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This newsletter can be found on the SafeFood web site.

Check it out at:

<http://www.colostate.edu/Orgs/safefood/>

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SAFE FOOD NEWS

Volume X, No. 3

Spring 2006

SUSHI: MINIMIZING THE FOOD SAFETY RISK

Sushi has long been known as a traditional Japanese food, mainly available in specialty markets and not widely consumed in the United States. However, in recent years sushi has become more popular among Americans, with sushi restaurants becoming common and more and more people trying this trendy food for its taste, novelty, and healthfulness.

Sushi is made with vinegared rice, seaweed, vegetables, and often raw fish. Some types of sushi are prepared with cooked seafood, although many popular menu items are served raw. Sashimi is a type of sushi defined as raw fish served alone, without vinegared rice or other ingredients. With raw seafood prepared in any way, however, there are risks of foodborne illness.

Outbreaks of foodborne illness linked to sushi have most often been caused by *Vibrio parahaemolyticus*, *Staphylococcus aureus*, *Salmonella* species

and *Listeria monocytogenes* (1). For example, in February 2006, an outbreak of salmonellosis was linked to a sushi restaurant, Sushi King, in Bentonville, Arkansas (2). The Arkansas Department of Health and Human Services reported that 123 individuals became ill after eating at the restaurant; 30 cases of salmonellosis were confirmed. Following the outbreak, Sushi King was



voluntarily closed to sanitize the restaurant and implement employee classes on safe food handling. As sushi has become more popular, outbreaks such as this serve as a reminder of the food safety risks of consuming raw seafood – especially for those with compromised immunity.

The Boulder County (Colorado) Public Health Department website provides guidelines for consumers who eat sushi at restaurants or prepare it at home (3). According to Section 3-102B of the Colorado Retail Food Establishment Rules and Regulations (4), “raw, raw-marinated, lightly cooked-marinated, marinated, or partially cooked fish other than

molluscan shellfish shall be frozen throughout to a temperature of -4°F (-20°C) or below for 168 hours (7 days) in a freezer, or to a temperature of -31°F (-35°C) or below for 15 hours in a blast freezer” prior to preparation for use. The only exceptions are certain species of tuna: *Thunnus alalunga*, *Thunnus albacares* (Yellowfin), *Thunnus atlanticus*, *Thunnus maccoyii* (Southern Bluefin), *Thunnus obesus*, and *Thunnus thynnus* (Northern Bluefin) (3, 4). These may be served or sold in a raw, raw-marinated or partially cooked ready-to-eat form without prior freezing.

When purchasing raw seafood in grocery stores or ordering from a restaurant menu, the Boulder County Health Department recommends looking for the words “sushi-grade” or “sashimi-grade,” indicating that the seafood has been commercially frozen according to state the regulations. In addition, proper handling and preparation habits are crucial to ensure the safety of sushi made with raw fish. After purchase, raw seafood and fish and sushi rice should be refrigerated below 41°F until served. Preparing rice with vinegar, as is often done for sushi, lowers the pH of the product, which help slow the rate of bacterial growth (3).



Once sushi rolls and sashimi are prepared, they should be immediately refrigerated until serving. Cross-contamination is

also a concern since sushi can be made with both raw and cooked fish. To prevent cross-contamination, raw and cooked fish must be physically separated during preparation, and different utensils, cutting boards, and surfaces should ideally be used.

Finally, individuals with compromised immunity (young children, the elderly, pregnant women, and persons with disease or chronic illness) should entirely avoid consuming sushi made with raw fish or seafood.

By paying attention to these guidelines, sushi lovers can enjoy the new trend as more specialty sushi restaurants pop up around the country. More information on sushi safety is available at the following websites.

- <http://www.cfsan.fda.gov/~comm/ift4-4.html>
- <http://www.co.boulder.co.us/health/enviro/foodsafety/factsheets/safeSushi.htm>
- <http://hgic.clemson.edu/factsheets/HGIC3482.htm>
- <http://hgic.clemson.edu/factsheets/HGIC3660.htm>

Sources:

1. Government of the Hong Kong Special Administrative Region Food and Environmental Hygiene Department (FEHD). Safe Food and Public Health: An Evaluation of Sushi and Sashimi 1997-1999. Available at: http://www.fehd.gov.hk/safefood/report/sashimi/ss_ras2.html. Accessed March 29, 2006.
2. Number of People Sickened in Sushi Food Poisoning Case Rises. Available at: http://fsrio.nal.usda.gov/news_article.php?article_id=3166. Accessed March 29, 2006.
3. Boulder County Public Health Department. Food Safety Fact Sheets: Sushi Safety. Available at: <http://www.co.boulder.co.us/health/enviro/foodsafety/factsheets/safeSushi.htm>. Accessed March 29, 2006.
4. Colorado Retail Food Establishment Rules and Regulations. Section 3-102B. Available at: <http://www.cdphe.state.co.us/op/regs/consumer/101019retailfood.pdf>. Accessed March 29, 2006.

