

FOOD PROTECTION TRENDS

SCIENCE AND NEWS

FROM THE
INTERNATIONAL ASSOCIATION
FOR FOOD PROTECTION

VOL. 24, NO. 8
ISSN: 1541-9576
PERIODICALS
6200 Aurora Avenue•Suite 200W
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In the June issue of *FPT* on pages 419 and 423 the incorrect issue number was printed. The correct number is 6. We apologize for this error.

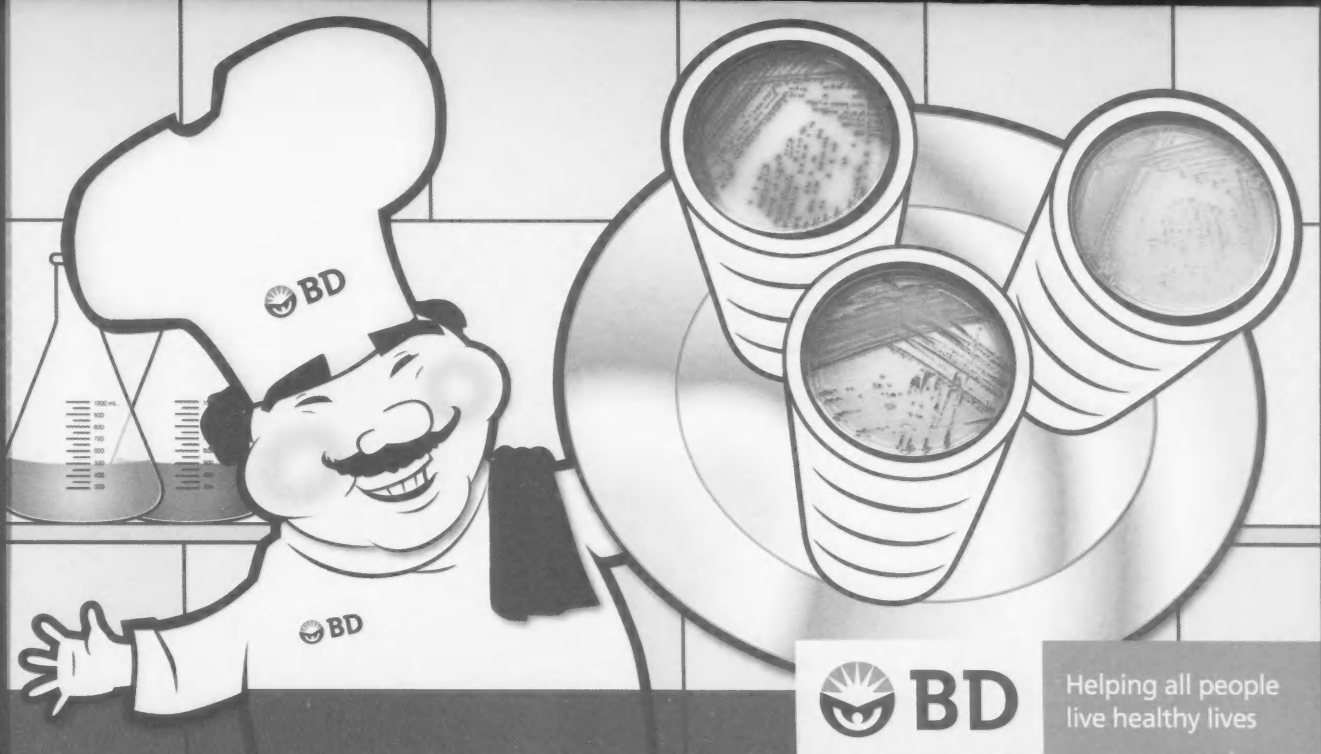
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FOOD PROTECTION TRENDS

SCIENCE AND NEWS
FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

Food Protection Trends (ISSN-1541-9576) is published monthly beginning with the January number by the International Association for Food Protection, 6200 Aurora Avenue, Suite 200W, Des Moines, Iowa 50322-2864, USA. Each volume comprises 12 numbers. Printed by Heuss Printing, Inc., 911 N. Second Street, Ames, Iowa 50010, USA. Periodical Postage paid at Des Moines, Iowa 50318 and additional entry offices.

Manuscripts: Correspondence regarding manuscripts should be addressed to Donna A. Bahun, Production Editor, International Association for Food Protection.

News Releases, Updates, Coming Events and Cover Photos: Correspondence for these materials should be sent to Donna A. Bahun, Production Editor, International Association for Food Protection.

"Instructions for Authors" may be obtained from our Web site at www.foodprotection.org or from Donna A. Bahun, Production Editor, International Association for Food Protection.

Orders for Reprints: All orders should be sent to *Food Protection Trends*, International Association for Food Protection. Note: Single copies of reprints are not available from this address; address single copy reprint requests to principal author.

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Subscription Rates: *Food Protection Trends* is available by subscription for \$227.00 US, \$242.00 Canada/Mexico, and \$257.00 International. Single issues are available for \$26.00 US and \$35.00 all other countries. All rates include shipping and handling. No cancellations accepted. For more information contact Julie A. Cattanch, Membership Services, International Association for Food Protection.

Claims: Notice of failure to receive copies must be reported within 30 days domestic, 90 days outside US.

Postmaster: Send address changes to *Food Protection Trends*, 6200 Aurora Avenue, Suite 200W, Des Moines, Iowa 50322-2864, USA.

Food Protection Trends is printed on paper that meets the requirements of ANSI/NISO Z39.48-1992.

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"PRESIDENT'S" PERSPECTIVE

Charles F. Kettering, the great American inventor whose innovations include the electronic cash register, the spark plug, safety glass, the automatic transmission, and freon for refrigerators and air conditioners once said, "My interest is in the future because I am going to spend the rest of my life there." I think this is a great way to look at the future and one in which we all should embrace a little more often. I am pleased to tell you that your Executive Board is keenly interested in helping to define and shape the future of your Association. Earlier this year the Executive Board, along with IAFP staff, participated in a planning session facilitated by Warren Dunham of Warren Dunham Associates. The focus of this planning session was to look into the future to see where we would like IAFP to be in the year 2010. What are the accomplishments and goals we envision having accomplished over the next six-year planning horizon? We all began the session by listing our expectations of the exercise. We then took time to look back through the history of IAFP, summarizing the accomplishments and highlights achieved over the decades since our inception in 1911. We then looked at IAFP in our present state and developed a list of trends, impacts, and strengths as we currently see them. We then fast-forwarded ourselves to the year 2010 and projected our dreams of where we want to be as an organization at that time. I can tell



By **PAUL A. HALL**
PRESIDENT

"The future is certain"

you that it was an exciting, provocative, and fun exercise!

There were a lot of great ideas expressed such as growing our membership to over 5,000 members, having at least 50 Affiliate organizations around the world, holding meetings outside of North America, and growing the Foundation Fund to over one million dollars, just to name a few. From this comprehensive list of ideas, our focus was condensed into the following five major themes:

- International Issues
- Publications
- Outreach and Education

- Foundation Fund
- Affiliates

Specific aims and milestones were defined for each of these major themes with the objective of achieving IAFP's desired future state by the year 2010. Space limitations preclude me from delving into the specifics of each major theme. However, the output of this joint exercise was to develop a living, ongoing planning framework that will help to guide your Executive Board in the future to make decisions and policy consistent with an overall cohesive strategy and vision. I feel extremely satisfied with the outcome of this planning session. I can assure you that your Association does, indeed, have a future! Now, I know how profound that must sound to you... but the point I'm trying to make is that with your current and future leadership, I strongly believe IAFP has a very bright future. With your help and participation we can achieve that future together.

The poet T. S. Eliot once wrote:
"Time present and time
past

Are both perhaps
present in time future,
And time future
contained in time past."

This is Eliot's eloquent way, I believe, of summing up the interconnectedness of our past, present, and future. We are a strong, vibrant professional Association with a rich, impactful past. Building on our past, we can work to assure a food supply that is safe for everyone around the world for future generations to come. I am very proud and thankful

to all of you for allowing me to play a small role in helping to shape the future of this great organization. This is my last column as your President. I have so many people to acknowledge and thank. First and foremost I want to thank you, the Members of IAFP for entrusting the future of your Association with me. I want to thank David Tharp and the wonderful IAFP staff for their true professionalism and unending dedication to making IAFP so

successful. I also extend my warm thanks to all of my fellow Executive Board colleagues and friends, present and past, that I've been privileged to work with. I have learned so much from each and every one of you! I especially want to recognize Past President Anna Lammerding for her leadership and dedication as she ends her tenure on the Executive Board. Additionally, I want to extend my sincere best wishes and support to Kathy Glass

as she assumes her role as President of your Association. Finally, I want to thank Kraft Foods for their commitment to food safety and for allowing me the time to devote to IAFP. My sincere gratitude goes to each and every one of you for making our food supply safer and our world a better place in which to live. As always, please feel free to contact me with your thoughts and comments at phall@kraft.com. See you down the road!

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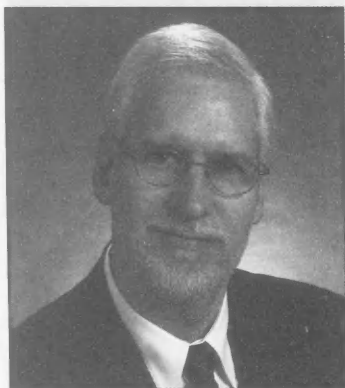
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Many companies do so much for IAFP throughout the year that I am sure to not be able to cover all ways that we receive support, but I am going to attempt to give you some ideas that may prompt you to take action. One of the easiest ways to provide meaningful support is through a contribution to the IAFP Foundation. Any dollar amount of giving is appreciated and will go a long way in assisting the Foundation to carry out their purpose. The Foundation Fund is growing and we would like to be able to add your company name to the contributor list!

Another easy and economical way to support both IAFP and the Foundation is by becoming a Sustaining Member. Sustaining Membership provides one individual with Membership benefits (two for Silver and three for Gold) while giving the company monthly recognition in both *Food Protection Trends* and the *Journal of Food Protection* (see page 584 in this issue). In addition, Sustaining Member company names and Web site links are included on the IAFP Web site. There are many benefits to the Sustaining Member pro-



By **DAVID W. THARP, CAE**
EXECUTIVE DIRECTOR

**"We always want
to recognize
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gram, so contact me to discuss this further.

Annual Meeting sponsorship is one area that has mushroomed over the past few years. We are indeed fortunate to have exhibiting companies and others who are willing to help make the IAFP Annual Meeting the BEST food science and food safety meeting – period! A multitude of events are provided for various levels of support giving a wide array of

recognition opportunities for your investment. A thank you to our IAFP 2004 special contributors and sponsors is included on the next page. In addition, we extend our sincere gratitude to all sponsors and contributors for making IAFP 2004 a grand success!

From time to time, there are special projects that arise where we need support to make these projects happen. The International Food Safety Icons are one recent example. The project could not have been a success without the unending support from Walt Disney World. Two additional companies assisted financially and many individuals gave freely of their time, but it was Disney that led the way!

We always want to recognize companies for providing support whether it is for contributions to the Foundation, Sustaining Membership, Annual Meeting support or for special projects. There are a variety of methods available to give the appropriate recognition and we always search for just the right way to do this.

If you are interested in providing support to IAFP, feel free to contact me at the IAFP office. We will be happy to assist you and your company in finding a niche to provide you with a unique experience.

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Ethnic Food Safety Trends in the United States Based on CDC Foodborne Illness Data

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SUMMARY

Americans' exposure to ethnic foods has expanded, while little information is available about the safety of these foods. This study examined CDC foodborne illness data (1990 to 2000) for ethnic foods to determine food safety trends. Total outbreaks associated with ethnic foods rose from 3% to 11%, whereas total number of cases showed no specific trend. Because most outbreaks reported were for Mexican, Italian, or Asian foods, this paper will focus on these three categories. The highest numbers of outbreaks occurred in restaurants (43%), private homes (21%), schools (7%), and others (29%), and the top five states were Florida (n=136), California (n=74), New York (n=42), Maryland (n=40), and Michigan (n=37). The etiologies of ethnic food outbreaks were primarily unknown (61%), then to *Salmonella* spp. (18%), *Clostridium* spp. (6%), *Bacillus* spp. (4%), *Staphylococcus* spp. (4%), and all others (7%). Based on known etiology, each ethnic category had its own profile of microorganisms and characteristic foods. Current food manager certification may not adequately cover specific details essential for safe ethnic food preparation. The findings should bring awareness to food safety professionals of unique issues and risks related to ethnic foods.

A peer-reviewed article

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TABLE 1. Outbreaks with known etiology related to selected ethnic foods in the United States (1990-2000)

Source		Microorganisms		Location of Outbreaks		
				Home	Commercial	Unknown
Mexican	<i>Bacillus cereus</i>	<i>Salmonella</i> Newport	Hepatitis A	17	74	9
	<i>Clostridium perfringens</i>	<i>S. infantis</i>	Norwalk (Norovirus)/			
	<i>C. botulinum</i>	<i>S. Manhattan</i>	Norwalk-like virus			
	<i>Campylobacter jejuni</i>	<i>S. Javiana</i>				
	<i>E. coli</i> O157:H7	<i>S. Oranienburg</i>				
	<i>Listeria monocytogenes</i>	<i>S. Montevideo</i>				
	<i>Salmonella</i> Typhi	<i>Salmonella</i> spp.				
	<i>S. Enteritidis</i>	<i>Staphylococcus aureus</i>				
	<i>S. Heidelberg</i>	<i>Shigella sonnei</i>				
	<i>S. Typhimurium</i>	<i>Shigella flexner</i>				
	<i>S. Thompson</i>	<i>Shigella boydii</i>				
	<i>S. berta/reading</i>					
Italian	<i>Bacillus cereus</i>	<i>Salmonella</i> Typhimurium	(Variant Hepatitis A)	23	52	7
	<i>Clostridium perfringens</i>	Copenhagen	Norwalk (Norovirus)/			
	<i>E. coli</i> O157:H7	<i>Staphylococcus aureus</i>	Norwalk-like virus			
	<i>Salmonella</i> Enteritidis	<i>Shigella sonnei</i>				
	<i>Salmonella</i> spp.	<i>Streptococcus</i> spp.				
	<i>S. Typhimurium</i>	<i>Shigella</i> spp.				
	<i>S. Heidelberg</i>	Multiple bacteria				
Asian	<i>Bacillus cereus</i>	<i>Salmonella</i> spp.	Norwalk (Norovirus)/	2	41	2
	<i>B. subtilis</i>	<i>Staphylococcus aureus</i>	Norwalk-like virus			
	<i>Clostridium perfringens</i>	<i>Vibrio parahaemolyticus</i>				
	<i>Salmonella</i> Enteritidis					

TABLE 2. Summary of the numbers of foodborne outbreaks with unknown etiology related to selected ethnic foods in the United States (1990-2000)

Source	Total	Location of Outbreaks		
		Home	Commercial	Unknown
Mexican	147	12	119	16
Italian	152	56	82	14
Asian	79	20	51	8

INTRODUCTION

Demographic studies show a significant change in the ethnic population of the United States during recent decades; in the year 2000 one out of four Americans was of a race other than Caucasian (24). These races include American Indian and

Alaska Native (1%), Asian and Pacific Islander (4%), some other race (5.5%), and two or more races (1.4%). On July 1st, 2002, the number of Hispanics (mainly Mexican-Americans) was 38.8 million, representing 13.4% of the total US population. It is expected that the Hispanic population will in the

near future be the largest minority group in the US. In addition, Asian American is the third largest group, accounting for 4.0% of the total US population; this group includes people of Chinese, Filipino, Asian Indian, Vietnamese, Korean, and Japanese origins (24).

