

(page 1)

Thank you for joining me today to talk about a few options for value-added products that you can create with your mushrooms. We're going to quickly discuss why mushroom-based value-added products are increasingly popular and how they are showing up in the marketplace, and then we'll look at a few product categories that you may want to consider for your own business. This presentation is intended to be more of an overview than a deep dive and hopefully will give you a few ideas to explore more on your own. Let's get started!

(page 2)

First, I want to state that this presentation is in no way intended to provide business advice, only general information. Please make sure that you've read this disclaimer and understand its contents.

(page 3)

You may have noticed more and more mushroom-based products on the market lately, and there are several reasons for that.

First, they appeal to health-conscious consumers who are looking to reap benefits such as increased energy and focus, decreased stress, improved mood, and stronger immunity.

Second, they appeal to foodies and consumers looking to explore something new. Mushrooms can act as a flavor enhancer and deliver the umami taste that really adds to savory foods. Depending on how they are prepared, mushrooms can have a similar mouthfeel to meat, so they may appeal to those looking to reduce their consumption of animal products. They're also an incredibly versatile ingredient. You've probably seen mushrooms as a center-of-plate item in an entree, maybe prepared as a burger or steak, or as a seasoning that's sprinkled onto a savory dish.

Finally, mushrooms have sustainability benefits that so many consumers are seeking. They require very little land, water, and energy to produce. In fact, you can grow a million pounds of mushrooms each year on just one acre of land! Mushrooms also have a relatively small carbon footprint compared with other foods, generating just 0.7 pounds of CO₂ per pound grown. As you may already know, mushrooms grow very quickly. All these facts make mushrooms very attractive to those looking to lessen their environmental impact by changing the food on their plates.

(page 4)

As I mentioned, mushrooms are showing up in all kinds of products! Fresh mushrooms can be sold as part of a soup kit, for example, and packaged with other produce, like fresh herbs and aromatics, or homemade broth. You can process mushrooms with ingredients like onion, garlic, nuts, and tofu to create a pâté. Prepared soups, broth, or stock can be sold hot, refrigerated, or frozen. In fact, if you're going to make other mushroom products, you may end up with broth as a by-product anyway. You may as well use it!

We're also seeing mushrooms in a lot of shelf-stable products. You can simply dry them, which we'll talk about in more detail later, but they can also be used to make things like jerky, mushroom beverages, pasta, or even chocolate.

If you want to explore each of these products more, click on the images to see hyperlinks to the product's page.

(page 5)

Mushrooms are also showing up in a number of supplements and even skin-care products. You've probably seen mushroom powders incorporated into protein powder or green juice blends or simply sold in jars or capsules. They can also be used to create elixirs or tinctures, which we'll cover later in this presentation.

In the skin-care space, you'll see products like face wash, serums, and lotions boasting mushroom ingredients thanks to their reported ability to fight free radicals and minimize environmental skin damage.

Again, click on each image to see the hyperlink to the products page if you're interested in learning more.

(page 6)

Now we're going to look at some of the more common value-added products and those you may want to explore for your business. I'll provide an overview of the market; recommendations for which species to use for each product; information on the general production process, supplies needed, and packaging for retail; the per-ounce retail averages as of July 2023, and a range for potential profit margin. Please note I'm not including the per-ounce materials and labor costs, as those can vary a great deal, depending on your region, the batch size, and the ingredients used.

Let's start with dried mushrooms. Dried mushrooms are easily found both in grocery stores and online. There is a high degree of market saturation. You'll notice that prices vary considerably according to mushroom type, country of origin, and size ordered. But in general, finding dried mushrooms at an affordable price is fairly easy.

I've highlighted a few of the larger retailers on this page so you can see the range of varieties and prices. Note that each company's logo links to their website, so you can click through for more information if you're interested. You can see that these sites offer anywhere from six to 31 varieties in sizes ranging from a single ounce to bulk boxes of 40 pounds. I've included some of the pricing as of July 2023 here for reference.

(page 7)

This slide highlights a couple of smaller producers. Pistol River is a farm in Oregon that began growing mushrooms in 1999. They also use a good deal of their mushrooms in their value-added products. In addition to dried mushrooms (of which they sell 13 individual species and three mixes), they also sell powders, seasonings, and gourmet foods via their website. Their sizes range from a half ounce to one pound, and you can see some of their pricing as of July 2023 represented here.

