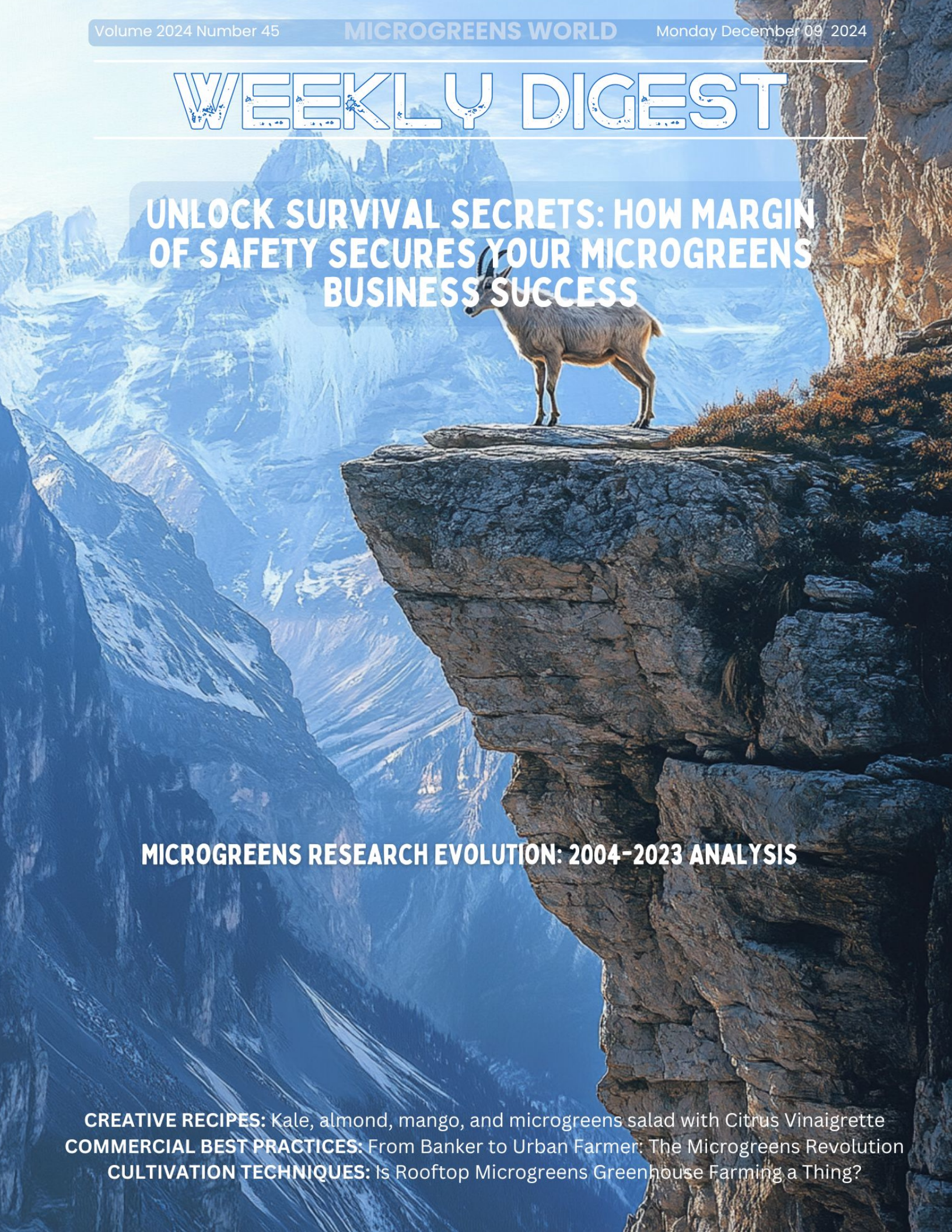
Volume 2024 Number 45 MICROGREENS WORLD Monday December 09 2024

WEEKLY DIGEST



UNLOCK SURVIVAL SECRETS: HOW MARGIN OF SAFETY SECURES YOUR MICROGREENS BUSINESS SUCCESS

MICROGREENS RESEARCH EVOLUTION: 2004-2023 ANALYSIS

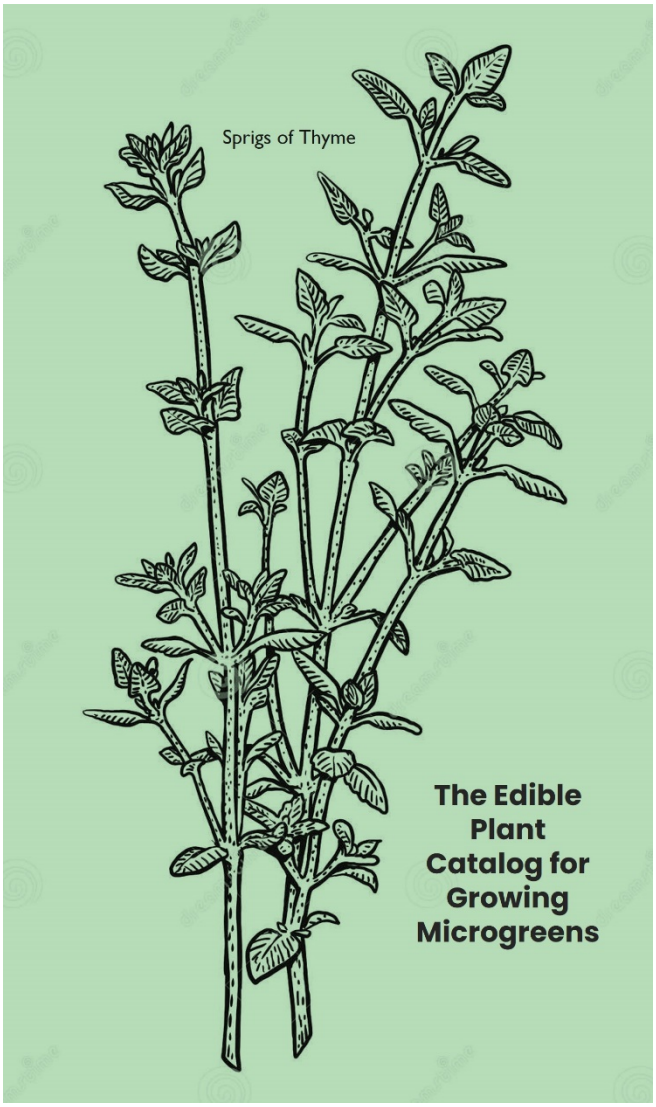
CREATIVE RECIPES: Kale, almond, mango, and microgreens salad with Citrus Vinaigrette
COMMERCIAL BEST PRACTICES: From Banker to Urban Farmer: The Microgreens Revolution
CULTIVATION TECHNIQUES: Is Rooftop Microgreens Greenhouse Farming a Thing?

"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.

Unlock Survival Secrets: How MOS Secures Microgreens Business Success

Vol. 2024 No. 45 Monday, December 09, 2024

The Edible Plant Catalog for Growing Microgreens



Discover a wealth of possibilities in microgreen cultivation with our meticulously curated guide featuring **over 200 edible plant species**.

Each entry outlines specific growing requirements to jumpstart your microgreens growing journey, offering insights into optimal light, temperature, and watering conditions.

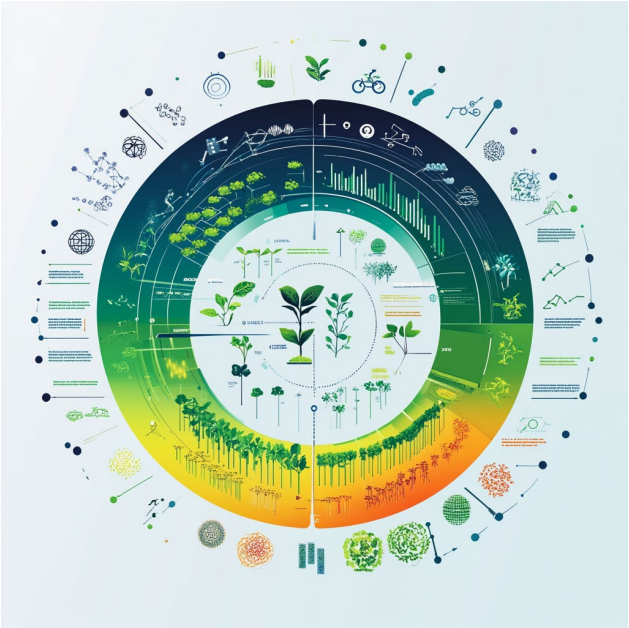
This invaluable resource caters to commercial growers, researchers, and home gardeners seeking to broaden their horizons beyond traditional crops.

