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## Food Facts For You!

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**A Closer Look at Produce Washes; Certain Soft Cheeses Made from Raw Milk: Risky for All; Stay Healthy at Animal Exhibits this Summer; New Research and Conflicting Information on Fish Consumption; Public Health Threat from Plastics?; and What's on Your Mind? (portable kitchen and germ-laden keyboards).**

### A Closer Look at Produce Washes

*(Note: The following is based on Colorado State University's Safefood News – Winter/Spring 2005 – Vol. 9 No.2/3 with editing to include newly published information.)*

Fresh and fresh-cut fruits and vegetables, traditionally considered “low risk,” are becoming more of a food safety concern. Produce items associated with foodborne outbreaks in recent years have included berries, cabbage, cantaloupe, lettuce, raw sprouts, tomatoes and watermelon. Fortunately, consumers are getting the message that it is important to wash fruits and vegetables before eating. The term “wash”, however, can have very different meanings even among the experts in the field.

**What not to use.** Although fruit and vegetable processing plants routinely use chlorine as an effective antimicrobial agent in their produce washing operations, the amounts used and timing are carefully controlled to ensure safety. For consumers, use of detergent or laundry bleach for cleansing fruits and vegetables is highly risky. Fruits and vegetables are porous and can absorb the soap or bleach, which are not approved or labeled by the Foods and Drug Administration for use on foods. Therefore, these products should **never** be recommended for home use in cleaning foods.

**Running water, the reliable standard.** The U.S. Department of Agriculture recommends that consumers simply “rinse fresh fruits and vegetables well under running water prior to eating.” More specifically, the University of Minnesota provides these tips on washing fresh produce:

- Before working with any foods, wash hands with soap and water. Also, make sure preparation areas are sanitary.
- Under clean, running water, rub fruits and vegetables briskly with your hands to remove dirt and surface microorganisms.
- Wash produce just before serving – not before storing, as washing will cause produce to spoil faster.
- Produce with a firm skin or hard rind like carrots, potatoes, melons or squash may be scrubbed with a vegetable brush and water.
- Discard the outer leaves of leafy vegetables such as lettuce and cabbage before washing.

Always wash squash and melons, even if you don't eat the rind or skin because

when cut, dirt or bacteria that is on the outer surface can be transferred to the inner flesh.

- **Do not** wash produce with detergent or bleach solutions. Fruits and vegetables are porous and can absorb the detergent or bleach, which is not intended for use on foods and consuming them on fruits and vegetables have the potential to make you sick.

**Commercial produce washes.** Several studies have looked at the effectiveness of produce washes. In most cases the produce washes have been found to be “equally effective or “slightly better” than tap or distilled water in removing microbes and pesticide residues. For example, in a study conducted at University of California-Riverside, one group of produce was washed with plain tap water, the second rinsed with both water and produce wash, and the third was not rinsed at all. The combined treatment of produce wash followed by water rinse reduced surface pesticide residues by 6% more than the water alone method, a difference too minor in the researcher’s opinion to justify the purchase price of a produce wash.

Some produce washes recommend soaking the fruits and vegetables in the wash solution. This can be problematic if the water becomes contaminated. Also, prolonged soaking of fruits and vegetables in wash solutions can damage produce quality and contribute to nutrient losses. Because rinsing in tap water alone is still highly effective, most researchers agree that it comes down to personal preference as to whether produce washes are worth the purchase price.

**Vinegar and lemon juice treatments.** A few studies have evaluated the effectiveness of vinegar and lemon juice (weak organic acids) as anti-microbial and anti-browning agents. In controlled studies, the best results in microbial reduction have been achieved when use of organic acids was combined with other treatments, such as a water rinse and/or agitation. In one such study, apples were spot inoculated with *Salmonella enterica*, wetted with 1 teaspoon of water or vinegar (5% acetic acid), rubbed for 5 or 30 seconds, rinsed with water, and dried with a paper towel. Dipping in vinegar, followed by rubbing for 5 seconds, rinsing with running water, and drying with a paper towel resulted in a reduction of 5.2 to 6.2 log CFU per apple, which was significantly ( $p < 0.05$ ) larger than reductions achieved with water washing alone (3.1 log CFU per apple). Another study evaluated the effectiveness of household products, including lemon juice and vinegar, in reducing levels of *E. coli* on iceberg lettuce. *E. coli* reductions were 2.1 log CFU/g when inoculated lettuce samples were exposed to 13% lemon juice and 2.6 logs CFU/g when samples were exposed to 13% lemon juice and agitation (10 min.). The authors concluded that 13% lemon juice was significantly ( $P < 0.05$ ) more effective when combined with agitation.

