Volume 2024 Number 19 MICROGREENS WORLD Monday June 03 2024

WEEKLY DIGEST

CELEBRATE NATIONAL GARDEN WEEK: DISCOVER THE JOYS AND BENEFITS OF GROWING MICROGREENS AT HOME

BOOSTING NUTRITION: INCREASING VITAMIN C IN ARUGULA MICROGREENS

CREATIVE RECIPES: Microgreens Pesto Pasta, Microgreens and Goat Cheese Frittata, Microgreens Smoothie Bowl

ENHANCING MICROGREEN YIELD: The Impact of Fertilizer and Substrate Depth

INDUSTRY NEWS: Broccoli Microgreens Market to Reach $398.5 Million by 2031

"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.

Celebrate US National Garden Week

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Nutrition Science

Boosting Nutrition: Increasing Vitamin C in Arugula Microgreens

This study explored ways to increase vitamin C in arugula microgreens by using ascorbic acid supplements.

Vitamin C is crucial for human health, but our bodies can't produce it, so we need it from our diet.

Researchers treated arugula microgreens with different concentrations of ascorbic acid.

They found that higher doses led to significantly more vitamin C in the plants.

The most effective concentration was 0.25%, which increased vitamin C levels without harming the plants.

Microgreens grown with 0.25% ascorbic acid had about six times more vitamin C than untreated ones, reaching levels similar to or higher than those in citrus fruits.

This method could help people meet their daily vitamin C needs by eating a smaller amount of these nutrient-rich microgreens.

The study also noted that these fortified microgreens could be easily grown at home, making them an accessible and practical solution to improve nutrition.

Kathi, Shivani, et al. "Increasing Vitamin C through Agronomic Biofortification of Arugula Microgreens." Scientific Reports, vol. 12, no. 1, July 2022, https://doi.org/10.1038/s41598-022-17030-4.

Community Spotlight

Exploring South Dakota's Year-Round Microgreen Cultivation

Wild Spruce Market, located in Custer, South Dakota, is showcasing the rich variety and nutritional benefits of locally grown microgreens.

The market, managed by Claude and Christie Smith, emphasizes the freshness of their produce, noting that their microgreens are harvested and delivered to their store within a day.

Microgreens are celebrated for their unique textures and intense flavors, enhancing everything from salads to main dishes.

Wild Spruce Market, in partnership with Urban Farmer Microgreens, offers a selection that includes microgreen salad mix and pea sprouts, with plans to expand their range as the season progresses.

This initiative is part of the Fresher is Fun! campaign by the South Dakota Specialty Producers Association, aimed at promoting local specialty crops.

In addition to microgreens, the store features other locally

sourced products like vegetables, mushrooms, honey, and dairy items, fostering a connection between local producers and consumers seeking healthful options.

Source: Morning AgClips, May 27, 2024.

Microfarms: Growing Tiny, Nutritious Greens

Jenna and Gregory Anton run a small farm called Microfarms, where they grow 12 types of microgreens.

At Microfarms, the microgreens are planted closely together in shallow trays and grown in small greenhouses. It takes anywhere from five to 25 days for the microgreens to be ready to eat.

They are harvested fresh, packed in plastic containers, and can last about a week in the fridge if you keep a damp paper towel in the container. You can also buy a whole tray to take home.

You can use microgreens in salads, sandwiches, juices, or teas. After you've harvested most of the microgreens, you can plant the remaining ones in your garden, where they will keep growing.

On the day we visited Microfarms, they had arugula, curled cress (which tastes like wasabi), radish, broccoli, and Chinese cabbage. The types of microgreens available change each week.

For more information, check out Microfarms on Facebook, Instagram, and TikTok.

You can ask about custom orders for specific greens, and QR codes at their booth provide more details on each type of microgreen they offer.

Source: Victorville Daily Press, CA, May 27, 2024.

Microgreens: Mama Kali's Farm was founded by a plant-crazy mother and daughter-duo from Te Puke

Mama Kali's Farm in Te Puke, New Zealand, was founded by Kali and her daughter Jiangyu in 2022.

