MICROGREENS : A SMALL STEP TOWARDS BETTER NUTRITION AND HEALTH

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Introduction

Food plays an important role in maintaining human health. However, changing lifestyles and unhealthy eating habits have increased the risk of several nutritional and lifestyle - related problems. As people become more aware of the importance of healthy food, there is growing interest in vegetables that provide better nutrition in smaller quantities. Microgreens are one such emerging food choice. Microgreens are young, edible seedlings of vegetables, herbs and other plants. They are harvested at an early stage of growth, usually after the cotyledons have fully developed and the first true leaves begin to appear. Although they are small in size, they contain several essential nutrients and natural plant compounds. Their attractive colours, fresh taste and nutritional properties have made them popular among health-conscious consumers. Microgreens can be produced throughout the year under suitable growing conditions. They require less space and have a shorter production period compared with many conventional vegetables. These features make them suitable for household cultivation as well as commercial production.

1. What are Microgreens?

Microgreens are young vegetable and herb seedlings harvested at an early stage of development. They are generally harvested within 7 - 21 days after sowing, depending on the crop and growing conditions. They are different from sprouts and baby leaves. Sprouts are consumed shortly after seed germination, whereas microgreens are grown in soil or other suitable growing media and harvested by cutting the young shoots above the growing surface. Some commonly cultivated microgreens include: Broccoli, Radish, Mustard, Sunflower, Pea, Beetroot, Cabbage and Amaranthus.

2. Important Phytochemicals Present in Microgreens

Phytochemicals are naturally occurring compounds present in plants. They are not essential nutrients, but many of them have beneficial effects on human health. Microgreens contain different phytochemicals that contribute to their nutritional importance.

- Phenolic compounds and flavonoids : These compounds act as antioxidants and help protect body cells from damage caused by free radicals. They also play a role in reducing oxidative stress and inflammation.

- Carotenoids : Carotenoids such as beta-carotene, lutein and zeaxanthin are important plant pigments. They support eye health, protect cells and contribute to the normal functioning of the immune system.
- Glucosinolates : Glucosinolates are mainly found in cruciferous crops such as broccoli, cabbage and mustard. They can produce biologically active compounds, including isothiocyanates, which have been studied for their potential protective effects against certain diseases.
- Vitamins and minerals : Microgreens provide vitamins such as A, C, E and K, along with minerals like calcium, iron, potassium and magnesium. These nutrients support immunity, bone health, blood formation and other important body functions.

3. Health Benefits of Microgreens

Microgreens are gaining attention because of their nutritional composition and the presence of beneficial plant compounds.

- Antioxidant activity : The antioxidants present in microgreens help protect cells against oxidative damage caused by free radicals. Regular inclusion in a balanced diet can contribute to overall health.
- Heart health : Certain microgreens contain compounds that may support cardiovascular health. Their nutrients and antioxidants contribute to maintaining normal body functions and may help in managing certain risk factors associated with heart diseases.
- Support in blood sugar management : Some microgreens contain dietary fibre and bioactive compounds that may support healthy blood glucose regulation. They can be included as part of a balanced diet.
- Potential protective effects against cancer : Microgreens belonging to the cruciferous family, particularly broccoli, contain glucosinolates and their breakdown products. These compounds have shown promising biological activities in research related to cancer prevention. However, microgreens should not be considered a treatment for cancer.
- Improvement in nutritional quality : Adding microgreens to regular meals is a simple way to increase the intake of vitamins, minerals and other beneficial plant compounds.

4. Uses of Microgreens in Food

Microgreens are used in different food preparations because of their fresh taste, attractive appearance and nutritional value.

- Salads : They are added to fresh salads to improve taste, colour and nutritional quality.
- Sandwiches and burgers : They provide freshness and add variety to everyday food.
- Soups : They can be used as toppings or added during the final stage of preparation.
- Food decoration : Their different colours and shapes make them useful for garnishing various dishes.
- Juices and smoothies : Selected microgreens can be added to fresh beverages to improve their nutritional composition.

