

Cold Water Hydrated Lime Bath Guide

Alkaline pasteurization of wheat straw for oyster mushroom cultivation

1. DOSAGE & PROPORTIONS (PH 11 - 12)

Alkaline pasteurization temporarily raises the pH level to pH 11–12. This eliminates competitors like molds and unwanted bacteria, allowing oyster mushroom mycelium to quickly colonize the straw.

Scale	Dry Straw	Water	Hydrated Lime Ca(OH)_2	Recommended Container
Small Batch	5 kg	approx. 50 liters	65 – 75 grams	Mortar tub (65–90L)
Large Batch	20 kg	approx. 180 – 200 liters	250 – 300 grams	55-gallon drum (200L)

Important Safety & Material Notice

Use exclusively **hydrated lime** (slaked lime / calcium hydroxide / Ca(OH)_2). Do *not* use agricultural lime (CaCO_3). Always wear **safety goggles, gloves, and a dust mask** when handling hydrated lime powder.

2. METHOD A: DIRECT PASTEURIZATION (SINGLE STEP)

This is the most common and simple method. The straw hydrates and pasteurizes simultaneously in the lime bath.

- Preparation:** Chop straw to lengths of 3 to 8 cm. Pack dry straw tightly into breathable mesh bags or woven burlap/polypropylene sacks.
- Prepare Lime Bath:** Fill quarter of the container with cold water. Add the weighed hydrated lime and stir thoroughly until a milky liquid forms. Fill up with cold water to the final volume.
- Submerge Straw:** Push the bags of straw completely underwater. Place heavy concrete pavers or stones on top. *All straw must remain fully submerged.*
- Soaking Time:** Leave straw submerged for **12 to 24 hours** at room temperature (at least 10 °C / 50 °F).
- Draining:** Remove bags from the bath and let them drain thoroughly for 1 to 2 hours. Perform a squeeze test: only a few drops of water should come out when squeezed firmly.
- Inoculation:** Mix the drained straw with 3% to 5% oyster mushroom grain or sawdust spawn in a clean workspace and pack into growing bags or buckets.

3. METHOD B: FERMENTATION + LIME SHOCK

In this approach, straw is pre-fermented in plain water first. This breaks down the straw's waxy coating faster and softens its structure. **No extra lime is needed**; the standard dosage is more than sufficient to neutralize the mild anaerobic acids.

STEP-BY-STEP FERMENTATION & SHOCK

- 1. Pre-Soak / Ferment (24 to 48 hours):** Submerge the bags of straw in a container with *plain tap water* (no lime). Let sit for 24 to 48 hours. The straw fully hydrates and undergoes mild fermentation.
- 2. Drain Water:** Drain off the old fermentation water, which contains organic runoff and mild acids. Fresh water produces a cleaner substrate.
- 3. Prepare Lime Bath:** Prepare a fresh lime bath using the standard dosage (10–15g lime per kg of original dry straw).
- 4. Lime Shock (2 to 4 hours):** Submerge the pre-soaked straw into the fresh lime bath for 2 to 4 hours. Since the straw is already saturated, this short duration delivers a full alkaline shock.
- 5. Drain & Inoculate:** Remove straw from the lime bath and let it drain extra thoroughly (at least 2 hours). Inoculate with grain or sawdust spawn.

METHOD COMPARISON

Direct Pasteurization

- **Time:** 12 - 24 hours total.
- **Labor:** Minimal (single step).
- **Pros:** Fast, easy, lower odor risk.
- **Cons:** Straw absorbs water slightly slower.

Fermentation + Shock

- **Time:** 28 - 52 hours total.
- **Labor:** Moderate (water draining).
- **Pros:** Faster mycelium run due to softer straw.
- **Cons:** Fermentation water can smell strong.

Disposal of Used Lime Water

The remaining lime water has a high pH. Dilute with plentiful water before draining into the sewage system, or use it to adjust highly acidic soil in your garden. Avoid pouring directly near acid-loving plants (such as rhododendrons or azaleas).