

Edible Insects

or, more than you ever wanted to know about eating bugs

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All about edible insects:

Edible insects; you may feel that these two words do not even belong in the same sentence. You have every right to be skeptical. In all probability, you have never deliberately eaten an insect. However you have probably inadvertently consumed over a **pound** of insects in your lifetime.

Your insect consumption adds up. Flour beetles, weevils, and other insect pests that infest granaries are milled along with the grain, finally ending up as tiny black specks in your piece of bread. Small grubs and other tiny insects can be found in your fruit and vegetables. Insects are especially common in canned and other types of processed food, and even in certain beverages; I once went on a tour of an apple orchard and while the group was viewing the area where they separate the rotten and bug infested fruits from the good ones, I asked the tour guide what they did with the bug infested apples. She told me that they use them to make cider; waste not, want not! It is virtually impossible that you have not ingested insects in one form or another during your lifetime. And it probably did not harm you, but instead did you some good by providing extra protein in your meal!

There are a number of points that I would like to make:

- Some insects are edible. In fact, most insects are edible, but there are a few species that are especially palatable, nutritious, and easily obtainable. I will concentrate on these.
- Many species of insects are lower in fat, higher in protein, and have a better feed to meat ratio than beef, lamb, pork, or chicken.
- Insects are tasty. Really! Even if you are too squeamish to have them as a main dish, you can make insect flour and add it to bread and other dishes for an added protein boost.
- Insects are easy to raise. There is no manure forking. No hay bale lifting. No veterinary bills. You can raise them in an apartment without getting complaints.
- Insects are beautiful. I think that all insects are beautiful, but most people I know will marvel at the iridescence of a butterfly, but shudder at the striping of a mealworm.
- Most people do not mind butchering insects. The butchery of insects is very simple compared with that of cattle or poultry, and nowhere near as gory.
- Raising insects is environmentally friendly. They require minimal space per pound of protein produced, have a better feed to meat ratio than any other animal you can raise, and are very low on the food chain. They are healthy, tasty, and have been utilized for the entire history of mankind (after all, it is easier to catch a grub than a mammoth).
- Also, as far as I know, no animal rights activists object to the eating of insects. You don't need to destroy any wildlife habitat to eat insects, and you can incorporate insects and earthworms into a recycling program.....vegetable waste in, yummy insect protein out.

O.K., O.K., I admit the slight possibility of disadvantages...

The only real problem you may run into while utilizing insect protein is the lack of social acceptance. That is why we sensible insect eaters must make it our duty to educate the public about the value of insect protein. You may encounter widespread disbelief, "You're kidding me. You *don't* eat insects!", revulsion "Yuck! You eat *insects!?!*", and refusal "You will *not* ever get me to eat insects." Press on! Remember, insects are the food of the future, and you are paving the way for future generations.

Is there a better name for it than insect eating?

Why yes, there is. The word is Entomophagy. You would think that a word this melodious would be in common usage, but sadly this is not the case. In fact, you probably have never heard this word before (unless you happen to be a friend of mine). Find ways to interject the word entomophagy in casual conversation, as in: "Did I ever tell you about the stunning array of culinary options revealed through the study of *entomophagy*?"

Other Random Entomophagy Factoids

In case you need a little more persuasion:

There are 1,462 *recorded* species of edible insects. Doubtless there are thousands more that simply have not been tasted yet.

100 grams of cricket contains: 121 calories, 12.9 grams of protein, 5.5 g. of fat, 5.1 g. of carbohydrates, 75.8 mg. calcium, 185.3 mg. of phosphorous, 9.5 mg. of iron, 0.36 mg. of thiamin, 1.09 mg. of riboflavin, and 3.10 mg. of niacin.

Compare this with ground beef, which, although it contains more protein (23.5 g.), also has 288.2 calories and a whopping 21.2 grams of fat!

NOTE:

I am no longer updating or maintaining this site. For a project that I am currently fozzling about with, visit sunfall.com (geek girl comics for the hoi polloi).

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How to Obtain Edible Insects

By far the most difficult part of attempting any insect recipe is acquiring the necessary ingredients. Insects are rarely sold in supermarkets, nor, aside from various novelty items, are there many pre prepared insect food products. Therefore, those who wish to eat insects must acquire them either by catching insects in the wild, by buying insects from pet stores or bait shops, or by raising their own.