Hernshaw Farms out of West Virginia is interesting because their “mine land to farmland” story feels similar to the aim of Transfarmation. They use their spent blocks as compost that they spread on old mine land to replenish the soil and help make it suitable for farming. Their website offers three species of dried mushrooms, as well as grow kits, supplies, merchandise, and other food items.

(page 8)

While dried mushrooms may be a product you’re used to seeing in the retail market, the sheer amount of product already in the marketplace is one of the reasons that we do not recommend trying to sell dried mushrooms yourself. When you factor in the value of the fresh mushrooms and the labor and materials that go into getting them retail-ready, the profit margins are likely to be well under 20%.

That said, if you have lower-grade mushrooms or mushrooms that didn’t sell at market, you may want to dry them and store them to use in a value-added product, like a seasoning blend or soup. Really, any species can be dried, but you want to keep profit margin in mind. Shiitake mushrooms, for example, are more expensive to grow and therefore best sold fresh to maximize profit.

Mushrooms can be dried whole, sliced, or processed, which you may want to consider so that pieces are uniform in size and will dry at the same rate. Your goal is to get them to 15%–20% of their fresh weight. If you use a water activity meter, which is best practice to be sure you’re not growing anything you don’t intend to, you want to aim for a reading of less than 0.4 a_w . Supplies you’ll need for this process include a food processor, dehydrator, scale, and water activity meter, which all together could cost you anywhere from \$1,500 to more than \$10,000, depending mostly on the size and quality of the dehydrator you buy. Dried mushrooms can be kept in freezer bags until ready to use.

(page 9)

The next category we’re going to review is seasoning blends. Seasoning blends combine dried mushrooms with salt, herbs, and spices. There are probably an infinite number of recipes you could create to make this product unique to your business. This slide showcases a few major brands to give you an idea of the size, price point, and species used. I think this also demonstrates that these products can have mass appeal and are something consumers can easily see the benefits of. Again, there are hyperlinks to each product’s page if you click on the brand names on this slide.

(page 10)

For smaller producers, the size ranges from two ounces up to 5.5 ounces but is typically somewhere between two and four ounces. You can see these sell for a much higher price than the more mass-produced options. I like that Colorado Mushroom Company offers a variety of flavor options to suit any taste, but there's also something to be said for just having one signature blend like Hazel Dell. It would certainly make managing inventory easier.

(page 11)

To make seasoning blends, you'll want to run whole mushrooms and any fresh herbs or garlic through a food processor to get them to a uniform size. This helps them dry at a consistent rate so you don't have some pieces burn before others are dry. Dry your mushroom-and-herb mixture in a dehydrator. If you decide to use wet Celtic salt (which may impart a better taste and provide a higher mineral content than some other salts), you'll want to dehydrate that as well before adding your mushroom blend and any additional seasonings to a grinder to make a granular powder. The ratio of mushrooms to other ingredients is up to you, but our consultants have seen success with a ratio of 50:50 by weight.

Again, you can use a variety of species for this product, but you'll want to keep profit margin in mind. This is a great use for product that's come back from market or for lower-grade mushrooms. Flavor is important too. Mushrooms like reishi or cordyceps are not recommended, as they may be too bitter.

Regarding equipment and supplies, you'll need a food processor, a dehydrator, a grinder or grain mill, a water activity meter, and a scale, as well as smaller items like a funnel, spatulas, and spoons. These supplies could cost you anywhere from around \$1,000 to more than \$10,000. And then of course you'll need any herbs, salts, or spices you want to add. Finally, you'll need spice jars. You'll want to look for options that have a pressure seal embedded in the lid. We provide a few in the appendix. It's important to keep the retail price and your profit margin in mind when considering your jar size. The customer's perceived value of your product is going to depend on the size of the jar. If the jar is too small, they may think the price is too expensive. But if the jar is large, the price will also be more, and, frankly, the customer may not want to shell out that much money at one time.

Overall, seasonings could see 60% to 70% profit margins and make use of mushrooms that might otherwise be wasted, so this is a good product to consider.