5. Cultivation and Harvesting of Microgreens

Microgreens can be grown easily in small spaces with simple materials. The major steps involved in their cultivation are as follows.

- Selection of seeds : Good-quality, healthy seeds with high germination capacity should be selected. Seeds intended for edible microgreen production should be free from unsuitable chemical treatments.
- Selection of growing medium: Cocopeat, soil and other suitable soilless growing media can be used. The medium should provide proper support, moisture and aeration for seedling growth.
- Sowing : Seeds are spread uniformly over the prepared growing medium. Proper seed density should be maintained to avoid overcrowding.
- Water management : The growing medium should be kept sufficiently moist throughout the growing period. Gentle watering or misting helps maintain moisture without disturbing the young seedlings.
- Light management : After germination, adequate light should be provided for healthy growth and proper development of green leaves.
- Harvesting : Microgreens are generally harvested when their cotyledons are fully developed and the first true leaves start appearing. The young shoots are cut just above the growing medium using clean scissors or a suitable harvesting tool.

6. Advantages of Microgreens Cultivation

Microgreens cultivation has several advantages, particularly for small-scale growers and urban households.

- Low space requirement : They can be grown in trays, containers, balconies and even small indoor spaces.
- Short growing period : Most microgreens are ready for harvesting within 7–21 days, depending on the crop.
- Simple cultivation: Their production does not require large agricultural fields or complicated equipment.
- Nutritional importance: They provide several vitamins, minerals and phytochemicals.
- Year-round production: They can be cultivated throughout the year under suitable environmental conditions.
- Income generation: Commercial cultivation provides opportunities for small entrepreneurs, urban farmers and young people.
- Fresh consumption: They can be harvested according to daily household requirements.

7. Role of Microgreens in Food and Nutritional Security

Microgreens can contribute to improving nutritional security by providing fresh and nutrient-rich food within a short period. Their cultivation is suitable for urban and peri-urban

areas where agricultural land is limited. Households can grow them in small containers and produce fresh vegetables for their own consumption. They also offer opportunities for local production and marketing. Since they have a short production cycle, several growing cycles can be completed within a year under suitable conditions. However, safe production practices are important. Clean seeds, safe irrigation water, hygienic growing media and proper handling are necessary to maintain the quality and safety of microgreens.

8. Challenges in Microgreens Production

Despite their advantages, microgreens cultivation has certain limitations.

- Seed cost : High-quality seeds may increase the initial production cost.
- Microbial contamination : Poor hygiene and contaminated seeds or water may affect food safety.
- Short shelf life : Microgreens are delicate and can lose freshness quickly after harvesting.
- Storage difficulties : Proper temperature and packaging are required to maintain quality.
- Limited consumer awareness : Many people are still unfamiliar with their nutritional value and methods of consumption.
- Marketing difficulties : Small producers may face challenges in maintaining regular supply and finding suitable markets.

9. Future Scope

Microgreens have good potential in modern agriculture because of their short production period, nutritional value and suitability for small-scale cultivation. Further research on suitable varieties, growing media, nutrient management, lighting conditions and harvesting techniques can improve their production and quality. Improved packaging, storage and post-harvest handling methods can also help increase their shelf life and market value. Awareness programmes, demonstrations and training can encourage farmers, students and urban households to adopt microgreens cultivation as an additional source of income and nutrition.

Conclusion

Microgreens are a promising group of young edible vegetables with considerable nutritional and commercial importance. Their rich nutritional composition, short growing period and low space requirement make them suitable for modern food production systems. They cannot replace a balanced diet, but they can be a valuable addition to daily meals. With proper cultivation practices, food safety measures and consumer awareness, microgreens can contribute to better nutrition, small-scale entrepreneurship and sustainable urban agriculture.

Microgreens may be small in size, but they offer a valuable contribution to healthy eating and sustainable food production.

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