They are passionate about microgreens, which they say are more than just a fancy garnish. The farm started small, but now they plant over 250 trays each week on a 72-square-meter area.

They sell more than 1,300 packets of microgreens weekly.

Kali and Jiangyu grow their microgreens using eco-friendly methods, avoiding chemicals and using natural light. They hand-harvest their crops to ensure quality.

The business began as a fun project, but thanks to community support, it quickly grew. Now, their products are sold in nearly 25 supermarkets, including New World and Pak'nSave.

They hope to expand their sales nationwide.

The farm is named after an inside joke between the duo. They encourage others to try

growing microgreens, as it requires little space and effort and is a healthy and enjoyable activity.

Source: The New Zealand Herald, May 30, 2024.

Cultivation Techniques

The Key Factor For Regenerating Your Soils

Do you grow microgreens using soil? Did you know you can use regenerative soil techniques when growing microgreens?

Soil Testing for Microgreens

Assessment of Biodiversity

Container Investigation:

- Gently remove a small sample of soil from the container using a spoon or small trowel.
- Examine the soil for signs of life, such as tiny insects or microorganisms, using a magnifying glass if needed.

Biodiversity Evaluation:

- Count the variety of organisms present in the soil sample.

Rate the biodiversity:

- 0-1: Not satisfactory
- 2-5: Acceptable
- 5+: Outstanding

Assessment of Soil Coverage

Creating a Measurement Tool:

Use a small wire frame or a repurposed wire coat hanger bent into a square shape to fit within your container.

Estimating Soil Coverage:

- Place the square on the soil surface inside the container.

- Estimate the proportion of soil surface covered by organic material or microgreen roots. Sufficient coverage is crucial for maintaining moisture levels and protecting the soil structure.

Integrating Regenerative Soil Techniques

Using a sieve (a salad spinner could also work), separate the microgreen roots from the soil.

Composting:

- Incorporate high-quality organic compost into the soil mix to enrich it with essential nutrients and beneficial microorganisms, promoting healthy microgreen growth.
- Add the roots to your existing compost bin.

Organic Amendments:

- Use organic amendments such as worm castings or kelp meal to provide additional nutrients and improve soil structure.

Diverse Planting:

- Rotate different microgreen varieties in each planting cycle to break pest cycles and enhance soil health through varied nutrient demands and root structures.

Microbial Inoculants:

- Introduce microbial inoculants to the soil to boost the population of beneficial microbes, enhancing nutrient availability and plant health.

Using regenerative soil techniques for growing microgreens helps improve plant growth and soil health.

By testing soil biodiversity, ensuring good coverage, composting, using organic amendments, rotating crops, and adding microbial inoculants, you can create a thriving environment for your microgreens.

These methods make your garden more sustainable and

productive, ensuring healthy and tasty microgreens while keeping your soil vibrant.

The Featured Article

Celebrate National Garden Week: Discover the Joys and Benefits of Growing Microgreens at Home

National Garden Week is an annual celebration in the United States that encourages people to embrace the wonders of gardening and **connect with nature**.

In 2024, National Garden Week will be held from June 2 to June 8. During this week, garden clubs, community organizations, and individuals across the country organize various events and activities to celebrate gardening and **raise awareness** about its benefits.

This year, why not join the festivities by discovering the joys and benefits of **growing microgreens at home**? These tiny, delicate greens have taken the culinary world by storm, and for a good reason!

If you are new to microgreens, they are the young, tenderlings of plants, including greens, flowers, herbs, and some fruits. They are harvested just a **week or two after germination** when their first true leaves appear.

Unlike sprouts, which are grown in water and consumed roots and all, microgreens are grown primarily in soil and harvested above the ground.

