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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 VIII, No. 4

Summer 2004

NEW HOME DRYING RECOMMENDATIONS

The practice of home food drying is gaining in popularity as an alternative to home canning of surplus fruits and vegetables. Home dried foods are very convenient to take along when camping and hiking, or just when eating on the run. Until recently not much thought was given to the safety of home drying methods. It was assumed that their low moisture content would prohibit microbial growth. However, recent research findings have shown that microorganisms, such as *Salmonella* and *E. coli* O157:H7, are hearty enough to survive basic drying methods, and that new procedures are needed to ensure the safety of home dried foods.



Vegetable Drying Studies

Two studies conducted at Colorado State University evaluated the influence of pre-drying treatments and aerobic storage on inactivation of a five-strain mixture of *Salmonella* (7.8 log CFU/g) during dehydration of carrot slices. Treatments evaluated in the first study included three pre-treatments (3 min steam blanching, 3 min water blanching, and immersion in a salt solution (3.23% NaCl), one post drying treatment (dehydrating, then oven heating for 15 minutes at 175°F) and an untreated control. All carrot slices were dehydrated at 140°F (60°C) for 6 hours.

None of the treatments in the first study effectively reduced bacterial populations. Therefore, a second study was performed to evaluate longer blanching times and new pre-drying treatments. Treatments evaluated in the second study included the following: 1) untreated control, 2) 10 min steam blanching, 3) 4 min water blanching, 4) 4 min blanching in 0.105% citric acid (1/4 teaspoon citric acid per 1 quart water), and 5) 4 min blanching in 0.210% citric acid (1/2 teaspoon citric acid per 1 quart water). Blanching carrot slices for 4 min in water or either of the citric acid solutions effectively reduced *Salmonella* populations. Interestingly, control and steam blanched samples had bacterial populations >1.9 log CFU/g after 6 hours of drying and 30 days storage, thereby illustrating the resiliency of some microorganisms and their potential food safety risk.



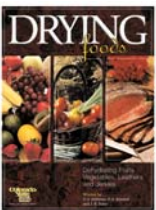
Fruit Drying Studies

Various pre-drying treatments for fruits have been explored as well. Two studies evaluated whether pre-treating either inoculated apple or peach slices with sodium metabisulfite or acidic solutions enhanced inactivation of *Salmonella* during dehydration and storage. After 6 hours of dehydration at 140°F (60°C), microbial counts on sodium metabisulfite, ascorbic acid and citric acid treated slices displayed much greater reductions (3.8 to 5.6 log CFU/g on apples and 4.3-6.2 log CFU/g on peaches) than sterile water (3.2-3.4 log CFU/g) respectively. Bacteria were still detectable on the stored slices by direct plating after 28 days, except on ascorbic acid treated slices.

★ New Drying Recommendations ★

Based on the above research findings, the take-home message for consumers is that pre-treating fruits and vegetables with an acidic solution prior to drying enhances the destruction of potentially harmful microorganism during home drying. For vegetables, water blanching is recommended, and in particular, blanching with a solution that contains 1/2 teaspoon of citric acid per quart of water before dehydration is encouraged. For drying fruit or making fruit leather, immersion in acidic solutions prior to dehydration is recommended to promote safety of the dried product.

The CSU Extension Fact Sheet *Drying Vegetables* (#9.308) has just been revised 7/04 with the new guidelines. This along with the revised fact sheets on *Drying Fruits* (#9.309) and *Leather and Jerkies* (#9.311) are currently available on CSU's Cooperative Extension website at <http://www.cerc.colostate.edu>.



The 15-page comprehensive booklet *Drying Foods* on dehydrating fruits, vegetables, leathers and jerkies will be available for purchase this autumn from the Cooperative Extension Resource Center. Please call 970-491-6198 for more information, or visit the publications section of the Extension website stated above.

Sources:

DiPersio, P.A., P.A. Kendall, M. Calicioglu and J.N. Sofos. (2003). Inactivation of *Salmonella* during drying and storage of apple slices treated with acidic or sodium metabisulfite solutions. *Journal of Food Protection*. 66:2245-2251.

DiPersio, P.A., P.A. Kendall and J.N. Sofos. (2004). Inactivation of *Listeria monocytogenes* during drying and storage of peach slices treated with acidic or sodium metabisulfite solutions. *Food Microbiology* (in press).

