



# AeroFarms®

**M Prize - Long-Term Capitalism Challenge – May 2012**

**AeroFarms: An Agricultural Start Up that Sees a New Way to Grow Greens  
and a New Way to Grow a Business**

# Agenda

- ▣ Global Food Crisis
- ▣ Farming Landscape
- ▣ AeroFarms Overview

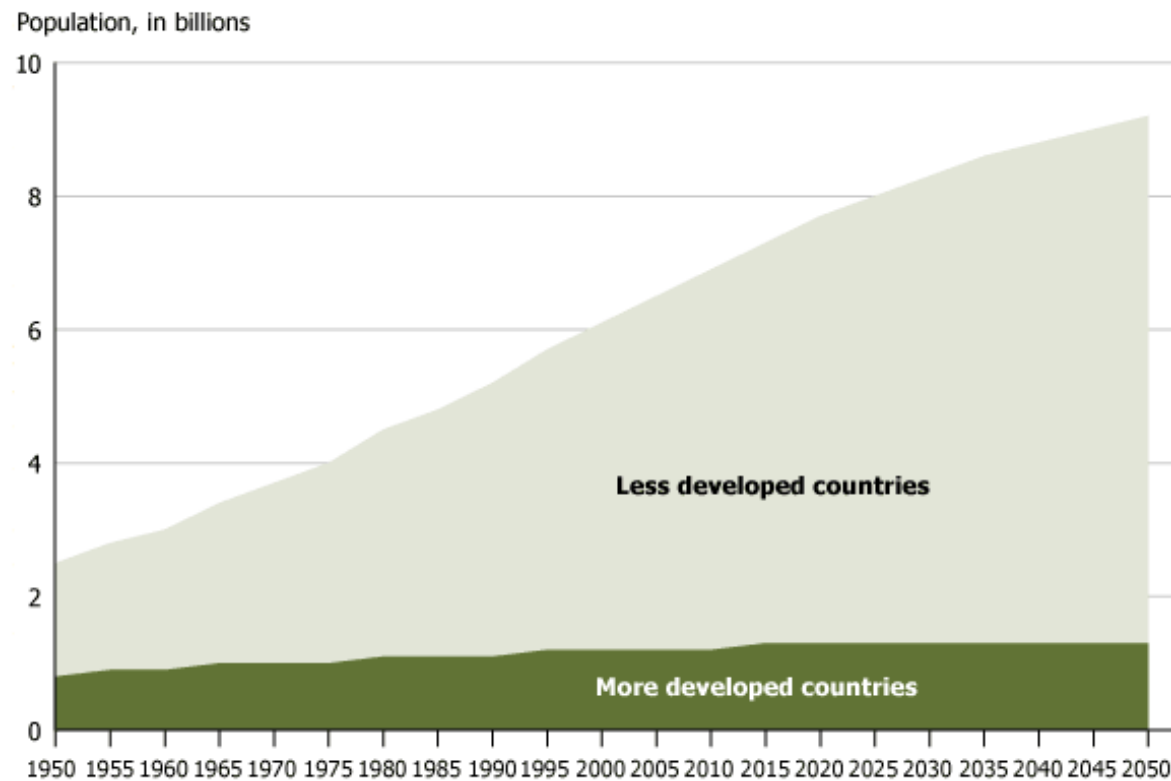