CLEANING UP NOROVIRUS OUTBREAKS

Most people think of bacteria like *Salmonella* and *E. coli* when they think of foodborne illness outbreaks, but a group of viruses, collectively called noroviruses, are thought to account for at least 50% of all cases of foodborne illness. Also known as caliciviruses or Norwalk-like viruses, noroviruses are a group of related, single-stranded RNA, non-envelope viruses that can cause acute gastroenteritis in humans (1).

Noroviruses can be transmitted through contaminated food and water, either person-to-person or through the fecal-oral route, and can also spread through contact with contaminated surfaces. The incubation period is typically about 12 to 48 hours, and the resulting illness is usually characterized by nausea, vomiting, diarrhea, abdominal cramps, headache, dehydration, and fever lasting 24 to 60 hours. Noroviruses are very contagious, a main reason why controlled environments such as cruise ships are ideal for the spread of noroviruses (2, 3).



The U.S. Centers for Disease Control and Prevention recommends using chlorine bleach to clean surfaces in areas affected by norovirus outbreaks, or where there has been contact with infected persons (1). A strong bleach-water concentration consisting of one part bleach to 50 parts water (1 teaspoon bleach to 1 cup water) has been shown to be effective in killing noroviruses.

Currently, there are no disinfectants specifically approved by the Environmental Protection Agency (EPA) that target and destroy noroviruses. There are, however, several different virucides that are being tested for effectiveness. The EPA evaluates the ability of the test agents to inactivate a virus similar to norovirus (4). The test agent is considered an acceptable virucide if there is a 4-log reduction in the infectious virus. The only product currently considered effective as a disinfecting agent is a peroxygen compound called Virkon-S (1). This compound, when used according to the manufacturer's specific instructions, can be used to disinfect contaminated surfaces.

The CDC also suggests that other compounds may have potential for disinfecting areas contaminated with Noroviruses (1). Ammonium compounds are often used to clean surfaces and floors after virus contamination, although their effectiveness has not been proven. Phenolic-based disinfectants have been shown to be effective against noroviruses in laboratories, but extremely high concentrations of these compounds may be required. Heat disinfection, or pasteurization, is an option for surfaces that should not be exposed to chemical disinfectants; temperatures of 140 degrees F or higher have been effective in laboratory conditions.

References:

1. Norovirus in Healthcare Facilities Fact Sheet. Centers for Disease Control and Prevention. Available at: http://www.cdc.gov/ncidod/dhqp/id_norovirusFS.html. Accessed April 7, 2006.
2. CDC Answers Your Questions About Noroviruses and Food Handlers. Centers for Disease Control and Prevention. Available at: <http://www.cdc.gov/ncidod/dvrd/revb/gastro/noro-foodhandlers.pdf>. Accessed April 7, 2006.
3. CDC Technical Fact Sheet About Noroviruses. Centers for Disease Control and Prevention. Available at: <http://www.cdc.gov/ncidod/dvrd/revb/gastro/noro-factsheet.pdf>. Accessed April 7, 2006.
4. Initial Virucidal Effectiveness Test. United States Environmental Protection Agency, Antimicrobials Division. Available at: http://www.epa.gov/oppad001/pdf_files/fcv1_initial_surf_pcol.pdf. Accessed April 7, 2006.



2005 FOOD CODE UPDATE

The FDA Food Code is revised every 4 years to reflect any changes related to food safety pertinent to retail food operations and institutions. Significant changes to the 2005 Food Code are identified below.

Food Allergens. Information has been added regarding major food allergens consistent with the Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA). Major food allergens have been defined as milk, egg, fish, crustacean shellfish, tree nuts, wheat, peanuts and soybeans; or a food ingredient that contains protein derived from one of these foods.

