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THE MICROGREENS WEEKLY

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

How LED Lighting And Color Affect the Nutrient Density of Microgreens

This Week: Monday, March 25, 2024

Beet Juice: It is All The Rage. But Are Beet Microgreens Better?

If you have noticed recently, at least in big market countries, "super-beets" are the latest fad. Why this sudden interest?

In one study, "*The Nitrate-Independent Blood Pressure–Lowering Effect of Beetroot Juice: A Systematic Review and Meta-Analysis,*" scientists looked at beetroot, considered a complementary treatment for hypertension because of its high content of inorganic NO_3 or nitrate ion.

As beets can boost the production of nitric oxide by increasing the concentration of nitrate in the bloodstream, consuming beet juice may help lower blood pressure.

The meta-analysis confirmed previous findings and contributed crucial new evidence that indicated the hypotensive properties of beetroot to be a potentially safe and cost-effective nutritional approach for managing hypertension and preventing undesirable cardiovascular outcomes.

Then there are the studies, *"Beetroot juice and exercise: pharmacodynamic and dose-response relationships." (Wylie et al., 2013),* that have shown beetroot juice to improve athletic performance by increasing nitric oxide (NO_3) production, which improves blood flow and oxygen delivery to muscles.

And then, "somebodies" decided to make money.

> Convenience is the mother of invention these days, not necessity.

Who besides me wants to spend 20 minutes making delicious juice?

I consider microgreens as a Superfood.

So, I looked for studies on beet microgreens and their nutrient content. I found a few, but the one that I reference here is by Acharya, Jyoti, et al., "*Pigments, Ascorbic Acid, and Total Polyphenols Content and Antioxidant Capacities of Beet (Beta Vulgaris) Microgreens during Growth."*

Beet microgreens and regular beets differ. In terms of physicochemical composition, beet microgreens have lower chlorophyll, carotenoids, and polyphenols than regular beets.

> However, beet microgreens possess high equivalent antioxidant capacities (EAC) as ascorbic acid due to their high betalains content.

Beet microgreens are a unique source of phytonutrients called betalains that have anti-antioxidant, anti-inflammatory, and detoxification properties.

It is important to note that the study of their physicochemical composition is limited, and further research is recommended to draw valuable information about potential bioactivity in humans.

The study suggests that incorporating beet microgreens into your diet could contribute to antioxidant intake, *potentially supporting overall health and well-being.*

So, for me, prevention is better than cure. If you have hypertension and your physician recommends it, certainly take some of these new "beet gummies."

But if you are looking to restore and maintain your health, go with microgreens.

I may be ahead of the research, but I am sticking with my beet microgreens for better health.

If you want more information, check out my article Discover the Nutritional Wonders of Beet Microgreens at Microgreens World.

It is important to note that while beets are undoubtedly a nutritious and healthy food, the term "superfood" can be misleading. No single food can provide all the nutrients we need, and a balanced and varied diet is essential for overall health.

And here is one of my favorite beet microgreens recipes from my book Eat Now! Book #3 Juices:

JUICING FOR RESTORING HEALTH

FRESH TROPICAL BLEND

Mmmmm! Taste that earthy, smooth juice with just a hint of spices for those hot days when you want to sit back and relax.

Taste	Aroma	Flavor	Intensity
Sweet		Earthy	Mild

Fresh Tropical Blend

Prep Time: 10 mins Blend Time: 2 mins

Course: Drinks
Cuisine: Tropical Islands
Keywords: Beet microgreens, juicing, microgreens

Servings: 1 Calories: 232 kcal

Equipment

- Hydraulic Press Juicer

Ingredients

- 1 Large Orange (3.2 oz of juice, 2.4 oz pulp)
- 1 Mango (3.3 oz of juice, 3 oz pulp)
- 4 oz. Beet Microgreens (2.5 oz juice, 1.5oz pulp)
- 1 Sprig ginger

Instructions

1. Peel your orange. *You can slice it into quarters, leaving the white pulp. Or you can remove the pulp and peg the orange.*
2. Peel your mango, either with a knife or use your fingers to remove the skin. Pare the mango, cutting the meat with the seed. Discard the seed.
3. Wash your microgreens, even if it is already in a "triple-washed" package.
4. Turn on your juicer. I bought a used Omega Juicer.
5. Put your 8 oz glass in place.
6. Put the mango slices in the first, followed by the microgreens, ginger, then the orange pieces.
7. It should take about 1-2 minutes, enough time to clean up.