DiPersio, P.A., P.A. Kendall, Y. Yoon and J.N. Sofos. (2004). Inactivation of *Salmonella* during drying of Nantes carrot slices treated with blanching or immersion in 3.23% NaCl before drying, or oven heating after drying. IFT Annual Meeting Poster.

DiPersio, P.A., et.al. (2004). *Inactivation of Salmonella During Drying and Storage of Nantes Carrot Slices Treated With Steam, Water or Acid Blanching Before Dehydration*. Poster session: International Association of Food Protection.

RESTAURANT INSPECTION SCORES AND FOODBORNE DISEASES

Restaurant patrons have been known to choose where and where not to eat based on restaurant inspection scores published in their local newspapers. Are these scores good indicators of the actual safety of the food being served in a restaurant? Interestingly, few studies have looked at the correlation between inspection scores or violations and incidence of foodborne illness.



Research Study

Researchers in Tennessee took on the task of determining what impact (if any) restaurant inspections have had on improving food safety. They examined over 167,000 statewide inspection records involving ~29,000 unique restaurants and 248 inspectors over a seven year period. Restaurants were selected based on known types of table service and cuisine and included both fast food and full service establishments.

Inspections were performed using standardized forms including 44 scored items with a possible total score of 100. Of those 44 items, 13 were designated as “critical.” Critical items are defined as violations “which are more likely to contribute to food contamination, illness, or environmental

degradation and represent substantial public health hazards and [are] most closely associated with potential foodborne disease transmission.”

Inspection Results

From 1993 - 2000, the mean inspection score rose steadily from 80.2 to 83.8, and the mean number of violations cited per inspection fell from 11.1 to 9.9. Establishments scoring <60 had a mean improvement of 16 points on subsequent inspections with an additional mean increase of 5 on the next inspection. Establishments scoring >60 tended to have fairly stable scores on subsequent inspections, with a mean drop of 2 points on the subsequent inspection. None of the 12 most commonly cited violations were among those designated as “critical” food safety hazards. The critical violation most commonly cited was the improper storage or use of toxic items (i.e., storing cleaning fluids on a shelf next to food.)

Connection to Foodborne Disease

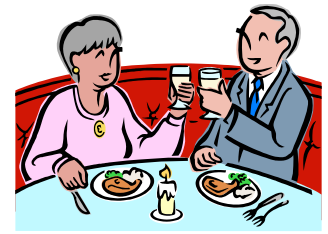
Restaurant inspection data were available from 49 restaurants that were identified as the source of foodborne disease outbreaks from 1999 to 2002 in Tennessee. These restaurants had a mean inspection score of 81.2 before the reported outbreak and a mean score of 81.6 after the outbreak. These mean scores did not differ from the mean score reported for all restaurants during the same period.

Based on the limited data available in this study, the researchers concluded that restaurant inspection scores alone do not predict the likelihood of a foodborne outbreak occurring in a particular establishment. Further, overall scores are not a good measure of the criticalness of the violations. For example, a substantial number of inspections with a final score >90 also had critical violations. Likewise, some restaurants with scores <80 had no critical violations. Thus, overall score alone is not necessarily a sufficient measure of restaurant safety.

Conclusion

Before consumers become discouraged by these results, remember there is more to a restaurant inspection than just the score. Simply the anticipation of routine inspections probably improves compliance with regulations, as many businesses are motivated to avoid bad publicity and

negative economic repercussions. Additionally, inspections help to ensure the immediate physical safety of patrons and workers in the environment. The federal government has recently joined efforts with several states to launch an Environmental Health Specialist Network project to explore how this long standing and important public health system can be further improved. This along with further studies will help determine the most efficient and effective methods for assessing factors associated with food safety.



Source: Jones, T.F., et. al. *Restaurant Inspection Scores and Foodborne Disease*. *Emerging Infectious Diseases* online. <http://www.cdc.gov/ncidod/EID/vol10no4/03-0343.htm>. Vol. 10, No. 4, April 2004.

UPDATE ON PRODUCE SAFETY

Knowing what to eat these days can be confusing. Health experts expound on the benefits of eating fresh fruits and vegetables, yet along with these benefits come a degree of risk. According to the Centers for Disease Control and Prevention (CDC), in the U.S. the number of reported produce-related outbreaks per year doubled between the period 1973 - 1987 and 1988 - 1992. The CDC estimates that, in the 1990s, at least 12 percent of foodborne outbreak-associated illnesses were linked to fresh produce items.



Why is Produce becoming a “Risky” Food?

