

## Waste Materials (ie Worm Food)

Usually people set up their own worm bin at home so they can compost their food scraps and leftovers. Unfortunately not all waste materials are created equal from a worm's standpoint (or a human health standpoint for that matter), so we should talk a little about what should and should not be added to an indoor worm bin.

### YES

- Vegetable & fruit waste (citrus fruit should be added in moderation when using smaller bins)
- Starchy materials - bread, pasta, rice, potatoes - all in moderation (beginners may want to avoid these altogether initially)
- Aged animal manures (careful with rabbit and poultry - need lots of bedding to balance)
- Shredded newspaper, used paper towels (common sense applies here), cardboard (great idea to add these carbon rich materials at the same time you add any wet food waste)
- Egg shells (best if ground up and in moderation)
- Coffee grounds
- Tea bags

### NO

- Human/pet waste
- Non biodegradable materials
- Dairy/meat
- Oils/grease
- Harsh chemicals

These are fairly basic guidelines and of course there are exceptions under certain circumstances. I will definitely be going into much more detail in later articles.

Something I alluded to in the previous section was the fact that letting your waste material sit for a period of time is better than adding it right away. Often people assume that the worms feed directly on the waste materials themselves. In a sense they do, but more specifically they are slurping up the microbial soup that forms on rotting materials. If you throw in a bunch of fresh carrot peelings the worms won't be able to start processing the material until sufficient microbial colonization has occurred.

As I mentioned above, a fantastic way to ensure that your new bin takes off successfully is to mix a decent quantity of waste material in with your fresh bedding, then simply letting the bin sit for a week or so before adding the worms. I know this can be a challenge for those people anxious to get started, but it will go a long way in terms of ensuring your success.

Should you choose not to wait (obviously if you get your worms at the same time you get your bin it doesn't make sense to wait) I would highly recommend that you at least try to add some partially rotting materials so that the worms have something to feed on.

I like to keep food waste in an [old milk carton](#) that sits under my sink. Aside from the convenience of not needing to take it down to the basement (where my indoor bins are located) or outside (to my outdoor bin) multiple times per day, this also allows time for microbial colonization of the materials - and don't worry, you won't have a stinky mess in your container if you do it properly (I'll definitely write more about that in another article).

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## Composting Worms



One of the common misconceptions amongst vermicomposting beginners is that any earthworm can be used for worm composting, or kept in an indoor bin in general.

I can still remember the disappointment of discovering (during my teenage years) that I could not keep a population of soil dwelling worms in a bucket. Before becoming interested in worm composting I was an avid aquarium hobbyist, always looking for ways to raise live food for my fish. Having heard that people were able to keep thriving "worm bins" in their house I naturally assumed they were raising the same kind I found in my garden.

Eventually I learned that most of my yard worms were of the "anecic" type - that is to say they were soil dwelling worms that create burrows and tend to lead a somewhat solitary existence (they need their space). The worms ideally suited for composting on the other hand are referred to as "epigeic". This group tends to live in rich organic material (not soil), and are adapted to crowding and warmer temperatures. So its not difficult to see why epigeic worms would do much better in an indoor composting bin than their soil dwelling cousins.

By far, the most common variety of composting worm is *Eisenia fetida* - also known as the red worm or red wiggler (see the "[Quick Facts](#)" section for other names). If you are looking to start up your own worm composting bin this is definitely the worm for you. There are other species of composting worm, but we can deal with them in future articles.

So where does one get hold of some of these worms??

Well there are various options. The easiest (but most expensive) is to simply buy them. There are a wide variety of online merchants who will sell them to you, OR you may be able to track down a local supplier (I will be eventually setting up a comprehensive supplier directory to help people find merchants in their area). If you need some recommendations simply drop me an email.

In general worms are pretty expensive (typically running somewhere between \$25 and \$40/lb USD, although decent discounts tend to be given on larger orders), but it's amazing how fast you can build a large thriving population starting with only a pound of worms.

Another option is to track down someone else with a worm bin in your area and ask them to share. Over the years I've been given worms on multiple occasions and now happily 'pay it forward' on occasion myself. Getting in touch with your local gardening clubs or municipal waste management division should prove helpful.

Composting worms (*E. fetida*) don't typically occur in "nature", but there IS a decent chance of finding some on a local farm if they keep aged manure piles. I can still remember the very first time I saw a population of red wiggler worms. I was working at a horse farm and happened to dig into a pile of manure sitting behind the barn. It was absolutely LOADED with red worms! I had never seen so many worms in one place ever (nor have I since then). If I had been into worm composting at the time this would have been like hitting the jackpot.

When it comes to adding worms to a new system, I like to err on the side of caution. I prefer to build my population up to the ideal level, rather than using standard guidelines. A widely accepted recommendation is to add 1lb of worms for each sq ft of bin surface area you have. So if your bin is 1.5 X 2 ft (width x length) it should be able to handle 3 lbs of worms. I would personally rather add 1lb of worms to a bin this size and let the population reach an equilibrium on its

own. Red worms reproduce very rapidly under favorable conditions so it shouldn't take too long.

New to worm composting? Looking for some quick and dirty info before jumping in head-first?

Well this is will be a great place to get started.

- Worm composting (also known as vermicomposting) involves the breakdown of organic wastes via the joint action of worms and microorganisms (although there are often other critters that lend a hand)
- Regular (soil and garden) earthworms cannot be used for worm composting. They will die if added to an indoor worm bin.
- Soil worms will however congregate in the lower regions of outdoor bins (if open to surrounding soil)
- Composting worms are specialized surface dwellers (not burrowers), typically living in very rich organic matter such as manure, compost heaps or leaf litter
- Most common variety used is *Eisenia fetida* (also spelled 'foetida'), although it's larger cousin, *Eisenia hortensis* (a.k.a. the 'European Nightcrawler') is commonly used as well (more commonly to be sold as bait worms)
- Common names for *E. fetida* include: red worm, red wiggler, brandling worm, manure worm, tiger worm
- You won't likely find this species on your property (unless you live on a farm, or happen to introduce them into your compost heap).
- *Lumbricus rubellus* is another species (and also a small reddish worm) sometimes used for vermicomposting, but is not as effective as *E. fetida*
- It is widely believed that a composting worm can process the equivalent of it's own weight in waste each day. Under highly optimum conditions (not likely to be attained with a small home system) red worms have been found to process multiple times their own weight! This is very much dependent on the foodstock and how well managed the system is.
- A reasonable guideline to follow is 1/4-1/2 total worm weight in waste per day. So if you have a pound of worms, they should be able to process roughly 1/4-1/2 lb of food waste per day. Keep in mind however that you may need to feed them less during the first couple months since they usually require a period of acclimation when added to a new system.
- Red worms technically graze on the microbial community that colonizes waste materials - not really the waste itself (although they certainly ingest some of the rotting waste in the process). Some research has indicated that protozoans are the primary food source, while there is also evidence that fungi and other microbes are consumed as well.
- There have been a number of research studies indicating that vermicomposting can significantly reduce levels of pathogens in waste materials, such as biosolids.
- Red worms love (and can tolerate) very high levels of moisture content (80-90%), but they also require oxygen so it's important to find the right balance
- One lb of composting worms is estimated to consist of approximately 1000 individuals, and can cost anywhere from \$15 to \$40 USD
- Surface area far more important than depth when it comes to worm bins (ie tubs work much better than buckets)

- Regular light is harmful to worms but red light is not
- Red worm eggs look like tiny straw-coloured lemons
- Baby worms look like very small versions of the adults (but have less red pigment)
- Adding crushed egg shells (or other calcium sources) can help stimulate worm reproduction