

Button mushroom cultivation



Commercially cultivated Mushrooms

- *Agaricus bisporus* (Button Mushroom)
- *Pleurotus spp.* (Oyster Mushroom)
- *Volvariella volvaceae* (paddy straw mushroom)
- *Lentinula edodes* (Shitake of Japan)
- *Calocybe indica* (Milky mushroom)

Button mushroom cultivation needs technical skill, availability of resources and labourers

Requirements

- Good quality spawn (mushroom seed)
- Substrate or compost for cultivation
- Water
- Composting yard
- Pasteurization facility
- Moderated cropping room



Mother culture



Spawn production

1. Select healthy sorghum seeds and wash in a good quality water
2. Boil in water for 45 min. or until the seeds bulge and open slightly
3. Decant the water and shade dry the seeds on news paper or clean cloth
4. Mix the seeds with 2% each calcium carbonate and calcium sulphate powder
5. Fill the seeds in 300ml capacity saline bottle or polypropylene covers up to $\frac{3}{4}$, plug with cotton and wrap with paper
6. Sterilize at 121°C, 15 psi pressure for 30 minutes
7. Cool to ambient temperature, inoculate mushroom mycelium and plug with cotton and incubate at 28 °C for 15 days
8. Mycelial growth covers all over the seeds and spawn is ready for cultivation.



2. SPAWN

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Button mushroom cultivation

Materials required

1. Compost
2. Polyethylene bags (21'' x 18'')
3. Casing material
4. Pasteurization chamber
5. Spawn
6. Cropping (environmental controlled) cropping room

Compost formula (components)

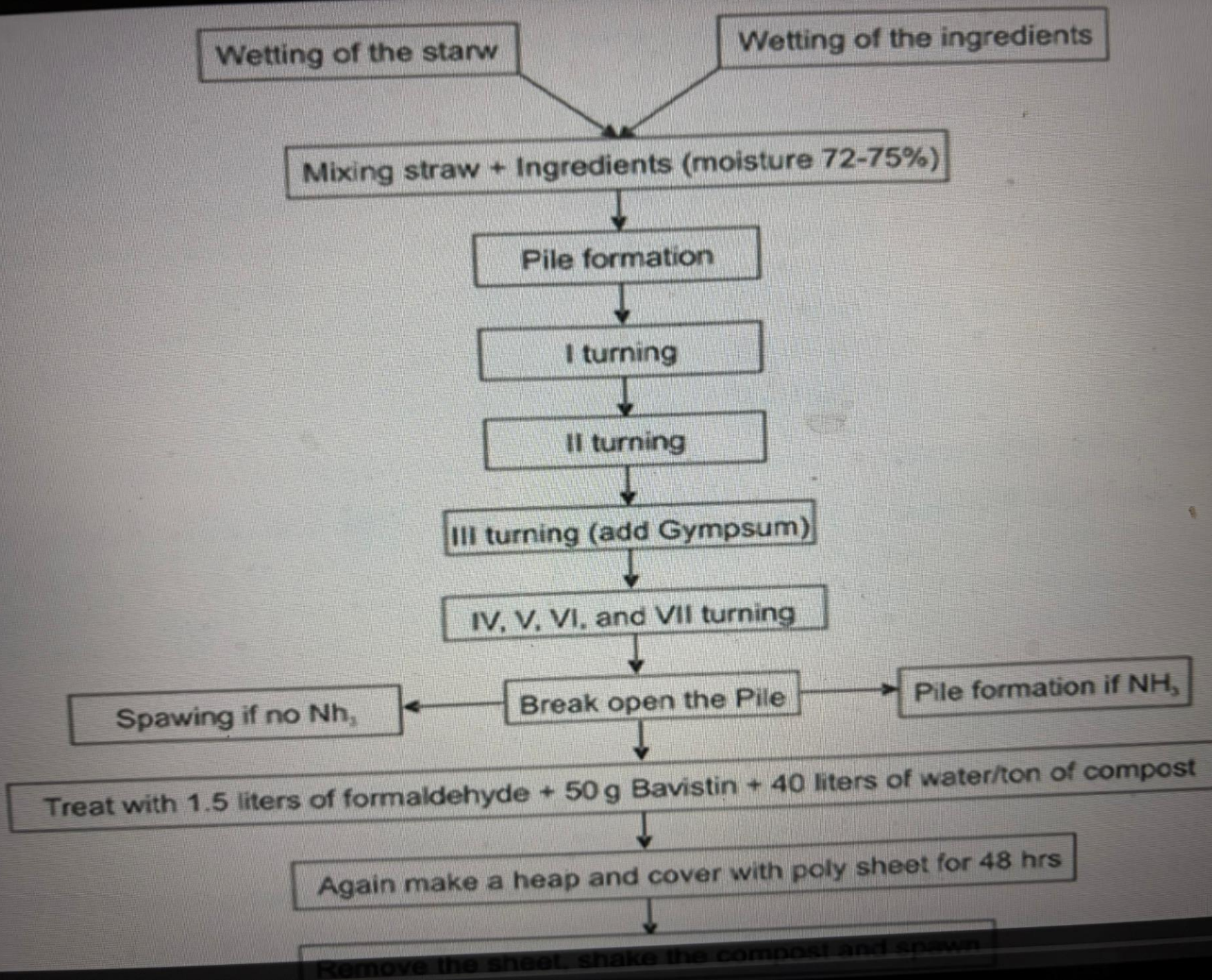
1. Wheat straw or Paddy straw	300 kg
2. Wheat bran	15 kg
3. CAN	9 kg
4. Urea	3 kg
5. Super phosphate	3 kg
6. Muriate of potash	3 kg
7. Gypsum	20kg