An increase in the ethnic population has, in turn, increased American's exposure to food and flavors from other cultures, through ethnic restaurants, retail markets and other means. Americans are constantly looking for new flavor combinations, increasing sales of ethnic foods over the past few years (2, 23). Because of increased familiarity, certain ethnic foods, such as Italian, Mexican and Asian (Chinese, Cantonese) cuisines, are becoming

FIGURE 1A. Total number of outbreaks associated with the three top ethnic foods by year between 1990 and 2000 with both known and unknown etiology as compared to all other foods

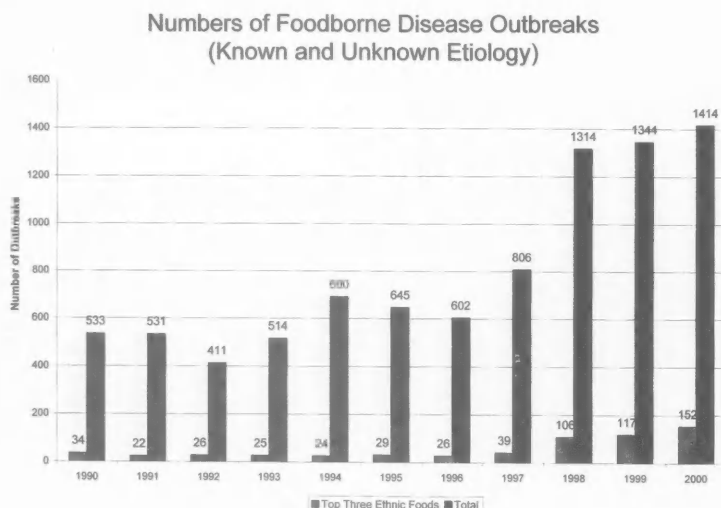
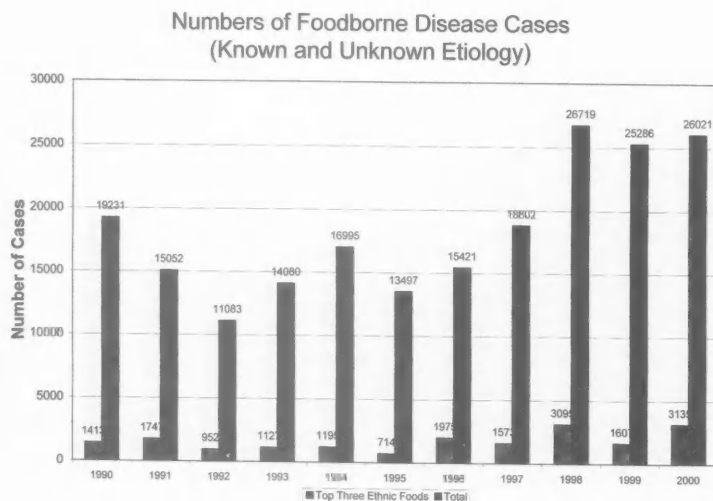


FIGURE 1B. Total number of cases associated with the three top ethnic foods by year between 1990 and 2000 with both known and unknown etiology as compared to all other foods



more and more mainstream. For simplicity, in this paper we group all Asian cuisines (Chinese and non-Chinese) together as "Asian" and all Mexican, "Tex-Mex", and Latino cuisine as "Mexican".

Italian cuisine has long been established in the United States whereas

Mexican and oriental cuisines have become popular more recently. For example, in 1997, Italian food retail and food service sales were about \$8.1 billion and \$9.3 billion, respectively. In that same year, Mexican food retail and food services sales reached almost \$2.8 billion and \$11 billion,

respectively. In addition, an estimated \$10 billion was spent on oriental cuisine (mostly in the foodservice sector) (2).

Food services and supermarkets responded quickly to the increases in ethnic food needs (5, 8, 9, 10, 15, 20, 21, 25). In one market survey of chain restaurant operators, more than 90% said that ethnic foods are popular with their customers. Eight in 10 say that offering ethnic foods makes their operations look cutting-edge. Two-thirds say that ethnic foods help increase traffic flow and distinguish their chains from those of their competitors (25). In addition, according to Promar International study, 75% of ethnic food consumption is by *mainstream consumers*. Thus, the popularity of ethnic foods is due not only to ethnic Americans, but also to so-called *mainstream consumers* (2). Food service and supermarket operators are aware of the spending power of both Asian and Hispanic Americans, which is estimated at about \$500 billion per year (8, 10, 16, 21). These groups of people are more likely than Caucasian to be restaurant patrons on any typical day (15). These data have prompted recent changes in restaurant menus; according to an industry report, among the top 100 menu category, Asian (27%) is the leading ethnic food, followed by Mexican (12.5%), and Italian (11%), respectively, in terms of sales (19). Moreover, according to the market research firm Packaged Facts Inc., 46% of households polled ate Mexican food four or more times per month. Meanwhile, 45% of American adults ate Asian foods over the course of any one month (8).

Further, increased consumption of spices or peppers and rice, which are three typical ethnic ingredients, is another good example of increased ethnic food consumption in recent years (18). Since 1980, American's consumption of chili peppers has

FIGURE IC. Total number of outbreaks associated with the three top ethnic foods by year between 1990 and 2000 with known etiology as compared to all other foods

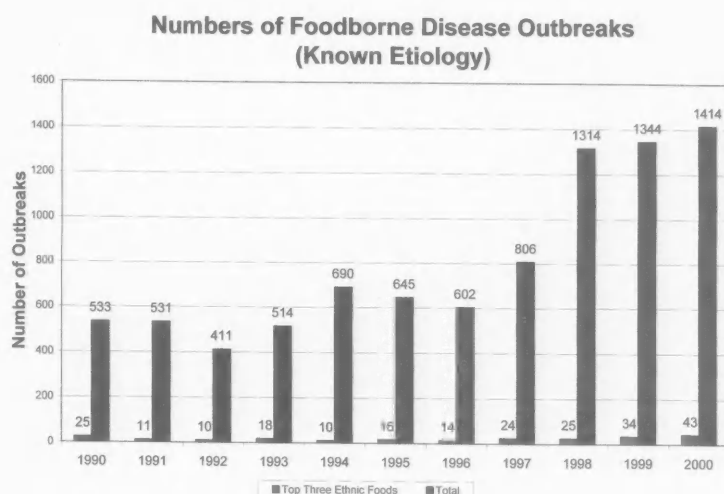
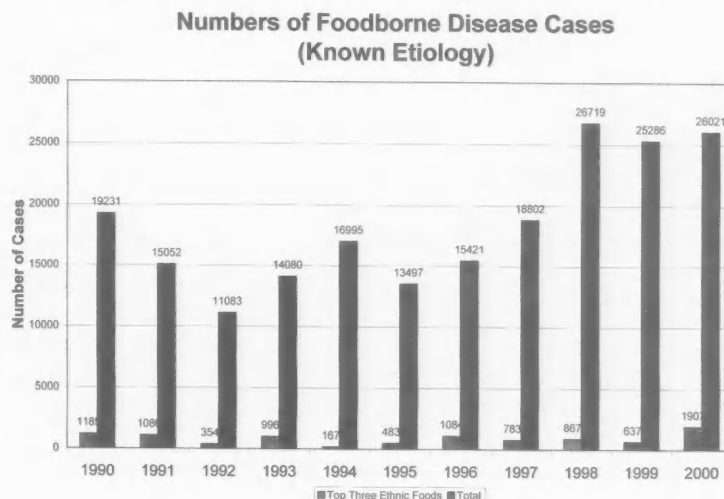


FIGURE ID. Total number of cases associated with the three top ethnic foods by year between 1990 and 2000 with known etiology as compared to all other foods



doubled, to almost six pounds per capita, according to the USDA's Economic Research Service. Also, red pepper usage has nearly tripled over the last two decades, according to the American Spice Trade Association (5). In addition, per capita consumption of rice in 1997–1998 was about 26.29

lbs. as compared to 25.38 lbs. in the previous year (10).

Ethnic foods seem to have a promising future, particularly Asian food. Indeed, with a population expected to increase considerably in the next decade, Asian Americans earn a higher median household income

than any other ethnic group (24). Those facts, coupled with the notions of ethnic food such as spices, vegetables and garlic as healthful ingredients and alternatives to the traditional high-fat, high-meat American diet, cause ethnic food to be considered one of the bright spots in the sluggish US food industry today (16). A recent study by PROMAR International indicates that one of every seven food-dollars over the next decade will be spent on ethnic foods (11), making this area one of the fastest rising in the food industry (10).

Foodborne illnesses continue to cause significant economic losses for the US each year, and ethnic foods continue to be a significant part of the American way of eating, yet little is known about the safety of these foods (7). The objectives of this study were to (1) examine the available foodborne illness data from CDC from 1990 to 2000 to determine trends in the outbreaks of foodborne illness in ethnic foods as compared to all other foods, and (2) examine the nature of the outbreaks involving ethnic foods and explore whether additional educational programs targeted at ethnic food vendors are needed.

MATERIALS AND METHODS

Foodborne illness data (1990–2000) from the Centers for Disease Control and Prevention (CDC) were reviewed and used as the primary compilation source (http://www.cdc.gov/foodborneoutbreaks/us_outb.htm) (6) for outbreaks of foodborne illness related to ethnic foods. The outbreak data is current with the CDC website on July 19, 2003; thus this manuscript is not accountable for additional changes of the CDC data thereafter. Whenever possible, the data are cross-checked with other outbreak records at <http://www.cspinet.org/reports/>

FIGURE 2A. Breakdown of outbreaks associated with each of the three top ethnic foods (Asian, Mexican and Italian) by year between 1990 and 2000, with both known and unknown etiology

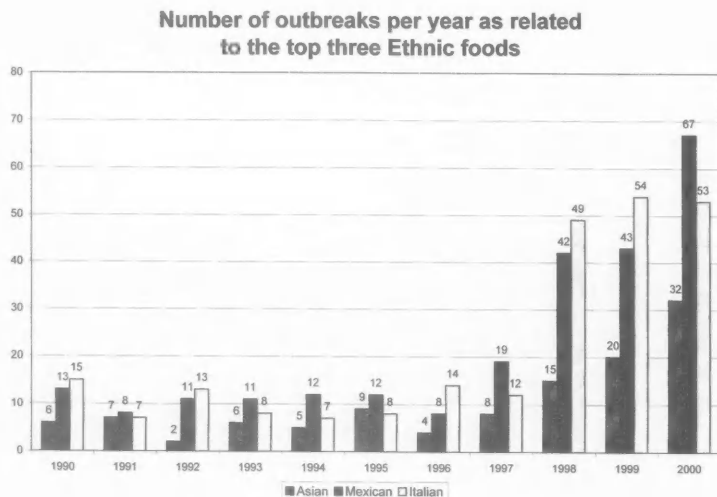
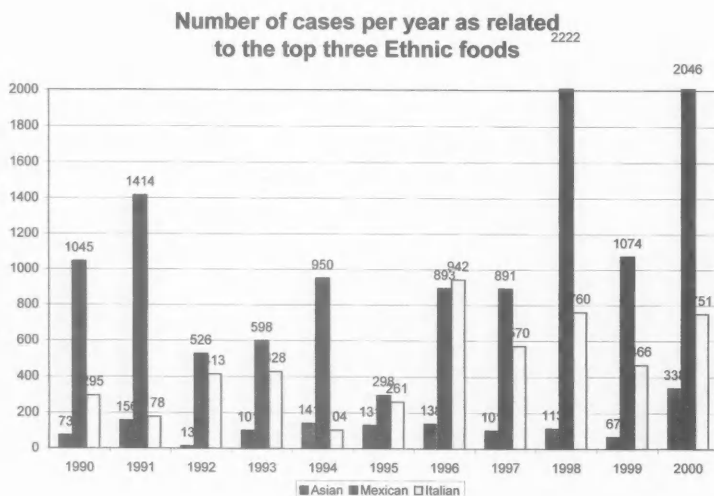


FIGURE 2B. Breakdown of cases associated with each of the three top ethnic foods (Asian, Mexican and Italian) by year between 1990 and 2000, with both known and unknown etiology



outbreak_alert/appendix_a.htm (1) as well as with the CDC MMWR and other publications. Ethnic foods implicated in the outbreaks were examined against Webster's New World Dictionary of Culinary Arts (13) to determine their true culinary origin

before they were assigned to a group as defined in the introduction of this paper. Please note that because some outbreaks may involve more than one type of food, some degree of error ($\pm 5\%$) is inevitable. Raw data are summarized in Table 1 (outbreaks

with known pathogens) and Table 2 (outbreaks with unknown pathogens). The number of outbreaks and cases were cross-checked with the printed data for accuracy. To aid readers, definitions of selected ethnic foods have been provided in Table 3. Total numbers of outbreaks and total cases for all ethnic foods with both known and unknown pathogens were compared with the total foodborne illness outbreaks and cases. Because the most outbreaks reported by the CDC were for Mexican, Italian, or Asian foods, this paper will focus on these three categories.

RESULTS AND DISCUSSIONS

Table 1 provides a summary of all microorganisms implicated in the outbreaks and the number of outbreaks in different settings, while Table 2 provides numbers of outbreaks with unknown causative agents with respect to outbreak location. Fewer microorganisms were implicated in the outbreaks related to Asian foods than in those related to Mexican or Italian foods. Graphs and calculations were then based on both Table 1 and 2. Overall, the total number of outbreaks (with known and unknown etiology) in ethnic foods rose from 3% to 10% of the total number of outbreaks between 1990 to 2000 (Fig. 1a), while the total number of cases did not follow a specific trend (Fig. 1b). Figures 1c and 1d also provide data on outbreaks with known causative agents. This data represents an increasing trend of incidence of foodborne outbreaks as related to ethnic foods from 1990-2000.

In descending order Mexican (41%), Italian (39%), and Asian foods (20%) represent the most frequent sources of reported foodborne illness outbreaks (Fig. 2a and 2b), compared to the total number of ethnic foods

FIGURE 3A. Overall average cases per outbreak of the ethnic foods, with both known and unknown etiology

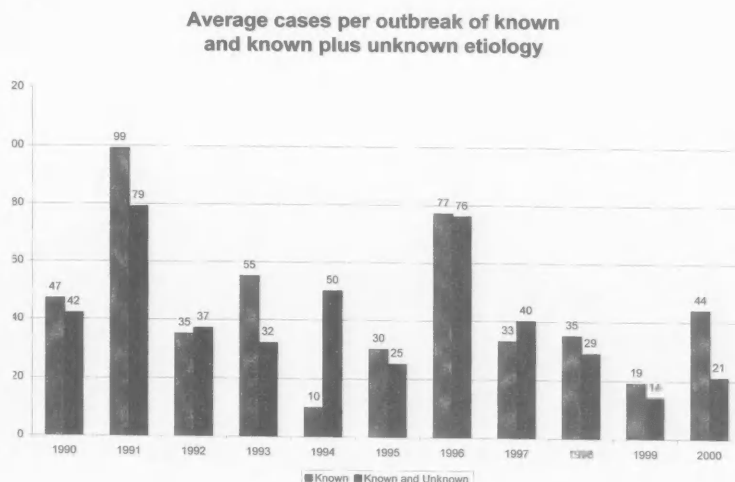
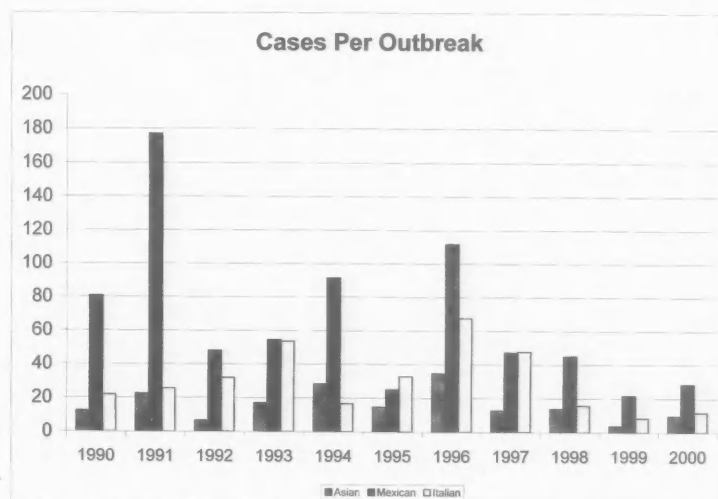


FIGURE 3B. Overall average cases per outbreak for each of the three ethnic foods, with both known and unknown etiology



outbreaks. Considering the average number of cases per outbreak per year associated with ethnic foods, the outbreak can be sizable, ranging from 15 to 100 cases/outbreak (Figure 3a). Although it is impossible to rank severity of outbreak for each cuisine, the break-down of cases per outbreak

gives some idea of the extensiveness of the outbreaks for each food group. It appears, that, for the most part, the number of cases per outbreak tends to be higher for Mexican foods than that of Italian and Asian foods (Fig. 3b). Within the scope of this paper, it is not possible to provide any rank-

ing of severity of the foodborne outbreaks for the different types of food because the severity of outbreaks and illness is dependent on many factors, such as mortality and hospitalization rate, profile of microorganisms, and health status of the host.

