In United States meadow mushrooms are mostly cultivated. Meadow mushrooms (Agaricus brunnescens, the sporophores of A. brunnescens are used in pizzas. Other mushrooms like; Shiitake, oyster and straw mushrooms are also being used for the same purpose and are commercially grown. Mushroom has higher amino acids content than all fungi except spinach and soybeans- mushroom has also medicinal value are being used to cure tumor and chlesterol. Two naturally grown fungi are morels and Truffles, they are highly renowned for their taste and other nutritional values. Truffles are associated with the roots of many trees especially oak tree. Truffles are hunted by pigs and dogs. Truffles are highly expensive because these are found in Europ European people sell them at very high cost that is one pound for hundreds of dollars. morels are also known as sponge mushr-om. morels appears only for few weeks in spring in certain geograph-cal regions of the world, therefore people plane to hunt them. This is really a great leisure activity in many parts of the world, specially in U.S.A.

Many mushrooms are highly poisonous. most renowned poisnous mushroom is Amnita spp.

the symptoms which may appear due to poisnous mushroom may be;

- Gastrointestinal distress.
- Sever liver and kidney damage

Some years ago, American Ambass-ador to Italy is said to have become ill because one voracious fungus attacked the green pigment in the wall paper of her bedroom producing arsin, a poisnous gas.

A Smut fungus i.e. Ustilago maydis that attacks on the ears of corn, produces galls these galls are called 'Maize Mush-rooms'. These maize mushrooms have differ-food additives which are used in mexican dishes and are very popular in mexico. These mushrooms are also being used as gourmet cooks in U.S.A.

Many other fungi, for example are being used for many purposes. eg

↳ penicillium are used to give flavour to cheese

↳ many fungi are used in the pro-duction of various types of sausages, soya sauce from wheat and soyabeans.

↳ Rhizopus, Mucor and Actino-mucor are used in increasing the digestibility of vegetable material.

↳ many fungi are involved in fermentation

↳ Fusarium graminearum are used as high quality mycoprotein instead of meat in U.S.A and U.K.

These mycoprotein are highly nutritious but these have two constraints i)- Having high level of nucleic acid that can cause health problem ii) low in number of amino acids.

Yeasts like Saccharomyces cerevisiae convert glucose sugar to ethyle alchohal and Co2 (fermentation process), thus fungi in this way are important in brewing and bakery industry. During fermentation, the small bubbles of Co2 raise the bread, while in brewery alchohal is the important product. Virtually any plant that contains either sugar or starch can be used to produce alchohal. Fungi like Botrytis cineres plays role in making dessert wine by grapes. Therefore, European farmer inoculate the grapes vines with B. cineres that rot the vines and make them sweather. For this reason, B. cineres is also called "Noble rot".

Different types alchohal are formed from different plant sources; VODKA from wheat, rye, potato and corns, BEER from barley, RYE from corn, MEAD from honey and BOURBON from corn. As the grains of wheat, Barley, rice etc have starches which can not directly be converted into alchohal. Therefore, first must be converted into simple glucose molecules, and then to alchohal. Fungi in this regard help, for example, Mucor, Rhizopus and

yeasts saccharify the starches to glucose, which than after fermentation are converted to alchohal. Hence, it is proven, fungi are pivotal in Brewing industry.

In addition to ethyle alchohal, fungi also produce veriety of chemical compounds, e.g. ergosterol, Cortisone, various enzymes, α-amylase, rennin, cellulase, catalase, lactase, and lipase; acids such as fumaric acid, lactic, citric, succinic acid; and plant growth regulator known as gibberellins. B-vitamins can also be obtained from yeasts.

Fungi are offcourse very important interms of plant diseases and are causing billion dollars losses in the world. Examples of these diseases may be;

- Downy mildew
- Powdery mildew
- Late Blight of potato and tomato.
- Early Blight of potato and tomato.
- Corn smut
- Rust diseases
- Foolish seedling disease of rice
- Ergot of rye
- club root of crucifers
- Golf disease i.e. grass disease caused by Pythium and Phytophthora spp.

Fungi are also important to control weeds as weedicides. Colletotrichum gleoesporioides is used as mycoherbicide. Fungi producing phytoalexins are also being used against many ~~diseases~~ weeds as biological control.

