

# CEA Food Safety

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# Controlled Environment Agriculture

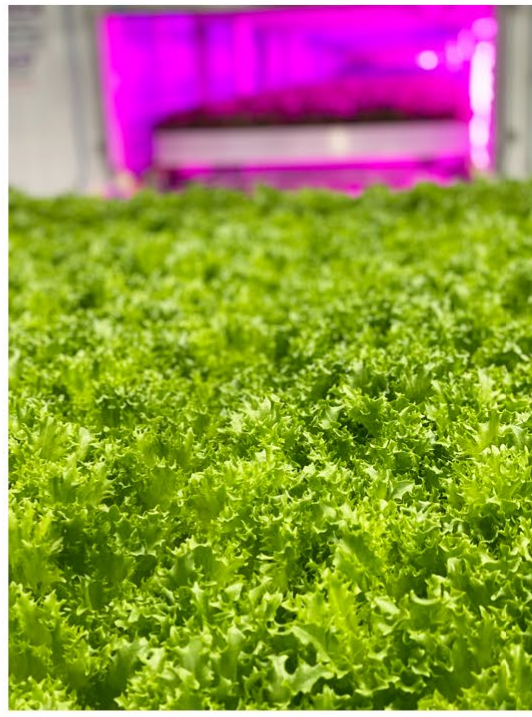
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- Greenhouses, vertical farms or a combination of both.
- Partially or fully enclosed
- Operation year round
- Ability to reduce/limit the use of pesticides
- Given the structural design, ability to limit exposure to wildlife, pest access and impact of nearby operations.