The highest numbers of outbreaks were reported by five states: Florida (n=136), California (n=74), New York (n=42), Maryland (n=40), and Michigan (n=37) (Fig. 4). Additional ranks for the top ten states are given in Table 4. These numbers were not correlated in any way with the total populations or the number of restaurant establishments. As to locations of the outbreaks, the highest number of incidents occurred in restaurants (43%), followed by private homes (21%), schools (7%), multiple locations (7%), workplaces (4%), unknown (4%), and others (14%) (Fig. 5). Other outbreak locations (with 5 or more outbreaks) include, but are not limited to, hotels, conferences, camps, festivals, delicatessens, prisons, picnics, and churches.

Taking into consideration both known and unknown etiology, the majority of the outbreaks for all ethnic foods are due to unknown causative agents. For outbreaks of known etiology, the major genera of bacterial causes were *Salmonella* (18%), *Clostridium* (6%), *Bacillus* and *Staphylococcus* (4% each) (Fig. 6). In descending order for known etiology, the top five microorganisms reported were *Salmonella* Enteritidis (30%), *Clostridium perfringens* (15%), *Bacillus cereus* (11%), *Staphylococcus aureus* (9%), and *Salmonella* species (7%) (Fig. 7).

We further examined the profiles of microorganisms in each ethnic food. The majority of ethnic foodborne outbreaks, 56%, 60% and 68% in Mexican, Asian, and Italian foods, respectively, are of unknown etiology (Fig. 8a, 8b and 8c). The number

FIGURE 4. Sites of outbreaks associated with all ethnic foods within the United States.

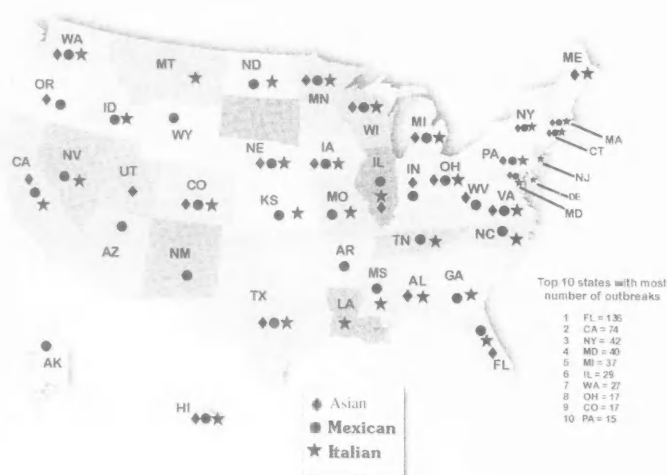
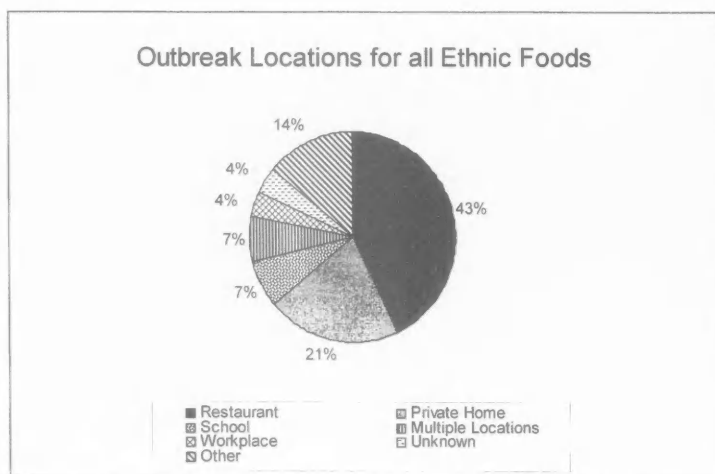


FIGURE 5. Overall location of the outbreaks associated with all ethnic foods



of unknown-etiology outbreaks in this study is consistent with previous estimates by Mead et al. (14). For outbreaks of known etiology, the three types of ethnic foods have very different profiles of microorganisms implicated. For Asian foods, *Bacillus* spp. (50%), *Salmonella* (31%), and *Staphylococcus* (14%) were the

major causative microorganisms (Fig. 9a). It appears that fewer microorganisms are involved in the outbreaks related to Asian foods, which may due to the fact that these foods are cooked, prepared or served differently from other ethnic foods. Italian and Mexican foods have more complicated profiles of microorganisms

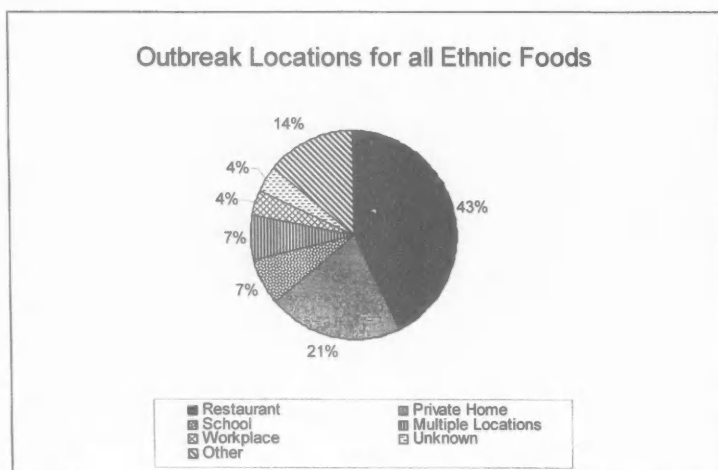
(Table 1). Major microorganisms implicated in Italian foods include *Salmonella* spp. (58%), *Staphylococcus* (12%), *Clostridium* spp. (10%), and Norwalk or Norovirus (10%) (Fig. 9b). Major microorganisms for outbreaks in Mexican foods are *Salmonella* spp. (47%), *Clostridium* spp. (26%), *Shigella* spp. (10%), and *Staphylococcus* (5%) (Fig. 9c). It appears that more severe pathogens (*Clostridium botulinum*, *E. coli* O157:H7, *Shigella* spp., *S. sonnei*, *S. flexneri*, *S. boydii*), and *Listeria monocytogenes* are found more often in Mexican foods than in the Italian or oriental foods. Three of the microorganisms implicated in Mexican foods (*E. coli* O157:H7, *Salmonella* spp., *Listeria monocytogenes*) are among the five that can cause the most severe illnesses (22). Other microorganisms found in outbreaks related to Italian cuisine were *E. coli* O157:H7 and *S. sonnei*, whereas, the other very virulent microorganism found in oriental food was *Vibrio parahaemolyticus*, which was associated with an Asian seafood dish. The differences in the profile of microorganisms may be attributed to ingredients, cooking and preparation methods, and how the food is served. For example, although the Asian cuisine extensively utilizes meats, fish and seafood, fruits and vegetables, and a wide varieties of other high-risk ingredients, the majority of Asian dishes are cooked prior to serving (12). The major microorganism involved in oriental food outbreaks from 1990-2000 was *Bacillus cereus* (50%); *Bacillus cereus* accounted for 2% of the confirmed outbreaks in the United States from 1973 to 1987 (3). Despite the magnitude of the problem with *Bacillus cereus*, little specific effort is being made to convey the information to targeted audiences. This information may help educators to put additional emphasis on the particular issues related to each ethnic



FIGURE 4. Sites of outbreaks associated with all ethnic foods within the United State.



FIGURE 5. Overall location of the outbreaks associated with all ethnic foods



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FIGURE 6. Breakdowns of the etiology related to outbreaks of foodborne illness associated with all three ethnic foods

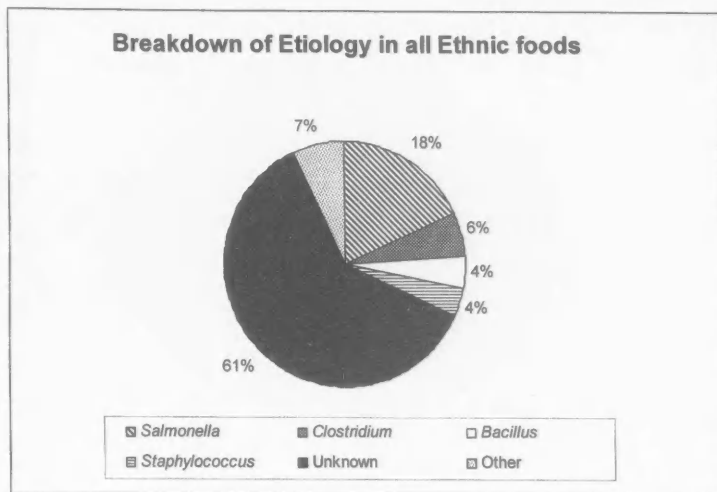
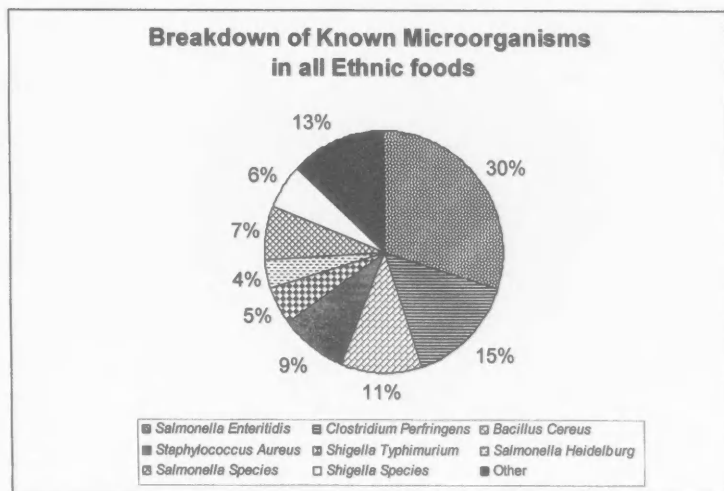


FIGURE 7. Breakdown of the known microorganisms implicated in the outbreaks



food, in addition to basic food manager certification programs.

As the results show, Mexican foods represent unusually great problems with regard to foodborne illnesses. It is possible that this is due

to that fact that Mexican foods contain more high-risk ingredients, such as vegetables that are served fresh or uncooked. In addition, it was noted in a recent study (4) that Hispanics have a higher incidence of several foodborne diseases (including camp-

lyobacteriosis, listeriosis, and salmonellosis) than other racial/ethnic groups. Investigations of outbreaks of these diseases indicate that Hispanics ate several high-risk foods more frequently (4). In 1998, people of Hispanic origin accounted for 16 percent of all eating-and-drinking-place employees, as well as 17 percent of all persons employed in food-preparation and foodservice occupations (17). Although there is no clear evidence connecting the high incidence of foodborne illness in Hispanic populations to the incidence of outbreaks in Mexican foods, Hispanics are a rapidly growing minority group who have made exceptional inroads into the restaurant industry. According to the National Restaurant Association (17), Hispanics were more likely than average to be employed as cooks (22%), wait staff assistants (19%) and miscellaneous food workers (26%).

Further, we examined foods associated with the outbreaks for each cuisine. Foods often implicated in Asian cuisine outbreaks were fried rice (64%), egg rolls (8%), chow mein, salad and soups (6% each) (Fig. 10a); only 10% of other foods were associated with the outbreaks. While the major foods associated with the outbreaks in Italian foods were pizza (49%), lasagna (15%), and spaghetti (6%), it is noticeable that a wide variety of other Italian foods (30% others) were also associated with outbreaks (Fig. 10b). Foods often associated with outbreaks in Mexican cuisine were tacos (25%), burritos (14%), chili (8%), salsa (8%), enchiladas, refried beans, and nachos (6% each), guacamole (4%), and others (23%) (Fig. 10c). These data suggest that most food items in Mexican cuisine are susceptible to contamination with foodborne pathogens; this may due to the fact that each of the menu items may contain more than three items,

TABLE 3. Description of selected ethnic foods

Food	Main Ingredients	Description
Asian		
Pancit	Noodles, chicken, ham, shrimp, or pork	Rice, wheat, or mung bean noodles mixed with cooked chicken, ham, shrimp, or pork in a soy-and garlic-flavored sauce
Tempura	Fish or vegetables	Batter-dipped, deep-fried pieces of fish or vegetables, which is usually accompanied by soy sauce, can be served as a hors d'oeuvre, first course or entrée
Tandoori	Meat or chicken	Dish cooked in an Indian barrel-shaped clay oven "Tandur" is a correct spelling
Masala	Meat or rice	Masala is Hindi for spice; it should refer to a dish cooked in such spice
Italian		
Cannoli	Pastry, ricotta cheese, chocolate	Horn-shaped pastry shells that have been deep-fried, then filled with a sweetened filling of whipped ricotta (and often whipped cream) mixed with bits of chocolate, candied citron and sometimes nuts.
Marinara sauce	Tomato based sauce, onions	Highly seasoned Italian tomato sauce made with onions, garlic and oregano. It's used with pasta and some meat.
Chicken Marsala	Chicken	Marsala is an Italian fortified white wine made from Catarratto, Grillo and Inzolia grapes. It is an ingredient for many Italian dishes.
Chicken tetrazzini	Pasta, chicken	Cooked spaghetti and strips of chicken with a sherry-Parmesan cheese cream sauce. Parmesan or breadcrumbs are sprinkled over the surface and the dish is baked until bubbly and golden brown. Turkey is sometimes substituted for chicken in this dish.
Manicotti	Pasta, meat or cheese	Tube-shaped Italian noodles about 4 inches long and 1 inch in diameter. Manicotti are boiled, then stuffed with a meat or cheese mixture, covered with a sauce and baked.
Minestrone soup	Pasta, vegetables	Thick vegetable soup that generally contains pasta and sometimes peas or beans. It's usually topped liberally with grated Parmesan cheese and is hearty enough to be considered a complete meal.
Pasta primavera	Vegetables, pasta	This Italian phrase means "spring style" and culinarily refers to the use of fresh vegetables (raw or blanched) as a garnish to various dishes. One of the most popular dishes prepared in this manner is pasta primavera, pasta tossed or topped with diced or julienned cooked vegetables.

TABLE 3. (continued) Description of selected ethnic foods

Food	Main Ingredients	Description
Pastrami	Beef, spices	It is a highly seasoned beef made from a cut of plate, brisket or round. After the fat is trimmed, the meat's surface is rubbed with salt and a seasoning paste that can include garlic, ground peppercorns, cinnamon, red pepper, cloves, allspice and coriander seeds. The meat is dry-cured, smoked and cooked.
Tiramisu	Sponge cake or ladyfingers, mascarpone, chocolate	A light composition of sponge cake or ladyfingers dipped in a coffee-marsala mixture, then layered with mascarpone (an ultra-rich Italian cream cheese) and grated chocolate. The dessert is refrigerated for several hours before serving to allow the flavors to intermingle. Although <i>tiramisu</i> is sometimes referred to as an Italian trifle, its texture is much lighter than that dessert.
Tortellini	Pasta, various fillings (cheese, meat)	Italian small pasta stuffed with various fillings, folded over and shaped into a ring or hat shape.
Mexican		
Burrito	Tortilla, meat cheese, beans	This Mexican dish is composed of a flour tortilla folded and rolled to completely enclose any of several savory fillings including shredded or chopped meat, refried beans, grated cheese, sour cream, lettuce, etc.
Carnitas	Pork	Mexican for "little meats," this dish is simply small bits or shreds of well-browned pork. It's made from an inexpensive cut of pork that's simmered in a small amount of water until tender, then finished by cooking the pieces in pork fat until nicely browned all over. Carnitas are usually eaten with salsa and are sometimes used as the filling in tacos and burritos.
Enchilada	Tortilla, meat, cheese,	Rolling a softened corn tortilla around meat or cheese filling makes this Mexican specialty. It's served hot, usually topped with a tomato-based salsa and sprinkled with cheese.
Fajita	Beef, onions, sweet peppers, bean	This Mexican dish is made of skirt steak that has been marinated in a mixture of oil, lime juice, red pepper and garlic for at least 24 hours before being grilled. This cooked meat is cut into strips that are then usually wrapped (burrito-style) in warm tortillas, accompanied by a variety of garnishes including grilled onions and sweet peppers, guacamole, refried beans and salsa.
Guacamole	Avocado, lime juice, tomatoes, onions	A Mexican specialty of mashed avocado mixed with lemon or lime juice and various seasonings (usually chili powder and red pepper). Sometimes finely chopped tomato, green onion and cilantro are added. Guacamole can be used as a dip, sauce, topping or side dish. It must be covered closely and tightly to prevent discoloration.