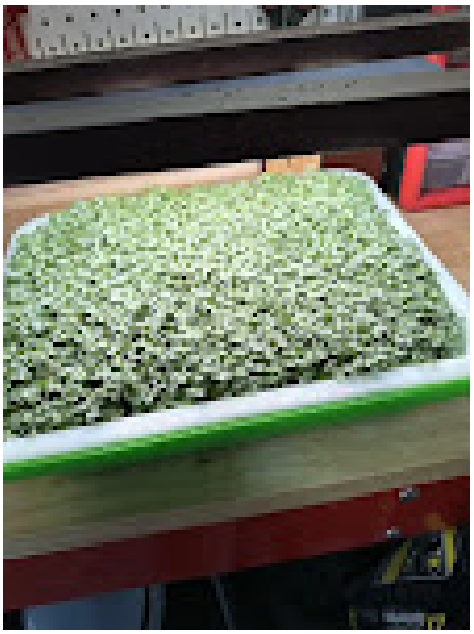
They are also distinct from baby greens, which are allowed to grow a bit larger before being harvested.

One of the most appealing aspects of microgreens is their **incredible nutritional value**.

Studies have shown that these tiny powerhouses can pack up to **40 times more nutrients** than their mature counterparts! They are rich in vitamins, minerals, and antioxidants, making them a fantastic addition to any diet. Plus, their delicate textures and intense flavors can elevate any dish, from salads and sandwiches to smoothies and main courses.

If you have never tried growing microgreens at home, I encourage you to try them this week.

It is not only rewarding but also incredibly easy. To get started, just **grab a copy of my book** and follow the **green brick road to success**.



"I downloaded the book written by Mr. Neves . . . This pic is from my first tray following his guidance. Prior to downloading his book, I had mold, inconsistency in growth, etc. I did stop using the coco coir and switched to the soil. That was one of the biggest changes.

This is not a paid endorsement for Mr. Neves at Microgreens World! I bought the book like everyone else!" – Jim C.

You will have complete control over the quality and freshness of your greens, and you will always have a ready supply right at your fingertips. Plus, it's much more cost-effective than buying pre-packaged microgreens from the store.

All you need is some essential equipment (like trays, potting soil, and seeds), a sunny windowsill or grow light, and a little bit of love and attention.

Simply fill your trays with potting soil, sprinkle your chosen seeds evenly over the surface, and gently press them into the soil. Water them lightly and place them in a warm, sunny spot or under a grow light. In just a week, you'll be harvesting your very own crop of fresh, vibrant microgreens!

National Garden Week is the perfect time to embark on your microgreens journey. Share your experiences on social media using the hashtags **#NationalGardenWeek** and **#MicrogreensWorld,** and inspire others to join in on the fun.

If you're an experienced grower, consider mentoring a newcomer and sharing your tips and tricks.

So, what are you waiting for? Celebrate National Garden Week by discovering the joys and benefits of growing microgreens at home.

Not only will you be treating yourself to the freshest, most nutritious greens possible, but you'll also be joining a community of enthusiastic gardeners and foodies who share your passion for healthy, sustainable living.

Happy growing!

There are several ways to participate in National Garden Week, whether you are a home gardener or a commercial farmer.

1. *Educational workshops*: During National Garden Week, you could organize or participate in workshops that teach people how to grow microgreens at home or in community gardens. These workshops can cover topics such as seed selection, growing media, lighting, watering, and harvesting.

2. *Microgreens garden tours*: If you have a microgreens garden or know of any in your community, you could organize tours during National Garden Week to showcase the beauty and benefits of growing microgreens.

3. *Microgreens tastings and demonstrations*: Set up a booth at a local garden center, farmers market, or community event during National Garden Week to offer samples of microgreens and demonstrate how to incorporate them into various dishes. **A great marketing tool!**

4. *Camp gardening programs*: Work with local camps to incorporate microgreens into their gardening curricula during National Garden Week. This can teach children about the fast growth cycle and nutritional benefits of microgreens.

