



# REVIEW ON EXPLORING THE ROLE OF OYSTER MUSHROOMS IN OBESITY

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## ABSTRACT

Maximum of the humans now are dealing with weight problems as their foremost issues. It may motivate because of calorie intake, non-stop paintings without workout and modifications in meals behaviour this is intake of junks and etc., Mushroom is one of the tastiest snack that everybody likes to have it. In the growing present day drug treatments the position of our herbs and conventional meals behaviour like mushroom and others are gambling very crucial position in our health. In this overview article we're going to see the useful position of oyster mushroom in weight problems problem.

## INTRODUCTION

Obesity is a complicated sickness regarding too much frame fats. Obesity is not only a beauty concern. It is a clinical hassle that will increase your chance of different illnesses and fitness problems, along with coronary heart sickness, diabetes, excessive blood stress and sure cancers. Obesity regularly consequences from taking in greater energy than are burned through workout and regular each day activities. Obesity takes place whilst a person's frame mass index is 25 or more. The immoderate frame fats will increase the chance of great fitness problems. The mainstay of remedy is life-style adjustments along with food plan and workout. For adults, WHO defines obese and weight problems as follows obese is a BMI more than or identical to twenty-five and weight problems is a BMI more than or identical to 30. BMI gives the maximum beneficial population-stage degree of obese and weight problems as it's far the identical for each sex and for every age of adults. However, it need to be taken into consideration a hard manual due to the fact it can now no longer correspond to the identical diploma of fatness in specific people. For youngsters, age desires to be taken into consideration whilst defining obese and weight problems. For youngsters beneathneath five years of age obese is weight-for-top more than 2 trendy deviations above WHO Child Growth Standards median and weight problems is weight-for-top more than three trendy deviations above the WHO Child Growth Standards median. Overweight and weight problems are

described as follows for youngsters elderly among five–19 years obese is BMI-for-age more than 1 trendy deviation above the WHO Growth Reference median and weight problems is more than 2 trendy deviations above the WHO Growth Reference median Raised BMI is a chief chance issue for non communicable illnesses along with cardiovascular illnesses (specially coronary heart sickness and stroke), which have been the main reason of demise in 2012; diabetes; musculoskeletal disorders (particularly osteoarthritis – a quite disabling degenerative sickness of the joints); a few cancers (inclusive of endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon). The chance for those non communicable illnesses will increase, with will increase in BMI. Childhood weight problems is related to a better threat of weight problems, untimely demise and incapacity in adulthood. But similarly to improved destiny risks, overweight youngsters revel in respiratory difficulties, improved chance of fractures, hypertension, early markers of cardiovascular sickness, insulin resistance and mental effects. Children in low- and middle-earnings nations are greater liable to insufficient pre-natal, infant, and younger infant nutrition. At the identical time, those youngsters are uncovered to excessive-fats, excessive-sugar, excessive-salt, strength-dense, and micronutrient-negative foods, which have a tendency to be decrease in value however additionally decrease in nutrient quality. These nutritional patterns, along side decrease tiers of bodily activity, bring about sharp will increase in early life weight problems even as under nutrition troubles stay unsolved. The World Cancer Research Fund and International Agency for Research on Cancer have cautioned that obese or overweight people are quite liable to get diverse cancers, particularly adeno carcinoma of the esophagus, colon, breast, endometrium, and kidney. Epidemiological research have additionally indicated that malignancies of the liver, gallbladder, and pancreas are weight problems-related and that weight problems should decorate the risk for different malignancies inclusive of thyroid, prostate, leukemia, non-Hodgkin's lymphoma, more than one myeloma, and melanoma. It has been appraised that approximately 20% of all most cancers demises withinside the United States may be diagnosed as linked with obese and weight problems. Decreased tiers of oestrogen after menopause have additionally been related with extra adiposity and accumulation of visceral fats. Besides that, weight problems prompted through hormonal imbalances is attached to a number of destructive fitness headaches because of cardiovascular abnormalities and insulin resistance. It is widely known that testosterone is a number one hormone withinside the pathophysiology of obese and weight problems. Decreased tiers of testosterone are linked with excessive-fats mass, in particular imperative adiposity and reduced skinny mass in males. These feature functions are linked to metabolic syndrome and testosterone deficiency and are related with strength inequity, hyperglycemia, insulin resistance and dyslipidemia. Testis dysplasia and alteration of intercourse hormone tiers exist in overweight male adolescents. Obesity and accumulation of fats cause accelerated estradiol and declined general and loose testosterone that ends in erectile dysfunction.

