statistics about hunger and malnutrition. To help answer these questions, we've compiled a list of **useful facts and figures** on world hunger.

- **Some 805 million people** in the world do not have enough food to lead a healthy active life. That's about one in nine people on earth.
- The vast majority of the world's hungry people **live in developing countries**, where 13.5 percent of the population is undernourished.
- Asia is the continent with the most hungry people - two thirds of the total. The percentage in southern Asia has fallen in recent years but in western Asia it has increased slightly.
- Sub-Saharan Africa is the region with the highest *prevalence* (percentage of population) of hunger. One person in four there is undernourished.
- Poor nutrition causes **nearly half (45%) of deaths** in children under five - 3.1 million children each year.
- One out of six children -- roughly 100 million -- in developing countries is **underweight**.
- One in four of the world's **children are stunted**. In developing countries the proportion can rise to one in three.
- If **women** farmers had the same access to resources as men, the number of hungry in the world could be **reduced by up to 150 million**.
- 66 million primary school-age **children attend classes hungry** across the developing world, with 23 million in Africa alone.
- WFP calculates that **US\$3.2 billion** is needed per year to reach all 66 million hungry school-age children.

CLAIM

UNITED NATIONS: Starving People Should Eat Bugs

Jennifer Welsh for *Business Insider*: May 14, 2013

A new 200-page report from the Food and Agriculture Organization (FAO) of the United Nations suggests that if more people incorporate insects into their diet, we could reduce world hunger, food shortages, and food insecurity.

"Insects are not harmful to eat, quite the contrary. They are nutritious, they have a lot of protein and are considered a delicacy in many countries," said Eva Muller, the Director of FAO's Forest Economics, Policy and Products Division, in a press release. But, we haven't learned how to farm them yet, she said: "If we think about edible insects, there's a huge potential that has essentially not been tapped yet."

Edible insects include beetles, wasps, caterpillars, grasshoppers, worms, and cicadas. The report says that these insects have high nutritional value.

They also suggest that farming insects is better for the environment than other protein-rich foods, like pigs or cows. Insects are easier to raise, use less water, feed on waste materials, and produce less greenhouse gasses than other livestock.

Insects could not only serve as a food source for humans, but could be a food source for animals that humans raise for food. Insect-farming operations could provide income for people in rural areas, as well.

The problem? People are grossed out by eating insects. You are probably cringing reading this post.

"Consumer disgust remains one of the largest barriers to the adoption of insects as viable sources of protein in many Western countries," Muller said. "Nevertheless, history has shown that dietary patterns can change quickly, particularly in the globalized world."

And don't forget, most of us have already eaten insect-derived food products — remember Starbucks' Strawberry Frappe coloring?

Even if westerners develop a taste for bugs, there's a long way to go to get everyone eating insects. We need to develop technologies and techniques to grow them in large numbers and explore potential allergies, the report cautions.

COUNTERCLAIM

PROFESSOR: Here's Why Insects Won't Solve World Hunger

Robert Ferris for *Business Insider*: 5/18/13

A new report from the United Nations Food and Agriculture Organization said that eating insects, known as entomophagy, can reduce world hunger. Not everyone agrees: Insect-eater and researcher Tom Turpin, from Purdue University says that while insects can be tasty they won't make a dent in world hunger.

"I think the issue is not whether or not we would be willing to eat them, but whether we could produce enough to make a dent in world hunger," Turpin said. "We have spent thousands of years trying to master crop production, master animal husbandry, to produce the volume that we need to rely on something as a food source."

continued...

Apart from the insects grown for fishing bait, pollinating crops, and zoos, Turpin has not seen any commercial production of insects and nothing on the scale large enough to feed the world population. "It doesn't mean we couldn't do it, but we haven't spent the time culturing insects in the way we have cultured plants and animals for that food purpose," he said.

Insect eating also suffers from a serious image issue in Europe and the United States, and some Western attitudes toward insects have spread to other cultures, sometimes through Christian missionaries or other means.

People also often change their eating habits throughout their lives, especially as they become wealthier. "It's one of those things where people say, 'oh I always had to eat that growing up,'" Turpin said. "Even in China, where larvae and pupae are commonly eaten, when some people become wealthier they seem less likely to eat those. So even in cultures that accept it, sometimes we see a change based on social status."

The authors of the UN report theorize that insects never caught on as a food source or agricultural product because domesticated meat sources like cattle were just too useful — they also provided milk and leather for clothing in colder climates.

Most insect consumption occurs in warmer climates, since tropical insects tend to be larger, more plentiful, and available year-round.