5. *Plant sales and exchanges*: Include microgreen seeds or starter kits in plant sales or exchanges organized during National Garden Week. **A great marketing tool!**

6. *Social media campaigns*: Share information, photos, and videos about microgreens on social media platforms using hashtags related to National Garden Week to raise awareness about the benefits of growing and consuming microgreens.

7. *Community garden projects*: Encourage community gardens to dedicate space for microgreens during National Garden Week and provide resources or workshops to help gardeners get started.

By incorporating microgreens into National Garden Week activities, you can raise awareness about their benefits, encourage more people to grow them and promote their consumption as a healthy addition to diets.

Creative Recipes

Incorporating homegrown microgreens into these recipes not only adds a **unique flavor** and **nutrient boost** but also fosters a sense of **pride** and **connection** to the food we eat.

Experiment with different microgreen varieties and flavor combinations, focusing on the **therapeutic** aspects of the entire process, from planting and tending to harvesting and cooking.

The act of **nurturing** and **creating** something delicious and healthy can be incredibly empowering and emotionally rewarding, making it a perfect way to celebrate National Garden Week.

Microgreens Pesto Pasta

Therapeutic Benefits

Engaging in the process of harvesting, washing, and creating a meal with homegrown microgreens can be incredibly satisfying and rewarding.

Below are the ingredients and detailed step-by-step instructions for two servings:

Ingredients

- 2 cups mixed microgreens (basil, cilantro, and arugula)
- 2 cloves garlic
- 1/4 cup olive oil
- 2 tablespoons lemon juice
- 1/4 cup grated parmesan cheese
- 1/4 cup pine nuts or walnuts
- Salt and pepper to taste
- 200g pasta of your choice

Instructions

1. *Prepare Ingredients*: Wash and dry the mixed microgreens. Peel the garlic cloves.

2. *Blend Ingredients*: In a food processor, combine the microgreens, garlic, nuts, parmesan cheese, and lemon juice.

3. *Add Olive Oil*: With the food processor running, gradually add olive oil until the mixture reaches the desired consistency.

4. *Season*: Season the pesto with salt and pepper to taste.

5. *Cook Pasta*: Cook the pasta according to package instructions. Drain and reserve some pasta water.

6. *Toss with Pesto*: In a large bowl, toss the cooked pasta with the microgreens pesto, adding reserved pasta water as needed to achieve a smooth, creamy sauce.

7. *Garnish and Serve:* Serve the pasta on a plate, garnished with extra microgreens and a sprinkle of parmesan cheese. Enjoy your meal!

Microgreens and Goat Cheese Frittata

Therapeutic benefits

Harvesting delicate microgreens and incorporating them into a wholesome, home-cooked meal can provide a sense of accomplishment and nourishment.

Below are the ingredients and detailed step-by-step instructions for two servings:

Ingredients:

- 1 cup mixed microgreens (kale, Swiss chard, and beet greens)
- 4 large eggs
- 1/4 cup milk
- 1/4 cup crumbled goat cheese
- 1 small onion, finely chopped
- 2 cloves garlic, minced
- Salt and pepper to taste
- Olive oil for sautéing

Instructions:

1. *Preheat Oven:* Preheat your oven to 375°F (190°C).
2. *Prepare Ingredients:* Wash and dry the mixed microgreens. Finely chop the onion and mince the garlic.
3. *Sauté Onion and Garlic:* Heat a small amount of olive oil in an oven-safe skillet over medium heat. Add the chopped onion and minced garlic, and sauté until they are soft and fragrant.

4. *Whisk Eggs and Milk:* In a medium bowl, whisk together the eggs and milk until well combined.
5. *Add Microgreens and Goat Cheese:* Stir in the mixed microgreens and crumbled goat cheese into the egg mixture. Season with salt and pepper to taste.
6. *Cook Frittata on Stove:* Pour the egg mixture into the skillet with the sautéed onions and garlic. Cook on the stove over medium heat until the edges start to set, about 5-7 minutes.
7. *Bake in Oven:* ***Transfer*** the skillet to the preheated oven and bake until the center of the frittata is set about 10-12 minutes.
8. *Garnish and Serve:* Remove the frittata from the oven and let it cool slightly. Garnish with extra microgreens before serving. Enjoy your meal!

