Food Contamination Risks & Good Agricultural Practices in Greenhouse-Grown Produce

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Stages where Contamination Can Occur

Whether it is small scale- or large scale- farming, harvesting and handling, processing, or wholesale/ direct markets,

The Potential for Food Contamination and Resulting Foodborne Illnesses Exists!

Pre-Harvest Production
Risks in a Greenhouse

- Think of the indoor greenhouse space like “field-grown” space
- Think soil, water, worker health & hygiene, pests, sanitation
- Types of risks depend on GH system used
  - Hydroponic, soil-less
  - Pots using soil-less media
  - Planting beds w/ or w/out plasticulture using soil
  - Other

Water-Related Risks

Soil-Related Risks

Other Risks

- Glass Breakage from grow lights and other fixtures
- Rodents and birds have access to growing area
- Chemicals and pesticides are stored where they can contaminate produce
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### Harvesting

- **Pre-Harvest Production**
- **Market Place Handling**
- **Further Processing**
- **Harvesting**
- **Post-Harvest Handling**

### Poor Worker Health and Hygiene, & Improper Sanitation/Handling

- Not following good hygienic practices or having facilities available
- Harvesting produce when in poor health, or if an accident has occurred (like cutting hand, etc.)
- Eating and drinking when handling produce
- Using bins and harvesting tools that are not clean and sanitized
- Not handling harvested produce at proper temperatures

### Post-Harvest Handling

- **Pre-Harvest Production**
- **Market Place Handling**
- **Further Processing**
- **Harvesting**
- **Post-Harvest Handling**

### Poor Worker Health and Hygiene, & Improper Sanitation/Handling

- Just like Harvest Risks
- If using ice to cool and store, it is not potable
- Produce is not stored under proper conditions (temperature and humidity)
- Produce is packaged improperly
- Transport vehicles are not clean and/or protected
Good Agricultural Practices

What is GAP?

- Good Agricultural Practices developed to safeguard fresh produce for human consumption
- Reduces risk of food-borne disease contamination on fresh produce
- Targets primary sources of contamination that can be transmitted through soil, water, workers, surfaces, etc.
- Practices are aimed at the Pre-Harvest, Harvest, Post-Harvest Handling, and Market Place Levels

Minimize Soil & Water Contamination

- If using soil-based media, use properly composted manures and avoid using raw manures
- Have water tested regularly to insure it is potable and safe for irrigation
- If needed, treat water that is applied directly to any produce
- Use only potable water for spraying and washing produce
- Regularly monitor water throughout system

- With hydroponic systems, sanitize gutters and growing pots regularly between rotations
- Use separate bins designated for different tasks
  - Growing media mixing
  - Harvesting produce
  - Washing produce
- Have sanitization procedures in place for various tasks
  - Bins/Containers
  - Harvesting Tools and Equipment
  - Greenhouse Area
  - Packing Surfaces
  - Cooling units
  - Transport Vehicles
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Use Protected Light Fixtures and Bulbs

Follow Good Personal Worker Health & Hygiene Practices

Spray down Packing Surfaces with Effective Sanitizing Spray before Packing

Use Sanitized Cutting Boards, Bins, & Coolers
Use Sanitized Bins or New Cardboard Boxes

Store Packing Containers Properly

Store Pesticides In A Separate Location from Where Produce is Packed/Stored

Have Pest Control in Place in Greenhouse, Packing Area, and Outdoors
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Maintain Produce at Proper Storage Temperatures

Inspect Vehicles Used for Transporting Product

Have a traceability system that allows product to be traced back to farm

Food Safety Means Reducing Risks From Farm to Fork

Pre-Harvest Production

Targeted Practices at each Stage

Market Place Handling

Harvesting

Further Processing

Post-Harvest Handling
Other Important Reasons to Consider GAP Certification

- **Mandated by Government** that Agricultural Sector ensure Food Safety as much as possible
- **Heightened Awareness** by Buyers and Consumers, who are looking for greater measures by growers and processors to prevent food contamination
- Increasing number of **Buyers and Retailers requiring GAP Certification** or they will not purchase product
- **Customer Relationships** and way to foster trust in product
- **Opportunity for Growers to tap into new markets** with GAP-branded produce

Developing Your Plan to Reduce Risks

- In-depth Training about Food Safety Risks at all the different levels (from Production to Market Place)
- Make an Organized Plan that you can Follow
- Implement Practices
- If you are interested, please see Mark, Cathy, or Amber!!

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THANK YOU!!