



Food Safety

NEWS

Food Safety **CURRENT NEWS**

Sprouts can cause foodborne ailments

At K-State

Food Safety Scholarships

The following food safety-related scholarships are available at Kansas State University:

- The Alex Donelly Scholarship
- Kansas City IFT Scholarships
- KSU Food Science Club
- Fung Undergraduate and Graduate Award

Contact Dr. Ike Jeon for details: (785) 532-1211.

Fung Presents 'Rapid Methods' Lectures

Dr. Daniel Y.C. Fung is currently president of the National Phi Tau Sigma food science society. If you are interested in having him present a lecture on "Rapid Methods in Microbiological Safety," contact Dr. Fung at: (785) 532-5654.

On the World Wide Web

Food Safety of Jerky
(publication of FSIS)

<http://www.fsis.usda.gov/OA/pubs/jerky.htm>

K-State Research and Extension
Food Safety Website:

www.oznet.ksu.edu/foodsafety

Sprouting of seeds for human consumption has been practiced for centuries. Consumption of raw sprouts has increased in popularity along with the consumer shift toward healthier foods. Increased consumption, however, might expose some individuals to foodborne disease associated with raw sprouts.

Seed sprouting provides a suitable medium to promote bacterial growth. Alfalfa and mung bean seeds contain high numbers of microbial flora, which in turn can contain high levels of coliforms and fecal coliforms. Enzymatic, nutritional, and environmental factors encourage rapid growth of bacteria on sprouts. The high levels of trypsin inhibitors in mung beans, alfalfa seeds and soybeans is reduced during germination, and the nutritional content of the seed is increased. This provides the microflora an envi-

ronment suitable for rapid reproduction.

The presence of pathogenic bacterial species has not been found on seeds or sprouts in most microbial analyses, but a recent study in Thailand reported that 8.7% of 30 bean sprout samples examined contained *Salmonella* of various serotypes. Another study suggests that low levels of *Salmonella* species seeded into mung bean and alfalfa seeds can increase by as much as 4 to 5 logs in the germinated sprouts. With the presence of only a few pathogenic microorganisms, a microbiological disaster could evolve.

Sprouts have a long history of association with foodborne outbreaks. In 1988, bean sprouts were the source of an outbreak of *Salmonella saintpaul* in the Oxford region of the United Kingdom, where 143 cases were reported. In 1994, alfalfa sprouts were the source of a *Salmonella* outbreak in Sweden

and Finland. Another large international outbreak that involved the United States and Finland in 1995 was caused by alfalfa sprouts contaminated with *Salmonella stanley*. Evidence suggested that contamination was not due to unsanitary production, but because the seeds used to produce the sprouts were contaminated. This outbreak resulted in 242 cases, but based on the underreporting rates for *Salmonella* outbreaks, the case count could have been between 5,000 and 24,000. Finally, another outbreak of *E.coli* O157:H7 was associated with alfalfa sprouts in Virginia and Michigan.

Producers have acted to reduce the potential for foodborne illness from raw sprout consumption. The sprout industry has explored different compounds to reduce microflora on sprout seeds before planting. Previous treatment of alfalfa seeds with a 0.5% sodium
(continued on page 3)

FAQ's

Is it safe to drink raw milk?

Raw milk consumption is not advised. Raw milk is a great environment for pathogens, such as *Salmonella*, *Listeria*, *E. coli* O157:H7 and *Campylobacter* to grow. These pathogens can be particularly harmful to elderly, young children and individuals who are immunocompromised.

If raw milk is served at home, the milk should be pasteurized. Home pasteurization units can be purchased at large retail stores and some farm/home stores. To pasteurize raw milk, it must be heated to a minimum of 145°F and held at that temperature for a minimum of 30 minutes. Then, the milk should be quickly cooled and should remain cool.

Currently, the U.S. milk industry uses high temperature short time pasteurization (HTST) to destroy pathogens in raw milk, but in most European countries, ultra high temperature pasteurization (UHT) is used. In the case of UHT, the milk is commercially sterile (free from all microbes), is packaged under sterile conditions, and as such can be stored at room temperature for several months.