Microgreens Smoothie Bowl

Therapeutic benefits

The process of carefully selecting and arranging vibrant microgreens and toppings can be a mindful, artistic experience that promotes relaxation and creativity.

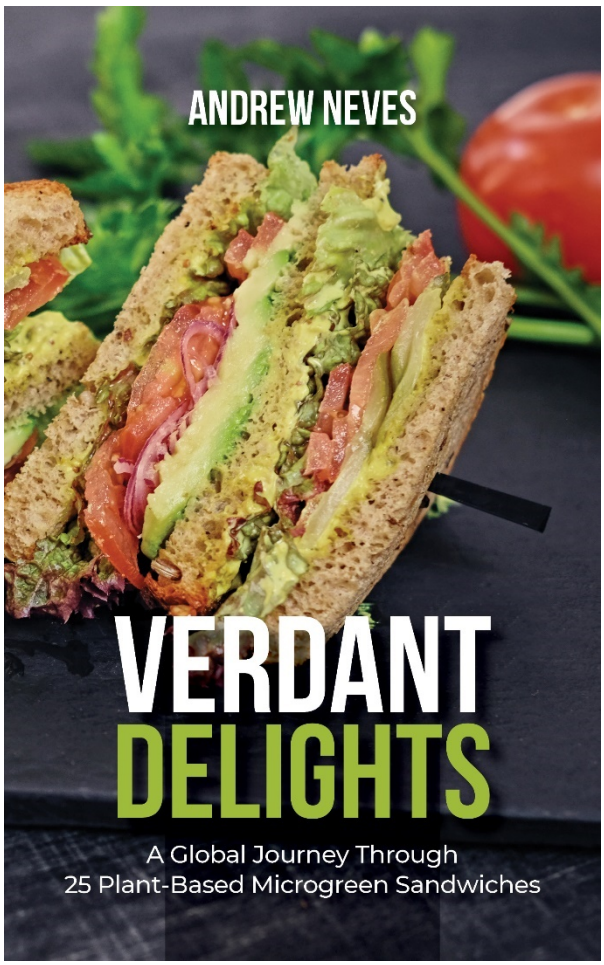
Below are the ingredients and detailed step-by-step instructions for two servings:

Ingredients:

- 1 cup mixed microgreens (broccoli, radish, and sunflower)
- 2 frozen bananas
- 1 cup mixed berries (fresh or frozen)
- 1/2 cup yogurt
- 1/2 cup milk (dairy or non-dairy)
- 2 tablespoons honey
- Toppings: granola, nuts, seeds, fresh fruit

Instructions:

1. *Prepare Ingredients:* Wash and dry the mixed microgreens. Peel and freeze the bananas if not already frozen.
2. *Blend Ingredients:* In a blender, combine the microgreens, frozen bananas, mixed berries, yogurt, milk, and honey. Blend until smooth.
3. *Pour into Bowl:* Pour the smoothie mixture into two bowls.
4. *Add Toppings:* Arrange the toppings (granola, nuts, seeds, fresh fruit) on top of the smoothie in an attractive pattern.
5. *Serve:* Enjoy your nutritious and delicious microgreens smoothie bowl!



Evidence-based Expertise

Enhancing Microgreens Yield: The Impact of Fertilizer and Substrate Depth

This study explores how different levels of fertilizer and varying substrate depths affect the yield of arugula, mizuna, and mustard microgreens.

Fertilizer Concentration

Microgreens are often thought to need no additional fertilizer because their seeds contain enough nutrients for early growth.

However, this study tested the impact of water-soluble fertilizer concentrations (0, 50, 100, 150, and 200 ppm nitrogen) on microgreens' yield.

Seeds were planted in a peat/perlite mix and watered with the respective fertilizer concentrations.