## BACKGROUND INFORMATION

Mushrooms were considerably used as meals, nutraceuticals, and drugs considering the fact that time immemorial. They comprise diverse bioactive compounds, which include number one metabolites that might forestall oxidative stress. Mushrooms are fungi – a member of the 0.33 meals kingdom – biologically wonderful from plant and animal-derived meals that contain the USDA meals patterns, but have a completely unique nutrient profile that offers vitamins not unusualplace to each plant and animal meals. Mushrooms are becoming more popular as major entrees in plant-based diets, despite being classified as a vegetable. According to the studies team, the fungi ought to raise consumers' efforts to comply with meals-primarily based totally nutritional steering pointers to decrease their consumption of energy, saturated fatty acids, and sodium, whilst growing their consumption of under-fed on vitamins which include fibre, potassium and diet D. Often grouped with greens, mushrooms offer the various nutrient attributes of produce, in addition to attributes extra generally located in meat, beans or grains. According to the studies team, mushrooms are precise in that they may be the simplest meals withinside the produce aisle that comprise diet D. One serving of raw, UV-exposed white (ninety grammes) and crimini (eighty grammes) mushrooms contains 23. 6 mcg (118 percent RDA) and 25. 52 mcg (128 percent RDA), respectively, of vitamin D. They're also high in antioxidants like ergothioneine and selenium, both of which are anti-inflammatory substances. The phyto chemicals—or evidently taking place plant chemicals—in mushrooms “appear to be mainly potent, showing a few anti-most cancers and anti-getting old houses,” says Brian St. Pierre, a registered dietitian and director of overall performance vitamins at Precision Nutrition. The oyster mushroom is a not unusualplace form of safe to eat mushroom. The fungi were given their call due to the fact they've a form and colour much like an oyster. They are regularly fed on as a meals, however oyster mushroom dietary supplements also are available. Oyster mushrooms comprise some of materials idea to persuade fitness. These materials encompass nutritional fiber, beta-glucan, and numerous different polysaccharides—a category of carbohydrates located to have an effect on immune function. Scientific research at the fitness advantages of oyster mushrooms are emerging. Research has tested the capability advantages of this fungus. Oyster mushrooms offer nutritional fiber, beta-glucan, and different elements that could raise fitness. They have a sensitive flavor and may be used to feature taste to a extensive style of savory dishes. They can without difficulty be located in maximum grocery stores, making them a clever addition in your diet. Oyster mushrooms are almost fat-free, supplying simply 0.3 grams in step with serving. When you consume a cup of oyster mushrooms, you'll get roughly three grammes of protein. Oyster mushrooms are high in a variety of vitamins, including niacin (which accounts for 21% of your recommended daily intake), riboflavin (18%), and pantothenic acid (which accounts for 12%). (11 percent ). You'll additionally get smaller quantities of folate, diet B6, and thiamine Phosphorus, potassium, copper (each providing 10% of your daily needs), iron, magnesium, zinc, manganese, and selenium are among the minerals found in oyster mushrooms. Oyster mushrooms (*Pleurotus ostreatus*) contain enough dietary fibre to help lower triglyceride levels in the liver, according to a 2015 study. Research has indicated that entire meals with fiber, together with mushrooms, offer numerous fitness results with few energy making them a clever desire for a wholesome

ingesting pattern. Several research have related a better consumption of fiber with higher coronary heart fitness. Authors of 1 look at in particular stated that fiber in greens and different meals "makes them appealing objectives for disorder prevention and discount of hazard of atherosclerosis and cardiovascular disorder." Oyster mushrooms can also additionally beautify immune function, in step with a small look at posted in 2016. For the look at, members ingested an oyster mushroom extract for 8 weeks. At the look at end, researchers located proof that the extract can also additionally have immune-improving results. Oyster mushrooms, according to another study, contain chemicals that function as immune modulators, assisting in the modification of the immune system. The beta-glucans and antioxidants in oyster mushrooms make it a high- quality meals for decreasing infection. Some studies suggests that past beta-glucans, a number of the oyster's anti inflammatory houses come from a completely unique and extremely unknown amino acid referred to as ergothioneine. According to the studies, ergothioneine lowers "systemic" infection throughout the whole frame which regularly contributes to sicknesses like dementia and diabetes. The research display that copper has an effect at the mind pathways consisting of galactose and dopamine which allows to preserve the energy, temper, recognition and outlook. The deficiency of copper effects in fatigue, low metabolic activity, terrible temper and hassle in concentration. Copper additionally allows to make use of the antioxidants consisting of superoxide dismutase, Vitamin C, tyrosinase and ascorbate oxidase. This allows to save you the harm made via way of means of loose radicals withinside the mind and additionally slows down the system of ageing, neuro - degenerative sicknesses and cancer. An insufficient quantity of oxygen withinside the blood, low pink bloods mobileular manufacturing and the blood loss are the reasons of Anemia. Vitamin B2 allows to save you the anemia. Vitamin B2 is important for manufacturing of pink blood cells and steroid hormone synthesis. It assists in transporting the oxygen withinside the frame and additionally mobilizes iron. The humans with low Vitamin B2 have the excessive possibilities of sickle mobileular anemia and anemia. The studies indicates that Vitamin B2 allows to lessen the homocysteine degrees withinside the blood. Vitamin B converts the carbohydrate into glucose that is used as a gasoline to supply energy. Vitamin B synthesizes the frame and metabolizes proteins and fats. Vitamin B5 help to rebuild muscles, tissues and organs. Vitamin B5 allows to preserve the greatest stage of metabolism. Vitamin D, phosphorus and calcium allows to shape and preserve the dental fitness via way of means of supporting the jaw-bone mineral density, keeping the enamel and teeth enamel. Children want calcium and phosphorus wealthy meals to broaden the grownup enamel and shape the difficult shape of enamel. Vitamin D calls for phosphorus to stability the calcium and beautify absorption whilst forming teeth. Vitamin D reduces the gum infection that is associated with periodontal gum disease. Neurotransmitter features rely on the ok quantity of iron to preserve a superb temper. It additionally relies upon at the hormone stability consisting of dopamine, serotonin and others. So the deficiency of iron results in horrific sleep, terrible temper, loss of motivation and occasional stage of energy. Vitamin B1 help to lessen the possibilities of mind sickness named as Wernicke - Korsakoff Syndrome which incorporates nerve harm, muscle movement, hassle in taking walks and lethargy. It is brought about because of the low thiamine and terrible eating regimen however is

