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Food Facts For You!

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New Web Design & Thank You to Everyone; Produce Safety: Questions and Answers; Seafood: Balancing Benefits and Risks; Human Prion Diseases; What's On Your Mind? (botulism update, recipe calculator, Craisins, toxins from cookware, plumping canner gaskets, freezing home-prepared foods, paraffin in candy-making)

New Web Design & Thank You to Everyone

Over the fall semester, we found out that some of our web-based information wasn't as easy to locate after we introduced a new web design in September (2006). So, we are releasing yet another web design that I hope will be easier to use. Please let me know how you like this new one.

Thank you to everyone for being so understanding while I was less available during my fall sabbatical. The sabbatical 'leave' was spent on campus, preparing a new course that I will teach next year and coordinating all the curriculum revision efforts for my department (10 courses affected, in all). I wasn't able to complete any of the special projects as I had hoped, but the work towards curriculum revision in my department will greatly benefit the students in our program.

Produce Safety: Questions and Answers

*The media has been filled with information this fall about foodborne illness-outbreaks linked to fresh produce. While scientists have known for years that the trend is towards more and more illness outbreaks linked to fresh produce, consumers may be alarmed seeing spinach, onions or lettuce linked to illness. Following are some questions (and answers) about this trend. See the **Resources** section following this article for more information.*

Q: Should I keep eating lettuce, tomatoes, onions and other fresh produce?

A: For most people, the nutritional benefits of eating fruits and vegetables outweigh the risk of developing a foodborne illness. You may wish to take extra precautions — such as sticking to cooked produce if you're eating away from home and can't verify where the produce came from or how it was washed — if you belong to a higher-risk group. That includes pregnant women, children, the elderly and those with weakened immune systems, such as people with HIV/AIDS or those undergoing cancer treatment.

Q: Will washing produce help?

A: Thorough washing can remove some bacteria, but not all. The deadly *E. coli* O157:H7 bacteria can be particularly hard to remove from leafy greens, and just a tiny amount can cause illness. Bacteria can also contaminate soil and then grow inside stems of plants or inside fruits, and washing can't reach bacteria hiding inside. Wash fruits and vegetables under running water just before eating, cutting, or cooking, even if you plan to peel them, i.e. wash carrots and potatoes before peeling, and again after peeling. **Don't use soap**, it can leave a residue which, when consumed, can make you sick. There is also no

evidence that **chlorine** bleach used at home is any more effective than plain water; and the down-side of chlorine is that it can also leave a residue.

Q. Some of the foodborne illness outbreaks have been linked to pre-washed greens. Should we tell consumers to wash bagged salad greens before use?

Current evidence indicates that triple-washed salad greens should be OK to consume without further washing; other bagged salad greens should be washed before eating, cutting or cooking. Washing all fruits and vegetables, whether bagged salad greens, bagged carrots, bagged spinach and the like, before eating, cutting or cooking is a good habit to get into. And clients in our educational programs will benefit from seeing a good example set by our educators. [Why not make this one of your New Year's resolutions?]

Q. If I use a commercial fruit and vegetable wash such as FIT, will that help? While the makers of FIT would have you believe that a produce wash will ensure safety, scientists strongly disagree. There is no evidence that any produce wash will remove bacteria once they are firmly attached to fruits or vegetables. FIT is a product made from fruit acids and oils (citric acid and grapefruit oil). It cuts into the waxy cuticle layer found on the surface of all produce and helps to remove dirt that may be attached to the waxy cuticle. However, there are just too many nooks and crannies for any one step, such as using a produce wash, to ensure safety. All this said, use of a produce wash such as FIT shouldn't hurt and, while not recommended, consumers can use these products if they wish.

Q: What kinds of produce are most often linked to foodborne illness?

A: Currently, sprouted seeds (i.e. alfalfa or radish sprouts), cantaloupe, tomatoes, leafy greens such as lettuce and spinach, and onions have been linked to foodborne illness.

Q: Why do these outbreaks keep happening?

