Steps to Food Safety Success for Dried Herb Producers

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Check out our websites, subscribe to us on YouTube!
psla.umd.edu/extension/produce-safety

Funding for our work is made possible, in part, by the Maryland Department of Agriculture Specialty Crop Block Grant Funds awarded by USDA-AMS. The views expressed in written materials or publications and by speakers and moderators do not necessarily reflect the official policies of the United States Department of Agriculture; nor does any mention of trade names, commercial practices, or organization imply endorsement by the United States Government.
Why is food safety important when making dried herb products?

- Since 1999 there have been 814 illnesses and 1 death in the US associated with herbs and spices foodborne outbreaks (NORS Dashboard, www.cdc.gov/norsdashboard/).
- Pathogens of interest include *Salmonella enterica*, *Staphylococcus aureus*, *Bacillus cereus*, and *Clostridium botulinum*.

### Table 1. Estimated *Salmonella* prevalence (125 g) in spices offered for sale at retail establishments; samples collected November 2013-September 2014 or October 2014-March 2015.

<table>
<thead>
<tr>
<th>Spice Typea</th>
<th>Total No. of samples tested</th>
<th>No. of samples positive for <em>Salmonella</em></th>
<th><em>Salmonella</em> Prevalence (%)</th>
<th>Clopper and Pearson’s 95% Confidence Interval (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basil</td>
<td>529</td>
<td>1</td>
<td>0.19</td>
<td>0.0048-1.1</td>
</tr>
<tr>
<td>Black pepper</td>
<td>1,264</td>
<td>3</td>
<td>0.24</td>
<td>0.049-0.69</td>
</tr>
<tr>
<td>Coriander, grd</td>
<td>543</td>
<td>3</td>
<td>0.56</td>
<td>0.11 – 1.6</td>
</tr>
<tr>
<td>Cumin</td>
<td>549</td>
<td>0</td>
<td>0</td>
<td>0.00 – 0.67</td>
</tr>
<tr>
<td>Curry powder, grd</td>
<td>518</td>
<td>1</td>
<td>0.19</td>
<td>0.0049 – 1.1</td>
</tr>
<tr>
<td>Dehydrated garlic, grd</td>
<td>615</td>
<td>3</td>
<td>0.49</td>
<td>0.10 – 1.4</td>
</tr>
<tr>
<td>Oregano</td>
<td>669</td>
<td>1</td>
<td>0.15</td>
<td>0.0038 – 0.83</td>
</tr>
<tr>
<td>Paprika, grd</td>
<td>816</td>
<td>2</td>
<td>0.25</td>
<td>0.030 – 0.88</td>
</tr>
<tr>
<td>Red pepper, grd</td>
<td>633</td>
<td>4</td>
<td>0.64</td>
<td>0.17 – 1.6</td>
</tr>
<tr>
<td>Sesame seed, whole</td>
<td>526</td>
<td>0</td>
<td>0</td>
<td>0.00 – 0.70</td>
</tr>
<tr>
<td>White pepper, grd</td>
<td>588</td>
<td>0</td>
<td>0</td>
<td>0.00 – 0.63</td>
</tr>
</tbody>
</table>

https://www.fda.gov/media/108126/download
Since 1999 there have been 814 illnesses and 1 death in the US associated with herbs and spices foodborne outbreaks (NORS Dashboard, www.cdc.gov/norsdashboard/).

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### Why is food safety important when making dried herb products?

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How do we reduce food safety risk with dried herb products?

1. Following Good Agricultural Practices to produce the source material.
2. Following a validated process.
3. Sanitation and good housekeeping.
4. Safe consumer handling and preparation.

More risky to Less risky.
Good Ag. Practices that impact the safety and quality of fresh herbs
Agricultural products in Maryland are governed by different federal and state regulations
<table>
<thead>
<tr>
<th>Fruits and vegetables normally eaten raw</th>
<th>Fruits and vegetables not normally eaten raw</th>
<th>Value added - (Jams, Jellies, Juices)</th>
<th>Value added - Cut fresh produce</th>
<th>Value added - Dried vegetables and herbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject to PSR</td>
<td>Exempt from PSR</td>
<td>Preventive controls for human food</td>
<td>Preventive controls for human food</td>
<td>May Be Subject to PSR</td>
</tr>
<tr>
<td>Eligible for GAP certification?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Growing yes, cutting no</td>
<td>No</td>
</tr>
<tr>
<td>Under purview of which MD governing body</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDA</td>
<td>MDA</td>
<td>Could be covered by MD cottage food law depending on product</td>
<td>Process - requires a license from MDH</td>
<td>Process - requires a license from MDH</td>
</tr>
</tbody>
</table>
Which license are you targeting?

