



Salmonella and Cantaloupe: What Can Consumers Really Do?

Experience with overall consumption of cantaloupe purchased and prepared in the home should give consumers confidence in the safety of this nutritious and enjoyable fruit. Many improvements in food safety awareness and management have been put in place by domestic and international producers and shippers, particularly over the past three years, which are also providing a foundation for confidence in the supply of cantaloupes throughout the year. However, no one can guarantee an absolutely risk-free system for melons grown in an open environment despite the best of precautions and intentions. Consumers have a precautionary role in food safety with cantaloupes and that involves adequate washing just prior to cutting for consumption and timely refrigeration of uneaten fruit. Washing and scrubbing under running tap water is all we recommend but some consumers are sufficiently concerned to use a variety of disinfectant treatments. These are challenging to perform in the home but may add a little extra benefit if done correctly. Though we don't advocate the necessity for these extra wash steps, for some the effort is worth the piece of mind that *"what can be done has been done"*.

Why Talk about Melon Washing Now?

Concern over widespread illness due to consumption of cantaloupe has surfaced once again. Although any potentially affected melons should be gone from the market, the timing of news reports raises the level of concern for other imported cantaloupes and comes very close to the beginning of domestic melon shipments to retail stores. What triggered this now is that imported cantaloupes from a single company have been associated with over 50 cases of illness involving 16 states, from California to New York and five provinces across Canada. The U.S. Food and Drug Administration (FDA) has issued an alert for retailers and consumers to discard any remaining fruit and to prevent further entry of cantaloupe from this shipper, based on current information, whose export season to the U.S. and Canada typically runs until May. Fruit from this shipper, as with many others, may be sold in retail stores as individual melons or are available in large membership "wholesale" retailers as a consumer-pack of three cantaloupes in a netted sleeve. Consumers would be highly unlikely to know whether



the cantaloupes originated from the named shipper or another based on information in common media channels.

The immediate media association of *Salmonella* to cantaloupe consumption is unfortunate but understandable as there have been seven such outbreaks since 1990 and more than six large-scale cantaloupe recalls in the past three years triggered by contamination detected in surveillance programs. Each time we experience one of these episodes the questions “What can consumers really do? Does washing prevent illness?” always come up. Despite the availability of consistent information from the FDA, the Center for Disease Control (CDC), and various universities and food associations about the why’s and how to’s of home washing of melons, information communicated to the media doesn’t always have a practical ring to it from a consumer perspective. In an effort to translate laboratory perspectives to consumer messages, recommendations for washing the outer rind of cantaloupe with up to 200 ppm bleach with a mild detergent always surface. We do not support this approach, nor does any consumer guidance from FDA and CDC include such methods. Resources for the standard recommendations are provided below. The core messages are repeated here in the Sidebar for convenience.

The purpose of this UC Food Safety Note is to briefly describe a few options that are easy to obtain for home use and relatively inexpensive. Each would be a positive step in safe handling of cantaloupe melons and seem more likely to be safely applied during food preparation in the average home.

Fruit Blemishes May Increase Risk

The first step is the selection of melons in the store. Focusing on some signs that should raise an immediate red-flag, that may be relevant for the current FDA advisory; avoid all fruit that have sunken and darkened areas on the rind and around the ends. Surface pitting or sunken and brown patches may be associated with harvesting cantaloupes too early and improper management during shipping. We have observed this disorder in retail stores over the past few months



with disturbing frequency. Although cutting away these areas is typically needed only for cosmetic reasons and not food safety, **why take a chance?** These prematurely softened and sunken areas are more likely to allow for transfer of surface contamination to the edible flesh. Once this occurs, no amount of washing will help.

The same is true for any visible signs of mold growing on the surface or around the stem-end scar (like a belly-button). If you can see any mold with the naked eye, there is a chance that the fine strands on the surface have created an avenue for bacteria, including *Salmonella*, to reach the edible flesh. Shipping melons long distances in special film bags generally improves quality but, if handled incorrectly, can lead to early development of exterior mold growth that will enter the interior flesh but not cause visible decay right away. Here again, washing after the fact won't help. Though domestic shipments are not packed and handled in this way those same precautions for careful inspection of the fruit you buy apply. Neither sunken areas nor minor mold growth mean that there is *Salmonella* contamination or a certain risk of illness. **However, it is your money, Why take a chance?** Unfortunately, though extremely rare, even good looking, sound melons may also be carriers for *Salmonella* contamination but proper washing has a much better chance of providing some protection.

Sensible Choices for Cantaloupe Washing

Unfortunately, survey after survey confirm that consumers generally don't wash fruit items like cantaloupes before preparing for eating or serving to family and guests. Washing with scrubbing, as described in the guidance articles listed below, is a good, simple, and prudent step that will help reduce risk in most cases. We do not agree that household bleach, especially at 200 ppm, should be used for washing cantaloupes, or other fruits and vegetables. Typical bleach products are not labeled for this use and may have various additives that make them unsuitable for food preparation uses.