A: Foodborne disease outbreaks linked to fresh produce have been increasing, for various reasons. Americans are eating more uncooked fruits and vegetables because of their nutritional benefits. If meat is contaminated, consumers can kill bacteria by properly cooking it. But fresh produce is eaten raw, which means consumers have fewer safeguards to eliminate bacteria. Washing can help, but it won't get rid of some contamination. In addition, food distribution networks that send lettuce from one small growing region to supermarkets around the country can spread foodborne disease more widely than ever before. Potential causes of contamination include dirty irrigation water; manure, whether used as fertilizer or spreading bacteria from an adjacent field; harvesters or processors who don't wash hands after using the bathroom; improperly treated wash water in processing plants; and improper refrigeration.

Q. I read somewhere that animals (wild pigs) were involved in the illness outbreak linked to spinach. How did that happen?

When a foodborne illness that affects hundreds of people in several states strikes, investigators go to work. Federal public health officials work with local officers to try to pinpoint the source of the outbreak and how it spread. One way that they can do this is to 'fingerprint' the bacteria involved and see where it is found. Each strain of bacteria has its own unique fingerprint and this helps investigators put the pieces of the puzzle together. In the outbreak linked to spinach, investigators were able to find *E. coli* O157:H7 in bags of spinach. Based on bacterial fingerprinting, the same strain of *E. coli* O157:H7 was found in manure on a cattle ranch a mile from where the spinach was grown. Later, the bacterium was found associated with some of the cattle themselves. Finding exactly the same *E. coli* O157:H7

at the cattle ranch wasn't much of a surprise, roughly 5% of cattle carry the organism. The same bacterial fingerprint was also found in samples of water from a stream nearby. But how did the bacterium get from the cattle ranch to the spinach field? Investigators also linked the fatal strain of *E. coli* O157:H7 to wild pigs that may have spread the bacteria by trampling fences surrounding one of the spinach fields. The wild pigs are one "vehicle" that could explain how *E. coli* O157:H7 spread from cattle on the ranch to the spinach field less than a mile away. The final pieces of the puzzle are still not in place, but investigators have a pretty good idea that someone contamination from the cattle ranch was spread to the spinach field, and contamination on the spinach led to the outbreak of illness.

Q. Are organic fruits and vegetables any safer?

A. There is no evidence that organically grown fruits and vegetables are any safer; some of the recent outbreaks have been linked to organically grown produce.

Q. Is *E. coli* O157:H7 a concern for home gardeners?

Gardeners who use manure as fertilizer should know their growing plants could become contaminated by harmful pathogens unless they follow proper manure management rules. *E. coli* O157:H7, *Salmonella* and *Listeria* can be transferred to humans from animal manure, which may also contain parasites like roundworms and tapeworms. Manure from pigs, dogs and cats should never be used in gardens or compost because it may contain parasites that can infect humans.

The risk of food contamination is greatest with fresh manure, which should never be applied to the garden or put in the compost pile. Anyone who works in a garden where fresh manure has been applied or eats produce from it is at high risk of becoming ill. Besides being a health risk, fresh manure is unpleasant to work with and will burn growing plant roots because it's too high in nitrogen. Specialists suggest that if you want to use manure on the vegetable garden, use only composted, rotted manure. Composted manure is often best applied to the garden before anything is planted and worked into the soil. The manure sold in bags at garden centers has been composted and dried. Follow the label directions in applying it on your garden.

Composted manure can be beneficial to the garden soil because it not only provides fertilizer but it may improve the soil's tilth or texture. Manure from a horse or cattle stable usually contains bedding material like straw or sawdust, which will help loosen clay soils, but may also introduce weed seeds into the home garden.

