

GROWING MUSHROOMS

THE ULTIMATE GUIDE TO STARTING CULTIVATION AT
HOME AND BECOMING A MUSHROOM EXPERT

A wicker basket filled with various mushrooms, including large white ones and smaller brown ones, surrounded by autumn leaves in shades of yellow, orange, and red. The basket sits on a rustic wooden surface. The background is a warm, golden-yellow gradient with soft bokeh light effects.

LOUIS MURPHY

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Introduction

Man has been eating mushrooms for millennia. The earliest physical records of consumption go back to skeletons found in prehistoric Spanish caves and growths found in ancient Mayan temples. Their deliberate cultivation is an altogether more modern affair. The Chinese have dabbled in production for a few centuries, but here in the west, they are newcomers to our diets. For many years they were even associated with ill health and poison.

Once we did discover that they were not only delicious to eat but were actually good for our health, cultivation started to become widespread, but it still seemed to remain some sort of secret art that was only available to trained mycologist and other wizardly types.

This book seeks to break that myth. It will teach you that mushroom production is not only quite simple but that it is a form of farming that is well within the capabilities of anyone with the passion for giving it a go. The wonder of this form of cultivation is that you don't need a great deal of space. If your ambition was always to become a farmer or small holder, but you were constantly thwarted by a lack of space, this book could just reignite your dreams. Another great plus is that the whole process is easily scalable. You can dip your toe in the water by growing enough of a harvest to feed your family and perhaps a few friends and that you can take the knowledge gained from that to grow a business.

To start with, you will not need any space. You could be living in a fifth-floor apartment and still grow enough mushrooms to add them to your diet regularly. If your ambitions are greater than that, you could produce a great little sideline business out of space less than the size of a small garage. Even fairly large scale mushroom producers require very little space compared to most other forms of traditional agriculture.

Generally, most small businesses come with quite a high entry cost, but that is not at all the case when it comes to mushrooms. For just a few dollars, you could be growing mushrooms for yourself, and then, if you invest a little more, you could start producing enough to have a saleable surplus. At each level to which you choose to climb, you can use the profit from sales to finance the next step up the ladder.

One of the biggest threats to small businesses can often be big business. You often find that it is simply not viable to compete with the big boys, or if you

do, the entry costs are prohibitively high. With mushrooms, the market is huge, but the main mushrooms produced are white button mushrooms or varieties thereof. That leaves all of the other mushrooms as a specialty market, which is ripe for the picking by willing small producers. Top that off with the fact that there is a huge demand for bespoke mushrooms with their different flavors, colors, and benefits, and that makes the whole small grower business suddenly look very attractive.

Chapter 1: Mushrooms

If you are thinking about immersing yourself in the mushroom world so you can set up your indoor or outdoor farm, then you must first understand some concepts.

Whenever individuals talk about edible mushrooms, they refer to the sporophores, which are the edible types of fungi. On the other hand, the term toadstool is used for poisonous and inedible sporophores (or mushrooms).

In other words, you could either say "I'm going to grow some mushrooms", or "I'm going to grow some sporophores". Scientifically, there is no distinction between these two terms, so if you would like to sound more knowledgeable, why don't you go for the sporophore term? It's got a nice sound to it!

Structure of Mushrooms

If you would like to grow mushrooms, you will need to know how to identify them correctly. And, for you to identify them, you will also need to have a basic understanding of how mushrooms are structured in a macroscopic and microscopic way.

Mushrooms are unusual in whichever way you look at them, especially if you consider that when you see a mushroom, you are usually not observing the organism of it because you see the flower part and its fruiting head. But what goes on underneath that mushroom is an entirely different story. There is so much more to them, and it's all happening right underneath the soil.

Most edible mushrooms are from a group of fungi called Basidiomycota. They, along with Ascomycota, form part of the subkingdom Dikarya, which, in turn, is one of the subkingdoms that constitutes the Kingdom of Fungi. On a structural level, all of these mushrooms are gilled, and this characteristic allows them to produce spores that will be released right under the caps; thus, more mushrooms could be created as a result.

Not only this type of mushroom exists, as there is also another family of mushrooms called Agaricales, and the type of the genus is Agaricus. They are field mushrooms scientifically referred to as *Agaricus campestris*.

But what is the most common structure of a mushroom? Let's go from top to bottom.

- **The Cap:** They can have a wide range of shapes and colors. They serve as a barrier to the gills. They resemble a button or a headdress.
- **The Gills:** These are where the fertile spores are produced, which are located right underneath the cap. They usually look like lines.
- **The Ring:** It's a membrane situated underneath the cap, and it circles the stem.
- **The Spores:** They are microscopic seeds that will allow mushrooms to reproduce themselves. They are released into the air, and then either the mushroom will create its own wind to locate them somewhere or simply fall on the substrate to produce a new mushroom so that the cycle can continue.
- **The Volva:** It used to be part of the mushroom's membrane before the mushroom matured.
- **The Stem:** This is the axis that supports the mushroom's cap. Some mushrooms do not have a visible stem, whereas others will only have a short or small one.
- **The Hypha:** They are microscopic filaments that absorb water and all the necessary organic matter.
- **The Mycelium:** Many long fibers of hyphae, which, in turn, allows the mushroom to have a vegetative structure. They grow on the organic matter where the mushroom is, and they will be asexual until they join paths with another mycelium.

Additionally, a basidiospore (which is a reproductive spore of this type of mushroom) is released from the basidia part of the mushroom (which is where the basidiospores are located). These spores will ultimately fall between the gills. Sometimes the mushrooms will have their caps cut off, and you will be able to see a powdery impression that will show you the spores.

This powder is often referred to as spore print and is one of the leading clues indicators for classifying a mushroom. All spores have different colors, most of them are white, but there are many other shades of black, brown, cream, yellow, and purple-pink.

Characteristics of Mushrooms

Mushrooms have unique characteristics in comparison to plants, fruit, or vegetables. For instance:

- A mushroom does not release or create a seed. They will, however, release a spore, which does a similar job to a seed.
- The mycelium (which is very cottony-like), is the one that will "fruit", and it will give mushrooms room and a "little push" to grow.
- Mushrooms like moisture, so keep this in mind if you would like your mushrooms to thrive.
- Although there are many methods of growing mushrooms and are relatively similar, each mushroom will also have individual requirements that must be respected.

Possible Health Benefits of Mushrooms

Many ancient nations and societies believed in the medicinal value of mushrooms. In fact, they were often used as treatments for diseases, and, even up to these days, mushrooms are still considered a superfood, which has the potential to alleviate many health problems.

As a result, many health benefits are associated with edible and medicinal mushrooms. The following are just a few examples:

- Mushrooms are composed of 90% of water; this is why they are recommended for overweight individuals who would like to lose weight naturally.
- Mushrooms contain no sugar and no sodium, so they are recommended for individuals who have diabetes.
- Mushrooms contain proteins, different vitamins and minerals, and many antioxidants that are great for keeping diseases at bay, but also as a way of avoiding any future health problems.
- One of these antioxidants, the selenium, is said to help both men and women whenever they have fertility issues.
- Mushrooms do not have fat, so they don't have cholesterol either, which is excellent, especially if you are looking into adding more

nutritious food into your diet.

- Mushrooms have vitamin D, and even though this is dependent on the treatment the mushroom receives whenever they are being harvested, it is still a great source of vitamins for people who tend to consume mushrooms.
- Mushrooms have potassium! And potassium is known for regulating blood pressure so that cardiovascular diseases will be kept at bay! Some mushrooms are known for having more potassium than bananas; how incredible is that!?
- Mushrooms have Choline. This is a reasonably new nutrient that supports cellular growth, metabolism, memory, and learning. Even though the human body produces Choline, there are minimal quantities compared to what we should intake. Therefore, mushrooms will add a valuable nutrient to your daily life if you start consuming more of this superfood!
- If you are growing your own mushrooms, this activity will release endorphins because you are (hopefully) doing something you love. At the same time, being out in nature improves your health and your immune system. So, even if you are looking into growing mushrooms to sell them (and not for personal consumption), then you could still benefit from it.
- Mushrooms have anti-inflammatory properties, which makes fungi a great resource of nutrients that help fight diseases where inflammation is the norm.