<table>
<thead>
<tr>
<th>Annual Sales*</th>
<th>Type of License</th>
<th>Basic Requirements</th>
</tr>
</thead>
</table>
| Under $40,000 | On-Farm home processing license  | • Potable water  
• Approved sewage disposal  
• Plan review               |
| Over $40,000  | Processing license               | • Potable water  
• Approved sewage disposal  
• Plan review  
• Commercial kitchen         |

*Total sales of products approved for the processing license.
Manufacturing Site Details

Sanitation SOP's (SSOP)

Your product’s plan
These recommendations are NOT one size fits all.

Your product may require additional or separate specifications. Contact MDH early and often for up-to-date, operation specific licensing requirements.
Start here!

• Make a list of your intended products.
• Make a list of equipment you’ll be using.
• Prep a description of planned processes ➔ process flow diagrams can help with this.
• Contact MDH and state herb experts to discuss your proposed process.
• Get a water potability test.

Maryland Map of Water Testing Labs
maryland.maps.arcgis.com/apps/webappviewer/index.html?id=4228cc4917f84bc3aea03a00992ea563
General facility requirements

- Ventilation
- Cleanable Building Surfaces
- Sink
- Shatterproof or Covered Lights
- Bathroom
- Waste Disposal
- Sanitation Program for Equipment

Icons made by https://www.freepik.com from https://www.flaticon.com
Process flow diagrams

• Unidirectional flow is best to prevent cross-contamination of finished products by any hazards present in raw material.
• This can be achieved by separating activities in physical space or by time.
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- This can be achieved by separating activities in physical space or by time.

![Diagram showing process flow]

- Harvest
- Staging before drying
- Washing
- Storage
- Drying
- Weighing/packing
- Packaging materials
- Transport to customer
Process flow diagrams

• Unidirectional flow is best to prevent cross-contamination of finished products by any hazards present in raw material.
• This can be achieved by separating activities in physical space or by time.
SOPS are needed for each step in your process flow

<table>
<thead>
<tr>
<th>Process Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest and staging</td>
</tr>
<tr>
<td>Washing</td>
</tr>
<tr>
<td>Dehydrating</td>
</tr>
<tr>
<td>Weighing and packing</td>
</tr>
<tr>
<td>Storage</td>
</tr>
<tr>
<td>Distribution</td>
</tr>
<tr>
<td>Sanitation SOPs</td>
</tr>
</tbody>
</table>
The Harvest SOP

*Important points to consider*

• Workers should be able to spot potential contamination (💩, etc.) and not harvest affected herbs.

• Harvesting bins and utensils should be clean before going to the field.

• Minimize harvested herb contact with the ground.

• Train workers on these and all your harvest expectations!

Photo credit: Carol Allen
The Herb Washing SOP

Important points to consider

• Herbs must be washed, but use of a sanitizer is optional.

• If you are using recirculated water (e.g. 3-compartment sink), sanitizer is highly recommended.

• Sanitizers in wash water primarily act to inactivate pathogens in the water, as opposed to produce surfaces.

Your sanitizer must be labeled for use in produce wash water

The Drying SOP

• Effective drying and subsequent storage temperature can control the growth of bacteria and molds.

• Your drying equipment and process will be thoroughly reviewed by MDH.

• Required criterion – controlled drying temperature for the appropriate amount of time to bring your product’s Water Activity \( (a_w) < 0.85 \).

• Batch temperature, time in, and time out should be recorded.
The Drying SOP: using Water Activity ($a_w$) to verify your process

What is water activity and why do I need to submit my product for analysis?

• Water activity is the amount of unbound water in product.
• This data is important to verify that your process (drying time/temperature) is working effectively to reduce food safety risk.

How often do I need to get $a_w$ testing?
Whenever you change a recipe or your drying process.

Where do I go for testing?
• If in the formulation stage, contact Dr. Melinda Schwarz at University of Maryland, Eastern Shore (mschwarz@umes.edu).
• If ready to submit a regulatory sample, Microbac (located in Baltimore and Warrendale, PA) can assist (baltimore_food@microbac.com).