Date marking. Date marking practices have been amended for consistency with recommendations in the *Listeria monocytogenes* Risk Assessment. This is the practice of indicating the date or day by which a ready-to-eat, potentially hazardous food that requires time and temperature control for safety (TCS) should be consumed, sold, or discarded, a practice that helps prevent growth of *Listeria monocytogenes*. The 2005 Food Code now exempts deli salads (e.g., ham, chicken, egg, seafood, pasta, potato and macaroni) prepared and packaged in a food processing plant, because scientific data supports that these items contain sufficient acidity and preservatives to prevent the growth of *Listeria monocytogenes*. Also exempted are cultured dairy products and certain types of hard and semi-soft cheeses, because these products contain organic acids, preservatives, competing microorganisms, or have a pH, water activity or salt concentration that controls the growth of LM.



Potentially hazardous foods. Two pH and water activity interaction tables were added to the definition of potentially hazardous foods and the definition of a potentially hazardous food was modified to be any "food that requires time/temperature control for safety (TCS) to limit pathogenic microorganism growth or toxin formation."

Juice. The definition for juice was amended to say that purees of fruits or vegetables, often prepared in

health care facilities, that are not used as beverages or ingredients in beverages are not required to comply with HACCP requirements.

Employee Health. This section has more targeted criteria for reporting, restriction, exclusion and returning to work. Handwashing procedures have been amended to update the proper sequence for handwashing so that recontamination of the hands after handwashing is avoided, consistent with CSC's Hygienic Practice Guidelines for Health Care Workers.



For a complete Summary of Changes or Questions and Answers info on the 2005 Food Code, go to <http://www.cfsan.fda.gov>.

Sources:

The 2005 FDA Food Code Questions and Answers at <http://www.cfsan.fda.gov/~dms/fc05-qa.html>
Summary of Changes at <http://www.cfsan.fda.gov/~dms/fc05-sum.html>.

NEW ALLERGEN LABELING REQUIREMENTS FROM THE FDA

For people with food allergies, it can be difficult to completely avoid foods containing substances that cause allergic reactions. Food labels can be hard to read or confusing, and often don't clearly list common allergens dangerous to those with food allergies. An estimated 2% of adults and 5% of infants and children in the United States have true food allergies, and 30,000 people are taken to emergency rooms annually as a result of allergic reactions to food – so allergens in food should be taken seriously by both consumers and manufacturers.

As of January 1, 2006, the Food and Drug Administration (FDA) now requires food labels to clearly list any ingredients derived from the eight main food allergens: milk, eggs, fish, Crustacean shellfish, peanuts, tree nuts, wheat, and soybeans. This requirement comes as part of the Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA), an amendment to the Federal Food, Drug, and Cosmetic Act, and states that food manufacturers must use plain language to identify the eight main food allergens on labels (1). Because these allergens

account for over 90% of documented food allergies in the U.S. (1), most consumers with food allergies will benefit from the new labeling requirements.

The new FALCPA guidelines require manufacturers to label allergens in one of two ways (2). The first is to add a “contains” statement next to the ingredient list that identifies the types of allergenic foods contained in the product (e.g., “Contains milk and wheat”). The other option is to place the food source in parentheses next to any ingredient derived from one of the eight potentially offending foods classes, for example, sodium caseinate (milk), albumin (egg). The name of the allergen only needs to appear once in the ingredient statement. For example, if a product contains both milk and a milk-derived ingredient such as whey, the manufacture is not required to define whey as also being a milk product. In the case of nuts and seafood, the new law requires that the specific type of nut (e.g., peanuts, almonds, cashews) or species of fish (e.g., cod, bass) or shellfish (shrimp, lobster) be specified. Also, the presence of such ingredients must be listed even if they are contained only in colorings, flavoring agents or spice blends used in the product.



Despite these helpful label additions, consumers with food allergies should still be aware that products labeled before January 1, 2006, can remain on shelves; FALCPA does not require them to be removed and relabeled according to the new rules. There are also certain exemptions to the new labeling requirements. For instance, highly refined oils derived from food allergens and raw agricultural products such as fruits and vegetables are exempt. Manufacturers may apply for an exemption for any product by petitioning the Secretary of Health and Human Services; this petition process requires scientific evidence showing that the food does not contain any allergenic protein or cause an allergic response.

The law applies to pre-packaged foods sold in retail and food-service establishments, but not to products or meals ordered in restaurants or delis. It's up to the consumer to ask questions about ingredients and preparation methods when eating at restaurants, delis or any place outside the consumer's home.