TABLE 3. (continued) Description of selected ethnic foods

Food	Main Ingredients	Description
Nachos	Tortilla chips, cheese	Crisp tortilla chips topped with melted cheese (usually cheddar) and chopped chiles, usually served as an appetizer or snack. Nachos sometimes appear on menus as "Mexican pizza," in which case they generally have additional toppings such as cooked, ground chorizo, onions and sometimes olives.
Pico de gallo	Jicama, oranges, onion, bell peppers, jalapeno peppers, cucumber	Spanish for "rooster's beak," <i>pico de gallo</i> is a relish made of finely chopped ingredients like jicama, oranges, onions, bell peppers, jalapeno peppers and cucumbers, along with various seasonings. This condiment was so named because it was once purportedly eaten with the thumb and finger, an action that resembles a rooster's pecking beak.
Pinto beans	Pinto beans,	The pinto (Spanish for "painted") bean has streaks of reddish-brown on a background of pale pink. The beans are grown in the United States Southwest and are common in most Spanish-speaking countries, where they're often served with rice or used in soups and stews.
Queso fresco	Cheese	A rather dry cottage cheese-style cheese made in Spain and Latin American countries from goat's milk. Also call <i>queso blanco</i> .
Taco	Tortilla, beef, pork, chicken, tomatoes, lettuce, cheese	Mexican-style "sandwich" consisting of a folded corn tortilla filled with various ingredients including varieties of meat, fresh vegetables (e.g., tomatoes, lettuce), dairy products, refried beans, and salsa.
Tamale	Meats, vegetables	A Mexican dish consisting of chopped meat or vegetables coated with masa dough, wrapped in a softened corn husk and steamed (the husk is not eaten). Sweet tamales are filled with fruits.
Tortilla	Wheat or corn (masa) flour	It is a round, thin, unleavened Mexican bread made from masa or wheat flour and baked on a griddle, eaten plain or wrapped around various fillings. Tortillas are the base for burritos, tacos, and a multitude of other dishes. In Spain, the word <i>tortilla</i> refers also to a thin omelet.

such as meat, fresh vegetables and cheese, all three of which are often involved in foodborne outbreaks (CDC).

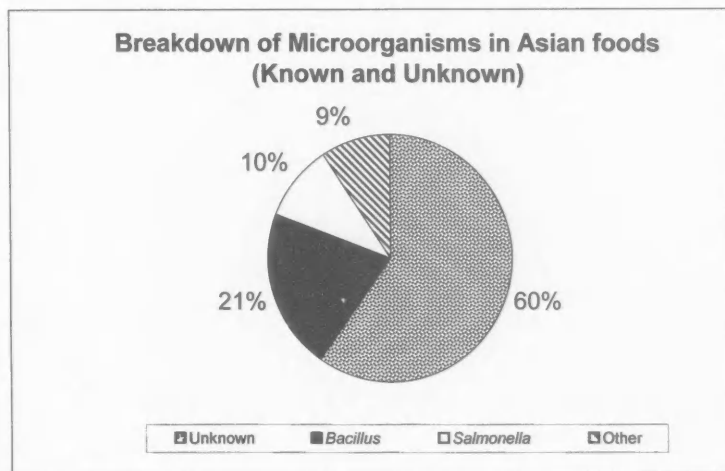
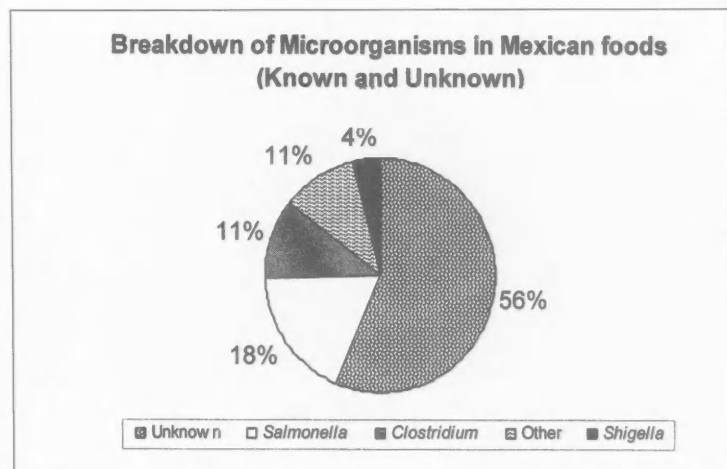
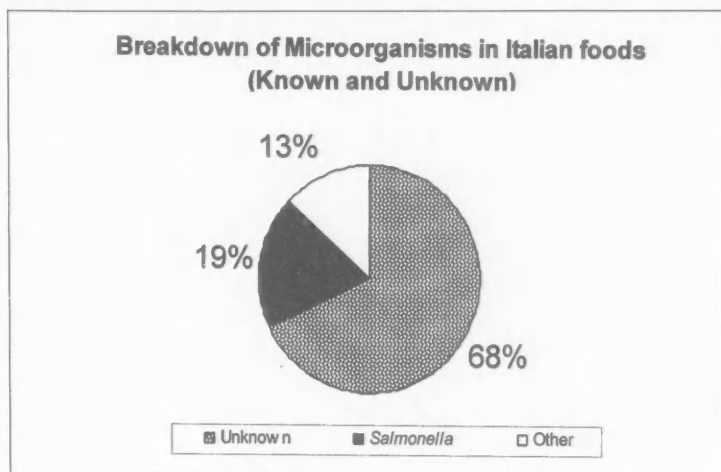
Considering the time of year for the occurrence of the outbreaks, we plotted the average outbreak per month from the outbreak data of 1990–2000. It appears that January and February are the only two months

of the year during which an average of only three outbreaks occurred; this seems to imply that foodborne illness outbreaks related to ethnic foods occur all year round without any particular seasonal trend (Fig. 11).

Although the overall profile of microorganisms implicated in the outbreaks is consistent with current knowledge regarding FDA risk fac-

tors, which include improper holding times and temperatures (e.g., *Clostridium perfringens*, *Bacillus cereus*) contaminated equipment (any microbes), cross contamination (e.g., *E. coli* O157:H7, *Shigella* spp., *Salmonella* spp.), inadequate cooking of food (e.g., *E. coli* O157:H7, *Shigella* spp., *Salmonella* spp.), improper cooling (e.g., *Bacillus cereus*), poor

FIGURE 8 A, B, AND C. Breakdown of the etiology of outbreaks, including unknown, in Asian, Italian and Mexican foods



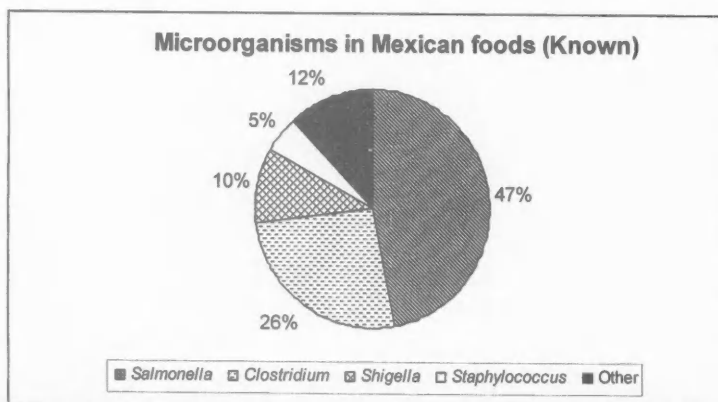
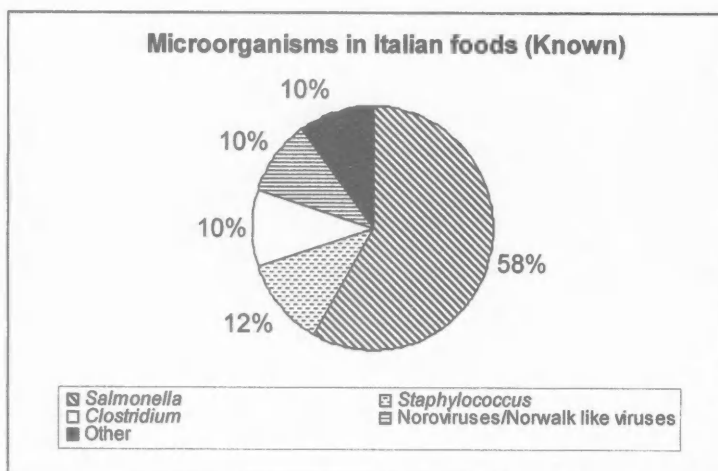
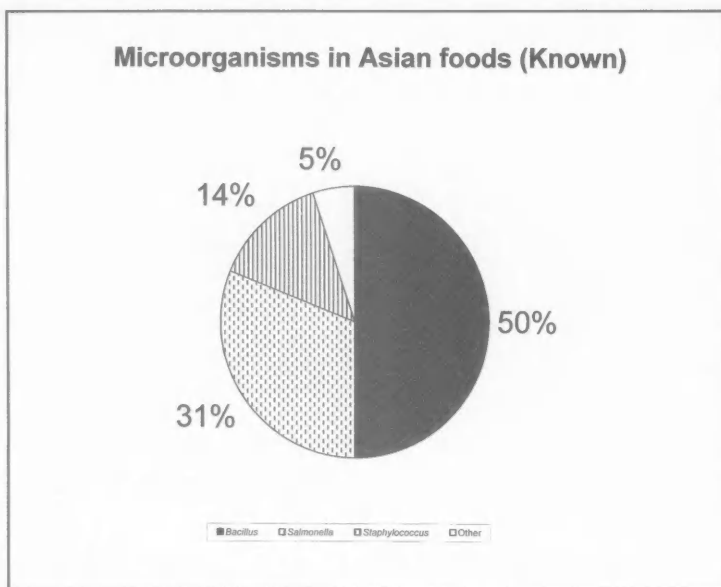
personal hygiene (e.g., *S. aureus*, *Shigella* spp., and viruses) and foods from unsafe sources, the differences in profiles of the different cuisines may be an indication of underlying (subtle) insufficiencies in the current food protection manager's training and certification programs. It is possible that current "one size fits all" food manager certification programs may need to be extended to include risk factors that would consider uniqueness of each ethnic food.

Most food manager certification programs are in agreement with the current FDA Food Codes. They typically cover the importance of food safety and foodborne illnesses, personal hygiene, food safety hazards, protection of foods through the operational chain (receiving, storage, cooking, preparation, hot and cold holding and serving), proper cleaning, sanitizing procedures, and HACCP concepts. While training can help reduce risks of foodborne illness, specific focus on special food preparation is lacking. For an example, despite the wealth of information available for *Bacillus cereus*, there is limited information on how to make safe fried rice, especially for owners of Asian restaurant and consumers (3). In addition, special education programs may be needed for the growing numbers of Hispanic cooks and other workers.

CONCLUSION

Foodborne illness outbreaks related to ethnic foods are on the rise in the United State, based on CDC data from 1990–2000. The magnitudes of the problem are different for each of the top three ethnic foods (Asian, Italian, and Mexican) in descending order, Mexican (41%), Italian (39%), and Asian foods (20%) represent the most frequent sources of reported foodborne outbreaks. Furthermore, profiles of microorganisms implicated

FIGURE 9A, B, AND C. Breakdown of the known etiology of outbreaks associated with Asian, Italian and Mexican foods



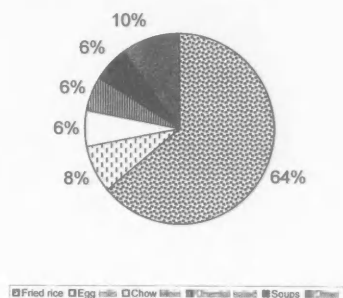
in the outbreaks associated with outbreaks associated with each ethnic food are slightly different. For example, the top two genera of microorganisms implicated in the outbreaks associated with Asian foods were *Bacillus* spp. (50%) and *Staphylococcus* (14%), while the top two genera of microorganisms associated with outbreaks associated with Italian foods were *Salmonella* spp. (58%) and *Staphylococcus* (12%), and with Mexican foods were *Salmonella* spp. (47%), and *Clostridium* spp. (26%). Although fried rice (64%) and pizza (49%) were often implicated in the outbreaks associated with Asian and Italian foods, respectively, most Mexican foods have been implicated the outbreaks, with tacos (25%) as a major culprit. These data reveal that currently available materials for food manager certification programs may not be specific enough to combat the increasing number of foodborne outbreaks associated with ethnic foods.

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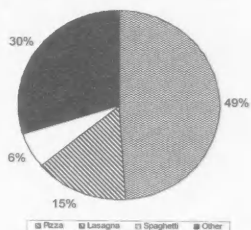
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FIGURE 10 A, B, AND C. Foods involved in outbreaks associated with Asian, Italian and Mexican foods, with both known and unknown etiology

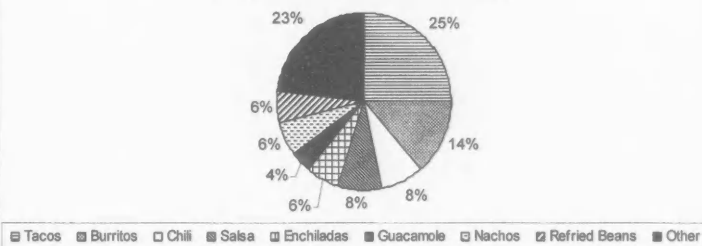
**Asian foods involved
(Known and Unknown Etiology)**



**Italian foods involved
(Known and Unknown Etiology)**



**Mexican foods involved
(Known and Unknown Etiology)**

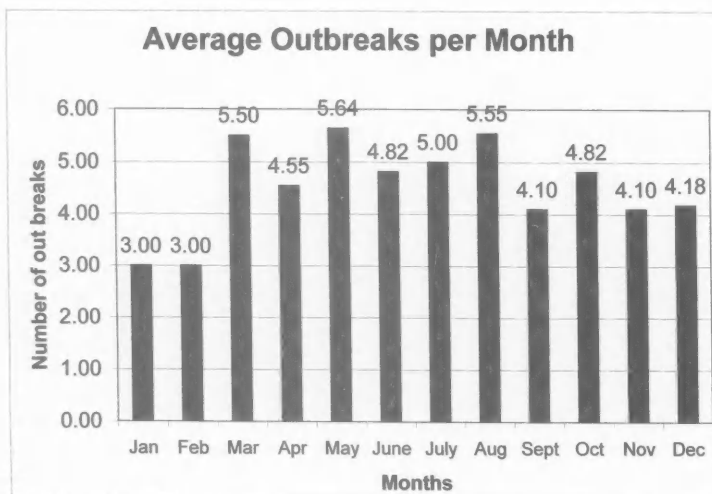


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TABLE 4. Top ten states based on the number of outbreaks as related to the three major ethnic foods for both known and unknown etiology from 1990-2000. The ranks did not take into consideration the multi-state outbreaks

Rank # Outbreak	State	Number of Outbreaks	Number of cases (Average Cases/Outbreak)
1	Florida	136	1,791 (13)
2	California	74	3,031 (41)
3	New York	42	1,167(28)
4	Maryland	40	344(9)
5	Michigan	37	506(14)
6	Illinois	29	1,631(56)
7	Washington	27	632(23)
8	Ohio	17	600(35)
9	Colorado	17	256(15)
10	Pennsylvania	15	716(48)

FIGURE 11. Shows the average outbreaks per month, 1990-2000 for all ethnic foods, etiology both known and unknown



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Consumers' Attitudes toward Labeling Food Products with Possible Allergens

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SUMMARY

Individuals with food allergies may read labels on food packaging to determine whether a food allergen is present. Food regulatory agencies, food manufacturers, and special interest groups are working together to provide consumers with adequate and appropriate allergen information on food labels. This study used focus groups to explore consumers' use of ingredients statements, their preference for allergen labeling, and their attitudes toward a federal regulation that would require allergen statements (e.g., "May Contain Peanuts") on food products with possible allergens. The focus group findings suggest that identification of the source of ingredients (e.g., "whey [milk]") in ingredients statements would be beneficial to consumers. Additionally, some consumers would find allergen statements useful in avoiding foods with possible allergens. Based on these findings, some consumers would benefit from adequate and appropriate allergen information on food labels.