Q. What are the symptoms of illness associated with *E. coli* O157:H7?

A. According to the Centers for Disease Control and Prevention, people generally become ill from *E. coli* O157:H7 two to eight days (average of 3-4) after being exposed to the bacteria. *Escherichia coli* O157:H7 infection often causes severe bloody diarrhea and abdominal cramps. Sometimes the infection causes non-bloody diarrhea or no symptoms. Usually little or no fever is present, and the illness resolves in 5 to 10 days. In some persons, particularly children under 5 years of age and the elderly, the infection can also cause a complication called hemolytic uremic syndrome (HUS), in which the red blood cells are destroyed and the kidneys fail. About 8% of persons whose diarrheal illness is severe enough that they seek medical care develop this complication. In the United States, HUS is the principal cause of acute kidney failure in children, and most cases of HUS are caused by *E. coli* O157:H7. Infection with *E. coli* O157:H7 is diagnosed by detecting the bacterium in the stool.

Q. Not only are more people getting sick, but it seems that more people are having to go to the hospital due to contracting a foodborne illness. Why is this happening?

A. Just over half the cases (50.03%) of illness linked to *E. coli* O157:H7-contaminated spinach earlier this Fall required hospitalization (66 of 131 cases). In a typical outbreak involving *E. coli* O157:H7, health experts would expect 20–25% of people to be hospitalized. Hospitalizations occur because patients develop a potentially fatal kidney disorder hemolytic uremic syndrome (HUS) caused by the bacteria's toxin. The illness was also more deadly.

There is evidence that the particular strain of *E. coli* O157:H7 associated with the spinach outbreak is particularly deadly, thus resulting in more hospitalizations. Records of the investigation indicate that this year's lethal outbreak of *E. coli* O157:H7 in fresh spinach from the Salinas Valley was caused by a particularly malevolent breed of the bacteria. Within this dangerous microbial family scientists have recorded the genetic fingerprints of 20,000 subtypes. All of the victims in the outbreak linked to spinach were sickened by a single subtype labeled EXHX01.0124. It may be the most dangerous strains of O157:H7 yet detected. Scientists have indicated that one possible explanation for 0124's unusual punch lies in the type of toxin that this bacterium makes. Once the bacterium is ingested and reaches the small intestine, the toxin that it produces can make its way into the blood stream and attach the kidneys, causing severe, and sometimes fatal, damage.

Perhaps confounding the problem is that illness linked to *E. coli* O157:H7 is treated somewhat differently from other bacterial illnesses: **antibiotics should not be used to treat this infection**. There is evidence that the toxin produced is formed inside the bacterium. When antibiotics are given, the bacteria break apart, allowing the toxin to spread through the patient's system. Hydration therapy is considered the best way to treat the disease; with dialysis an option if the disease sufficiently damages the kidneys. I spoke with one of our state epidemiologists in October as the outbreak linked to spinach was winding down. He informed me that physicians were not always aware of the harm that antibiotics can cause a patient infected with *E. coli* O157:H7. If you ever find yourself, or someone in your family, at the emergency room with blood diarrhea (and I sincerely hope that you don't!!!) you may need to remind the physician to test for this particular bacterium before ordering treatment.

Q. What can a consumer do to avoid a foodborne illness linked to fresh produce?

A. Raw fruits and vegetables are not sterile tissues. The soil and water in which fresh produce grows is host to large number of microorganisms, some responsible for spoilage (rot/decay) of plant tissue, others which may cause human illness (pathogens) and still others which we consider beneficial (bacteria which allow for the natural fermentation of cabbage or cucumbers into sauerkraut or pickles). Recent outbreaks reaffirm that, like meat, fresh produce needs to be handled carefully at all points in the process from farm to table. Here are some tips for purchasing fresh produce, and ideas for handling produce at home (summarized from Nutrition Action Health Letter, 12/06)

- Buy **fresh-cut** produce like half a watermelon or bagged salad greens only if it's refrigerated or surrounded by ice.
- Store **perishable fresh fruits and vegetables** (like strawberries, lettuce, herbs and mushrooms) or **pre-cut or peeled produce** in a clean refrigerator at a temperature of 40°F or below.