Catching insects in the wild, unless you're fortunate enough to live in a rural area, is a laborious and potentially dangerous task. I advise this type of insect collection only if you're sure that the insects you're collecting are edible (doyous...), and that the area where you're collecting is free of pesticides. Cicadas, field crickets, grasshoppers, grubs, tomato hornworms, and so forth, are among the edible insects one is likely to find on such hunting expeditions.

Buying insects is the easiest way to get edible insects, but it is also the most expensive (ain't it always the way?). Most pet stores and bait shops carry crickets and mealworms, two of the most easily raised and prepared insect species. You can also buy these insects in bulk from various insect suppliers (see my [Links, Etc.](#) page for more information on the subject). The only preparation that you need give to insects acquired in this manner is that of feeding them for a few days on fresh grain; most insects you buy at bait shops or pet stores have been eating newspaper, sawdust, or similarly unsavory packing material, which, while completely harmless, might affect the insect's taste if you ate them while the material was still in their digestive tract.

Raising insects, in my opinion, is the optimum way of ensuring a steady supply of palatable insects. While not entirely as convenient as simply popping into the pet store whenever you need insects, it is far cheaper, more environmentally friendly, and more rewarding in the long run. See my page on [Raising Insects](#) for all the juicy details.

How to Prepare Insects for Cooking

Those who are accustomed to eating animals probably know that most animals must be killed, cleaned, and cooked before one can eat them. The case is similar with insects. While there are many people in other countries who prefer to eat insects live and raw, and while it is true that you could probably get the most nutrients that way, I prefer food that won't crawl off my plate. I have tried eating live ants and mealworms, and in fact present a "recipe" for live insect consumption below; however, I would advise that beginning insect eaters start with cooked insects.

To prepare a batch of crickets or mealworms:

Take the desired quantity of live insects, rinse them off and then pat them dry. This procedure is easy to do with mealworms, but fairly hard to do with crickets. To do so with crickets, pour them all into a colander and cover it quickly with a piece of wire screening or cheesecloth. Rinse them, then dry them by shaking the colander until all the water drains. Then put the crickets or mealworms in a plastic bag and put them in the freezer until they are dead but not frozen. Fifteen minutes or so should be sufficient. Then take them out and rinse them again. You don't really have to clean mealworms, though if you want, you can chop off their heads. Cricket's heads, hind legs, and wing cases can be removed according to personal preference; I like doing so, since cricket legs tend to get stuck in your teeth. You are now ready to use the insects in all kinds of culinary treats!

Mealworm Chocolate Chip Cookies

- 1/2 cup butter
- 1/2 cup brown sugar
- 1/2 cup white sugar
- 1 egg
- 1/2 teaspoon vanilla
- 1 cup all purpose flour
- 1/2 teaspoon salt
- 1/2 teaspoon baking soda
- 1/2 cup oats
- 1/2 cup chocolate chips
- 1/4 cup mealworm flour

Cream butter well, then mix in sugar, egg, vanilla flour, salt, baking soda, chocolate chips, oats, and mealworm flour. Drop batter by the teaspoonful on a greased cookie sheet. Bake for 10 minutes at 375 degrees fahrenheit. This recipe doesn't have much in the way of palpable insect content, but is an excellent way to introduce others (or yourself!) to entomophagy. Even many rather squeamish people will try mealworm cookies, since the cookie format doesn't look "gross" to most people, and since it is rather difficult to actually taste the mealworms, though they enrich the cookie with a somewhat nutty flavor and extra protein.

To make insect flour:

Spread your cleaned insects out on a lightly greased cookie sheet. Set your oven 200 degrees and dry insects for approximately 1-3 hours. When the insects are done, they should be fairly brittle and crush easily. Take your dried insects and put them into a blender or coffee grinder, and grind them till they are about consistency of wheat germ. Use in practically any recipe! Try sprinkling insect flour on salads, add it to soups, your favorite bread recipe, on a boat, with a goat, etc.

Chocolate Covered Crickets

- 25 adult crickets
- Several squares of semisweet chocolate

Prepare the crickets as described above. Bake at 250 degrees until crunchy (the time needed varies from oven to oven). Heat the squares of semi sweet chocolate in a double boiler until melted. Dip the dry roasted crickets in the melted chocolate one by one, and then set the chocolate covered crickets out to dry on a piece of wax paper. Enjoy! This is a little time consuming to make, but definitely worth it...the crickets are deliciously crunchy!

