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Mushroom: Good source for better nutrition and health benefits

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Abstract

Mushroom is micro edible food fungus. It is eaten as a vegetable and other recipes and food products. Mushrooms are a storehouse of nutritional and medicinal properties. Due to being full of all the nutrients in it, it is called the power of house nutritional element. Various type nutrients low calories, carbohydrates, vitamins, minerals, protein, fiber, fats, lipid, all amino acids of human development found in mushrooms. It contains sufficient amounts of thiamin B1 riboflavin B2 niacin, pantothenic acids, biotin, folic acids and is an excellent source of vitamins A, B, C, D, E, and K which are not destroyed even after cooking. Protein, vitamins D fibers, antioxidants are found in high amount carbohydrates, fats are found in small amount in mushroom. It is actually interesting to know that mushrooms are the only non - animal source of vitamin D. It absorbs UV rays from sunlight and is good sources of vitamin D. Consuming mushrooms in food strengthens the immune system protects and malnutrition the body form diseases. It is beneficial for human health and improves quality of life. Mushroom maintains heart health, brain function, bone health, skin disease cell formation in the body and develops fetal in pregnancy. It prevents cancer hypertension, diabetes, osteoarthritis. Medicinal properties in mushroom antiviral, antifungal, antibacterial, antitumor, antilipidaemic, and antihyperglycaemic, antihypertensive, immunomodulators, cardiovascular protector, antigenotoxic, anti - HIV. Mushroom cultivation and consumption play an important role in increasing income, self - employment business economic development. There is a Chinese saying for mushrooms “medicines and food have a same origin”. Mushrooms are indeed one of the best vegetarian foods, which provide complete nutrition.

Keywords: Mushrooms, complete nutritional, medicinal properties, protection disease, indoor activity, consumptions, commercial benefits, immune system, antioxidants agent, ergocalciferol, health benefits

Introduction

Mushroom is a micro fungus, which is visual by naked eye, which is picked and broken by hand. Mushroom is a type of edible food fungus, whose body is flat or umbrella - shaped, which grows very quickly, it is eaten as a vegetable.

Commonly found in most places like soil, cow dung, wood / dead wood material in stone crevices and on tree. These are hypogenous or epigeous so they are visible to the naked eye are picked by hand (Chang and Miles, 1992) [4].

But the edible mushroom is grown by the farmer through the mushroom seeds on the purified paddy straw or wheat straw by seeds which does not contain toxin. There are many varieties of mushroom in which having different shape, size, textures, aroma, colours flavors etc.

Mushrooms are being consumed in different countries since ancient time. Mushroom is considered by china as healthy food and “elixir of life”. The Romans considered mushrooms to be the “Food of Gods”. The ancient Greeks believed that mushrooms were food to provide strength to warriors in battle.

Mushrooms are healthy diet for human. Mushroom provides many types of nutrients, which are beneficial for human health and fitness. Mushroom is store house of many types of nutrition. Mushrooms are edible fungi that provide many important nutrients.

Nutrition profile in mushrooms contains calories, protein, vitamins, minerals, lipids, fibers, carbohydrates and fats. Protein, fibers, vitamin - D, antioxidants are found in high in mushrooms. Mushrooms are low in carbohydrates and fats. It consists of carbohydrate including chitin, hemicellulose and glycogen.

Due to the abundance of rich in protein, minerals, vitamins, in mushroom, its nutritional

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value is high. Mushroom has low fat, calories, N: K ratio and starch is absent, so it is considered suitable for obesity, hypertension, blood pressure, diabetes patients (Quimio, 1976, Vijaya and Pandya, 1981, Wahid *et al.*, 1988) [19, 9, 10].

Mushroom being high in nutrients are a perfect fit in health and daily lifestyle, and are a versatile product. Mushroom being an important source of protein are delicious healthy and sustainable food for vegetarians.

For non-vegetarians, non-vegetarian meals provide satisfaction and are an easy way to get more protein by reducing the consumption of meat. Mushrooms are considered the super foods of health and healthy life.