- Wash your hands for 20 seconds with soap and warm water before and after preparing **any food**.
- Wash **fruits and vegetables** under running water before eating, cutting, or cooking, even if you plan to peel them.
- Scrub **firm produce** like melons and cucumbers with a clean produce brush. Let them air dry before cutting.
- Remove the outer leaves of **heads of leafy vegetables** like cabbage and lettuce.
- Don't eat **raw sprouted seeds** (alfalfa, bean, broccoli, radish, etc) – this applies even if you sprout seeds at home
- **Cook produce** to 160°F, or higher, if you are worried about contamination
- Choose **processed (canned or frozen) vegetables and fruit** if you are cooking for someone in the at-risk population. Processed items will be nearly identical in nutritional value, and often higher, than fresh produce.
- Limit **the time** that fresh produce is stored in your refrigerator. Nutritive value drops on storage and there is always the risk of contaminating bacteria taking a firmer hold.

Avoid **contaminating fresh produce** with raw meat juices.

Resources:

Fear of Fresh. 2006. Nutrition Action Health Letter. Vol 33, p.1-6.

U.S. Food and Drug Administration <http://www.fda.gov/>

Centers for Disease Control and Prevention <http://www.cdc.gov/ecoli/>

Seafood: Balancing Benefits and Risks

The National Academy of Science's **Institute of Medicine** has released a report entitled "**Seafood Choices: Balancing Benefits and Risks**" which provides a summary of current seafood consumption patterns and how those patterns have changed over time. On the basis of the analysis of the available evidence and data on consumption patterns, the committee who wrote the report developed guidance on seafood consumption for each of four population subgroups:

1. Women who are or may become pregnant or who are breast-feeding may benefit from eating seafood, especially those kinds which have relatively higher concentrations of EPA and DHA. A reasonable amount would be two 3-ounce servings per week, but they can safely consume up to 12 ounces per week. They can consume up to 6 ounces of white tuna that is, albacore -- weekly, and should avoid eating large predatory fish such as shark, swordfish, tilefish, and king mackerel.
2. Children ages 12 and under are given the same guidance as pregnant women, except that serving sizes should be age-appropriate.
3. Adolescent and adult males and women who will not become pregnant may reduce their risk for cardiovascular disease by eating seafood regularly -- for example, two 3-ounce servings per week. Those who consume more than two servings per week should choose a variety of seafood to reduce risk for exposure to contaminants from a single source.
4. Adult men and females who are at risk of coronary heart disease may reduce that risk by consuming seafood regularly -- for example, two 3-ounce servings per week. There may be additional benefits from including seafood selections high in EPA and DHA, although supporting evidence is limited.

In the committee's judgment, age, gender, pregnancy, and breast-feeding are the factors that distinguish among these target groups who face different benefit-risk trade-offs. Individuals at risk of coronary heart disease benefit from the advice given to the general population.

Human Prion Disease

Note: Researchers from Colorado, where chronic wasting disease is endemic in part of the deer population, recently published information which may be instructive for hunters in Wisconsin. A summary of that study follows:

Chronic Wasting Disease (CWD) is a contagious disease of mule deer, white-tailed deer and Rocky Mountain elk that has potential human health implications. CWD is related to other mammalian transmissible spongiform encephalopathies (TSEs), such as Creutzfeldt-Jakob disease (CJD) in humans, bovine spongiform encephalopathy (BSE) – Mad Cow Disease - in cattle, and scrapie in sheep. In prion diseases, a normally produced cellular protein accumulates in an abnormal, misfolded, and aggregated form, which results in neuron destruction and a universally fatal outcome after a prolonged incubation period.

CWD infects wild and captive deer and elk in several US states and Canadian provinces. Research has shown that humans and animals can acquire TSEs by consuming prion-contaminated food. Outbreaks of prion disease include an epidemic of kuru among the cannibalistic Fore tribe of the New Guinea highlands and an outbreak of BSE in cattle in the United Kingdom, caused by feeding healthy cattle protein supplements derived from prion-infected cattle offal. These outbreaks are examples of transmission of the disease within one species, i.e. human-to-human and cattle-to-cattle transmission, respectively. Food-based prion transmission between species also occurs, although a phenomenon known as the "species barrier" decreases transmission efficiency. For instance, feeding cattle the remains of scrapie-infected sheep may have initiated the outbreak of BSE in Europe and humans have been shown to become infected with variant Creutzfeldt-Jakob disease as a result of eating BSE-contaminated beef products. Laboratory studies, however, indicate that a natural barrier reduces human susceptibility to certain animal prion diseases, including CWD. As yet, no cases of human prion disease have been linked with CWD, and natural transmission of CWD to humans or traditional domestic livestock seems unlikely.