**Cold storage.** An additional factor in controlling bacterial populations on fresh produce is cold temperature storage. Studies have continued to show that cold storage slows the growth of pathogenic bacteria. For example, *Salmonella Montevideo* grew on tomatoes stored at 20 and 30°C but not at 10°C (Zhaung et al., 1995). *Listeria monocytogenes* grew well on fresh-cut cabbage and onions stored at 10°C but not at 4 °C (Farber et al., 1998) and *Escherichia coli* O157:H7 grew on fresh-cut melon at 12-25°C but not at 5°C (41°F) (Del Rosario and Beuchat, 1995).

**Conclusion:** Consumers are encouraged to wash all fresh produce items before preparing, cooking or eating them. Rinsing produce with clear, running water and

scrubbing (where appropriate) is an effective first step at preventing illness tied to fresh produce. Consumers may dip fresh produce in vinegar (undiluted) or lemon juice, but effective use of an acid wash requires both an acid rinse and vigorous washing (up to 10 minutes) with unknown effect on flavor. Regardless, dipped in acid should be rinsed and dried before eating or further handling.

Sources:

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### **Certain Soft Cheeses Made from Raw Milk: Risky for All**

The Food and Drug Administration (FDA) has issued a health advisory warning against the consumption of certain soft cheese made from raw milk. The FDA's advisory notes that some soft cheese made with raw (unpasteurized) milk present a health risk to all individuals, and especially to high risk groups, such as pregnant women, newborns, older adults, and people with weakened immune systems. Traditionally, soft cheeses made from raw milk have been linked to potential contamination with *Listeria monocytogenes*. Due to a recent outbreak of tuberculosis in New York City, federal officials are reminding consumers of the potential for contamination of raw milk cheeses with several serious infectious diseases including listeriosis, brucellosis, salmonellosis and tuberculosis. Recently, cases of tuberculosis in New York City have been linked to consumption of queso fresco-style cheeses contaminated with *Mycobacterium bovis*. Queso fresco-style cheese, a soft, white cheese, is popular among the Hispanic community. The raw-milk soft cheeses of most concern originate from Mexico and Central American countries, especially Nicaragua and Honduras, and are imported into this country illegally. Soft raw-milk cheeses prepared at home should also be avoided. Hard cheeses, such as Cheddar, Swiss, and Parmesan, that are aged (stored for six to 12 months, or more, before sale) are not cause for concern at this time. Hard cheeses are ones which can be easily grated; soft cheeses do not lend themselves to grating and are most often sliced.

**Video resource available.** Washington State University has a video entitled ***Fresh Cheese Made Safely in Your Own Kitchen***. (English- and Spanish-language) The video illustrates how to make queso fresco at home using pasteurized milk. If you are working with families which prepare soft cheeses in their home, you might find this video a useful teaching tool. Please contact Barb Ingham ([bhinham@wisc.edu](mailto:bhinham@wisc.edu)) if you would like to borrow a copy of either the English or Spanish version.

## **Stay Healthy at Animal Exhibits this Summer**

It will soon be time for summer visits to the farm, and petting exhibits at the zoo and county fairs will be a favorite spot for children. But, unfortunately, many people become sick every year because of a visit to an animal exhibit at a farm, a zoo, or a fair. When people forget to wash their hands after petting an animal or bring food into an area where animals are being housed, they are at risk for becoming ill. The Center for Disease Control (CDC) offers the following tips for a healthy visit to an animal exhibit:

### **Hand-washing stations.**

- Find out where hand-washing stations are located.
- Always wash your hands after petting animals or touching the animal enclosure, especially before eating and drinking.
- Running water and soap are best. Use hand gels if running water and soap are not available.
- Hand washing should be supervised by an adult.

### **Food and drinks.**

- Keep food and drinks out of animal areas.
- Do not share your food with animals – no matter how much they like it!
- Do not eat or drink raw (unpasteurized) dairy products.

### **Human-animal contact.**

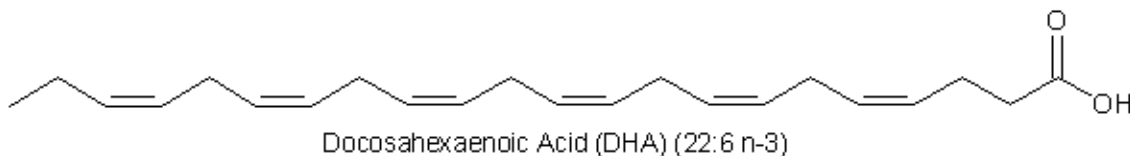
- Do not kiss animals or allow their mouths to come into contact with your face. Do not allow children to put their face to animal enclosures – germs don't just keep to one side of the fence.
- Beware of the risk of contamination via pacifiers and toys that children put in their mouths.

