Article Id
AL04520

MICROGREENS: TINY PLANTS, THE FUTURE OF FUNCTIONAL SUPERFOODS

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In the world of healthy eating, big benefits sometimes come in tiny packages. Microgreens young, tender shoots harvested just after the first leaves appear are quickly gaining popularity among chefs, nutritionists and home gardeners alike. Despite their small size, these miniature greens are power-packed with vitamins, minerals and antioxidants, contains higher nutrient levels than their fully grown counterparts. Easy to grow at home, versatile in kitchen and bursting with flavor and they are not just a garnish they are a superfood you can eat every day**.**

What are Microgreens

Microgreens, known as “vegetable confetti’ and they are immature, nutrient-rich leafy vegetables harvested at the early seedling stage typically 7 to 21 days after germination, when the cotyledons are fully developed and one or two true leaves may begin to appear, usually 2–8 cm in height (Treadwell *et al*., 2013). Unlike mature vegetables, microgreens are harvested without their roots, giving them a compact, delicate structure. Despite their small size, they offer concentrated flavors, brilliant colors and a tender texture that can elevate everything from everyday meals to gourmet dishes (Mitra *et al*., 2025). They are rich in phytonutrients, including antioxidants, vitamins, minerals and phenolic compounds, which make them a next-generation superfood or functional food (Samuoliene *et al*., 2019)

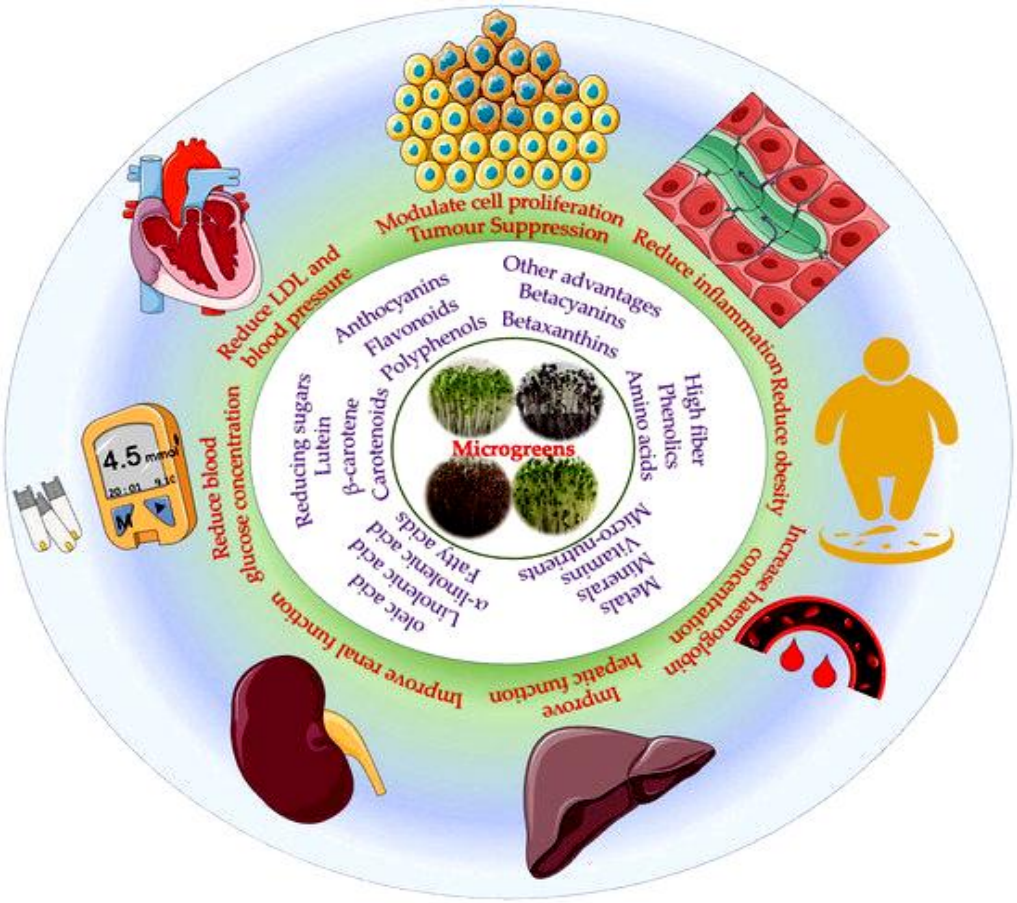
Nutrient Power of Microgreens

Commonly grown microgreens include varieties of mustard, radish, lettuce, cabbage, buckwheat, spinach, basil and other leafy greens. These types not only differ in taste ranging from sweet and mild to peppery or slightly spicy but also in their nutrient profiles (Mitra *et al*., 2025). What makes microgreens especially exciting is their nutrient density: several studies report that microgreens can contain 4–40 times higher concentrations of nutrients (such as

vitamins, minerals and antioxidants) compared to their mature counterparts (Priyadarshini *et al*., 2025). For instance, microgreens from brassica species (like red cabbage) can be exceptionally rich in vitamin E and vitamin C and some microgreens even show elevated levels of carotenoids and phenolic antioxidants (Vucetic *et al*., 2025).

Health Benefits of Microgreens

Microgreens are considered functional foods due to their rich content of phytonutrients, vitamins, minerals and antioxidants, offering multiple health benefits (Bhaswant *et al*., 2023).