Ant Brood Tacos

- 2 tablespoons butter or peanut oil?
- 1/2 pound ant larvae and pupae
- 3 serrano chilies, raw, finely chopped
- 1 tomato, finely chopped
- Pepper, to taste
- Cumin, to taste
- Oregano, to taste
- 1 handful cilantro, chopped
- Taco shells, to serve

Heat the butter or oil in a frying pan and fry the larvae or pupae. Add the chopped onions, chilies, and tomato, and season with salt. Sprinkle with ground pepper, cumin, and oregano, to taste. Serve in tacos and garnish with cilantro. (Not living in an area exceptionally prolific with ants, I have never been able to try this recipe. But it sounds perfectly delicious! I found it in 'Creepy Crawly Cuisine', an excellent recipe book.)

"Natural Style"

- As many mealworms as you can sanely eat

Open mouth. Insert live mealworms. Chew. Swallow.

You can eat almost every kind of edible insect raw; however, this method of eating insects should only be performed on insects that you keep yourself or know are free from pesticides. Do not snag passing cockroaches, ants, or termites in an urban area unless you have developed a natural immunity to pesticides. And don't forget to wash your insects before eating them!

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Raising Mealworms

Raising mealworms (*Tenebrio Molitor*) is quite easy and recommended for the beginner. Simply take a flat plastic tub with a lid, fill it with an inch or so of oats or other grain, put in a slice of potato, carrot or other hard vegetable as a source of water, and then deposit your mealworms! Make sure to replace the slice of potato fairly frequently, otherwise you will be growing mold instead of mealworms.

The mealworms you get at the store are in their larval stage, and it may be a few months before they mature into beetles, so be patient. 100 mealworm larvae is a good colony start if you are not going to be eating them very often. If you wish to make insect protein a regular part of your diet, you can obtain mealworms in bulk from reptile food supply companies and start a large colony (5000 or more is the way to start in this case).

If you have an ant problem in your area, you should float the mealworm tub in a dish of soapy water to prevent ants from infesting your grain. However, unlike crickets, mealworms are unlikely to escape unless you are hideously careless.

Raising Crickets

Crickets are quite easy to raise and prepare, and the main problem is making sure that they don't escape. Crickets can be kept in any fairly large container with high sides and a tight fitting lid. An aquarium is a good choice. Put a couple inches of potting soil on the bottom of the container. This will be where the crickets deposit their eggs. Put several egg cartons in the aquarium for the crickets to roost on. Then, place a small container of grains and vegetable scraps in for food, and a container of moist cotton balls for water. Add 50-100 crickets. Mist the potting soil lightly every few days, and make sure that the crickets always have fresh food. You can probably start harvesting the crickets within a few months.

Crickets are escape artists!!! It is a good idea to put a rock on top of the lid to ensure that you don't accidentally knock it off. It is also a good idea to float the container in a tub of soapy water. Unlike mealworms, it is almost impossible to recapture crickets once they escape, and crickets may start infesting your house if they get out while you're on vacation (don't panic, though...they rarely cause any real damage to food or furnishings). I would really recommend that you start with mealworms if you are new to insect raising.

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Entomophagy Links and Resources

Pages Concerning Entomophagy:

- [Bay Area Bug Eating Society](#)
- [Yahoo's Entomophagy Page](#)
- [The Food Insects Newsletter](#)
- [Orkin Insect Recipes](#)
- [Froggy Recipes](#)
- [Bugs on the Menu](#)
- [Sowbug Recipes](#) (all right, this isn't precisely entomophagy, but it's in the spirit of the thing)
- [FDA Food Defect Action Levels](#) (find out the government accepted level of entomophagy in your favorite food!)

Bulk Insect Retailers

- [Grubco](#)
- [Milbrook Cricket Farm](#)
- [Nature's Way](#)

Other Links

- [Catholic Culture - Lepanto League](#)

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Why Bother Reading a Real Insect Cookbook?

Yes, this site is extensive, and yes, it has recipes. However, the books that I list here go into much more detail and list far more recipes than I could ever invent. Also, there are certain benefits in having a hard copy of information; these web pages do not rustle when you turn them, nor do they have an enticing, booky smell, nor yet are they written by a professional author. I have perused each and every one of the books listed here, and I find them entrancing. To make things convenient in the event that you should wish to purchase the books I have listed here, I have set things up so that you can link directly to the books and purchase them from Amazon.com. Ahem---I get a small percentage from the sale of each book bought through a link from this page, so I would definitely encourage you to take advantage of this service.