Fungi as a "mycorhizal phenomenon" are not only benefiting themselves but also associating roots of higher plants. Mycorhizal ~~fungi~~ relationship is basically beneficial relationship in which both fungi and higher plants both take benefits. Fungi which are associated with the roots of higher plants take their carbohydrates and vitamins from the plants, while plants takes benefits because their surface area becomes increased resulting in the absorption of more water and nutrients from the soil. Mycorhizal fungi also benefit the plant by protecting it from many other pathogenic fungi.

Fungi in the form of endophytes also help the plants in protecting from pathogenic fungi and grazing mammals. Endophytes are basically fungi that live inside the leaves and stem of the plants. Endophytes protect their host by the highly active alkaloids

but these alkaloids are highly toxic to mammals, therefore negatively impact the mammals. They may cause different problems in mammals;

(i) Lethergy
(ii) Lowering of weight
(iii) Lower milk production
(iv) Lowering fertility
(v) Spontaneous abortions
(vi) Type of gangrene leads towards loss of limbs or tails and even foot.

Other positive effect of endophytic grasses is, that when these grasses are sown in lawns, become protected from various types of threats like mammals, insect pests, and even such grasses are more tolerant to drought.

Fungi are also important in biological control of insect pest. There are many fungi of phyllum Ascomycota and Basidiomycota which are being used as a biological control of insect pests.

There is also beneficial relationship between fungi and insects, inwhich insects help the fungi to transport from one place to other place, while insect use them as food.

For example, wood wasps, fungi grow in the pouches of the wood wasps, and transfered from one place to other place, while wood wasp use these fungi as food. Fungus filled pouches of woodwasp are called mycangia (singular; mycangium). Similar relationship has also been seen in mites and beetles. Such beneficial fungi belong to phyllum Ascomycots and yeasts. Still another beneficial relationship (symbiotic relationship) is, ~~between~~ in which fungi live intercellular ~~between~~ spaces of the insects and protect them from toxic secondary products of their beetle hosts. In this relationship ascomycetous yeasts live in the intercellular spaces of insect body. Further, insect also feed on the fungi and take their food. Example of such mechanism is, Drosophila feed on mushrooms and take their food. It is said that when Drosophilla feed on Amnits spp. it become tolerant against its nematodes parasites, which also another benefit.

Fungi also form association with blue green bacteria and green algae. These well known symbioses is called Lichens. In lichens, fungi involved are Ascomycetes and beidiomycets. The benefit of this symbiotic relationship is; fungi provide protection cover to algae from adverse environmental factors while algae provide

carbohydrates to fungi.

A variety of fungi causes diseases of animals and Humanbeings. Fungi infections are called mycoses, which during certain cases results in death of patients. It is important to mention that less treatment is available for mycoses.

Patients of AIDS (Immunodeficiency Syndrome Acquired) Cancer patients, burn victims and organ transplantations are more prone to fungal infections. Fungi may causes internal and external infections (mycoses) these include; external mycoses, example ringworm; internal mycoses, example skin, muscle, bone and internal organ. Common mycoses are;

1. Blastomycosis.
2. Coccidiomycosis.
3. Histoplasmosis.
4. Aspergillosis.
5. cryptococcosis
6. ~~Histoplasmosis~~ candidiasis

Cryptococcosis is the most fatal for AIDS patients, it is the most life threatening for AIDS patients. Fungi also cause mouth and vaginal mycoses, these infections are caused by yeast usually.

AIDS associated Pneumonia is also caused by fungus Pneumocystis carinii

Fungi also cause allergis.
Fungi also Causes sick-building syndrome

Fungi have become popular experimental organisms for studies of fundamental biological processes, ~~Fungi are true~~ because, these can be grown on simple media in test tubes and require less space, less care, and less expensive equipment than most plants and animals. one of the most famous fungus used in genetic studies is, of course, the red bread mold Neurospora spp. Fungi; Schizosaccharomyces pombi ~~cerevisiae~~ and Saccharomyces cerevisiae are being used for molecular and cellular studies at the replacement of Escherichia Coli.

Fungus Amanita phalloides is being used for biological and bio-medical research. Amatoxin produced by this fungus, is being used as transcription Inhibitor.

The End