Volume 2024 Number 22 MICROGREENS WORLD Monday June 24 2024

WEEKLY DIGEST

FISETIN: NATURE'S ANTI-AGING SUPERHERO HIDING IN YOUR MICROGREENS!

FIRST GLOBAL REPORT OF DOWNY MILDEW OF COMMERCIAL MICROGREENS

CREATIVE RECIPES: Soul Food and Texas Microgreens Caviar
CULTIVATION TECHNIQUES: From Farm to Plate: Rækta's Mushrooms and Microgreens
INDUSTRY NEWS: FDA Publishes FSMA Pre-Harvest Agricultural Water Final Rule

"Delivered to Your Inbox Every Monday," your summary digest of the latest microgreens, urban, vertical farming, and new trends and exciting startup stories from around the world.

Fisetin: Nature's Anti-Aging Superhero Hiding in Your Microgreens

This Week: Monday, June 24, 2024

UNLOCK MARKETING SUCCESS FOR YOUR MICROGREENS BUSINESS

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Nutrition Science

New Indian Dietary Guidelines Promote Eating Microgreens

The release of the Indian Dietary Guidelines 2024 by the National Institute of Nutrition (NIN) underscores a significant emphasis on promoting **healthy eating patterns** and combating diet-related chronic diseases.

While these guidelines primarily target the general population in India, their principles can resonate globally, impacting dietary practices and **nutrition education worldwide**.

For microgreens, which are nutrient-dense and versatile, this initiative highlights an opportunity to **integrate** them more prominently into **dietary recommendations**.

Microgreens offer concentrated levels of vitamins, minerals, and **phytochemicals**, aligning well with goals to enhance diet quality and combat malnutrition.

The Hindustan Times article on dietary guidelines emphasizes the following key recommendations:

1. **Sugar Reduction**: Limit daily intake to 20-25 grams; avoid HFSS products.
2. **Healthy Fats**: Moderate cooking oils, increase nuts and fish.
3. **Safe Cooking Methods**: Use earthen cookware; avoid damaged non-stick pans.
4. **Millets for Gut Health**: Incorporate 30-40% millets in cereal intake.

5. **Informed Food Choices**: Focus on food safety and labeling.
6. **'My Plate for the Day'**: Include ten different food groups.
7. **Microgreens**: Add to daily meals for nutrition.
8. **Responsible Protein Supplementation:** Avoid routine use of protein supplements; be cautious about alcohol consumption.

The Indian Dietary Guidelines 2024 aim to promote healthy eating and prevent lifestyle diseases in the general population.

The guidelines serve as a call to action for incorporating nutrient-dense foods like microgreens into everyday diets, contributing to global health initiatives focused on nutrition and disease prevention.

Shiraz, Z. (2024, June 20). Dietary guidelines that promote balanced diet: 8 key recommendations for healthy eating. Hindustan Times. Retrieved from https://www.hindustantimes.com/lifestyle/health/dietary-guidelines-that-promote-balanced-diet-8-key-recommendations-for-healthy-eating-101718850867649.html

Community Spotlight

Local Farm Growing Microgreens in Elma, Washington

Grays Greens Farm, located in Elma, Washington, is a woman-owned farm specializing in sustainable microgreens production.

Founded by Tara Newman in 2021, the farm emphasizes

organic practices and nutrient-dense produce.

Newman started the farm immediately upon moving to Grays Harbor, driven by her enthusiasm for growing food without harmful pesticides and fertilizers.

The farm's microgreens, harvested 7-21 days after germination, are reported to be up to 40 times more nutrient-dense than mature greens like broccoli.

Newman's approach to farming focuses on building soil health through no-till methods, organic composting, cover cropping, and regular soil testing to ensure nutritious and pest-resistant plants.

Grays Greens Farm offers a subscription-based delivery service, ensuring that produce reaches customers within 24 hours of harvest, thus maintaining peak freshness and nutritional value.

The farm also provides a variety of seasonal produce and fosters a direct relationship between consumers and the farmer.

Although not open to the public, the farm facilitates one-off deliveries and pick-ups for those outside the delivery area.

Newman's dedication to sustainable agriculture and fresh, local produce highlights the farm-to-table ethos that defines Grays Greens Farm.

Lotz, K. (2024, June 19). Local farm growing microgreens in Elma. GraysHarborTalk. *https://www.graysharbortalk.com/2024/06/19/local-farm-growing-microgreens-in-elma/*

Farmers Market Bringing More Microgreens

Tracy and Aaron Sanford, owners of Thistle Dew Microgreens in Marblehead, Ottawa, began growing microgreens as a hobby due to their interest in hydroponics, eventually turning it into a commercial venture.