Several reasons play a role in the increasing incidence of produce-related foodborne outbreaks. For starters, American consumers are eating about 20 pounds more fresh produce annually than we did two decades ago. Importation of fresh produce has allowed us to enjoy a wider selection of fruits and vegetables year round. However, outbreaks of foodborne disease have been traced to areas having substandard sanitation conditions and practices in developing countries where the produce is grown.

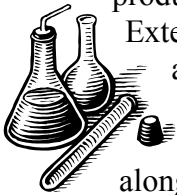
Additionally, the emergence of pathogens not previously associated with raw produce has enhanced the potential for foodborne illness outbreaks associated with raw fruits and vegetables. Among the greatest concerns with human pathogens on fresh fruits and vegetables are enteric pathogens (e.g., *Escherichia coli* O157:H7 and *Salmonella*) that have the potential for rapid growth prior to consumption or have a low infectious dose.

Plant Pathology and Foodborne Disease

Complex plant ecosystems on the surface of raw fruits and vegetables can affect a plant's ability to support the growth of pathogenic bacteria. For example, bacteria grow well on the surface of vegetables, melons and some soft overripe fruits having a pH of 4.6 or higher; in comparison, firm tomatoes are generally acidic enough to retard growth of enteric pathogens such as *Shigella* or *E. coli* O157:H7. Differences among types of plants provide microorganisms the opportunity to infiltrate cracks, crevices, and intercellular spaces as well as the seeds themselves. Pathogenic bacteria can survive for prolonged periods in or on stored dried seed, making it difficult to find the optimum mode of treatment without compromising seed quality. Additionally, the formation of biofilms on plant surfaces can encapsulate and protect pathogenic organisms, thereby reducing the effectiveness of sanitizers and other inhibitory agents.

Actions Taken

Produce is vulnerable to numerous sources of potential microbial contamination both pre- and post-harvesting, including any point during production, packing and preparation.



Extensive research is underway in the areas of seed treatment, seed testing and antimicrobial treatments for fresh produce. While these methods along with training on and enforcement of good agricultural practices certainly help minimize risk, no one treatment intervention can control or completely eliminate pathogenic microorganisms on fresh produce.

To help address this complex issue, the U.S. Food and Drug Administration (FDA) has had an advisory committee in place since 1995 to

investigate the association between cases of foodborne illness and fresh produce and to provide recommendations to reduce the risk of foodborne outbreaks. As a further step, FDA this summer proposed a four-part action plan designed to minimize foodborne illness associated with the consumption of fresh produce. The plan is designed to extend to all parts of the food chain, from farm through retail to consumer preparation and consumption and has four objectives:

1. Prevent contamination of fresh produce with pathogens.
2. Minimize the public health impact when contamination of fresh produce occurs.
3. Improve communication with producers, preparers and consumers about fresh produce.
4. Facilitate and support research relevant to fresh produce.

The plan's success will require collaborative efforts among both U.S. and foreign governments, state and local agencies, the private sector and consumers.

Conclusion

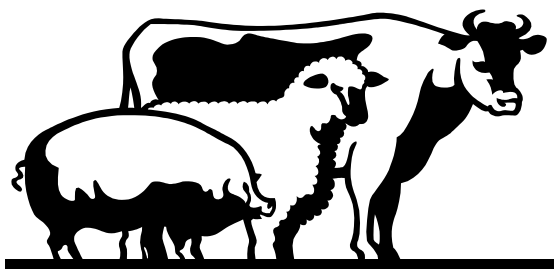
It is likely that a multi-faceted approach that includes sound regulatory policies with adequate enforcement, good agricultural and manufacturing practices, proper harvesting and storage, seed testing and antimicrobial treatments will be most effective in reducing the incidence of foodborne illnesses associated with fresh produce. The take-home message to consumers still remains that no matter what precautionary measures have been taken prior to fresh produce reaching their hands, it is imperative to rinse all fruits and vegetables well prior to preparing or eating.

Sources:

- 1) Buck, J.W., et al. 2003. *Recent trends in microbiological safety of fruits and vegetables*. Online. Plant Health Progress doi. 10.1094/PHP-2003-0121-01-RV.
- 2) USDA Center for Food Safety and Applied Nutrition. *Produce Safety From Production to Consumption: A Proposed Action Plan to Minimize Foodborne Illness Associated with Fresh Produce Consumption*. June 18, 2004. available at: <http://www.cfsan.fda.gov/~dms/prodplan.html>

FARM ANIMAL CONTACT

Whether your family is heading for the county fair or a visit to the zoo this summer, keep in mind that thorough handwashing is in order when visiting the animal petting areas. Farm animals such as cows, sheep, pigs and goats can pass diseases to people, primarily through their feces or anything that it touches.