In this study, researchers from the University of Colorado and the Colorado Division of Wildlife used Colorado death certificate data from 1979 through 2001 to evaluate rates of death from the human prion disease Creutzfeldt-Jakob disease (CJD). Using data from seven Colorado counties with high CWD prevalence in the deer and elk population, the relative risk (RR) of CJD for CWD-endemic county residents was **not significantly increased** (RR 0.81, 95% confidence interval [CI] 0.40–1.63) compared to the general population, and the rate of CJD did not increase over time (5-year RR 0.92, 95% CI 0.73–1.16). **The researchers concluded that, in Colorado the risk of human prion disease resulting from CWD exposure is rare or nonexistent.** The scientists did note, however, that given uncertainties about the incubation period, exposure, and clinical presentation, the possibility that the CWD agent might cause human disease cannot be eliminated. **This study would suggest that hunters and others consuming venison from Wisconsin, even venison from CWD-positive areas of the state, would not significantly increase their risk of contracting CJD.** Regardless, UWEX continues to urge hunters to use caution when handling deer from all areas of the state, and to only consume meat from apparently healthy animals.

Citation: MaWhinney S, Pape WJ, Forster JE, Anderson CA, Bosque P, Miller MW. Human prion disease and relative risk associated with chronic wasting disease. *Emerg Infect Dis* [serial on the Internet]. 2006 Oct [cited 20 December 2006]. Available from <http://www.cdc.gov/ncidod/EID/vol12no10/06-0019.htm>

What's On Your Mind?

Botulism Update. Botulism poisoning made its way into the press this past fall with an outbreak of illness linked to carrot juice. *Bolthouse Farms 100% Carrot Juice*, *Earthbound Farm Organic Carrot Juice* and *President's Choice Organics 100% Pure Carrot Juice* were recalled in late September after four individuals were hospitalized with paralysis (a sign of botulism poisoning) linked to consumption of processed carrot juice. Two other cases of botulism were linked to toxic carrot juice in Canada.

At issue, botulinum toxin was allowed to form when the carrot juice was improperly handled (not refrigerated); consumers were not aware that refrigeration is vital in ensuring the safety of a low-acid canned, non-acidified product like carrot juice. Increasingly botulism poisoning is linked to products other than improperly canned food items. Consumers are reminded to properly handle all canned and packaged food items.

New research on botulism poisoning. The botulinum toxin is a potent neurotoxin, latching onto nerve cells and causing paralysis and eventual death. New research from the **University of Wisconsin** and Scripps Research Institute shows how the astonishingly powerful botulinum toxin latches onto nerve cells, the first step in inactivating them. Researchers discovered how the toxin first attaches to a receptor on the surface of a nerve cell, then looks for a second type of receptor that is nearby. Once the toxin links to this second receptor, it can enter the nerve cell and break a protein needed to help deliver nerve cell impulses. Paralysis is experienced once nerve cells lose the ability transfer signals. By blocking the signaling molecule, the botulinum toxin can cause paralysis, and even death through respiratory failure. It is hoped that this type of research will lead to the development of effective medical therapies for botulism poisoning, and for treatment of diseases such as certain types of cancer.

Handy on-line recipe calculator. Have you ever struggled with the calculations for ingredient amounts when you want to double a recipe, or how about if you want to prepare 1-½ times the amount? **Faye Malek** (Manitowoc County) found a handy online recipe calculator that allows you to input the recipe ingredients and the computer will do the math for you <http://www.fruitfromwashington.com/Recipes/scale/recipeconversions.php> Thanks to Faye for sharing this tip!