It is a miracle in our foods as a balance diet. Mushrooms can be a vegetarian's protein supplement option due to their complete nutritional value. And various dishes can be used modern health therapeutic food.

Consuming mushroom in diet improves heart health, brain functioning, bone health, reduces the risk of diabetes, preventing cell damage, and promotes fetal development in pregnancy, skin disease, and other benefits in preventing cancer and hypertension patients for maintaining health.

Mushroom has the absence of starch, which is more useful for diabetes and help in reducing obesity. Mushroom are low fat in but rich in essential fatty acids, such as linoleic, palmitic acids, steric acids and oleic acids, monoterpenoid, diterpenoid lipids and free form cholesterol etc.

Mushroom lower cholesterol controlled weight and prevent the risk of type - II diabetes. Mushrooms are high in the protein antioxidants, glutathione and arginine, fighting oxidative, stress and inflammation and prevent of chronic disease.

Mushroom contain almost all type the essential amino acids of protein. Present in mushroom amino acid such as hydrophobins, leucine, isoleucine valine, tryptophan, hystidine, threonine, phenyl amine, methionine, lysine, and also the alanine, arginine, cysteine glycine, glutamic acids, praline acids, aspartic acids, organic acids, ascorbate, shikimate, malate and fumarate, serine etc.

Mushrooms are high in protein compared to other protein sources such as cereal crops, animal production and fish protein. Mushroom are an essential part of a human balance diet, a wonderful food for weight loss and happy healthy

living.

Mushrooms are now considered a useful food in the modern diet, being an integral part of a major supplement to a human balance diet. The high fiber present in mushroom prevents type - II diabetes reducing blood sugar levels.

The high fiber and alkaline ach and content present in mushroom help in digestibility and prevention of constipation and acidity hyperacidity problems. And keeps the stomach cleans.

The stem and cell wall of the mushroom contains a fiber called beta - glucans consuming it in food reduces the level of cholesterol in the blood.

Various types of vitamins are found in mushroom.

Good source of all type of Vitamins - A (carotene), Vitamin - B Complex B1 (Thiamine), B2 (Riboflavin), B3 (Niacin), B5 (pantothenic acid), B6, B9, (Folate) B12, Flavin and pyridoxine organic acid etc.

Vitamin B in mushroom gets energy from red blood cell in edible from. Vitamin B help the body get energy from food and vitamin B is important for brain health. Vitamin - C, Vitamin - D, Vitamin - E, Vitamin - K, is also presents in mushrooms.

Vitamin D2 is in from of ergocalciferol. Mushroom contains a substance called ergosterol which when exposed to ultraviolet light turn in to vitamin D. Vitamin D is abundant in mushroom, which strengthens the bone and prevents osteoarthritis. Mushrooms are only non - animal vegetarian source of vitamin D too.

Vitamin - C controlled skin disease scurvy. Folic or, folate found in mushroom is beneficial for fetal health. Mushrooms are good source of minerals. It contains less iron but is available. And calcium is high. Apart from this, it contains cadmium, lead, trace elements selenium and sodium, phosphorus, magnesium, potassium, zinc, manganese, copper. The calcium and phosphorus present in mushrooms in natural from strengthens our teeth and bone by making them structure. Selenium present in mushroom is a powerful antioxidant that is found as a naturally rich source that protects our body from cell damage, thereby reducing the chances of heart disease, cancer.

Six types of mushrooms are cultivated on large scales



Fig 1: Paddy straw mushrooms (*Volvariella Spp*)



Fig 2: Oyster mushrooms (*Pleurotus Spp*)



Fig 3: Button mushrooms (*Agaricus Spp.*)



Fig 4: Milky mushrooms (*calocybe spp.*)



Fig 5: Jew's mushrooms (*Auricularia Spp.*)



Fig 6: Shiitake mushrooms (*Lentinula Spp.*)

Potassium controls blood pressure and good for hypertension patients as the potassium, sodium ratio is balance in mushrooms. Mushroom antioxidants like ergothioneine and selenium protect body cell from damage that might lead to chronic diseases.