They supply local restaurants on the mainland and nearby islands, with a delivery radius of 25 miles.

At the inaugural Sunday Farmers Market at Hopfinger Zimmerman Memorial Park on June 9, they showcased their fresh microgreens.

Aaron, a military veteran, emphasized the nutritional benefits of microgreens, noting they can contain significantly more nutrients than their mature counterparts.

The market, supported by park founders Jack and Lorraine Zimmerman, aims to foster community and support local vendors like Thistle Dew Microgreens as part of its mission in Port Clinton's vibrant community (Trusty, Year).

The Ottowa Beacon, Jun1 18, 2024, Sherri Trusty, Homemade and handpicked hawked at The Sunday Farmers Market's first event - The Beacon.

Cultivation Techniques

From Farm to Plate: Rækta's Mushrooms and Microgreens

The article "From Farm to Plate: Rækta's Mushrooms and Microgreens" highlights the success and practices of Rækta Microfarm in Akureyri, Iceland.

Founded by Giacomo Montanelli and Serena Pedrana, Rækta specializes in growing over 20 varieties of microgreens using non-GMO seeds.

The farm emphasizes local production and zero-waste practices, primarily supplying local restaurants and offering a subscription model for individual consumers.

Microgreens, known for their nutrient density, are cultivated indoors, making them suitable for harsh Icelandic winters.

Despite the common belief that microgreens are easy to grow, they require meticulous care in lighting, temperature, and watering. Rækta's unique offerings, particularly basil, have gained positive feedback from customers.

The farm's sustainable approach includes a system for returning trays to minimize waste, and it continues to expand its reach in the region.

*Zubenko, I. (2024, June 21). From Farm to Plate: Rækta's Mushrooms and Microgreens. *The Reykjavík Grapevine*. Retrieved from https://grapevine.is/food-main/2024/06/21/from-farm-to-plate-raektas-mushrooms-and-microgreens/*

Evidence-Based Expertise

First Global Report of Downy Mildew of Commercial Microgreens

Pfeufer et al. (2024) report the first global occurrence of *Hyaloperonospora brassicae,* causing downy mildew in commercial broccoli and cabbage microgreens.

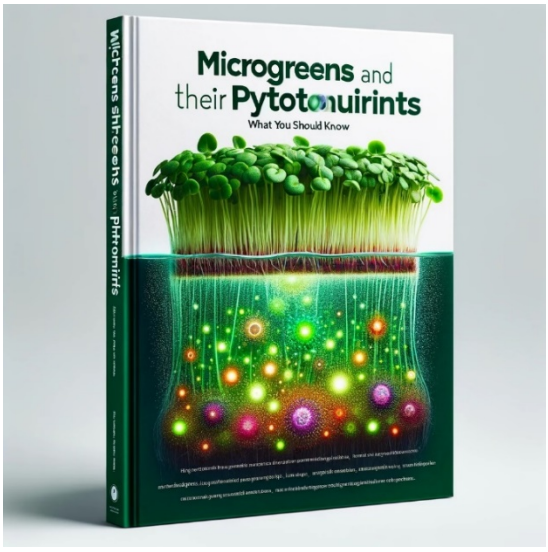
In November2023, kale, broccoli (H009B), and cabbage (H009C) microgreen crops in Michigan were observed with downy mildew at disease severities of 3%, 40%, and 20% foliage on 10 x 16 cm seeded blocks of plants, respectively.

The study observed significant disease severity in Michigan crops, confirmed through pathogenicity tests and DNA sequencing.

This discovery implies that microgreen growers need to **implement stringent disease monitoring and control measures** to prevent significant crop losses due to downy mildew.

*Pfeufer, E. E., Suresh, L. P., & Groben, G. (2024). First global report of *Hyaloperonospora brassicae* in commercial broccoli and cabbage microgreens. Plant Disease. https://doi.org/10.1094/PDIS-01-24-0266-PDN*

Coming Soon!



Read the Article on Microgreens World **HERE**

Microgreens and Global Food Security

Ateneo de Manila University's SDG 2: Zero Hunger Report highlights their commitment to addressing food insecurity through various initiatives, **including microgreen cultivation** integrated into educational curricula.

These efforts aim to enhance sustainable food systems and mitigate hunger challenges exacerbated by global crises like the pandemic.