# Global Food Crisis



# Global Food Crisis

**World population will exceed 9 billion by 2050.**

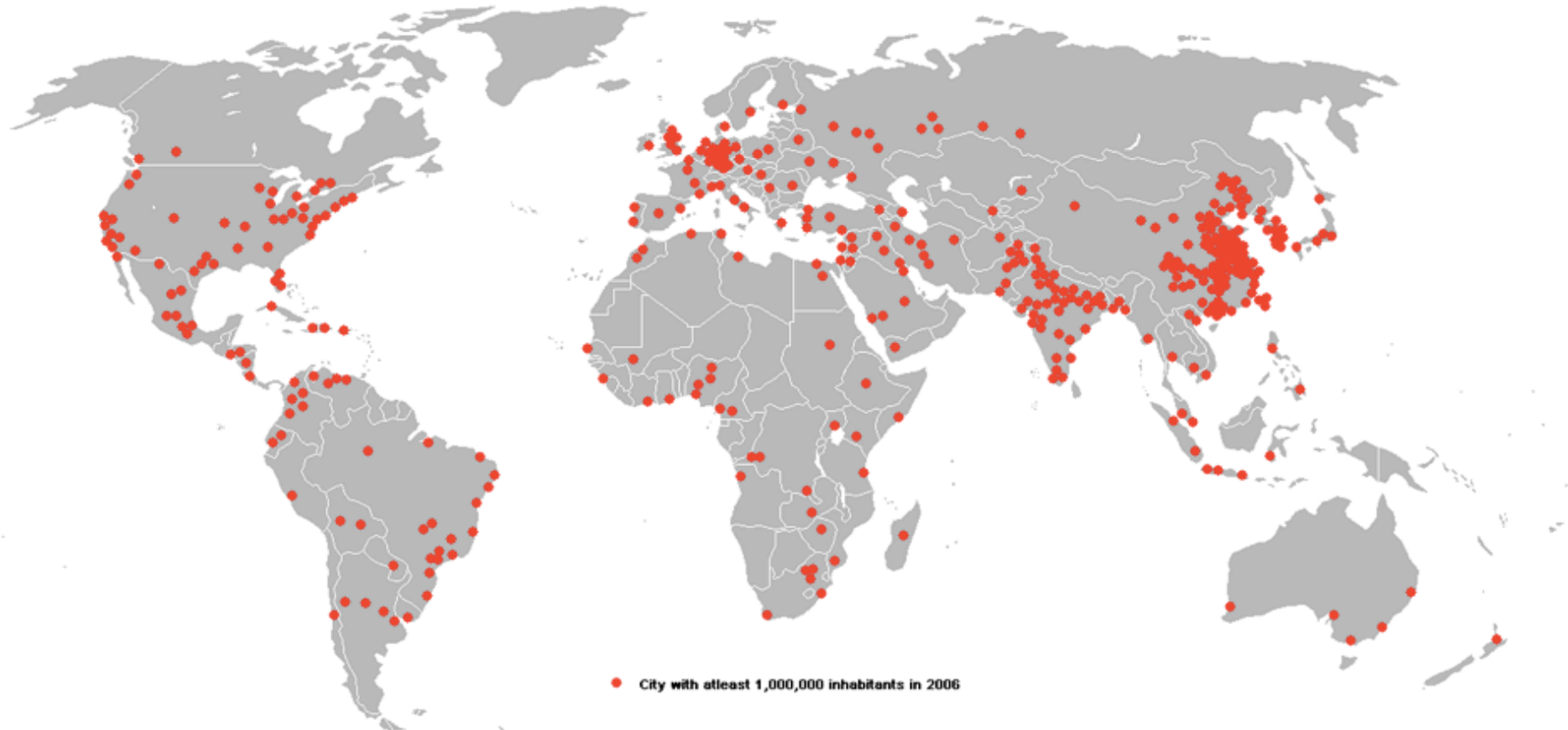
**World Population Growth, 1950–2050**





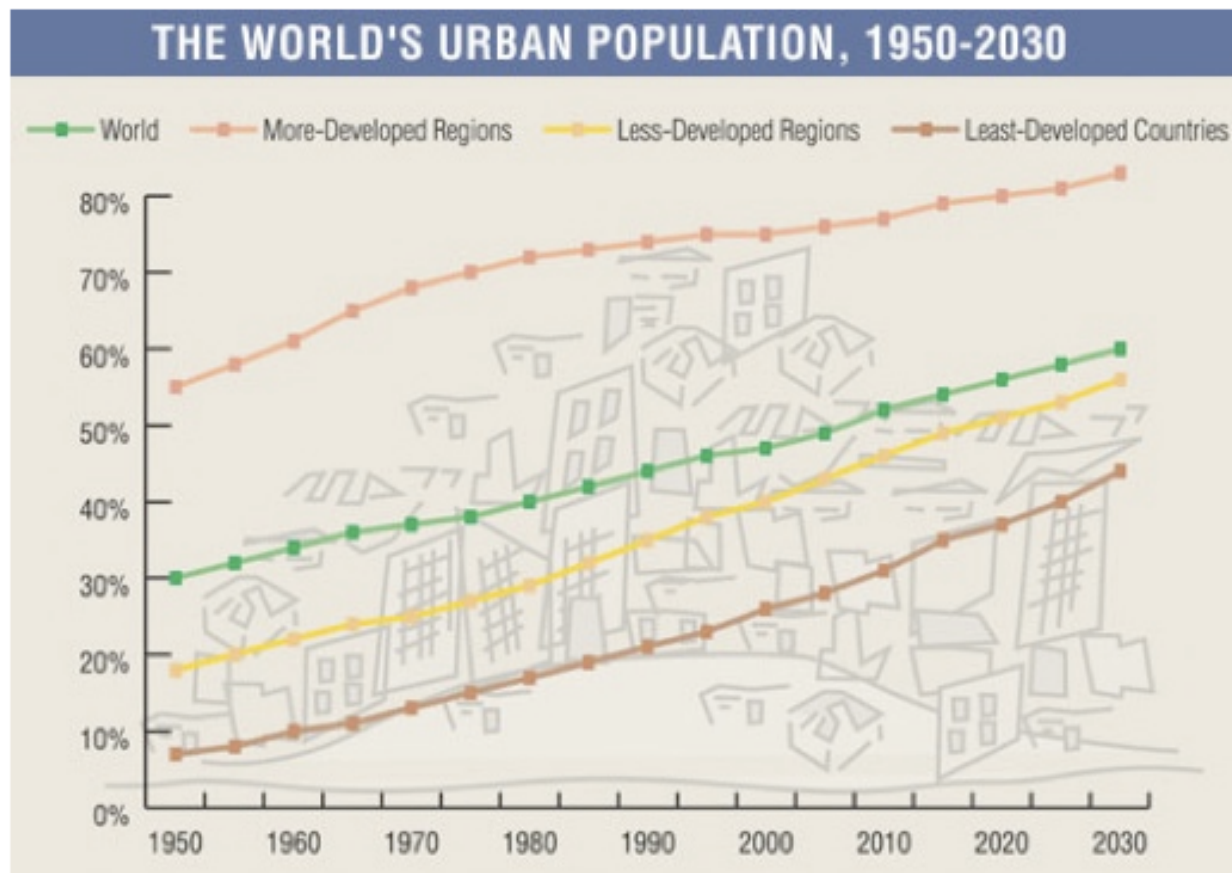
# Global Food Crisis

**Global urbanization is increasing.**



# Global Food Crisis

**Over 50% of the population are in urban areas.