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Production Development of Mushroom Merang in Mini Mushroom House as Source of Nutrition Society: Variation Mini Mushroom House

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***Abstract*— His study aims to improve nutrition in farmer after post-harvest paddy rice cultivators. During the wait for tillage and seeding of rice. Mushrooms contain a number of mineral salts twice the amount of mineral salts other vegetables with a protein content of 3.5%, 6.8% carbohydrate and caloric value of 210. These mushrooms contain folic acid which is helpful for patients with anemia. This research was conducted in Tonsaru Minahasa Tondano with treatment A is waste cow manure waste, namely fertilizer and poultry waste, and C are straw / hay, each with four replications. Mini mushroom house made is made with the length, width, and height, respectively for 1, 1, and 2 m; with the distribution of rack 50 cm distance. Sterilization media is done with hot steam from the autoclave replacement drum modified while the mushroom seeds of Bogor. Results are expected to be obtained where the postharvest composition of its fast and high nutritional value content.**

***Keywords*— house mini, nutritional value, mushroom.**

I. INTRODUCTION

Mushroom (*Volvariella volvaceae*) is one of the agricultural commodities that have a bright future to be developed. Up to now more and more people who know the nutritional value of edible mushroom and benefits for human health. On the other hand, the mushroom production in Indonesia is still very limited so that the economic value of mushroom growing.

A good way to the cultivation mushroom can increase the benefits to be obtained. However, more important is the availability of high-protein foods that are relatively inexpensive compared to other protein vegetable ingredients. Mushrooms contain a number of mineral salts twice the amount of mineral salts other vegetables with protein, carbohydrate, and caloric value. Mushroom contains folic acid is beneficial for patients with anemia (Gunawan, 2011).

Fungi can grow in many places like a terrace house, garden, yard, walls. Mushrooms will grow in places that had been ignored human.

Mushroom that grow in the wild began to grow in the phase button (knob) fully developed within four to five days, this fungus grows granduil first appears through the annulus or the casing is formed between the hood premises under the rod on the other side until the hood to be flat once and visible scales. These scales produce spores in the same way the plants produce seeds. If the fungus is already open is placed on a piece of white paper with scales pointing downwards for 48 hours will be patterned scales shape same on paper where the spores are produced fall down to form a picture of lamellae.

In the wild the spores will fall between the grass and the leaves that fall carried by the wind, the grass eaten by cattle horses, cattle or grazing animals more, the spores will participate in the manure and appear in the form of mushroom in nature, when cattle diminishing the population of fungi in the wild will decline. There is a presumption of mold growing in the wild better than being maintained. Actually, a fungus that grows in the wild, many distractions flies lay their eggs in lamellae where the larvae eat the portions mushrooms, make a hole in the trunk and hood mushroom stalks and mushrooms preserved if this damage can be prevented.

Mushroom used as a source of energy in the process of metabolism and multiplication of cells by bacteria while nitrogen (N) is used for protein synthesis or formation of protoplasm. Utilization element C as a source of energy for the bacteria will produce a discharge in the form of organic acid, alcohol and other gases such as CO_2 and CH_4 / gas methane. (Yuwono, 2002) . Supervision interval of 7-10 *days by giving EM4.*

Mini mushroom house used as a medium shade and mushroom after the media sterilized together mini mushroom house sterilization with steam aims, so that pathogenic microorganisms die and does not interfere with the growth of mushroom. Pasteurization is done for 4-5 hours with the temperature reaches 80-90 °C mini *mushroom house from vapor of boiling water poured into* mini mushroom house where mini mushroom house free from pests and diseases.

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Treatment is done after one day after pasteurization in order house has cooled at room temperature 32-35 °C house covered in plastic after stocking the seedlings so that the temperature reached 35-37 °C. The five days after stocking checked and do carburetion with the addition of 10% glucose and harvesting is done 14 days after stocking seedlings.

This study aims to improve nutrition in farmer after post-harvest rice cultivators wait paddy. For tillage and seeding of paddy is expected this study can add value to the economic improvement of farmers that use waste straw / hay as a medium to grow mushrooms.