Embrace this opportunity to innovate and contribute to the expanding field of microgreens, enhancing your expertise while enjoying the unique flavors and nutritional benefits of diverse plant varieties.

LEARN MORE

Nutrition Science

Microgreens Research Evolution: 2004-2023 Analysis



This comprehensive bibliometric analysis of microgreens research from 2004-2023 reveals three major trends shaping the field:

Nutritional Benefits

Research increasingly focuses on microgreens' **exceptional nutritional density**, with studies showing they contain higher concentrations of vitamins, minerals, and bioactive compounds compared to mature plants.

The analysis shows growing interest in functional food applications and health benefits, which is particularly evident in publications after 2017.

Cultivation Methods

Studies have evolved from basic growing techniques to sophisticated controlled-environment agriculture (CEA) systems.

LED lighting research emerged as a crucial focus area, with investigations into spectrum optimization and resource efficiency.

The analysis identified significant work on hydroponic systems and vertical farming applications, including space agriculture potential, through NASA-related research.

Sustainability Focus

Recent research demonstrates increasing emphasis on **sustainable production methods**, particularly in urban agriculture contexts.

Studies explore resource use efficiency, including water conservation, energy optimization, and space utilization in vertical farming systems.

Key Findings

- Research publications showed exponential growth after 2017
- **USA, Italy, and India emerged as leading research centers**
- Major research areas concentrated in Food Science Technology, Horticulture, and Plant Sciences
- Growing emphasis on sustainable production methods and urban agriculture applications

SUMMARY

This article is a bibliometric study analyzing research trends in microgreens publications from 2004 to 2023.

Using data from the Web of Science, the authors identify key publications, authors, countries, and journals contributing to the field.

The study reveals a significant increase in microgreens research since 2017, focusing on food science, horticulture, and plant science.

Major trends include exploring nutritional benefits, cultivation methods, and sustainability.

The findings are presented through tables, graphs, and charts illustrating co-authorship, co-occurrence, and co-citation relationships.

Future Implications

The analysis suggests emerging opportunities in urban farming technologies, nutritional optimization, and sustainable production methods.

The field shows **strong potential for continued growth**, particularly in areas combining technology, sustainability, and nutrition.

Source: Puente, L., Char, C., Patel, D., Thilakarathna, M. S., & S, R. M. (2024). Research Trends and Development Patterns in Microgreens Publications: A Bibliometric Study from 2004 to 2023. *Sustainability, 16(15)*, 6645. https://doi.org/10.3390/su16156645

Creative Recipes

Kale, almond, and microgreens salad with Citrus Vinaigrette

A vibrant celebration of textures and citrus notes, where the robustness of kale dances with the delicate sweetness of microgreens and the crunch of toasted almonds.

The citrus vinaigrette, bright and assertive, transforms these humble ingredients into something extraordinary.

Recipe Information:

- Prep Time: 20 minutes
- Cook Time: 5 minutes (toasting almonds)
- Category: Salad
- Method: Raw/Toast
- Cuisine: Caribbean-fusion
- Yield: 12 servings

Ingredients:

- 2 large bunches of curly kale, stems removed, leaves torn
- 2 cups mixed microgreens (radish, sunflower, pea shoots)
- 1 cup sliced almonds, toasted
- 2 ripe mangoes, cut into thin strips
- 1 cup toasted coconut flakes

Vinaigrette:

- 3 limes, juiced
- 1 orange, juiced
- 2 tablespoons honey
- 3 garlic cloves, finely minced
- 1/2 cup extra virgin olive oil

- Sea salt and black pepper
- 1 scotch bonnet pepper, deseeded and finely minced (optional)

Preparation

1. Massage kale leaves with a pinch of salt for 3 minutes until softened
2. Whisk citrus juices, honey, garlic, gradually add olive oil
3. Toast almonds until golden (3-5 minutes)
4. Toss kale with half the vinaigrette
5. Layer microgreens, mango, almonds, coconut

Plating

Arrange massaged kale on a large, shallow, black ceramic platter. Layer microgreens in clusters, creating height. Scatter mango strips, almonds, and coconut flakes. Drizzle the remaining vinaigrette. Finish with edible flowers.

Microgreens Benefits

Radish microgreens contain sulforaphane, which may help regulate blood sugar. Pea shoots are rich in polyphenols that support insulin sensitivity. Sunflower microgreens provide zinc and potassium, important minerals for diabetes management.

Community News

Danish Exhibit Circular Innovation with Microgreens

Micro Greens, a Danish company led by Alex Pichardt, operates with sustainability at its core, producing mushrooms and microgreens.

They have facilities in Ringe and Fredensborg, Denmark, and recently expanded to the Czech Republic and Austria.

They emphasize using sustainable methods such as utilizing coffee grounds as a growing medium and recycling 99% of nutrients.

Their strategy includes staying competitive against low-cost imports by cutting production costs, such as developing seeds in-house.

Micro Greens carefully selects its equipment, using Staal & Plast trays for durability and compliance with EU food safety regulations.

Their commitment to quality involves delivering products to restaurants within 10 hours of harvest.

The company is dedicated to forming collaborative relationships and sharing

knowledge with over 500 partners in Denmark.

With future expansion plans, they aim to maintain sustainability and high product quality across all operations.

This approach highlights the importance of adapting to market conditions, optimizing production processes, and investing in reliable and environmentally friendly resources for successful growth within the agri-business sector.

Source: Rademakers, H. (2024, December 6). Denmark: Improving microgreens growing by tackling inefficiency. *HortiDaily*. Retrieved from https://www.hortidaily.com/

A Scalable Success: Vertical Farming Across Borders

The article highlights the cross-border success story of Leafood, a vertical farming company based in Lithuania.

Founded in early 2023 by Valentinas Civinskas, Leafood focuses on growing fresh herbs, microgreens, and leafy greens for local and international markets.

Leafood's approach emphasizes the importance of not only technology but also a deep understanding of agricultural fundamentals.

To ensure freshness and rapid delivery, the company maintains a short two-day delivery window, surpassing the typical four-to-five-day period for imports from the Global South.

In addition, Leafood distinguishes itself by leveraging 100% renewable energy and innovative practices, such as playing classical music to promote healthier plant growth.

A key turning point for the company was its partnership

with German producer Dreesen Frische Kräuter, allowing it to fill supply gaps and provide EU-compliant products year-round to the German market.

This collaboration underscores the potential for cost reduction, increased efficiency, and fresher products.

For aspiring entrepreneurs, key takeaways include

- the significance of understanding local markets,
- adapting packaging based on customer feedback,
- and the power of forming strategic collaborations.

Valentinas envisions further expansion and a network of interconnected vertical farms enhancing the resilience and sustainability of the food system.

Source: Rademakers, H. (2024, December 5). Lithuania: Growing beyond borders. *VerticalFarmDaily.com*. https://www.VerticalFarmDaily.com

Certified Naturally Grown's List of Winter Conferences

Certified Naturally Grown

Conference season is about to be in full swing! Farm conferences are a wonderful way to learn and connect with growers in a vibrant regional context. Below is a short list of conferences aligned with CNG's sustainable farming ethos.