Some people may be intolerant to mushrooms. It may be that they are completely allergic to them or react to some of the fungi's components.

If a person is foraging mushrooms and is not completely sure about the mushroom they are about to pick, this could even bring fatal consequences. Some wild mushrooms have so many toxins that, if a person eats them, it could lead to fatalities.

Other wild mushrooms also contain a vast amount of heavy metals, which is very ironic, considering mushrooms are a vital resource for proper nutrients, which also help eliminate heavy metals produced by other things (such as contaminated water and environment). If you are not sure about the

mushroom, leave it behind! Your health (and life!) should always come first. Some argue edible mushrooms should be consumed in moderation, precisely because of its potency!

Be Careful with Wild Mushrooms

I remember my first time foraging in the wild. It was so exciting. I used to live in an apartment, in the most prominent and busiest city in the world. I decided to travel somewhere quieter and ended up in a small village where I went foraging with some friends.

We were so excited about finding some edible mushrooms, as we wanted to go back to the rental house and cook dinner with them. But guess what happened? All, and I mean, literally all of the mushrooms we found that day were poisonous, or they were non-edible.

I was gutted. I was looking forward to this, and it wasn't going very well. But, how did we know about those mushrooms? Because one of my friends is really knowledgeable and has been foraging mushrooms for the last 15 years or so. It also helped that he is a mycologist!

My friends would laugh all the time because I was naturally attracted to the most colorful and vibrant, red, yellow, and orange mushrooms I had ever seen. They were beautiful, and I don't think someone would ever doubt that. But they were also able to kill us if we had consumed them.

The worst part is that many edible mushrooms have poisonous look-alikes. So, what can you do if this ever happens to you? Well, first of all, you should always go foraging in pairs. It would be best if you never did so by yourself.

The thing is, there isn't a single way in which all toxic mushrooms can be identified. Thus, you will never find a guide or book telling you how to perfectly discern between edible, non-edible mushrooms, toxic mushrooms, and lethal mushrooms.

In addition, the really poisonous mushrooms are sometimes tiny! Can you believe this? I mean, they must be so powerful that they could literally kill a person or an animal, and they are smaller than my fingers.

But why are mushrooms toxic? They have this characteristic where they produce secondary metabolites that are either toxic or provide great resources, such as an antibiotic or antiviral. In other words, they could harm

you, but they could also make you feel better. Talk about a toxic relationship, hey!

Lastly, not all poisonous mushrooms are deadly. In fact, only a few of them are known to be deadly. However, I'm sure you do not want to try which ones are toxic (and produce death) and which ones are edible, so always keep in mind that if you are not completely sure about the mushroom, you are about to pick, leave it behind!

Medicinal Uses of Mushrooms

Not only do mushrooms taste great but they will also present a new perspective of nutritional value because they are known for having many health benefits that could cure (or at least improve) some of the following diseases:

Cancer

Mushrooms have an antioxidant component called polysaccharides that may help prevent different types of cancer, such as prostate, breast, and lung cancer. These components are known to be tough cancer fighters, and they know how to do their job!

Also, there is scientific evidence that shows how supplementation of vitamin D can help prevent or even treat some types of cancer, and, guess what? Most mushrooms contain vitamin D!

Consuming mushrooms means that you are also consuming antioxidants. And even if you do not have this disease, it is always good to eat some mushrooms as a way to prevent this disease.

Diabetes

Scientific evidence suggests eating fiber as a way of preventing diabetes. If, on the other hand, the person already has this disease, then eating mushrooms will reduce their blood glucose levels significantly.

Of course, this does not mean that I am advocating for you only to eat mushrooms, so all of your health problems will soon disappear! If you would like to be healthy, then you need to remember to live a healthy lifestyle where you eat nutritious food and where you also exercise and keep yourself active.

Heart-Related Issues

Mushrooms contain vitamin C, fiber, and potassium. It has been said that a Portobello mushroom could have more potassium than a banana! If you would like to have good cardiovascular health, then incorporate mushrooms into your life!

Pregnancy

Many women take folic acid as a supplement throughout their pregnancy; but, did you know that mushrooms also contain folate? Always consult with your doctor first, but if you are pregnant, you should definitely be thinking about consuming more mushrooms!

Reasons to Grow Mushrooms

It's Educational

It's impossible to grow mushrooms without learning something. You'll learn more about the role of fungi in the ecosystem. You'll learn about the mushroom life cycle. You'll learn about the quirks of different types of mushrooms. This makes it a great activity for school science projects, to do with kids, or just for the curious adult.

You'll Become More Self-Sufficient

There's something so powerful and useful about growing your own food. If you enjoy eating mushrooms, you won't have to rely as much on restaurants, grocery stores, and infrastructure to get them. Whether you're a homesteader or live in a downtown apartment, you can always benefit from becoming more self-reliant.

Mushrooms Are Beautiful

From reishi to pink oysters to shiitake and more, mushrooms are beautiful to behold. They're unique, interesting to look at, and bring a sense of visual excitement to any home or garden.

Interesting Human Interaction

People are fascinated by mushrooms, and are often very curious when they learn that you cultivate them. It's a great opportunity to meet new people at growing workshops, answer questions, and pass knowledge on to eager minds. It's a great conversation topic!

Develop A Greater Appreciation for Nature

Once you grow mushrooms, you'll develop a greater appreciation for how they thrive in the wild. You'll notice them more in a natural setting. You'll be more aware of your surroundings, of the rhythm of the natural world. There's a sense of wonder and joy that comes with watching things grow, and mushrooms are no exception!

Whether you use sterile techniques or easy mushroom kits, there are many benefits to be had.

Chapter 2: Mushrooms Throughout History

Mushrooms and other large varieties of fungus have been eaten since the human race began. We know this because of hints of puffballs found in the ancient lake settlements of Germany, Switzerland, and Austria. The hardest and best thought of mushrooms to be found were similar to the truffles and the oranges, and were exceptionally esteemed in ancient Greece and Rome, and as such have consistently been costly. Traditionally, Greeks and Romans grew the little *Agrocybe aegerita* on cuts of a poplar tree trunk. The Chinese and Japanese may also have been growing shiitake on spoiling logs for considerably longer than this. The cutting-edge European cultivation of mushrooms is tracked back to 1600, when the French agriculturist Olivier de Serres proposed a technique in his work *Le Theater d'agriculture des champs*. In 1678 another Frenchman, the botanist Merchant, exhibited to the Academie des Sciences how mushrooms could be developed in a controlled manner by transplanting their mycelia (these are fibers that spread through the dirt underneath the mushroom).

Proof shows mushrooms have been used throughout history. It's hard to learn the specific place and time that mushrooms were first used. There is proof in stone artistic creations that Saharan native clans of North Africa may have begun using these mushrooms from around 9000 BC. Rock works of art in Spain made around 6000 years ago uncover the mushroom specie *Psilocybe hispanica* that was used during specific rituals close Villar del Humo. It is fair to say that mushroom were used by ancient societies even before that, although we don't have a reasonable proof of this yet.

The mushroom got its name from two French words – Fungi and Molds. The historical backdrop of mushroom could be followed back to the presence of man on planet earth. Throughout the years, our ancestors used mushrooms that could be found in the fields and woods. Mushrooms are supposed to be the 'plants of everlasting status' by the Egyptians. The delectable flavor charmed the Pharaohs of Egypt so much that they announced that mushrooms were considered as food meant for the gods as in Egyptian and antiquated Aztecs practices where mushrooms were explicitly served to more prominent people in society rather than to normal, working men. Because of this, they guaranteed themselves the whole supply of mushrooms without the need to share these out.

This practice stopped in the mid-seventeenth century when a melon producer

close to Paris found mushrooms growing on his cultivation manure. He chose to industrially develop this recently discovered produce and he acquainted it with the Parisian eatery. The mushroom was then called the 'Parisian mushroom'. As times passed, this French melon cultivator found that the caverns had the perfect conditions for growing mushrooms, after which the cultivation of mushrooms started in huge scope and were created in the caverns around Paris.