Craisins! Craisins are delicious to eat, and cranberries are a plentiful crop in some parts of Wisconsin. A Master Food Preserver this past summer shared the following recipe for Craisins, and it comes the closest to duplicating the commercial product of any recipes that I have tried (thanks to **Gayle Rose Martinez** for tracking the recipe down!). Let me know what you think!

Homemade Craisins

Wash a 5 quart pail of cranberries, drain and cut each berry in half.

Prepare Syrup

3 c. Water

1 1/2 C. White Corn Syrup

1 c. Sugar

Bring syrup to a boil. Put cranberries in syrup and reheat, but do not boil. Cool. Set aside and allow to stand for 3 days, covered, in a cool location. Stir at least once per day. [This product does not have to be refrigerated.] Drain well. Place soaked cranberries on trays or racks in a food dehydrator set to 115 degrees F. After 15 hours, you may wish to lower the dehydrator temperature to 105-110 degrees F. [Recipe modification: you might try a syrup of concentrated orange juice + corn syrup as a way to infuse cranberries with an orange flavor.]

Toxins from Cookware. Thanks to **Peggy Olive** (Richland County) for asking about the purported threat to human health from teflon cookware. Articles periodically circulate which state that teflon releases toxins at high cooking temperatures, for example when frying bacon. Articles also circulate which warn against cooking in aluminum, saying that high levels of aluminum are released into food during the cooking process. [Some of these articles are put out by television chefs who sell their own line of stainless steel cookware!] If these questions come your way, a good resource to help in responding to these queries on these topics is the **Urban Legends & Folklore** web site (click on Food and Drink): <http://urbanlegends.about.com/index.htm?terms=urban+legends> or Search for your topic of interest.

Do you have any information on plumping the rubber sealing gasket for pressure canners? **Mary Meehan-Strub** (LaCross County) asked this question for a client and Presto Industries provided this response.

Mary's query: *I received a call from a lady that said a Carol Burton from University of Minnesota Extension had an article out about plumping your sealing gasket to get it to fit in your pressure canner lid. You put the gasket in a quart of warm water and 1/2 cup vinegar, and heat it. [The woman] tried it, said it worked great. Wondered how long it would last? Would she need to do this each time she used it? Her gasket is 2-3 years old and seems to have shrunk to the point it leaked and would not hold a seal.*

Nancy Becker of Presto Industries responded: *After receiving your email I had our Materials Engineer do a little experimenting with "plumping" sealing rings provided by Presto. The material that our sealing rings are made of is nitrile rubber. The procedure does in fact expand the sealing ring, however, only temporarily. In addition to expanding, the procedure also softens the sealing ring. **This is disturbing because a sealing ring that is soft can potentially release from the pressure canner while under pressure.** Sealing rings made of other synthetic rubbers may respond differently. **Presto would not recommend this procedure for "plumping" the sealing rings that we provide with and for, our canners.*** Thanks to Mary for bringing this to my attention, and to Presto Industries for their response.

What information is available on freezing home prepared foods? There are several excellent resources in this area, many from the National Center for Home Food Preservation:

- Freezing casseroles http://www.uga.edu/nchfp/tips/winter/Freezing_Prepared_Foods.html
- Foods that do not freeze well http://www.uga.edu/nchfp/how/freeze/dont_freeze_foods.html
- Freezing prepared foods <http://www.uga.edu/nchfp/publications/uga/FreezingPreparedFoods.pdf>
- Freezing home prepared foods <http://learningstore.uwex.edu/Freezing-Home-Prepared-Foods-P256C60.aspx>

These references might be useful for newsletter articles that you may write in the coming year.

Can paraffin be used in candy-making? Paraffin is not approved by the Food and Drug Administration as a food additive. Older recipes for dipped candy may call for the addition of paraffin to the chocolate. The label on the container of paraffin says that it is not for human consumption. Instead of using paraffin, purchase dipping or coating chocolate from candy or cake decorating specialty shops. This type of chocolate has added cocoa butter that gives a firm, glossy finish when set.

Happy New Year!