(page 12)

Next we have mushroom jerky, and I've included a photo of it so you can see what it looks like. This is another product that offers probably infinite ways to craft a recipe and certainly multiple flavor profiles that you could create. If you click on the jerky image here, you'll find a link to a recipe from The Mushroom Council. You'll see the larger producers I've highlighted here sell five to six varieties, generally in a two-ounce or slightly larger bag. They use shiitake mushrooms or even just the stems, as well as crimini or portobellos. Given the price per ounce, this is definitely

a more premium product than your typical gas-station jerky. As a reminder, each of these logos has a hyperlink to the manufacturer's website if you want to learn more about their products.

(page 13)

Two additional jerky makers are highlighted here. Moku is a larger brand whose products can be found on Amazon or purchased directly from their site. Canyon Creek Mushrooms just started in 2019 and has expanded to a 4,500-square-foot facility in the Coachella Valley. They sell directly to consumers through their website, at their farm, and at local farmers markets.

(page 14)

Making mushroom jerky is a little less straightforward than making some of the other products discussed here. The process begins with boiling cleaned fresh mushrooms that have been hand-shredded to a somewhat consistent size and thickness. Oyster mushrooms would probably be the most cost-effective species to use. But if you want to use imported shiitakes that have already been dehydrated, you could go that route. Using shiitakes that you've grown or purchased locally would likely be too expensive. Your local inspecting body will have an approved process dictating how long you need to boil your mushrooms. In North Carolina, the requirement is 10 minutes at a rolling boil. You'll then want to marinate the boiled mushrooms for eight to 12 hours before dehydrating them to your desired consistency. Your marinade should have a pH of <4.5. This is another place where you'll want to use a water activity meter to ensure food safety. This process may require a bit of trial and error to get everything just right. You may have to test various marinade recipes, try different dehydrating times, and run multiple batches to determine what works best for flavor, texture, and safety.

For supplies, you'll need a stock pot, pH meter, Cambro containers for marinating, a dehydrator, a water activity meter, and a scale. These could cost anywhere from \$1,100 to about \$9,800.

Jerky can be packaged for sale in zippered pouches, and you should include a desiccant pouch to absorb any excess moisture.

While it may be a little more complicated, jerky has the potential to bring in profit margins of 40%–60%, and the broth or stock you create in the production process can also be sold as a separate item.

(page 15)

Mushroom beverages are growing in popularity and are something I'm seeing a lot more these days. I see social media posts about mushroom drinks, mushroom coffee blends offered at my local coffee shop, and mushroom drink mixes for sale at the grocery store. Some of the larger brands you may have seen are shown here. Each brand seems to have a slightly different angle, with some offering a variety of options, from hot chocolate to latte blends, and others focusing on just one product. The logos link to the companies' websites, so you can click on them to learn more about what these businesses offer and see the language they use to educate consumers.

(page 16)

Smaller companies are also getting in on the mushroom-based beverage action. Two companies shown here sell mushroom coffee, hot chocolate, and teas through their shops on Etsy. You'll notice that all of these companies use a variety of mushroom species in their products. You want to be sure you can educate your customers on the benefits of the mushrooms you include as well as on the amount of mushroom that is actually in the product, as this can help differentiate you from other brands. Just be careful not to make any specific health claims!

(page 17)

Mushroom coffees can be made a couple of ways. Infusing whole coffee beans with mushroom extract is perhaps more common for larger producers, but since this involves extra steps without clear health or other benefits, we recommend going with powders for coffee, hot chocolate, or teas. You'll want to process your mushrooms to a consistent size before dehydrating them. Again, use a water activity meter to make sure you've dehydrated them enough, and then make a fine powder that will dissolve when added to water. Supplies could cost you anywhere from \$1,600 to about \$10,700. You can mix the powdered mushrooms with ground coffee, cacao or cocoa powder, or tea leaves along with other ingredients to create the flavor you're going for. Mushrooms such as lion's mane, cordyceps, and chaga may work best for coffee and hot chocolate, while mushrooms considered to have more medicinal benefits, like turkey tail and reishi, may be better suited for tea.

Just remember, it's best not to make any kind of medical claims for your products. You can use language like "some studies have shown" to convey benefits, but keep it general. I've included some links that may be helpful in the appendix.

You'll find that the mushroom coffee market is much bigger than the market for tea. Also, coffee creates a great opportunity to partner with a local roaster to develop a product that reflects your area.