**



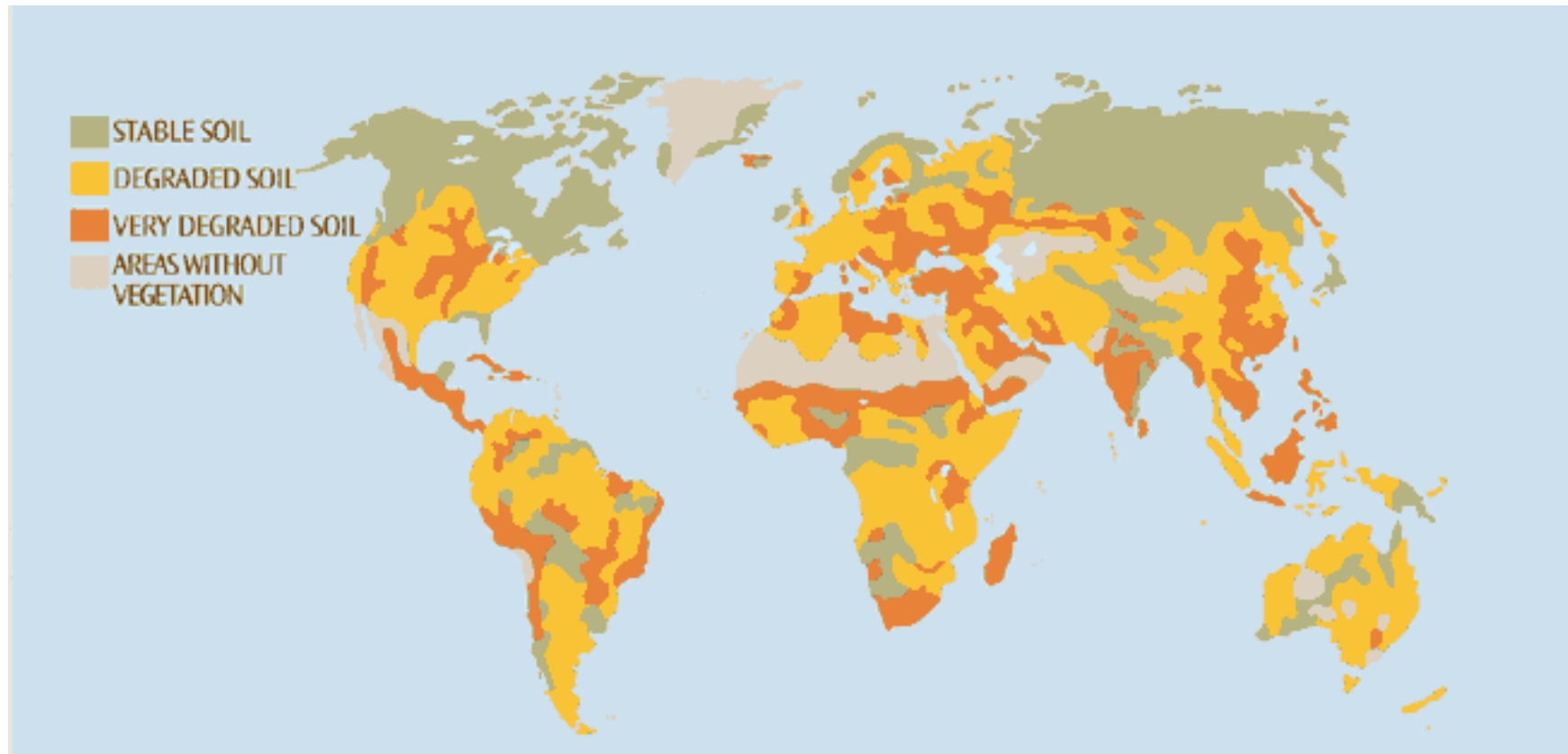
# Global Food Crisis

**Water scarcity is increasing.**



# Global Food Crisis

**Arable land is becoming more limited.**



# Global Food Crisis

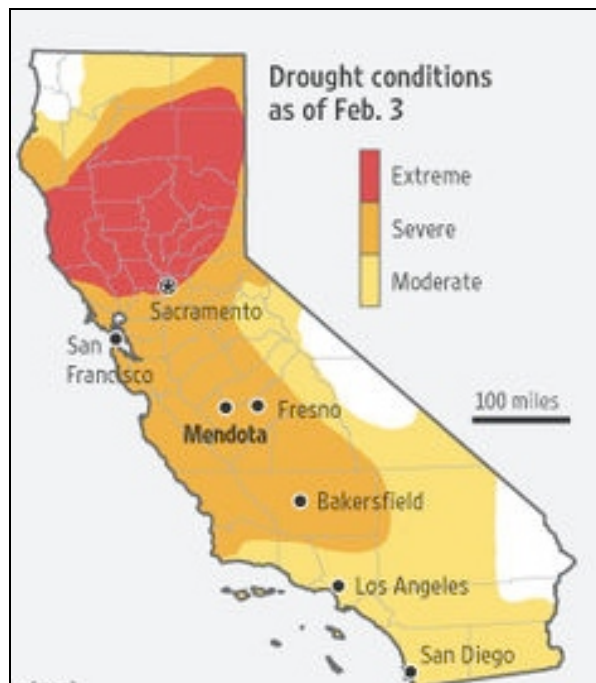
**Harmful run-off from pesticides and fertilizers from conventional farming.**





