Vermicomposting ("vermi" means worm) is a method of composting that uses worms to break down food wastes into a nutrient-rich manure that is excellent for gardens. Worm composting is great for urban residents because it can be done without access to land. Worm composting boxes can fit neatly underneath the kitchen sink. If done correctly, the process is odorless. Worms can eat their own weight in food during a 24-hour period under optimal conditions. When fed regularly, worms will multiply and can be used to start new worm boxes or be fed to birds or fish. Large operations are capable of processing institutional-scale food wastes.

The worm manure, or castings, is rich in nutrients and microbial life. As a worm has no acids in its stomach, all the digestion
is performed by bacteria living in its gut. These bacteria-rich castings are often used as an inoculant in compost tea. (See Compost Tea, page 185, for a definition.)

**WORMS**

Red wigglers (*Eisenia fetida*) are the type of worm most commonly used in vermicomposting. Unlike the common earthworm, which prefers a mineral-based environment like soil, red wigglers require a nutrient-rich environment like compost. Red wigglers wouldn't survive long in regular garden soil.

Red wigglers have another property that makes them ideal for treating food wastes: they secrete a substance that kills pathogenic bacteria. If placed on a Petri dish containing *E. coli* bacteria, a wiggler would not only kill all the bacteria it ate, it would kill any bacteria that touched its skin. For this reason, vermicomposting systems would be an ideal choice to process restaurant waste. Hundreds of worms wriggling about in the food scraps would disinfect them of any possible bacteria from customers' saliva.

The best place to get wigglers is from an existing vermicompost system. Simply dig through a friend's worm bin for a small container's worth. A pint of worms will soon multiply to create a healthy vermicomposting system. They can also be bought from bait stores or some garden supply stores.

**BINS**

The worm bin is a wood or plastic container with a lid. The dimensions can vary depending on the size of the operation. A guideline is 1 square foot of bin for every pound of food waste put in the box at any given time. Boxes should be shallow. Piled up food waste will begin to compost thermally, producing heat. Because the worms are trapped in the box, the heat can kill them.

The sides of the box should have holes covered with screen to allow for ventilation while preventing flies from becoming a problem.
The lid should keep light out, as worms prefer a dark environment. As the worms reproduce and the vermicompost system expands, bins can be added and stacked on top of each other.

Worm bins made of stacking, shallow trays are also commercially available and can probably be constructed with a little ingenuity.

BUILDING A CHEAP AND EASY WORM BIN

How to:

1. Using either a utility knife or hole saw, cut two, 2-inch holes on each of the long sides of the bin, near its top.
2. Cut pieces of window screen slightly larger than the holes.
3. Attach to the outside of the bin, over the holes, using silicone or other adhesive. Make sure a bead of adhesive spans the entire circumference of the hole so worms will not be able to escape.
4. Allow silicone to cure.
5. Add bedding, worms, and food.

BEDDING

Fill ¾ of the box with bedding. The bedding absorbs excess moisture and is something to bury the food under. The best bedding is shredded newspaper. It can also be made from cardboard, sawdust, old leaves, or straw. Bedding is a starting material: the worms will eventually eat the bedding and turn it into castings. More bedding can be added if moisture becomes a problem, but the worms are generally happy to live in their own castings.

FOODS

A worm has no teeth. It can only eat what it is able to pass its body through, making soft foods ideal. Smaller pieces of food are more quickly digested. Avocados, mangos, bananas, apples, melon, cof-

Supplies needed:

Plastic or wood storage bin with removable, snug-fitting lid that measures roughly 18 inches wide, 24 inches long, and 8 inches deep. Dimensions can vary.
Utility knife or 2-inch hole saw
Silicone or other adhesive
Window screen
fee grounds, pasta, rice, tofu, and tomatoes are all favorite worm foods. Worms do not handle meat, dairy, oils, or spicy foods well. Initially, give the worms small amounts of food. Add more only when it has all been eaten.

**MOISTURE AND TEMPERATURE**

Moisture levels need to be monitored. A slight dampness is ideal. Too much liquid will make the box go anaerobic and kill all the worms. Too little moisture will dry them out.

As worms do best in temperatures in the human comfort range, indoor vermicomposting is easier. Outdoor operations must be insulated and heated.

**HARVESTING AND USING THE CASTINGS**

Periodically, the castings should be harvested for use as a fertilizer. The easiest way is to push all the material in the bin to one side and place fresh food and bedding on the other side. The worms will migrate to the new food, leaving the old castings worm-free and ready to harvest. Another method is to spread the finished compost on a screen with holes big enough for the worms to crawl through. Put the screen in the sun. The light-sensitive worms will burrow away from the top layer. Keep removing the wormless top layer until all the worms have crawled through the screen.

Worm castings can be applied directly as a fertilizer to gardens. They can also be used to make compost tea. (See Compost Tea, page 185.)