

<http://www.mushroomhandbook.com/index.html>

This is a very good recipe for making compost to grow edible mushrooms. The ingredients make for a nutrient dense mushroom compost that adds both flavor and richness to your mushrooms.



mushroom compost

Making your own Mushroom Compost is actually not hard at all.

The important thing to remember is you need both a carbohydrate source and a nitrogen source. These sources must be adequate to feed the microbes that will break down the mushroom compost starter. Just like us, microbes need energy (carbohydrates) and protein (nitrogen) to live. But its very beneficial to have alot of organic matter (manure) for the microbes to colonize and grow in. And Water- very, very important. With out water your mushroom compost will not turn out.

Mushroom Composting is basically microbe decomposing. We feed the microorganisims and they inturn reward us with fresh mushroom compost. Water basically decides the amount of microbes, and the amount of decomposing that will go on. But dont get too crazy with water. Too much water

and your mushroom compost will ruin

Overwatering the mixture causes air pockets to fill with water. This causes an anaerobic or "no-oxygen" state. The microbes breathe oxygen, so drowning them won't help you get mushroom compost. But then again too much air or too dry a mixture and the heat the microbes build up to decompose the compost will evaporate, keeping the compost too cool-resulting in a mushroom compost that isn't finished curing.

So what is the right ratio? That is a best kept secret of all Professional Mushroom Composters. I judge it by the look of the mixture, and its squeezability. I grab a handful and squeeze it. If when squeezed, the compost mixture pours out water- its too wet. If when squeezed it doesn't have any water dripping, its too dry, If when squeezed it slowly drips water- its good. But what are the starter carbohydrate and nitrogen materials and supplements used in mushroom compost? Well the big one for Nitrogen is manure.

Manure by itself needs more nutrients because a lot of them were digested already by the animal. Horse manure is better than cow manure because a lot of the hay just gets broken down and not digested which helps you out a lot. Cow manure is less nutrient dense because cows have more than one stomach, so the straw or hay gets broken down and digested. Chicken manure is very nutrient dense and can make compost too hot or strong for microbes to grow correctly. That's why you don't use that much, its mainly used to balance out the horse manure. Horse manure is low in potassium and phosphorus, chicken manure replaces this for the compost.

High dollar nitrogen sources like blood meal are expensive but take a lot less of to make for a hot mixture. For example bloodmeal has a 13.5% nitrogen rating, while horse manure has just 0.9-1.2% nitrogen. I like using it because blood meal along with horse manure, it really helps in a more nutrient dense mushroom compost.

Cottonseed meal is another high nitrogen supplement to add to the horse manure. It contains almost 7% nitrogen. Along with cottonseed meal Cottonseed hulls are a great first step in the carbohydrate direction.

Microbes need energy. They get that energy from the carbohydrate sources we provide them.

Wheat straw is the most common starter carbohydrate source and has excellent texture that a good compost needs anyway. But by itself it isn't high in energy producing carbohydrates. So we need to add some supplements.

As previously mentioned Cottonseed hulls if you can find them are very high in carbohydrates. But they are tough to get for the small mushroom grower. So an excellent alternative is good ole' molasses. It is easy to find almost any grocery store and feed supply house. Grape pomace is another hard to find yet high nitrogen source.

Most commercial mushroom compost is made from the cheapest waste products the mushroom farmers can get. Usually they consist of manure from chicken houses and horse manure from local stables and race houses. These are fine to use, but you need to remember that with cheap starter supplies, you get mediocre mushroom compost. Since you're making your own mushroom compost why not go ahead and use the best products you can get. I always start mine with a base of horse manure and wheat straw, and add the high nutrient stuff in with it. The result are delicious flavorful mushrooms.

The balancing of the nitrogen to carbohydrate levels is very important. An imbalance will slow down the microbes growth and thus slow the production of compost.

Nitrogen source:

70-100 pounds of horse manure: The reason Horse Manure is most abundant in this mushroom compost recipe is the fact that it is full of microorganisms. The more microorganisms, the faster and better the compost will be made.

10 pounds of chicken manure

50 pounds of cow manure

1 pound of blood meal: This is one of those high dollar items, but its full of nitrogen for the microbes.

4 bales of wheat straw

1 gallon of Molasses. This is a great temperature booster and is a great additive.

50 pounds of cottonseed meal

Blending and curing items:

1-2 pounds of gypsum(essential for compost, prevents it from becoming greasy, provides Ca^{++} ions, a mineral essential to mushroom growth). It increases the ability of the mixture to hold water. It also helps in creating air spaces by keeping the mixture more granular.* Wait to add this until the second time you turn the pile*: You may end up adding more

1 pound of Super phosphate(promotes vigorous mycelia growth, but don't use to much it will turn the compost acidic to soon)

10 pounds Lime or calcium carbonate and more as needed: Keeps the mixture from becoming too acidic. Alot of supplements can cause an initial high ph.

1 gallon of compost activators. These are great. If you need to get your mushroom compost finished alot faster, you can pick up a bottle of these at most garden stores. Just mix with water and pour onto your mushroom compost pile.

