

Inputs for Mushroom

- Polythene bags (black or white)
- Lockable metal Drum
- Polythene tubes
- Methylated spirit or jik
- Table or polythene sheet (3 metres)
- Table spoon
- Fuel
- Water
- Labour
- Spawn (seed)
- Weighing scale
- Lime
- Supplement (Soybean meal or keratin)
- Molasses
- Substrate
- Sisal twine
- Soap
- Shed
- Basin
- Hand gloves
- Dust coat
- Cap
- Dust masks
- Hand spray pump

(1) Mushroom house

Mushroom house should not be sited near dumping sites and livestock pens to reduce the risk of insect infestation and diseases. It should preferably be under shade. The house can be made from locally available materials that can main cool temperatures and high humidity such as clay or bricks. In a small scale farmer scenario, a grass thatched mud walled house is the most ideal. The house should have air vents or small windows on the upper walls for ventilation and required light during fruiting. The vents and door should

have insect screens and be closed. If the temperature inside the house is high, water can be sprayed on the floor using a knapsack sprayer with fine nozzles and vents and door opened at night. Wooden shelves for holding bags or wooden racks for hanging spawned substrate tubes should be constructed at the height of about 1.5 m from the ground and 1 m apart for ease of working in the growing house.

(2) source(s) of high quality spawn ('seeds' of mushrooms)

Spawn in a bottle Spawn is a planting material equivalent of farmers' seed for starting mushroom cultures. It is made from mycelia (plural of mycelium) of mushroom grown on a carrier such as grains and is produced in specialized laboratories under sterile conditions. The amount of spawn needed is equal to 4-6% of the wet weight of the substrate. For example if the wet weight of the substrate is 50 kg, 2-3 kg of spawn is required. One kg of spawn may cost between Kenya shillings 600 and 800.

(3) Substrate (material on which mushrooms grow)

Substrate is an organic-based material on which mushrooms grow. And a good substrate should be rich in nutrients, have good aeration and water holding capacity. Substrates commonly used in mushroom production include agricultural by-products such as cereal straws (wheat, barley, rice, maize), cotton waste, maize cobs, coffee husks and pulp, sawdust, sugar bagasse, water hyacinth among others. Growing mushrooms on a substrate of water hyacinth was first promoted by the Chinese University of Hong Kong, and has been taken up by the African University of Mutare in Zimbabwe. The advantage of using water hyacinth, which is an unwanted weed that clogs up many waterways in Africa, is that the costs of preparing the substrate can be kept down. However, cereal straws, particularly wheat straw, are usually the best because they are rich in nutrients that mushrooms require and they facilitate quick colonization (the formation of a white mass of mushroom mycelium) of the substrate.

Gypsum is a useful ingredient to be added to the substrate as it provides calcium to the growing mushrooms, regulates the acidity level of the substrate, counters potassium, magnesium and phosphorus concentration and increases water holding capacity thus decreasing the risk of over wetting. It also improves the physical structure of the substrate. Lime may also be added to the substrate to adjust its pH (level of acidity)

It should be noted that different species of mushrooms will require different substrate mixes. The substrate must not be rotten, mouldy and should be kept dry while in storage.

Types of Mushrooms and Substrates used for their production

Mushroom Cultivation Media	
Growing Medium	Mushroom Species
Rice straw	Straw (Volvariella) Oyster (Pleurotus) Common (Agancus)
Wheat Straw	Oyster (Pleurotus) Common (Agaricus) Stropharia Straw (Volvarieila)
Coffee pulp	Oyster {Pleurotus) Shiitake (Lentinus)

Sawdust	Shiitake (Lentinus) Oyster (Pleurotus) Lion's Head or Pom Pom (Hericium) Ear (Auricularis) Ganoderma {Reishi) Maitake (Grifolia frondosa) Winter (Flammulina)
Sawdust-straw	Oyster (Pleurotus) Stropharia
Cotton waste from textile industry	Oyster (Pleurotus) Straw (Volvariella)
Cotton seed hulls	Oyster (Pleurotus) Shiitake (Lentinus)
Logs	Nameko (Pholiota) Shiitake (Lentinus) White jelly (Tremella)
Sawdust-rice bran	Nameko (Pholiota) Ear (Auricularis) Shaggy Mane (Coprinus) Winter (Flammulina) Shiitake (Lentinus)
Corncoobs	Oyster (Pleurotus) Lion's Head or Pom Pom (Hencium) Shiitake (Lentinus)
Paper	Oyster (Pleurotus) Stropharia
Horse manure (fresh or composted)	Common (Agaricus)
Crushed bagasse and molasses wastes from sugar industry	Oyster (Pleurotus)
Water hyacinth Water lily	Oyster (Pleurotus } Straw (Volvariella)
Oil palm pericarp waste	Straw (Volvariefia)
Bean straw	Oyster (Pleurotus)
Cotton straw	Oyster (Pleurotus)
Cocoa shell waste	Oyster (Pleurotus)
Coir	Oyster (Pleurotus)

Banana leaves	Straw (Volvariella)
Distillers grain waste	Lion's Head or Pom Pom (Hericiium)

(4) Supplements (additional nutrients to the substrate)

Supplements are materials added on the final mix of substrates to increase nitrogen content in order to improve the yields. Commonly used supplements include urea, bran, cotton seed cake, sunflower seed cake, molasses, broiler chicken manure and horse manure among others. However, it should be noted that heavy supplementation may increase the risk of contamination by other micro-organisms which are likely to benefit from extra nutrients added to the substrate.