commonly visible within the alcoholics. The excessive consumption of thiamine can lessen the signs and symptoms of alcohol withdrawal.

## CONCLUSION

Mushroom is an without difficulty to be had fungi that's beneficial within the procedure of checking out and useful charge is better than others. According to the diverse studies mushroom performs a totally critical function in weight problems and such studies inspire growing scientists to analyze within the herbal remedy area within the growing present day medicine.

## REFERENCE

- Bobek P, Ozdin L, Kuniak L. Antioxidative effect of oyster mushroom (*Pleurotus ostreatus*) in hypercholesterolemic rat. *Pharmazie*. 1995;50:441–442. [PubMed] [Google Scholar]
- Paulik S, Svrcek J, Mojzisova J, Durove A, Benisek Z, Huska M. The immunomodulatory effect of the soluble fungal glucan (*Pleurotus ostreatus*) on delayed hypersensitivity and phagocytic ability of blood leucocytes in mice. *Zentralbl Veterinarmed B*. 1996;43:129–135. [PubMed] [Google Scholar]
- Gu YH, Sivam G. Cytotoxic effect of oyster mushroom *Pleurotus ostreatus* on human androgen-independent prostate cancer PC-3 cells. *J Med Food*. 2006;9:196–204. [PubMed] [Google Scholar]
- Lavi I, Friesem D, Geresh S, Hadar Y, Schwartz B. An aqueous polysaccharide extract from the edible mushroom *Pleurotus ostreatus* induces anti-proliferative and pro-apoptotic effects on HT-29 colon cancer cells. *Cancer Lett*. 2006;244:61–70. [PubMed] [Google Scholar]
- Jiang J, Slivova V, Valachovicova T, Harvey K, Sliva D. *Ganoderma lucidum* inhibits proliferation and induces apoptosis in human prostate cancer cells PC-3. *Int J Oncol*. 2004;24:1093–1099. [PubMed] [Google Scholar]
- Sliva D, Harvey K, Mason R, Lloyd F, Jr, English D. Effect of phosphatidic acid on human breast cancer cells exposed to doxorubicin. *Cancer Invest*. 2001;19:783–790. [PubMed] [Google Scholar]
- Lim DY, Tyner AL, Park JB, Lee JY, Choi YH, Park JH. Inhibition of colon cancer cell proliferation by the dietary compound conjugated linoleic acid is mediated by the CDK inhibitor p21CIP1/WAF1. *J Cell Physiol*. 2005;205:107–113. [PubMed] [Google Scholar]
- Rajewska J, Balasinska B. Biologically active compounds of edible mushrooms and their beneficial impact on health. *Postepy Hig Med Dosw*. 2004;58:352–357. [PubMed] [Google Scholar]
- Poucheret P, Fons F, Rapior S. Biological and pharmacological activity of higher fungi: 20-Year retrospective analysis. *Cryptog Mycol*. 2006;27:311–333. [Google Scholar]
- Ajith TA, Janardhanan KK. Indian medicinal mushrooms as a source of antioxidant and antitumor agents. *J Clin Biochem Nutr*. 2007;40:157–162. [PMC free article] [PubMed] [Google Scholar]
- Sliva D, Jedinak A, Kawasaki J, Harvey K, Slivova V. *Phellinus linteus* suppresses growth, angiogenesis and invasive behaviour of breast cancer cells through the inhibition of AKT signalling. *Br J Cancer*. 2008;98:1348–1356. [PMC free article] [PubMed] [Google Scholar]
- Sarangi I, Ghosh D, Bhutia SK, Mallick SK, Maiti TK. Anti-tumor and immunomodulating effects of *Pleurotus ostreatus* mycelia-derived proteoglycans. *Int Immunopharmacol*. 2006;6:1287–1297. [PubMed] [Google Scholar]