For more information see the CDC website: [http://www.cdc.gov/healthypets/spotlight\\_an\\_exhbts.htm](http://www.cdc.gov/healthypets/spotlight_an_exhbts.htm)

## **New Research and Conflicting Information on Fish Consumption**

**Mercury and omega-3 fatty acids in retail fish sandwiches.** In last month's newsletter (March/April 2005) I shared a reminder of fish consumption guidelines for certain populations for salt-water fish and for freshwater fish caught in Wisconsin waters due to concern over mercury and PCB contamination. Scientists at Purdue University have provided new evidence as to the mercury content of retail fish sandwiches. The scientists also measured omega-3 fatty acid content in the fish sandwiches, a beneficial nutrient in fish.

Omega-3 fatty acids such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are found predominately in fish oil, fish, and other seafood. These dietary fatty acids are vital for fetal and infant brain and retina development. Aside from these positive nutrients, fish may also contain contaminants such as mercury, which is a well-known neurotoxicant. Mercury is especially harmful because it can move across the placenta and can enter breast milk. Fetal and infant exposure to excessive mercury has been associated with developmental delays and learning disabilities.



*Figure by RMB*

Mercury and fatty acids were measured in fish sandwiches from six retail restaurant chains. Average mercury concentrations ranged from 5 to 132 ppb and were well below the Food and Drug Administration action level (1,000 ppb). The average concentrations of eicosapentaenoic acid plus docosahexaenoic acid ranged from 91 to 620 mg per sandwich. Based upon consumption of two fish sandwiches per week, mercury intake from fish sandwiches would result in consumption of 2 to 40% of the reference dose for mercury for a 132-pound individual, while providing 18 to 126% of the adequate intake for EPA plus DHA recommended for a pregnant or lactating woman.

S.M. Shim, et al. 2005. *Journal of Food Protection* Volume 68:633-635.

**USDA Food Pyramid clashes with FDA/EPA safe fish recommendations.** The USDA's new Food Pyramid ([mypyramid.gov](http://mypyramid.gov)) recommends certain fish that the FDA and EPA agree should not be eaten at all by young children and women of childbearing age due to potential mercury contamination.

The Food Pyramid lists mackerel, swordfish and fresh tuna as recommendations within a daily allowance of meat, bean, nuts and fish. But in March 2004, the FDA/EPA's joint fish consumption advisory advises specifically against **any** consumption of swordfish and king mackerel due to their high levels of mercury contamination. The advisory applies to all women who may become pregnant, pregnant women, nursing mothers, and young children.

For a 35-year old active woman, the Food Pyramid would recommend eating 6 ounces per day of foods from the meat, bean, nuts and fish group. But eating even a single 6 ounce serving of fresh tuna or canned albacore tuna would push women and children far beyond what EPA would advise as a maximum amount of mercury for that week, let alone for the day. According to one official with the *Institute for Agriculture and Trade Policy*, "Fish are good food when they're not contaminated with mercury and other industrial pollutants. The USDA's Food Pyramid needs to tell people – and especially women and children – which fish to avoid, as well as which fish to eat."

**The bottom line:** the new pyramid is designed to accommodate the needs of many different types of individuals. In our outreach efforts, we should continue to warn certain groups (pregnant women, children, women of child-bearing age) against consumption of particular types of fish such as swordfish and king mackerel. (see March/April 2005 Food Facts in the archives: [www.wisc.edu/foodsafety](http://www.wisc.edu/foodsafety) )

### **Public Health Threat from Plastics?**

Scientists at **Yale University** recently unveiled results which question the safety of common household plastic materials. As a result of research conducted in the Department of Neurobiology at the Yale School of Medicine, scientists warned that low doses of a chemical widely used to make many plastics, **bisphenolA (BPA)**, can impair brain function, leading to learning disabilities and age-related neurodegenerative diseases. The research scientists found that low doses of BPA in female rats inhibited the function of estrogen in brain development and function. Citation: *Environmental Health Perspectives*, 10. 1289, Online Feb. 24, 2005.