II. Research Method

A. Materials

Materials used are agricultural solid waste such as rice straw / straw chopped cattle dung, poultry droppings, rice bran, quicklime, EM4, plastic, alcohol, and materials that support the manufacture of edible mushroom media.

The tools used in this study include glass tools commonly used in the laboratory, pH meter, spade, hoe, spray for the manufacture of organic fertilizer / compost, as well as mini mushroom house and drum sterilization.

B. Methods

Step I

The first step in this research is the collection of cattle waste to be cleaned of impurities such as plastic and wood, as well as for chicken manure, cutting hay with a freezer so evenly and the provision of rice bran and quicklime.

Step 2. Mini mushroom house

The shape and size of a mini mushroom house made up as a mushroom cultivation. Mini mushroom house size in this study are: long x height x width = 150 x 100 x 60 cm. One mini mushroom house consists of 4 shelves.

Step 3. Setting up a mushroom growing media.

Table 1
Media Mushroom

Treatment	Bran (kg)	calcium oxide (kg)	Cow dung compost (%)	Chicken manure compost (%)
I	-	-	-	100
II	-	-	100	-
III	5	3	75	75
IV	5	3	50	50
V	5	3	25	25

Step 4.

Observations: Temperature

During maintenance, the temperature inside the mini mushroom house should be maintained between 32-38 C, not more than 38 °C or less than 30 °C because production will not be good.

Temperatures below 30 °C will cause the formation of fruiting bodies quickly, but small and stems are long and thin and will easily open umbrellas so the quality is bad. At a temperature of 26-27 °C fruiting body was never formed and mycelium dormant. The temperature is above 38 °C will cause the paying formed thin and stunted my growth and parasol mushrooms hard. At a temperature of 40 °C will be difficult to form a mushroom, but instead Coprinus weed growth will be very fertile.

Humidity.

Needed air humidity for optimum mushroom production is 65% for development of mycelium and 80-85% for the formation of fruiting bodies. Air humidity is too high (95-100%) are the bad conditions for mushroom easily rot, brown and withered as well as nonperishable mushroom, brown and wither and rot fungus wet. Meanwhile, the air humidity is too low (< 80%) will result in a small fruiting bodies are formed and are often formed under medium straw, fruit stalk is long and thin, as well as easy-open umbrella mushrooms.

Acidity

Mycelium mildew or fungus can grow in the range of acidity (pH) of 5.0 to 8.0 media. For mushroom, media optimum pH should be about 6.8 to 7.0. Therefore, mushroom compost is usually acidic (pH below 6) that need to be lime that its pH rises. However, the contaminant plume will grow well. By adjusting the pH optimum for the actual mushroom fungus and reduce weed growth. Analysis of the nutritional value of edible mushroom include:

1. Testing protein content.
2. Testing fat content.
3. Testing carbohydrates.
4. Testing of mineral.

III. Result And Discussion

Initially mushroom is a fungus that is cultivated only mediated straw or rice straw. But now the fungus can be cultivated in a variety of media one is the rest of the plant that contain cellulose obtained from agricultural waste. The media are often used for the cultivation of mushroom namely straw waste and livestock waste and cotton.

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Mushroom is one type of fungus that is popular in the community which is often used as a food ingredient. Besides having raced mushroom flavor is efficacious for health. This is a great opportunity to do business for mushroom cultivation. Some reasons business prospects mushroom:

1. The cultivation technique is easy mushroom cultivation can be done throughout the year regardless of the season. Land required for cultivation not media narrow area can be done by using multilevel racks.
2. Raw materials readily available be used media which can be obtained from agricultural and household waste such as straw, livestock waste, waste bins, cardboard mainly raw materials containing cellulose.
3. The brief harvest time mushroom can be harvested 8-12 days after the seeds are stocked mushroom, mushroom harvest relatively short business money making rounds take place relatively quickly.
4. Waste of media compostable media waste is used as compost for vegetable crop cultivation media flower or or worms.
5. Business opportunities are wide open for mushroom market requirements have not been fulfilled yet asked for supplies between the islands, including fungus mushroom consumption among the public.
6. The development of both direstoran refined menu and simple restaurant makes a request mushroom perna not recede.