Human advancement throughout the world, including Russia, China, Greece, Mexico, and Latin America, began to use mushrooms more regularly. Many thought that mushrooms had properties that could be good for your health and also good for prosperity and godliness.

Fungus was developed in huge amounts in Asia in the year 600. In Europe, mushrooms were the main fungi to be cultivated and developed there.. Mushrooms were brought into the Netherlands just toward the start of the nineteenth century, yet it was not until after the 1900s that they were developed for a huge scope in the Marl Mines in Limburg. Throughout the years, the mushroom was still only accessible to the rich. Since that time mushrooms have become increasingly successful and there has been a colossal increment in the cultivation of mushroom. After 1950, the Dutch purchaser turned out to be increasingly familiar with the mushroom. Meanwhile, different parts in the Netherlands spent significant time in mushroom cultivation, particularly in the south. The Dutch used very strict strategies in cultivation to ensure their mushroom growth was successful.

Over the last 50 years, the Netherlands has developed into the biggest mushroom production nation inside the European Union, with a yearly creation of 270 million kilograms, creating more than 10,000 jobs. Close to China and the United States, the Netherlands holds third place in the market. China is in the lead position with 70% of the world's creation. Yearly, a huge number of mushrooms are developed around the world.

A brief rundown of when and how mushrooms appeared

The first time a mushroom was found by a melon producer in the region of Paris by sprinkling the waste from melon crops with leachate from ready mushrooms.

This is when the control of 'edible fungi' was first developed in a vegetable

nursery. Cultivation of mushrooms began in underground stone quarries close to Haarlem, where the atmosphere is helpful for constant mushroom cultivation.

Cultivation of the mushrooms fluweelgroten (velvet collapses), Valkenburg and in the St. Pietersberg gives in close Maastricht.

Mushroom cultivation was first logically concentrated in the Research Station in the Netherlands. Laboratory guides for mushroom culture were produced under the oversight of incredible mushroom pioneers.

The first over-the-ground mushroom nurseries were built with a few cultivation territories. The plates here were made of concrete.

The CNC, a Dutch Cooperative Growers Mushroom Association in Mook was set up. This affiliation incited the establishing of the Research Station for Mushroom Cultivation in 1957.

Chapter 3: Delicious mushrooms for a long, healthy life

While almost any edible mushroom will offer you a boost in nutrients, these seven nutrient-dense mushrooms are filled with antioxidants and may assist you stay longer and healthier.

Mushrooms are prebiotic, boosting the beneficial bacteria of the microbiome, such as *Acidophilus* and *Bifidobacterium*, enhancing digestion and general wellness.

A diet rich in antioxidants such as ergothionine and glutathione saves cells from free radicals, assisting the body resist ordinary oxidative stress that damages good cells. In relation to boosting longevity, mushrooms have a severe dietary impact, offering an excellent source of vitamin D, which is vital for a powerful immune system feature.

Adding almost any sort of edible mushroom to your diet will give you a good amount of nutrients, but there are some mushrooms that stand out from the remainder.

What Are The Best Mushrooms To Eat?

1. Porcini

Porcini is a large mushroom with a cap that can reach up to 12 inches in diameter. Popular in Italian cuisine, porcini mushrooms are a few different kinds, typically reddish-brown in color, have a thick stem and are slightly sticky to the touch.

This sort of mushroom fruit is available from spring to fall, so you can find it most of the year in specialty stores. Look for porcini mushrooms in the mulchy undergrowth of hardwood forests with pine, plum, hemlock and palm plants if you're a forger.

2. Golden Oyster

Golden Oyster mushrooms are usually cultivated rather than wild-harvested, making them an outstanding home-grown mushroom. They have a yellow hue, grow in clusters, and a nutty, slightly bitter smell.

3. Pioppino

Pioppino mushrooms, often called Velvet Pioppino because of the velvety-brown form of their small capes, grow on decaying wood or on the mulchy

foundations of hardwood forests.

Pioppinos have a mild, slightly peppery flavour, making them a popular choice to add to the meals. They grow in clusters with long, solid stems, are smaller in size (caps are only about 2 centimeters wide) and retain a powerful texture when cooked.

4. Oyster

Oysters are one of the most common and varied mushrooms in the world. Easy to create, the oysters grow mainly on decaying wood and have a slightly sweet, anise-like flavor.

The colors differ from green, to violet, to yellow, depending on the sort. Fluted caps vary from two to eight inches, with black gills on the underside and a short, stubby stem.

5. Lions Mane

It's easy to see the name of the Lion Mane flower! Thanks to its ability to increase the Nerve Growth Factor (NGF) synthesis, this renowned edible and medicinal mushroom has excellent neuroprotective capacities. NGF is a protein that plays a key role in the retention, conservation and regeneration of neurons in the primary and peripheral nervous systems.

6. Maitake

Found in clusters, generally at the bottom of oak forests, mayonnaises have strong anti-cancer properties.

Polypore mushrooms may not have distinctive gills on the underside of the cap. Multiple caps are formed by a single, thick underground stem in layers, and can grow quite large. The whole "fruit body" can weigh 50 pounds or more, with a single cap extending as wide as 12 inches in diameter.

The caps range from white to brown, are semi-firm when cooked, and have a slightly earthy flavor that suits the taste of your chosen cooking medium. Maitakes has been explored for a variety of health benefits, including lowering cholesterol concentrations and lowering blood glucose concentrations in rats.

7. Shiitake

Shiitake mushrooms are, for an outstanding purpose, one of the most

prevalent mushrooms in the world. Revered for millennia in Asia for its strong medicinal properties, shiitake mushrooms have become a symbol of longevity in some cultures.

A classic type of parasol, the shiitakes are both beautiful and important. The caps are black to light blue with white highlights and can be up to 8 inches in diameter. Cooking provides off a "garlicpine" aroma and a rich, earthy taste. Good luck to us, shiitakes are available all year round in most areas.

and Easy Mushroom Recipes

- Fry those mushrooms!

Ingredients: You will need your favorite type of mushrooms, your chosen oil, sea salt, and butter.

Albeit, this may not be the healthiest of recipes, but it is so good you will want to eat all of the mushrooms you recently harvested!

Heat your pan with the oil. Cut the mushrooms; however, you would like to have them. Add to the pan, and stir them every couple of minutes. Add the salt whenever they are about to be fully cooked. You can add some butter once they are done - and you can garnish them with some parsley or cilantro on top!

- Mushroom soup!

Ingredients: You will need mushrooms, oil, garlic, salt, and any other vegetable you would like to add.

You could make a broth by placing everything together in the pressure cooker, or you could do them in a casserole. Some people like to blend them all in, so it turns out denser and creamier. Add some parmesan cheese on top of it, and that's it!

- Add them to your pizzas!

Make your favorite pizza and add your mushrooms as your toppings! You can also put some arugula, ham, bacon, corn, or whatever else you fancy!

- Pickled Mushrooms

Ingredients: You will need mushrooms, salt, vinegar, garlic, water, and condiments you wish to put. Place them all in a large pot and bring to boil until all the mushrooms are softened. This shouldn't take you a long time, so watch out! Put everything inside a large jar and let it rest overnight. The next day you will be able to eat delicious yet simple pickled mushrooms!

- A mushroom pie

Ingredients: Mushrooms, olive oil, garlic, carrots, zucchinis, and a pie crust.

Make your own pie crust (I swear they are so easy!) you can also add some seeds to make it more nutritious. Then, cook the mushrooms with olive oil, garlic, and zucchinis. You can add any vegetables you like. I usually grate the carrots and lightly sauté them as well alongside the mushrooms.

Then, make a mixture between all of the vegetables, the mushrooms, and a couple of eggs. Fill the pie with the mixture and take it to the oven. You could add some cheese on top of it, so the grated effect will make this pie even more amazing!

You can experiment with mushrooms in your kitchen as you wish, just make sure you wash them thoroughly before using them! Get creative and enjoy this newfound sense of self-sustainability; nothing will ever taste as good as your own grown mushrooms!

- Mushroom frittata!