Food Safety RESEARCH

Summary: Foodborne illnesses 1996-97

FoodNet is the principal foodborne disease component of the Centers for Disease Control and Prevention's Emerging Infections Program. It is a collaborative project of the CDC, the U.S. Department of Agriculture, the Food and Drug Administration, and seven EIP sites. Total population of these sites is 20.3 million, or 7.7% of the population.

FoodNet's objectives are to determine frequency and severity of foodborne diseases; determine the proportion of common foodborne diseases that results from eating specific foods; and describe the epidemiology of new and emerging bacterial, parasitic and viral foodborne pathogens. FoodNet also documents the effectiveness of new food safety initiatives, such as the

USDA Pathogen Reduction and Hazard Analysis and Critical Control Points Rule.

Active bacterial surveillance for laboratory-confirmed cases of *Campylobacter*, *E. coli* O157:H7, *Listeria*, *Salmonella*, *Shigella*, *Vibrio*, and *Yersinia* infections was initiated January 1, 1996, in Minnesota, Oregon and parts of California, Connecticut and Georgia. In 1997, surveillance for lab-confirmed cases of *Cryptosporidium* and *Cyclospora* infections were added in Minnesota and Connecticut, and in parts of California.

In 1997, 8,576 lab-confirmed cases were identified; 8,051 were bacterial. Seasonal variation was discovered for several pathogens. During June, July and August, 52% of *E. coli* O157:H7, 35% of *Campylobacter*, and 32% of *Salmonella* reported cases were isolated.

During illness, 1,270 of the 8,576 lab-confirmed cases required hospitalization. Listeriosis caused the highest level of hospitalization at 88%; *E. coli* O157:H7 infections represented 29%; and salmonellosis, 21%.

Thirty-six patients with laboratory-confirmed infections died.

Fifteen deaths involved *Listeria*, 13 *Salmonella*, four *E. coli* O157:H7, two *Cryptosporidium*, one *Campylobacter*, and one *Shigella*. *Campylobacteriosis* had the highest incidence rate of 24.7 per 100,000. Salmonellosis (13.7) and shigellosis (7.8) followed.

Of the 10,000 individuals surveyed, 11% reported a diarrheal illness during the previous month (1.4 episodes of diarrhea per person per year). Of those who were ill, only 8% sought medical care and 20% of those treated reported submitting a stool specimen for culture.

Case rate was 50.4 illnesses per 100,000 for the pathogens studied, with a death rate of 0.5%.

The 1997 surveillance data are similar to 1996 data. The largest difference was in the incidence rate reported illnesses caused by *Vibrio*.

Preliminary data reported to FoodNet in first six months of 1998 show a decrease in *Campylobacter* and *Salmonella* infections, but an increase in *E. coli* O157:H7, *Vibrio*, and *Yersinia* infections.

CDC, *Morbidity and Mortality Weekly Report*, 47:785-86, 1998

Table 1A. Cases of infections caused by specific bacterial pathogens, reported by FoodNet sites, 1997.

Pathogen	CA	CT	GA	MN	OR	Total
Campylobacter	1038	528	496	1175	737	3974
E.coli O157:H7	19	34	8	199	80	340
Listeria	14	12	20	18	13	77
Salmonella	370	413	475	619	330	2207
Shigella	293	78	577	138	177	1263
Vibrio	31	4	2	2	12	51
Yersinia	35	15	43	31	15	139
Total	1800	1084	1621	2182	1364	8051

Store breast milk safely at work

Mothers often return to work soon after giving birth, and those who breast-feed face challenges: Where do I store the breast milk after it is expressed? If the workplace does not have a refrigerator, can I store it at room temperature?