Results showed that all three types of microgreens (arugula, mizuna, mustard) increased in fresh weight as fertilizer concentration rose.

Arugula had the most significant increase (106%), followed by mizuna (70%). Despite the highest yields at 200 ppm nitrogen, plants were more prone to lodging and damage during harvest.

Substrate Depth

The study also examined how different substrate depths (0.7, 1.3, 1.7, and 2.3 inches) influenced microgreens' growth.

The results indicated that deeper substrates generally led

to higher yields, with arugula, mizuna, and mustard increasing in fresh weight by 41%, 45%, and 40%, respectively, from the shallowest to the deepest substrate. =

However, the shallowest substrate dried out quickly and needed more frequent watering, while the deepest substrate retained too much moisture, leading to increased disease risk, especially in arugula.

A substrate depth of 1.7 inches was found to strike the best balance between moisture retention and air porosity.

Conclusion

For optimal microgreen yield, using a complete water-soluble fertilizer at 150 ppm nitrogen and a substrate depth of 1.7 inches is recommended.

These adjustments, though slight increases in input costs, can significantly enhance microgreens production.

Growers are advised to trial new practices on a small scale before widespread implementation.

Source: Vertical Farm Daily, May 24, 2024.

Emerging Industry News

Tiny Acres: Pioneering Urban Farming with Microgreens in Malaysia

Tiny Acres, a Malaysian agritech startup founded by Qi-Guang and Karen in mid-2022, is revolutionizing urban farming with a focus on microgreens.

Despite having no formal agricultural background, the duo's shared passion for farming and food security drove them to establish an indoor vertical farm

that cultivates up to 14 varieties of microgreens.

Their venture goes beyond mere produce; Tiny Acres aims to create a sustainable urban farming model.

To cater to those who dislike eating vegetables, they have developed a liquified form of microgreens.

They are also working on a honey probiotic drink incorporating these nutrient-rich greens. These initiatives align with their mission to reduce food miles and provide city dwellers with fresh, high-quality produce.

Tiny Acres collaborates with local farmers, chefs, and businesses, enhancing food security and promoting sustainable living practices. Their educational efforts include hosting tasting sessions and creating informative content to raise awareness about the health benefits of microgreens.

While they are aware of the similarities in name with other startups, such as Tiny Greens, their focus remains on partnerships that strengthen the local food ecosystem rather than competition.

Tiny Acres continues to overcome challenges in research and development, particularly in optimizing growing conditions for different microgreens.

Currently managed solely by the founders, the company plans to scale up and expand its offerings to include a broader range of vegetables and herbs.

This expansion will necessitate significant investments in infrastructure and technology,

aiming to contribute to Malaysia's future food security and sustainable agriculture.

Learn more about Tiny Acres and their journey towards innovative urban farming on their Instagram page.

Source: Vulcan Post, the knowledge hub of Singapore and Malaysia, May 28, 2024.

Broccoli Microgreens Market to Reach $398.5 Million by 2031

The broccoli microgreens market is projected to grow significantly, reaching $398.5 million by 2031 with a 5.5% annual growth rate.

This growth is driven by the increase in indoor vertical and greenhouse farming, as well as a higher demand for fresh, nutritious food.

Broccoli microgreens are young broccoli plants harvested within **10 days of germination** and are known for their **health benefits**.

Indoor farming is becoming more popular due to rising food demand and less available fertile land. New technologies like sensors, AI, and hydroponic systems are being used.

However, there is a shortage of skilled workers to operate these systems.

The market is divided by end users (residential and commercial), farming methods (indoor, vertical, greenhouse), and distribution channels (retail, online, farmers' markets).

Europe currently leads the market, and major players are expanding through product launches and business growth strategies.

Source: Allied Market Research, May 29, 2024.