Books, Books, Wonderful Books

[The Eat-A-Bug Cookbook](#), by David George Gordon

I loved this book! It has a variety of gourmet recipes for several different kinds of insects, as well as amusing coverage of the history of bug devouring. The writing style is engaging, and the overall book design can be described as nothing short of "purty". I especially liked the idea of using roasted crickets as party snacks (they are exactly the right texture for it--crunchy!).

[Creepy Crawly Cuisine](#), by Julieta Ramos-Elorduy, Ph.D.

This book is extensive and well researched, with a multitude of interesting recipes. The materials for some of the recipes may be hard to find (Where the heck could you find half a pound of tree hoppers?!), but on the whole the recipes looked palatable and easy to prepare. Creepy Crawly Cuisine also contains photographs of bug recipes (the stink bug pate looks especially attractive), and tables listing the nutritive qualities of common edible insects. Definitely worth a look.

[Beetles Lightly Toasted](#) by Phyllis Reynolds Naylor

Consider yourself warned; this is a children's fiction book. In fact, I encountered it as a child, and this book was probably the one that started me off on my insect eating career. If you have younger relatives whom you wish to introduce to the world of insect eating, this would be an excellent choice.

[Man Eating Bugs](#), by Peter Manzel and Faith D'Aluisio

This book is the most incredible book on eating insects that I have ever seen; it is not a recipe book, but a photo documentary of entomophagy around the world. The photographs are simply incredible...I have handed this book to several different people, and they have all had the same reaction: They open the book, say "Ewww", and keep on turning the pages, saying "Ewww! Ewww! Ewwwww!!" at each consecutive page. Truly an impressive coffee table book.

Other Works on Entomophagy

"Butterflies in My Stomach" is an entomophagy classic, but is, alas, out of print. Keep your eyes open at library book sales, used book stores, and the like, as this book is well worth acquiring. Happily, "Entertaining With Insects" has been republished, though it doesn't seem to be available on Amazon.

Butterflies in My Stomach, by Ronald L. Taylor

Entertaining with Insects, by Ronald L. Taylor and Barbara J. Carter

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I'll admit, having a page full of gifs isn't quite as gratifying as having a wall full of trophies. However, since no one seems likely to award me a wall full of trophies in the near future, a page full of gifs is most heartwarming! Thanks to all who decided (or were bribed...erm, just kidding...) to give this humble site an award...

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FAQ

I get quite a bit of email, much of it generated from this site (this site has received over 150,000 visitors, and many are generous enough to take the time to write me). Receiving all this email is in some respects exceptionally gratifying (bwahahaha, I get a great deal of email! I must be important! Or not...), but in other respects extremely frustrating, since I receive approximately the same questions over and over and over again. In the hopes of preventing the unnecessary multiplication of bytes, I present this list of Frequently Asked Questions...check to see if yours is listed.

What is your favorite kind of insect to eat?

I am quite fond of mealworms, personally. Chocolate covered crickets are tasty as well.

Where can I get edible insects?

From a pet store, bait shop, or bulk insect supplier. Sheesh, don't you guys read the [Recipes](#) page?

Do you know of any restaurants in (fill in your area here) that serve insects?

No.

Are you a scientist/professor/journalist?

Bwahahahaha...yes, I'm a scientist...a MAD scientist!!! Erm, actually, I'm none of the above; I'm a seventeen year old homeschooler, and have no qualifications other than the ability to write and a life long interest in entomology. You can read more about me on my (cleverly named) [About the Author](#) page.

Could you send me a book or brochure?

Nope!

Could you send me more information on the nutritional value of (insert your favorite insect species here)?

In general, no.

Could you send me more recipes?

Nay. When it comes to this web page, what you see is what you get. While I can be prevailed upon to track down more esoteric information about entomophagy, most of my pertinent knowledge about insect eating is already contained on eatbug.com. If you are interested in learning more about entomophagy, there is a startlingly large amount of information about entomophagy available in various [printed resources](#), and there are also several other [entomophagy sites](#) on the net. In other words, "go look it up!"

Can you help me with my science project?

I can certainly try; however, since I have various Real Life obligations (not the least of which is scholastic work of my own!), it may be a while before I get back to you.