Popularity is not too focused on the nutritional content but the emphasis on taste, good sense of its own mushroom (single entity) or in combination with other foods. Fungi are known to contain many nutrition that are important to human nutrition and caloric needs. Mushroom is a group of fungi that form fleshy fruiting body, the body is generally shaped umbrella with roots apparent (Rhizoid) stalk, hoods, sometimes accompanied by the ring and the cup (volva) (Sinaga, 2011).

Mushrooms contain a variety of vitamins, mineral and cholesterol low that the fungus may be regarded as a slimming food. Higher protein content than the protein in plants in general, comparable to milk protein legumes, vegetables bulbous. In addition to the nutritional value is high enough some fungi can be used in medicine.

Table 2
Composition mushroom nutrition (%)

No	Composition of fresh weight	composition
1	Moisture	90.50 %
2	Fat	0.25 %
3	Protein	1.65 %
4	Abu	1.30 %
5	Calcium	30 $mg/_{100g}$
6	Phosphorus	0.90 $mg/_{100g}$
7	Vitamin C	1.50 $mg/_{100g}$
8	Thiamine (Vit B)	0.03 $mg/_{100g}$

Life originated from the fungus spores (basidiospores) which will then germinate to form hyphae form of fine threads. The hyphae will grow into other parts of the growing medium from a collection of hyphae or mycelium will form small clumps like a knot thread that indicates that fungal fruiting bodies began to form the amino acid content of mushroom produced mini mushroom shown in the table below.

Table 3
Composition Amino Esensial mushroom ($g/_{100\,g}$ dry mass)

No	amino acid	Unit g/100 g
1	Leucine (Leu)	1,25
2	*Lizine (Lys)*	*2,08*
3	Methionine (Met)	0,25
4	Vanile (Val)	1,52
5	Tirozine (Tyr)	1,30

Table 4
Composition Amino acid Non Esential (g/100g dry mass)

No	Amino acid	Unit g/100 mg
1	Alanine (Ala)	1,20
2	Arginine (Arg)	1,15
3	Aspantie acid (Asp)	1,50
4	Glicine (Gli)	0,75
5	Serine (Ser)	0,90

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Figure 1. Mushroom merang

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Table 5
Summary T-test (post-test)

Statistic	Crop Fungus On Mini Beetle	
	Distance 60	Distance 75
Number of respondent	20	20
Average ($\overline{X}$)	3,90	4,12
Variance (S^2)	0,11	0,04
t_{hitung}	-2,562	
t_{tabel}	1,725	
Conclusion	Thank H_0	

1. Factors amount of compost (main influence) does not provide real interaction (non-significant).
2. Factors types of compost (main influence) significant effect (significant = 6.62).
3. Combination two major influences (the number and types of compost) no significant effect (no interaction).

According to the table above can be seen on the calculation hypothesis test at real level $\alpha = 0.05 = -2,562$dan obtained t table = 1.725. In accordance with the criteria analysis. If: $t_{table} \geq t_{count}$, then Ho is accepted. Therefore, the data analyzed t tabel greater than t count accept the research hypothesis Ho, which means that the result means that the fungus beetles Yields mini distance of 60 cm is not better or equal to harvest the fungus beetles distance of 75 cm. Thus the harvest fungus beetles distance of 75 cm better than the mushroom harvest beetle mini distance of 60 cm.

The distance between the shelves with a height of 75cm real impact on mushroom production compared to the distance between the shelves as high as 60cm. Media mushrooms always wanted a high material content. Wherein the concentration of organic media (waste cattle) 100% figures show production is also high compared to a concentration of 50% and 25% of the organic waste. Obtained five essential amino acids and minerals and protein in mushroom and five pieces of essential amino acids.

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IV. CONCLUSION

Factors amount of compost (main influence) does not provide real interaction (non-significant). Factors types of compost (main influence) significant effect (significant = 6.62). Combination two major influences (the number and types of compost) no significant effect (no interaction).

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