In essence, microgreens serve as a compact, nutrient-dense solution for improving overall health, preventing chronic diseases and supporting balanced nutrition. Given their nutritional richness and compact growing habit, microgreens have found growing popularity not just in high-end kitchens and chef's dishes, but also in home gardening. They are used as garnishes or functional food components in salads, soups, sandwiches, smoothies and more. Their fast growth cycle, small footprint and year-round cultivation potential make them especially well-suited to urban agriculture and sustainable food systems.

What Are All the Crops Can Be Grown as Microgreens

Sprouts and microgreens are grown from the seeds of many crops, such as legumes, cereals, pseudo-cereals, oilseeds, vegetables and herbs (Source: Ebert, A. W, 2022**)**

Plant Family	Microgreen Crops	Uses / Benefits
Amaranthaceae	Amaranth, Beet, Quinoa, Spinach, Buckwheat, Chard	Rich in vitamins (A, C, K), minerals (Fe, Ca, Mg), antioxidants; supports heart health and immunity
Amaryllidaceae	Garlic, Onion, Leek	Antimicrobial, antioxidant, cardiovascular benefits; enhances flavor
Apiaceae	Parsley, Carrot, Fennel, Celery, Dill, Chervil, Cilantro, Coriander	Rich in vitamins, antioxidants, digestive aids; improves flavor and aroma
Asteraceae	Lettuce, Radicchio, Chicory, Endive, Tarragon, Common Dandelion	High in dietary fiber, vitamin K, antioxidants; supports digestive and metabolic health
Boraginaceae	Phacelia	Contains bioactive compounds; attracts pollinators; used as a cover/companion crop
Brassicaceae	Radish, Watercress, Arugula, Broccoli, Cauliflower, Cabbage, Chicory, Wild Rocket	Rich in glucosinolates, vitamins C & K, antioxidants; anti-cancer, anti-inflammatory, immune boosting
Convolvulaceae	Water Convolvulus	High in fiber and antioxidants; detoxifying properties
Cucurbitaceae	Melon, Cucumber, Squash	Hydrating, rich in vitamins, minerals; antioxidant and skin health benefits
Malvaceae	Jute Mallow / Nalta Jute	High in iron and calcium; supports bone and blood health
Poaceae	Corn, Lemongrass	Energy-rich, antioxidant and antimicrobial; lemongrass adds flavor and aroma
Lamiaceae	Chia	Rich in omega-3 fatty acids, antioxidants and fiber; supports heart and brain health
Leguminosae / Fabaceae	Chickpea, Alfalfa, Bean, Green Bean, Fenugreek, Fava Bean, Lentil, Pea, Clover	High in protein, minerals, antioxidants; supports muscle health, immunity and digestion
Onagraceae	Evening Primrose	Source of essential fatty acids; supports hormonal balance and skin health
Portulacaceae	Common Purslane, Moss-Ross Purslane	Rich in omega-3 fatty acids, antioxidants and vitamins; anti-inflammatory and heart health
Cereals	Oat, Soft Wheat, Durum Wheat, Corn, Barley, Rice	Rich in carbohydrates, protein, fiber; supports energy metabolism and gut health
Oleaginous Plants	Sunflower	Rich in vitamin E, healthy fats; antioxidant and heart health benefits

Fiber Plants	Flax	High in omega-3 fatty acids and lignans; supports cardiovascular and digestive health
Aromatic Herbs	Basil, Chives, Cilantro, Cumin	Rich in antioxidants and flavor compounds; digestive, anti-inflammatory and antimicrobial benefits

Conclusion

Microgreens represent a promising, nutrient-dense food source that combines health, sustainability and ease of production. Their rich composition of vitamins, minerals and antioxidants makes them valuable in combating malnutrition and lifestyle diseases. With rapid growth and minimal space requirements, they are ideal for urban and home cultivation. Incorporating microgreens into daily diets can significantly enhance nutritional security. Thus, these tiny greens hold great potential as a future functional superfood.

References

Bhaswant, M., Shanmugam, D. K., Miyazawa, T., Abe, C., & Miyazawa, T. (2023). Microgreens - A Comprehensive Review of Bioactive Molecules and Health Benefits. *Molecules*, *28*(2), 867.

Ebert, A. W. (2022). Sprouts and Microgreens - Novel Food Sources for Healthy Diets. *Plants*, *11*(4), 571.

Mitra, P., Rao, V. S., & Singh, R. P. (2025). Microgreens as Nutritional, Functional and Agricultural Potential. *Inventum Biologicum: An International Journal of Biological Research*, *5*(4), 6-8.

Priyadarshini, V. M., Kumari, P. M., Porkodi, G., Anand, G., Ramamoorthy, P., & Abirami, R. (2025). Microgreens-Innovation for Nutrient Enhancement in Current Global Scenario. *Asian Journal of Advances in Agricultural Research*, *25*(8), 69-78.

Samuolienė, G., Brazaitytė, A., Viršilė, A., Miliauskienė, J., Vaštakaitė-Kairienė, V., & Duchovskis, P. (2019). Nutrient levels in Brassicaceae microgreens increase under tailored light-emitting diode spectra. *Frontiers in plant science*, *10*, 1475.

Treadwell, D.D., R. Hochmuth, L. Landrum and W. Laughlin. 2013. *Microgreens: a new specialty crop. HS1164*. Horticultural Sciences Department, UF/IFAS Extension, p. 1–3

Vucetic, A., Sovljanski, O., Pezo, L., Gligorijevic, N., Kostic, S., Vulic, J., & Canadanovic-Brunet, J. (2025). A Comprehensive Antioxidant and Nutritional Profiling of Brassicaceae Microgreens. *Antioxidants*, *14*(2), 191.