Food safety in school gardens
Best practices and lessons learned

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Foodborne illness in the US

- 48 million cases of foodborne illness
- 127,839 hospitalizations
- 3,037 deaths
Food safety culture

- It is a set of shared attitudes, values and beliefs around food safety
  - Production/sources
  - Handling/storage
  - Preparation

- You can have a good food safety culture or a bad one

Listeria in Cantaloupe, Colorado 2011

- 33 dead
- 146 sickened
- Producers blame auditors, auditors blame government
- Producers lose, consumers lose
Absolutely Positively Listeria Free!
Outbreaks

- In 2000, *Escherichia coli* O157:H7 linked to samples in Fort Collins, CO
  - 14 illnesses, two hospitalizations

- In 2011, *Escherichia coli* O157:H7 linked to strawberries sold at multiple farm stands and farmers' markets in Oregon
  - One death, 15 illnesses, and seven hospitalizations

Oregon Health Authority, 2011; Bridges, 2000
Who is at most risk?

- Carnivore, herbivore, omnivore, locavore
- All at risk for foodborne illness
- Bacteria are blind to source, they don’t care whether the product they live in is sold at a retail store or farmers market
Produce-related outbreaks

- Over 500 since 1990
- Tens of Thousands of illnesses
  - Leafy greens
  - Tomatoes
  - Melons
  - Berries
  - Fresh herbs
Spinach linked *E. coli* O157 outbreak 2006
200 people, 26 states, 3 dead
Garden-to-fork continuum

- Raw product (pre-harvest)
Farm-to-fork continuum

- Raw product (pre-harvest)
- Harvest
Farm-to-fork continuum

- Raw product (pre-harvest)
- Harvest
- Processing & Storage (post-harvest)
A food safety culture program

- Develop tools
  - Designed to address target audience needs
- Getting dirty
  - Reality-based research
- Evaluation
  - Did our efforts work?

Risk assessment and microbial modeling
Where have we been?

- 41 gardens total in 2011 and 2012
- Counties: Wake, Orange, Durham
- School districts: Wake, Orange, Durham, Carrboro-Chapel Hill
What is safe food?
Are there indicators?
Back to the gardens.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Possible Score</th>
<th>Notes</th>
<th>Proof (date)</th>
<th>Yes</th>
<th>No</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITE HISTORY</td>
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<td>Was a site history obtained? If so, what was learned? (Heavy metals in the land, etc)</td>
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<td>What was done with the information? (Was there an attempt to mitigate the risks?)</td>
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<td>GARDEN DESIGN + COMPOST</td>
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<td>Is the garden creating its own compost?</td>
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<td>Is the garden buying compost or getting it from the city/county?</td>
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<td>What is the source?</td>
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<td>Is there <strong>manure</strong> in the compost?</td>
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<td>Is compost placed in an area to minimize the flow of contaminants into the garden if flooded/heavy rain?</td>
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<td>Do the gardeners take the temperature of the compost before it is used on the garden?</td>
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<td>Is there a fence and does it keep animals from entering the garden?</td>
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<td>Have the volunteers seen evidence of animals in the garden (and which ones—high risk are birds nests, deer and lizards/turtles)?</td>
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food safety
FOR SCHOOL + COMMUNITY GARDENS

A HANDBOOK FOR BEGINNING + VETERAN GARDEN ORGANIZERS: HOW TO REDUCE FOOD SAFETY RISKS.

Creating and maintaining community and school gardens has been identified as an effective strategy to increase healthy food awareness and consumption. Fresh fruit and vegetables have unfortunately been linked to over 450 outbreaks of foodborne illness in the U.S. since 1990. In commercial food production, employing a set of risk-reduction steps, known as good agricultural practices (GAPs), has been pointed to by the U.S. Food and Drug Administration as the best prevention against foodborne illness-causing pathogens.

The Centers for Disease Control and Prevention estimates that there are 48 million people who are sickened with foodborne illness in the United States each year. While most people who become sick from foodborne illness recover quickly, there are on average almost 130,000 hospitalizations annually and 3,000 associated deaths. Contamination may come from many sources including physical contaminants, metal, stones or glass and chemical contaminants (runoff from parking lots or pesticide drift).