<table>
<thead>
<tr>
<th>Food</th>
<th>$a_w$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>1.00</td>
</tr>
<tr>
<td>Apples, Fresh</td>
<td>0.99</td>
</tr>
<tr>
<td>Salami</td>
<td>0.88</td>
</tr>
<tr>
<td>Jam, Strawberry</td>
<td>0.84</td>
</tr>
<tr>
<td>Orange Juice Concentrate</td>
<td>0.80</td>
</tr>
<tr>
<td>Black Pepper, Pure Ground</td>
<td>0.72</td>
</tr>
<tr>
<td>Honey</td>
<td>0.55</td>
</tr>
<tr>
<td>Granola Bar</td>
<td>0.21</td>
</tr>
</tbody>
</table>

Sanitation SOPs

Sanitation SOPs cover:
• Your pest control program
• Cleaning, sanitizing, and maintaining equipment, food contact surfaces, packaging, and building
• Water
• Employ health, hygiene, and PPE
• Labeling and storage of chemicals

For cleaning and sanitizing SOPs, include:
• What is to be cleaned
• How to clean and sanitize
• How often to clean and sanitize
• Where it’s stored after cleaning
• What records are used to monitor the procedures

Remember, cleaning always comes before sanitizing.

Be sure to use sanitizers according to their label directions → incorporate label directions on SSOP.

Source: https://phpa.health.maryland.gov/OEHFP/OFPCHS/SiteAssets/Pages/plan-review/MDH%20Developing%20SSOPs_5-2019.pdf
Packaging considerations

Important points to consider

• Store packaging in a clean area, separate from raw materials.
• You will submit a sample of your label(s) for plan review.
• Ensure label includes the following:

Mint Tea

Angela’s herbs | 28 ash Ave. Towson, MD 20732
(410)-555-5551
0.5 oz

Ingredients: Mint leaves

Instructions: Boil water to 212°F. Add 0.5 tsp to teacup. Pour boiled water over tea. Steep covered for 5 min.
Traceability

• Create lot numbers to easily track your product as it flows out to your customers.
  • A **lot number** is a unique identifier for an amount of your product.
  • A basic lot number includes the product code and the dry date.

<table>
<thead>
<tr>
<th>Product</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basil</td>
<td>Ba</td>
</tr>
<tr>
<td>Lemon balm tea</td>
<td>Le</td>
</tr>
<tr>
<td>Mint</td>
<td>Mi</td>
</tr>
<tr>
<td>Energizer tea (mint and lemon balm)</td>
<td>En</td>
</tr>
</tbody>
</table>

Sample Code: Ba-137-21

- **Product code**
- **Year**
- **Julian dates - 1 to 365**
  (This is May 17th)
Traceability

- Create lot numbers to easily track your product as it flows out to your customers.
  - Use lot numbers when recording your sales.
  - When you become comfortable, you can use lot codes to perform a traceability exercise.
- Traceability is an important component in Recall-readiness.

<table>
<thead>
<tr>
<th>Product label</th>
<th>Lot number</th>
<th>Optional harvest date</th>
<th>Optional Package date</th>
<th>Optional Date sold</th>
<th>Customer</th>
<th>Units sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried Basil</td>
<td>Ba-137-21</td>
<td></td>
<td></td>
<td></td>
<td>Greenbelt FM</td>
<td>15</td>
</tr>
<tr>
<td>Dried Basil</td>
<td>Ba-137-21</td>
<td></td>
<td></td>
<td></td>
<td>Retail store A</td>
<td>35</td>
</tr>
<tr>
<td>Lemon balm tea</td>
<td>Le-137-21</td>
<td></td>
<td></td>
<td></td>
<td>Greenbelt FM</td>
<td>5</td>
</tr>
</tbody>
</table>
Summary

- Food safety is important for dried herb safety and superior quality.
- Establish an early relationship with MDH & herb experts → call often!
- Sit down with your team and devise a process flow.
- SOPs, SSOPs, and controls may be specific to your operation.
Selected references list

• Processing and Selling Value Added Food Products in Maryland

• On-Farm Home Processing Plan Review Guidelines

• COMAR 10.15.04.18 On-Farm Home Processing Licensing Procedure Step-by-Step

• Plan Review Submission Form

• Maryland Map of Water Testing Labs
  maryland.maps.arcgis.com/apps/webappviewer/index.html?id=4228cc4917f84bc3aea03a00992ea563

• On-farm Cleaning and Sanitizing Guide
  drive.google.com/file/d/1Anox1Tmjn1yr7mfXMJhd0CPqELcbJMeU/view

• Produce Safety Alliance: Introduction to Selecting an EPA Labeled Sanitizer
Questions?

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