Ingredients: Olive oil, four eggs, mushrooms, asparagus, salt, pepper, parmesan cheese, milk, and salt and peppers.

A Frittata is similar to an omelet. You will have to sauté the mushrooms and asparagus with some olive oil. Add the salt and pepper. Then, you will need to mix all of these with the eggs. Add some parmesan cheese. You could do it in your preferred pan, or you could take it to the oven, either way, it is really good and filled with nutrients!

- Fettuccini's and mushroom sauce

Ingredients: Cream, mushrooms, fettuccini pasta, salt, pepper, onions, and garlic.

Another great lunch or dinner plate. You will have to boil the fettuccini's and then do the sauce. Add some olive oil and sauté the mushrooms, onions, and garlic. You will then need to add the heavy cream and add some salt and pepper. Put the fettuccini on top of the cream, add some cheese to end this dish! Also, you could add some crispy bacon to bring some extra flavor to this dish!

- Mushroom bruschetta: Bruschetta can be the perfect appetizer! They are simply toasted bread, and you can add different toppings! My favorite way of doing bruschetta is to put some mushrooms on top of it. You can cook your mushrooms with olive oil, garlic, onions, salt, and pepper. Mix it all! Then put some ricotta cheese on top of the bread, and place the mushrooms mix on top of it as well. You could take it to the oven again, or you could eat it as it is, simply delicious!

Chapter 4: The Basic Process of Growing Mushrooms

The Needs for Mushroom Growth

Light

Mushrooms cannot extract nutrients from the sun as green plants do, so they do not need light. However, mushrooms do not necessarily need a dark environment to grow. The advantage of growing mushrooms in the dark is that darkness preserves the moisture that mushroom spores need to reproduce. A basement provides ideal conditions for growing common and other button mushrooms, and logs used to grow shiitake mushrooms should be kept out of direct sunlight.

Moisture

Mushrooms, like all fungi, thrive in moist environments.

Temperature

Button mushrooms need temperatures between 55 and 60 degrees Fahrenheit to grow properly, and strong drafts or dry air can kill them or prevent them from growing. The ideal temperature for growing shiitake mushrooms is between 72 and 78 F, but they can grow in temperatures from 40 to 90 F. Keep shiitake logs in a shaded outdoor area or under trees to preserve their moisture and maintain an ideal temperature. Heaters or fans may be necessary to create the controlled environment button mushrooms require to grow indoors.

Nutrients

Mushrooms synthesize the nutrients they need from organic material.

How Do Mushrooms Grow?

There are no seeds for growing mushrooms. They are grown from spores which are so small that you won't be able to see individual spores with your naked eyes. Instead of soil, these spores grow good in substances like grain, straw, sawdust, wood chips etc from which the growing mushrooms absorb nutrition.

A mix of the spores and these substances is called spawn. This mushroom spawn works just like the starter required to make sourdough bread.

Basically, the cultivated mushroom forms a small fruiting body. This stage is called pin stage due to their small size. A little after, they grow a little and are called buttons because of their size and shape. When the mushrooms reach the button stage, they pull water rapidly and develop into tiny, white and threadlike bodies called mycelium.

In home gardening, the spawn helps the growth of mycelium. It is only after the growth of mycelium that a mushroom starts to grow.

You can grow your mushrooms directly from the spawn but it will be better to apply the spawn to a growing medium for a better harvest. The growing medium used may be different depending on the type of mushroom. You can use straw, cardboard, wood chips, logs or compost with a blend of material like corn cobs, straw, cocoa seed hulls.

Where to Grow Mushrooms?

Mushrooms like dark, cool, and humid growing environments. When you're growing mushrooms at home, a place like your basement is ideal, but a spot under the sink could also work.

Before you start growing, test out your spot by checking the temperature. Growing mushrooms is a good project for the winter, because many basements will get too warm in the summer for ideal conditions.

Mushrooms can tolerate some light, but the spot you choose should stay mostly dark or in low light. If you choose to grow mushrooms in your basement, it might be best to put them in a closet where they won't be disturbed. Some mushroom types still grow best outdoors in prepared ground or logs, which is a much longer process (six months to three years) than in controlled environments inside.

Let's move on to the basics of growing mushrooms. Before you cultivate mushrooms, you need to be familiar with three essential things: the spawn, tissue culture, and the agar.

Spawn is a term that refers to the mycelium of a fungus species.

Tissue culture, on the other hand, is the process of propagating fungi on a medium. This process is also called "cloning."

The third essential element is the agar. Agar is a jelly-like substance derived from a variety of seaweed species. Agar is used by vegetarians as a substitute for jelly products that are usually derived from animal sources. This substance is widely used in mushroom cultivation because it can easily be sterilized through cooking, and the nutrient content of the agar medium can also be adjusted based on the specifications of the mushroom species that needs to be cultured.

Agar is widely available and is usually sold in packets. Unprocessed agar usually comes in powder form, and you have to manually prepare the medium based on the requirements of what you are trying to grow. Now, it should be noted that fungus mycelium will not grow just because you have added spawn to medium.

The medium itself needs to be boosted with nutrients. Believe it or not, mushroom cultivators throughout the years have used a wide variety of nutrients, including animal blood and dog food. Cooked and “boosted” agar must be added to petri dishes (or in some cases, regular test tubes) before the medium begins to harden as its temperature goes down.

How to Harvest Mushrooms

If your mushrooms look good enough to eat, they are probably ready for harvesting.

Harvesting mushrooms is extremely easy. Here are some basic guidelines when it comes to picking mushrooms that are ready for the harvest:

If your mushrooms have relatively slender stems, you can pick them with your hands. Twist the mushroom at the base of the stem and pull upward (not sideways).

This ensures that the stem will be snapped away neatly, and the mycelium network underneath will not be damaged too much. This method is also a neater approach to harvesting trust me, you won't drop mushrooms to the ground accidentally if you pick them properly.

Avoid pulling out the substrate or any part of the fungi that rests below the substrate. Target the visible end point of the stem of the mushroom (which can be clearly seen from the surface of the woodchips or plastic casing) and twist off the mushroom from that point.

Avoid creating holes on the surface of the substrate. Random stumps should also be avoided.

Use a soft brush to remove visible contaminants on the mushrooms you have picked. Do not wash the mushrooms and don't submerge them in water! If you do not have a brush, a piece of clean cloth will do. Gently clean the mushrooms and place them in a paper bag or a basket.

Avoid storing freshly picked mushrooms in plastic bags or worse, Ziploc bags. Mushrooms are always better off if they are stored in a cool and dry place. Woven baskets are also excellent for storing harvested mushrooms.

It should be noted that most mushrooms only need three to seven days to fully mature. If a mushroom looks good enough to be cooked, then it is probably ready for harvesting. Harvest the mushrooms immediately!

If you wait too long, your mushrooms can end up being overly mature, and this might have an impact on the mushroom's appearance, flavor, and ultimately, its marketability. Don't forget to research your market as well.

Is there a market for dried mushrooms?

Are people cooking with fresh mushrooms frequently?

Do people like the idea of combining mushrooms with other vegan ingredients?

These are the basic market-related questions that you have to answer because these questions will ultimately have an impact on your harvesting methods, and your timing, when harvesting mushrooms.

Ways to use mushrooms

If you're not sure how to manage mushrooms before they get worse, here are

some ideas. Added to the pasta, the pizza with the lid, add to soups or mix - fry and add to the hamburger. Mushrooms are also a delicious side of the steak. Check out their collection of recipes, and you will surely discover many plans that would be fantastic with many mushrooms. Wash them in hot water and finish the parts of the company. Mushrooms on the cross should be cut or cut into four. Freezing will change the shading and surface of the mushrooms, making them darker and softer. The steamed mushrooms are more refreshing than in the life of the mushroom fried.

Frozen:

Mushrooms should be cooked before freezing. There are two different ways to achieve this:

Fried:

Heat the mushrooms in a gold pan with a little butter or oil over high heat. Cook them for about five minutes or until the mushrooms are thoroughly cooked, and most of the liquid disappears.