INTRODUCTION

Five percent of children under the age of 3 and 1.5 percent of the adult population of the United States have food allergies (15). Anaphylaxis due to food consumption results in about 125 deaths each year in the United States (2). Although there are treatments for food allergies, avoiding foods that contain allergens is the only effective way to prevent adverse reactions to an allergenic ingredient (5). Individuals with food allergies may read labels on food packaging to determine whether a food contains an allergen. Consumers rely on completeness and accuracy of food labels to avoid possible allergic reaction (1).

All food products that contain two or more ingredients are required by federal regulations to display an ingredients statement on the product label (§317.2[f] for meat, §381.118 for poultry, and §590.411[c] for egg products) (18). The ingredients statement must include all ingredients and list them in descending order of predominance, with few exceptions (18). Al-

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TABLE 1. Questions from the moderator guide

Topics	Questions
Use of Ingredient Statements	When deciding which meat, poultry, and egg products to purchase, do you read the ingredient list on the product packaging? If yes, how often do you read the ingredient list? Do you read the ingredient list on all products or only for certain products? Do you believe that all ingredients are listed?
Preference for Allergen Labeling Features	Do you think it is necessary to provide both the ingredient (e.g., whey) and the source (e.g., milk) in the ingredients statement on the product label? What do you think about providing a web address or 800 number so the consumer can access allergen information? Do you think the federal government should require companies to display statements providing special allergen statements (e.g., "May Contain Peanuts")? Why or why not?

though all ingredients used to manufacture a flavor (e.g., beef flavor) must be declared in the ingredients statement, true spices, flavorings (e.g., spice extractives), and colors may be declared collectively as "flavorings" without naming each one (18). Incidental additives (e.g., processing aids) present at insignificant levels need not be declared in ingredients statements if they do not have an effect in the finished product; however, in cases where trace amounts of a possible allergenic substance may be present, the substance is required to be declared on product labeling (18).

For some food ingredients (e.g., whey), the source (milk) of the ingredient as well as the ingredient (whey) itself may be allergenic. The source of the ingredient may or may not be listed in the ingredients statement of a food product. Some consumers may be unaware that some ingredients are possible allergens because they are not listed by their common or usual names in the ingredients statement. For example, some consumers may not know that

the source of the ingredient "whey" is milk (4).

Since 1990, the number of recalls due to undeclared food allergens has increased steadily, and the Food and Drug Administration (FDA) has received a number of reports concerning consumers who have experienced adverse reactions to an allergenic ingredient that was undeclared on the food label (5, 21). A 1999 study of 85 bakery, ice cream, and candy manufacturers found that 25 percent of the manufacturers did not list ingredients that may cause potentially fatal allergic reactions and 47 percent did not verify that their product ingredients were accurately portrayed on the product label (8).

In 2000, the Food Allergy & Anaphylaxis Network (FAAN) surveyed 550 members, including individuals who have food allergies or have family members with food allergies, at its annual conference and found that 88 percent of the respondents did not consider current food labels easy to understand and 98 percent considered current allergen information on

product packaging insufficient (13). Notably, FAAN's members are considered more educated about food allergens than the general public, and "they are struggling with these [allergen] labels (13)."

Food regulatory agencies, food manufacturers, and special interest groups are working together to increase public awareness of food allergens and provide consumers with adequate and appropriate information on food labels (5). Although the federal government does not require food manufacturers to display allergen information on food product labels, manufacturers can voluntarily use source labeling and/or supplemental allergen statements (e.g., "May Contain Peanuts") to alert consumers to possible allergens (7, 19). Some manufacturers also provide toll-free numbers or web sites that consumers can access for allergen information (13).

Our review of the literature revealed that little research has been conducted with the general public to

FIGURE 1. Types of allergen labeling discussed in focus groups

a) Source Labeling	Ingredients: ENRICHED FLOUR, VEGETABLE SHORTENING, WHEY (MILK), WHOLE WHEAT FLOUR, SUGAR.
b) Allergen Statements	Ingredients: ENRICHED FLOUR, VEGETABLE SHORTENING, WHEY (MILK), WHOLE WHEAT FLOUR, SUGAR. MAY CONTAIN TRACES OF PEANUT.
c) Bold Ingredients	Ingredients: MILK, CORN SYRUP, EGG YOLKS, SUGAR, NATURAL AND ARTIFICIAL FLAVORS.
d) Telephone Number	Ingredients: MILK, CORN SYRUP, EGG YOLKS, SUGAR, NATURAL AND ARTIFICIAL FLAVORS. If you have a question/concern related to this product, please call us at 1-888-888-8888.

determine consumers' preferences for labeling food products with possible allergens. This study used focus groups to gain a better understanding of consumers' perceptions of labeling features for food products with possible allergens. Focus groups provide useful insights into consumer thinking that are otherwise difficult to acquire through surveys or other quantitative research methods. The study explored consumers' use of ingredients statements, their preferences for allergen labeling features, and their attitudes toward a federal regulation that would require allergen statements on food products with possible allergens. The study findings suggest that some consumers would benefit from adequate and appropriate allergen information on food labels.

METHODS

A focus group generally consists of eight to ten participants who discuss selected topics with a moderator or discussion leader for approximately 1 to 2 hours (9). Focus group

discussions are usually loosely structured, with the moderator introducing topics for discussion and encouraging interaction among group members while ensuring that the discussion adheres to the main issues (12). Focus groups can provide government policy makers with answers to a variety of questions, which may be difficult to ascertain using traditional research efforts, in a timely and cost-effective manner (16).

In December 2001, six focus groups were conducted with household grocery shoppers and meal preparers at local market research facilities in Raleigh, North Carolina; Philadelphia, Pennsylvania; and St. Louis, Missouri, to provide for geographic diversity. As suggested by Greenbaum, (10) the groups were segmented by education and age to increase homogeneity within groups. In each location, one focus group was conducted with individuals who have a high school education or less and another with individuals who have a college education. Two focus groups were conducted with individuals in each of three age groups (18 to 30, 35 to 55, and 60 or older).

Besides meeting the education and age specifications established for each focus group, participants had to meet other criteria to be eligible for participation. Using contact information from facilities' databanks and a questionnaire to screen interested subjects, local market research facilities recruited individuals who have primary or shared responsibility for grocery shopping and cooking in their households and who prepare food and cook at home at least three times a week. In addition, the market research facilities recruited four males, four females, and at most three individuals who have food allergies or have household members with food allergies to participate in each group discussion. Each market research facility also recruited individuals to represent the racial diversity of the area where each group discussion was conducted.

Each focus group discussion was conducted by two experienced moderators. At the beginning of each group, the moderators encouraged interaction and asked participants to share their opinions on a variety of labeling topics (3, 14). This paper is limited to participants' discussions of food allergen labeling. Table 1 presents the primary food allergen labeling questions addressed in the moderator guide. Participants first discussed their use of ingredients statements on product labeling. Next, they discussed their preferences for labeling of products with possible allergens; this discussion included the use of source labeling and other labeling features, including supplemental allergen statements (e.g., "May Contain Peanuts") on product packaging to identify possible allergens and a toll-free number or web site that consumers can access for allergen information. Finally, participants discussed their attitudes toward a federal regulation that would require allergen statements on food products

TABLE 2. Participant Demographics (n = 48)

Gender	
Male	50%
Female	50%
Race/Ethnicity	
Non-Hispanic Caucasian	65%
Hispanic Caucasian	4%
Non-Hispanic African American	25%
Asian/Pacific Islander	2%
Other race/multiracial	2%
No response	2%
Education	
11th grade or less	2%
High school graduate or GED	44%
Some college	4%
College graduate	31%
Postgraduate	17%
No response	2%

containing possible allergens. Figure 1 presents the types of allergen labeling participants discussed in the focus groups.

Each focus group lasted approximately 90 minutes, and participants were paid an honorarium of \$50 to \$60 (depending on location) for their participation in a discussion. Each focus group was videotaped and audio recorded, and transcripts were prepared. The moderators reviewed the transcripts and videotapes to prepare a detailed summary of each focus group discussion. The detailed summaries were then systematically reviewed by the moderators to identify common themes within and across groups and any exceptions to these trends. Because the study was exploratory in nature, observational forms and independent coders were not employed as part of the analysis procedures.

RESULTS

Each focus group consisted of eight participants, for a total of 48 participants. Nineteen participants (42 percent) have food allergies or have members in their household with food allergies. Notably, most of our participants were not members of allergy networks or even especially knowledgeable about food allergies. Most participants have household members who experience moderate side effects from consuming foods with allergens. A few participants have celiac disease and must follow gluten-free diets.

Participants' ages ranged from 18 years to over 70 years, and 50 percent of participants are male. Sixty-five percent of participants are non-Hispanic Caucasian, 4 percent are Hispanic Caucasian, 25 percent are non-Hispanic African American, and

6 percent represent other races. Table 2 summarizes demographic information for the focus group participants.

Use of ingredients statements

About half of the focus group participants read the ingredients statements on food product labeling. Of those participants who read the ingredients statement, some always read them, and many only read them when trying a product for the first time. Some participants are concerned that all of the product's ingredients are not listed in the ingredients statement. Some participants find the ingredients statement confusing because they are unfamiliar with the names of many ingredients (e.g., additives and preservatives). One participant commented, "You need a dictionary to determine what some ingredients are"; a concern expressed by other participants as well.

Most participants who have food allergies or have household members with food allergies always read the ingredients statement to identify possible allergens. Several participants with food allergies do not always read the ingredients statement and rely on their knowledge and past experience with a product. A few participants also look at the picture on the product label to determine whether any allergens are present or rely on lists of "approved" foods suggested by their doctors or determined by their own experience.

Preferences for allergen labeling

For ingredients that are possible allergens, most participants want the source of the ingredient listed next to the ingredient itself in the ingredients statement (e.g., "whey [milk]"). They believe this information would be useful to consumers with food allergies in making purchase decisions, and they question why manufacturers do not currently follow this prac-

tice. A few participants prefer that only the source be listed. Several participants, particularly high school-educated seniors (aged 60+) in St. Louis, think that listing only the ingredient is sufficient. They believe it would be difficult to identify and list all possible allergens on product packaging and argue that individuals with food allergies should educate themselves and take personal responsibility for reading ingredients statements to identify possible allergens.

Participants in one group suggested that manufacturers highlight or use boldface print to list ingredients that may be common allergens. They believe this would facilitate immediate identification of possible allergens. One participant stated, "This would be very helpful for people with allergies to identify products more quickly, instead of reading an ingredient list for 20 minutes."

A few participants who have food allergies or have members in their household with food allergies would like a toll-free number on product packaging, but they admit that a toll-free number is not convenient when grocery shopping. One participant with a food allergy stated, "When you're shopping, you want to know right then and there...if it's something [a food product] I can have." Other participants are indifferent about a toll-free number or web site that consumers can access for special allergen information. One participant said, "It wouldn't hurt," while another stated, "Manufacturers who are really concerned about their relationship with their consumers will take the initiative and provide such information to their customers." Those participants who support a toll-free number or web site think the government, rather than individual food manufacturers, should sponsor it; they consider the government to be a more credible and knowledgeable source for food allergen information.

Attitudes toward mandatory allergen statements

Participants are divided on the need for a federal regulation that would require allergen statements (e.g., "May Contain Peanuts") on food products with possible allergens. Participants who support mandatory allergen statements think that such statements would be beneficial to consumers and support them for safety reasons. All of the high school-educated participants aged 35 to 55 years in Philadelphia fervently support mandatory allergen statements and insist that the federal government should require manufacturers to provide allergen statements to prevent illness and death. One participant stated, "They're [the government] supposed to be watching out for us... People can get really sick and die from certain allergies." Participants suggested that allergen statements should be prominently displayed on the front of product packaging or above the ingredients statement so consumers can easily locate them.

Participants who do *not* support mandatory allergen statements offered a variety of reasons why they think such a regulation is not necessary. Some participants think that individuals with allergies should be responsible for reading ingredients statements to check for possible allergens, and others think that manufacturers who want to meet the needs of their consumers will provide allergen statements voluntarily on their food products. Several participants doubt the usefulness of allergen statements. One participant stated, "If I'm allergic to something, I'm going to read the ingredient list anyway." Several participants think it would be difficult to provide allergen statements because there are so many different food allergies, and they are concerned about too much information on the product label.

DISCUSSION

Focus groups help researchers gain an understanding of the "why" behind consumers' attitudes and behavior (10). Although the results of focus group discussions should not be generalized to a larger population in any statistical sense (12), they can be useful in guiding food labeling decisions (6). For example, the US Department of Agriculture used focus groups in developing the Safe Handling Instructions label for raw meat and poultry packaging (17). Our focus groups provided information on consumers' use of ingredients statements, their preferences for labeling of food products with possible allergens, and their attitudes toward mandatory allergen statements. Subsequent to our study, the Food Allergen Consumer Protection Act (S.R. 2499) (20) was introduced in May 2002. If signed into law, the bill would assist consumers with food allergies by requiring, among other things, source labeling, allergen statements, and a toll-free number on food products with possible allergens.

Most focus group participants who have food allergies or have household members with food allergies always read the ingredients statements to identify possible allergens. Some focus group participants are concerned that *all* of the product's ingredients are not listed in the ingredients statements, and some find the ingredients statement confusing because they are unfamiliar with the names of many ingredients. According to FAAN, members with food allergies read ingredients statements diligently and use them to make purchasing decisions even though they believe the information is not always complete (13). Participants in one focus group suggested that manufacturers highlight or use boldface print to list ingredients that may be common allergens to facilitate immediate identification of possible allergens in

the ingredients statement. FAAN members reported the bolding or highlighting of allergens in ingredients statements helps them read labels quickly and saves time when shopping for groceries (13).

The focus group findings suggest that consumers, particularly consumers with food allergies, would find source labeling (e.g., "whey [milk]") in ingredients statements beneficial because it would help consumers with allergies avoid foods that contain possible allergens. Recent research also supports the benefit of source labeling. In a Mount Sinai School of Medicine study, only 7 percent of parents of children with milk allergies were able to identify milk ingredients (e.g., whey or sodium caseinate) in food products' ingredients statements (11). The study suggests that source labeling could help parents easily identify common food allergens and possibly avoid potentially dangerous allergic reactions.

In the focus group discussions, most participants did not find a toll-free number or web site that consumers could access for allergen information convenient because the allergen information would not be readily available at the point of purchase. According to FAAN, approximately 80 percent of its members surveyed contact manufacturers for allergen information (13); these results are inconsistent with our findings. A toll-free number or web site may be appealing only to consumers who have food allergies or have members in their household who have food allergies.

The focus group discussions reveal no consensus among participants in support of a federally mandated requirement to provide allergen statements for food products with possible allergens. Some think that such labeling would be beneficial to consumers and support it for safety reasons, while others do not. Currently, some manufacturers voluntarily use supplemental allergen statements (e.g., "Contains Soy" or "May Contain Peanuts") to provide consumers with special allergen information. Accord-

ing to FAAN survey results, the majority of members surveyed avoid food products with allergen statements on the packaging, but the use of "may contain" statements is confusing to consumers. They question whether the allergen is actually present in the product, sometimes assuming it is not, thereby putting themselves or their children at potential risk (13).

The focus group findings suggest that source labeling would be beneficial to consumers in that it would help decrease consumers' confusion and increase the usefulness of the information consumers obtain from ingredients statements. Additionally, some consumers would find allergen statements useful in allowing them to avoid foods that contain possible allergens. Manufacturers can use the study findings to inform their labeling practices.

ACKNOWLEDGMENTS

This research was made possible by funding from the Food Safety and Inspection Service (FSIS) of the US Department of Agriculture (Contract No. 53-3A94-98-03, Delivery Order 19). We thank Donald Anderson of RTI for his review of the draft manuscript. We also thank all of the focus group members who participated. This paper was prepared by the authors alone and does not necessarily represent the views of FSIS.

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Actions from the 3-A SSI Standards Committee Annual Meeting

The 3-A Sanitary Standards Committees met from May 17 to 21, 2004 in Milwaukee, WI. In plenary session, 9 T-documents were considered for approval. The following were approved for publication and distribution with an effective date to be assigned after all signatures are received.