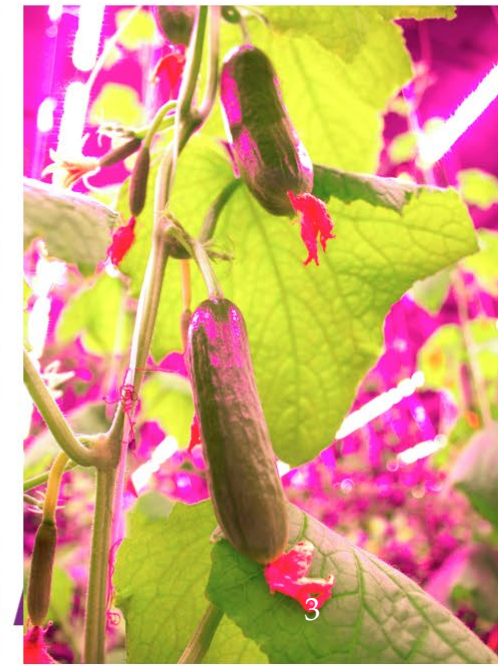




# OUR FARMS



| Proprietary & Confidential

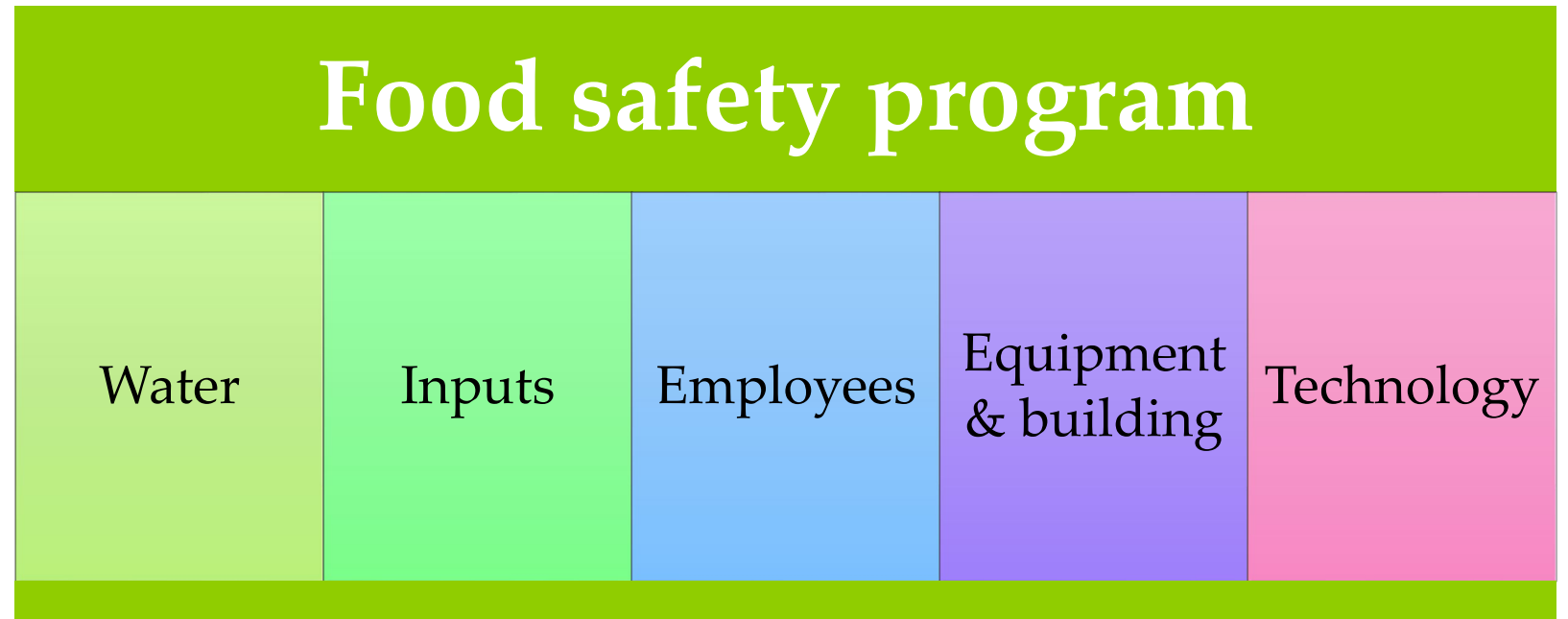




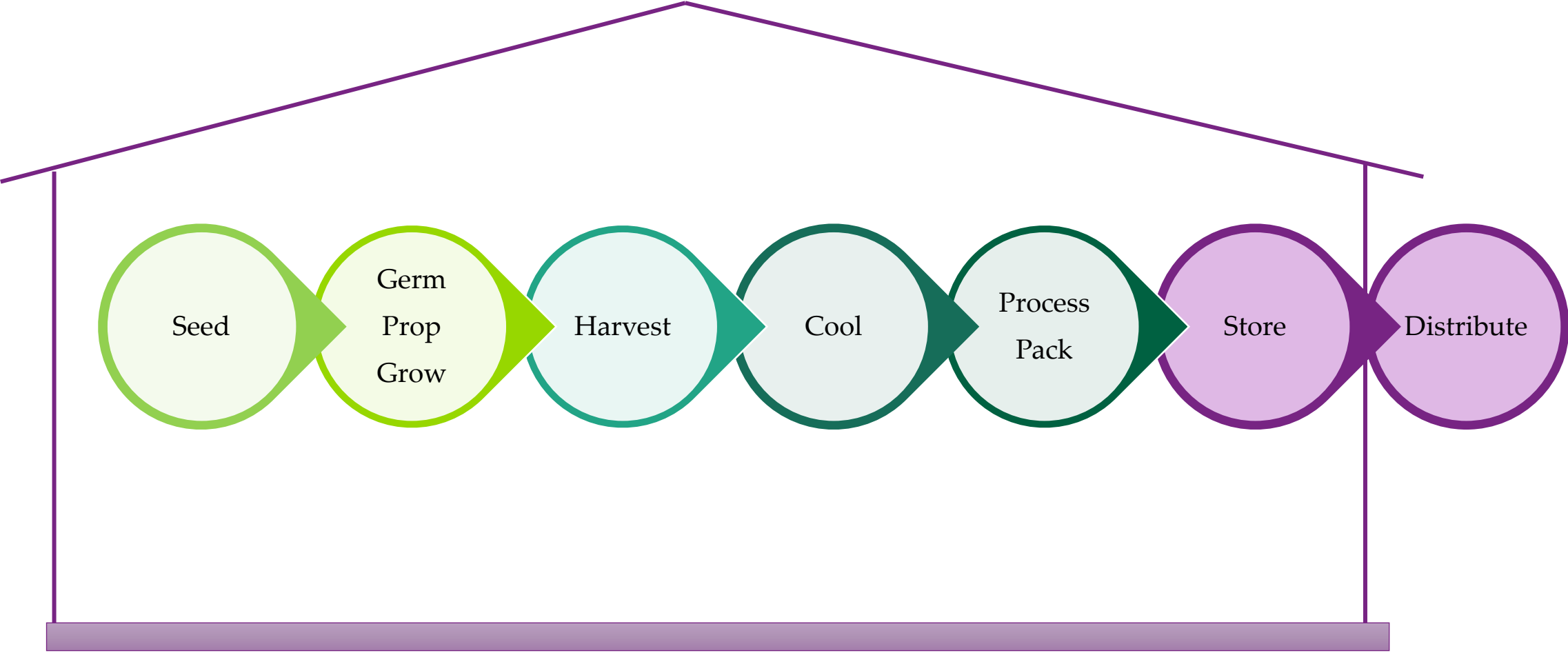
# Food safety at 80 Acres

## Building a food safety plan & food safety culture

- Unique use of agricultural inputs
- Unique operations: seed to finished product Mixed-type facility: Produce Safety and Preventive Controls
- Existing research
- 3<sup>rd</sup> party audit standards