# Global Food Crisis

**Severe natural disasters are more common.**

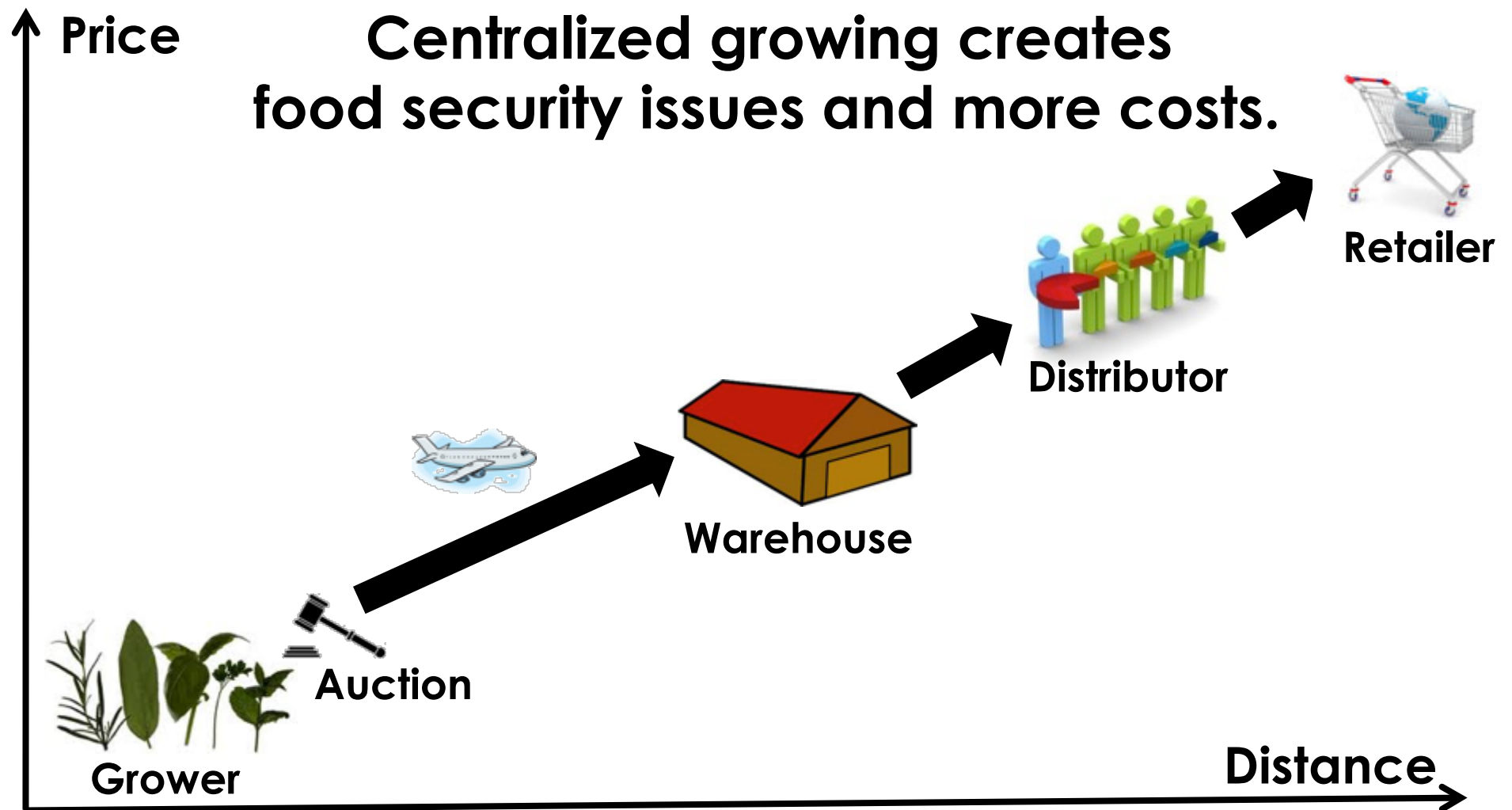


# Global Food Crisis

**Food safety is a major issue.**



# Global Food Crisis

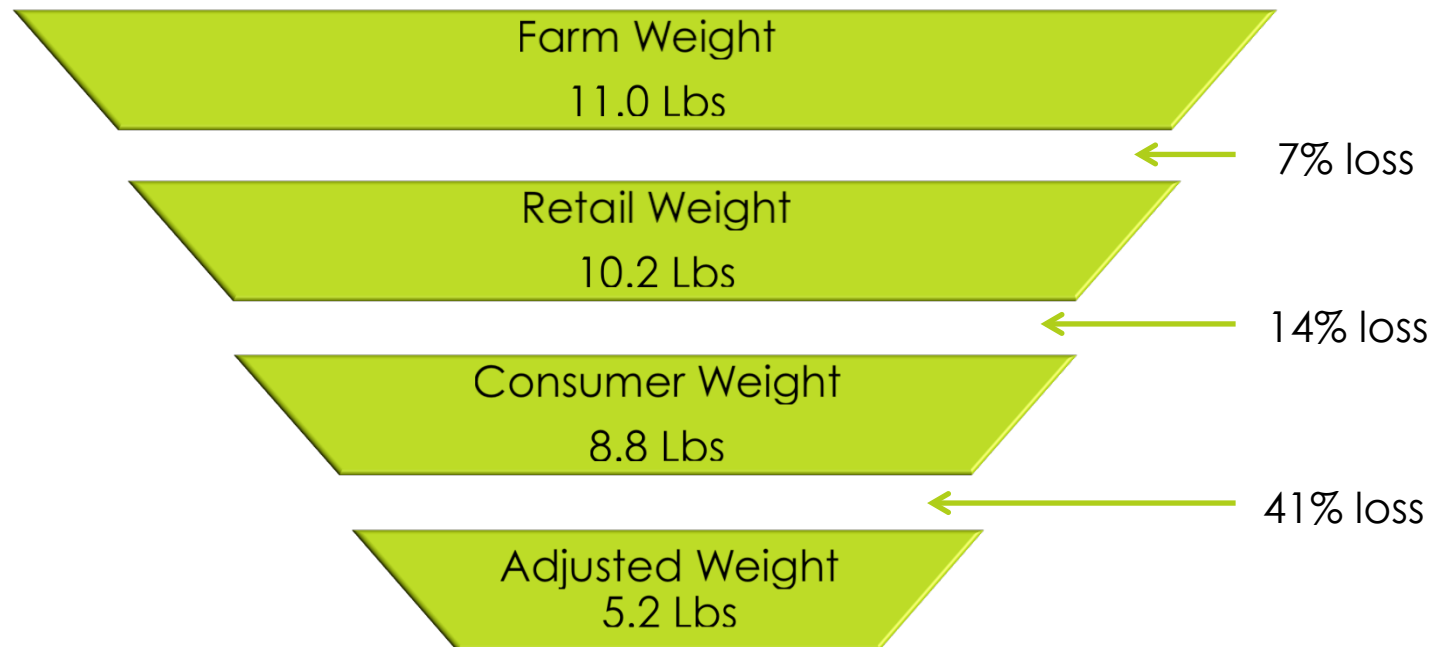




# Global Food Crisis

## Major Losses Throughout the Supply and Value Chain

### U.S. - Romaine and Leaf Lettuce Example



Source: USDA

# Global Food Crisis

**A New Farming Paradigm is needed.**



**Healthy, Safe, Environmental, and Social**

# Farming Landscape

## Possible Solution: Local Farming

- Food Security
  - Bringing food production closer to the consumer and shortening the supply chain.
- Better Nutrition
  - Less time to table after harvest.
- Lower Energy Use
  - No transcontinental trucking or centralized cold storage.
- Community Support
  - Employment and education opportunities.

# Farming Landscape

## Possible Solution: Soilless Farming

- Greater Output
  - Higher yields per acre than conventional.
  - Fast crop cycles (up to 50% shorter growing time).
  - Year-round production.
- Better Efficiency
  - No use of heavy machinery.
  - Over 90% less water use.
  - Use of non-arable land, brownfields and existing facilities.
- Effective and Safer Controls
  - Consistency in produce quality.
  - Longer at market shelf life with elimination of washing step.
  - Closed loop system to recapture nutrients and water.
  - Less impact on the workers.