- 3-A Sanitary Standards for: Multiple-Use Plastic Materials Used as Product Contact Surfaces, Number 20-23
- 3-A Sanitary Standards for: Silo-Type Storage Tanks, Number 22-08
- 3-A Sanitary Standards for: Double-Seat Mixproof Valves, Number 85-00
- 3-A Accepted Practices for: Supplying Air Under Pressure for Contact with Product or Product Contact Surfaces, Number 604-05
- 3-A Accepted Practices for: Spray Drying Systems, Number 607-05
- 3-A Accepted Practices for: Method of Producing Steam of Culinary Quality, Number 609-03

For additional information on the 3-A Sanitary Standards, visit www.3-a.org or call 3-A SSI at 703.790.0295

Treatment Options to Eliminate or Control Growth of *Listeria monocytogenes* on Raw Material and on Finished Product for the Smoked Fish Industry

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SUMMARY

The Smoked Seafood Working Group (SSWG), a collaboration of the National Fisheries Institute, the National Food Processors Association, several smoked fish processors and universities, reviewed scientific papers that describe possible treatments to eliminate or reduce the amount of *Listeria monocytogenes* present on incoming raw material and eliminate or minimize its growth on finished product. Suggested treatment options that are approved for use on seafood, can be used by most commercial smoked fish companies, and have potential to significantly reduce *L. monocytogenes* numbers on incoming raw fish include (1) washing of raw fish with water containing chlorine and (2) treatment of raw fish with calcium hydroxide solution (pH 12). Other potential treatments approved for raw materials include washing of fish with acidified sodium chlorite solutions, ozone treatment, steam surface pasteurization, and electrochemical brine tank treatments. Treatment options to control *L. monocytogenes* on finished product include (1) freezing of finished product to stop growth; and (2) addition of approved chemical growth inhibitors. Other treatment options that have potential to eliminate *L. monocytogenes* or control its growth on finished product but that are not currently approved for use on seafood include addition of natural growth inhibitors, addition of high levels of *Carnobacterium piscicola* ($\sim 2 \times 10^6$ CFU/g), and irradiation. All treatment options require validation under commercial processing conditions.

A peer-reviewed article

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INTRODUCTION

Listeria monocytogenes is an organism found throughout the fish processing environment and on the fish itself (18, 31). *L. monocytogenes* has been isolated from many types of refrigerated foods, including ready-to-eat (RTE) meat sandwiches, deli-type salads, cheeses, deli-meats, frankfurters, and cold smoked fish products (26). *L. monocytogenes* is a Gram positive, foodborne pathogen that is psychrotrophic and halo-tolerant (6, 44). Under optimal conditions, it grows in the range of 1 to 45°C and at salt concentrations between zero and 10% NaCl. It grows in many food products that have an extended shelf life (4, 41, 42). Ready-to-eat products that support growth and do not receive additional heat treatment by consumers can contain high numbers of *L. monocytogenes* by the time of consumption. Ready-to-eat fish products have been linked to sporadic cases of listeriosis outside of the United States and epidemiological evidence specifically suggests that listeriosis has been caused by smoked mussels (7), "gravid" trout (21), and smoked trout (36).

Listeria monocytogenes has been isolated from seafood products such as smoked fish, cooked and frozen seafoods, marinated fish, and surimi (16). Studies have reported prevalences of 6 to 36% in RTE cold smoked salmon and cooked fishery products (5), although a recent survey by the National Food Processors Association (NFPA) suggests a prevalence of about 5% in smoked fish produced in the United States (26). These studies raise concern regarding the survival and growth potential of *L. monocytogenes*, including in seafoods and other RTE foods. The ingestion of high numbers of *L. monocytogenes* is a significant health threat for people in high risk groups such as the immunocompromised, the elderly, pregnant women and their fetuses, and neo-

nates. In these groups, the mortality from listeriosis can be as high as 20–30% (35). Foods implicated in past major listeriosis outbreaks were products in which *L. monocytogenes* was able to grow to large numbers prior to consumption (27). In the United States, federal agencies with responsibility for public health and food protection established a zero tolerance for *L. monocytogenes* (< one organism per 25 g sample) in RTE foods (45).

Farber (22) reported that moderate to severe temperature abuse of contaminated fish products may greatly enhance the growth of *Listeria* spp. on fish. Nevertheless, because of the low naturally occurring levels of *L. monocytogenes* and the relatively short shelf life of many fishery products, *Listeria*-contaminated fish stored at temperatures $\leq 4^{\circ}\text{C}$ or lower present little risk to public health. Although the minimum infective dose for *L. monocytogenes* has not been established, there is little evidence that low numbers cause listeriosis (10, 22). Saguy (43) predicted that, on products stored under typical retail and consumer temperature conditions, *L. monocytogenes* numbers can reach levels that could cause infections in people with immune compromised systems. Without appropriate interventions, the number of human listeriosis cases could increase during the next several decades because of the continuing increase in the proportion of the population that is highly susceptible to this disease (e.g., elderly and immuno compromised individuals) (8, 23).

The Institute of Food Technologists (IFT) assembled an expert panel to review processing parameters for cold smoked fishery products with respect to pathogens, including *L. monocytogenes* (31). The report concluded that reduction of *L. monocytogenes* in the processing plant was directly dependent on adherence to Good Hygienic Practices

(GHPs) and Good Manufacturing Practices (GMPs) (31). Areas in the processing plant that require particular attention include the brine, injection needles, and slicing equipment. This report also identified other methods to control *L. monocytogenes* in fishery products (e.g., frozen storage, adding nitrite, lactate, sorbate, and bacteriocins) (31). This document presents recommendations on control of *L. monocytogenes* on raw materials to be used for production of smoked seafood products, and on finished product. These recommendations were developed as a consensus document by the Smoked Seafood Working Group (SSWG), a collaboration of the National Fisheries Institute, the National Food Processors Association, several smoked fish processors and universities (24). This is the third in a series of four papers describing critical components of a *L. monocytogenes* control program for smoked seafood plants. The papers include (1) development of targeted GMP and sanitation procedures to prevent finished product contamination (24); (2) implementation of *Listeria* testing programs (in preparation); (3) control of *L. monocytogenes* in raw materials and finished product (this manuscript); and (4) implementation of employee training programs (28).

L. MONOCYTOGENES CONTROL ON RAW MATERIALS

As part of an overall *Listeria* control program, processors of RTE seafood products must decide how to reduce or minimize *Listeria* contamination of raw materials brought into a plant. As noted above, *L. monocytogenes* can be present on raw food products such as fish and shellfish. The prevalence of *L. monocytogenes* contamination on raw fish intended for smoking can vary significantly from one source to another (20, 29, 48). Processors should also evaluate

the need for raw material controls based on the type of processes utilized. The hot smoking process contains a listericidal step, and the testing or treatment of raw materials may not be as important as for cold smoking, which does not include a lethal heat treatment. Regardless of the process, smoked seafood processors should consider the importance of raw material as a source of *Listeria* contamination in the plant environment, since studies have shown that environmental sites and equipment in the plant are the most likely source of finished product contamination with *L. monocytogenes* (3, 32, 39). Testing of raw materials is one method to monitor and control products from different suppliers that may be contaminated with *Listeria*. Another control option is to use processing treatments to eliminate *L. monocytogenes* or reduce the numbers of the organism on the incoming raw material.

Raw material testing

Processors may wish to consider testing fresh or frozen fish from various suppliers to evaluate contamination levels associated with specific species, suppliers or sources. Detailed information on testing procedures for raw materials is provided in another manuscript in this series. The type and frequency of testing is likely to be influenced by the species used and products produced, previous supplier performance, and other factors. Fresh fish are more likely to have higher numbers of *Listeria* because they are stored at refrigeration temperatures where the organism can grow. Frozen fish may also be contaminated with *Listeria* but may contain lower numbers because they are stored at freezer temperatures that are too low for *Listeria* growth. However, the potential for temperature abuse of either fresh or frozen fish should be considered when evaluating raw material sources.

Raw material treatments

Processors may wish to consider options to treat raw materials to reduce *L. monocytogenes* in lieu of raw material testing and/or in addition to testing. Treatments for controlling *L. monocytogenes* can be applied to the raw materials by the primary supplier, or by the processor after the raw material is received, or immediately before use. Two methods for treating raw material (non-prioritized) discussed below are available to most large and small smoked seafood processors. They do not require large investments of capital and equipment, and they can reduce numbers of *L. monocytogenes* on incoming raw material. In addition to the first two methods, summary information is also provided on other possible treatments to control *L. monocytogenes* on raw material. The practical application of these treatments may be limited by a variety of factors, which may include (1) lack of explicit regulatory approval of a treatment that is likely to be effective; (2) evidence indicating that approved treatments may not be effective in eliminating *L. monocytogenes*; and (3) absence of scientific studies validating the effectiveness of specific treatments on fish or other seafood products.

CHLORINE

Washing raw fish in a dilute chlorine solution can reduce the amount of *Listeria* contamination on raw fish. Chlorine concentrations in excess of 10 ppm (the level considered by the FDA to be GRAS [Generally Recognized as Safe]) are not allowed by the FDA to come into contact with seafood products. Firms using higher chlorine levels risk being cited during a regulatory inspection. However, many research studies have been conducted using higher concentrations of chlorine. For example, Eklund et al., (19) recommended thawing frozen

fish in running water containing 20–30 ppm chlorine and exposing unfrozen fish to 20–30 ppm chlorine for 1 to 2 h. However, he reported that even at these concentrations, the treatment would not ensure that the raw material is completely free of *L. monocytogenes* (19). The use of thaw tanks instead of running water is also an option for thawing frozen fish. Bremer and Osborne (6) conducted studies to determine optimum industrial scale washing regimes for thawing fish. They reported that flow regime with a turnover rate of 0.75 cycles/h for 72 min with 130 ppm chlorine provided optimum *L. monocytogenes* reduction.

Control using food grade calcium hydroxide

As an alternative to chlorine, high pH treatments may be considered to reduce *L. monocytogenes* contamination on raw materials. Studies at the University of Alaska showed that food grade calcium hydroxide CaOH_2 (GRAS) (14) can be used to reduce *L. monocytogenes* contamination on headed and gutted (H&G) salmon (53). Raw salmon were inoculated with *L. monocytogenes* at two different levels ($\sim 10^4$ CFU/cm² and $\sim 10^6$ CFU/cm²) and then held in a water solution containing calcium hydroxide (pH 12.9) for 3, 6, and 9 h. Results indicate that *L. monocytogenes* numbers at the lower inoculum (i.e., 10^4 CFU/cm²) were reduced to 10^2 CFU/cm² at 3 h and to less than 10^1 CFU/cm² in 6–9 h. At the higher inoculum concentration (i.e., 10^6 CFU/cm²), *L. monocytogenes* numbers decreased to approximately 10^4 CFU/cm² at 3–6 h, and to 10^3 CFU/cm² after 9 h in limed water.

Other raw material treatments

A variety of other treatments have been studied and evaluated for their effectiveness in reducing pathogens, including *L. monocytogenes*, in many

different food products. A brief summary of other potential treatments is provided below. One of the suggested treatments, chlorine dioxide, is not currently approved for use on seafood products, but anecdotal reports by industry indicate that it may have potential to reduce *Listeria* contamination on incoming raw material.

Acidified sodium chlorite

Acidified sodium chlorite (ASC) is an antimicrobial compound recognized for its disinfectant properties and ability to control harmful microorganisms. In August 1999, the FDA approved ASC for direct contact on seafood at a concentration of 40–50 ppm in water in accordance with industry standards and GMPs (11). Seafoods intended to be eaten raw, and treated with ASC, must be rinsed with potable water prior to consumption (11).

Acidified sodium chlorite does not appear to be highly effective for reducing numbers of Gram positive organisms on seafood products. Su and Morrissey (46) reported that *L. monocytogenes* levels were reduced by only 0.52 log after salmon inoculated with *L. monocytogenes* were washed with an ASC solution of 50 ppm. Slight additional reductions (0.62 log) were observed when the salmon were first washed with ASC, followed by storage in ice containing ASC. Depending on the level of contamination, such reductions may or may not be adequate.

Ozone

The FDA has approved the use of ozone in the gas or liquid form for direct contact with foods including meat, poultry, and seafood, when used according to GMPs (13). Khadre et al. (33) reported that ozone is effective for decontaminating produce, equipment, food contact surfaces and the general processing environment.

The use of ozone to decontaminate meat products may have limited efficacy due to the high ozone demand of meat proteins. Bacteria imbedded in the meat surface may also be more resistant to ozone treatments. Goche and Cox (25) evaluated the effects of ozone for reducing total plate count numbers on H&G salmon. They concluded that ozone was at least as effective as chlorine for reducing total plate count numbers, but tests were not conducted against *L. monocytogenes*.

Steam surface pasteurization

Bremer and Osborne (6) evaluated the use of a pilot steam treatment system for reducing *L. monocytogenes* contamination on exterior surfaces of king salmon. A four-log reduction in *L. monocytogenes* was achieved after an eight second steam treatment. The researchers reported that an in-plant system was subsequently shown to reduce “naturally” occurring *L. monocytogenes* while maintaining a high quality final product.

Electrochemical brine tank treatment

Ye et al. (52) reported that a continuous in-line electrochemical treatment system was effective in controlling *L. monocytogenes* levels in brine tanks. An average D-value of 1.61 min was achieved at 7mA/cm² current in fresh brine (t = 0 h). In used brine (t = 20 h), the D-value was 2.5 min at 35mA/cm².

Chlorine dioxide

Chlorine dioxide (ClO₂) is not specifically approved for use on seafood products, but at a concentration not to exceed 3 ppm it is approved as an antimicrobial agent in water to wash poultry, fruits and vegetables (12). One advantage of ClO₂, compared with chlorine, is that it is stable in a high organic environment, and

retains some sanitizing capability up to pH 10.0. However, it is more expensive than liquid chlorine, and an on-site generating system is required (50). Kim et al. (34) evaluated the effect of three different chlorine dioxide concentrations (40, 100, and 200 ppm available ClO₂) on reduction of bacterial numbers on red grouper (*Epinephelus morio*), salmon (*Salmo salar*), shrimp (*Penaeus aztecus*) and Calico scallops (*Aequipecten gibbus*). The ability of chlorine dioxide to reduce *L. monocytogenes* levels was not evaluated. The results indicate that chlorine dioxide reduced bacterial numbers at all concentrations, but was more effective at higher concentrations. However, concentrations of 100 and 200 ppm bleached the skin of red grouper and salmon.

L. MONOCYTOGENES CONTROL ON FINISHED PRODUCT

The cold smoking process, unlike hot smoking, does not include a listericidal kill step. Recent in-plant studies using molecular subtyping techniques indicate that the processing plant environment is responsible for most incidences of finished product contamination on both hot and cold smoked products (3, 32, 39). Contamination from the processing plant environment during or after processing appears to be the major source of finished product contamination for other RTE foods as well (49). Thus, finished products may need to be treated to eliminate *L. monocytogenes* even if steps have been taken to prevent post-processing contamination of finished products with *L. monocytogenes*. Cross contamination of RTE products with *L. monocytogenes* from the plant environment can be due to poor plant sanitation practices, poor personnel hygienic practices, poor food handling practices, etc.

Finished product testing

Finished product testing is not an essential part of a *L. monocytogenes* control program. Many manufacturers conduct product testing at the request of their customers. Manufacturers may also use periodic testing of finished products as confirmation that sanitation programs and other *L. monocytogenes* control measures are effective. When considering finished product testing, the implications of current government policies as well as finding low levels of contamination should be carefully considered (30). Detailed information on finished product testing options is provided in another manuscript in this series.

Finished product treatments

Processors must consider options to minimize or prevent the growth of *L. monocytogenes* on finished products from the time they are produced until they are consumed. Although the amount and frequency of contamination is likely to be low for processors with effective *Listeria* controls, the potential for growth during the product's shelf life should be considered for some products. Information about treatment options that may be available to processors is summarized below. The practical application of these treatments may be limited by a variety of factors, including those listed for raw material treatments.

Freezing product

Freezing the finished product is an effective method to prevent the growth of *L. monocytogenes*. Freezing does not eliminate *L. monocytogenes* (if present) on the finished product, but *L. monocytogenes* will not grow in frozen storage. However, prolonged refrigerated storage of the finished product, after thawing, can result in growth of *L. monocytogenes* on the finished product. Freezing and prolonged frozen storage of finished product can also adversely affect the sensory properties of the product.