Storage of breast milk at refrigeration temperatures and at frozen temperatures has been studied, but little is known about room temperature storage. Studies show human milk can be stored at 39°F (4°C) for up to eight days and can be stored at 0°F (-18°C) for six months. At temperatures below -4°F (-20°C), breast milk can be stored for 12 months. At 39°F (4°C), microbial growth is minimal. Milk bacterial count during the first few hours of storage is decreased. This can be explained by the products of lipid breakdown: The free fatty acids and monoglyceride products have an antiviral, an antibacterial, and an antiprotozoan effect. This trend is not found in frozen milk, since freezing temperatures greatly reduce the breakdown of the lipids. Refrigeration of breast milk causes little change in composition. Lactose and immunoglobulin A concentrations do

not change during the eight-day refrigeration period, but the lipid concentration does decrease over time, especially if the milk contains high initial levels of bacteria.

The recommendations for storage at room temperature range from studies stating that breast milk should not be held at room temperature, to studies suggesting that eight to 10 hours at room temperature is acceptable. This discrepancy evolves from the fact that there is no consensus about the maximal bacteria levels acceptable for untreated human milk and the type of bacteria that are commonly found in human milk. When human milk is expressed it becomes contaminated, primarily by nonpathogenic skin flora. Coagulase negative staphylococci and alpha hemolytic streptococci are the most common cultured organisms. The sources of these organisms are the mother's breast and hand surfaces. Pathogens are not commonly detected in breast milk, but with milk held at room temperature 77°F (25°C) for 24 hours, pathogens such as *Bacillus coliformis*, enterococci, and *Staphylococcus aureus* may be found.

Proper sanitation procedures must be followed during collection to minimize bacterial contamination. Milk expression equipment must be clean and sterile, and clean glass or plastic containers must be used. Mothers should avoid using polyethylene storage bags because of increased risk of contamination associated with their use.

To ensure wholesomeness, breast milk should be refrigerated immediately after expression, if possible. If a refrigerator is not available, the mother could use a storage container, such as a lunch box cooler, which will keep the milk at approximately 59°F (15°C). Storage at this temperature would ensure the milk's safety for 24 hours. Some organizations recommend that milk may be left at room temperature for a few hours, if necessary. Due to the protective factors in breast milk, this practice should not lead to problems.

Barger, J. and P. Bull, International Journal of Childbirth Education 2: 29-30, 1987.

Hamosh, M. et al, Pediatrics, 97(4): 492-498, 1996.

Jones, L., Modern Midwife, 6:27-29, 1996.

Pardou, A. Bio Neonate 65:302-309, 1994

Sprouts

(continued from page 1)

hypochlorite solution for 45 minutes did not prevent growth of pathogenic bacteria. Treatment with water at least 129°F (54°C) for 10 minutes reduced microbial populations, but caused a substantial reduction in seed viability. Soaking sprout seeds prior to germination and growth in a 2% calcium hypochlorite solution resulted in some reduction of microflora. Seed pasteurization before sprouting has been examined to reduce pathogenic bacteria, but no data are available to determine its effectiveness.

The Food and Drug Administration recommends that individuals who are at high risk for foodborne disease should avoid eating raw alfalfa sprouts until intervention methods can be implemented to ensure the safety of these products.

Food and Drug Administration (1998). Interim Advisory on Alfalfa Sprouts [On-line]. Available. <http://vm.cfsan.fda.gov/~lid/tpalfalf.html>

Food and Drug Administration (1997). A summary of Background Information and Foodborne Illness Associated With the Consumption of Sprouts [On-line]. Available. <http://vm.cfsan.fda.gov/~mow/sprouts.html>

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Upcoming Events

January 8-10, 1999

K-State HACCP Workshop
Manhattan, KS
Contact: Liz Boyle
(785) 532-1247
or Kelly Getty
(785) 532-0191

February 5-7, 1999

AAMP/K-State HACCP Workshop
Kansas City, MO
Contact: Liz Boyle
(785) 532-1247
or Kelly Getty
(785) 532-0191

March 3-4, 1999

Second Kansas Conference
on Food Protection
Wichita, KS
Contact: Stephen Paige
(785) 296-0189

July 9-16, 1999

19th International Rapid Methods
and Automation in Microbiology
Workshop
Manhattan, KS
Contact: Daniel Fung
(785) 532-5654