Finally, the new law does not specifically address gluten, only wheat. Gluten describes a group of proteins found in certain grains (wheat, barley, rye) that is not tolerated by persons with celiac disease. The new law does require the FDA to issue a proposed rule that would allow voluntary use of the term “gluten free” by August 2006 and to have a final rule on “gluten free” in place by August 2008.

The FDA cautions consumers to continue to read labels carefully and ask questions if ingredient information is unclear while products labeled before the new requirements remain on the market. More information on FALCPA and its specific requirements can be found in a detailed report available at <http://www.cfsan.fda.gov/~dms/alrgact.html>.

References

1. U.S. Food and Drug Administration FDA News. Available at: <http://www.fda.gov/>. Accessed April 3, 2006.
2. U.S. FDA/CFSAN Advice to Consumers: Food Allergen Labeling and Consumer Protection Act of 2004 Questions and Answers. Available at: <http://www.cfsan.fda.gov>. Accessed April 3, 2006.

GLUTEN-FREE DIETS

by Diane Braithwaite
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Among those who suffer from allergies or sensitivities to specific foods, one of the more challenging food sensitivities is intolerance to gluten. Gluten is a combination of two proteins, gliadin and glutenin, found in certain grains (including wheat, barley, rye and oats). Gluten’s function is to form a sticky protein that provides the elasticity and structure to baked breads. It is the gliadin portion in gluten that elicits the allergic response, which varies in severity and manifestation of symptoms in those with this condition. The only treatment is complete removal of gluten from the diet, something that can be nearly impossible to achieve.



The gluten response

Although the body’s response to gluten sensitivity is an autoimmune reaction, it is not considered a true allergy, but rather is usually referred to as “gluten intolerant enteropathy” or celiac disease and is characterized by damage to the small intestine. It is thought that the increased permeability of the gut lining allows gliadin

entry into the intestinal lamina, thereby triggering release of antibodies and inflammatory responses. Repeated insult by gluten ingestion further damages the intestine, causing lesions and villi atrophy. This can lead to many problems including malabsorption, and if in a child, failure to thrive. Some of the most common symptoms are indigestion, abdominal bloating, and diarrhea.

Who has it?

Once thought of as uncommon in the U.S., celiac disease is now believed to occur in 1 in every 133 people. Because the symptoms of this disease can be similar to other gastrointestinal diseases, it can be easily misdiagnosed, meaning it may be even more common than the numbers show. Celiac disease is thought to be a genetic disorder which can be diagnosed early in some children; however, others may not experience it until much later in life. Having an environmental trigger is believed to be an important component of the disease. Possible triggers include viral infection, parasites, or recent surgery.

Diet – the only treatment

The sole treatment for gluten intolerance is complete and permanent removal of all gluten from the diet. Although the severity of the intolerance varies, some individuals can’t tolerate even a molecule of gluten. This means avoiding anything made with wheat, rye, barley and oats. The most obvious foods to eliminate are baked goods such as breads, cakes, cookies, muffins, pancakes, and crackers. Less obvious ones are tortillas, pasta, cereals, and snack bars. Diligent label reading is necessary because even small amounts can be found in unsuspected food sources. For example, wheat flour is frequently added as a flow agent to seasonings and spices or as a thickener to soups and condiments. Gluten is also added as stabilizers in hot dogs, cold cuts, sandwich spreads, and canned meats.

Other diet challenges

Even though it is pretty clear which grains need to be avoided by persons with celiac disease, there are still some grains in question. One of these is oatmeal. Current research is inconclusive regarding tolerance to oatmeal. Results range from completely intolerant, ability to tolerate some, to completely tolerant. One concern with oatmeal and other products, is cross contamination. When the oatmeal is processed in the same place as wheat it is possible to become contaminated with gluten. This cross contamination issue can apply to restaurants too. Even though a dish

might be made with gluten free ingredients, it could still be cooked on the same grill as wheat battered fish.

Gluten-free products

Fortunately, gluten-free foods are now available at health food stores and even some major grocery stores. Alternative grains like rice, corn, quinoa, amaranth, or millet are being incorporated into gluten-free pastas, cereals, snacks bars and baking mixes, to mention a few. These products can be expensive so learning to cook gluten-free is also an option. Wheat flour can be substituted with many other flours such as amaranth, rice, sorghum, and soy flours. Baking with other flours takes a little more work than simply switching out wheat for the alternative flour, but there are several cookbooks and websites with gluten-free recipes to help out. One cookbook, *Wheat, Gluten Milk and Egg-Free Recipes*, is available from CSU's Cooperative Extension Resource Center at <http://www.cerc.colostate.edu/cookbooks.html> or by calling (970) 491-6198. Extensive lists of foods to avoid and acceptable alternatives can also be found on celiac association websites and organizations, such as those listed below.