**A review from the American Council on Science and Health.** The release of the study results from Yale University has led to a heightened discussion as to the safety of standard household plastic containers. While scientific evidence can sway opinion and lead to the formation of new recommendations, a group of scientists from the **American**

**Council of Science and Health** has indicated that the evidence presented does not point to a direct threat to human health from the presence of bisphenol A in plastics. The amounts of bisphenol A that may migrate into food and beverages from plastic containers are extremely small and well within acceptable limits that are set by various regulatory agencies. Suspicions that exposure to bisphenol A at very low doses might cause harmful effects that do not occur at higher doses have not been confirmed by further research. There is no need for concern about the current, very low levels of human exposure to bisphenol A from plastic bottles and other consumer products.

**What Is Bisphenol A?** Bisphenol A is an industrial chemical that is used in the manufacture of polycarbonate plastic. Polycarbonate plastic is light in weight, durable, shatter-resistant, and heat resistant; thus, it is well suited for a variety of uses. Several types of products that come into contact with food or beverages -- including infant feeding bottles, some brands of water bottles carried by sports enthusiasts, reusable five-gallon water bottles, returnable beverage bottles, plastic dinnerware, and plastic food storage containers -- may be made of polycarbonate. Polycarbonate is also used in other types of consumer products, such as eyeglass lenses, electrical equipment, cell phones, automobiles, medical equipment, household appliances, sports safety equipment, CDs, and DVDs. Bisphenol A is also used in the manufacture of epoxy resins. These resins are used in a variety of protective coatings, including the coatings that line food and beverage cans. They are also used in the manufacture of paints, adhesives, floorings, and printed circuit boards. Similar resins are used in some dental composites (filling materials) and sealants.

**How Are People Exposed to Bisphenol A?** The principal way in which consumers may be exposed to bisphenol A is through food and beverages. Traces of bisphenol A may migrate into foods or beverages from polycarbonate containers or from cans lined with epoxy resins.

**Is the Amount of Bisphenol A That People Are Exposed to a Cause for Concern?**

To determine whether there is cause for concern about people's exposure to any substance, it is necessary to have the answers to two questions:

- 1) How much of the substance are people exposed to?
- 2) At what levels of exposure do harmful effects occur?

It is important to recognize that practically all substances -- even substances that are essential for life, such as oxygen and vitamins -- can have harmful effects at high doses. The only direct evidence about the effects of bisphenol A in humans comes from the experiences of workers who were exposed to the substance on the job. As a result of long-term exposure to high levels of bisphenol A in the air at their workplaces, some of these individuals experienced irritation of the eyes, respiratory tract, and skin. These symptoms, however, resulted from inhaling bisphenol A, not from ingesting it in foods and beverages, and thus the experiences of workers who were exposed to bisphenol A on the job are not applicable to the experiences of the general public. Because no direct information is available on the effects of human exposure to bisphenol A in foods and beverages, it is necessary to make use of data from studies in experimental animals. In studies conducted by the U.S. National Toxicology Program, harmful effects, especially a reduction in body weight, were found in mice and rats only when the amount of bisphenol A fed to the animals exceeded 50,000 micrograms (50 milligrams) per kilogram of body weight per day – **or 0.1 ounce of pure bisphenol A for a 150-pound individual every day.** Lower doses did not harm the rodents. When bisphenol A was fed to pregnant animals, the offspring were harmed only by doses that were high enough

to also cause toxicity in the mother. Bisphenol A is not carcinogenic (cancer-causing) in experimental animals, and although the results of various tests have not been entirely consistent, the overall scientific evidence indicates that it does not cause mutations (genetic damage).

Because the amount of a substance that is needed to produce a harmful effect may differ between humans and test animals, and because individual humans may differ in their sensitivity to a substance, it is customary to use a substantial safety factor when applying the results of studies in experimental animals to the human situation. Using this approach, the EPA calculated an acceptable daily dose of 50 micrograms per kilogram body weight per day. Comparing this value with exposure estimates from the food supply indicates that the amounts considered acceptable by government agencies are 100 to 500 times higher than the highest estimated human exposure levels. Thus, a **substantial margin of safety exists** between current levels of exposure to bisphenol A and levels that might be harmful.