Vapor:

To reduce the darkening effect during cooking, dip the truffles in a teaspoon of lemon juice or 1/2 teaspoon of citric acid in 16 ounces of water for five minutes. So steaming according to the recommended times: Finished Mushrooms: Mushrooms 5 minutes: 3 1/2 minutes mushrooms into quarters: 3 1/2 minutes chopped mushrooms 3 minutes Detailed instructions for preserving mushrooms. Allow the mushrooms to cool completely. Then spread them on the healing sheet and the fire will solidify them. When they are entirely hardened, use a spatula to collect the mushrooms from the treatment sheet. Then pack the mushrooms into compartments or place the packages in the refrigerator, leaving half an inch of free space for expansion and replace them in the fridge. Drain as much air as possible before sealing the brackets. This will prevent the refrigerator from breaking. Mushrooms, however, should be used during the year before it is better. Use Food Saver to seal the mushrooms under vacuum. Because they have a high water content, fungi are more sensitive to colder decomposition than other nutrients. Remember that washing mushrooms occasionally can leave them saturated and pour them in the refrigerator. Some people want to forget or clean them before putting them in the

fridge.

The most effective method for its use

Store canned mushrooms to warm them or thaw them in the refrigerator before using them. When you freeze mushrooms independently, you can get precisely what you need for use.

Other ways to store mushrooms

If your new mushrooms aren't kept in the refrigerator for as long as you want, this could be how you handle them. Avoid stacking objects on top of each other to avoid injury and avoid strong odours as fungi absorb and retain odours. If the more relaxed space is limited, take a look at buying dried mushrooms or dry them yourself. They are almost painful to hydrate when needed and barely take up space.

The most effective method of freezing mushrooms

You can dry most, but not all, types of mushrooms properly. Some have a much better surface if you freeze them. Some mushrooms are better cooked before freezing; others are suitable for cooling.

They were developed raw frozen yeast mushrooms, creminis and portobellos purchased from the market (adultcreminis), which can be frozen raw or cooked. The upper part of the mushroom and maitake forest areas is well preserved when cold. Forest mushrooms type Suillus the dirt cover is delicious, but have high moisture content, and it is practically difficult to dry completely; It's best to keep them frozen raw. In the case of cooked and unprocessed mushrooms, the purpose of freezing them is to prevent the accumulation of mushrooms in essential containers. When it's time to use them, you should be ready to get exactly what you need, and you don't have to thaw the entire block of frozen food. For unrefined mushrooms, freezing them first in a single layer before grouping them avoids this.

Technique

Clean the freshest mushrooms you can find. Avoid mushrooms with shady spots, dry and unpleasant odours. Cut the mushrooms into slices. They can be

cut during use. Until further notice, look for parts that are no thicker than 2 inches. Distribute the pieces of mushrooms in a single layer on a large sheet or treatment plate. Touching the elements is fine, but there is no need to cover them. Freeze for 2 hours. Transfer the solidified mushrooms to a cooler compartment. When solidifying in a single layer for the first time, the pieces must remain free and separate in the supports.

Cooked Mushrooms

Mushrooms purchased on the market, such as shiitake and forest mushrooms, including lobsters, chicken and forest mushrooms, have a dominant surface when they are finally used if cooked before hardening. Clean the freshest mushrooms you can find. Avoid mushrooms with shady spots, dry and unpleasant odors. Cut the mushrooms into small pieces less than 1/2 inch thick (cut them more modest than the raw technique). Add the mushrooms and cook, frequently stirring, until the mushrooms release the liquid and then absorb it again. You can also prepare steamed mushrooms first. Trust the cooked mushrooms to cool them to room temperature. Transfer the chilled mushrooms to smaller containers of no more than 1 cup.

On the other hand, place the mushrooms in colder packages in a layer no more than 1/2 inch thick. Cooling bags should be stored on a flat surface. It will end with a frozen mushroom flapjack, which can be divided into parts to get exactly what you need.

Chapter 5: Preserving Mushrooms

There are five ways that we can preserve our mushrooms, though these can be broken down into three categories: freezing, pickling, drying.

We'll look at these methods by starting with the three ways of freezing our mushrooms. From there, we'll see how to dry out mushrooms and then how to pickle them. You may still be able to make money selling dried or pickled mushrooms, but the income will be much less than selling fresh. So, when it comes to preserving yours, go for which option you think tastes the best.

We will also take a look at how to take a spore print, which can be thought of as preserving the seeds of your mushrooms for later use or identification.

Freezing Mushrooms

To freeze mushrooms, they must first be blanched or cooked. This requires you to have a stove and a pot or pan. You'll also want to have a freezer bag or an airtight container. Frozen mushrooms will last nine to twelve months. We'll start by blanching our mushrooms. From there, we'll steam them, and then we'll fry them.

Blanching: Begin by washing your mushrooms. Remember that mushrooms should only be washed prior to cooking or blanching. If you wash them after they are harvested, this will promote faster rotting. However, we need to make sure they are clean before blanching them, so wash them under cool water. Also, give them a quick clean with your hands to wipe any dirt away.

Next, take your large pot and fill it with water. Add a little bit of salt. There is an old wives' tale that adding salt to a pot makes it boil faster. This isn't true, but it will help your mushrooms to keep their flavor better. A lid isn't necessary, but it can help to speed up the process.

As the water is heating, cut the mushrooms. You can do slices or chunks, but it will be much easier to preserve them when they have already been cut. Just make sure that you cut them all roughly the same size. Don't go from chunks to slices for the same batch.

When the water is boiling, it will be time to dunk the mushrooms. But it only takes two minutes to blanch them. Since there isn't much time during the blanching process itself, you might like to prepare the aftercare materials first. Take a bowl and fill it with cold water and ice cubes. This needs to stay

cold. We'll use it to cool down our mushrooms in a few moments. Try to have enough water to cover all of the mushrooms, but you can always add more if there wasn't enough.

With the water boiling, toss your prepared mushrooms into the boiling water and use a cooking utensil to make sure that they are all in the water. Cook the mushrooms for two minutes, and then take them off the heat and dump them into a colander. Give the colander a good shake to let excess moisture roll off. Quickly drop the colander into the ice water. If the water is not fully covering the mushrooms, then add some more, making sure it is cold. The mushrooms should be cold in a few minutes, no more than five. Immediately put them into the containers or bags that you have ready. Mushrooms get larger as they freeze, so don't pack them too tightly. Stick the mushrooms into the freezer and they can keep for a year. It is best to keep them deep in the freezer. The front of the freezer around the door experiences lots of temperature change when the door is opened while the back holds onto its chill much longer.

Steaming: Steamed mushrooms are a delicacy that fires up the taste buds and makes your mouth water. But learning how to steam your mushrooms is a significant part of learning how to freeze them. It offers a different approach than blanching, one which holds onto a much higher quality of flavor. It shares this with the fry and freeze method.

To begin, wash your mushrooms. Remember to clean them only before cooking, not days or even hours in advance. Wash them thoroughly and while they are still whole before you cut them. Even though we will be removing bits from them, wash them before you cut them so that dirt and germs don't get into the openings. When they have been cleaned and dried off, take them over to your cutting board. Remove the stem as close to the cap as you can without cutting into the cap. Flip the stemless mushroom onto the cap and slice it into quarters. With steaming, we always stick with quarters when we are planning to freeze them. When you are dealing with a lot of mushrooms, it is useful to pick a size of cut and make it exclusive to a single approach. Going with quarters for steamed or fried mushrooms, we can stick with slices for blanching. Doing that will make it easier to tell the difference between the various mushrooms we've frozen.

We added a dash of salt to our water when blanching mushrooms. That's

done to help preserve their flavor, as well as keeping their color instead of allowing them to darken. When it comes to steaming, we add another step to the process. Add two cups of water to a bowl or pot large enough to fit all of your quartered mushrooms. If two cups aren't enough to fully cover your mushrooms, then use four cups. Stick to multiples of two. Add a teaspoon of lemon juice for every two cups of water you've used. Add your mushrooms and give them five minutes to soak up the liquid. This isn't necessary if you don't care about their color, but aesthetics are an important part of cooking, so I recommend taking the extra five minutes to do so.