The university collaborates extensively with organizations such as Gawad Kalinga, supporting programs like Kusina ng Kalinga (KnK+) to establish Zero Hunger Communities nationwide.

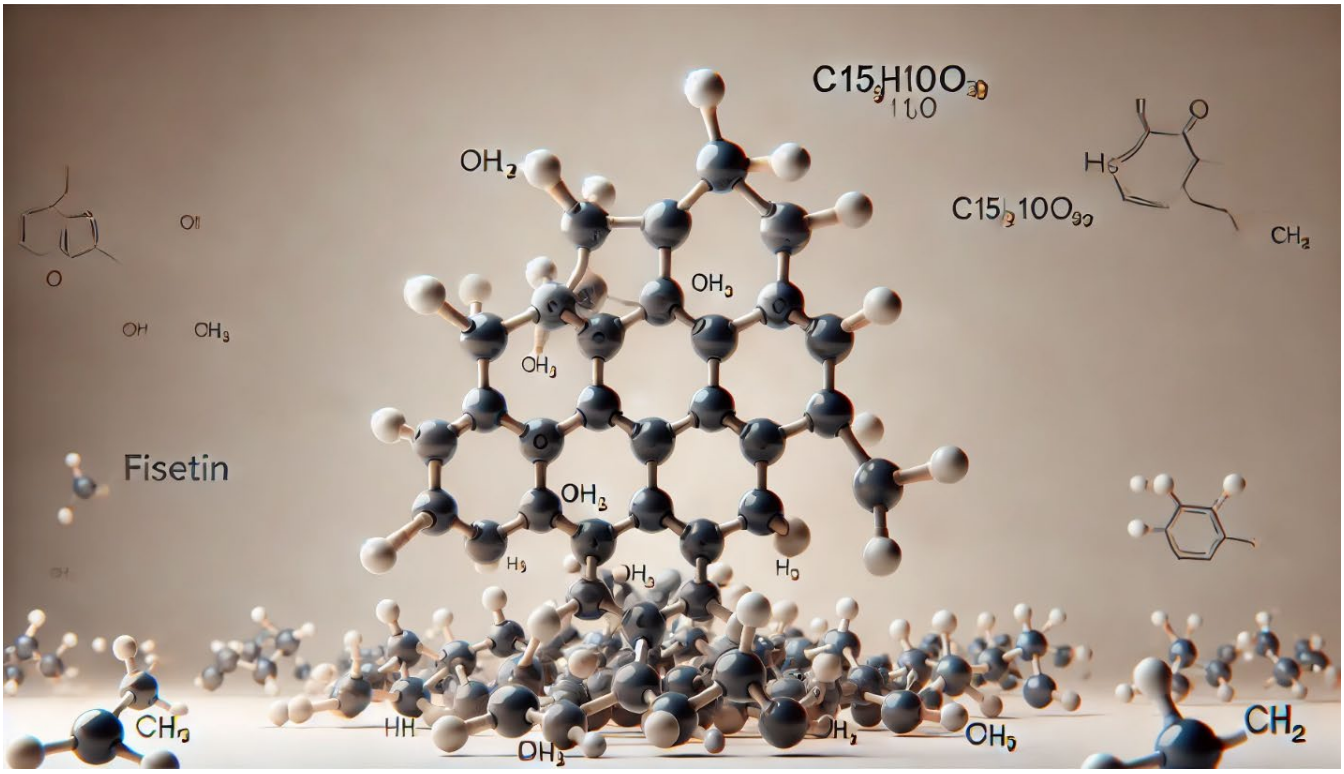
By **integrating hydroponics** and microgreen cultivation into their science programs, Ateneo fosters innovative approaches to food production that align with the United Nations' Sustainable Development Goal 2.

This comprehensive approach underscores Ateneo's leadership in leveraging education and community engagement to combat hunger sustainably (Ateneo de Manila University, 2024).

*Ateneo de Manila University. (2024). *Ateneo de Manila University's SDG 2: Zero Hunger Report for the academic year 2022-2023*. Retrieved from https://www.ateneo.edu/features/2024/06/18/ateneo-de-manila-universitys-sdg-2-zero-hunger-report-academic-year-2022-2023*

The Featured Article

Fisetin: Nature's Anti-Aging Superhero Hiding in Your Microgreens



Fisetin, a **flavonoid** found in fruits and vegetables, has emerged as a promising compound with diverse therapeutic potential.