Cultivation

1. Procurement of spawn
2. Preparation of compost
3. Spawning
4. Casing
5. Production of crop

Compost preparation (Long method)

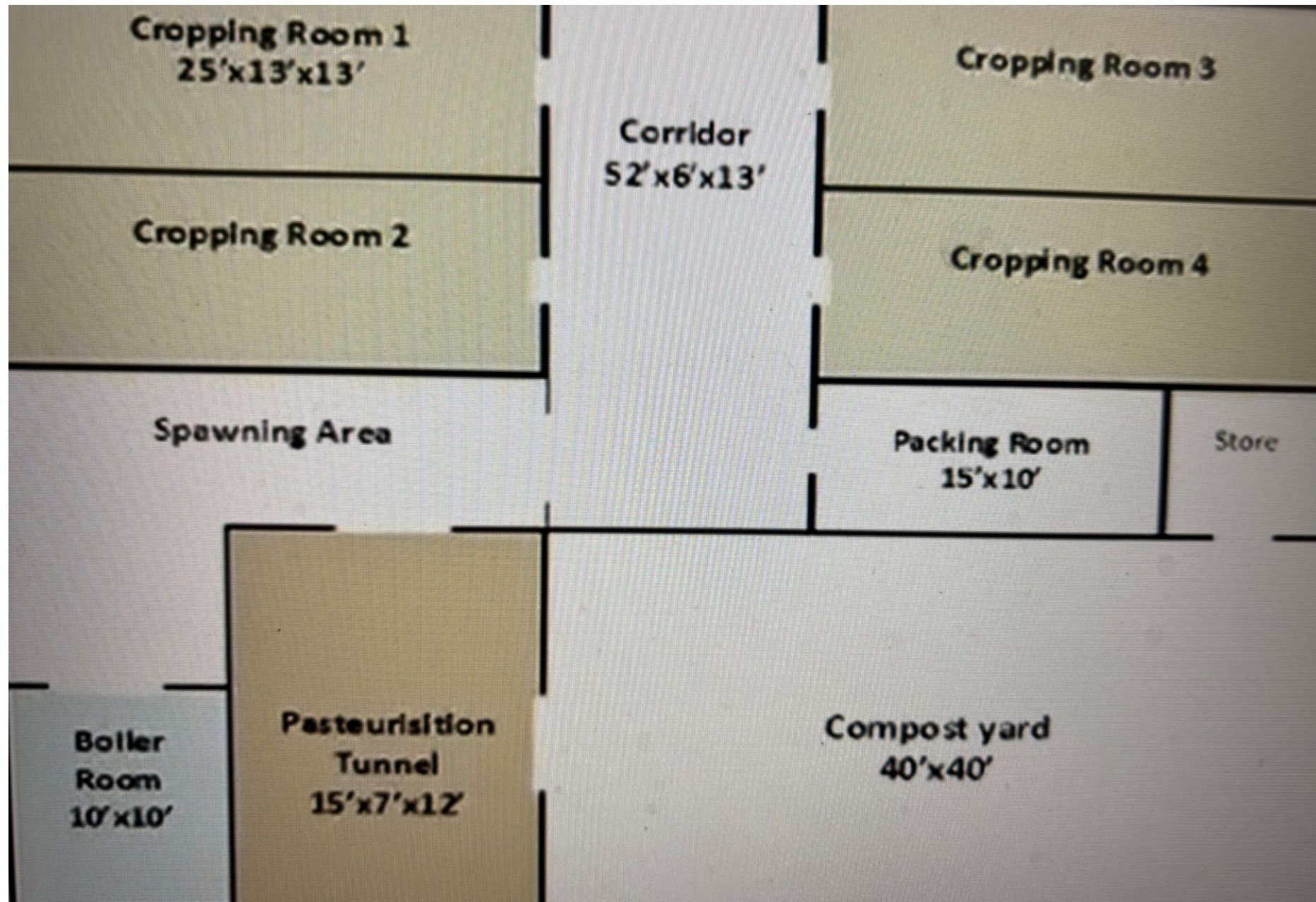
1. Wetting of paddy straw
2. Mixing of ingredients
3. Pile formation
4. Turning



1. Clean the area with 2% formalin and spread the cut straw on the floor.
2. Sprinkle the water and turn the straw frequently to absorb water up to 75% (1 ton of straw 4000L water).
3. 0 day--Mix the ingredients and heap it (5 feet breadth 8 feet length and 5 feet height)
4. 6th day---first turning is given and again heaped- strong smell of ammonia is observed, temperature start raising.
5. 10th day--- second turn given. Temperature raising and strong ammonia smell can be noticed. White patches appearing are actinomycetes. It is a good sign of composting. Compost turn brown.
6. 13th day—third turning, Gypsum is added mixed and re-heaping is made.
7. 16th, 19th and 22nd continue turning and re-heaping. On 25th day add required insecticide (malathion 0.01%).
8. 28th day—final turning- ammonia should not be present. Then, pasteurize using formalin.

Quality of compost

1. Colour -----Dark brown
2. Smell -----Pleasant
3. Pliability -----soft
4. Texture -----friable
5. pH -----7.6-7.8
6. Ammonia -----nil or less than %
7. Nitrogen -----2.5-2.7%
8. Moisture ----- 6.8-70%





















Cultivation/spawning

- Sterilize the spawning room using formalin
- Fill the compost in polyethylene cover up to 3/4th
- Mix the spawn in the top portion of the compost (500-750g spawn)
- Incubate the bags on the rack at 23-25 °C in the cropping room
- Spawn run takes about 15 days. Growth of mushroom mycelium on compost is termed as spawn running.

Preparation of casing soil

1:1 mixture of decomposed (2-3 year old) farmyard manure and garden soil, or use coir pith with these materials, ensuring the casing has a pH of 7-7.5 and high water-holding capacity.