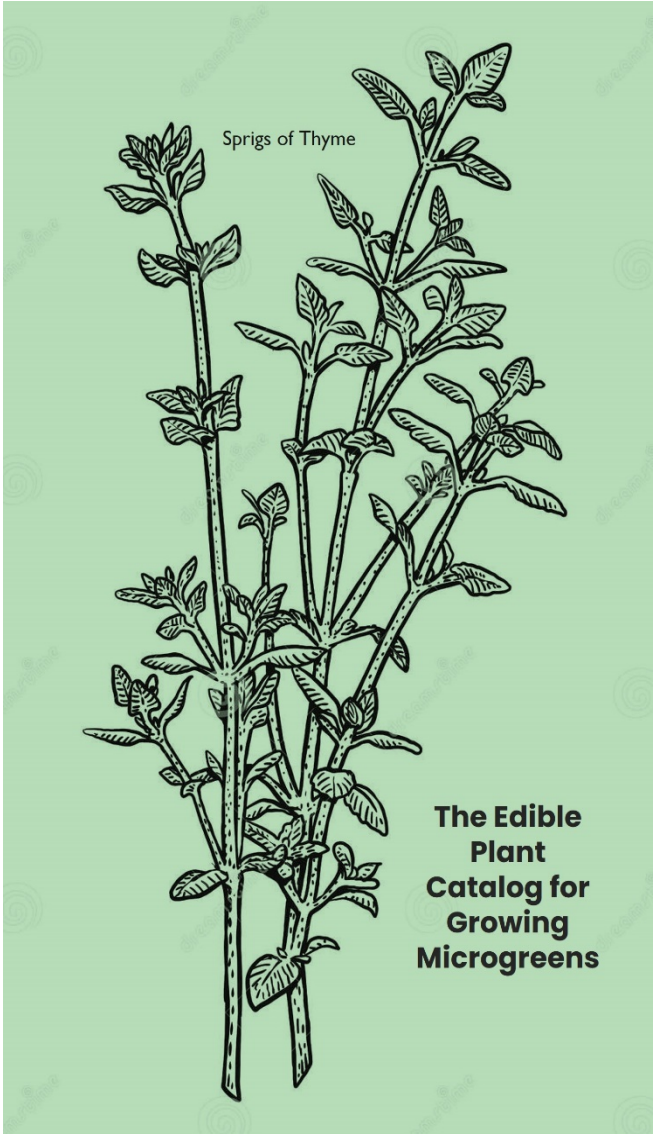
Make sure to tag us in your conference photos @cngfarming!

December 17-19, 2024 – Manchester, NH	New England Vegetable and Fruit Conference (NEVF)
January 10-12, 2025 – Roanoke, VA	Virginia Association for Biological Farming Conference (VABF)
January 17-18, 2025 – Silver Spring, MD	Future Harvest
January 23-25, 2025 – Frankfort, KY	Organic Association of Kentucky Annual Farming Conference (OAK)
January 24-25, 2025 – Montrose, CO	Western Co. Health, Food & Farm Forum

January 29th-February 1st, 2025 – Hot Springs, AR	Arkansas Grown Conference & Expo
February 4-6, 2025 – Atlanta, GA	SOWTH
February 5-7, 2025 – Lancaster, PA	PASA Sustainable Agriculture Conference
February 13-15, 2025 – Newark, Ohio	Ohio Ecological Food and Farming Association Conference
February 15, 2025 – Burlington, VT	Northeast Organic Farming Association of Vermont (NOFAVT)

Source: *Certified Naturally Grown*. (2024, October 2). Certified Naturally Grown's List of Winter Conferences. https://www.naturallygrown.org/certified-naturally-growns-list-of-winter-conferences/

The Edible Plant Catalog for Growing Microgreens



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LEARN MORE

FEATURED ARTICLE

Unlock Survival Secrets: How MOS Secures Your Microgreens Business Success

You've heard about successful **microgreens businesses**, but you're unsure why some thrive while others barely survive.

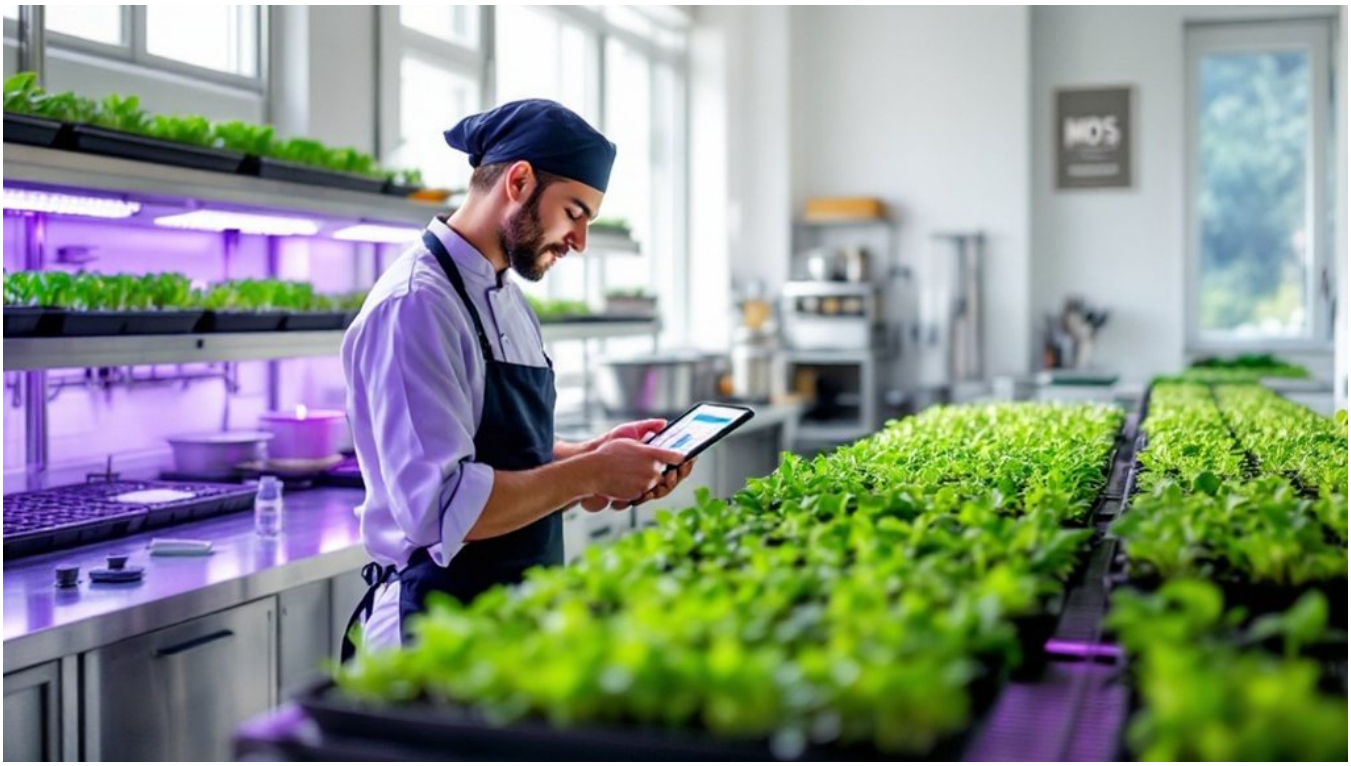
The secret lies in a powerful financial concept called the Margin of Safety (MOS) that can make the difference between **constant stress** and **confident growth**.

As a microgreens entrepreneur, you'll need more than just growing expertise to secure your business's future.

Through strategic MOS planning, you're not just creating a **safety net** - you're building a foundation for **sustainable profits** and **scalable operations**.

Let's investigate how this vital principle can transform your venture from vulnerable to virtually unstoppable.

Why Startups Like Microgreens Fail



While a staggering 53% of U.S. **startups fail** within their first five years, specialty businesses like **microgreens operations** face even steeper challenges due to their unique production cycles, narrow **profit margins**, and market volatility.

Your microgreens venture's survival demands more than just horticultural expertise and market knowledge—it requires a robust financial strategy centered on the often-overlooked concept of Margin of Safety (MOS), which can provide essential protection against unexpected setbacks and seasonal fluctuations.

Starting with 2-3 key varieties and gradually expanding based on market feedback has proven to be a successful approach for sustainable growth in the microgreens industry.

Developing a comprehensive business plan is crucial for defining clear objectives and creating a roadmap that guides your operation toward long-term success.