American Celiac Society

P.O. Box 23455
New Orleans, LA 70183
Ph. (504) 737-3293
Fx. (504) 737-4283
Email: amerceliacsoc@netscape.net

Celiac Disease Foundation

13251 Ventura Boulevard, #1
Studio City, CA 91604
Ph. (818) 990-2354
Internet: <http://www.celiac.org>

Celiac Sprue Association

P.O. Box 31700
Omaha, NE 68131-0700
Ph. 1-877-CSA-4CSA
Internet: <http://www.csaceliacs.org>

Gluten Intolerance Group of North America

15110 10th Avenue, SW., Suite A
Seattle, WA 98166
Ph. (206) 246-6652
Internet: <http://www.gluten.net>

Sources:

FDA. Approaches to establishing thresholds for major allergen and for gluten in food. June 2005. Available at: <http://www.cfsan.fda.gov/~dms/alrgn.html>.

Kasarda, D.D. Grains in relation to celiac disease. *Cereal Foods World* 2003;46:209-210. Available at: <http://wheat.pw.usda.gov/ggpages/topics/Celiac.vs.grains.html>.

EMERGENCY PREPAREDNESS AND FOOD SAFETY

Disasters can strike at any time and place, taking many different forms from hurricanes and earthquakes to hazardous spills and terrorist acts. Disasters occur both slowly and suddenly, cause both transient and long-lasting damage, and affect millions of Americans each year. With reports of severe hurricanes, tsunamis, terror threats, flu outbreaks, and other disasters dominating recent news, consumers and experts have become increasingly aware of the need to plan ahead for adequate and safe supplies of food and water in times of a disaster.

For example, during Hurricane Katrina in 2005 many Louisiana residents were stuck without food and clean water for days. After Katrina, the Food and Drug Administration (FDA) released a notice reminding consumers that such a severe hurricane could have lasting and hazardous public health effects impacting food safety. According to this FDA report (1), crop supplies and processed foods in many areas were completely submerged under flood waters and were likely exposed to sewage, chemicals, and contaminants; consumers were warned that perishable and frozen foods were unsafe to eat.

Since March 2003, the Federal Emergency Management Agency (FEMA) has been part of the U.S. Department of Homeland Security (DHS). As such, FEMA is responsible for responding to, planning for, and recovering from disasters such as hurricanes, earthquakes, and floods. FEMA's mission is to help prepare the nation for all hazards, manage federal response and recovery efforts following national incidents, train first responders, and manage the National Flood Insurance Program (2).

The FEMA website includes a special section entitled "Are You Ready? An In-Depth Guide to Citizen Preparedness," which provides steps to help consumers prepare for possible disasters as well as information on what to do during and after such events. FEMA recommends storing a three days' supply of non-perishable foods, including those that don't require refrigeration or cooking. Recommendations for a 3-day emergency food supply of shelf-stable foods and guidance on emergency preparedness can be found on the Colorado State University and University of

Georgia Cooperative Extension webpages (3, 4). These guides suggest choosing compact or lightweight foods, ready-to-eat canned foods, powdered milk, shelf-stable canned juice, sugar, salt and pepper, high energy foods such as peanut butter, granola bars and trail mix, comfort foods, vitamins, and foods for infants or people on special diets. Some of the items recommended are those that many people already have stored at home, but they need to be stored in an accessible place in case of an emergency and need to include a can opener, scissors, or knife.

It's important that food in prepared disaster supply kits be carefully inspected following a disaster. For instance, if commercially canned foods have been submerged in water, the cans need to be carefully inspected; if they have not been damaged, the cans can be sanitized and the food inside safely eaten (4). The University of Georgia guide lists steps for thoroughly cleaning sealed cans after a natural disaster. First, undamaged cans should be washed in a strong detergent solution with a scrub brush; cans should then be soaked for 15 minutes in a solution of bleach and water (3). After the cans are thoroughly dried, the food inside can be safely eaten. In contrast, fresh produce, home canned foods, damaged cans, and any perishable foods that are exposed to flood or hurricane waters should always be destroyed – they cannot be adequately cleaned to make them safe for consumption (1). These are a few key steps to keep in mind while preparing for and reacting to natural and other disasters. Additional information is available at the sites listed below.