# Farming Landscape

## Possible Solutions within Soilless Farming



### Pond Hydroponics

- Pond of water
- Requires oxygenation system
- Frequent transplanting
- Requires much labor



### Nutrient Film Technique (NFT) Hydroponics

- Developed in 1960's
- Uses pipes and troughs to channel nutrients



### Aeroponics

- Developed in 1980s
- Uses nutrient mist
- "Cadillac" of methods
- NASA research since 1990s

# AeroFarms – The Solution

## Local Farming Plus Aeroponics



- ▣ AeroFarms offers leafy greens that are
  - ▣ **Fresher** (grown locally, so no long delivery),
  - ▣ **Cleaner** and **healthier** (no pesticides, no chemicals, no diseases),
  - ▣ At a **predictable price...**
  - ▣ **... All year round!**

# AeroFarms – Our History

- In 2004, our technology founder, a former associate professor at Cornell Cooperative Extension, built our first commercial aeroponic farm selling locally grown leafy greens to supermarkets and restaurants for four years. *AeroFarms* innovation continued from misting systems to the growing media, lighting, and overall design.
- In 2009, *The Quercus Trust* and *21 Ventures* invested \$1.7 mm invested in our Series A round. *AeroFarms* sold five farm systems to different farmers (under strong NDA agreements). These farmers are fans and remain our partners.
- In December 2011, *AeroFarms* came together with *Just Greens*, a start up formed by David Rosenberg and Marc Oshima in the vertical farming space.

\* Light-Emitting Diode (LED)

# AeroFarms – Our Mission

Fundamentally transforming the agriculture business, we are a different kind of company  
***helping people care about their food.™***

## Mission

To build trusted farms in markets everywhere, working to make the world better for generations by nourishing people with great tasting, safe, healthy food that is locally grown while using responsible, innovative methods that champion the environment and educate our community.



# AeroFarms – Our Vision

- **Dedicated to helping** address the global food crisis, we are leveraging innovation to cultivate a **sustainable, for-profit business** with positive impact on our food systems. We are delivering **flavorful, safe produce** free of any pesticides, or GMO seeds that can be traced to its source through a simple and transparent supply chain.
- We are **leading by example**, creating a **respected brand** committed to helping people care about their food as passionately as we do. Our local community commitment is as much about educating people to make the *right* food choices as it is about selling them produce.
- We are **maximizing positive** impact in the world and are working to integrate sustainability in every way possible. We are creating an engaging, caring, collaborative working environment with fair wages and benefits where both **our people and plants will thrive**.

# AeroFarms – Our Values

- We **fundamentally care** about the health and well-being of our social, environmental and economic community, both locally and globally.
- We **actively question** both conventional wisdom and our own assumptions and operate with an urgency to create innovative solutions and positive change.
- We **responsibly lead** by example and hold ourselves to the highest standards of excellence and accountability.
- We **clearly communicate** what we are doing and value open dialogue and education.
- We **proudly cherish** our people, fostering a great team and collaborative spirit while respecting and empowering them as individuals to make the right decisions.

# AeroFarms – Our Brand Manifesto

Pure, safe, honest food offering the freshest, most nutritious leafy greens grown with the highest integrity and absolute commitment to protecting the environment.

Our expertise is leafy greens. That's it. So we can maximize our crop yields and produce the most flavorful, healthy greens around. It's our focused proposition for our customers, partners, and investors. This is just what we do.

Providing information about leafy greens to help our community make intelligent decisions about their health and well-being and care about their food.  
Donating product to schools and community programs.  
It's just the right thing to do.

Just fresh. Just wholesome. Just good for you.  
Just picked locally for you. Just great flavor.  
Just picked in Newark. Just picked in Chicago. Just picked in Jeddah.

# AeroFarms – Our Community

- Our commitment to the community is core to our business and reflects our values and focus on **helping people care about their food.**
- We are investing in the following initiatives.
  - Creating jobs for our community.
    - 25-30 new jobs per farm
  - Educating the community.
    - Informational tours to help teach people about different varieties of greens, their nutritional value, and guidelines on how to incorporate in to their daily diet.
  - Donating healthy, tasty leafy greens.
    - Certain % of our annual production goes to local schools and food banks.
  - Partnering with local institutions and government agencies.
    - Selling at discounted pricing to help support certain programs.

# AeroFarms – Our Target Markets

- We are distributing our locally grown leafy greens through the following channels:
  - Direct through Farmer's Markets, CSAs, On Premise, and Online
  - Grocery Store Chains, Specialty Food Stores, Mass Merchandisers, Club Stores
  - Wholesalers
  - Food Service
  - Restaurants
- We are targeting the following “local produce consumer.”
  - Generally well educated
  - Higher disposable income
  - Environmentally conscious consumer
  - Organic purchaser

# AeroFarms – Our Leadership

- David Rosenberg, Chief Executive Officer and Co-Founder
  - Former CEO of *The McDonough Group*, which builds businesses seeking to transform the world of human enterprise through leadership in design, innovation and collaboration.
  - Founder and current Chairman of Hycrete, Inc., a nanotechnology firm in the construction business with manufacturing in Newark, New Jersey. Hycrete was the first ever Cradle-to-Cradle certified product helping pioneer what has become the movement for sustainability and social responsibility.
    - Raised Series A, B, and C financing and public financing.
    - Recognized leader in cleantech and recipient of numerous awards in cleantech and innovation.
      - 2008 Time Magazine – Top 4 enterprise on the leading edge of the new energy frontier
      - 2010 Finalist for Ernst & Young Entrepreneur Of The Year Award for NJ
      - 2009 Best New Jersey CleanTech Company of the Year awarded by the NJ Tech Counsel
  - Member of the World Economic Forum and Young Presidents Organization.
    - Co-chairs the World Economic Forum Taskforce on *Sustainability and New Business Models*
  - Active on several for profit and non-profit boards.
    - *Wermuth Asset Management Cleantech Fund, Ecological Sequestration Trust,* and the agriculture software company *AgSquared*
  - B.A. from UNC Chapel Hill and M.B.A. from Columbia Business School
  - Three time U.S. Fencing National Champion

# AeroFarms – Our Leadership

- Ed Harwood, Chief Technology Officer and Co-Founder
  - With over 30 years of agricultural and engineering experience, Ed founded AeroFarms® in 2004 as GreatVeggies® LLC based on his own original design of an aeroponic growing system.
    - Commercialized further in 2009 with cleantech investment by 21 Ventures and The Quercus Trust
  - Noted Agricultural Author
    - *Planetizen, Renewable Energy World, Maximum Yield, Green Tech Media, The Growing Edge*
  - Former Professor and Associate Director of Cornell Cooperative Extension for Agriculture responsible for identifying cutting edge technologies for agriculture.
  - Former CEO of *Topline Waikato*, Inc. a New Zealand milking equipment supplier.
  - B.S. in Microbiology and B.S. and M.S. in Animal Science from Colorado State University and a Ph.D. in Dairy Science minoring in Artificial Intelligence from the University of Wisconsin-Madison.

