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## PF Tek

### *Psilocybe Fanaticus Technique*

PF Tek is a method of mushroom cultivation pioneered by Robert McPherson, aka Psilocybe Fanaticus, and published in his webpage [www.fanaticus.com](http://www.fanaticus.com) in the early 90s. The original technique (tek) pamphlet used organic rye berries as substrate, but years later he changed his method for a mixture of brown rice flour and vermiculite moistened with water in half pint wide mouthed canning jars, then topped with a layer of dry vermiculite as a filter agent to keep out competing bacteria and fungus. The mixture is subsequently sterilized by boiling or pressure cooking. The sterilized "PF jar" is then injected with a solution containing spores and water from a syringe, creating a one step procedure for reliably growing mushrooms indoors.

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Mushrooms are picked before or just after the veil has teared. Mushrooms left to mature will sporulate and color the mushrooms black. If one desires to make sporeprints of course the mushrooms should be left to mature. Once the first flush is picked, the vermiculite in the tray is watered heavily with a spray bottle to replenish the lost moisture. This will allow for a second flush or, when repeated, even a third flush.



Pictures made by Antoni Gandia  
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Depending on many factors (temperature, substrate composition, mushroom strain etc.) the cakes will be colonized in 7-20 days.

Once the substrate is totally colonized by the white mushroom mycelium the jars can move to the next step. The dry layer of vermiculite on top usually does not colonize but that's ok.

Growth of any other shape or color than the white mushroom mycelium, except maybe from a little blueish tone, can be considered a contamination. Contaminated cakes should be discarded. Although many contaminants are harmless some are toxic and some can cause disease in humans. Therefore contaminated jars should be thrown out completely or they should be sterilized in a pressure cooker before being emptied out. Contaminated jars should NEVER be emptied before having been sterilized.

## Fructification

Vermiculite (preferably fine) is soaked and drained to achieve maximum water content without leaking. A layer of 2 cm is put in a disposable tray. A colonized cake is tapped loose from the jar and placed on the wet vermiculite. The tray with the colonized cake is put in a filter patch bag, which is closed on top with two paperclips.

The bag is put in a place where it receives some light (no full sun!) and where temperatures are between 20-30°C. No care is necessary from this point on until the first flush of mushrooms is picked.

The cakes will become fluffy in the next few days and the mycelium will start to grow into the wet vermiculite. The wet vermiculite supplies water to the cakes and this allows for more mushrooms without the need for dunking/soaking.

For most strains pinheads will appear after approximately a week. These are usually located on the bottom (former top) of the cake where most moisture is available. They first appear as small (<1 mm) white dots, which over the course of 1-2 days will slowly take on a mushroom shape. They will grow out to mature mushrooms in 5-7 days.

## Cultivation of *Psilocybe cubensis* on riceflour cakes

This method is actually a reviewed and updated mirror of the information that you can find at the original Robert McPherson website: [www.fanatiscus.com](http://www.fanatiscus.com).

## Introduction

The methods described here are generally known as the "PF-tek", although we made some useful adaptations here and there. The cultivation of *Psilocybe cubensis* on riceflour cakes is generally considered easier than cultivation on cased rye grain and is a method often employed by novice cultivators. A properly prepared and inoculated cake may produce up to 200 grams of fresh mushrooms (500 ml cake) in three flushes.

All *cubensis* strains can be grown on these cakes, even those that are somewhat harder to fruit on cased rye grain.

## Overview

Mycelium of *Psilocybe cubensis* is grown on a sterilized substrate of brown riceflour, vermiculite and water. Substrate jars are prepared and subsequently sterilized in a pressure cooker. Inoculation is done by injecting spores with a syringe. After colonization the substrate cakes are taken out of their containers and placed on wet vermiculite in a filter patch bag. After some time mushrooms form on the riceflour cakes. After the mushrooms have been picked the vermiculite is re-moistened to allow for a second and third flush.

## Substrate containers

Glass jars can be used. Canning jars are the best but it may be difficult to locate them. An alternative that can be found in the supermarket is 'Bon Maman' jelly, which comes in typical looking jars with a red/white blocked lid. These jars are good although a little on the small side. Jars need to be non-tapered (no shoulders) or the colonized cake cannot come out without smashing the jar. A very suitable container is the microbox: A non-tapered polypropylene jar with a filter in the lid. These jars can be pressure cooked, are reusable and provide an excellent alternative to glass jars.

## Preparation of the lid

The lids will need to be fitted with 4 inoculation holes. A heated needle or pin can be used to melt holes in the lid of the microbox. With a hammer and a small screwdriver (or similar object) holes can be punched in metal lids of glass jars. The holes are spaced evenly apart near the edge of the lid.



**OPTIONAL:** To prevent the entry of contaminant organisms into the jars, these holes are taped shut, only to be opened for a few seconds during inoculation. Pieces of tape are prepared by folding back one end onto itself. This makes it easier to remove them during inoculation. The pieces of tape are then placed over the holes.

Some types of tape can not be used. These will melt or lose their stickiness. Still we found that most types can be pressure cooked with reasonable success although they might curl up a little on the edges. Polypropylene or nylon tape generally works fine. Masking tape can be pressure cooked but some types might harden out during sterilization. If suitable tape can not be found it's possible to sterilize the jars without tape and to tape the holes directly after inoculation. This however, is not recommended because of increased contamination risk.