Microgreens and Sinusitis Relief: A Springtime Challenge

It is Springtime here in Georgia! Watching flowers and Pink Magnolia trees bloom is my favorite time of the year!

But it is a blessing and a curse for millions of you in the Northern Hemisphere. Pollen, allergies, and sinusitis can make for miserable days.

There may be severe pain and discomfort from sinusitis and inflammation of the nasal passages. Chronic sinusitis, lasting over three weeks, affects a considerable portion of the global population, leading to substantial spending on medications for symptom relief.

Common symptoms include fever, fatigue, cough, runny nose, nasal congestion, and sore throat caused by postnasal drip.

While medication can help manage these symptoms, incorporating certain superfoods into your diet may offer additional support and potentially reduce the risk of developing this bothersome condition.

Vitamin C, an abundant component of citrus fruits,

berries, tomatoes, *broccoli, cabbage, and spinach microgreens*, plays a significant role in maintaining good immunity.

> Did you know that broccoli contains more vitamin C than a medium orange? Just 4 ounces of broccoli microgreens provide over 100% of your daily vitamin C requirement, making it a powerhouse for immune support.

The B-complex vitamins, which include thiamine (B1), riboflavin (B2), niacin (B3), and folic acid (B9), are found in *spinach microgreens*, essential for a healthy nervous system and energy production.

Vitamin E protects the cells from damage and contributes to immune function by virtue of its antioxidant properties in vegetable oils, nuts, or green *leafy vegetable microgreens* like kale, mustard greens, Swiss chard, arugula, bok choy, beet greens, watercress, and radicchio.

Beyond dietary changes, there are home remedies that can offer comfort and relief. Inhaling steam, using saline nasal spray, and applying warm compresses to the inflamed area can help soothe irritated sinuses.

Individuals prone to sinus issues, especially those with allergies, should avoid triggers like cigarette smoke, air pollutants, and alcohol, as these can worsen inflammation. Limiting dairy products, which can increase mucus production, may also be beneficial.

Research Comes To Life: Ro-Gro Launches Pioneering Biofortified Microgreens

Ro-Gro has developed a unique biofortification process that increases the levels of essential nutrients in microgreens.

Their initial offering includes *biofortified broccoli and red cabbage microgreens*, with plans to expand to other varieties.

These biofortified microgreens contain higher levels of vitamins, minerals, and antioxidants, making them a powerful addition to a healthy diet.

> A significant benefit of biofortified food is that the body more readily absorbs the added nutrients. A 15g portion of Ro-Gro Pea Shoots will provide an adult's recommended daily allowance (RDA) of 1.5µg (micrograms) of Vitamin B12.

This was the first vitamin selected for biofortification at Ro-Gro as it is a common deficiency, particularly for those on a plant-based diet.

Ro-Gro aims to address nutrient deficiencies and promote better health through its biofortified microgreens.

This launch marks a potentially significant development in the microgreen industry, offering consumers access to even more nutrient-dense options. Feast Magazine 2024-03-21

The Featured Article

The Spectrum of Life

I consider myself an enthusiastic microgreen farmer. Since 2017, I have been fascinated by the potential of these tiny, nutrient-packed plants, but there was more to discover. In 2021, in the middle of the pandemic, I wrote a book about them, "Children of the Soil."

At the beginning of 2024, while tending to my vibrant microgreen garden, an idea struck me: *how could I use LED light and color to enhance the nutrient density of my crops?*

Intrigued by this concept, I dove into research, studying the intricacies of LED lighting and its impact on plant growth. I learned that different colors of light, blue and red, could stimulate the production of antioxidants, vitamins, and minerals in microgreens (*Ntsoane et al., 2024; Kopsell et al., 2024*).

Armed with this knowledge, I set out to design the perfect LED lighting system for my garden. I experimented with various combinations of blue and red light, carefully monitoring the growth and nutrient content. The results were astounding. The microgreens grown under the optimized LED lights were bursting with flavor and packed with even more nutrients than before.

How do I know other than by taste?