Directions:

Soak the wheat straw for about a 3 days. This starts the breaking down process of the straw and allows the straw to start soaking up alot of water. The microbes need alot of water. If you let your compost mixture dry out, it will kill the microbes and ruin your compost.

Then drain out the water and place the mushroom compost in a large dark colored bin. Mix in all other ingredients and supplements evenly and use water as needed to keep it moist not soaked. All that soaking you did the first 3 days with the straw should have the moisture you need.

While mixing the ingredients, make a pile. You want to generate a lot of heat, so spreading it out won't work, keep it in a nice pile. Professional mushroom composters will tell you they call this pile a windrow. It just means it's piled up.

The pile should be about 3-5 feet wide, and 3-5 feet high.

Don't pack the pile, you want to keep air spaces in it
the base should be wider with the top tapering somewhat.

The shape will end up looking like a square

At about three to seven days the temperature inside the compost will start reaching high temps. You can tell that the compost is "working" or curing by checking the temperature, the center of the pile will be around 150-180 degrees F. That's good, everything is working right.

When the temperature begins to fall, don't panic, it's time to turn the pile and mix it up again (around 6 days). The reason is the pile is running out of air, and needs more. Plus this will give you time to add water to places in the pile which have dried usually due to normal evaporation by air. Also it gives you a chance to make sure that the entire pile will be composted by mixing the well underway parts with the slow composting parts. A general guide line in turning is to mix the outsides in and the insides out, giving the outer part of the mushroom compost pile a chance to catch up with the inner hotter part.

Form your pile back into the same shape it was in before you mixed it. You will also notice while mixing up your pile a strong smell of ammonia, this is normal, don't panic.

During the precomposting when you were soaking the straw, that sour smell you smelled was bacteria doing its thing breaking down the straw releasing this ammonia. That ammonia is then consumed by even more microbes and so on. So the smell will be strong because hopefully you have massive amounts of colonies in your mushroom compost pile by now. Also you may notice while you are mixing up the pile that you see bright white fungus towards the center of the pile. This is normal and a very good sign every thing is correct.

These white fungi are called "Actinomycetes". They live where it's really hot, which means that your mushroom compost pile is reaching its correct temperatures. Usually they stay in the center of the compost pile.

Let this new pile sit for about a week. The temperatures should increase back to the 150 to 180 degree F point by that time. You can use your thermometer to check the temperature in the center of the pile. Make sure to use one with a long neck. At the end of the week, it's ready to mix up again.

Do the same thing you did on the first turn, but this time we need to add the GYPSUM. Don't forget to add it at this point. And also water the pile again to evenly wet the parts that have dried some. Then shape the pile back again the same way you did the first time. Make sure to mix the white fungus up with the whole pile to speed along the composting process.

This time let the pile sit for 5 days before you mix it up again. When you mix it up this time the strong smell of ammonia should be gone and only a slight smell left. That white fungus should be all over the place. With all the heat, you will probably need to water the pile more than you did on the first and second turn so watch for drying.

When you form the new pile the size will be different. Shape it into a 3 to 4 foot wide by 2 foot high pile. You will notice that every turn of the pile it gets smaller, this is due to composting, so we have to adjust for that change.

Now after another 4 to 5 days, its time for the final turn or mix of the compost. The mushroom compost should now have a rich blackish brown color with white speckles all over of the white fungus. There shouldnt be any smells of ammonia left, just an Earthy smell.

Its at this point that we need to check the ph. It should be close to 7.0-7.5. If its not then you need to mix the pile up again after 2 days, and re check the compost. You will have to keep mixing up the pile and keeping it moist every two days until the ph gets to 7.0-7.5. This is the optimum growth ph level for mushrooms.

The Mushroom Compost is ready when When

The ph reaches 7.0-7.5

It has a nice dark brown color with speckles of white fungus

When you squish it, it holds its shape and no water appears.

Now its ready for pasteurizing. Since growing mushrooms means a clean enviroment, we need to pasteurize the mushroom compost to prepare it for our mushroom culture or mycelia stock. You dont want to lose your fresh made mushroom compost to invading bacteria that could harm your mushrooms and could make you very sick.

To pasteurize it I take small quantities of the mushroom compost and place in a clean turkey pan. Put a lid on to make sure you keep in the moisture. Then put in the oven for 4 hours at 140 degrees F. Next, let it cool keeping the lid on. Do not take the lid off until your ready to put your mushroom mycelia culture in it.

Thats the final step in creating your own mushroom compost.

Now for the people who dont want a massive amount of compost, here is a mini tek:

10 pounds of hourse manure

2 cups of chicken manure

1 bale of soaked wheat straw(essential)

1/2 cup blood meal

2 pounds of cottonseed meal

1/4 cup of super phosphate

1 pound of potash

1-3 pounds of gypsum

8 oz bag of activators.

Both of the above recipes can be altered very much in amounts. You just have to experiment. And remember to check your ph regularly. Try to keep it at around 7-7.5.