# AeroFarms – Our Leadership

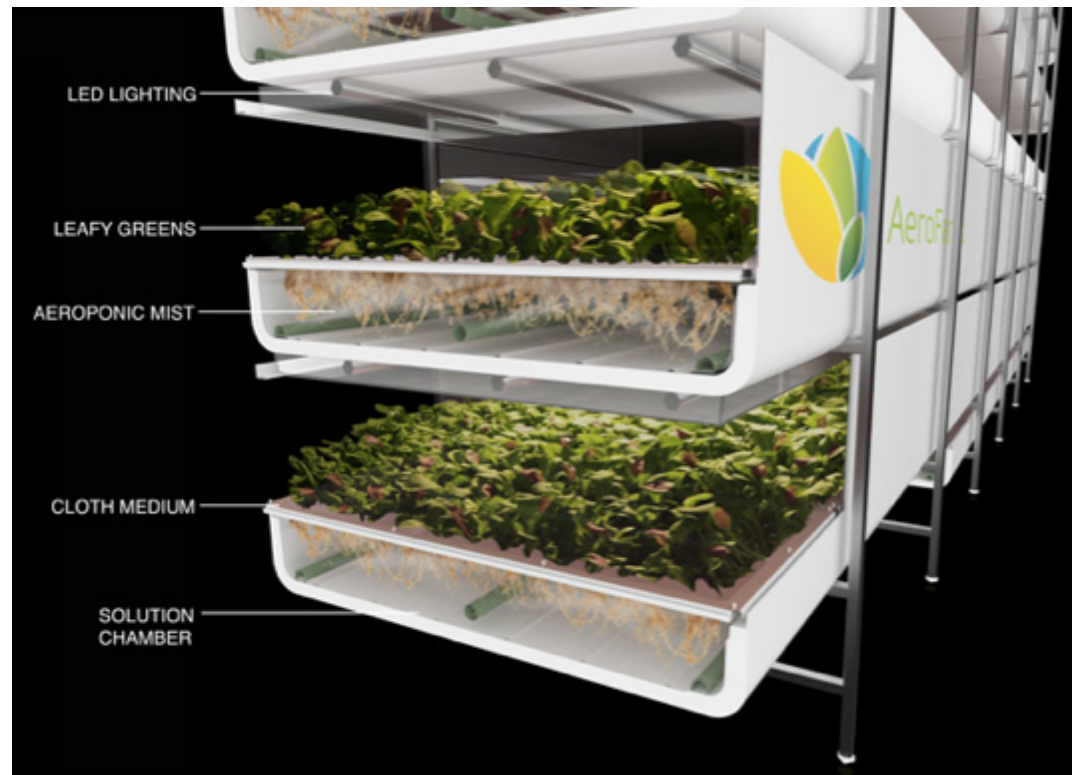
- Marc Oshima, Chief Marketing Officer and Co-Founder
  - Headed up marketing for *The Food Emporium*, a leading NY metro grocery store chain, and most recently for *Citarella* gourmet markets which has been recognized as one of the Top 50 Specialty Food Retailers in the United States.
  - Overall, extensive marketing background in media, retail, and brand management with leading companies including Turner Broadcasting, Toys R Us, and L'Oreal.
  - Developed award winning marketing campaigns to break through clutter and connect with the customer.
    - AdWeek "Best Spots of the Year", *Creativity's* "Spot of the Week", AICP "Advertising Excellence", AdAge's "Highest Brand Recall for the Year"
    - Webby "Award Winner", *Internet Advertising Competition Award* for "Best Advertising – Integrated Ad Campaign"
    - *M16 Video Game Industry* "Best Integrated Marketing Campaign", *Toy Industry Association* "Best Marketing Campaign", *American Academy of Dermatology* "Gold Triangle Award"
  - *Food Bank for NYC* - Marketing Advisory Committee member since 2004.
  - B.A. Columbia College and M.B.A. Columbia Business School



# AeroFarms – Our Technology

## Aeroponics Plus Advance LED\* Lighting

- Farming since 2004.
- Controlled indoor growing without sun, soil, or dangerous pesticides.
- Expertise cultivating over 250 different leafy greens and herbs
- Ideal for urban settings utilizing warehouse spaces.



\* Light-Emitting Diode (LED)

# AeroFarms – Our Technology

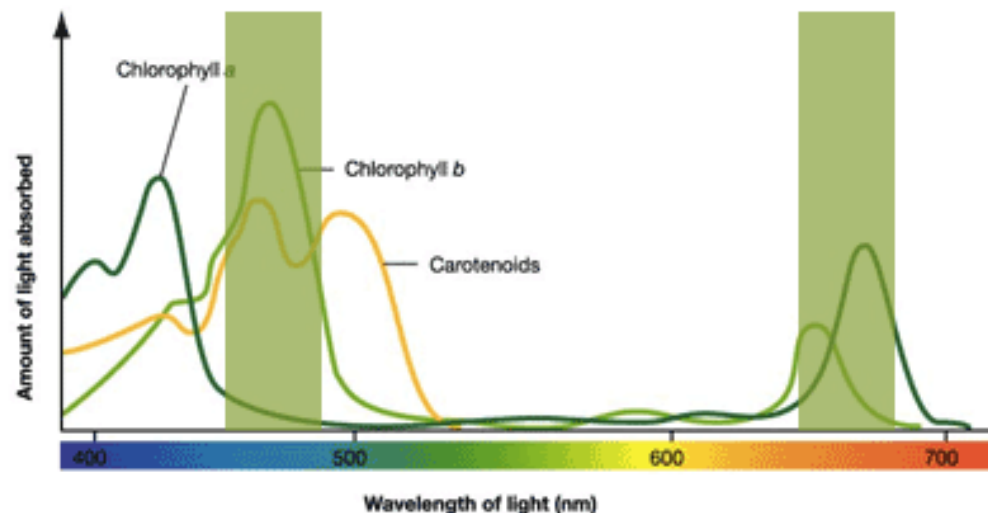
## Advantages of Aeroponics

- Faster growth and crop yields due to oxygenation of roots.
- Lighter weight which allows for vertical stacking and more efficient space utilization in buildings.
- Cost savings due to reduced nutrients needed for spraying vs. conventional or other hydroponic approaches.