Gu YH, Leonard J. In vitro effects on proliferation, apoptosis and colony inhibition in ER-dependent and ER-independent human breast cancer cells by selected mushroom species. *Oncol Rep.* 2006;15:417–423. [PubMed] [Google Scholar]

Bobek P, Galbavy S. Hypocholesterolemic and antiatherogenic effect of oyster mushroom (*Pleurotus ostreatus*) in rabbits. *Nahrung.* 1999;43:339–342. [PubMed] [Google Scholar]

Caz V, Gil-Ramírez A, Largo C, et al. Modulation of cholesterol-related gene expression by dietary fiber fractions from edible mushrooms. *J Agric Food Chem.* 2015;63(33):7371-80. doi:10.1021/acs.jafc.5b02942

Chang ST, Wasser SP *Int J Med Mushrooms.* 2012; 14(2):95-134.

Impact of consumption of repeatedly heated cooking oils on the incidence of various cancers- A critical review. Ganesan K, Sukalingam K, Xu B *Crit Rev Food Sci Nutr.* 2019; 59(3):488-505.

Jemal A, Siegel R, Ward E, Hao Y, Xu J, Murray T, Thun MJ. Cancer statistics. *CA Cancer J Clin.* 2008;58:71–96. [PubMed] [Google Scholar]

Lee KH, Morris-Natschke SL, Yang X, et al. Recent progress of research on medicinal mushrooms, foods, and other herbal products used in traditional Chinese medicine. *J Tradit Complement Med.* 2012;2(2):84-95.

Martin KR, Brophy SK. Commonly consumed and specialty dietary mushrooms reduce cellular proliferation in MCF-7 human breast cancer cells. *Exp Biol Med.* 2010;235(11):1306-14. doi:10.1258/ebm.2010.010113

Minato KI, Ohara A, Mizuno M. A proinflammatory effect of the  $\beta$ -glucan from mushroom on macrophage action. *Mediators Inflamm.* 2017;2017:8402405. doi:10.1155/2017/8402405.

Minato KI, Ohara A, Mizuno M. A proinflammatory effect of the  $\beta$ -glucan from mushroom on macrophage action. *Mediators Inflamm.* 2017;2017:8402405. doi:10.1155/2017/8402405

Molecular targets of vitexin and isovitexin in cancer therapy: a critical review. Ganesan K, Xu B *Ann N Y Acad Sci.* 2017 Aug; 1401(1):102-113.

Mushroom Polysaccharides: Chemistry and Antiobesity, Antidiabetes, Anticancer, and Antibiotic Properties in Cells, Rodents, and Humans. Friedman M *Foods.* 2016 Nov 29; 5(4):

Obesity and prostate cancer: weighing the evidence. Allott EH, Masko EM, Freedland SJ *Eur Urol.* 2013 May; 63(5):800-9.

Obesity as a major risk factor for cancer. De Pergola G, Silvestris F *J Obes.* 2013; 2013():291546.

Pathophysiology of human visceral obesity: an update. Tchernof A, Després JP *Physiol Rev.* 2013 Jan; 93(1):359-404.

Soliman GA. Dietary fiber, atherosclerosis, and cardiovascular disease. *Nutrients.* 2019;11(5):1155. doi:10.3390/nu11051155

Tanaka A, Nishimura M, Sato Y, Sato H, Nishihira J. Enhancement of the Th1-phenotype immune system by the intake of Oyster mushroom (*Tamogitake*) extract in a double-blind, placebo-controlled study. *J Tradit Complement Med.* 2016;6(4):424-430. doi:10.1016/j.jtcme.2015.11.004

Testosterone and obesity. Kelly DM, Jones TH *Obes Rev.* 2015 Jul; 16(7):581-606.

The adverse effects of obesity on conception and implantation. Brewer CJ, Balen AH *Reproduction.* 2010 Sep; 140(3):347-64.

The role of culinary-medicinal mushrooms on human welfare with a pyramid model for human health.

Zhang LD, Li HC, Gao M, Wang L, Deng Q, Shi T, He JL, Chong T, Wang ZM *Zhonghua Nan Ke Xue.* 2013 May; 19(5):434-8.