Casing and case running

- Casing means covering of compost colonized with mushroom mycelium using casing soil. After spawn run mycelium enter reproductive stage to produce fruiting bodies.
- Casing material is prepared using garden soil, FYM (1:1 ratio) and sterilized.
- Spawn run compost is covered with casing soil about 1 inch and water is sprinkled. Temperature in the cropping room is maintained around 22-24 °C for one week.
- After one week, the temperature in the cropping room is reduced to 15-17 °C and relative humidity should be 80-90 %. Mushroom pin head appear 15 days after casing, the mushroom appear within a week.
- Mushroom should be harvested when they are in button stage.











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Packing



Value addition

Process of changing or transforming a product from its original state to a more valuable state.



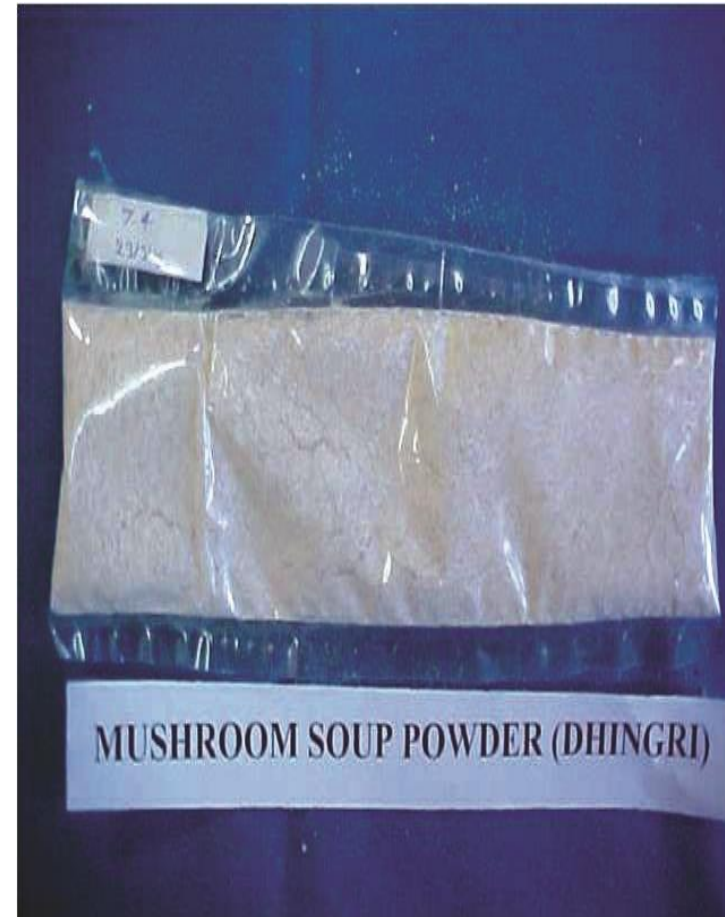
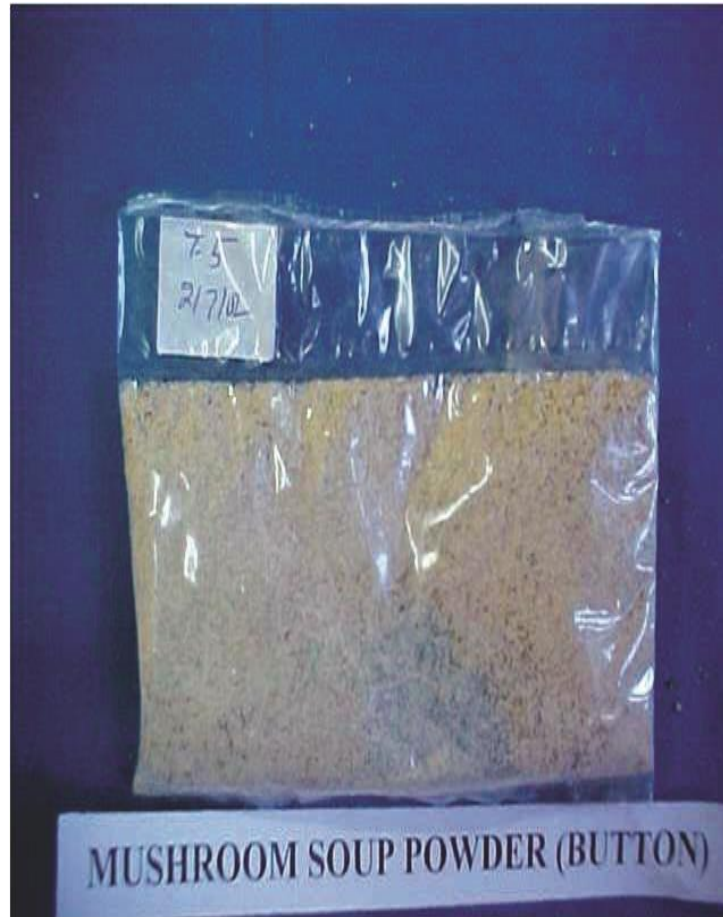
Mushroom value addition-Advantages