Research has revealed its **senotherapeutic** (helping to treat or prevent aging) properties, showing an ability to reduce senescent cells and potentially extend healthspan in animal studies. This effect could have implications for age-related diseases and **longevity**.

Additionally, fisetin has demonstrated neuroprotective capabilities, particularly against neurodegenerative conditions like Parkinson's and Alzheimer's. Its **antioxidant** and anti-inflammatory mechanisms appear to play a crucial role in this protection. Studies have also

suggested fisetin may help preserve **bone health** and **combat cellular aging**.

Consuming fisetin-rich foods such as **strawberries**, **cucumbers**, onions, **apples**, grapes, lotus root, and kiwi fruit to incorporate fisetin into the diet.

Beyond these effects, fisetin has shown promise in other areas of health. It exhibits **anticancer** properties in various models, displays **anti-inflammatory** activities that could benefit multiple conditions, and has demonstrated potential as a **hypoglycemic** agent. These wide-ranging effects make fisetin an intriguing subject for further research in various fields of medicine and health science.

This flavonoid has garnered attention for its potential to promote longevity and healthspan.

Fisetin is a natural compound found in various fruits and vegetables, and it belongs to the **polyphenol** family.

Known for its powerful antioxidant properties, fisetin helps the body function more efficiently. It protects it from harmful pathogens, toxins, and stressors that can trigger inflammatory reactions.

Fisetin combats the effects of aging by reducing the number of **free radicals** in the body.

Free radicals are unstable molecules that can cause oxidative damage to cells, leading to accelerated aging and age-related illnesses. By scavenging these free radicals, fisetin provides antioxidant protection for cells, thereby slowing down the aging process.

Additionally, fisetin stimulates **sirtuins**, proteins that promote cellular health and extend lifespan by enhancing natural cell repair processes.

There are several vital benefits of fisetin:

1. **Neuroprotection**: Fisetin has shown potential neuroprotective effects, which could help prevent age-related cognitive decline and neurodegenerative diseases such as Alzheimer's and Parkinson's. Studies have indicated that fisetin can reduce amyloid plaque buildup and protect healthy brain cells.
2. **Cancer Prevention**: Research suggests that fisetin can inhibit the growth of cancer cells and promote cell death in breast, prostate, and colon cancers. Its antioxidant and anti-inflammatory properties make it well-suited for fighting cancer cell growth (*Jia, 2019; Beltzig, 2024*).
3. **Heart Health**: Fisetin's anti-inflammatory properties and ability to reduce cholesterol and blood pressure levels may improve heart health. Animal studies have shown that fisetin can enhance heart function and tissue health following cardiac events (*Yu, 2024*).

4. **Diabetes Management**: Preliminary studies indicate that fisetin may improve insulin sensitivity and help regulate blood sugar levels, making it potentially valuable for diabetes management (*Lai, 2023*).
5. **Metabolic Support**: Fisetin may aid in controlling metabolic issues and weight gain. An animal study reported significantly less weight gain when a high-fat diet was paired with fisetin.
6. **Skin Health**: Fisetin's antioxidant abilities can shield the skin from damage caused by UV radiation and environmental toxins, promoting skin health and potentially reducing signs of aging. It has also shown promise in treating inflammatory skin conditions like eczema (*Kento, 2023*)
7. **Pathogen-Fighting**: Fisetin may possess antimicrobial properties, including anti-bacterial, anti-fungal, and anti-parasitic effects (*Molagoda, 2021*).

Strawberries, cucumbers, onions, and apples can be grown as microgreens. These microgreens are rich in nutrients and provide a convenient way to enhance fisetin intake.

Strawberries are particularly notable for their high fisetin content and can be easily grown as microgreens. Onions are another excellent choice, offering a potent source of fisetin. While cucumbers and apples are less commonly grown as microgreens, they can still be considered for their potential health benefits.

Incorporating these fruits and plants as microgreens into the diet can help enhance the anti-aging and health-boosting properties of fisetin.