**Conclusion.** Overwhelmingly, the evidence suggests that the current, very low levels of exposure to bisphenol A from plastic bottles and other consumer products do not pose a hazard to human health. Consumers should, however, continue to follow safe practices for handling and preparing food. When heating food in the oven or microwave, use plastic materials designed specifically for that purpose. And do not store food, especially fatty or acidic food, in plastic containers such as garbage bags that are not designed for use with food. [http://www.acsh.org/publications/pubID.1033/pub\\_detail.asp](http://www.acsh.org/publications/pubID.1033/pub_detail.asp)

### **What's On Your Mind?**

**The Portable Kitchen.** Jan Scholl of Penn State University has produced a fact sheet entitled *The Portable Kitchen Assembly Guide*. The *Portable Kitchen Assembly Guide* is an extension bulletin developed to help professionals assemble a kitchen that can be transported to locations where kitchen facilities are limited. Food demonstrations are often used as a technique to place nutrition information into the day-to-day reality of most people. Moving equipment to remote locations, particularly if the presentations are given in low-income areas or day camp situations is particularly arduous, especially if your transportation is limited to a bus! The portable kitchen was designed to put 40 + kitchen utensils together into two dishpans that could also be used as a makeshift double sink. The dishpans are stacked with the equipment in them; they can be transported in a rolling suitcase, a backpack, or even a canvas shopping bag. *The Portable Kitchen Assembly Guide* was printed with an explanation of its use and various equipment options to guide putting the kitchen together. An oft-cited reason for using the bulletin and assembling a portable kitchen has been to prepare for natural disasters, such as hurricanes, tornadoes, floods, and other situations where families do not have adequate warning before evacuations are necessary. The bulletin has also been useful in school classrooms and for youth involved in 4-H foods projects. The guide can also be handy for personal use such as when planning a family camping trip. Multiple copies may be ordered from Penn State Publications <http://pubs.cas.psu.edu/> A copy of the *Guide* is also available on-line <http://pubs.cas.psu.edu/freepubs/pdfs/ui360.pdf>

**Keyboards havens for bacteria.** Lucia Patritto (Iron County) alerted me to a recent news release that indicates that those computer keyboards that we use might be dirtier than we thought! The news release highlighted keyboards used in hospitals:

Electronic recordkeeping in hospitals and other health care settings may be spreading more than just information. A new study [4/11/2005] shows that some nasty bacteria can survive and grow for at least 24 hours on computer keyboards. "Not only do we demonstrate that some bacteria can survive for a long time on keyboards, but that it's possible to transmit them from the keys to the fingertips -- and if you're not careful about washing hands, potentially pass them along through contact with other patients," said Dr. Gary Noskin, medical director of health care epidemiology and quality at Northwestern Memorial Hospital in Chicago. "We looked at this because the trend nationally is to have computerized order entry, which in a lot of hospitals means computers in patients' rooms, in places that are in direct close contact with patients." His team "inoculated" keyboards and covers with three types of bacteria commonly found in hospitals -- vancomycin-resistant enterococcus (VRE), methicillin-resistant Staphylococcus aureus (MRSA) and Pseudomonas aeruginosa (PSAE). They found that the first two bugs continued to grow for at least 24 hours. "PSAE, on the other hand, could be recovered only up to one hour on (the) keyboard and five minutes on the keyboard cover," Noskin said. Although VRE and PSAE seldom cause problems for anyone other than hospitalized patients whose immune systems are compromised by other illness, antibiotic-resistant staph infections to the skin have become increasingly common both in hospitals and in community settings such as locker rooms, schools and prisons. "We studied only the hospital setting," Noskin said, "but it's a sure bet that no keyboard anywhere is sterile and people using them in libraries and schools or offices need to keep that in mind, particularly if they have any kind of breaks in their skin that could allow bacteria to penetrate," Noskin said. The researchers also had volunteers type on the contaminated keyboards and found that the more contact, the more likely bacteria would wind up on the hands -- up to a 92 percent transmission rate for the staph germs, 50 percent for VRE and 18 percent for PSAE. Washing the equipment with hospital disinfectants heavy on ammonia killed the germs after it was left on for five to 10 minutes -- which has grim implications for the electronic circuits beneath the keys.

**Food safety education....it's in your future!** Now is a good time to begin planning for food safety educational programs for the summer and fall.

This **summer**, a new food safety campaign will be launched over the July 4<sup>th</sup> holiday. The thermometer education campaign is entitled "**Is It Done Yet? You Can't Tell By Looking. Use a Food Thermometer To Be Sure!**" If you plan to program in this area and need dial-stem thermometers, let me know, I have plenty to share. More information can be found online: <http://www.foodsafe.msu.edu/>

Looking ahead to **September** is **National Food Safety Education Month**. Federal, state, and local government agencies, food safety educators and restaurants will all participate in this year's campaign with the theme "**Keep Hands Clean with Good Hygiene.**" For help with planning your 2005 activities, visit The National Restaurant Association Educational Foundation (NRAEF) Web site at: <http://www.nraef.org/nfsem>

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