# AeroFarms – Our Technology

## Light-Emitting Diode (LED) Advantages

- Target light spectrum for increased crop yields and better quality.
- Save significantly in energy and cooling costs compared with traditional High Pressure Sodium or Metal Halide Lamps.
- Can be stacked because they more evenly light and do not heat plants.



# AeroFarms – Our Technology

**Our exclusive, first-of-its-kind scientific LED testing instrument to optimize our growing recipes.**





# AeroFarms – Our Technology

**LED optimization leads to greater yields.**



# AeroFarms – Our Technology

## Rigorous Science-Based Approach

- LEDs – Proprietary Growing Recipes.
  - Targeting light spectrum, intensity, and frequency.
  - Using Cornell University labs for flavanoid analysis.
  - Working with Rensselaer Polytechnic Institute for LED controllable arrays for spectrum and intensity.



Cornell University



Rensselaer  
Lighting  
Research Center

- Patent-Pending Cloth – on the use of cloth for growing plants.
  - Reusable and environmentally friendly.
  - Partnership with North Carolina State University to identify actual specification.

NC STATE UNIVERSITY

# AeroFarms – Our Technology

## Disruptive Approach – Environmental Leader

### ■ Award Winning

- 2012 TiE50 Finalist for Energy/Cleantech
  - Silicon Valley's premier annual awards program recognizing the best technology opportunities throughout the world.
  - Selected out of over 2,000 different companies that were evaluated.
- 2012 Wall Street Journal EConomics Conference
  - One of six companies selected to by WSJ editors for cutting-edge technology and ability to impact positively the environment.
- 2011 Finalist Red Herring Global Top 100
- 2011 World Technology Awards Finalist for the Environment
  - Global award presented by TIME, Fortune, CNN, Science, and Technology Review for most innovative organizations.
- 2011 Clean Equity Monaco Runner Up
  - Leading technology for emerging cleantech
- 2010 Winner Red Herring Top 100
  - Most promising technology for private ventures



# AeroFarms – Our Technology

## Disruptive Approach – Real Applications

- United States
  - Ithaca, New York
  - Chicago, Illinois
  - Seattle, Washington State
  - Newark, New Jersey
- International
  - Jeddah, Saudi Arabia
  - Dubai, United Arab Emirates