<http://www.bt.cdc.gov/disasters>

<http://www.fsis.usda.gov>

http://www.ready.gov/america/natural_disasters.html

References:

1. U.S. Food and Drug Administration, Notice to Food Industry about Safety of Food Affected by Hurricane Katrina, September 2, 2005. Available at: <http://www.fda.gov/oc/katrina/foodindustrykatrina.html>. Accessed April 7, 2006.
2. Federal Emergency Management Agency, U.S. Department of Homeland Security. Available at: <http://www.fema.gov>. Accessed April 3, 2006.
3. Front Range Healthy Lifestyles Issues Team. Three-day Emergency Supply of Shelf Stable Food for One Person. Available at <http://www.ext.colostate.edu/pubs/emergency/3day.html>. Accessed April 25, 2006.
4. Andress, E, Harrison, J. Consumer's Guide: Preparing an Emergency Food Supply. Athens, GA: University of Georgia Cooperative Extension Service, 1999. Available at: <http://www.fcs.uga.edu/pubs/current/FDNS-E-34-2.html>. Accessed April 7, 2006.

IN THE NEWS

CSU-OSU RESEARCHERS TO STUDY LISTERIA IN THE FARM-HOME ENVIRONMENT

Food microbiologists and consumer behavior researchers at Colorado State University and The Ohio State University are on a mission to better understand how a bacterium like *Listeria monocytogenes* gets into your kitchen. Listeriosis is a fairly rare foodborne disease, but one with a high risk of fatality; of the 2,500 Americans who get the disease each year, 500 (20%) die. Those at greatest risk are pregnant women and their fetuses, infants, the elderly and persons with challenged immune systems.

Listeriosis made headlines in 1998 when 40 people in 10 states became ill and four died. The outbreak was traced to contaminated hot dogs that were eaten cold or undercooked. Despite similar periodic outbreaks, the vast majority of listeriosis cases occur sporadically.



This fall, Pat Kendall and John Sofos at CSU along with Lydia Medeiros and Jeff LeJeune at OSU received a \$600,000 grant to better understand how sporadic cases of listeriosis are spread. The study, entitled "Incidence, Significance, and Control of *Listeria monocytogenes* in the Home Environment," is funded through the National Integrated Food Safety Initiative by the Cooperative State Research, Education, and Extension Service.

At each university, researchers are looking for 25 families who live on farms with cows, sheep or other ruminant animals, and 25 other rural families who don't have regular contact with ruminants. Ruminants tend to get *Listeria* in their digestive tract and shed it in their feces, often without any signs of illness.



As noted by LeJeune at OSU, "We are looking at this as an occupational safety and health issue. Are farm families more exposed to *Listeria monocytogenes*? Are

farmers bringing their work home with them -- literally -- on their clothing? If that is occurring, how can we interrupt the pattern?" The researchers need other families -- those who don't live around ruminant animals -- to act as controls. "It could be that this stuff is everywhere," LeJeune said. "If we find it in farm households, we need a comparison of non-farm households to determine if it's farm-related." The study will shed light on how foodborne illnesses can spread.

Participants are being asked to complete a questionnaire and participate in an interview about their food preparation and other household practices. Then, the researchers go through the house with a family member to collect samples and schedule three more visits on a monthly basis. Any *Listeria* bacteria found will be DNA-typed to determine if bacteria found in different places came from the same source. The findings will help the researchers guide both consumers and farm families on what they can do to prevent listeriosis in their homes.

To learn more about the study or for additional details about participating, contact Ruth Inglis-Widrick at (970) 491-3747 or inglis@cahs.colostate.edu.



THE FUTURE OF FOOD SAFETY: NANO-PARTICLES

by Diane Braithwaite
CSU FSHN Master's Candidate and Intern

Nanotechnology has had a place in electronics for some time and is now finding a new home in the food industry. These tiny particles are being researched for a variety of applications from sensing biological agents to enhancing flavor.

What is nanotechnology?

Nanotechnology refers to technology on a nanometer scale, specifically less than 100 nanometers. The original nano-particles used in this technology are tiny spheres (fullerenes) or tubes (nanotubes) made from carbon atoms. New nano-particles are being made of silicon, ceramic, polymers or even natural ingredients

that break down in the body. Some of the characteristics that make these particles useful in the food industry include optical properties, reactivity to temperature, and biodegradability. They can be used as probes or filled with flavorings or nutrients for delivery.