Next, it is time to steam the mushrooms at last. You will need a stovetop steamer for this. A rice cooker with a steaming option may do the trick for small batches, but a larger stovetop steamer is necessary if you have anything beyond a single, small batch. Plus, a stovetop steamer is a great addition to any kitchen, so getting one should be a must for everyone, regardless of whether or not they're even growing mushrooms. The size of your steamer will determine how much water you use, but most work the same way. Put some water in the bottom of the pot, add your steaming tray, and fill it up full of mushrooms. Put a lid over the pot and wait. It shouldn't take any longer than five minutes. In fact, it often takes less time. You can tell a mushroom has been properly steamed by stabbing it with a fork. It should take very little effort to poke the fork through all but the center of your mushroom quarter. The smaller your mushrooms are, the less time it takes to steam. You could steam whole mushrooms if you wanted; I would recommend doing this if you are steaming to freeze. If you are steaming to eat, then I highly recommend trying whole steamed mushrooms that you've grown yourself; it is a delicious and rewarding experience.

As you take out the steaming tray, give it one or two shakes to knock free any excess moisture. Using freezer bags, trays, or whatever other containers you have prepared, simply fill them up with your steamed mushrooms. Frozen mushrooms expand, so you will need to leave a little bit of space in the container to prevent this from damaging them. When you have filled the containers, let them sit out for a bit to cool down. That should only take thirty to sixty minutes; this gives you enough time to prepare another batch, take a shower, watch a show, or prepare dinner. You don't need to pay the mushrooms any attention during this stage; you just want to make sure that they aren't going into the freezer hot. This is less to do with your mushrooms

and more to do with the other items in your freezer. Tossing in items that are still hot raises the overall temperature inside the freezer, and this can cause issues with other foods thawing out, such as your freshly blanched mushrooms. Many foods can only be frozen once, as thawing them out and freezing them again allows for the growth of harmful bacteria and rot.

As with blanched mushrooms, you can store steamed mushrooms for about a year. Remember to keep them near the back of your freezer. If you have never cleaned or considered the organization of your freezer, then now is an ideal time to start. Items that are used quickly should be near the front, and those that are kept for any length of time should be pushed to the back. Five minutes of cleaning your freezer can help you keep your food healthy and ready to eat for months.

Frying: The final approach to freezing is the fry and freeze. Fried mushrooms are among my favorite foods to eat, so I feel comfortable telling you that this is my favorite approach to freezing. Being able to add fried mushrooms to my pizzas and soups is a major time saver. Unfortunately, I will also admit that frying definitely has one glaring weakness that blanching and steaming don't. Whereas mushrooms that have been blanched or steamed are able to keep for roughly a year, fried mushrooms only keep for about three quarters of a year or nine months. Because of this, I recommend frying and freezing should be carried out less often. I like to freeze a big batch of fried mushrooms and wait until I have used them all up before I do a second. I usually end up with two or three freezer bags filled with fried mushrooms, and I tend to use them up in four or five months.

To begin with, wash and clean your mushrooms. At this point, you already know how this is done. When cutting, I like going with quarters for my fried mushrooms. This can make it harder to tell your fried mushrooms from your steamed mushrooms, but I leave myself an evident sign by leaving the stems on my mushrooms before frying them. If you aren't a fan of the stems, then it doesn't hurt you to remove them. If you are a fan, you may want to remove them, fry and freeze them specifically. The best indicator for this is personal taste, so use your preferences to guide your decision.

There aren't as many steps to frying mushrooms as there are with the other ways of freezing. Get yourself a frying pan that comfortably fits your mushrooms and toss a little butter or oil into it. Let it heat up and melt the

butter or loosen up the oil. Once the pan is fully heated, and your butter entirely melted, toss the mushrooms in. It only takes a couple of minutes to fry up your mushrooms. Smaller species may take only two minutes, larger ones may take up to five, but most quarters will be good with about three minutes of cooking. Mushrooms need to be stirred a little while cooking, but you want to avoid over-stirring. Once a minute or so should be fine. If you like your mushrooms to be spiced, then now is the time to add some. I personally enjoy a dash of basil, but you can use anything you like.

As your mushrooms fry, you'll see them turning brown. You can tell they're ready when they've turned brown all over. Keep in mind that the caps will be a darker shade of brown than the stems are. You want the caps to be an even color and the stems to be an even color, but these two colors don't need to be the same. Focus on making sure that each part of the mushroom is even to the equivalent parts on the other pieces. This way, you don't burn your mushrooms by trying to get the stems as dark as the caps. When they're done, take them off the stove and scoop them onto a plate to cool. You'll notice that there isn't a lot of moisture left in the pan at this stage. If there is, then you'll want to give them another minute on the heat.

When they've cooled down, pour them into your freezer bags or containers and toss them into the freezer. You now have fried mushrooms, seasoned to taste and ready to be stored for three quarters of a year. You can tell when any of your frozen mushrooms have gone bad because they'll start to become slimy and tender, and new substances will start to grow on them. If you open up the container and find slimy mushrooms, just throw them out. It's never worth gambling on mushrooms once they've started to go bad.

Drying Your Mushrooms

Dried mushrooms are great in soups, stews, and sauces. As a preservation technique, drying works especially well because the mushrooms are able to keep their flavor without any problems. With the freezing techniques, we can preserve some of the flavor by adding steps to the process to compensate for the natural loss of flavor that happens when cooking. With drying, so long as we don't use too high a temperature, the mushrooms taste the most like they would when fresh. While there are many approaches you can take to drying, we will be using a dehydrator. This electronic kitchen appliance will make drying your mushrooms easy. You can also use a dehydrator for making your

own jerky or granola, as well as sun-dried tomatoes, dehydrated fruits, and potpourri. If you are considering drying mushrooms, then this approach is the most rapid there is, and it gives you so many other delicious options. A dehydrator ranges from \$50 to \$400, depending on the size and complexity of the machine.

Plug in your dehydrator and set it for a temp of 110F. Most dehydrators are slow to warm up, so you can expect this to take anywhere from two or three hours to upwards of eight or nine. You can use a higher heat for less time drying (though it'll take longer to heat up), but I don't recommend it. The higher the heat, the more flavor that is lost in the process. Wait until the dehydrator is heated, or very close to being heated, before you wash your mushrooms.

After washing, you are going to want to be very careful when slicing them. How thick they are is going to determine how long they take to dry. It is recommended that you slice them as thin as you can, but this is simply to make the drying process quicker. It is more important to make sure that they are sliced the same thickness rather than the thinnest one. This is done so that the pieces all dry evenly. If you have thick slices next to thin slices, then you should check on the thin ones and remove them before the larger ones finish. You can, of course, dry both together in the same batch, but it will take much more effort on your part when compared to a batch that has been evenly sliced.

A dehydrator is made up of threaded trays that allow the heated air to pass through the whole appliance. Lay your slices out on the tray so that they are flat. If you do have slices that have been cut to a different size, then you can make your life a little bit easier by keeping them to the same tray. Place the larger slices on the bottom tray, with each subsequent tray having thinner and thinner slices. That way, you can check on the top tray and remove it when it is done, making it easier to check on the slices that should be ready next. At the bare minimum, you can expect the drying process to take three hours. Go and take a walk or grab a nap, but if it's the latter, set a timer to remind yourself to check on them.

To check on them, simply open up the dehydrator and see if they are ready. It is quite easy to tell when a mushroom has been dehydrated fully. Pick it up, being careful not to burn yourself. Right away, it should feel different from

the mushroom slice that went in. If you can snap it in half like a fortune cookie, then you know that it's definitely ready. Remove any that are done. Those that aren't can be left for another hour. Check on them again and remove them if they are ready. If they aren't, then go ahead and wait another hour, repeating the process until they are finally done. You expect most species to finish in three to five hours, but there are some that need longer. You should never leave a dehydrator on overnight, so try to schedule your drying sessions to begin before noon.

As the mushrooms are removed from the dehydrator, they are set aside to cool off. It typically takes an hour or so. You can start to package them once they are dry, or you can wait for the rest of the batch in the dehydrator to finish. If you have taken out all of the mushrooms from the dehydrator, I want to suggest that you leave it plugged in and turned on still. You might notice after they've cooled down that a few slices aren't fully dried. If you've left the dehydrator on, then it is easy to put them back in for a little while to finish up the job. If you unplug the dehydrator, it's going to take a few hours until it is back up to temperature.