- Transported easily.
- Generate Employment.
- Better utilization of resources
- Benefits of value addition:-
- Longer shelf life.
- Export purpose.
- Increase profit.

Value added products

- Mushroom soup powder.
- Mushroom biscuit.
- Mushroom ketch-up.
- Mushroom chips.
- Mushroom Pickle.
- Mushroom candy.

Mushroom soup powder



Preparation of mushroom soup

Ingredients

Parts (%)

• Mushroom powder	16
• Corn flour	5
• Milk powder	50
• Refined oil	4
• Salt	10
• Cumin powder	2
• Black pepper	2
• Sugar	10
• Ajinomoto	2

- Dried button or whole oyster mushrooms were finely ground and passed through 0.5 mm sieve.
- Mushroom soup powder is prepared by mixing this powder with milk power, corn flour and other ingredients
- This has to be mixed with equal quantity of water for the preparation of good quality mushroom soup with characteristic aroma and taste

Mushroom Groundnut chutney powder

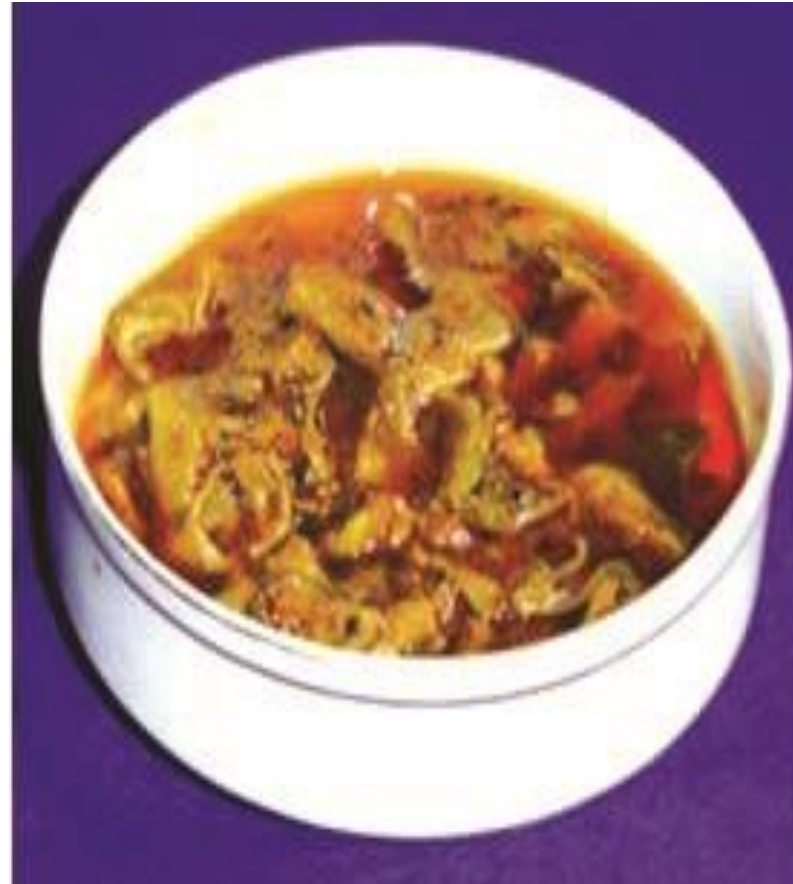
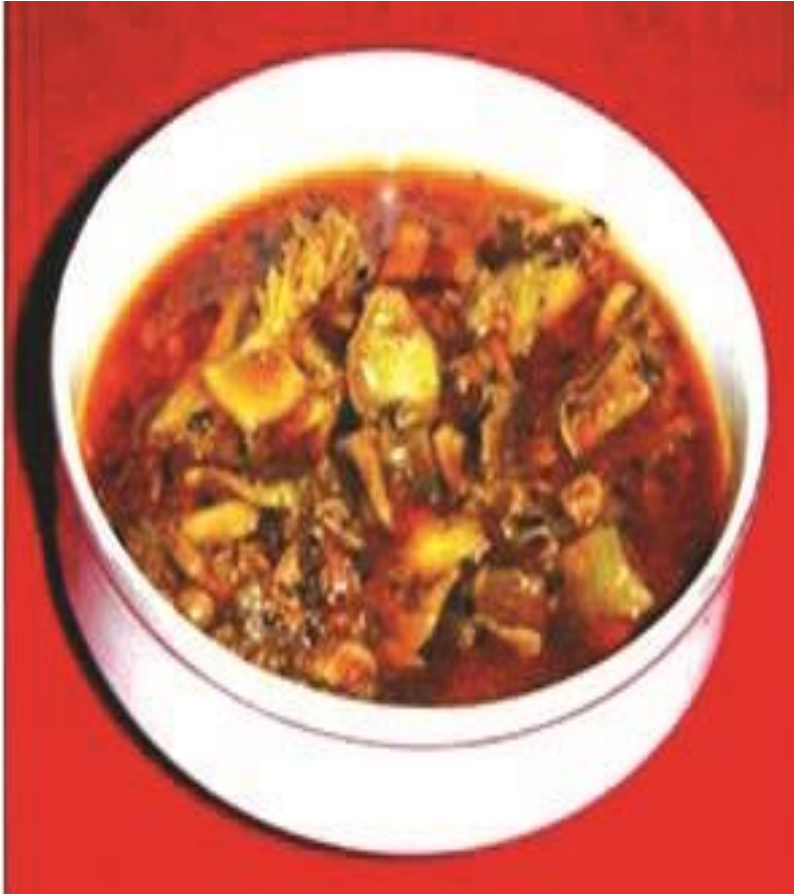


Mushroom pickle

Ingredients	g/kg
Black mustard seed powder.....	35
Turmeric powder	20
Red chilly powder	10
Cumin seed powder	1.5
Fennel seed powder (<i>saunf</i>).....	1.5
Carom seed (<i>ajwain</i>)	10
Nigella seed (<i>kalonji</i>)	10
Oil	200 ml
Salt	90

- The blanched mushrooms are washed and the excess water is drained off.
- Sodium chloride is added and kept over night.
- The various spices namely turmeric powder, black mustard seed powder, red chilly powder, cumin seed powder, fenugreek seed powder, aniseed powder, black pepper, carom seed (*ajwain*), nigella seed (*kalonji*), fennel seed powder and mustard oil are added to prepare tasty pickle.
- Acetic acid and sodium benzoate within the permitted limits are used as preservatives

Mushroom pickles



Mushroom Biscuit

• Ingredients (g)	Parts
• Maida	50
• Sugar powder	20
• Bakery ghee	5
• Oyster mushroom powder....	5
• Coconut powder	8.3
• Baking powder	5
• Ammonium bichromate....	0.035
• Milk powder	3.4
• Water	8.3

Entire ingredients were finely ground and cleaned with the help of fine sieve separately.