Commercial Best Practices

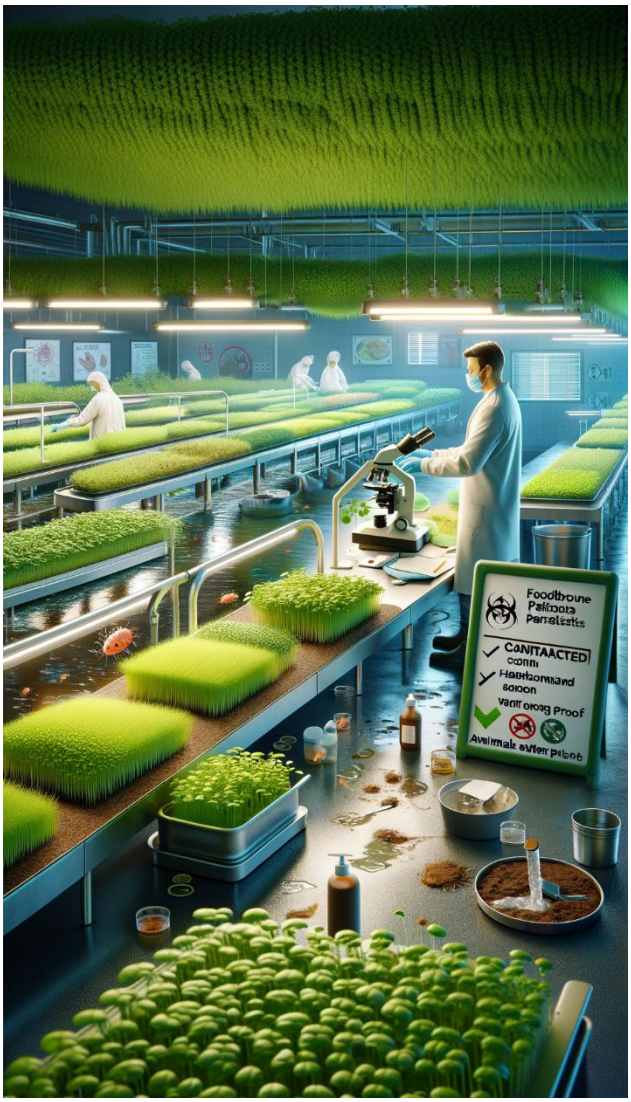
Critical Foodborne Parasites: Ensuring Safety in Commercial Microgreens Production

Foodborne parasites are a significant but often overlooked threat to food safety.

They can infect various foods, including fish, shellfish, fruits, vegetables **(including microgreens)**, and meat. These parasites, such as helminths, ameba, and protozoa, are more challenging to detect and control compared to bacteria.

For commercial microgreens growers, understanding the risks posed by foodborne parasites is crucial.

These parasites can contaminate microgreens through various means, such as **contaminated water or soil**.



One notable parasite is *Toxoplasma gondii*, which can infect humans through contact with cat feces-contaminated produce.

> If you are a home grower with animals in the home, ensure that your growing area is animal-proof.

Another example is Cyclospora, which can cause illness if produce is contaminated by human waste.

> Ensure all employees wash their hands before and after entering or leaving the production area.

Detection and control of these parasites require specialized methods, often involving microscopy and skilled parasitologists.

Standard practices like thorough washing of fruits and vegetables, proper hand hygiene, and using clean water sources are essential preventive measures.

The impact of climate change has led to the spread of certain parasites to new areas, making vigilance even more critical.

For microgreen growers, this means regularly monitoring their growing environments and ensuring strict hygiene practices to prevent contamination.

In summary, while foodborne parasites are less frequently discussed than bacteria, they pose a significant risk to public health and food safety.

Microgreens growers must be aware of these risks and implement rigorous safety measures to ensure their produce is safe for consumption.

Source: Food Safety Magazine, April 2024.

Learn all the essential aspects of growing microgreens successfully!

Instructor: M.S. Karla Garcia
-Hort Americas Technical Service
-Master in Plant Sciences from The University of Arizona
-Recognition by ISHS in strawberry hydroponic research
-Editor: Book Roadmap to Growing Leafy Greens and Herbs
-CEO at Microgreens FLN

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