Environmental threats to insect populations around the world may yet be the biggest obstacle to worldwide insect-eating. Collapsing wild bee populations and evidence of declines in other insect numbers may turn what is now a plentiful resource into a rare delicacy.

But they are delicious.

Beetles are the most popular six-legged snack, followed by caterpillars, then bees, wasps, and ants. People are also known to grub on grasshoppers, cicadas, termites, dragonflies, and others.

Turpin estimates that he has eaten at least 40 different species of insects on his travels around the world and has even dished them up at the annual Bug Bowl he co-founded at Purdue.

"When we do our demos, we cook mealworms in some kind of cooking oil or even butter, and you just stir fry them and they taste a little bit like popcorn," Turpin told Business Insider. "We mix them with vegetables and make a sort of chop suey sort of thing; we make what we call chocolate chirpy chip cookies, where we substitute cricket bits for some of the chocolate chips."

It may sound gross, but insects often blend well into recipes where you might otherwise use meat, Turpin said. "If you use insects in a recipe, whatever it is, they're going to taste mostly like whatever spices you are using in the recipe, just like meat or vegetables."

In one very elite cultural institution in Europe and America, insect-based dishes are starting to catch on: the high-end restaurant.

"Eating insects to the North Americans and Europeans could become more like eating some types of mushrooms; it becomes a kind of specialty food item," Turpin said. "So if you go to a high-end restaurant, you can eat some things that you normally wouldn't find in a grocery store or wouldn't normally include in your diet. So I actually think that it will fit into that genre of food: a not-readily-available everyday food, but more of a specialty or unique food item."

Don't bug out, but your food is covered in insects

KYLE HILL, SCIENTIFIC AMERICAN, JUN 5, 2013

I grabbed a box of cereal out of my cabinet. The flakes smelled stale, but I was hungry enough. I poured a cup or two into a bowl, followed by a splash of milk. Well into my third bite, I knew that stale cereal wasn't all I was eating. I saw thrips—slender insects commonly known as corn lice—swimming in the bottom of the bowl, extending their legs in hopes of finding a flake—like a desperate swimmer in a flood. I immediately discarded the cereal, repulsed by the other bugs I had surely already eaten. But while I didn't always see them, I had been eating bugs my whole life. So have you.

The UN's Food and Agricultural Organization recently released a report touting the nutritional and environment benefits of eating our many-legged friends (or pests), which scuttled into all corners of the media. (You can read a very thorough write-up bug eating at io9 and here at *Scientific American*.) The gist is that insects may end up solving a real food crisis by giving up their lives for human consumption. To most of the world, this was old news—insects are considered staples and even delicacies in many cultures. But Western media still let out an audible cringe at the thought of crunching down on chitin. Ignorance is bliss...

Out of Sight, Still In Your Mouth

You're deluding yourself if you think farming is as clean as making a microchip. We are always on insect territory. Try as we might with insecticides and other engineered poisons, bugs crawl all over our food to feed (and procreate) on it. When we harvest and package our crops, a lot of bugs come along for the ride. Be aware, all the hitchhikers aren't removed. At least there are limits on how many bugs the Food and Drug Administration (FDA) lets you unknowingly eat.

The FDA's *Defect Levels Handbook* lays it all out. Staples like broccoli, canned tomatoes, and hops readily contain "insect fragments"—heads, thoraxes, and legs—and even whole insects. (I won't tell you about the rat hair limits...) Fig paste can harbor up to 13 insect heads in 100 grams; canned fruit juices can contain a maggot for every 250 milliliters; 10 grams of hops can be the home for 2,500 aphids (pictured above).

All of these are merely aesthetic limits. It's seemingly for your mental well-being. Like a child moving a mountain of peas around on a plate until it looks like she's eaten more, the insect legs, bodies, and heads are less noticeable to us at the FDA's proposed concentrations. Your shredded wheat won't look like shredded thrip anytime soon. Anything over these limits would be aesthetically unpleasing, but it's doing you no harm. You obviously aren't keeling over from eating too much carapace.

The "action levels" sets by the FDA are for maximum insect contamination, so you ultimately ingest less than these limits. Nevertheless, bugs are making it into your gut whether you see them or not. Layla Eplett over at the *Scientific American* Guest Blog estimates that "an individual probably ingests about one to two pounds of flies, maggots and other bugs each year without even knowing it."

So, I hate to break it to you, but you already eat bugs. Not nearly enough for you to recognize it or to potentially harm you, but down the hatch they go. You don't really notice now, so just how much bug would have to be in your food for you to notice? If Westerners aren't ready to dive into katydid kabobs, we can at least calculate the equivalent amount of bug burgers in your food.