The ingredients viz., ghee and sugar were well mixed for 5-7 minutes using Dough kneeder to make homogenous.

Thereafter, 500 ml water was added to kneeder to make dough cohesive and homogenous for next 10-15 minutes

After that dough was kept for 10 minutes under the wet cloths to make it cool

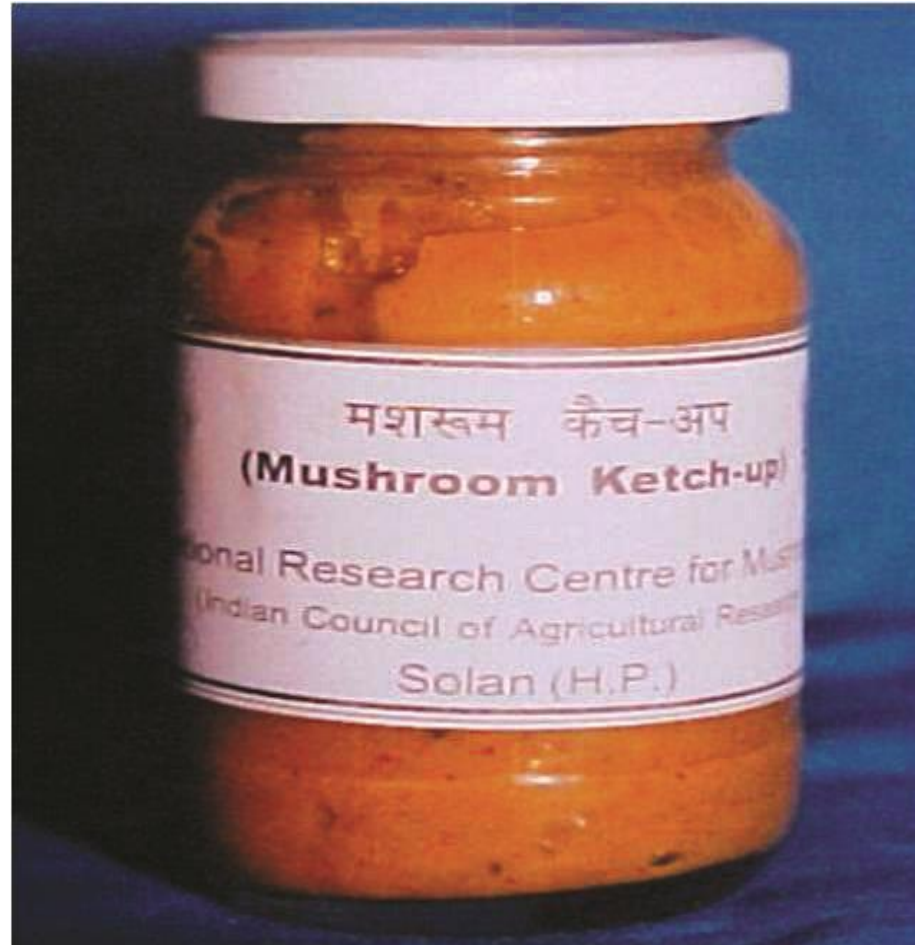
thin sheets of dough (1.25 cm thick) were made and cut into different shapes in trays.

The trays were shifted to hot oven (180°C) for baking purpose for 20 minutes,

The trays were removed from the hot oven and cooled, the biscuits were ready for packaging and or serving



Mushroom ketchup





Where to get Information on Mushroom production

- Directorate of mushroom Research, Solan (H.P.)
- University of Agricultural Sciences, Bangalore
- Indian Institute of Horticulture Research, Hesaragatta, Bangalore
- Department of Horticulture, Government of Karnataka.



Formal education will make
you a living; self-education
will make you a fortune.



Thank you