You'll want to package your beverage powders in resealable pouches with a valve that allows gas to escape and therefore extends the shelf life of your product.

Average retail for these products varies a great deal, with instant coffees or latte mixes averaging about \$8.22 per ounce and ground or whole-bean coffees about \$1.85 per ounce. We have a couple of examples of smaller producers making coffee and selling it for \$2.50 to \$3.33 per ounce.

In general, beverages are one of the easier products to make and can see a margin of 60%–70%, so this is a great product to consider.

(page 18)

Powders are an interesting category because they can be thought of as either a food product or a supplement. Supplements may fetch a higher price, but for regulatory reasons, we recommend marketing your mushroom powders as a food product.

This slide shows a few national brands. You can see the wide variety of mushroom powders available on the market. Nuts.com is a good example of a company with product in either four or eight ounces. Their prices range from \$7.99 for a four-ounce bag of shiitake powder all the way up to \$29.99 for an eight-ounce bag of cordyceps.

(page 19)

We have two smaller producers represented here. Both have websites through which they sell their products, and Mount Si Fungi also has an Etsy shop. Take a look at their sites for examples of product descriptions. You can also see how their products are packaged in resealable kraft bags with a branded sticker.

(page 20)

We covered the process for making powders in the section on beverages, and it's very straightforward. To reiterate, you'll want to process your mushrooms to a consistent size so they dehydrate at the same rate. Once they're dehydrated to a safe level, you'll grind them to a very fine powder. You can achieve this with a coffee grinder or high-speed blender, but you will likely want to invest in something like a spice grinder or the grain grinder shown here.

You can package powders in either plastic or kraft resealable bags. The sizes most common in the marketplace, particularly for smaller producers, are two, four, eight, or 16 ounces. The price per ounce varies by species, ranging from \$1.56 to \$9.50, with an average of about \$4.29 per ounce. The potential profit margin for powders is around 30%–40%.

(page 21)

The last product category we're going to cover is tinctures. Tinctures are concentrated mushroom extracts made by soaking mushrooms in an alcohol-based solvent. This process breaks down cell walls and makes a mushroom's beneficial compounds available for use by the body. You can see from the examples shown here that tinctures are sold as supplements and can be taken by squeezing the contents of a dropper directly into the mouth or by mixing them into a beverage. I recommend exploring each of these websites to look at the species used, see how the sellers talk about the health benefits of mushroom tinctures, and note how they differentiate their products from those of their competitors.

(page 22)

This page features two smaller tincture makers. Taylor's sells their two-ounce bottles for \$30 each through their Etsy shop, while Harmony Acres sells through their website. Harmony Acres sells both two- and four-ounce bottles, and their price varies by size, species, or blend. Again, take some time to check out their product descriptions.

(page 23)

Mushroom tinctures can be made with any individual species of mushroom, or you can create your own blend. Mushrooms like turkey tail, chaga, and lion's mane are more well known for their health benefits, while oyster mushrooms may be something you would include only in a blend. Tinctures can be made with either fresh or dried mushrooms. Obviously, using fresh mushrooms will save a step in the process, but if you have dried mushrooms on hand that you've saved from past harvests, feel free to use them.

Begin the process by soaking your mushrooms in high-proof grain alcohol for four to six weeks. Shake the mixture daily. Next, strain the mushrooms out of the alcohol extract. Pour the enriched alcohol into a bottle or jug with a lid, and put the mushroom material in a stock pot with water. You may also wish to add fresh mushrooms at this point to increase potency. Simmer for 24 to 48 hours. Once the mushroom mixture has cooled down, strain it again, and combine the water and alcohol extract to get a finished alcohol content of 25% to 35%.

Supplies needed for this production process include an optional dehydrator, jugs with nonmetal screw-on lids for soaking, a stock pot for simmering, a cooking surface of some kind, and a hydrometer for measuring the final alcohol content. Along the way, you'll need other supplies, like a funnel and a strainer or cheesecloth.

Tinctures should be packaged in amber-colored dropper bottles. These must be heat-sealed, so you'll also need a heat gun or just a hair dryer.

Without a dehydrator, you could probably buy all the necessary supplies for under \$150. Depending on the dehydrator you choose, you could also spend more than \$9,000.

