

PA DEPARTMENT OF AGRICULTURE
BUREAU OF FOOD SAFETY AND LABORATORY SERVICES

Inspection of Farm-Raised Mushroom Growers/Processors and
Inspection of Wild Mushroom Harvesters

Due to increasing inquiries into the inspection process of mushrooms (either cultivated and/or wild harvested mushrooms) the following guidance document has been developed, to assist inspection personnel in regards to the PDA regulatory approach to these types of operations. The 2013 Food Code is as follows:

Wild mushrooms (§3-201.16)

A. Except as specified in subsection B of this section, mushroom species picked in the wild shall not be offered for sale or service by a food establishment unless the food establishment has been approved to do so.

B. This section does not apply to:

1. Cultivated wild mushroom species that are grown, harvested, and processed in an operation that is regulated by the food regulatory agency that has jurisdiction over the operation; or
2. Wild mushroom species if they are in packaged form and are the product of a food processing plant that is regulated by the food regulatory agency that has jurisdiction over the plant.

At present, there is no regulatory inspection in place, for producers of **mushroom cultures** and/or mycelium plugs. Furthermore, mushroom cultures must be pure, in order to achieve growth under ideal conditions. This market is considered to be “self-regulating,” similar to that of the raw, agricultural commodity industry. Where a “farmer” sells whole, fresh, uncut produce directly to retail establishments, a PDA Food Safety inspection is not typically required for the raw agricultural produce. With this longstanding policy in mind, where mushrooms provided to local retail establishments are derived from commercially available mycelium plugs, and are indeed cultivated and harvested from a farm, this office would have no objection to mushrooms being provided to local restaurants, grocery stores or retail firms. Under such circumstances, the mushrooms are considered to be from an “approved” source, which is consistent with the latest FDA Model Food Code.

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CULTIVATED/FARM-RAISED

When considering whether or not to place a mushroom cultivator under inspection, you must first determine whether or not the products will be sold as raw, unprocessed, agricultural commodities or as processed, finished products, being offered in a consumer-size retail package.

- 1. If offered as a raw, unprocessed, agricultural commodity**, the firm will NOT be placed under inspection, regardless of whether the growing and cultivating takes place indoors or outdoors. An example of an outdoor growing operation would be growing shiitake mushrooms on logs. In these cases, growers typically purchase “plugs” that have previously been inoculated with fungi (usually shiitake), and insert them into holes that have been drilled into the logs. Then, as environmental conditions allow, the mushrooms begin to grow, directly on the logs and are then picked, by hand. In these cases, PDA will provide guidance and assistance, pertinent to food safety, upon request. When growing mushrooms in this manner, the firm should be able to provide written verification as to the origin/supplier of the mycelium or inoculated “plugs.”

Indoor mushroom growing operations should be treated in the same manner, as long as the products are being offered as raw, unprocessed, agricultural commodities. For these types of operations, the commodities will typically be offered bulk, or sold at a Farmer’s Market, in baskets or open paper bags. In the event that a grower is being prevented from selling his/her goods, due to a lack of inspection/approved source, PDA Food Safety Division will voluntarily place the operation under inspection.

- 2. If offered as processed, finished goods, in retail packages**, mushroom growing and processing operations WILL be placed under inspection by the PDA Food Safety Division. In these cases, field personnel are advised to use the applicable laws and regulations, when conducting inspections of these types of operations. Some examples of post-harvest processing by growers are washing, slicing, cutting, chopping, drying, heating, canning and/or packaging. When conducting these inspections, field personnel are advised to ensure that Good Manufacturing Practices are being followed, as well as the requirements of food labeling, as outlined in Title 21 CFR, Parts 110 and 101, respectively.

WILD HARVESTED

There are over 200,000 wild mushroom species in this Region of the country, of which about 200 are edible and 25 actually worth eating and normally sold. However, mushrooms picked in the wild and sold to a consumer, that haven’t been verified as safe by an individual with adequate training, could result in serious illness and/or death.

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If/when encountering an individual that offers for sale wild mushrooms as raw, unprocessed, agricultural commodities, inspection personnel are advised to inform the individual/s of the need to have met the following requirements as set forth by the department and the harvester/operation will be placed under inspection by the PDA Food Safety Division. This is the case for the post-harvest processing of wild mushrooms, as well. In these cases, it is the responsibility of the forager/harvester to provide written documentation to inspection personnel, upon demand, verifying that the wild mushroom species were examined and deemed fit for human consumption.

The following requirements must be met for foragers/harvesters of edible wild harvested mushrooms:

1. The harvester shall describe their qualifications and training in writing or otherwise be able to demonstrate knowledge to PDA for approval. In looking to approve someone as a qualified mushroom identifier we would accept any of the following:
 - Taking and passing a comprehensive mushroom identification course(s) which includes; illness information, identification (including hands-on identification), harvesting, best handling practices, regulatory requirements and an exam.
 - Have a Master's Degree or higher in Mycology.
 - Obtain written verification from an already identified mushroom expert that you are competent to identify wild harvested mushrooms proficiently. The mushroom expert must submit their credentials to the Department.
2. Harvesters should also keep records with the names of the Food Establishments and Food Facilities where wild mushrooms were sold, including dates/species/quantities. In addition the package/container of mushrooms should have a label/tag stating the following:
 - a. Common name and scientific name of mushroom species
 - b. Name and address (city, state, zip code) of the harvester
 - c. Location/county of harvest
 - d. Dates of harvest
 - e. An accurate net weight

The intent of this requirement is to help establish record-keeping and traceability to assure safety of wild harvested mushrooms.