The high failure rate of microgreens startups

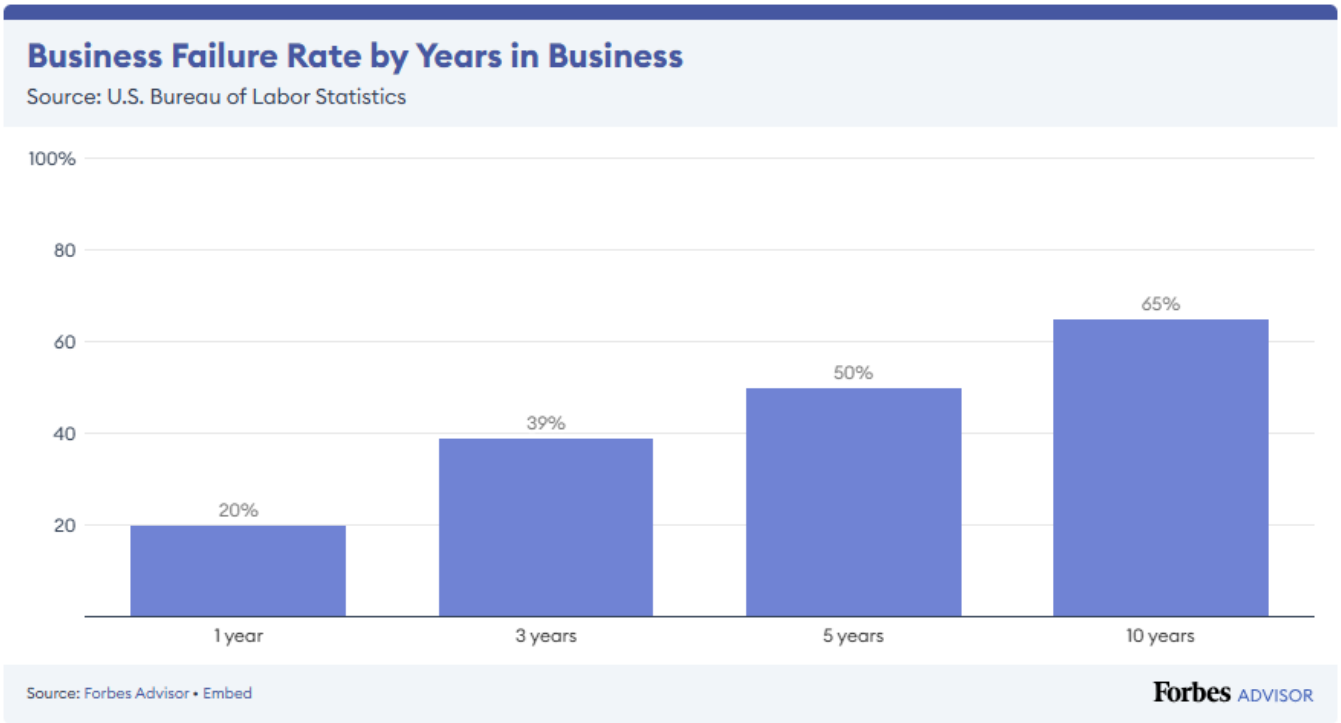
Starting a **microgreens business** may feel exciting, but the sobering reality is that 90% of **startups fail** across industries, with **niche agricultural ventures** facing even steeper challenges (Ruby et al., 2022).

You're entering a market where success demands more than just agricultural expertise; it requires a robust understanding of **financial sustainability** and **risk management** through strategies like Margin of Safety (MOS).

According to Ghosh et al. (2021), 16% of startups fail due to **cash flow problems**, while 42% collapse from misreading **market demand** - challenges you can mitigate through proper MOS implementation.

When you're maneuvering through the complexities of microgreens production, where margins are typically narrow and operational costs high, understanding your **break-even point** becomes essential for **startup survival strategies**.

With less than 1% of startups receiving any kind of growth capital funding, it's crucial to establish sustainable financial practices from the beginning.



Research by Aryadita (2023) shows that **first-time founders** have only an 18% success rate. With average startup costs of $3,000, you can't afford to operate without a **financial buffer**.

By implementing MOS for startups, you'll join the ranks of businesses that survive beyond the **critical five-year mark**, where 53% of new ventures typically fail.

Your success in the microgreens industry depends on establishing this **fundamental financial safeguard** from day one.

Margin of Safety (MOS) is a unique, underutilized strategy for ensuring survival

Financial resilience in your microgreens business doesn't come from luck - it stems from implementing a proven yet underutilized strategy called **Margin of Safety (MOS)**.

As a critical financial stability metric, MOS represents the buffer between your actual sales and **break-even point**, providing essential protection against **market volatility** and unexpected challenges.

While many microgreens entrepreneurs focus solely on production techniques and marketing, understanding your **definition of margin of safety** becomes your **competitive advantage** in an increasingly saturated market.

By calculating the difference between your current **revenue** and the minimum needed to cover costs, you'll gain precise insight into your business's **financial cushion**.

Revenue diversification helps minimize dependence on single product lines while strengthening your overall financial position.

Fixed costs remain constant regardless of production volume, making them crucial to consider in your break-even calculations.

For instance, if your monthly break-even point is $5,000 and you're generating $8,000 in sales, you're operating with a 37.5% margin of safety.

> A healthy MOS, typically 30-40% above break-even

This financial buffer isn't just a theoretical concept - it's your business's lifeline during **seasonal fluctuations**, supply chain interruptions, or unexpected equipment failures.

With most successful agricultural enterprises maintaining a MOS of 50% or higher, you'll want to position your microgreens operation within this resilient range through **strategic pricing** and **cost management**.

Actionable insights on how MOS can secure your microgreens business success

Three compelling reasons render Margin of Safety (MOS) essential for your microgreens business's long-term success.

- First, as a financial stability metric for startups, MOS provides a vital buffer against market volatility, enabling your operation to weather unexpected challenges like supply chain interruptions or seasonal demand fluctuations.
- Second, understanding your MOS helps you make educated choices about scaling operations, particularly when considering investments in new growing equipment or expanding your product line. Regular review of your cost structures ensures optimal financial performance.
- When implementing MOS, you'll realize it's particularly valuable in the microgreens industry, where tight margins and perishable inventory demand precise financial management. Setting aside emergency reserves helps prepare your business for unforeseen challenges while maintaining operational stability.

By maintaining **a healthy MOS, typically 30-40% above break-even**, you'll position yourself alongside successful peers who've excelled in this approach to business sustainability.

Through careful monitoring of your fixed costs, variable expenses, and contribution margins, you'll develop the financial acumen necessary to make strategic decisions about pricing, production volumes, and market expansion.

This scientific approach to financial planning distinguishes profitable microgreens operations from those that struggle to maintain long-term viability.

What is MOS and Why It Matters

Margin of Safety (MOS), your **financial buffer** between actual sales and **break-even point**, serves as a vital lifeline in the volatile microgreens industry.

You'll find this concept especially relevant when calculating how much wiggle room you have before your operation starts losing money, particularly during seasonal fluctuations or unexpected market shifts.

Implementing detailed food records helps track financial performance and maintain compliance with safety regulations.

Understanding MOS becomes crucial since microgreens are ready for harvest within 7-10 days, allowing for quick inventory adjustments based on market demands.

Your MOS directly impacts essential business decisions, from determining **optimal growing space** and crop selection to setting

sustainable pricing strategies that can weather market downturns while maintaining profitability.

MOS: The financial buffer between expected sales and the break-even point

Smart business owners know that success requires more than just breaking even - it requires a safety cushion.

CALCULATING YOUR MARGIN OF SAFETY

Benjamin Graham and David Dodd coined the term "margin of safety" in 1934 in their book Security. Margin of safety (MOS) is defined as the difference between the expected (or actual) sales level and the breakeven sales level. It can be expressed in the equation form below:

Margin of Safety = Expected (or) Actual Sales Level (quantity or dollar amount) - Breakeven Sales Level (quantity or dollar amount)

To calculate the margin of safety, we need to know two things: **the sales and the break-even sales.** The sales can be either the **actual sales for a given period** or the **projected sales for a future period**. The break-even sales are the sales level that **covers all the fixed and variable costs of the business**.