Do you eat mealworm larvae, or beetles?

While both larvae and beetles are edible, most people prefer eating the larvae...besides, if you eat all the beetles in your colony, you won't have any more larvae *or* beetles, rendering this a moot question.

Can you catch parasites/diseases from eating insects?

Properly raised crickets and mealworms do not carry any parasites or diseases communicable to man. The only dangers potentially posed by entomophagy are those of allergic reactions to insects (if you're allergic to shellfish, you're probably allergic to insects too), pesticide contamination (be careful where you harvest your insects!), and the potential for insects such as wild caught cockroaches to carry disease (don't eat the cockroaches you find under the kitchen sink).

Do you know where I can buy premade insect food products?

[Hotlix](#) is the only company I know that sells such products; they sell lollipops with insects inside (intended as a novelty, but they taste pretty good), and mealworm snack foods (sold as "Larvettes") .

Do edible insects have medicinal qualities?

While I know that various cultures believe that insects have medical value, I really couldn't tell you who believes which insect has what medicinal property. In general, I assume that whatever insect I'm eating has about as much medicinal value as the average cow... "Take four heaping handfuls of mealworm every day for relief of hunger."

Are you married?

Yes, people have actually asked me this question. The answer is no; I'm a mere 17 years of age, and am not contemplating such a drastic course of action for quite some time.

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About Me

For some reason, many visitors are intensely curious as to what kind of person would devote their time and energy to maintaining a page about entomophagy. Therefore, to simplify life for such visitors, I am providing a very brief description of myself. Please, feel free to run away screaming at any moment...

I am female, 17 years of age. My full name is Aletheia Price (or, at least, it was the last time I checked). I have been eating insects since the age of 13; originally, I took up entomophagy as a means of shocking my elders and betters (some teens dye their hair green, some start listening to heavy metal, some stay out all night partying...I ate insects). Entomophagy was most efficacious in this respect, but soon I became more and more interested in it, until eating insects became a full blown hobby. Not content to merely eat insects myself, I took it upon myself to make all my friends and immediate family members aware of the joys of eating insects. When my friends and immediate family members took to putting their hands over their ears and singing "La la la, I can't hear you!" whenever I mentioned entomophagy, I deduced that it was time to seek other ranting grounds...in this case, the world wide web. I created eatbug.com at the age of 15, and, startlingly enough, was mentioned as a Yahoo! Pick of the Week and began generating *actual traffic* only a few weeks after publishing the site. Needless to say, this popularity inflated my adolescent ego to an untoward degree...

However, entomophagy is just one facet of my (somewhat eclectic) personality. I am also defined by my homeschooling...I have created a community site for teen homeschoolers, named, somewhat unoriginally, [The Teen Homeschooler](#). Here, you can catch a glimpse of my life, interests, and writing style, such as it is.

Scholastically I would normally be considered a high school senior, and will be heading off to college this fall (hurrah!). My current favorite subjects are philosophy, Irish history, logic, and Latin...my less-than-favorite subjects are pre-calculus and trigonometry. I greatly admire chemistry, physics, and so forth, but have been hampered in every effort to study them by my merely passable math skills (when castigated for these failures, my response is "I'm not a math geek, I'm an artiste!"). My one true love is currently writing, and I eventually hope to be a writer. The chances are high that I'll change my mind about this, however...at various stages in life my ~career goals have included: xenobiologist, entomologist, nun, agricultural scientist, galactic conquerer, ballet dancer, veterinarian, and singer.

Hmmm...what else? I'm Roman Catholic, prolife, a computer geek (no, wait, artiste!), a member of the Petite Elite (only those 5'6" or under qualify...death to the Freakish Giants!), and am exceptionally keen on science fiction and fantasy. In Real Life, I'm a mild mannered loudmouth, and strike people as either amusing, interesting, frightening, annoying, ludicrous, charming, or admirable, depending on the alignment of the planets and how much coffee I've had that day. I usually wear ankle length dresses; it is simply amazing how many people you can shock by wearing modest clothing. All of my actions are governed by the two little green aliens who live under my desk. All will bow before them, muahahaha! My Official Nickname is "Tia". I work towards the complete eradication of the phrase "Wazzup?". I insist upon equal rights for unborn women. My favorite author is G.K. Chesterton, my favorite color, purple. Glorp bleezog vibble glaborn wog!

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