Nano-particles in food safety:

One application for nano-particles being researched is detection of bacterial contamination. Qingrong Huang of Rutgers University is working on a portable device using the fluorescent property of nano-particles. Nano-particles made from silicon-containing materials will be used to create a chip for the device. When DNA probes embedded in the nano-particle chip make contact with the DNA of a pathogen, it will cause the material to fluoresce. Huang's focus for this device is to detect *E. coli* and *Listeria*.

Incorporating nanotechnology into food packaging is another potential way to monitor for spoilage. Researchers are developing the "electronic tongue," a type of packaging embedded with nano-sensors for detecting pathogens. The packaging is being designed to fluoresce or change color when the nano-sensors detect pathogens or chemicals released as the foods spoil. Another twist on nano-sensors within packaging is the development of "release on command" preservatives, which release as the food begins to spoil.

Controversial use of nano-particles:

A more controversial use of nano-particles is as flavor enhancers or nutrient delivery mechanisms. Nano-particles can be designed to encapsulate substances which degrade in acidic conditions or in response to the small intestine, allowing for more effective delivery of nutrients or medicines. This can also prolong the shelf life of products like omega-3 oils. One beverage company is working to encapsulate flavor compounds to extend shelf time. More research is needed to learn what effects nano-particles might have on the body or environment.

Sources:

Goho, A. Hungry for Nano: The fruits of nanotechnology could transform the food industry. *Science News*, 2004; 166: 200-201.
Wolfe, J. Safer and guilt-free nano foods. <http://www.forbes.com>. Accessed 02/10/2006.

RESOURCES



The University of Georgia National Center for Home Food Preservation is offering a free, self-paced, online course for those wanting to learn more about home canning and preservation. The modules include:

- Introduction to Food Preservation
- General Canning
- Canning Acid Foods
- Canning Low-Acid Foods

This course is offered through the University of Georgia WebCT system. To obtain a registration login, go to <http://www.uga.edu/nchfp/>.

So Easy to Preserve. The much anticipated 4th edition book is expected to be out in July 2006. Stay tuned!

So Easy to Preserve-DVD. The University of Georgia Cooperative Extension is now pleased to offer a new *So Easy to Preserve* video series. Eight shows (20 to 35 minutes each) contain the most up-to-date recommendations for preserving fresh foods and great taste in your home. Features include home canning of tomatoes, vegetables and fruits; freezing fruits and vegetables; drying fruits and vegetables; pickling; making jams and jellies; and, a show devoted to the canned specialties of hot chile salsa, mango chutney and spicy jicama relish. The cost of the DVD is \$39.95 and can be ordered at: <http://www.uga.edu/nchfp/>.

2005 FOOD CODE CHANGES REFLECTED IN 4TH EDITION SERVSAFE®

The National Restaurant Association Educational Foundation has released the 4th edition of ServSafe® training materials, featuring changes based on the 2005 FDA Food Code updates.

New to the Instructor Toolkit is added fact sheets, practice quizzes, downloadable posters and in-class activities to supplement the updated PowerPoint presentation, instructor guide and showdown review game. Since the manager's certification exam won't reflect these changes until July 2006, instructors have

the option to continue using the 3rd edition materials until that time. An updated video series can be expected in late 2006, or early 2007. More information can be obtained through the website at <http://www.nraef.org>.

CHILDREN'S BOOK: A VISIT TO THE FARMERS' MARKET

This easy-to-read, picture book promotes the benefits of shopping at a Farmers' Market, while introducing key concepts of nutrition such as importance of variety, color, and freshness of foods. It can be an excellent resource for educators or others who work with WIC, Farmers' Market programs, 5 A Day for Better Health, obesity prevention, family literacy, nutrition and food stamp outreach programs, to mention a few. With so much to see and taste, *A Visit to the Farmers' Market* is healthy and fun for all ages! The book is 22 pages and costs \$4.29, with quantity discounts available. To order: go to <http://www.brainchildbooks.homestead.com/NEW.html>

COMING EVENTS

UPCOMING CONFERENCES

Rocky Mountain Food Safety Conference

The 34th annual Rocky Mountain Food Safety Conference will be held May 23 – 24, 2006, at the Arvada Center for the Performing Arts. This year's topics include:

- Food Safety During a Crisis: Lessons from Hurricane Katrina
- Handwashing: Motivation, Measurement and Management
- The Industry's Best Practices for Driving Compliance
- Chefs Speak out on Food Safety
- Sick or Not Sick: Darden Employee Illness Policy
- New School Lunch Act
- Reaching the Consumer: National Coalition for Food-Safe Schools
- Successes and Pitfalls of Seafood HACCP
- Using Health Department Data in Foodborne Illness Litigation
- Ethnic Foods: Meeting the Challenge

The annual scholarship fund-raising Golf Tournament is scheduled for May 22. For more information on the golf tournament, contact Devin Koontz at (303) 236-3020. To download a conference brochure, go to the CSU SafeFood website at <http://www.colostate.edu/orgs/safefood> under upcoming conferences.