While much of the attention for GAPs implementation, as well as the outbreaks and recalls, has focused on commercial production, the use of steps to reduce contamination risk are also applicable to community and school gardens. The steps presented in this guide are rooted in science, practical and presented in a context suitable for the passionate organizers and volunteers associated with community gardens.

a project of North Carolina State University + North Carolina Cooperative Extension
Funded by Nourishing North Carolina

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- compost 9
- garden design + pests 11
- sanitation + tools 12
- volunteer know-how 13
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growingsafergardens.com
Identified are key areas of risk and best garden practices:

- Site Selection
- Water
- Compost
- Animals
- Handwashing
- Sanitation
- Tools
What’s the best way to lower the risk?

- The best practice is to obtain the history of the site from planning officials and determine whether the garden site is suitable.
- If it is unavailable, ask the community. Cooperative Extension Agents and community members might be able to help.
Handwashing

What’s the best way to lower the risk?

- The best practice is to wash your hands with soap and clean, running water and dry using single-use towels.

- If running water is not available, wear disposable, single-use gloves while harvesting. If the task is maintenance-only, traditional gardening gloves are recommended.
What’s the best way to lower the risk?

The best practice is to use a regulated, treated water source. Water authorities employ filtration, chlorination and testing to ensure it meets EPA drinking water standards.

If you are using or intend use another source, such as a well, have the water tested and make sure it is up to EPA standards before you use it for watering or washing (things like hands, equipment and food).
Compost

What’s the best way to lower the risk?

- The best practice is to put the bin as far from the garden as possible, downhill.
- Additionally, use a long-stemmed thermometer to check that compost has been over 130°F for at least 5 days before using in the garden.
- If the compost is already in use, create barriers to keep the contents from getting into the garden until they are ready, with careful attention to flooding.
Animals

What’s the best way to lower the risk?

- The best practice is to use a fence to keep out animals, like deer. Electric fences keep out many kinds of pests, but are more expensive.

- If a fence is out of the question, use repellents and sprays to keep out the known pests, be it rabbits or deer or birds. Maintain records and attempt to prevent any animals from entering the garden.
Sanitation and tools

What’s the best way to lower the risk?

- The best practice is to wear one-use only gloves when harvesting and put the harvest into clean, sanitized containers.

- Equally as effective is to wash hands before harvesting and if contaminated. If you are unsure when the containers were last washed, put the harvest into new plastic bags.
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Info Sheets (and then some)

**Info Sheets:** An info sheet is a short, yet detailed, explanation of a particular gardening procedure. They are an adaptation of food industry-centric Food Safety Info Sheets, which are “used to provide food safety risk-reduction information to generate behavior change.” While similar, these focus on garden particulars.

Info Sheet #1: [Flooding in the Garden](#).

**Rain Barrels and Cistern Testing.**

We've heard that y'all are interested in testing your rain barrels for generic E. coli, which is awesome. So, now what? [This post](#) is a great explanation as to how to do it. There are even links to companies all over North Carolina that perform not only generic E. coli testing, but many more! Some roof runoff might be contaminating the water with heavy metals, but that varies by location and is something you might want to bring up when you contact the ...
Easy to change

- Handwashing and hand-sanitizing
- Composting
- Sanitation
- Rules/Order of Operations
Difficult to change

- Building a fence
- Testing the rain barrels and cisterns
- Testing for heavy metals in the soil
- Irrigation methods
The big questions

- Composting: Nightshades, cafeteria waste, cold compost, and Black Kow
- How do I maintain the garden all summer?
- Rain barrels: Testing and bleach
- Soil testing: 2 tests
- Harvesting: Bags, plastic containers, hands
- Handwashing: sanitizer, gloves
- How do I pay for it all?
Where are we going?

- Revisit gardens with an interest in selling their harvest to the cafeterias
- GAP certification for 2-3 school gardens
- Creation of a model so other gardens have a template of what to do (and not to do)
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- Ashley Chaifetz
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