Mushroom contains polysaccharides which act as prebiotics for beneficial bacteria of the intestine and are beneficial for gut health. Mushrooms are considered a nutraceutical food product, an integral part of a normal balance human diet.

The choline present in mushroom helps with important bodily functions such as muscles movement healthy brain development, the nervous system and metabolism learning and memory. Choline helps maintain the structure of cellular membranes and play a role in the transmission of nerve impulses.

Consuming mushrooms in the diet helpful in curing human diseases like high blood pressure, obesity, hyperlipidemia, hypertension and tumor and also protects the body from disease (Chang, 1996) ^[4]. Mushrooms reduce tumor growth and inflammation, inhibit blood lipid concentration (Zhang, *et al.*, 1994, Wang *et al.*, 2005., Hu *et al.*, 2006b) ^[20, 21, 5] and prevent high blood pressure atherosclerosis (Gunde - Cimmermann, 1999) ^[22].

Mushrooms are becoming an internal part of human diet presently people are including mushroom in their diet. Mushroom has medicinal properties, it contains antitumor (Wandati *et al.*, 2013) ^[23] antigenotoxic, bioantimutagenic (Fillipie *et al.*, 2002) ^[2] anti - inflammatory, antilipidaemic, antihyperglycaemic and antihypertensive, (Hu *et al.*, 2006) ^[5] antibacterial and antifungal (Nehra *et al.*, 2012) ^[6], immunomodulators (Jeong *et al.*, 2010) ^[7], antibiotic properties (Upadhyay, 2007) ^[12], antiviral, antifungal and antibacterial (Chang and miles 1989) ^[24] and

hypocholesterolemic anti-HIV (Wangat *et al.*, 2000).

Antioxidant present in mushroom protects the cell of body from damage. Protects the body from chronic disease, repair the damage cells and formation new cells. Antioxidants agent present in mushrooms protect and prevent the body from lung, prostate, breast, and other type of cancer.

Mushroom are healthy diet to eat and beneficial for human health and fitness and human immune system and improves quality of life. Consuming mushroom in food provides good health and protection from diseases. It is an integral part of our balanced diet.

Mushroom produce vitamin D naturally after harvesting when exposed to sunlight. According to the US Department of Agriculture, the amount of vitamin D in mushrooms depends on the unexposed exposure to sunlight after harvesting.

Water is 91% in it, due to high moisture, it is difficult to store for a long time. Nutrient rich mushrooms are processed in to food products such as pickle, jam, mushroom juice or power, biscuits and bread, papad, laddu, soup, candy, noodles, namkeen, medicines and other production. Mushroom halva, pulao, kheer, thekua, pakora, mathri and other products are being used in food. So that commercial and consumptions value can be boosted.

Mushroom can also be used as colours. Chromophores of colours are present in this organic compound, from which colours are formed. Mushrooms are used to dye wool and other natural fibers. All colours of the spectrum can be obtained from mushrooms.

Before the invention of synthetic dyes, mushrooms were also used for dyeing clothes. Mushrooms are also used to promote plant growth in the development of new biological treatment techniques. And mushroom fungus is also used to reduce the level of bacteria present in contaminated water through

filtration techniques.

Mushroom cultivation can open a new window in the development of industrial sectors by boosting the economy and commercialization. Mushroom cultivation appears essential for biodiversity, conservation, health benefits, and industrial sectors such as agricultural, pharmaceuticals, bio waste management and commercial benefits bio-filtration.

Farmers burn the grain straw or, paddy straw in field or, farm. Due to which there is air pollution. Carbon dioxide, carbon monoxide, and methane gases increase in the atmosphere. And the earthworm and rhizobium bacteria present in the soil also die.

Due to which the fertility of the soil decreases. Earthworm and rhizobium bacteria are called friends of farmer. Earthworm makes the soil friable, due to which the soil gets oxygen.