Dried mushrooms can be stored in airtight containers such as sealed bags or jars. They are stored on a shelf, but it should be one that is in a dark and cool location. A basement or cellar pantry is an ideal place for dried mushrooms. Given the right conditions, they'll keep for six to twelve months. When you want to use them again, it is easy to toss dried mushrooms into a meal. But if you put them into a bowl and pour some boiling water onto them to sit, they will rehydrate after a half-hour bath. Make sure that you only rehydrate mushrooms you plan on using. You won't be able to preserve them any further at this point. Keep in mind, too, that dried mushrooms go bad differently than frozen mushrooms do. Frozen mushrooms start to get slimy and gross. Dried mushrooms don't really look much different when they go bad, but they do smell different. In fact, they smell different because they don't smell at all. That rich aroma that mushrooms have eventually fades away. If your dried mushrooms don't have a smell, then throw them out.

Pickling Your Mushrooms

Pickling your mushrooms isn't a fantastic way to preserve them for the long term, as they only keep about a month when done quickly. But pickling does offer another way of enjoying them and increasing their longevity when

compared to fresh mushrooms. It also brings us to our more interesting approaches to keeping mushrooms. We'll be focusing on pickling, but other ways that we can increase our mushrooms are by mixing them into sauces or salsas. These offer us more goods to sell at farmers' markets or local grocery stores. They also give us a wider variety of flavors to go with our meals. As much as I love fried mushrooms, it would get pretty tiresome eating them all the time without switching things up. Pickling and creating sauces offer this much-needed spice of life.

We have to wash our mushrooms and cut them if we so choose. This is up to taste, although size also plays a role. Smaller mushrooms should be kept whole in general. Larger mushrooms might need to be cut to fit into the jars without issue. After cleaning and cutting, you should prepare the pickling jar. That is done before cooking so that it is easy to transfer the mushrooms into it. You want to go with a jar made out of thick glass, as it is going to have hot pickling juice poured in before it is shoved in the fridge. Going from room temperature to burning hot and back down to cold is very stressful on glass, and a thinner jar runs the risk of cracking and making an awful mess. You may want to add some herbs such as oregano, dill, or bay leaves. That's a matter for individual taste, and I encourage you to experiment with different combinations to find your favorites. Leave the lid off the jar for the time being, though it is a good idea to test and make sure that it creates an airtight seal. Testing the lid at this stage will prevent a headache later in the process.

Next, we need to make the pickling solution. You'll want a large saucepan for this one. Emphasize height over width when picking a pan. You will want a minimum of three quarters a cup of water and one third a cup of white vinegar. We will focus on the ingredients for a baseline mixture. Vinegar has a reaction with certain metals, and the mixture will take on a metallic flavor if you use one of these. Use a ceramic, glass, or stainless steel saucepan for this mixture to avoid this flavor. Of course, if you actually enjoy a bit of a metallic taste, then you may purposefully want to use cast iron or copper here.

Add a tablespoon of salt and another of black peppercorns. These will give you the base spices needed for the pickling brine. At this point, you may want to add in other spices such as mustard seed or cajun spice. Don't forget that the flavors from the brine will be combined with the herbs in the jar. You may love the taste of rosemary with mushrooms, but when you add rosemary

to the brine and to the jar, it can become overpowering.

After your spices, toss in your mushrooms and turn the heat on. You can keep it at a medium temperature. Wait until the water begins to boil. Smaller mushrooms will only need a minute or two; larger mushrooms will take upwards of five. You'll want to try to avoid overcooking, as this can result in a mushy and slightly disagreeable end product. After cooking at a boil, reduce the heat down to a simmer. Make sure that you don't keep boiling your mushrooms. You want to simmer them for fifteen minutes, but if the water is still boiling, then you are going to end up ruining them by keeping them in that long.

When the time has elapsed, take the saucepan off the stove. Use a spoon or spatula to scoop out the mushrooms and drop them into your jar. Get all of the pieces transferred first. Then, being careful not to burn yourself, lift the saucepan, and carefully pour the liquid brine into the jar until it's full. Tightly screw the lid on. Wait for the jar to cool off, and you have yourself some pickled mushrooms to store in the fridge. You will want to give them three or four days to settle before enjoying them. Remember to eat them quickly, as they only keep for a month.

Preserving Spore Prints

After you have grown your mushrooms, you may want to take a spore print from them for later use. The primary purpose of a spore print is as a diagnostic tool for identifying the species of mushroom you are holding. If you decide to collect mushrooms in the wild, you will become intimately familiar with spore prints because they're necessary to keep you alive. There are plenty of mushrooms that look similar to each other, except for the fact that they are poisonous. You might not be able to tell two species apart from each other through eyesight alone. But, if you take a spore print, you can see exactly what species you are dealing with. In this manner, spore prints are like the fingerprints of the mushroom kingdom.

When you grow mushrooms, it is a smart idea to have a print of the species you are looking to grow. This is especially true when growing outdoors, as there is more room for Nature's chaos to work. After your mushrooms begin to grow, harvest one and take a spore print first. If you already have a preserved spore print from the intended species, then you can compare it against the new one.

Taking a spore print changes depending on the way the mushroom is shaped. The two most common varieties are those with gills or pores. There are other mushrooms that have even more unique physiologies, but we'll be sticking with gills and pores for the time being. To take a spore print from a mushroom with gills, you need to remove the stem and press the cap, gills on the bottom, onto a piece of paper. Since the spores are on the surface of the gill, pressing it down is all it takes. You may want to sprinkle a single drop of water onto the top of the cap, as this will help to loosen up the spores. It takes anywhere from a couple of hours to a full day for the spores to all fall and create the print, so you can set it up and leave it by itself. Just make sure to put a glass or a bowl or something protective over the cap to prevent it from being jostled or getting contaminated with dust and dirt. If the mushroom has pores instead of gills, then, in general, you need to follow the same procedure. The only real issue is the fact that mushrooms with pores are often much tougher, and this makes them harder to get spores from. To make it easier, take some paper towel and wet it so that it is damp. Wrap the mushroom in the wet paper towel, and leave it alone for eight hours. It should be soft enough to take a spore print afterward. Remember, though, that the moisture will cause the mushroom to begin rotting much sooner than it usually would. As a rule, you will be throwing away the mushrooms you made the spore print with rather than cooking and eating them.

A spore print can be sprayed with a little hair spray or artist spray in order to be preserved for long term collecting. These prints can last upwards of twenty years if properly cared for with a minimal amount of handling. Instead of using the spore of your mushroom print for further cultivation, you should store the print, and use fresh spores from the remaining mushrooms you've harvested. You can begin cultivating a new batch from a spore print. We often do this when we are first starting work with a new species, and want to begin the cultivation process from scratch rather than buying a premade spawn. But, when you have access to fresh spores, save your prints and make use of the resources you have in high supply.

Chapter 6: Diseases and Pests

There are going to be times when you are blighted by disease. This can be devastating, but it is also inevitable, so the sooner you can locate the cause and get to grips with it, the better. Here we will look at some of the most common fungal diseases you are likely to encounter.

Green Mold

This is by far the most common problem the mushroom growers come across. It looks like a green powder that you will be familiar with if you have ever seen bread turn moldy. It appears on the casing and most commonly on the surface of the growing substrate. You will easily be able to spot it as you look for mycelium appearing.

It is as the result of contamination during the sterilization process, so look at your sanitation procedures. Re-sterilize all tools and equipment and check that filters have not become clogged. Make sure that humidity levels are not too high.

Dactylion Disease

This forms a web-like mycelia growth that looks like a very fine spider web and which, although normally white in color, can also veer toward pink or gray.

Once again, good sanitization will alleviate the problem, but infected material will need to be disposed of.

Verticillium Spot

If you see small spots appearing on the fruit, it is possible that you have an infection of this fungus, which is carried by flies or on un-sanitized equipment. It can be destroyed by salt or saltwater, but this is probably the wrong course of action.