Pathogens of Concern

Different types of animals can carry different diseases, which can be quite serious depending on a person's age and health status. The pathogen, *E. coli* O157, is prevalent in the manure of young calves and other cattle and can cause very serious illness, especially in young children. Animals do not have to be ill to transmit *E. coli* O157 and other pathogens to humans. Pigs can carry the bacterium *Yersinia enterocolitica* which causes the disease yersiniosis. In addition to farm animals, the illness salmonellosis can easily be passed to people by reptiles (lizards, snakes and turtles), baby chicks, ducklings, and even by dogs, cats, pet birds, and horses.



Special Advice

Those advised to take special precaution around contact with farm animals include infants, children younger than 5 years old, pregnant women and those with weakened immune systems due to illness or chronic disease. Special care should be taken even with school-age children. Everyone should assume that animals are contaminated and take precautions accordingly.

It is important that visitors refrain from any hand-mouth activities, such as eating, drinking, smoking, and carrying toys or pacifiers in the animal interaction areas. Ideally, trained staff and posted signs will remind visitors to wash their hands immediately on leaving the interaction area. Handwashing stations with running water, soap and disposable towels should be available, but if not, using a hand sanitizer is better than nothing. All food and beverages must be prepared, served, and consumed only in animal-free areas, and only after adequate handwashing has occurred. Raw milk should never be offered.

Further Information

The website

http://www.cdc.gov/healthypets/animals/farm_animals.htm provides links to simple safety tips for protecting people who may be at increased risk for infectious diseases. Some individuals such as pregnant women, or those with HIV/AIDS, organ transplants or cancer may choose to avoid contact with farm animals altogether. The majority of people can continue to enjoy the enriching experience of interacting with farm animals with this added perspective.

Sources

- 1) Center for Disease Control. National Center for Infectious Diseases. Healthy Pets Healthy People. *Diseases from Farm Animals*.
http://www.cdc.gov/healthypets/animals/farm_animals.htm
- 2) Center for Disease Control. Foodborne Outbreak Response and Surveillance Unit. *Recommendations: Farm Animal Contact*.
http://www.cdc.gov/foodborneoutbreaks/pulication/recom_m_farm_animal.htm



IN THE NEWS

FDA AND USDA ANNOUNCE NEW ACTIONS TO PREVENT BSE

On July 9, 2004, HHS Secretary Tommy G. Thompson and Agriculture Secretary Ann M. Veneman announced three actions being taken to further strengthen existing safeguards that protect consumers against the agent that causes bovine spongiform encephalopathy (BSE), also known as "mad cow disease." The three actions are:

1. An interim final FDA rule that prohibits the use of certain cattle-derived materials (which may contain BSE agents) in food, dietary supplements, and cosmetics. The rule is immediately effective, but FDA will accept comments for 90 days. The BSE interim final rule is online at: <http://www.cfsan.fda.gov/~lrd/fr04714a.html>.
2. A proposed FDA rule on recordkeeping requirements for the interim final rule, requiring manufacturers and processors of human food, dietary supplements, and cosmetics that are manufactured from, processed with, or otherwise contain material from cattle to establish and maintain records. FDA will accept comments on this proposed rule for 30 days. The BSE Recordkeeping Proposed Rule is online at: <http://www.cfsan.fda.gov/~lrd/fr04714b.html>
3. A joint USDA-FSIS, USDA-APHIS and FDA Center for Veterinary Medicine (CVM) notice asking for public comments and scientific information on additional measures to help prevent the spread of BSE.

The complete press release announcing these measures is on FDA's Web site at <http://www.cfsan.fda.gov/~lrd/hhsbse4.html>.

Source:

USDA Food Safety Inspection Service News Release. *USDA and HHS Strengthen Safeguards Against Bovine Spongiform Encephalopathy*. July 9, 2004. <http://www.fda.gov/bbs/topics/news/2004/NEW01084.html>



FROM THE ROCKY MOUNTAIN FOOD SAFETY CONFERENCE

The new visitor center at Red Rocks amphitheatre in Morrison, Colorado, provided a beautiful setting for this year's annual event held in May. Attendees received updates on many interesting and pertinent topics during the two day event.