I've had a number of other microgreens growers from around the world contact me, and that's why I wrote the article, The Definitive List: 1,500+ Types of Microgreens You Can Grow, where I show you how your agricultural extension service of your state's agricultural college (*in my case, the University of Georgia*) provides all sorts of agricultural testing, including "plant tissue analysis": AESL Plant Tissue Analyses (uga.edu).

I have started writing a small pamphlet detailing the science behind LED lighting and color. I hope it will give practical guidance on how to create the ideal lighting environment for various microgreen species.

Here are excerpts from the pamphlet:

- LED lights increase the concentration of ascorbic acid (vitamin C) in microgreens. Cabbage and arugula microgreens exposed to far-red (FR) LED light showed a higher vitamin C concentration. In contrast, radish microgreens exposed to blue LED lights maintained higher vitamin C concentrations.
- LED lights, particularly red light, enhance the levels of bioactive compounds such as glucosinolates and phenolics in broccoli microgreens.
- LED light intensity can influence the color of microgreens, with lower intensities promoting a higher concentration of yellow-red pigments and a lower chlorophyll concentration. On the other hand, higher light intensities can lead to changes in the coloration of microgreens, potentially enhancing the purple and blue pigments, which are associated with higher anthocyanins and other flavonoid contents.

- Additionally, the red LED light treatment improved the nutritional value of the microgreens by delaying the reduction of AA after postharvest storage.
- Microgreens grown under the blue spectrum LED lighting have the highest content of ascorbic acid total phenolics and the highest antioxidant capacity.

The pamphlet will be available sometime this summer. If you are interested in getting a copy, send an email to marketing@microgreensworld.com with the Subject: "LED Lighting Pamphlet."

In the pamphlet/e-book, I emphasize the importance of a balanced light spectrum, optimal intensity, and proper duration to maximize nutrient density without compromising plant health.

References

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Illuminating Growth: The Next Generation of Greenhouse Lighting Innovations

This article explores the latest advancements in greenhouse lighting technology and how these innovations are shaping the future of horticulture.

Key points:

LEDs are becoming the dominant force in greenhouse lighting.

Their energy efficiency, customizable spectrum, and longer lifespan offer significant advantages over traditional lighting sources like HPS lamps.

Innovators focus on optimizing plant growth and resource efficiency.

This focus includes tailoring light spectrums to specific crops and growth stages, utilizing sensors and automation for precise control, and integrating AI and machine learning for data-driven optimization.

Vertical farming and controlled environment agriculture are driving demand for innovative lighting solutions.

These systems rely heavily on artificial lighting, and advancements in LED technology are making them more viable and efficient.

Sustainability is a key focus:

New lighting solutions aim to reduce energy consumption, minimize environmental impact, and promote responsible resource management.

Overall, the article paints a picture of a rapidly evolving field where technological advancements are enabling more precise, efficient, and sustainable greenhouse lighting solutions. These innovations have the potential to significantly impact food production, resource management, and the future of agriculture. iGrow News, 2024-03-17

Arugula Microgreen Market Set to Reach $402.6 Million by 2031

Analysts expect the global arugula microgreen market to reach $402.6 million by 2031, growing at a CAGR of 10.2% from 2022 to 2031.

- They attribute this growth to factors that include:

Increased consumer interest in healthy and nutritious foods:

Arugula microgreens are packed with vitamins, minerals, and antioxidants, making them a

popular choice for health-conscious consumers.

- Rising demand for fresh and flavorful ingredients:

Arugula microgreens offer a unique peppery flavor, and you can use them in various dishes, from salads and sandwiches to pizzas and pasta.

- The growing popularity of microgreens in general:

Chefs and home cooks alike increasingly use microgreens, and arugula is one of the most popular varieties.

- Expansion of the food service industry:

Restaurants and other food service establishments are increasingly incorporating microgreens into their dishes, driving demand.

The report suggests that the arugula microgreen market presents a promising opportunity for investors and businesses in the food and agriculture sectors. Analysts expect to see an increasing demand for these nutritious and flavorful greens, driving market growth in the coming years. **Allied Research, 2024-03-19**

Brought to you by **Doc Green**, Andrew Neves' personally trained AI assistant. "You may ask me anything about microgreens."

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