Organic Acid Spray SOP

There are three common types of organic acid spray solutions available for use: acetic acid (vinegar), lactic acid, and FreshBloom® (a mix of citric acid, ascorbic acid and erythorbic acid). Other acids may be applied following a standard protocol. The type of acid used each slaughter day shall be recorded in the Organic Acid Spray SOP Log, along with the amounts of acid and tap water used to prepare the solution. The organic acid solution shall be prepared to yield the following concentrations:

- **Acetic Acid**: 2.5% (vol/vol). Commercial vinegar is usually 5% acetic acid (label will be checked), so a 50:50 dilution in tap water will normally produce the 2.5% solution.
- **Lactic acid**: 2 – 2.5% (vol/vol). Purchased lactic acid is usually 88% (label will be checked), so adding 3.25 fluid ounces of that solution to a gallon of water will result in a 2.1% solution, or adding 3.75 fluid ounces of that solution to a gallon of water will result in a 2.4% solution.
- **FreshBloom®** will be prepared at a rate of 8 ounces (weight) per gallon of water to result in a final concentration of 5.9% (wt/vol).

Other acids may be used following manufacturer’s instructions and a standard protocol.

Regardless of the acid used, the following basic steps will be followed:

**Step 1. Warm Water Wash**

**Working with one carcass at a time:**

- **Observe** the surface of the carcass during washing to ensure that hair, blood and other obvious debris are adequately removed. Failure to remove any visible contamination may interfere with the final sanitizing step.
- Wash each side of beef with warm water (preferably) **for at least 2 minutes**.
- Wash the carcass from top to bottom. This way you will work with gravity to wash bacteria and foreign matter down the carcass and towards the floor and you will not cross-contaminate other parts of the carcass.
- **Hold** the spray nozzle no more than 12 inches from the carcass.
- Use a stool and aim the spray downwards (as opposed to straight at the carcass) to encourage removal of contamination versus pushing the contamination into the muscle.

Careful washing will set up the acid intervention ‘for success’. Be careful not to spray water directly on the floor since bacteria could be splashed back onto the carcass. If you use cold water (rather than warm) it is even more important that this step be **at least 2 minutes**.
Step 2. 5-Minute Drip

This step is critical. The water needs to drip off or the acid will be diluted and/or the water ‘film’ on the surface will prevent the acid from reaching the carcass.

- **Allow excess water to drip from the carcass for at least 5 minutes.** This step ensures that the antimicrobial rinse (e.g. 2.5% acetic acid) makes better contact with bacteria on the carcass surface.
- Carcasses should be spaced to avoid contacting each other, nearby walls, and other surfaces. Immediately after washing, a water film is present on the carcass surface. So, the carcass must be given time to allow the water film to dissipate.

Step 3. Antimicrobial Rinse

- **Rinse the carcass with enough organic acid** to cover the carcass completely; acid needs to drip from the carcass (a sign that the surface is ‘saturated’ with acid solution).
- Keep the spray nozzle **within 12 inches** of the carcass surface. Use a gentle sweeping motion to apply the acid to the entire carcass surface for **at least 1 minute**. Generally 2 passes (at least) of the surface.
- Work methodically from **top to bottom, using a stool** (recommended) and spraying downward (but not towards the floor).

At this point, the carcass is ready to be moved into the hotbox or chill cooler.

**Tips for success:**

- Make sure acid is at the proper **concentration**
- **Use a stool** to ensure proper coverage of the carcass. **Always work top to bottom!**
- **Keep track of time:** 1 minute (for acid) and 2 minutes (for water) can seem like a long time but are necessary for your efforts to work. Likewise, the 5 minute drip is critical.
- **Warm water** may be more effective than tap water (room temperature or cooler). Consider a warm water rinse for enhanced antimicrobial effect.

This SOP was developed by the University of Wisconsin-Madison based on research data and best practice guidelines. Contact Dr. Barbara Ingham, Extension Food Safety Specialist; for more information contact bhingham@wisc.edu or 608-263-7383.
<table>
<thead>
<tr>
<th>Date</th>
<th>Type of Acid</th>
<th>Acid Concentration#</th>
<th>Amount of Acid*</th>
<th>Amount of Water Added*</th>
<th>Time/Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample^</td>
<td>Lactic acid</td>
<td>2.5%</td>
<td>3.75 fl oz. of 88% stock</td>
<td>Water to equal 1 gallon total</td>
<td>10:04 AM SCI</td>
</tr>
</tbody>
</table>

#Acid concentration of the prepared solution (acid applied to the carcass)

*Measured amount added. Units of measure (mls, fluid ounces (fl oz), weight) must be noted.

^Must be hand written at the time of preparation. No pre-filling of forms.