3. Food Facilities should keep records with the name and contact information of the person who identified the mushroom and the mushroom seller including invoices with dates/species/quantities. The mushrooms should remain in the container in which they were received and accompanied with a record (tag/label). The records should be retained for at least 90 days from the date the container is emptied.

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The records should be retained for at least 90 days from the date the container is emptied. This retention period accounts for potentially long asymptomatic latent periods (that can be up to 14 days from consumption), diagnosis and investigation timeframes that can be up to 3 weeks, and already existing records retention timeframes specified in the FDA model Food Code for other foods. Commingling of wild harvested mushroom lots is not recommended as it serves to confound traceback or foodborne illness investigations and could hinder efforts to remove implicated product from the food chain.

4. Edible wild harvested mushrooms for retail sale shall not be harvested from Federal, State, and local parks and forests. The removal of edible wild mushrooms with the intent of retail sale from federal/state and/or local lands is generally prohibited without obtaining written permission beforehand. Individuals should contact the appropriate local or state authority responsible for management of the public lands to determine if mushroom harvesting is permissible and the permits those authorities may require. Individuals intending to forage/harvest from someone else's property/land should obtain permission in writing from the landowner before removing any edible wild mushrooms with the intent of retail sale.

The following types of wild harvested mushrooms (mushrooms with tubes, spines and ridges and other mavericks) are considered approved by the regulatory authority (PDA Food Safety Division) since they have clear identification marks and are easily identifiable in the field (fresh state) and there are no potentially poisonous look-a-likes:

- Hen of the Woods (*grifola frondosa*) – Japanese name is “Maitake”, a cluster of fan shaped overlapping caps
- Golden Chanterelle (*cantharellus cibarius*), White Chanterelle (*cantharellus subalbidus*), Blue Chanterelle (*polyozellus multiplex*) – funnel shaped with ridges and cross-veins under cap
- Black Trumpet (*cantharellus tubaeformis*) – trumpet shaped with ridges and a hole in the cap center, hollow stem
- Hedgehog Fungus (*hydnum repandum*, *dentinum albidum*, *dentinum repandum*, *dentinum umbilicatum*) – matte white to yellow brown with spines under the cap, wavy- edged cap
- Common Puffball (*lycoperdon perlatum*) – white conical spines on the cap, net pattern when spines rubbed off, white uniform flesh
- Horn of Plenty (*craterellus cornucopioides*) – wavy and out-rolled cap, funnel shaped

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- Cauliflower Mushroom (*sparassis crispa*) – cauliflower or sea sponge shaped, curved lobes
- Chicken of the Woods (*laetiporus sulphureus*) – sulphur yellow to orange, grow in brackets, tubes present
- Lion’s Mane or Bear’s Head or Bearded Tooth (*hericium erinaceus*) – spines present with what appears to be hanging, white “fur”
- Various bolete species to include: Queen Bolete (*boletus aereus*), King Bolete or Cepe or Porcini (*boletus edulis*), Manzanita Bolete (*leccinum manzanitae*) – brown to red brown and spongy under the cap, no gills present
- Matsutake (*armillaria ponderosa*, *tricholoma magnivelare*) – tannish white cap with brown scales
- Blewit (*lepista nuda*) – bluish lavender with notched cap and gills
- Morels (*morchella* spp.) – sponge, pinecone or honeycomb shape with pits and ridges
- Oyster Mushroom (*pleurotus ostreatus*) – white, tan or ivory with short gills connecting to an off-center stem
- Shaggy Mane or Lawyer’s Wig (*coprinus comatus*) – long, white cylindrical cap with shaggy, upturned brown scales
- Coral Fungi (*clavariaceae*) – appear as branching stems pointing upward similar to coral
- Truffles (*tuber aestivum*, *tuber magnatum*) – black to gray and brown/white, irregular round shape

Other Points of Emphasis

- Mushroom caps with gills (oyster, shiitake, etc.) should be avoided by beginner harvesters because they can be confused with others in the same group that are seriously poisonous and deadly.
- Wild harvested mushrooms should be thoroughly cooked and never consumed raw.
- Should not show any signs of spoilage (rotten, soggy, mushy, slimy, moldy) and/or insect infestation.
- Mushrooms need to breathe and the packaging should have air holes or be made of a breathable material.
- Generally speaking the months of harvest in PA run from early spring to late fall.
- Any other types of wild mushroom species found offered for sale or used in Food Facilities would be out of compliance with the PDA Food Code, Chapter 46. As a result, they may be subject to regulatory action, if found in commerce.

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If field personnel encounter an operation that is not addressed in this guidance document, they should contact their Field Supervisor, Program Manager or Program Specialist for assistance.

References and Resources

- Schwab, Alexander. *Mushrooming Without Fear: The Beginner's Guide to Collecting Safe and Delicious Mushrooms*. Skyhorse Publishing Inc., 1996.
- Lincoff, Gary. *The Complete Mushroom Hunter: An Illustrated Guide for Finding, Harvesting, and Enjoying Wild Mushrooms*. Quarry Books, 2010.
- Kuo, Michael. *100 Edible Mushrooms*. The University of Michigan Press, 2007.
- National Audubon Society. *Field Guide to Mushrooms of North America*. Chanticleer Press Inc., 1981.
- National Audubon Society. *Field Guide to Trees of Eastern Region North America*. Chanticleer Press Inc., 1980.
- Dr. Kathy Hodge, Cornell University
- Mr. Steve Haas, Haas Shrooms
- North American Mycological Association (NAMA) www.namyco.org
- The American Mushroom Institute (AMI) www.americanmushroom.org
- The International Mycological Association (IMA) www.ima-mycology.org
- VDACS, Field Operations Manual, November 2014