

# Mediamatic

## Handout

### *Grow your own mushrooms*

Mycelium	Mycelium is the root system and vegetative part of the mushroom as it absorbs nutrients from the environment. It is formed of many filamentous structures called hyphae. In contrast to the assumption of most people the mycelium is the main part of the mushroom. The fruit-bodies only work as the reproductive part, generating spores.
Mycelium spawn	Mycelium spawn is a colonised substrate which can easily be transferred and re-distributed. Usually it comes in the form of colonised grains such as rye, millet and wheat. These seeds, once colonised can be used to inoculate many different substrates, most likely agricultural waste. If you work clean enough, you will only need 0.5% spawn in relation to substrate.
Autoklav-Bags	Autoklav bags are heat resistant bags with integrated filters. These bags can be filled with substrate which then can be pressure cooked to sterilize. The filters allow the mycelium to be aerated while growing.
Growing substrates	In the workshop we are using straw as our growing substrate. Agricultural waste such as wood chips, sawdust or wheat husks can be used as. In case you use straw: Chopping before processing can lead to increased yields as it provides more surface area for the mycelium to grow.
Fruit-bodies	When growing in a very nutrient rich environment a mushroom starts building fruit-bodies to reproduce. The cells of the mycelium suddenly start filling with water and the fruit-body blasts out of the substrate. The fruit-bodies contain spores which then start sprouting and building new mycelium.

## Process of growing mushrooms

In the workshop we are using the grey king oyster mushroom to grow our own fruit-bodies, as it is a very strong cultivated mushroom promising high success rates. You can apply the technique to other species.

### **Substrate preparation and Inoculation:**

Here is a list of the different ways of preparing the substrate (depending on your equipment). Make sure you are working in a very clean environment - clean your working table and tools with alcohol (bio-ethanol) and disinfect your hands/gloves. In the workshop we used the first method mentioned on the next page.



### 1) Soak substrate

*Required equipment: Mushroom spawn (available online in mushroom growing supply shops) bigger pot, polyethylene bags (plastic rubbish bags), cleaning alcohol, hand disinfection*

Cut your straw in smaller pieces and soak it in water for 4-6 days. Due to the lack of oxygen, contaminants in the straw will mostly be killed and the spawn is able to propagate and push past some of the still consisting contaminants. Rinse water, put the straw on a clean table and let it cool to room temperature. Inoculate your substrate with spawn and pack it in the plastic bags. Use a higher percentage of spawn to inoculate here. Make sure you punch some holes in the bag for the mushroom to get air.

### 2) Pasteurize substrate

*Required equipment: Mushroom spawn (available online in mushroom growing supply shops) pot, thermometer, stove, polyethylene bags, cleaning alcohol, hand disinfection*

Pasteurize your straw in a pot for 45 minutes at 70°C – this will kill all the spores and bacteria that could stop the mushroom from growing. Rinse water, put the straw on a clean table and let it cool to room temperature. Inoculate your substrate with spawn and pack it in the plastic bags. Use a higher percentage of spawn to inoculate here. Make sure you punch some holes inside the bag for the mushroom to get air.

### 3) Use Autoklav Bags and Pressure cooker

*Required equipment: Mushroom spawn (available online in mushroom growing supply shops) pressure cooker, Autoklav-Bags, cleaning alcohol, hand disinfection (laminar air flow)*

Soak substrate in water for an hour, rinse it and put it in the autoklav-bags. Sterilize the straw in the pressure cooker at 121°C for 30 minutes, let it cool down to room temperature and inoculate with spawn. In case you own a laminar air flow open the bag in the flow for inoculation. Using this method you'll need less spawn.

Lower equipment costs  
=  
higher costs for spawn

Higher equipment costs  
=  
lower costs for spawn

**Supplementation:** You can add high nitrogen containing materials, such as coffee grounds, to your substrate to increase the productivity of your mycelium. However, no more than 20% of your substrate weight should be added.

Growing mushrooms includes two different phases, one is the phase of mycelium growth and the other is the fruiting phase. Both need different conditions, mimicking natural environ-

### Best parameters for the mycelium growth:

*Required equipment: spray bottle with clean water*

Best mycelium growth for the grey oyster mushroom is reached at a temperature range of 24-25°C. Fill the mix into your plastic bags and let it sit in a dark place at this temperature. Don't disturb the bags in this time. After 2-8 weeks mycelium will have grown throughout the whole substrate.

Note: growth parameter differentiates for various species of mushrooms. Between 16-23°C is good for most species

### Best parameters for the fruiting phase

*Required equipment: spray bottle with clean water*

To initiate building fruit-bodies, punch holes inside (the mushroom will grow out of them) provide some light to the mycelium and if possible reduce temperature to around 16°C (mimicking autumn). Make sure you keep the mycelium and fruit-bodies humid, by spraying the holes with clean water. When fruit-bodies are ready to be harvested, cut them off with a clean knife and clean away all leftovers as these could rot and spoil your bag. You will have several flushings.

**Best of luck and happy mushroom growing!**