- **Fixed Costs** = Facility Rent/Lease, Equipment, Utilities, Insurance, Licenses and Permits, and Marketing and Advertising.
- **Variable Costs** = Seeds and Growing Medium, Labor, Packaging Materials, Refrigeration and Storage, Transportation and Delivery, Marketing and Advertising, Regulatory Compliance, Repairs and Maintenance, and Training and Development

The formula for the **break-even sales** is: **Fixed costs * Contribution margin ratio.**
The contribution margin is the difference between the sales and the variable costs. The contribution margin ratio is the ratio of the contribution margin to the sales.

The formula for the **contribution margin ratio** is: $\frac{\text{Sales}-\text{Variable costs}}{\text{Sales}}$

Once we **have the sales and the break-even sales, we can calculate the margin of safety using the formula:**
Margin of safety (MOS) = Sales - Break-even sales Or, alternatively, we can calculate the margin of safety as a percentage of sales using the formula:

Margin of safety percentage = $\frac{\text{Margin of safety}}{\text{Sales}} \times 100\%$

Let's see an example of how to apply these formulas. Suppose your microgreens farm has the following data for a month: **Sales: $5,000 | Fixed costs: $2,000 | Variable costs: $3,000**

We can calculate the contribution margin ratio as follows:

Contribution margin ratio = $\frac{\text{Sales}-\text{Variable costs}}{\text{Sales}} = \frac{5{,}000-3{,}000}{5{,}000} = 0.4$

We can then calculate the break-even sales as follows: $\frac{\text{Fixed costs}}{\text{Contribution margin ratio}} = \frac{2{,}000}{0.4} = 5,000$
We can see that the **break-even sales are equal to the sales**, which means the company is just breaking even and has **no margin of safety**. If the sales drop by even a small amount, the company will start to incur losses.

Now, suppose the company manages to increase its sales by 10% to $5,500, while keeping the fixed and variable costs unchanged. We can calculate the new margin of safety as follows:
Margin of safety = Sales - Break-even Sales = 5,500 - 5,000 = 500

Margin of safety percentage = $\frac{\text{Margin of safety}}{\text{Sales}} \times 100\% = \frac{500}{5{,}500} \times 100\% = 9.09\%$

We can see that the margin of safety has increased to $50,000 or 9.09% of sales, which means the company has more room to withstand a decline in sales before reaching the break-even point.

Your Margin of Safety (MOS), the critical buffer between your expected sales and **break-even point**, serves as your business's **financial safety net**, protecting you from **unexpected market fluctuations** and operational challenges that could otherwise threaten your microgreens venture's survival.

Understanding your **MOS calculation formula** is straightforward: subtract your break-even sales from your actual or projected sales to determine your **cushion in dollars**, or express it as a percentage by dividing this difference by your actual sales and multiplying by 100.

Creating detailed variable budgets after your initial weeks of operation helps maintain accurate MOS calculations.

Regularly monitoring this metric is essential since constant cost assumptions may not reflect real-world market dynamics.

> For example, if you're selling $10,000 worth of microgreens monthly with a break-even point of $7,000, your MOS would be $3,000, or 30%.

This margin of safety importance can't be overstated, as it reflects your business's **resilience against market downturns**, **seasonal fluctuations**, or unexpected expenses.

Microgreens MOS: Common startup challenges

Running a microgreens business means facing unique startup challenges that directly impact your margin of safety.

Understanding how MOS interacts with pricing **strategies** and **market volatility** becomes essential as you maneuver through the

complexities of maintaining profitability while competing in a dynamic marketplace.

Your success depends on carefully balancing **operational costs** against **revenue potential**, particularly when market conditions fluctuate unexpectedly.

The industry's projected growth to $2 billion by 2026 indicates substantial opportunities for businesses that maintain strong financial practices.

The growing trend of urban farming has made microgreens more accessible and profitable for startups in metropolitan areas.

Recent studies by Singh et al. (2024) indicate that successful microgreens operations must maintain financial resilience through effective MOS management by considering these vital factors:

- Implement dynamic pricing strategies that maintain a target gross margin of 75% or higher, allowing flexibility to modify prices based on market demand while preserving your financial buffer.
- Calculate comprehensive labor and packaging costs accurately, ensuring your pricing structure accommodates all operational expenses.
- Develop **subscription-based revenue models** to create predictable income streams, reducing vulnerability to market fluctuations.
- Monitor **local market trends** and competition continuously, adjusting your pricing strategy to maintain **competitive advantage** without compromising your MOS.

MOS: Minimize risk, increase financial stability, and flexibility in decision-making

Understanding your margin of safety (MOS) can make the difference between thriving and merely surviving in the microgreens business.

When you maintain a strong MOS **financial cushion**, you're protecting your operation against unexpected **market fluctuations**, **seasonal demand changes**, and **operational setbacks** that could otherwise threaten your sustainability.

Your MOS **competitive advantage** becomes evident through multiple channels: financially, you'll have the flexibility to weather economic downturns while maintaining quality production; operationally, you can invest in efficiency improvements and expansion opportunities without compromising your core business.

Consider how successful microgreens operations utilize their MOS to **diversify revenue streams** across restaurants, farmer's markets,

and direct-to-consumer channels, creating a robust business model that's resistant to **market volatility**.

Through careful monitoring of your MOS, you'll develop the capacity to make **strategic decisions** with confidence, whether that's investing in new growing equipment, expanding your product line, or entering new markets.

The data shows that businesses maintaining a healthy MOS consistently outperform their competitors, with superior operating margins and **sustained profitability** across economic cycles.

Start Securing Your Success with MOS

To secure lasting success in your microgreens business, you'll need to excel in the strategic implementation of **Margin of Safety principles**, which provide essential **financial buffers** against market volatility and operational challenges.

Your ability to calculate and maintain a healthy MOS, typically 30-40% above **break-even** for sustainable microgreens operations, will determine your capacity to weather seasonal fluctuations, supply chain interruptions, and unexpected expenses.

Understanding your break-even point and actively **monitoring your MOS** through meticulous cost tracking and sales analysis will empower you to make **data-driven decisions** about pricing, production scaling, and market expansion opportunities.

Designing and understanding MOS to achieve microgreens business success

Success in the microgreens industry hinges on commanding your Margin of Safety (MOS) through precise **operational planning** and execution.

Your **financial resilience** depends on understanding **break-even analysis** and maintaining **operational efficiency**, which together create a sustainable foundation for long-term business success.

By implementing robust MOS strategies, you'll join successful growers who've perfected the balance between **production costs** and market demands.

1. Track your operational metrics meticulously, including seed-to-harvest ratios, waste percentages, and labor costs, to establish accurate break-even points.
2. Develop diverse product offerings that combine staple microgreens with seasonal specialties, ensuring consistent revenue streams.
3. Maintain detailed **financial projections**, regularly updating them with actual performance data to enhance your MOS.

4. Build **strategic partnerships** with chefs and distributors while monitoring **market dynamics** to modify your pricing strategies.

Understanding and implementing MOS principles isn't just about survival—it's about thriving in a competitive market.

Your success depends on maintaining **operational excellence** while adjusting to market changes, ensuring you're positioned for sustained growth through careful management of your financial cushion and production efficiencies.

Your Next Steps to Success

Three essential steps will launch your journey toward a thriving microgreens business with a strong Margin of Safety.

First, you'll need to implement **comprehensive business planning** with MOS, incorporating **detailed market analysis** that examines local demand, identifies **premium customer segments**, and evaluates **competitive landscapes** to establish your unique position in the marketplace.

Second, you'll want to develop rigorous **stakeholder engagement protocols**, focusing on building relationships with **high-volume clients** like restaurants and specialty grocers.

Additionally, implement effective **cost-control measures** that enhance your growing operations and minimize waste throughout your production cycle.

Third, you must establish robust operational frameworks that encompass everything from growing area enhancement to **quality control systems**.

This ensures you're consistently delivering premium products while maintaining healthy profit margins.