Natural growth inhibitors

Natural growth inhibitors such as nisin and ALTA™ 2341 are not currently approved for use in seafood, but some data indicate that these additives have potential to help control growth of *L. monocytogenes* on finished product. For example, in one study, smoked salmon slices were inoculated with a mixture of seven *L. monocytogenes* isolates (2.5 log₁₀ CFU/g), treated with nisin (400 or 1250 IU/g) or ALTA™ 2341 (0.1 or 1%), packaged under vacuum or 100% CO₂ and then stored at 4°C for 28 days or 10°C for 9 days. Untreated (i.e., no added nisin or ALTA™ 2341) inoculated salmon fillets were also packaged and stored at 4°C for 28 days or 10°C for 9 days (47). The results indicate that nisin and ALTA™ 2341 retarded growth of *L. monocytogenes* in the vacuum-packaged product. However, under 100% CO₂, *L. monocytogenes* growth was prevented for all nisin and ALTA™ 2341 treated samples (47).

In another study, Nilsson et al., (38) added nisin (500 or 1000 IU/g) to cold smoked salmon inoculated with six strains of *L. monocytogenes* (~10³ CFU/g), vacuum packaged the salmon and stored it at 5°C. Under vacuum-packaging conditions, growth of *L. monocytogenes* was delayed but not prevented (i.e., *L. monocytogenes* increased to 10⁸ CFU/g in 8 days). However, packaging under 100% CO₂ with added nisin (500 or 1000 IU/g) resulted in a 1 to 2 log reduction in *L. monocytogenes* numbers and an 8 and 20 day lag phase, respectively (38).

Chemical growth inhibitors

Pelroy et al. (40) used committed raw salmon, inoculated with 10 *L. monocytogenes*/g, to determine the effects of combinations of sodium lactate, sodium chloride, and sodium nitrite on *L. monocytogenes* growth. The samples were vacuum packaged

and stored at 5°C or 10°C. The results indicate that a combination of 2% sodium lactate and 3% water phase salt (WPS) inhibited the growth of *L. monocytogenes* stored at 5°C for 50 days. At 10°C, total growth inhibition of *L. monocytogenes* for 35 days required 3% sodium lactate and 3% WPS, or 2% sodium lactate and 125 ppm sodium nitrite NaNO₂ (40). However, industry experience suggest that it is difficult to achieve sufficient levels of sodium lactate (i.e., 2–3%) in the finished product to control *L. monocytogenes* growth. In the United States, NaNO₂ is approved for use only in smoked cured tunafish (10 ppm) and smoked cured salmon, chubs, sablefish, and shad, with concentrations not to exceed 200 ppm (2).

Competitive lactic acid bacteria flora

The use of competitive lactic acid bacteria to control growth of *L. monocytogenes* on smoked fish products has not been given GRAS status by the FDA; however, some data indicates that it has potential for controlling growth of *L. monocytogenes* on finished product. For example, in one study, *Lactobacillus sake* strain LKES5 and four strains of *Carnobacterium piscicola* were inoculated on cold smoked salmon (37). The authors reported that inoculum levels of ~2 × 10⁶ CFU/g of a bacteriocin-producing strain of *Carnobacterium piscicola* (A9b) and a non bacteriocin-producing strain (A10a) caused no undesirable sensory changes, and controlled the growth in cold smoked salmon of *L. monocytogenes* strain O157 inoculated at ~2 × 10² CFU/g. However, *L. sake* LKES5 caused strong sulfurous flavors in the cold smoked salmon product. In a separate study, Duffes et al. (17) reported that *Carnobacterium piscicola* V1 was bactericidal and *C. divergens* V41 was bacteriostatic to *L. monocytogenes* in vacuum packaged cold smoked salmon stored at 4°C and 8°C, respectively.

Irradiation

Research conducted on seafood products since the mid-1950s has demonstrated that ionizing radiation can help maintain the safety, quality and freshness of seafood products (1). The World Health Organization (WHO) reported that irradiation is an effective process that can improve the safety and quality of our food supply (51). The Centers for Disease Control and Prevention (CDC) stated that irradiation can prevent foodborne illnesses, and that overwhelming evidence indicates that when irradiated, foods are not made dangerous and the nutritional values remain unchanged (9). In the United States, the FDA has approved irradiation for wheat flour, white potatoes, pork, fruits and vegetables, poultry, and fresh and frozen uncooked red meat, but not seafood (9). Petitions have been submitted to the FDA to approve irradiation of molluscan shellfish (1999) and crustaceans (2000), but approval has not been granted (15).

SUMMARY

Listeria monocytogenes can be a contaminant on raw fish and can be present on finished products if there is no kill step in its processing. The presence of *L. monocytogenes* on finished product can also occur through post-processing contamination from the plant environment, and/or from poor personnel hygiene or poor food handling practices. Raw product testing or pathogen reduction treatments can help to reduce or eliminate *L. monocytogenes* on raw material and possibly reduce the levels of *L. monocytogenes* in the plant environment. Similarly, pathogen reduction treatments can also reduce or eliminate *L. monocytogenes* on finished product.

A number of treatments are approved by the FDA for use on raw materials or on finished product. They are also likely to be available to most

smoked seafood processors and have been demonstrated to control or reduce numbers of *L. monocytogenes*. However, they require validation under actual commercial processing conditions. Treatments for raw material include: (1) washing raw fish with water containing chlorine; and (2) treating raw fish with calcium hydroxide solution (pH 12). Treatments for finished product include: (1) freezing to stop growth; and (2) addition of approved chemical growth inhibitors.

ACKNOWLEDGMENTS

This project was supported by the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture, under Agreement No. 00-51110-9769. Any opinions, findings, conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the Department of Agriculture. The authors wish to thank and acknowledge the individuals from the smoked seafood firms who participated in the Smoked Seafood Working Group, including: Frank Costanzo, Service Smoked Fish Corporation, Brooklyn, NY; Dusty Batley and Mike Strang, Ducktrap River Fish Farm, Belfast, ME; Jim Yonker, Ocean Beauty Seafood, Seattle, WA; Doug Mohar, Morey's Seafood International, Golden Valley, MN; Ken Molfese, Vita Food Products, Chicago, IL; and Dave Caslow, Acme Smoked Fish, Brooklyn, NY. The experience, expertise, time and commitment that each of these individuals contributed to this effort provides an exceptional example of the type of industry collaboration and cooperation needed to solve difficult food safety issues such as those posed by *Listeria monocytogenes* for manufacturers of ready-to-eat foods like smoked seafood.

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- D1180 10 Points to Dairy Quality**—(10 minute videotape). Provides in-depth explanation of a critical control point in the residue prevention protocol. Illustrated with on-farm, packing plant, and milk-receiving plant scenes as well as interviews of producers, practicing veterinarians, regulatory officials and others. (Dairy Quality Assurance—1992) (Reviewed 1998)
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- D1040 Ether Extraction Method for Determination of Raw Milk**—(26 minute videotape). Describes the ether extraction procedure to measure milkfat in dairy products. Included is an explanation of the chemical reagents used in each step of the process. (CA—1988) (Reviewed 1998)
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- D1060 Frozen Dairy Products**—(27 minute videotape). Developed by the California Department of Food and Agriculture. Although it mentions the importance of frozen desserts, safety and checking ingredients; emphasis is on what to look for in a plant inspection. Everything from receiving, through processing and cleaning and sanitizing is outlined, concluded with a quality control program. Directed to plant workers and supervisors, it shows you what should be done. (CA—1987) (Reviewed 1997)
- D1070 The Gerber Butterfat Test**—(7 minute videotape). Describes the Gerber milkfat test procedure for dairy products and compares it to the Babcock test procedure. (CA—1990) (Reviewed 1998)
- D1080 High-Temperature, Short-Time Pasteurizer**—(59 minute videotape). Provided by the Dairy Division of Borden, Inc. It was developed to train pasteurizer operators and is well done. There are seven sections with the first covering the twelve components of a pasteurizer and the purpose and operation of each. The tape provides the opportunity for discussion after each section or continuous running of the videotape. Flow diagrams, processing and cleaning are covered. (Borden, Inc.—1986) (Reviewed 1997)
- D1090 Managing Milking Quality**—(33 minute videotape). This training video is designed to help dairy farmers develop a quality management process and is consistent with ISO 9000 certification and HACCP processes. The first step is to evaluate the strengths and weaknesses of a dairy operation. The video will help you find ways to improve the weaknesses that are identified on your farm.
- D1100 Mastitis Prevention and Control**—(2-45 minute videotapes). This video is ideal for one-on-one or small group presentations. Section titles include: Mastitis Pathogens, Host Defense, Monitoring Mastitis, Mastitis Therapy, Recommended Milking Procedures, Postmilking Teat Dip Protocols, Milk Quality, Milking Systems. (Nasco—1993)
- D1105 Milk Hauler Training**—(35 minute videotape). This video covers the procedures and duties of the Milk Hauler from the time of arrival at the dairy farm, to the delivery of the milk at the processing plant. It also provides the viewer with a general understanding of the quality control issues involved in milk production and distribution. Topics include milk composition breakdown, milk fat content measurement, testing for added water, antibiotic and pesticide residues, somatic cell and bacteria counts, sediment, and aflatoxins. (Avalon Mediaworks LLC—2003)
- D1110 Milk Plant Sanitation: Chemical Solution**—(13 minute videotape). This explains the proper procedure required of laboratory or plant personnel when performing chemical titration in a dairy plant. Five major titrations are reviewed... alkaline wash, presence of chlorine and iodophor, and caustic wash and an acid wash in a HTST system. Emphasis is also placed on record keeping and employee safety. (1989)
- D1120 Milk Processing Plant Inspection Procedures**—(15 minute videotape). Developed by the California Department of Food and Agriculture. It covers pre- and post-inspection meeting with management, but emphasis is on inspection of all manual and cleaned in place equipment in the receiving, processing and filling rooms. CIP systems are checked along with recording charts and employee locker and restrooms. Recommended for showing to plant workers and supervisors. (CA—1986)

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- D1130 Pasteurizer – Design and Regulation**—(16 minute videotape). This tape provides a summary of the public health reasons for pasteurization and a nonlegal definition of pasteurization. The components of an HTST pasteurizer, elements of design, flow-through diagram and legal controls are discussed. (Kraft General Foods—1990) (Reviewed 1998)
- D1140 Pasteurizer – Operation**—(11 minute videotape). This tape provides a summary of the operation of an HTST pasteurizer from start-up with hot water sanitization to product pasteurization and shut-down. There is an emphasis on the legal documentation required. (Kraft General Foods—1990) (Reviewed 1998)
- D1150 Processing Fluid Milk**—(30 minute—140 slides—script—tape). This slide set was developed to train processing plant personnel on preventing food poisoning and spoilage bacteria in fluid dairy products. Emphasis is on processing procedures to meet federal regulations and standards. Processing procedures, pasteurization times and temperatures, purposes of equipment, composition standards, and cleaning and sanitizing are covered. Primary emphasis is on facilities such as drains and floors, and filling equipment to prevent post-pasteurization contamination with spoilage or food poisoning bacteria. It was reviewed by many industry plant operators and regulatory agents and is directed to plant workers and management. (Penn State—1987) (Reviewed 1998)

ENVIRONMENTAL

- E3010 The ABCs of Clean—A Handwashing & Cleanliness Program for Early Childhood Programs**—For early childhood program employees. This tape illustrates how proper handwashing and clean hands can contribute to the infection control program in daycare centers and other early childhood programs. (The Soap & Detergent Association—1991)
- E3020 Acceptable Risks?**—(16 minute videotape). Accidents, deliberate misinformation, and the rapid proliferation of nuclear power plants have created increased fears of improper nuclear waste disposal, accidents during the transportation of waste, and the release of radioactive effluents from plants. The program shows the occurrence of statistically anomalous leukemia clusters; governmental testing of marine organisms and how they absorb radiation; charts the kinds and amounts of natural and man-made radiation to which man is subject; and suggests there is no easy solution to balancing our fears to nuclear power and our need for it. (Films for the Humanities & Sciences, Inc.—1993) (Reviewed 1998)

- E3030 Air Pollution: Indoor**—(26 minute videotape). Indoor air pollution is in many ways a self-induced problem...which makes it no easier to solve. Painting and other home improvements have introduced pollutants, thermal insulation and other energy-saving and water-proofing devices have trapped the pollutants inside. The result is that air pollution inside a modern home can be worse than inside a chemical plant. (Films for the Humanities & Sciences, Inc.) (Reviewed 1998)
- E3031 Allergy Beware**—(15 minute videotape). Designed to educate food and beverage company employees about their role in preventing an accidental allergic reaction caused by a product their company produces. Recommended for product development, production, labeling, scheduling and cleaning. Everyone has an important role to prevent cross-contamination and mislabeling issues. (Food and Consumer Products Manufacturers of Canada—2003)
- E3040 Asbestos Awareness**—(20 minute videotape). This videotape discusses the major types of asbestos and their current and past uses. Emphasis is given to the health risks associated with asbestos exposure and approved asbestos removal abatement techniques. (Industrial Training, Inc.—1988) (Reviewed 1998)
- E3055 Effective Handwashing—Preventing Cross-Contamination in the Food Service Industry**—(3 1/2 minute videotape). It is critical that all food service workers wash their hands often and correctly. This video discusses the double wash method and the single wash method and when to use each method. (Zep Manufacturing Company—1993)
- E3060 EPA Test Methods for Freshwater Effluent Toxicity Tests (Using Ceriodaphnia)**—(22 minute videotape). Demonstrates the Ceriodaphnia 7-Day Survival and Reproduction Toxicity Test and how it is used to monitor and evaluate effluents for their toxicity to biota and their impact on receiving waters and the establishment of NPDES permit limitations for toxicity. The tape covers the general procedures for the test including how it is set up, started, monitored, renewed and terminated. (1989) (Reviewed 1998)
- E3070 EPA Test Methods for Freshwater Effluent Toxicity Tests (Using Fathead Minnow Larva)**—(15 minute videotape). A training tape that teaches environmental professionals about the Fathead Minnow Larval Survival and Growth Toxicity Test. The method described is found in an EPA document entitled, "Short Term Methods for Estimating the Chronic Toxicity of Effluents & Receiving Waters to Freshwater Organisms." The tape demonstrates how fathead minnow toxicity tests can be used to monitor and evaluate effluents for their toxicity to biota and their impact on receiving waters and the establishment of NPDES permit limitations for toxicity. (1989) (Reviewed 1998)
- E3075 EPA: This is Super Fund**—(12 minute videotape). Produced by the United States Environmental Protection Agency (EPA) in Washington, D.C., this videotape focuses on reporting and handling hazardous waste sites in our environment. The agency emphasizes community involvement in identifying chemical waste sites and reporting contaminated areas to the authorities. The primary goal of the "Super Fund Site Process" is to protect human health and to prevent and eliminate haz-

ardous chemicals in communities. The film outlines how to identify and report abandoned waste sites and how communities can participate in the process of cleaning up hazardous sites. The program also explains how federal, state and local governments, industry and residents can work together to develop and implement local emergency preparedness/response plans in case chemical waste is discovered in a community.