BELTZIG, L., CHRISTMANN, M., MINODORA DOBREANU, & KAINA, B. (2024). Genotoxic and Cytotoxic Activity of Fisetin on Glioblastoma Cells. Anticancer Research/Anticancer Research, 44(3), 901–910. https://doi.org/10.21873/anticanres.16884

Jia, S., Xu, X., Zhou, S., Chen, Y., Ding, G., & Cao, L. (2019). Fisetin induces autophagy in pancreatic cancer cells via endoplasmic reticulum stress- and mitochondrial stress-dependent pathways. Cell Death & Disease, 10(2), 142. https://doi.org/10.1038/s41419-019-1366-y

Kento Takaya, Toru Asou, & Kishi, K. (2023). Fisetin is a potential skin rejuvenation drug that eliminates senescent cells in the dermis. Biogerontology, 25(1), 161–175. https://doi.org/10.1007/s10522-023-10064-9

Lai, M., Lan, C., Zhong, J., Wu, L., & Lin, C. (2023). Fisetin Prevents Angiogenesis in Diabetic Retinopathy by Downregulating VEGF. Journal of Ophthalmology, 2023, 7951928. https://doi.org/10.1155/2023/7951928

Lipman, F. (2024, May 20). 5 Thoughts on Fisetin, the Anti-Aging Flavonoid. Retrieved from https://www.drfranklipman.com/post/5-thoughts-on-fisetin-the-anti-aging-flavinoid

Molagoda, I. M. N., Jayasingha, J. A. C. C., Choi, Y. H., Jayasooriya, R. G. P. T., Kang, C.-H., & Kim, G.-Y. (2021). Fisetin inhibits lipopolysaccharide-induced inflammatory response by activating β-catenin, leading to a decrease in endotoxic shock. Scientific Reports, 11(1). https://doi.org/10.1038/s41598-021-87257-0

Sokal, A., Stocerz, K., Olczyk, P., Kadela-Tomanek, M. (2024). Therapeutic potential of flavonoids used in traditional Chinese medicine – a comparative study of galangin, kaempferol, chrysin, and fisetin. Annales Academiae Medicae Silesiensis, 78, 49-60. https://doi.org/10.18794/aams/175007

Wang, N., Sheng, Q., Zhu, H., Wang, J., Qiu, J., Cui, M., Zhou, Y., Deng, X., Deng, Y., & Wang, L. (2024). Enhancing the effectiveness of polymyxin E with a fisetin nanoemulsion against a colistin-resistant Salmonella typhimurium infection. Phytomedicine, 130, 155768–155768. https://doi.org/10.1016/j.phymed.2024.155768

Yu, W., Zhao, Y., Ilyas, I., Wang, L., Little, P. J., & Xu, S. (2024). The natural polyphenol fisetin in atherosclerosis prevention: a mechanistic review. Journal of Pharmacy and Pharmacology. https://doi.org/10.1093/jpp/rgae053

Creative Recipes

Mango, Ginger, and Microgreen Juice

I love green juices, and one of my favorites is inspired by Lindsey Love of Dolly and Oatmeal.

The best microgreens I find complement the flavors of mango, mint, ginger, and lemon while adding a touch of visual appeal and nutritional value.

Pea shoots, with their mild, sweet flavor and radish, add a peppery twist that complements the mint and basil, which complements the mango and mint.

Choose one or a combination of these microgreens based on your preference for flavor and texture.

They will enhance the nutritional profile and aesthetic appeal of your smoothie while blending harmoniously with the other ingredients.

Mango, Ginger, and Microgreen Juice make one 8oz. Drink.

Ingredients

- ½ cup basil microgreens
- 1 large sprig mint (approx. 6-8 large leaves)
- 1 mango, peeled and cut into chunks

- 1-inch piece of fresh ginger root, peeled and chopped rough
- Juice from 1 lemon
- 5-6 coconut water ice cubes (you can also use water ice cubes)
- Chia seeds
- Extra mint leaves

Instructions

1. Combine all the ingredients in a high-speed blender.
2. Blend for approximately one minute.
3. To achieve pulp-free juice, strain the mixture through a fine mesh sieve directly into your glass.
4. Garnish with chia seeds and mint.
5. Enjoy immediately for a healthy boost!

Texas Caviar

June is National Soul Food Month.

Here is a refreshing salad mix, including parsley microgreens, that's ready for any family gathering.

Yield: 6 to 8 servings

Ingredients

- 1 12-oz. pkg frozen black-eyed peas
- 1 15-oz. black beans
- 1 cup cherry tomatoes, quartered
- 1 medium yellow bell pepper

- 1/2 cup sliced green onions (scallion)
- 1 small to medium jalapeno chile, seeded and deveined (optional)
- **1/4 cup fresh parsley microgreens**
- 1/2 cup bottled Italian Dressing or Balsamic Dressing
- 1 teaspoon cumin
- 1 teaspoon chile powder
- Salt and pepper, to taste

Instructions

1. Prepare black-eyed peas according to package directions.
2. Drain and rinse black beans
3. Seed and chop the pepper
4. In a two-quart mixing bowl, combine black-eyed peas and the remaining ingredients.
5. Mix lightly to blend.
6. Cover and chill for four hours or overnight.
7. Garnish with additional chopped parsley, if desired.