You'll need to monitor **key performance indicators** closely, adjusting your strategies based on real-time data and market feedback to maintain your competitive edge.

When you integrate these fundamental steps into your business model, you'll create a resilient enterprise that can weather market fluctuations while steadily building toward long-term success in the microgreens industry.

Conduct a financial analysis to determine your current MOS

Carrying out a detailed **financial analysis** to determine your Margin of Safety (MOS) stands as a critical first step in securing your microgreens business's long-term viability.

Your ability to maneuver MOS cost strategies effectively depends on maintaining meticulous records of your Cost of Goods Sold (COGS), which should ideally remain below 30% of **total revenue** to guarantee adequate financial cushioning.

To perform a comprehensive MOS analysis, you'll need to examine several key financial components that fellow successful microgreens entrepreneurs consistently monitor:

1. Calculate your **gross profit margin** by subtracting COGS from revenue, then dividing by revenue and multiplying by 100 - aim for 50-80% in line with industry standards.
2. Determine your **break-even point** by dividing **fixed costs** by the difference between per-unit revenue and variable costs.
3. Project your **income**, operating costs, and **cash flows** over a 3-5-year period to identify potential MOS forecasting difficulties.
4. Monitor your COGS components regularly, including seeds, soil, water, and labor costs, to maintain optimal **production efficiency**.

Understanding these metrics enables you to establish a robust financial foundation and join the ranks of sustainable microgreens operations.

Implement strategies to build and leverage your MOS effectively

To maximize your **microgreens business's staying power**, you'll need proven strategies for building and maintaining a robust **margin of safety** through careful **financial planning**.

Your path to sustainable profitability requires perfecting advanced techniques in **cost management**, **pricing optimization**, and market positioning, which are comprehensively covered in The Microgreens Profit Blueprint training program.

Through this structured learning experience, you'll gain access to battle-tested frameworks for calculating optimal price points, managing variable costs, and implementing subscription models that

can help your operation achieve a margin of safety exceeding industry benchmarks.

Get Step-by-Step Guidance on maximizing MOS and achieving sustainable revenue

Ready to **transform** your microgreens venture into a **thriving business** with a **robust margin of safety**?

> *The **Microgreens MOS Guide** is a unique financial blueprint that helps aspiring microgreens entrepreneurs achieve sustainable profitability without constant cash flow stress, supply chain disruptions, or market volatility so they can build a resilient, thriving business with predictable revenue streams.*

The Microgreens MOS Guide offers **comprehensive guidance** on overcoming common MOS business limitations while implementing **proven strategies** to increase sales volume and guarantee **sustainable growth** through systematic, data-driven approaches.

The step-by-step Microgreens MOS Guide helps you join a community of successful microgreens entrepreneurs who've perfected the art of maintaining healthy profit margins.

Through detailed financial modeling and **strategic planning**, you'll learn to enhance your operations while building a sustainable **competitive advantage** in this growing market.

1. Perfect advanced cultivation techniques that reduce waste and maximize yield efficiency.
2. Implement sophisticated pricing strategies based on real-world market analysis and cost structures.
3. Develop streamlined systems for tracking key performance indicators and maintaining optimal MOS.
4. Create scalable business models that protect against **market volatility** and seasonal fluctuations.

Don't let uncertainty limit your business potential. The Microgreens MOS Guide provides you with **actionable insights**, proven methodologies, and ongoing support to help you achieve and maintain a strong margin of safety.

ORDER YOUR COPY NOW!

Get your copy today to access our complete library of resources.

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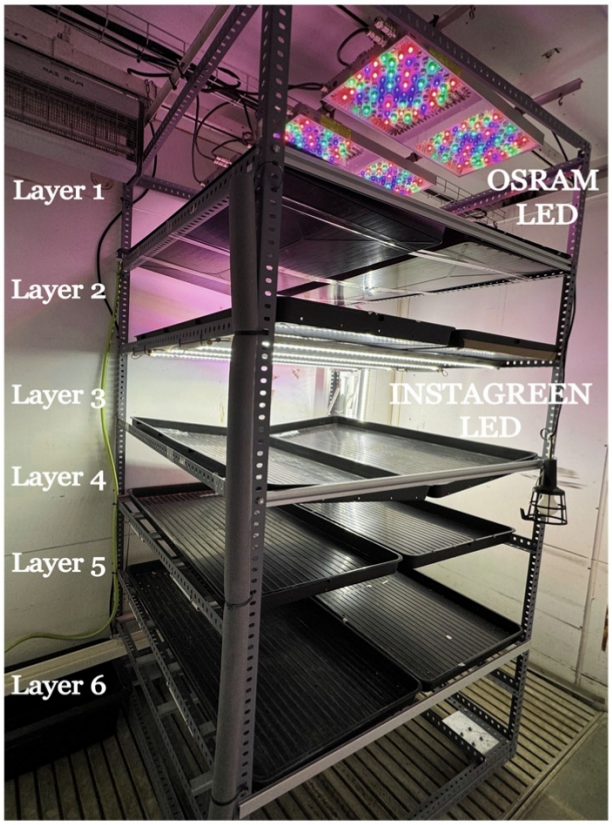
Evidence-based Expertise

Optimizing Light Recipes for Microgreen Production: Key Insights



This comprehensive study examined how different LED lighting conditions affect microgreen growth, comparing OSRAM LED (209.5 µmol m−2s−1) and INSTAGREEN LED (45 µmol m−2s−1) across 14 species.

The research revealed several **important findings** for optimizing controlled-environment agriculture (CEA) production of microgreens.

Growth Performance and Species-Specific Responses

Sunflower emerged as the top performer under both lighting conditions, showing the highest biomass production and chlorophyll content (SPAD values).

Most species achieved better growth under the higher-intensity OSRAM LED, though **nasturtium and leek** notably performed better under the lower-intensity INSTAGREEN LED.

This highlights the importance of species-specific light optimization in CEA systems.

SUMMARY

This research article, published in Agronomy, investigates the effects of varying light intensity and spectrum on the growth and resource use efficiency of fourteen microgreen species.

Using two different LED light systems, the study measured biomass, hypocotyl length, SPAD (Soil Plant Analysis Development)** content, and leaf area index across different plant families.

The results demonstrate species-specific responses to light conditions, with sunflower exhibiting the highest biomass.

The study also compares the resource use efficiency of the two LED systems, revealing trade-offs between cost-effectiveness and water/surface use efficiency.

The findings offer valuable insights for optimizing microgreen production in controlled-environment agriculture.

**A SPAD meter, such as the Konica Minolta SPAD-502Plus, is a portable device designed to measure the chlorophyll content in plant leaves non-destructively. The term "SPAD" in the SPAD meter stands for Soil Plant Analysis Development. This acronym reflects the device's origin and purpose in agricultural research, specifically for assessing plant health and nutrient status.

Resource Use Efficiency

The study found interesting tradeoffs in resource efficiency between the two lighting systems.

The lower-cost INSTAGREEN LED demonstrated superior light use efficiency (LUE) and energy use efficiency (EUE), being 3.5 times more efficient in converting light to biomass.

However, the OSRAM LED showed better water use efficiency (WUE) and surface use efficiency (SUE), requiring less water and space to produce equivalent biomass.

Economic Considerations

Operating costs revealed significant differences, with INSTAGREEN LED costing about four times less to operate than OSRAM LED ($48 vs. $189 annually).

This suggests the **potential for cost optimization** in commercial production through strategic light management.

Practical Implications

The findings indicate that **moderate light intensities** may offer the best balance between maximizing biomass production and resource efficiency. The study recommends:

- Tailoring light recipes to specific species
- Considering economic factors alongside growth metrics
- Balancing resource efficiency with production goals

Future Directions

The researchers suggest exploring new LED technologies and investigating the effects of varying light intensities on nutritional content and shelf life.

This could further optimize microgreen production in CEA systems while maintaining sustainability and economic viability.