# GENERAL PROCESS



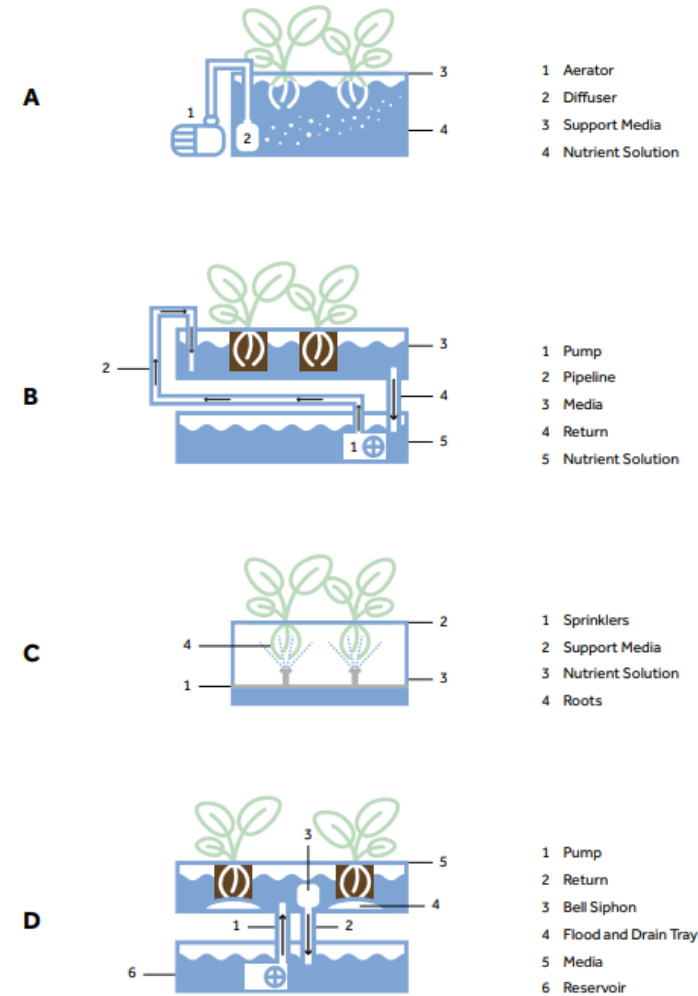
# Irrigation Water & Subpart E

## Recirculated irrigation systems

- Water source type
- Application method
- Treatment
- Intentional or incidental contact with product
- Water quality monitoring
- Equipment design
- Equipment cleaning

Figure 3

Schematic illustration of CEA water/nutrient delivery systems: a) deep water culture; b) nutrient film techniques; c) aeroponics; d) ebb and flow. Image adapted from Dr. Boce Zhang, Assistant Professor, University of Florida and Dr. Yaguang Luo, USDA.