In all three of the cases, you should consider getting rid of the infected material and starting again after reviewing your sanitary systems and filters. Do NOT open any of the grow bags in the grow chamber or anywhere else indoors as the spores will get everywhere.

Pests

Growing indoors, you will hopefully be exempt from two of the most

common pest: flies and ants. These are a problem for outdoor growers, but they should not prove an issue in the grow room.

The pest that may trouble you is the mouse. These little guys are fond of both mushrooms and grain, so grain spawn will suit them fine until the mushrooms appear, and then they will just boost their diet with some nice healthy mushrooms. The best way to eliminate them is to simply make sure that your grow room is impenetrable. This is not always easy as they can squeeze through a hole the size of a pencil.

If you are unable to prevent them from gaining access, then you will need to resort to setting traps or even laying poison bait somewhere outside that might attract them more than your product will. You should be emptying your grow room and cleaning it every week, and this is a good time to see if you can find where they are gaining entry and place the appropriate barriers.

Chapter 7: Frequently Asked Questions

We have now dealt with most of the aspects of mushroom growing, and you have enough information to help you start as a home grower, turn that into a sideline and even create a full-time business. They provide a quick point of reference for yourself, but you can also use them to field the many questions that are going to be fired at you once you become known as someone who grows mushrooms.

Are our mushroom kits worthwhile?

Almost everyone who wants to get a feel for growing mushrooms will start with a kit. They are definitely worthwhile in that it gives you a feel for the subject without having to invest in a great deal of equipment or have a great deal of knowledge. It gives you the chance to try out a number of different varieties of mushroom and find which ones you like most and which do best in the environment that you want to grow them in.

Can you use mushroom kits more than once?

Most kits will give you at least one further flush after the initial harvest, and some will go on producing for months. The first harvest tends to be the most abundant, and they start declining in volume and quality after that.

What is mycelium?

Mycelium is the fine web-like growth that mushroom spores develop to colonize the substrate (growing medium). Think of it as being a little like the roots of a plant slowly becoming established. It is normally white but some mushrooms a different color. When you open a colonized bag or container, it should have a distinctly mushroom odor. If there is an unpleasant sour odor, then your growing medium has become contaminated somewhere along the process. Cover the container so that the invasive spores don't leak out and then dispose of the contents outdoors.

What is grain spawn?

Grain spawn is a mixture of grain such as wheat, sorghum, or barley that has been sterilized and then had mushroom spawn added to it. In the right conditions, the spawn sends out mycelium to colonize the grain, and this can then be mixed with other substrate and grown on further, or you can bring your mushrooms to fruit on the actual grain spawn. Many types of grain will

serve the purpose here. Once sterilized and soaked, it should hold moisture well and provides the ideal nutrients for the mycelium to grow.

Do mushrooms need to be kept in the dark?

Unlike plants, mushrooms do not contain chlorophyll, and so they do not need light to grow in. To produce fruit, they need some light but not direct sunlight. Diffused light through a window is normally adequate.

How much space is needed?

That really depends on how many mushrooms you want to grow. You can produce mushrooms in an airing cupboard or even on a window with no direct sunlight. If you want to start producing enough mushrooms to have some to sell, then a small garage is enough space to get you on your way. Even many commercial operations are conducted in comparatively small amounts of space in relation to other agricultural crops.

What are the best mushrooms to sell?

That will vary from area to area, but you should stay away from white button mushrooms, portobellos, and creminis as these are the area where massive mushroom producers focus, and it is impossible to match their prices. All of the other mushrooms fall into a more luxury market, and pricing is not so competitive. Demand is also high because these are mushrooms that people don't see every day.

What mushrooms grow best in hotter climates?

Some mushrooms have evolved in hot climates, so yes, there are mushrooms for just about every climatic condition. For warmer climates, try paddy straw, reishi, or Florida oyster mushrooms.

Can mushrooms be grown all over America?

Yes. Mushrooms are grown in every state, but do your homework and find out what mushrooms would appreciate your particular climate.

How long can you keep mushrooms after they are harvested?

This really depends on the variety, but most mushrooms don't have a very long shelf life even when kept in the refrigerator. Mushrooms can be dried, bottled, or even pickled, so there is no real reason to waste any of them.

Are there health benefits from eating mushrooms?

Yes, they are regarded as something of a superfood with many health advantages. One of the most important of these is their ability to store Vitamin D when exposed to the sun. Vitamin D is on the decline in many western populations as we spend more time indoors.

How do you know when a mushroom is toxic?

This is a surprisingly common question that you will find people asking you again and again. There are plenty of toxic wild mushrooms, but cultivated mushrooms are not toxic, or they wouldn't be cultivated. If you are foraging with mushrooms, you should always go with someone who really knows the local mushrooms. Even then, be wary if they claim to know more than three or four edible varieties.

Are mushrooms vegetables?

No mushroom share many traits with the plant kingdom, but they also share many traits with the animal kingdom too. Mushrooms are part of a totally different kingdom called fungi.

Is mushroom farming a smelly process?

No, not unless you don't like the smell of mushrooms. The substrates they are grown on are all sterilized, and the worst thing you might smell is coffee grinds if that is the chosen substrate.

What are the substrates?

Substrates are a sterile medium on which mushrooms are cultivated. They supply material for the mycelium to colonize, and they must allow air movement and a certain amount of moisture retention. There must also be some form of nutrient for the mushroom to consume.

What are the best substrates?

That is a subjective question and one that will get long time mushroom growers to argue over easily. Generally, mushrooms are very tolerant about what substrate they grow on, and the amount of different substrates is enormous. They range from used coffee grounds to soya husks and sugar cane waste to chopped straw. The best substrate is the material that is most cheaply available where you live. Once you get the hang of the growing process, you can start experimenting with different types and percentages in your substrates until you find that one that is most pertinent to your situation.

Isn't it necessary to have everything sterile?

Certain parts of the process require a great deal of sterility, but there are others that don't. If you are growing from kits, there is very little in the way of sterilization as long as you have access to chlorine-free water to soak the grow block.

Is all of the equipment expensive?

Much of the equipment can be made by a handyman, and some items, such as a pressure cooker can be used to do the sterilization. Overall, in terms of return, the input costs are extremely low.

Conclusion

I hope that this book has given you a taste for what is involved in growing mushrooms and some idea of the scope of mushrooms as a business. It is by no means a fully comprehensive book, and there are great tomes out there that you could pore over for weeks and still not know all there is to know about this huge subject. What you do have is enough knowledge to take a realistic look at all aspects of the growing process. From there, you will be able to make an informed decision as to where you want this project to take you.

Most people who become interested in mushroom farming come to the subject through foraging. In my experience, it is a habit that they never really get over and, if anything, gets worse once they step onto the cultivation trail. Now they are hunting not only for mushrooms for the pot but also mushrooms that they can clone or take spore prints from. Gathering mushrooms in the wild is always fraught with risks as well as excitement, and these books will aid immensely in terms of both identification and in-depth information about the mushrooms in general.

Whether you are simply wanting to grow enough mushrooms to feed yourself and your family or hoping to turn your life totally upside down and become a full-time grower, this book will have given you the basics of how to do either. In between the two extremes is the potential to create a nice little side job that will bring in extra cash as well as provide a nutritious and healthy additive to your diet.

To pretend this book tells you everything about this vast subject would be to mislead you. No book can. It is just so much you can learn through reading, and then you reach a point where you simply have to leave the shallow waters of sedate study and actually swim for yourself. It is there that you will really start to learn what this form of farming is all about. It will be a roller coaster of a ride where there will be times you want to tear your hair out in frustration. Then there will be those moments when you are sitting down to a delicious meal of mushrooms cooked to perfection, and the knowledge that you grew those yourself will wash away all of those frustrations and make you want to head back to your grow room and start the whole thing over again.

From the moment you finish this book, you will never look at a mushroom in

quite the same way. The mere sight of a golden oyster or a fresh shiitake will cause you to stop in your tracks and wonder if it is a variety you could grow yourself. It is an addictive form of farming that you won't be able to let go of easily once you have started. You have been warned.