Emerging Industry News

Broccoli Microgreens Market to Reach $398.5 Million by 2031

The report by Allied Market Research projects that the broccoli microgreens market, valued at $237.20 million in 2021, will reach **$398.5 million by 2031**, with a compound annual growth rate (CAGR) of 5.5% from 2022 to 2031.

This growth is attributed to the increasing adoption of **indoor farming** due to **rising food demand** and **declining agricultural productivity** caused by poor meteorological conditions and the reduction in fertile land.

Technological advancements in **vertical farming** and greenhouses, which offer increased productivity and protection from extreme weather, pests, and diseases, are further driving market growth.

Despite these benefits, challenges such as a **lack of skilled labor** and limited awareness among farmers about **advanced farming techniques** may hinder the market's expansion.

The report also highlights the dominance of the commercial segment in the market and the significance of commercial greenhouses and **farmers' markets** as key distribution channels.

Geographically, Europe is the leading region in the broccoli microgreens market.

Key market players include 2BFresh, AeroFarms, and Fresh City Farms Inc.

Allied Market Research. (2024, June 20). Broccoli microgreens market to reach $398.5 million by 2031. openPR. Retrieved from https://www.openpr.com/news/3546350/broccoli-microgreens-market-to-reach-398-5-million-by-2031-amr

FDA Publishes FSMA Pre-Harvest Agricultural Water Final Rule

The FDA's new FSMA Pre-Harvest Agricultural Water Final Rule mandates annual assessments of agricultural water systems to identify and mitigate hazards, enhancing produce safety.

Compliance deadlines vary by farm size.

The rule emphasizes evaluating water sources, practices, and impacts on nearby land.

For microgreen growers, this means **stricter monitoring** and **quicker mitigation responses** to water-related risks to ensure safe production.

To assist growers with compliance, the FDA released

several factsheets and additional resources that describe factors to consider during pre-harvest agricultural water assessments, mitigation and corrective measures, equivalent testing methodology, and other requirements outlined in the final rule.

U.S. Food and Drug Administration. (2024). FSMA Final Rule on Pre-Harvest Agricultural Water. Food Safety Magazine. Retrieved from https://www.food-safety.com/emagazine

Commercial Best Practices

Fresh Simple Greens in UTAH

Fresh Simple Greens, a pioneering year-round farming operation in Huntsville, Utah, was founded by Braden and Erin Scothern.

Utilizing advanced hydroponic systems and climate-controlled environments, the farm produces microgreens and leafy greens even during harsh winter months.

The business model, inspired by pandemic-related supply chain disruptions, focuses on sustainable practices, using minimal water and no pesticides.

This innovative approach, employing LED lights and nutrient-infused water, ensures consistent quality and yield, supplying grocery stores and local customers.

Fresh Simple Greens emphasizes the benefits of locally sourced food, demonstrating modern agricultural technology's potential to overcome seasonal limitations and support local economies.

*Dudley, L. (2024, June 16). Fresh Simple Greens: A year-round farming marvel in Huntsville, Utah. *Utah Stories*. https://utahstories.com/2024/06/fresh-simple-greens-a-year-round-farming-marvel-in-huntsville-utah/*

Innovative Microgreens Venture Targets Sandwich Stores and Exporters

Micro's Unilight, founded by Cesar van der Spurt and Yuval Depicker, transitioned from a college dropout's idea to a successful microgreens business.

Initially growing microgreens in a sea container, they shifted to a greenhouse, drastically increasing efficiency and reducing costs.

Their microgreens, grown on potting soil, offer higher nutritional value and taste compared to hydroponic methods.

Aimed at the professional market, they supply eight cress mixes to catering suppliers and supermarkets.

Now, targeting sandwich stores and exporters, they maintain a social mission by donating to care institutions.

Their approach highlights cost-effective, residue-free production and innovative market strategies.

VerticalFarmDaily. (2024, June 21). Our next target market will be sandwich stores and exporters. VerticalFarmDaily. https://www.verticalfarmdaily.com/article/9637213/our-next-target-market-will-be-sandwich-stores-and-exporters/

Learn all the essential aspects of growing microgreens successfully!

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Editor: D. Andrew Neves, andrew.neves@microgreensworld.com

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Guest Posting: marketing@microgrenworld.com

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