Source: Mir, S., Krumins, R., Purmale, L., Chaudhary, V. P., & Ghaley, B. B. (2024). Effects of Light Intensity and Spectrum Mix on Biomass, Growth and Resource Use Efficiency in Microgreen Species. *Agronomy*, 14(12), 2895. https://doi.org/10.3390/agronomy14122895

Cultivation Techniques

Is Rooftop Microgreens Greenhouse Farming a Thing?

I was in Berkeley, California, a few weeks ago (my son's Senior Day) when I came across some homes with rooftop farms. I talked to one person about microgreens, and they were intrigued. We started talking about a small greenhouse (not even 5 sq. ft.) on their roof.

Letz's experience with rooftop farming in Berkeley offers valuable insights for urban microgreen producers.

Her quarter-acre rooftop operation demonstrates the

viability of container-style growing in limited urban spaces, particularly relevant for microgreen cultivation.

Key takeaways for microgreen growers include:

1. Growing Medium Considerations:

- The 10-inch soil depth successfully supports plant growth
- Specialized growing medium combining lava rock, pumice, and other materials ensures proper drainage
- Regular amendment additions and fertigation maintain nutrient levels

2. Climate Management:

- Mini hoop houses (fitting five 1020 trays) provide protected growing space
- Shallow soil warms quickly, requiring temperature management
- Urban settings offer milder temperatures than rural areas
- Shade cloth helps regulate temperature

3. Infrastructure Requirements:

- Reliable elevator access is crucial for materials and harvest transport
- Drainage systems prevent water accumulation
- Building cooperation and proper leasing agreements are essential
- Climate control becomes more critical in restricted spaces

4. Business Integration:

- Urban location facilitates direct customer access
- Pop-up farmstands provide marketing opportunities
- Educational components can diversify revenue
- Proximity to customers reduces transportation costs

For microgreen growers specifically, the article suggests that small greenhouse operations are viable in urban settings. However, they require

careful planning for temperature control and materials transport.

The success of shallow-soil growing systems particularly applies to microgreen production, which doesn't require deep soil.

The article also demonstrates that profitable urban agriculture is possible with proper infrastructure and business planning.

Source: Letz, J. (2021, April 30). Rooftop farming is on the rise. *Growing for Market*. https://growingformarket.com/articles/rooftop-farming-the-rise

MSU vegetable short course set for Feb. 25-26

VERONA, Miss. -- Current and prospective commercial vegetable growers can learn about specialized production methods during Mississippi State University's **2025 Vegetable Short Course Feb. 25-26.**

The course will be held at the North Mississippi Research and Extension Center's Magnolia Building in Verona from 8 a.m. to 5 p.m. each day.

It is open to greenhouse, high-tunnel, and field vegetable producers throughout the Southeast.

Attendees will learn about vegetable management practices for growing tomatoes, lettuce, and other crops via greenhouse, high-tunnel, and field production.

Participants will attend educational sessions and participate in hands-on activities.

Topics include microgreens, nutrient management, pesticide

safety, floating growing systems, and insect and disease issues.

Speakers will also present information on current tomato, strawberry, and lettuce research.

Vendors will offer various goods and services.

Preregistration is available until Feb. 15

PRE-REGISTER!

Preregistration is $40 per person. On-site registration is $50 for both days or $25 for one day per person.

The fee covers conference materials, lunch, and refreshments.

The Magnolia Building is located at 5395 Mississippi Highway 145 South.

The event is organized by personnel with the MSU Extension Service and Mississippi Agricultural and Forestry Experiment Station.

Emerging Industry News

Microgreens Surge: Innovation and Growth Forecast

The article highlights the burgeoning microgreens market projected to reach $3.46 billion by 2028, growing at a compound annual growth rate (CAGR) of 12.8% from $1.91 billion in 2023.

This expansion is driven by factors such as growing consumer health consciousness,

urban agriculture, and the sustainability movement.

Microgreens are becoming a staple in culinary applications due to their high nutrient content. They are gaining traction in both the food service and cosmetic industries.

Noteworthy trends include product innovation like Broccoli Microgreens Superfood Powder and sustainable packaging solutions, which align with consumer preferences for health and eco-consciousness.

Major players such as AeroFarms LLC, Goodleaf Farms, and Gotham Greens are at the forefront, leveraging vertical farming technology to enhance production efficiency.

For aspiring entrepreneurs, food innovators, and wellness pioneers, integrating microgreens into their offerings can align them with current sustainable and health-focused market trends.

The transition to urban and indoor farming further provides opportunities for novel business models.

The increasing importance of these practices is reflected in urban vertical farms, which are expected to increase to 2 million square meters by 2027, emphasizing the potential and necessity for unique microgreen varieties and resilient supply chains.

Source: The Business Research Company. (2024, December 4). Key microgreens market trend 2024-2033: Product innovation for health and sustainability. *EIN Presswire*. https://www.einpresswire.com/article/765706616/key-microgreens-market-trend-2024-2033-product-innovation-for-health-and-sustainability

FDA Issues 2024 Edition of Voluntary Retail Program Standards

The FDA Food Code's standards, while not directly

addressing microgreens, have several **potential implications for small growers** and consumers in this sector.

Small microgreens producers may face increased regulatory oversight due to the Code's emphasis on "active managerial control" of foodborne illness risk factors.

This could result in a greater burden as state, local, and tribal agencies adopt these standards.

Necessity for Training and Documentation

Growers may need to invest in **training programs** and maintain **detailed documentation** to demonstrate compliance.

The risk-based inspection approach means that establishments are categorized according to their food safety risks, determining inspection frequency.

Higher-risk operations would face more frequent inspections, necessitating consistent adherence to safety practices.

Emphasis on Traceability and Recalls

The Code's focus on traceability and recall procedures means growers should **implement systems to track products from seed to sale**, preparing for potential foodborne illness investigations.

While these standards aim to protect public health and boost consumer confidence, **small**

growers might struggle with compliance requirements.

Impact on Consumer Confidence

Though the Code primarily targets retail food establishments, its food safety principles remain relevant for direct-to-consumer sales.

Small growers would benefit from **understanding these standards, regardless of their sales channels**.

However, specific regulations may vary by jurisdiction, and growers should consult local regulatory authorities for definitive guidance.

***Disclaimer**: This analysis is based on the FDA Food Code's broader implications. Specific regulations for microgreens production and sales may vary by jurisdiction. Consult local regulatory authorities for definitive guidance pertinent to your situation.*

Source: Food Safety Magazine Editorial Team. (2024, December 2). FDA issues 2024 edition of voluntary retail program standards. *Food Safety Magazine*. https://www.food-safety.com/articles/9941-fda-issues-2024-edition-of-voluntary-retail-program-standards

Commercial Best Practices

From Banker to Urban Farmer: The Microgreens Revolution

In 2017, a simple lunch in Bengaluru changed Ajay Gopinath's life trajectory.

Intrigued by microgreens garnishing his salad, the 48-year-old Citigroup banker began researching these nutrient-dense seedlings.

By December 2020, he had left his banking career to launch "Grow Greens" in his hometown of Kochi.

Starting in a modest 64-square-foot bedroom, Ajay transformed the space into a

sophisticated vertical farming operation.

Through extensive research, including guidance from a UK-based friend and countless YouTube tutorials, he moved beyond basic growing methods using tissue paper to develop a professional setup utilizing food-grade trays and cocopeat.

Today, his operation produces 7-8 kilograms of microgreens daily across four racks, offering 15 varieties ranging from affordable options like sunflower and radish white (₹150 per 80-100g box | $1.77 per 2.8-3.5 oz) to premium varieties like amaranth and broccoli (₹250 per box, $2.95).

His client base spans gyms, hospitals, hotels, and individual customers, generating monthly revenue of ₹5 lakh ($5,095).

Ajay's success stems from his focus on quality and accessibility. He sources organic seeds from farmers in Srinagar and Uttarakhand, maintains precise growing conditions (temperature below 25°C (77°F, humidity 40-60%), and uses tailored artificial lighting.

His mission extends beyond profit – he aims to make microgreens, often perceived as a luxury item, accessible to middle-class households.

The venture has expanded beyond Kochi, with Ajay helping establish over 30 microgreens franchises across India.