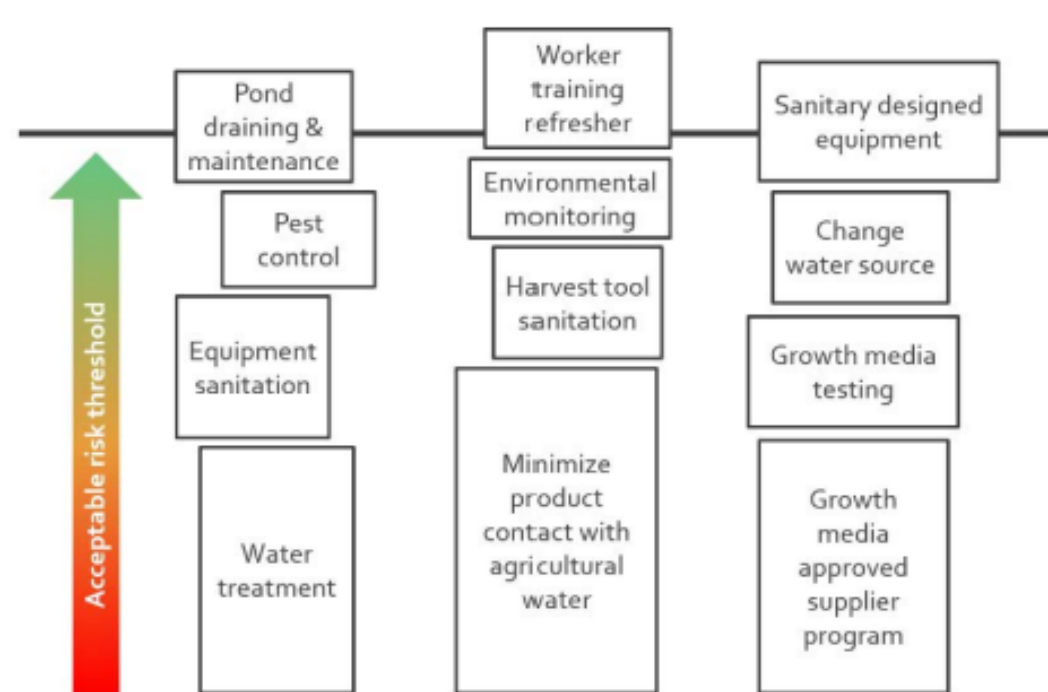


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# Risk assessment

**Figure 2**

Example water system diagram with inputs and water treatments. Note that there is no single "correct" way to set up a water distribution and treatment system. There are many variables that will need to be accounted for during the risk assessment which will help determine what interventions or controls might be necessary.

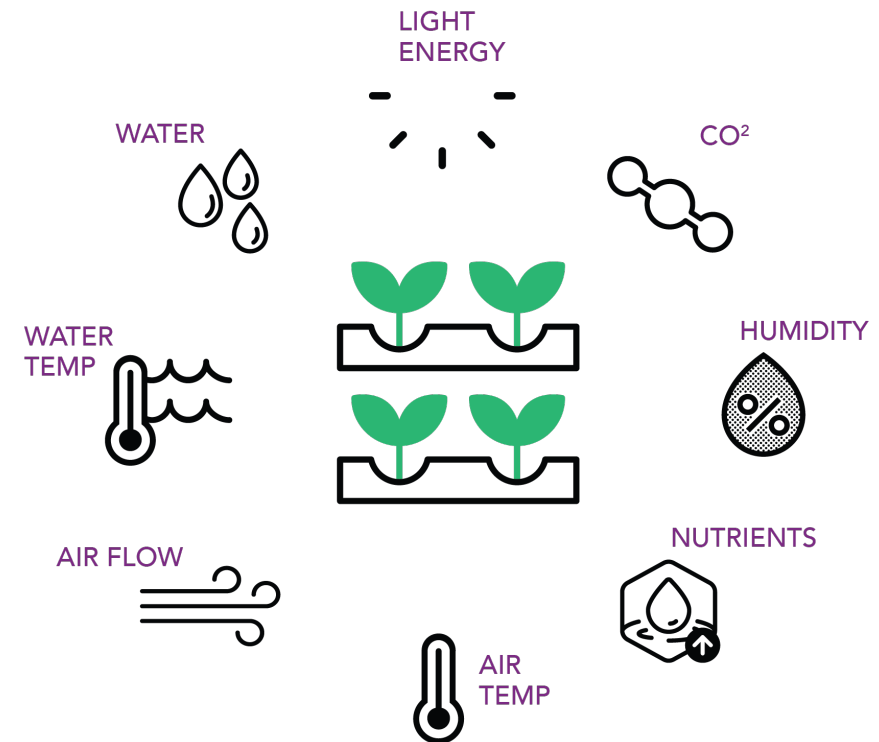


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# Inputs

Seeds, grow media, fertilizers

- Material selection
- Supplier approval program
- Incoming material inspection and testing
- Management of incidental product contact
- Control of harvest process





## Employees & process

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- Limited access to grow zones
- Employee, process and traffic flow (seed to finished product)
- Color coding (seed to finished product)
- Training
- Product traceability
- Waste management

## Building & equipment

- Farm/Plant design
- Separation of functions (farm vs pack)
- Equipment sanitary design and commissioning
- Surrounding areas and use of building exterior
- Pest Management
- Cleaning and Sanitation program/EMP

# Technology

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- Vulnerability assessment
- New process & technology risk assessment

# TRACEABILITY

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- Input traceability
- Product identification through process
- Lot definition/separation
- Consumer-level identifier (lots should be traceable to grow, transformation, ship location)



# CEA Alliance – Commodity Specific Food Safety Guidelines for CEA

- [https://ceaalliance.com/wp-content/uploads/2023/11/cea\\_guide\\_oct23-2.pdf](https://ceaalliance.com/wp-content/uploads/2023/11/cea_guide_oct23-2.pdf)

## Commodity Specific Food Safety Guidelines for Controlled Environment Agriculture

*focused on leafy  
greens and herbs*



# THANK YOU!

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