## Incubation

The cakes should be incubated in a warm, clean and dark location. Since the microboxes have an air filter they can be placed virtually anywhere. They will not suffer from air contamination even in the dustiest environment. The glass jars however do not have filter and care should be taken not to expose them to drafts.

The temperature should be between 20-30°C and the jars should be kept in the dark. Early exposure to light may lead to the formation of mushrooms while the substrate is still partly un-colonized. For this reason the jars should be disturbed as little as possible. A minute of light each day will not make them pin prematurely but an hour may.

A few days after inoculation, spots of white fluffy mycelium should be visible. These are the germinating spores. In the following days the mycelium will colonize the rice flour substrate. Often the 'rhizomorphs' will change from fluffy to thread. These threads are called 'rhizomorphs' and are considered a good thing. Good fruiting cakes often showed strong rhizomorphs during colonization.



## Inoculation

Once the jars have cooled down completely to room temperature they can be inoculated with spores. A spore syringe (bought or self-made) is used to inject the spores into the substrate so that they can germinate and form a mycelium.

Although the risk of introducing contaminants into the substrate is pretty small because of the small inoculation holes, inoculation should preferably take place in a clean environment. A flow cabinet is best but a glovebox or improvised inoculation hood will also reduce the amount of contamination. The table top is cleaned with alcohol or lysol and remember, as always: **BE CAREFUL WITH ALCOHOL AND LYSOL IN THE PRESENCE OF AN OPEN FLAME!**

Just for inoculation the screw-type lids should be screwed tight to prevent accidentally tipping them off. After inoculation, during incubation these lids should be loosened again. The foil is taken off and replaced after inoculation. For the microboxes the foil can be discarded after inoculation.

Any moisture that may be present on the lid is wiped off with a clean tissue.

The needle of the spore syringe is flamed until red hot then left to cool for 10-15 seconds. The needle may not touch anything or it should be flamed again.

The tape of one of the inoculation holes is peeled back and the needle is inserted through the inoculation hole, through the dry layer of vermiculite on top, aimed at the glass. 1/4 ml (or more) is injected in the substrate. Then the needle is pulled back, the tape is replaced and the next hole is inoculated in the same way. It's not necessary to sterilise the needle after every hole but it's advisable to do this in between jars to prevent cross contamination.

The aluminum foil is replaced on the glass jars and the lid is loosened again. For microboxes the aluminum foil can be discarded.

## Substrate preparation

The mycelium will be cultured on a substrate composed of brown riceflour, vermiculite and water.

### Substrate recipe

- 1 part brown riceflour
  - 2 parts vermiculite
  - 1 part water
- (all by volume)

The mycelium will have difficulty growing in a substrate that does not have the correct moisture content. First the dry ingredients are mixed. Then, while stirring, the water is slowly added. The finished substrate should not be soggy. If too much water was added and the substrate ends up too wet, some dry vermiculite/riceflour can be added to absorb excess moisture.



## Sterilization

Originally the PF-tek uses a sort of semi-sterilization in a normal pot at 100° Celsius. The results of this method are unpredictable to say the least. Therefore it will not be discussed here.

The only proper way to sterilize the riceflour substrate is with a pressure cooker. For more information about pressure cooking look below or visit [www.mushmush.nl](http://www.mushmush.nl).

Both types of jars are sterilized for 60 minutes at 121° Celsius. Every jar is inspected before it is put in the cooker to make sure that the lid is still on loosely, or in the case of microboxes, the lid is at least 1/4 open.

When letting the jars cool down, make sure that the lids are still on loosely. For microboxes the lids should preferably be closed completely as soon as they come out of the cooker. The jars/microboxes are left to cool in a clean spot.

## Typical sterilization cycle

A rack is placed in the pressure cooker so that the items to be sterilized are not in direct contact with the bottom.

An appropriate amount of water, usually a few (3-4) centimeters to cover the bottom, is put in the cooker. Items to be sterilized are placed inside. The lid is closed and the heat is turned on.

After some time the water in the cooker will start to boil. Steam will start escaping from the vent pipe. The weight is not placed yet. After a few minutes the steam will flow continuously from the vent pipe and all air that was inside of the cooker is now expelled. This forms a saturated steam environment. The weight is now placed on the vent pipe. Since the weight is now blocking the steam flow, pressure will start to rise in the cooker.

Sterilization time is measured from the moment that the cooker reaches 121°C until the moment that the heat is turned off. The cooker is left to cool until the pressure has returned to zero. When the pressure has returned to zero, the cooker can be opened.

## Filling the jars

The substrate is spooned loosely into the jars and compacted lightly by tapping the jars. Approximately 2 cm is left between the top of the substrate and the lid of the jar. This space is filled with a layer of dry, clean vermiculite. Since clean vermiculite does not support the growth of any competing organisms, this layer helps to prevent the entry of contaminant organisms into the substrate during inoculation



In the case of a microbox the lid is closed for 3/4 or left loosely on top of the jar. Microboxes should never be fully closed during sterilization or they will implode/explode and/or deform!

Screw-type lids of glass jars are put on loosely but never screwed tight.

Both types of container should be covered with a double layer of aluminum foil to keep the lids in place and to prevent them (and the tapes) from getting (too) wet.