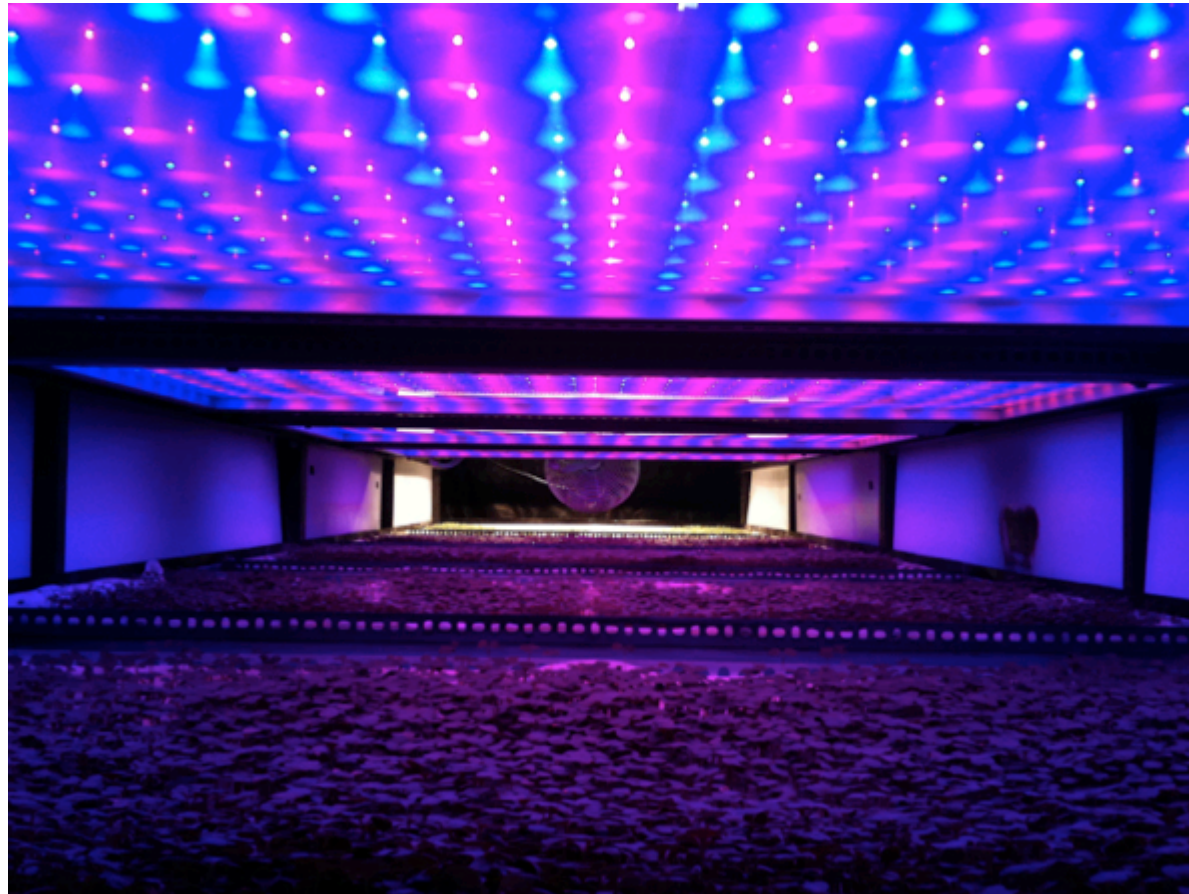


Ithaca, NY



# AeroFarms Sites – Ithaca, NY

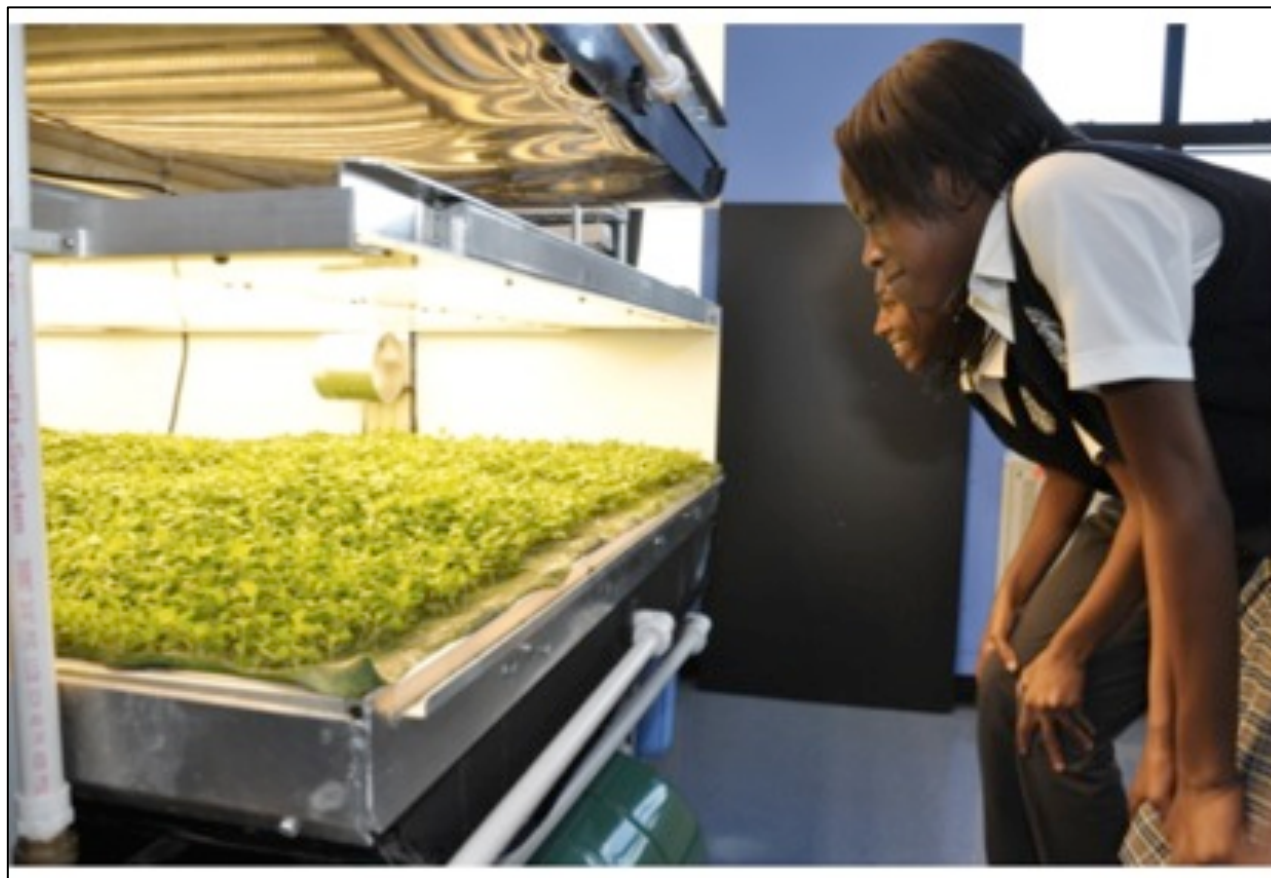
## AeroFarms R&D Center



*Helping people care about their food.™*

# AeroFarms Sites – Newark, NJ

## *St. Philip's Academy*



*Helping people care about their food.™*

# AeroFarms Sites – Chicago, IL

## ***Farmed Here Farm***



*Helping people care about their food.™*



# AeroFarms Sites – Chicago, IL



- Distributed in major supermarkets
  - Whole Foods
  - Mariano's Fresh Market
  - Garden Fresh Market
  - Fresh Farms International Market



# AeroFarms Sites – Chicago, IL



"The quality and beauty of the farmedhere basil is absolutely stunning. We use the basil in everything at City Provisions and love having it in our kitchen", says Chef Cleetus Friedman of [City Provisions](#), Chicago.



# AeroFarms Sites – Seattle, WA

## ***Farmbox Greens Farm***



*Helping people care about their food.™*



# AeroFarms Sites – Seattle, WA

## ***Farmbox Greens Farm***



- Focused on Fine Dining Restaurants
  - Microgreens
  - Baby Leafy Greens



# AeroFarms – Our Technology

## Advantages of AeroFarms

	Conventional	Greenhouse	AeroFarms	
<b>Growth Cycle</b>	35 - 70 days	25 – 50 days	<b>16 - 18 days (70% shorter)</b>	
<b>Grow Indoors/Urban Setting/ Reclaim Buildings</b>	No	No	<b>Yes</b>	✓
<b>Annual Yield / Sq. Ft.</b>	< 1 lb	2 - 3 lbs	<b>30 lbs</b>	✓
<b>Food Safety</b>	Difficult	Medium	<b>Easy Very Safe</b>	✓
<b>Pesticides</b>	Often	Occasionally	<b>No Pesticides</b>	✓
<b>Use of LEDs for greater crop yields</b>	No	No	<b>Yes</b>	✓
<b>Use of Reusable Growing Medium</b>	No	No	<b>Yes Proprietary, Reusable</b>	✓
<b>Water Usage</b>	High Unsustainable	Medium	<b>Low</b>	✓



# AeroFarms – Our Advantages

## Environmental Farming Leader

- Grows healthy, safe, delicious leafy greens indoors using proprietary cutting-edge technology and science.
- Produces greater crop yields with less than 10% of the water usage of conventional farming.
- Mitigates any kind of natural disasters – droughts, storms, frost – by growing in a controlled indoor environment 365 days of the year.
- Disintermediates the supply chain by producing locally with environmentally leading technology.
- Experienced management team.

### HIGHER QUALITY OF FOOD



### LOWER IMPACT



# AeroFarms - Questions & Answers



## **Contact Information**

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