

Eisenia fetida

Red Wigglers can consume up to 50% of their body weight per day, so if you have two pounds of earthworms, you could possibly feed them one pound of food per day.

- **Do earthworms have eyes?**

No, instead they have receptor cells that are sensitive to light and touch. These cells allow earthworms to detect different intensities of light and to feel vibrations. They will move away from light, if they can. If earthworms are exposed to light for too long (about an hour), they will become paralyzed and die when their skin dries out.

- **Can earthworms smell?**

Instead of noses, earthworms have chemoreceptors in the anterior region that react to chemicals.

- **How do earthworms breathe?**

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How do earthworms move?

They have groups of bristles (called setae) on each segment that move in and out to grip surfaces as the worms stretch and contract their muscles to push themselves forward or backward.

If I cut an earthworm in half, will it regenerate into two earthworms?

No. The half with the earthworm's head can grow a new tail if the cut is after the segments containing vital organs. But the other half of the earthworm cannot grow a new head (and all of the other organs needed to sustain the earthworm).

Which end is the head?

The head is at the end closest to a swollen band encircling the earthworm. Although they can move forward and backward, they tend to move forward most often.

How do earthworms eat?

They have tiny mouths and no teeth, so earthworms eat differently than you and I. An earthworm will push its pharynx (throat) out, grab microorganisms and little bits of organic matter, and pull them into its mouth. The food is coated with saliva, pushed down the esophagus into the crop and on to the gizzard, where it is crushed and ground apart. Next, it moves into the intestine, where food is broken down more by digestive enzymes. Some of the food is passed into the bloodstream for use by the earthworm and the rest passes out the anus as castings (worm poop).

What is the swollen band near the head called and what is it for?

It is called a clitellum, and it contains eggs and sperm for reproduction.

How do earthworms reproduce?

Earthworms are hermaphrodites, so each one has both female and male organs. They mate by joining their clitella and exchanging sperm. Each earthworm will form an egg capsule in its clitellum and pass it into the castings 7 to 10 days later. The egg capsule is golden-brown colored and looks like a tiny lemon the size of a match head. Two to seven *Eisenia fetida* babies will hatch from an egg capsule in 30 to 75 days.

to actively eat and reproduce, *Eisenia fetida* needs their bin environment to be between 59 and 77 degrees Fahrenheit.

In 2006, the U.S. EPA estimated that 55-65% of the waste generated in the United States is residential. Most of what we throw away is organic materials that could be vermicomposted, composted, or recycled. Paper and paperboard products account for 34%, and food scraps and yard trimmings make up 25% (by weight).

Organic waste causes global warming. Landfills are the largest human-related source of methane in the U.S. (34% of all methane emissions). Food residuals are the second biggest source of methane in landfills.



- **1) What is the importance of vermiculture to our environment?**

Vermiculture turns "waste" organic materials into a valuable product (vermicompost) that enhances soil by increasing its porosity, water-holding capacity, texture, and reduces erosion. Vermicompost also helps plants grow bigger, increases crop yields, and decreases plant diseases and pest attacks.

- **2) What type of earthworm do I use for vermicomposting?**

Of the 4,000+ species of earthworms, only half a dozen of them are suitable for vermicomposting. The most commonly used species is *Eisenia fetida*.

- **3) Where do I obtain *Eisenia fetida* (red wigglers) for vermicomposting?**

Do not buy worms from a bait shop. You need at least 1,000 worms, and bait shops only sell about a dozen per cup. Buy them by the pound from a worm grower. Worm growers can be found on the Directory of Vermiculture Resources by State in the U.S. and by Country: Worms, Supplies, and Information at

<http://www.bae.ncsu.edu/topic/vermicomposting/vermiculture/directory-by-state.html>. Most worm growers will ship worms, so you don't have to live near them. You can also ask your county Cooperative Extension office if they are aware of local worm growers.

- **4) What conditions are ideal for raising Eisenia fetida?**

Proper temperatures, moisture, oxygen levels, and pH should be maintained. Temperature limits are between 55 and 80 degrees Fahrenheit, with 60 to 70 degrees being ideal. As temperatures go farther below or above these limits, the worms will decrease the amount they eat and breed. Moisture limits are 60 to 85 percent, with 80 percent being optimum. Oxygen is necessary, so make sure your worm bin has holes to allow air to flow through.

Try to maintain a pH of 7.0 in the bin.

- **5) How often do I feed the worms?**

Feedstock throughput in vermiculture is based roughly on how many worms you have. Eisenia fetida will consume 50% to 100% of their body weight per day. For planning purposes, assume the worms will eat half of their body weight daily. The number of worms you have is measured in pounds; there are approximately 1,000 Eisenia fetida per pound (if they are all adults, there may be 500 worms; if they are all juveniles, there could be 2,000 worms). So one pound of worms can consume half a pound of food per day.

Aren't all worms the same?

No, there are over 4,000 species of earthworms ranging in size from ½-inch to 22 feet long.

A worm has no arms, legs or eyes.

There are approximately 2,700 different kinds of earthworms.

Worms live where there is food, moisture, oxygen and a favorable temperature. If they don't have these things, they go somewhere else.

In one acre of land, there can be more than a million earthworms.

The largest earthworm ever found was in South Africa and measured 22 feet from its nose to the tip of its tail.

Guess what? Worms have five hearts! All of these hearts pump blood through my blood vessels just like your one heart.

Worm composting is a great method in which the red wiggler worms eat the kitchen and yard waste and convert them into worm castings or worm excrement. This material mixed with a bit of soil is extremely rich in nutrients and has been renamed 'Black Gold' for its ability to fertilize plants.

- 1) I am a member of the animal kingdom.
- 2) I'm like Goldilocks – I like/need everything just right – not too hot or too cold, not too wet or too dry, not too much food, not too little food.
- 3) I like coffee and tea, but not milk or hot chocolate. Watermelon is one of my favorite foods, salad too – skip the dressing, please.
- 4) I am an invertebrate, but I have no problems moving up and down, side to side.
- 5) I eat my weight in food every couple of days, but I am not fat. Pleasingly plump and full of ___ ___ ___ is my best self.
- 6) I am a hermaphrodite.
- 7) Some people call my body wastes “Black Gold.”
- 8) I watch out for the early bird; if I'm not careful, I'm history.
- 9) Prudent people in a heated argument may be careful not to open a can of me.
- 10) Unlike some people, I like food that has been frozen.
- 11) My favorite songs include “Strawberry Fields Forever” and “I love to eat, eat, eat...” but not “Singing in the Rain.”
- 12) Some people say my home is the best place for garbage.
- 13) I am one of approximately 2,700 species; the world record holder of my relatives is 22 feet long.
- 14) My scientific name is *Eisenia fetida*, but I am more commonly known by my nickname that describes my color and pattern of movement.
- 15) Castings are part of the conversation about me, but I have no bones to break.
- 16) I have a mouth but no eyes or nose, a heart but no lungs, and definitely, I have an anus.
- 17) Bristles help me move.
- 18) *Kingdom* Animalia, *Phylum* Annelida, *Class*: Clitellata, *Order* Haplotaxida, *Suborder* Lumbricina *Family* Lumbricidae, *Genus* and *Species* *Eisenia foetida*. *Eisenia foetida* (red wiggler worm).
- 19) I help solve a world-wide problem.
- 20) I live where there is food, moisture, oxygen and a favorable temperature. I'm fond of newspapers, but not to read them. Straw in my bedding helps maintain air pockets.