Rhizobium bacteria get nitrogen from the atmosphere and convert it in to nitrate, which in the fertility of the soil. This straw can be used as raw material for mushroom cultivation. In this way environmental pollution can be reduced significantly by bioconversion.

India is an agricultural based country. Here all varieties of

mushroom are cultivated in different season at different temperatures. Mushroom cultivation can be beneficial for landless farmers, unemployed youth and other entrepreneurs. Mushroom cultivation and consumption creates opportunities of self - employment and opens the doors for economical development.

Its cultivation is also done in less space basically it is an indoor activity. Mushroom is a cash crop. It is considered as short return agriculture business and farmer can obtain instant benefits. To grow mushroom one should have little space on which they can grow mushroom easily.

Land has been a limiting factor in food production, but less land is required for mushroom production. Mushroom production and cultivation can prove to be a boon for eco - friendly and reducing the problems of global energy crisis by recycling agro-industrial waste.

There are many species of mushrooms some wild mushrooms contain toxins, which are harmful to health. Therefore, one should always identify the varieties of edible mushrooms and buy them from trusted places. Mushrooms can be poisonous if with eaten with alcohol, may cause purple - reddish skin discoloration.

Table 1: According to USDA, the nutrition of (100 gram) of mushroom is as follows

Calories	22 kcal	Iron	0.5 mg
Carbohydrates	3.26 g	Copper	0.318 mg
Protein	3.09 g	Selenium	26µ
Fiber	1 gram	Zinc	0.52 mg
Fat	0.34 g	Sugar	1.98 g
Potassium	318 mg	Vitamin B6	104 mg
Phosphors	86 mg	Vitamin B12	0.04 mg
Magnesium	9 mg	Vitamin C	2.1 mg
Sodium	5 mg	Vitamin D	33%
Calcium	3 mg	Vitamin D (UV exposed)	1276 IU
Water	91%	Vitamin K	Available
Choline	Available	Vitamin A	Available
Lead	Available	Vitamin E	Available

Aim of objective

1. To make people awareness of mushroom cultivation and to promote the consumption of mushroom in the diet.
2. To give information about the health benefits of consuming mushrooms in the diet, so that a happy life and healthy body can be built.
3. To make people aware of the medicinal properties and nutrients of mushrooms to popularize the cultivation and consumption of mushroom.

4. To give information about skill development, entrepreneurship social out rich, employment generation, prevention of malnutrition prevention of disease among people though mushroom cultivation.
5. To use in diet as a medical food and to information people about the nutritional value.
6. To give information about different recipes of mushroom and different food production.

Nutrition of mushroom	Benefits
High quality protein Low sodium high potassium No starch, low sugar No cholesterol Rich in fiber Only vegetable which vitamin D Folic acid, vitamin B and minerals Ascorbic acid and carotenoids Low calorie food And Low Fats Selenium and Egothioneine Low fats and Low calories Present in calcium and phosphorous Powerful Antioxidant	Combats malnutrition Controls hypertension Delight of diabetic's Healthy heart. Improves digestion No Hyperacidity Cures rickettsia And Strengtheners Bone Improves health Fetal Growth in Pregnancy Antioxidant Reduces Obesity Anti - cancer property Helps lose weight. Strengthens Bone And strong Teeth Boosted Immune system

Conclusion

Therefore, we can say that the cultivation of mushrooms provides health food production nutrients and reduces our environmental pollution. Create opportunities of self-employment and the open the doors for economic development. Consuming mushrooms foods improves human health and protects from diseases. Mushroom cultivation is not only to get quality complete food, but it is a way to

produce quality food, money, manure using agricultural waste. Mushrooms cultivation and consumption creates opportunities of self - employment for landless farmers, unemployed youth and other entrepreneur's for economical can prove to be boon. Mushrooms are one of the ideal foods for vegetarian, rich in nutrition, with delicious medicinal properties.

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