Two-ounce tinctures retail for an average of just under \$27, with a range of \$15 to \$35. You may have to work a little harder to generate demand for this product with marketing and customer education, but with potential profit margins in excess of 60%, it may be worth it.

One final note: As with beverages and powders, be careful not to make any health claims about your products. Once a producer makes claims about a product's ability to prevent or cure a disease or even treat symptoms of a disease, that product is considered a drug and would be subject to different requirements. Statements that are common on supplement labels usually say something like "this product has not been evaluated or approved by the Food and Drug Administration. The use of supplements for the prevention, treatment, mitigation, or cure of a disease has not been approved by the FDA or USDA, therefore the producer makes no claims to this effect."

(page 24)

You have a number of options regarding where to sell your product. As I've demonstrated, many sellers have their own websites or sell products through online marketplaces, such as Etsy, Amazon, or Thrive Market. If you have your own website, you could either ship product or arrange pickup for local customers. Farmers markets are a great avenue to get your product out

there. They give you the opportunity to speak with and educate customers and could help in generating word of mouth. Farmers markets may even be shopped by local restaurant owners or chefs who could be looking for a supplier just like you for their kitchens.

Brick-and-mortar retail is another direction you could go. You may want to form relationships with local businesses, like specialty food stores, farm stands, health food stores, or grocery stores, to which you could sell your products wholesale. Finally, you could consider selling your product to local food hubs or CSAs. You may even want to explore starting your own CSA if you have other produce to sell.

(page 25)

As I've mentioned, state agencies regulate food products, and their approaches vary. Make sure you understand your state's cottage food laws. You can typically find them online on your state's department of agriculture website.

Medicinal products are considered "dietary supplements" and fall under federal FDA rules. We've included a link here to the FDA's website for more information. Again, you just want to make sure you're keeping language general, discussing what studies have shown but not making any specific health claims about your product or the ingredients used.

There's no one-size-fits-all approach concerning regulations around these products. Your state may have more or fewer regulations than others. It's really important that you do your own research and make sure you understand what's required of you before trying to sell your products.

I hope this helps and gives you a few ideas to support and grow your business. Again, I want to stress that this is in no way intended to be business advice. We are just providing general information. If you have questions or are interested in learning about other product categories, please reach out, and we'll see how we can help. Thanks for your time!

Appendix

1. [Competitive Pricing](#) by Category as of July 2023

2. Processing Supplies (pricing as of July 2023)

Item	Seller	Description	Regular price	Sale price
pH meter	Amazon	Dr. Meter digital pH meter	\$30.00	
Hydrometer or refractometer	Amazon	Upromax hydrometer	\$15.00	

Item	Seller	Description	Regular price	Sale price
Water activity meter	Amazon	VTSYIQI water activity meter (Local universities may also have equipment you can use.)	\$586.00	
Scale	Amazon	Aclas digital price-computing scale	\$149.00	
Food processor	Amazon	VBENLEM commercial food processor	\$574.00	\$470.00
Grinder	Vevor	Vevor commercial high-speed grinder, 2,500 g, 3,750 W	\$135.00	
Grinder	The H2O Bottles	CGoldenwall high-speed grain grinder, 700 g, 2,500 W	\$400.00	\$250.00
Dehydrator	WebstaurantStore	Weston 10-rack stainless steel dehydrator, 15 sq. ft. (about 5 lb. at a time)	\$269.99	
Dehydrator	WebstaurantStore	Avantco 24-tray stainless steel dehydrator with glass door, 39 sq. ft. (about 15 lb. at a time)	\$529.00	
Dehydrator	WebstaurantStore	Avantco 32-tray stainless steel food dehydrator with glass doors, 52 sq. ft.	\$1,279.00	
Dehydrator	Commercial Dehydrators America	BenchFoods 16-tray commercial dehydrator, 27.5 sq. ft.	\$1,395.00	\$895.00
Dehydrator	Commercial Dehydrators America	BenchFoods 30-tray commercial dehydrator, 53 sq. ft.	\$3,495.00	\$2,199.00
Dehydrator	Commercial Dehydrators America	BenchFoods 32-tray commercial dehydrator, 55 sq. ft.	\$3,499.00	\$2,295.00
Dehydrator	Commercial Dehydrators America	BenchFoods 60-tray commercial dehydrator, 104 sq. ft.	\$6,995.00	\$4,995.00
Dehydrator	Commercial Dehydrators America	BenchFoods 28-tray commercial dehydrator, 130 sq. ft.	\$8,995.00	\$5,995.00
Jug	Uline	F-style wide-mouth plastic jug with nonmetal screw-on lid	\$39.60	
Cambro container	Amazon	Cambro 6 qt. container with lid	\$22.80	\$15.99