LFS Annual Conference 2006

The Lillian Fountain Smith Conference for Nutrition Educators will be held June 15 – 16, 2006, at the Marriott Hotel in Fort Collins. For more information, go to <http://www.cahs.colostate.edu>.

Food Safety Education Conference

Mark your calendar now for the upcoming food safety education conference, **“Reaching At-Risk Audiences and Today’s Other Food Safety Challenges”** to be held **September 27 - 29, 2006**, at the Adams Mark Hotel in Denver. The conference is sponsored by FDA, FSIS, CDC, CSREES, NSF International and NSF/WHO Collaborating Center for Food Safety. Pre-conference workshops will be held September 25 - 26. For more information go to <http://www.fsis.usda.gov/Denver2006/>.

SERVSAFE® TRAININGS

Denver Metro Region

Manager level ServSafe® trainings are offered monthly in the Denver metro area through the Colorado Restaurant Association. Cost: members - \$130; non-members - \$170. Please call 303-830-2972 for a complete schedule of dates and locations.

Western Region

<u>Date</u>	<u>Location</u>	<u>Intended Audience</u>	<u>Fee</u>
05/8/06 8 – 5:30p	Eagle County	Train-the-Trainer Certification Course	\$100
<i>Contact: Glenda Wentworth (970) 328-8630</i>			
05/24/06 230-430p	Frisco, CO County Commons	Food Handler Training for Youth	FREE - Call to register
<i>Contact: Laura Au-Yeung (970) 668-4140</i>			

Northern Region

<u>Date</u>	<u>Location</u>	<u>Intended Audience</u>	<u>Fee</u>
06/13/06 1:30 – 6p	Sterling, CO	Food Handler Training	(if >2wks) \$25 (if <2 wks) \$40
09/27/06 8 – 5:30p	Sterling, CO	Mgrs Certification Training	(by Aug 27) \$85 (if <30 days) \$100
<i>Contact: Joy Akey (970) 332-4151</i>			
5/15-19/06	Ft. Collins, CO CSU Campus - 203 Gifford Bldg.	Mgrs Certification	\$267.85
Listed as FN496E in CSU Summer Schedule Catalog -- 1 credit			
<i>Contact: Mary Schroeder (970) 491-7335</i>			

ADDITIONAL FOOD HANDLER TRAININGS

Larimer County Food SafetyWorks Program – Food Handler Training Fee: \$25

<u>Date</u>	<u>Location</u>	<u>Time</u>
05/08/06	Ft. Collins, CO (English)	2 – 5p
06/12/06	Ft. Collins, CO (English)	9 – 12noon
06/12/06	Estes Park, CO (Spanish)	2 – 5 p
07/10/06	Ft. Collins, CO (English)	2 – 5p
10/09/06	Ft. Collins, CO (Spanish)	2 – 5p

Contact: Edie McSherry (970) 498-6015

Weld Star Program - Food Handler Training

<u>Date</u>	<u>Location</u>	<u>Fee</u>
05/16/06	Ft. Lupton, CO (English)	\$5
06/06/06	Ft. Lupton, CO (Spanish)	\$5
08/22/06	Greeley, CO (English)	\$5
08/29/06	Greeley, CO (Spanish)	\$5

Registration required and fee due one week prior to class date.

*Contact: Staci Datterri-Frey at Weld County Health Department:
970-304-6415, ext. 2209*

Boulder County S.T.A.R. Program

Time: 2 – 4:15pm Fee: \$15

Contact: Elizabeth Valitchka at (303) 441-1567

English:	Mon	07/18/06
	Tues	08/23/06
Spanish:	Mon	07/25/06
	Thur	08/25/06
Chinese	Thur	07/14/06
	Thur	09/22/06

*This newsletter was prepared by Food Science &
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We also extend a special thanks to Diane Braithwaite, CSU Food Science and Human Nutrition Master’s candidate and intern, for contributing 2 articles to this issue of *SafeFood News*.

Direct comments about the newsletter to Mary Schroeder at:

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