Bug Burger

Bugs like thrips and aphids have to be tiny indeed to pepper our food with their parts without us noticing. By my estimation, 5,000 aphids weigh about the same as a paperclip (each aphid being 1/5 of a milligram). If you are feelings adventurous, that means you could mash and mold 567,000 of the little plant suckers into a leggy equivalent of a Mac Donald's.

You should be happy the bugs that call our food home aren't bigger. The largest insect with reliable data on its mass is New Zealand's Giant Weta, weighing about the same as a jumbo supermarket chicken egg. Just four of these bugs would be the same weight as a Big Mac. But you'll thankfully never find one of these insects in your food (you'd notice the crunch).

Following FDA guidelines, you don't have to order a bug burger to eat the same amount as one. If you are a fan of spinach, the action limit is 50 or more aphids, thrips and/or mites per 100 grams. That's spinach that is 0.01% bug by weight. By the time you eat 1,000 kilograms of spinach you have eaten a quarter pounder's worth of aphid. (Popeye has eaten a lot of bug burgers.)

Bug beer is even better. Many of the bugs and bug parts will be filtered out during brewing, but the FDA's limit on the hops that go into the tank is 2,500 aphids per 10 grams of hops. That's right, 5% of the total weight of the hops making your summer ale can be bug. A quarter pounder's worth of aphid butt goes into the brewer for every 2.5 kilograms of hops.

Dessert is the same. If we consider the "insect parts" that the FDA limits to be about the same weight as a tiny aphid—a conservative estimate—then once you eat around 100 kilograms of your favorite chocolate you've eaten a full kilogram of bug. That's a serious amount of cocoa, but nonetheless, bug you eat.

And if you fancy making bread from scratch, about one and a half kilograms of insect is sprinkled into every 100 kilograms you use.

Total up all the food you eat over the course of a lifetime, and I'd be surprised if we couldn't trace a cringe-worthy percentage back to bugs.

Despite all the potential knee-jerk revulsion, it's important to remember that like all the animals we eat, insects share the planet with us. They outnumber us by a wide margin. If anything, we share the Earth with them. To have insects spice up our food is unavoidable, but harmless. The op-ed pieces screaming about what "gross stuff" the FDA lets us eat are over-blown and under-informed. Think of how many pounds of food you have eaten in your lifetime. How many plates were infested, and how many times were you hospitalized with chitin-related injuries? The fact of the matter is that insects were here first. We do our best to minimize our contact with them, but the circle of life offers the little creepy crawlies up as a viable, nutritious food source, and we should embrace that.

After all, humans have eaten insects for millennia, and one day they will return the favor.



It's Healthier To Eat A Bug Than It Is To Eat A Steak

Holy cow.



Kate Bratskeir Food and Health Editor, The Huffington Post

Posted: 10/13/2015 08:16 AM EDT | Edited: 10/13/2015 09:13 AM EDT

It sounds like an ancient proverb, but it's actually a scientific finding: In a battle of little insect versus big cow, insect wins.

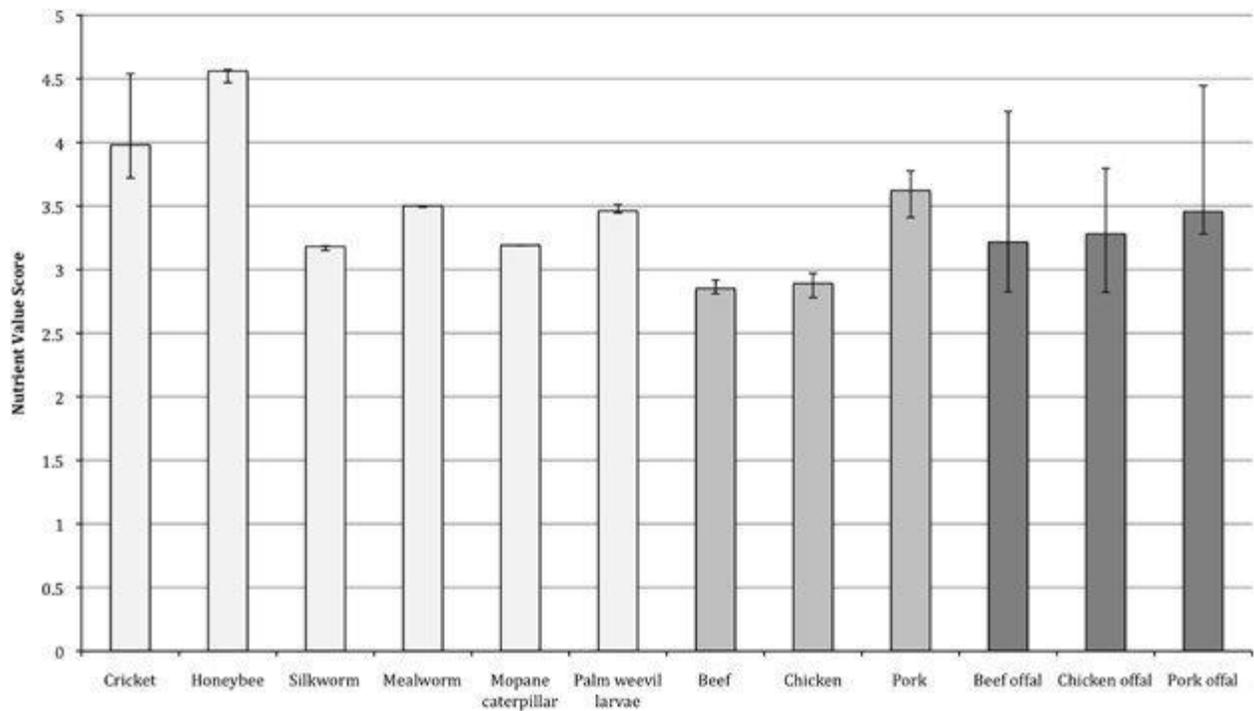
A study published in the *European Journal of Clinical Nutrition* compared the healthfulness of edible insects with more traditional protein like beef, pork and chicken, finding that the [bugs beat out the mammals in terms of nutritional value](#).



