

Cultivating Shiitake (*Lentinula edodes*) on supplemented sawdust blocks is the standard for modern indoor growing. While they can be grown outdoors on natural oak logs, the indoor sawdust method is much faster, yielding mushrooms in months rather than years.

Shiitake has a highly unique incubation process. Unlike other mushrooms that fruit out of a cut in the plastic bag, Shiitake blocks must go through a "browning" phase, after which the plastic bag is removed entirely.

Below is the detailed Standard Operating Procedure (SOP) for cultivating Shiitake indoors.

Phase 1: Materials and Equipment Needs

- **Spawn:** Shiitake sawdust spawn or grain spawn.
 - **Substrate:** Hardwood sawdust (oak is the absolute best for Shiitake, though maple or beech work well).
 - **Supplement:** Wheat bran or oat bran. (Unlike oysters or turkey tail, do not use the "Master's Mix" with soybean hulls, as Shiitake blocks tend to over-heat and deform on soy hulls).
 - **Grow Bags:** Autoclavable mushroom grow bags with a 0.2-micron filter patch.
 - **Sterilization:** Pressure cooker or commercial autoclave.
 - **Inoculation Environment:** Laminar flow hood or Still Air Box (SAB).
 - **Fruiting Environment:** A grow tent or fruiting chamber with humidity and fresh air exchange (FAE) controls.
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Phase 2: Substrate Preparation and Sterilization

1. **Mix the Substrate:** A standard, proven Shiitake recipe is:
 - o 80% Hardwood sawdust
 - o 20% Wheat bran
 - o (Optional: 1% Gypsum to prevent clumping and add calcium).
 2. **Hydration:** Gradually add water to the dry mix until it reaches **60% moisture content**. (When you squeeze a handful tightly, only a drop or two of water should emerge).
 3. **Bagging:** Pack about 5 lbs (2.3 kg) of the hydrated substrate tightly into each filter-patch grow bag.
 4. **Sterilization:** Load the bags into your pressure cooker. Sterilize at **15 PSI (121°C) for 2.5 hours**.
 5. **Cooling:** Allow the pressure cooker to depressurize naturally and let the bags cool completely to room temperature (usually overnight).
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Phase 3: Inoculation

Shiitake requires a long incubation, so flawless sterile technique is mandatory to prevent contamination from taking hold over time.

1. **Sanitize:** Clean your hands, workspace, and the outside of the spawn bag with 70% isopropyl alcohol.
2. **Transfer:** In front of a flow hood or inside a SAB, open the sterilized substrate bag and add the Shiitake spawn (an inoculation rate of 5%–10% by weight).
3. **Seal:** Immediately seal the grow bag using an impulse sealer.

4. **Mix:** Shake and massage the bag thoroughly to distribute the spawn evenly.
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Phase 4: Incubation (The Four Stages)

Shiitake has the longest and most distinct incubation period of any standard cultivated mushroom, taking **7 to 11 weeks** to complete all four stages. Maintain a room temperature of **68°F to 75°F (20°C–24°C)** throughout.

1. **Mycelial Run (Weeks 1–3):** The white mycelium will colonize the entire block.
 2. **Popcorning / Blistering (Weeks 4–5):** The mycelium will begin to form dense, white, bumpy nodules that look like popcorn across the surface of the block. This is normal and a sign the mycelium is storing energy to fruit.
 3. **Browning / Bark Formation (Weeks 6–9):** The popcorn bumps will begin to exude a brownish-red liquid (metabolites). Slowly, the entire outside of the white block will turn dark brown, forming a tough, skin-like "bark."
 4. **Pinning:** You know the block is ready when the entire surface is a rich brown, and you begin to see small, dark mushroom pins pushing against the plastic bag.
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Phase 5: Fruiting (The Shock and Strip)

Shiitake in the wild fruits in the spring and fall after heavy, cold rains. You must simulate this to trigger the block.

1. **Remove the Bag:** Once the block is fully browned and showing pins, use a knife to completely cut away and discard the plastic grow bag.
 2. **The "Cold Shock" & Slapping (Optional but highly recommended):** Place the naked block in a refrigerator overnight (around 40°F/4°C). When you take it out, give the block a few firm slaps with your open hand. This physical shock stimulates the mycelium and vastly increases pin-set.
 3. **Fruiting Chamber Parameters:** Place the naked brown block on a wire rack in your fruiting chamber.
 - o **Humidity:** Maintain **85%–90% Relative Humidity (RH)** while the pins are small. As the caps develop, drop the humidity slightly to 70%–80% so the caps don't get soggy.
 - o **Fresh Air Exchange (FAE):** Provide plenty of fresh air to prevent leggy, malformed stems.
 - o **Temperature:** Maintain **60°F–70°F (15°C–21°C)**.
 - o **Lighting:** Provide 12 hours of ambient, indirect light daily.
 4. **Growth:** Over the next 7 to 10 days, the pins will rapidly expand into beautiful, brown-capped mushrooms all over the surface of the block.
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Phase 6: Harvesting

1. **When to Harvest:** Shiitake is ready when the cap has fully expanded but the outer margin (edge) of the cap is still slightly curled underneath. Do not let the cap flatten out completely or invert, as the texture and shelf-life will degrade rapidly.

2. **How to Harvest:** Because you want to reuse the block, do not tear the mushrooms off. Use a sharp, sterilized knife or curved scissors to cut the stem flush with the surface of the brown bark.
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Phase 7: Resting and the Second Flush

Shiitake blocks can yield 3 to 5 flushes of mushrooms if managed properly.

1. **The Rest Period:** After the first harvest, the block will be very light and depleted of moisture. Leave the naked block in the fruiting chamber (or in a slightly drier environment) to rest for **10 to 14 days**. Do not try to fruit it immediately.
2. **The Soak:** After the rest period, submerge the entire block in cold water. You will need to weigh it down with a brick or heavy plate, as it will float.
3. **Soak Duration:** Leave it submerged for **12 to 24 hours**.
4. **Re-Fruiting:** Remove the block from the water, drain off the excess, and place it back in the fruiting chamber. The cold soak rehydrates the block and provides the necessary cold shock to trigger the second flush.