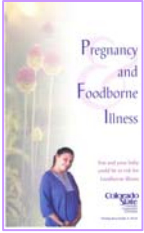
Presentations included a panel discussion on food safety during a black-out, a successful food safety training program for Spanish-speaking audiences, Campylobacter research, and Bovine Spongiform Encephalopathy (BSE) to mention a few. Attendees were informed that the Division of Human Resource Development at FDA now offers free on-line continuing education programs to state and local environmental health regulators. More information regarding its certification programs and courses is available at <http://www.EduNeering.com>.

Anyone not familiar with the National Sanitation Foundation International (NSF) was surprised to learn the valuable services offered by this not-for-profit, non-governmental organization. The NSF is known best for their product certification programs, and helps protect consumers through testing and certification of food, water, indoor air, and environmental products worldwide. Its consumer website offers educational resources such as food safety tips at <http://www.nsf.org>.

Many of us landlubbers were pleased to learn the rules and regulations governing interstate commerce for shellfish, as well as how to safely receive, store and display shellfish in retail establishments. The New Mexico Department of Environmental Health has compiled an educational packet complete with CD-ROM, which can be obtained free of charge by contacting Johnathan Gerhardt at johnathan_gerhardt@nmenv.state.nm.us.

RESOURCES

NEW PUBLICATION AVAILABLE!



Pregnancy and Foodborne Illness is a new booklet just released through CSU Cooperative Extension. It describes which pathogens are of greatest concern during pregnancy and how to prevent or reduce the risks of foodborne illness for pregnant mothers. This booklet can be

ordered through CSU's Cooperative Extension Resource Center for \$2.75 (+ S/H) each. Contact the Resource Center for ordering:

Phone: 970.491.6198

Email: cerc1@ur.colostate.edu

Website: <http://www.cerc.colostate.edu>



National Food Safety Education Month*
National Restaurant Association Educational Foundation

Remember that September is National Food Safety Education Month. The theme this year is **“Be aware when you prepare.”** Activity sheets and posters can be downloaded from the National Restaurant Association Educational Foundation website at <http://www.nraef.org/nfsem/>. It is not too soon to start planning consumer or worksite activities that emphasize basic safe food handling principles for thawing, cooking, cooling and storing food safely.

“KEEP YOUR BABY SAFE” HANDOUT

Copies of this colorful, 4-page handout can be made for distribution to women of childbearing years regarding the importance of food safety during pregnancy. This will be available on the Safe Food website by the end of August 2004. Go to <http://www.colostate.edu/orgs/safefood>.

COMING EVENTS

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. Call 303-830-2972 for a complete schedule of dates and locations.

Northern Region Cooperative Extension

Contact Joy Akey (970) 332-4151

<u>Date</u>	<u>Location</u>	<u>Intended Audience</u>	<u>Fee</u>
Tu 10/19/04 8 – 5:30 pm	Brush, CO	Mgrs Certification Trng	\$85 Deadline: 10/6
M 11/15/04 1:30 – 6 pm	Sterling, CO	Food Handlers Training	\$25 Deadline: 11/5

Western Region Cooperative Extension

Contact Glenda Wentworth (970) 328-8630

<u>Date</u>	<u>Location</u>	<u>Intended Audience</u>	<u>Fee</u>
W 10/13/04 8 - 5 pm	Eagle, CO	Mgrs Certification Trng	\$85 Deadline: 10/6

Southern Region Cooperative Extension

Contact Lois Illick (719) 583-6566

<u>Date</u>	<u>Location</u>	<u>Intended Audience</u>	<u>Fee</u>
W 9/8/04 8 – 5 pm	Pueblo, CO Ext. Ofc. Conf. Rm.	Mgrs Certification Trng	\$110 after 8/15, \$125

Free Continuing Ed Credit

Researchers at Colorado State University are looking for interested persons (dietitians, nurses, Extension staff, social workers and others) to participate in a pilot test of an on-line continuing education course, **“Food Safety Issues for High Risk Groups.”** This course is being piloted in Fall 2004 and requires completion of six different one-hour modules, with a brief pre-questionnaire before and post-evaluation component after each module. This is a great opportunity to receive **FREE** continuing education credit and also to gain valuable information about this important topic. Please contact:

Mary Schroeder, Project Coordinator
(970) 491-7335

mary.schroeder@colostate.edu

or

Pat Kendall, Project Director
(970) 491-1945

patricia.kendall@colostate.edu



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