Item	Seller	Description	Regular price	Sale price
Heat gun	Amazon	BLACK+DECKER heat gun, 1,350 W (Amazon offers several options for heat guns; a hair dryer may also work.)	\$30.00	

3. Packaging Supplies

A. Bags (dried mushrooms, powders, beverages, and jerky)

Item	Seller	Specs	Quantity	Cost per case	Cost per unit
Clear stand-up pouch with zip	Discount Plastic Bags	6" x 9", 4 mil, 8 oz.	500	\$109.82	\$0.22
Kraft Mylar stand-up pouch with zip	Discount Plastic Bags	5.975" x 9", 5 mil, 8 oz.	1,000	\$371.85	\$0.37
Clear stand-up pouch with zip	Uline	6" x 9", 5 mil, 8 oz.	1,000	\$200.00	\$0.20
Kraft stand-up barrier pouch	Uline	6" x 9", 6 mil, 8 oz.	1,000	\$257.00	\$0.26
Clear stand-up pouch with zip	ClearBags	7" x 9 15/16", 2.54 mil, 8–10 oz.	1,000	\$229.90	\$0.23
Kraft stand-up pouch with clear front	ClearBags	6 3/4" x 11 1/4", 4 mil, 8–12 oz.	1,000	\$344.90	\$0.34

B. Spice jars (seasoning blends)

Item	Seller	Specs	Quantity	Cost per case	Cost per unit
Clear round glass jar (lid sold separately)	TricorBraun	3.25" x 1.625", 2 oz.	12	\$8.14	\$0.68
Victorian square glass	Specialty	3.15" x 2",	1		\$1.30

jar with gold lid	Bottle	3.75 oz.			
Glass spice jar	Burch Bottle & Packaging	3.68" x 1.72", 3.5 oz.	48	\$23.47	\$0.49

C. Dropper bottles (tinctures)

Item	Seller	Specs	Quantity	Cost per case	Cost per unit
Glass bottle with dropper, amber	Amazon (The Bottle Depot)	1 oz.	72	\$41.99	\$0.58
Glass bottle with dropper, amber (includes funnel and long droppers)	Amazon (LOTUSBTDT)	1 oz.	100	\$41.89	\$0.42
Glass bottle, amber (bottle and dropper sold separately)	The Bottle Depot	1 oz.	360	\$179.20	\$0.50
Glass bottle with dropper, amber	Uline	2 oz.	72	\$75.60	\$1.05
Glass bottle with dropper, amber	Berlin Packaging	2 oz.	72	\$52.26	\$0.73
Glass bottle, amber (bottle and dropper sold separately)	The Bottle Depot	2 oz.	240	\$155.40	\$0.65
Glass bottle with dropper, amber	Uline	4 oz.	72	\$90.00	\$1.25

Glass bottle with dropper, amber (includes funnel, measuring cup, and labels)	Amazon (HWASHIN)	4 oz.	24	\$28.99	\$1.21
Shrink wrap	Amazon (Outus)	1.8" x 0.9", perforated	500	\$8.99	\$0.02

4. Mushroom Benefits Studies and Articles

- UCLA Health, ["7 Health Benefits of Mushrooms"](#)
- Harvard T.H. Chan School of Public Health, ["Mushrooms"](#)
- María Elena Valverde, Talía Hernández-Pérez, and Octavio Paredes-López, ["Edible Mushrooms: Improving Human Health and Promoting Quality Life"](#)
- Giuseppe Venturella, Valeria Ferraro, Fortunato Cirlincione, and Maria Letizia Gargano, ["Medicinal Mushrooms: Bioactive Compounds, Use, and Clinical Trials"](#)
- National Cancer Institute, ["Medicinal Mushrooms \(PDQ®\)—Health Professional Version"](#)