He emphasizes the remarkable nutritional density of his product – just 25 grams (0.88 oz) of red cabbage microgreens equals the nutritional value of 1 kg (35.27 oz) of mature cabbage.

Key Takeaways for Aspiring Entrepreneurs:

1. *Market Gap Identification*: Ajay recognized an opportunity to

make a luxury product accessible to a broader market.

2. *Research and Development*: He invested significant time (3 years) and money (₹5 lakh) in perfecting his techniques before launching.

3. *Start Small, Scale Smart*: Beginning with just two trays, he gradually expanded based on market response.

4. *Value Addition*: Beyond simply growing microgreens, he educated customers about their benefits and usage.

5. *Knowledge Sharing*: His franchise model demonstrates how sharing expertise can create additional revenue streams while expanding market reach.

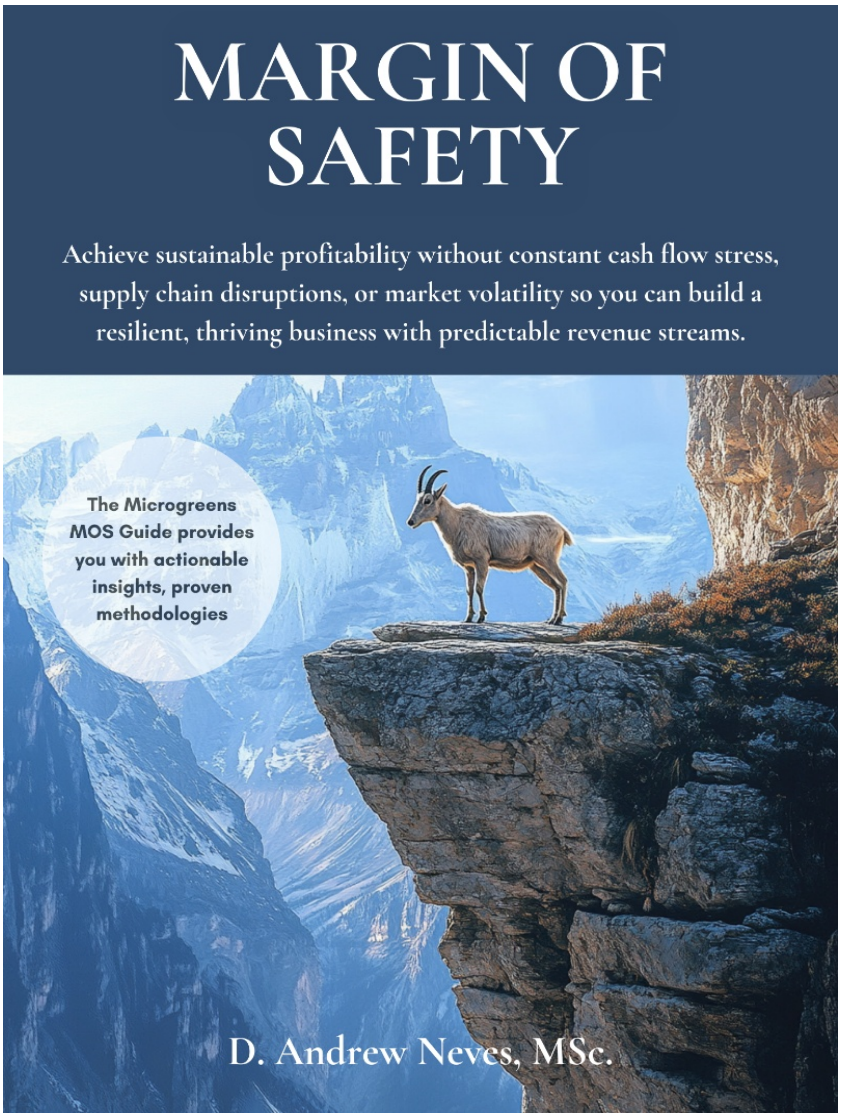
Source: Gopinath, A. (2024, December 2). Banker quits job to grow microgreens; Earns ₹5 lakh monthly from just a 64 sq ft room. *Pune Pulse*. https://www.mypunepulse.com/banker-quits-job-to-grow-microgreens-earns-%e2%82%b95-lakh-monthly-from-just-a-64-sq-ft-room/

Insider Secrets: Using trends to maximize microgreen sales

In this interactive workshop, dive deep into the strategies and tools to scale microgreens businesses by leveraging current consumer trends in sustainability and health-conscious eating.

Source: Microgreen Workshop. (2024, November 4). *Microgreens workshop: Maximizing sales through current trends* [Video]. YouTube. https://youtube.com/watch?v=5PyKcu7GkP4

The Microgreens Startup Margin of Safety (MOS) Guide



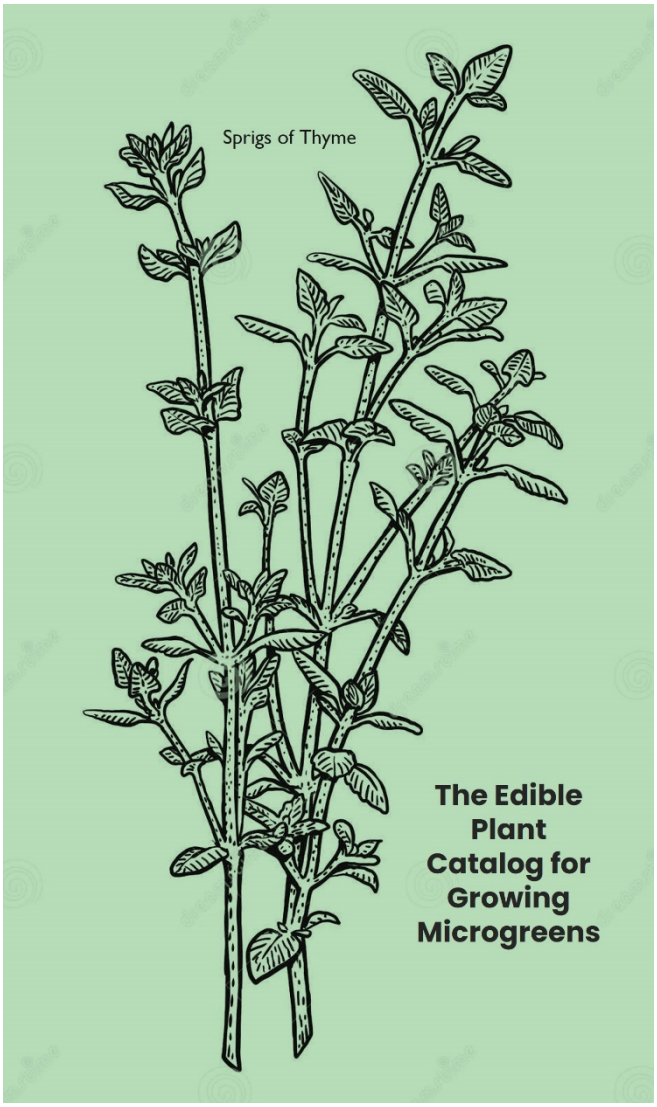
The Microgreens MOS Guide offers comprehensive guidance on overcoming common MOS business limitations while implementing proven strategies to increase sales volume and guarantee sustainable growth through systematic, data-driven approaches.

The step-by-step Microgreens MOS Guide helps you join a community of successful microgreens entrepreneurs who've perfected the art of maintaining healthy profit margins.

Through detailed financial modeling and strategic planning, you'll learn to enhance your operations while building a sustainable competitive advantage in this growing market.

LEARN MORE

The Edible Plant Catalog for Growing Microgreens



Discover a wealth of possibilities in microgreen cultivation with our meticulously curated guide featuring **over 200 edible plant species**.

Each entry outlines specific growing requirements to jumpstart your microgreens growing journey, offering insights into optimal light, temperature, and watering conditions.

This invaluable resource caters to commercial growers, researchers, and home gardeners seeking to broaden their horizons beyond traditional crops.

Embrace this opportunity to innovate and contribute to the expanding field of microgreens, enhancing your expertise while enjoying the unique flavors and nutritional benefits of diverse plant varieties.

LEARN MORE

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

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