Researchers at the University of Oxford used two different metrics of nutritiousness: The first, the Ofcom model, appoints a score from one to 100 based on a food's calorie, sodium, sugar and saturated fat content per 100 grams of weight. The second, Nutrient Value Scores, offers a similar score to Ofcom, but includes vitamin and mineral values.

The Ofcom test didn't show any significant differences between bugs and livestock. But when vitamins and minerals were taken into account for the NVS evaluation, crickets, palm weevils (beetles), honeybees and larvae scored much higher than chicken and beef in particular.

Continued...



Bar graph showing the median values and inter-quartile range of Nutrient Value Scores (a higher score indicates a more nutritious food) for insects (light grey), meat (medium grey) and offal (dark grey). Higher scores indicate healthier foods.

While bugs have yet to make it into mainstream American cuisine, insects are often included in meals in countries like China, Mexico and Thailand. But [insect-infused products like cricket protein powders and bars](#) are starting to creep up on U.S. store shelves, too.

Insect-eating advocates say that bugs should become the millennium's preferred protein. One perspective argues that [if vegans replaced plants with insects, they'd harm fewer animals](#). Others say that [eating insects could solve world hunger](#), citing sustainability benefits and bugs' high protein content.

If you can get past the creepy-crawler factor (hey, [lobsters were once perceived as nasty sea creatures fit only for the poor](#)), your dinner options could become a lot more interesting -- and vitamin-packed!

Informational Article Analysis

Title of Article: _____

Writer/Source: _____

Date of Publication: _____

In a single sentence, write the MAIN IDEA / THESIS / PRIMARY CLAIM of the article:

Sometimes the main idea is clearly stated; sometimes you have to make an inference based on the content of the article. One way or another, you need to read the entire article to be sure.

List any unfamiliar vocabulary words from the article: _____

Summarize the most powerful evidence (examples, data, details, quotes, etc.) supporting the main idea.

1. _____

2. _____

3. _____

Synthesis: What does your assigned article have in common with some of the other articles/videos presented? How do they differ? When you put all these ideas together, what logical claim could you explain and support?

After studying the available sources, write a well-developed, multi-paragraph informational essay explaining the different positions on the issue of eating insects. Are insects a viable food source for humans? What are the pros and cons of eating insects? Analyze and explain the merits of each position, and use textual evidence (concrete details and examples) from the sources to support your explanation. Cite your sources in the text of your essay.

Rule 1: Address the prompt! Make sure that the essay you write is actually doing what the prompt requires. If there is a question to answer, ANSWER IT, clearly, as part of your thesis statement.

Restructure the question into a statement, as in this example:

Q: Can eating insects help solve world hunger?

A: According to the experts, eating insects probably can/cannot help solve world hunger. (This becomes your thesis!)

Rule 2: No matter how long the essay has to be, you must know the basic elements of academic writing inside and out:

- **Introduction: “Hook” (attention getter), background info (title of article, names of people involved, backstory that led to this writing, etc.), CLEARLY STATED THESIS that addresses the prompt**
- **Body paragraphs: Offer support for thesis, including topic sentences that clearly state supporting reasons, textual evidence (quotations/summaries from text), reasoning that explains how the evidence supports the thesis**
- **Conclusion**