Hydrogen peroxide

Hydrogen peroxide has been shown to be effective in reducing the risk of transferring surface contamination prior to cutting through a melon rind. Typical retail and drug store sources (3% Hydrogen Peroxide) are not recommended. These products typically contain stabilizers or additives not suitable or registered for food use, such as phenols; fine for finger cuts but not for eating. Consumers can purchase 7, 10, 19%, or up to 30% Food Grade Hydrogen Peroxide for Horticultural and Home Uses from a variety of sources. Our recommendation is not to handle the higher concentrates in the home, especially if there are young children around. A solution made from food grade 7% hydrogen peroxide, diluted one-half cup per gallon, to use for a vigorous surface scrub of the cantaloupe followed by a quick rinse in a clean sink under running water is a good precautionary step before cutting on a cleaned and sanitized surface. It is a good idea to wear clean gloves when handling hydrogen peroxide, especially the concentrate; wearing safety glasses when pouring concentrates that come in larger containers makes good sense.

Though more work is involved, washing cantaloupe in **heated hydrogen peroxide** helps increase the killing power. Wash and scrub the cantaloupe under running tap water and set on a clean paper towel. Heat the water until uncomfortable to touch but not beginning to boil. Remove from heat. Add the hydrogen peroxide and immerse the melon so it is about half covered in the container. Rotate and vigorously scrub for about 30 seconds. Remove and blot dry with paper towels before cutting.

Vinegar

White vinegar, commonly available as a 5% solution, is reported to be effective as a cantaloupe surface treatment for disinfection. However test results reported in scientific literature are highly variable which makes clear consumer tips for the kitchen nearly impossible. In several tests white vinegar was better than brown. One thing we do know is that it takes quite a lot to be effective, so spraying a mixture of 1 cup white vinegar mixed with one cup tap water over the surface of the melon may be a best choice. It does take some time to kill what



you can that might be on the surface so spritz the entire cantaloupe until well covered and let set for at least 2 minutes, preferably 10 minutes, and then rinse in a clean colander or sanitized sink under running water. Blot dry before cutting. Off-flavors should be unlikely unless the cantaloupe was overripe. Well ripened and softer melons are more likely to absorb the vinegar and it is difficult to fully rinse off after treatment.

Commercial Produce Washes for the Home

Rigorous comparisons of retail and on-line marketed produce washes are hard to come by and none are currently approved and registered as antimicrobial agents. The main reasons aren't necessary to describe for the purpose of this article but there are some that have shown to be effective at both removing soil and applied fruit waxes and helpful in removing bacteria from the surface of produce. We provide two examples because these are easily available to consumers and have been tested. Each appears to provide a benefit to eating quality and to reduce food safety concerns. Ingredients are all FDA food-safe, typically plant extracts that have detergent-like properties for cleaning and mild, plant-based acids and antimicrobials. Applications are a few ounces per pint applied as a spray for larger fruit such as cantaloupe. As above, spritz the entire surface of the cantaloupe until well covered and let set for about 2 min, then rinse in a clean colander or sink under running water. Blot dry before cutting. Various plant essential oils are also effective but expensive in concentrated form, harder to obtain, and more likely to impact flavor.

SunSmile[®] Fruit & Vegetable Rinse

http://www.sunrider.com/Eng/WebForm/Products/ProductLines.aspx#6:SunSmile_SunBright

Veggie Wash[®]

<http://www.veggie-wash.com/cgi-bin/category.cgi?category=0>

Are These Wash Steps Necessary?

Unfortunately, we can't truly answer this most reasonable question. As we said at the beginning, the risk of illness is very, very low but it



does happen. Science doesn't have a clear answer or solution that will ensure the safety of all consumers though efforts to move closer and closer to practical answers continues. We feel strongly that thorough washing, as described below, is both sensible and sufficient. The extra steps described above are strictly a matter of personal choice.

A Few Consumer Friendly Resources for Melon Washing Information:

Safe-Handling of Fruits & Vegetables

http://wifss.ucdavis.edu/pdf/ucfoodsafety_english.pdf

Cantaloupe: Safe Methods to Store, Preserve, and Enjoy.

<http://anrcatalog.ucdavis.edu/pdf/8095.pdf>

Safe Handling of Raw Produce and Fresh-Squeezed Fruit and Vegetable Juices

<http://www.cfsan.fda.gov/~acrobat/prodsafe.pdf>

Safe Handling of Fresh Fruits and Vegetables and Safe Handling of Fresh Cantaloupe

<http://fruitandvegetablesafety.tamu.edu/Consumers/GeneralSafety.pdf>

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Basic Consumer Recommendations for Cantaloupe Washing

- Wash cantaloupes just before you eat or serve them. Even though you do not eat the rind, it is important to wash the cantaloupe before you cut it.
- First, wash your hands with hot, soapy water for 20 seconds. Dry your hands with a new paper towel.
- Wash with soap and water and sanitize all food preparation areas and utensils, including any fruit/vegetable brush, with a solution of 1 teaspoon chlorine bleach in 1 quart water.
- Use a cleaned and sanitized fruit/vegetable brush to vigorously scrub the outside of the cantaloupe in a clean sink under clean running water.
- Do not use detergents, soaps or laundry bleach to wash cantaloupe. These products contain materials that are not suitable for food uses, may leave off-odors and change the flavor, and could be poisonous.
- Refrigerate leftover cut cantaloupe within 2 hours. If it is left unrefrigerated for longer than 2 hours, throw it away.