- E3080** **Fit to Drink**—(20 minute videotape). This program traces the water cycle, beginning with the collection of rain-water in rivers and lakes, in great detail through a water treatment plant, to some of the places where water is used, and finally back into the atmosphere. Treatment of the water begins with the use of chlorine to destroy organisms; the water is then filtered through various sedimentation tanks to remove solid matter. Other treatments employ ozone, which oxidizes contaminants and makes them easier to remove; hydrated lime, which reduces the acidity of the water; sulfur dioxide, which removes any excess chlorine; and flocculation, a process in which aluminum sulfate causes small particles to clump together and precipitate out. Throughout various stages of purification, the water is continuously tested for smell, taste, titration, and by fish. The treatment plant also monitors less common contaminants with the use of up-to-date techniques like flame spectrometers and gas liquefaction. (Films for the Humanities & Sciences, Inc.—1987)
- E3110** **Garbage: The Movie**—(25 minute videotape). A fascinating look at the solid waste problem and its impact on the environment. Viewers are introduced to landfills, incinerators, recycling plants and composting operations as solid waste management solutions. Problems associated with modern landfills are identified and low-impact alternatives such as recycling, reuse, and source reduction are examined. (Churchill Films) (Reviewed 1998)
- E3120** **Global Warming: Hot Times Ahead**—(23 minute videotape). An informative videotape program that explores the global warming phenomenon and some of the devastating changes it may cause. This program identifies greenhouse gases and how they are produced by human activities. Considered are: energy use in transportation, industry and home; effects of deforestation, planting of trees and recycling as means of slowing the build-up of greenhouse gases. (Churchill Films—1995)
- E3125** **Good Pest Exclusion Practices**—(28 minute videotape). Most pests you find inside come from outside your food plant. This video covers numerous tactics of keeping pests out of food processing and distribution operations. Tactics include grounds, landscaping and building design; inbound trailer and bulk transportation materials inspection; and key employee actions. Learn how to defend your perimeter with one of the best weapons in the battle against pests—exclusion. (CTI Publications—2004)
- E3128** **Integrated Pest Management (IPM)**—(28 minute videotape). This video develops the IPM concept into a comprehensive 12-point program. To emphasize this concept, computer-animated, digital graphics are used to piece together the IPM puzzle. This dramatic effect assists participants in visualizing and retaining key points of the video. To paint the

complete picture, each of the 12 points is discussed providing an IPM overview. (CTI Publications—2004)

- E3130** **Kentucky Public Swimming Pool & Bathing Facilities**—(38 minute videotape). Developed by the Lincoln Trail District Health Department in Kentucky and includes all of their state regulations which may be different from other states, provinces and countries. This tape can be used to train those responsible for operating pools and waterfront bath facilities. All aspects are included of which we are aware, including checking water conditions and filtration methods. (1987). (Reviewed 1998)
- E3131** **Key Pests of the Food Industry**—(28 minute videotape). Many types of pests can cause waste and loss of profits. Keeping food processing operations free of pest problems is a challenge. This video will assist food plant employees in the review of basic identification, biology, habits and control options of three key groups of pests frequently associated with food processing operations: birds, insects and rodents. (CTI Publications—2004)
- E3161** **The Kitchen Uncovered Orkin Sanitized EMP**—(13 minute videotape). This video teaches restaurant workers what they can do to prevent pest infestation, and what health inspectors look for. An excellent training tool for food service workers that can be used in conjunction with HACCP instruction. (Orkin Pest Control—1997)
- The New Superfund. What It Is & How It Works**—A six-hour national video conference sponsored by the EPA. Target audiences include the general public, private industry, emergency responders and public interest groups. The series features six videotapes that review and highlight the following issues:
- E3170** **Tape 1—Changes in the Remedial Process: Clean-up Standards and State Involvement Requirements**—(62 minute videotape). A general overview of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and the challenge of its implementation. The remedy process — long-term and permanent clean-up is illustrated step-by-step, with emphasis on the new mandatory clean-up schedules, preliminary site assessment petition procedures and the hazard ranking system/National Priority List revisions. The major role of state and local government involvement and responsibility is stressed.
- E3180** **Tape 2—Changes in the Removal Process: Removal and Additional Program Requirements**—(48 minute videotape). The removal process is a short-term action and usually an immediate response to accidents, fires and illegal dumped hazardous substances. This program explains the changes that expand removal authority and require procedures consistent with the goals of remedial action.
- E3190** **Tape 3—Enforcement & Federal Facilities**—(52 minute videotape). Who is responsible for SARA clean-up costs? Prin-

ciples of responsible party liability; the difference between strict, joint and several liability; and the issue of the innocent land owner are discussed. Superfund enforcement tools-mixed funding, De Minimis settlements and the new nonbinding preliminary allocations of responsibility (NBARs) are explained.

E3210 Tape 4-Emergency Preparedness & Community Right-to-Know-(48 minute videotape). A major part of SARA is a free-standing act known as Title III: The Emergency Planning and Community Right-to-Know Act of 1986, requiring federal, state, and local governments and industry to work together in developing local emergency preparedness/response plans. This program discusses local emergency planning committee requirements, emergency notification procedures, and specifications on community right-to-know reporting requirements such as using OSHA Material Safety Data Sheets, the emergency & hazardous chemical inventory and the toxic chemical release inventory.

E3220 Tape 5-Underground Storage Tank Trust Fund & Response Program-(21 minute videotape). Another addition to SARA is the Leaking Underground Storage Tank (LUST) Trust Fund. One half of the US population depends on ground water for drinking—and EPA estimates that as many as 200,000 underground storage tanks are corroding and leaking into our ground water. This program discusses how the LUST Trust Fund will be used by EPA and the states in responding quickly to contain and clean-up LUST releases. Also covered is state enforcement and action requirements, and owner/operator responsibility.

E3230 Tape 6-Research & Development/Closing Remarks-(33 minute videotape). An important new mandate of the new Superfund is the technical provisions for research and development to create more permanent methods in handling and disposing of hazardous wastes and managing hazardous substances. This segment discusses the SITE (Superfund Innovative Technology Evaluation) program, the University Hazardous Substance Research Centers, hazardous substance health research and the DOD research, development and demonstration management of DOD wastes.

E3133 Physical Pest Management Practices-(28 minute videotape). Do you feel that you can not do your job without pesticides? There are solutions. Many of them are what we call physical controls. This video will provide you with some of the things which can help you manipulate the physical environment in a manner that will prevent the growth of pest population, causing them to leave or die. (CTI Publications- 2004)

E3135 Plastics Recycling Today: A Growing Resource-(11:35 minute videotape). Recycling is a growing segment of our nation's solid waste management program. This video shows how plastics are handled from curbside pickup through the recycling process to end-use by consumers. This video provides a basic understanding of recycling programs and how communities, companies and others can benefit from recycling. (The Society of the Plastics Industry, Inc.-1988)

E3140 Putting Aside Pesticides-(26 minute videotape). This program probes the long-term effects of pesticides and explores alternative pest-control efforts; biological pesticides, genetically-engineered microbes that kill objectionable insects, the use of natural insect predators, and the cross-breeding and genetic engineering of new plant strains that produce their own anti-pest toxins. (Films for the Humanities & Sciences, Inc.) (Reviewed 1999)

E3150 Radon-(26 minute videotape). This program looks at the possible health implications of radon pollution, methods home-owners can use to detect radon gas in their homes, and what can be done to minimize hazards once they are found.

E3160 RCRA-Hazardous Waste-(19 minute videotape). This videotape explains the dangers associated with hazardous chemical handling and discusses the major hazardous waste handling requirements presented in the Resource Conservation and Recovery Act. (Industrial Training, Inc.)

E3235 Regulatory and Good Manufacturing Practices-(42 minute videotape). This video comes in two parts. Part one is a professional, 20-minute drama using real actors emphasizing the importance of food safety and GMPs. This dramatization will focus your emotions on the importance of cleanliness. Part two is a comprehensive 22-minute video introducing your employees to basic GMP elements. This training video uses numerous split screens of "good" and "bad" practices, and will help viewers understand GMPs and basic food safety. (CTI Publications-2004)

E3240 Sink a Germ-(10 minute videotape). A presentation on the rationale and techniques for effective handwashing in health care institutions. Uses strong imagery to educate hospital personnel that handwashing is the single most important means of preventing the spread of infection. (The Brevi Corp.-1986). (Reviewed 1998)

E3245 Wash Your Hands-(5 minute videotape). Handwashing is the single most important means of preventing the spread of infection. This video presents why handwashing is important and the correct way to wash your hands. (LWB Company-1995)

E3250 Waste Not: Reducing Hazardous Waste-(35 minute videotape). This tape looks at the progress and promise of efforts to reduce the generation of hazardous waste at the source. In a series of company profiles, it shows activities and programs within industry to minimize hazardous waste in the production process. Waste Not also looks at the obstacles to waste reduction, both within and outside of industry, and considers how society might further encourage the adoption of pollution prevention, rather than pollution control, as the pri-

mary approach to the problems posed by hazardous waste. (Umbrella films)

- E3251 Would Your Restaurant Kitchen Pass Inspection?**—(29 minute videotape). Help ensure a perfect score on any health inspection with this video by addressing safe food-handling techniques in the food service industry. Learn how foodborne illness is spread and how it can be prevented. Dramatizations display specific techniques students and employees can use to help any restaurant kitchen meet the highest standards. (Chipsbooks Company—2003)

FOOD

- F2260 100 Degrees of Doom... The Time & Temperature Caper**—(14 minute videotape). Video portraying a private eye tracking down the cause of a *Salmonella* poisoning. Temperature control is emphasized as a key factor in preventing foodborne illness. (Educational Communications, Inc.—1987) (Reviewed 1998)
- F2265 A Day in the Deli**—(22 minute videotape). This training video provides basic orientation for new deli department employees and highlights skills and sales techniques that will build department traffic and increased sales. The focus will be on the priorities of the deli department—freshness, strong customer service, professionalism and food safety. By understanding the most important issues for their position(s), employees can comprehend their contribution to the financial interests of the store. (Food Marketing Institute—2003)
- F2450 A Guide to Making Safe Smoked Fish**—(21 minute videotape). Smoked fish can be a profitable product for aquaculturalists, but it can be lethal if not done correctly. This video guides you through the steps necessary to make safe smoked fish. It provides directions for brining, smoking, cooling, packaging and labeling, and cold storage to ensure safety. The video features footage of fish smoking being done using both traditional and modern equipment. (University of Wisconsin-Madison—Spring, 1999)
- F2005 A Lot on the Line**—(25 minute videotape). Through a riveting dramatization, "A Lot on the Line" is a powerful training tool for food manufacturing and food service employees. In the video, a food plant supervisor and his pregnant wife are eagerly awaiting the birth of their first child. Across town, a deli manager is taking his wife and young daughter away for a relaxing weekend. Both families, in a devastating twist of fate, will experience the pain, fear, and disruption caused by foodborne illness. This emotionally charged video will enthrall new and old employees alike and strongly reinforce the importance of incorporating GMPs into everyday work routines. Without question, "A Lot on the Line" will become an indispensable part of your company's training efforts. (Silliker Laboratories—2000)
- F2007 The Amazing World of Microorganisms**—(12 minute videotape). This training video provides your employees with an overview of how microorganisms affect their everyday lives and the foods they produce. The video explores how microscopic creatures are crucial in producing foods, fighting disease, and protecting the environment. In addition, certain microorganisms—when given the proper time and conditions to grow—are responsible for food spoilage, illness, and even death. Equipped with this knowledge, your employees will be better able to protect your brand. (Silliker Laboratories Group, Inc., Homewood, IL—2001)
- F2011 Available Post Harvest Processing Technologies for Oysters**—(8 minute videotape). This video explains three currently available Post-Harvest Processing (PHP) technologies for oysters that continue to be developed to provide safer oysters to consumers. The Gulf oyster industry increasingly adopts solutions offered by modern technology in its efforts to continue to promote quality, food safety and extended shelf life of oysters. (MS Dept. of Marine Resources—2003)
- F2008 A Recipe for Food Safety Success**—(30 minute videotape). This video helps food-industry employees understand their obligations in the areas of safety and cleanliness... what the requirements are, why they exist, and the consequences for all involved if they're not adhered to consistently. Critical information covered includes the role of the FDA and USDA; HACCP systems; sanitation and pest control; time and temperature controls that fight bacteria growth, and the causes and effects of pathogens. (J. J. Keller—2002)
- F2009 Basic Personnel Practices**—(18 minute videotape). This training video covers the practical GMPs from the growing field to the grocery store with a common sense approach. Employees learn the necessary training to help them understand the basic principles of food safety. (AIB International—2003)
- F2012 Better TEDs for Better Fisheries**—Introduces the usefulness of turtle excluder devices (TEDs) and demonstrates the working nature of the devices. It covers the major sea turtles and the specific TEDs needed for each. It precedes two segments on installation of appropriate TEDs in shrimp trawl nets. (MS Dept. of Marine Resources—2003)
- F2440 Cleaning & Sanitizing in Vegetable Processing Plants: Do It Well, Do It Safely!**—(16 minute videotape) This training video shows how to safely and effectively clean and sanitize in a vegetable processing plant. It teaches how it is the same for processing plant as it is for washing dishes at home. (University of Wisconsin Extension—1996) (Available in Spanish)
- F2010 Close Encounters of the Bird Kind**—(18 minute videotape). A humorous but in-depth look at *Salmonella* bacteria, their sources, and their role in foodborne disease. A modern poultry processing plant is visited, and the primary processing steps and equipment are examined. Potential sources of *Salmonella* contamination are identified at the different stages of production along with the control techniques that are employed to insure safe poultry products. (Topek Products, Inc.) (Reviewed 1998)
- F2013 Control of *Listeria monocytogenes* in Small Meat and Poultry Establishments**—(26 minute videotape). This video addresses a variety of issues facing meat processors who must meet revised regulations concerning *Listeria monocytogenes* in ready-to-eat meats. Topics covered include personal hygiene, sanitation, Biofilms, cross contamination, inplant sampling, and microbiological testing. (Penn State College of Ag Sciences—2003)—(Available in Spanish)

- F2015 Controlling Listeria: A Team Approach**—(16 minute videotape). In this video, a small food company voluntarily shuts down following the implication of one of its products in devastating outbreak of *Listeria monocytogenes*. This recall dramatization is followed by actual in-plant footage highlighted key practices in controlling *Listeria*. This video provides workers with an overview of the organism, as well as practical steps that can be taken to control its growth in plant environments. Finally, the video leaves plant personnel with a powerful, resounding message: Teamwork and commitment are crucial in the production of safe, quality foods. (Silliker Laboratories—2000)
- F2111 Controlling Salmonella: Strategies That Work**—(13 minute videotape). This training video provides practical guidelines to prevent the growth of *Salmonella* in dry environments and avoid costly product recalls. Using this video as a discussion tool, supervisors can help employees learn about water and how it fosters conditions for the growth of *Salmonella* in dry processing plants with potentially devastating consequences. (Silliker Labs—2002)
- F2037 Cooking and Cooling of Meat and Poultry Products**—(2 videotapes – 176 minutes). (See Part 1 Tape F2035 and Part 2 Tape F2036). This is session 3 of a 3-part Meat and Poultry Teleconference cosponsored by AFDO and the USDA Food Safety Inspection Service. Upon completion of viewing these videotapes, the viewer will be able to (1) recognize inadequate processes associated with the cooking and cooling of meat and poultry at the retail level; (2) Discuss the hazards associated with foods and the cooking and cooling processes with management at the retail level; (3) Determine the adequacy of control methods to prevent microbiological hazards in cooking and cooling at the retail level, and (4) Understand the principle for determining temperature with various temperature measuring devices. (AFDO/USDA—1999)
- F2030 "Egg Games" Foodservice Egg Handling and Safety**—(18 minute videotape). Develop an effective egg handling and safety program that is right for your operation. Ideal for manager training and foodservice educational programs, this video provides step-by-step information in an entertaining, visually-exciting format. (American Egg Board—1999)
- F2020 Egg Handling & Safety**—(11 minute videotape). Provides basic guidelines for handling fresh eggs which could be useful in training regulatory and industry personnel. (American Egg Board—1997)
- F2021 Egg Production**—(46 minute videotape). Live action footage of a completely automated operation follows the egg from the chicken to the carton. Watch the eggs as they roll down onto the main line, are washed, "candled," sorted by weight, placed into their packing containers and prepared for shipment. Sanitation and health concerns are addressed. (Chipsbooks Company—2003)
- F2036 Emerging Pathogens and Grinding and Cooking Comminuted Beef**—(2 videotapes – 165 minutes.) (See Part 1 Tape F2035 and Part 3 Tape F2037.) This is session 2 of a 3-part Meat and Poultry Teleconference co-sponsored by AFDO and the USDA Food Safety Inspection Service. These videotapes present an action plan for federal, state, local authorities, industry, and trade associations in a foodborne outbreak. (AFDO/USDA—1998)
- F2035 Fabrication and Curing of Meat and Poultry Products**—(2 videotapes – 145 minutes). (See Part 2 Tape F2036 and Part 3 Tape F2037). This is session 1 of a 3-part Meat and Poultry Teleconference cosponsored by AFDO and the USDA Food Safety Inspection Service. Upon viewing, the sanitarian will be able to (1) Identify typical equipment used for meat and poultry fabrication at retail and understand their uses; (2) Define specific terms used in fabrication of meat and poultry products in retail establishments, and (3) Identify specific food safety hazards associated with fabrication and their controls. (AFDO/USDA—1997)
- FastTrack Restaurant Video Kit**—These five short, direct videos can help make your employees more aware of various food hazards and how they can promote food safety. (DiverseyLever/American Hotel & Lodging Educational Institute – 1994)
- F2500 Tape 1—Food Safety Essentials**—(23 minute videotape). This video provides an overview of food safety. All food service employees learn six crucial guidelines for combating foodborne illness. Prepares employees for further position-specific training to apply the six food safety principles to specific jobs.
- F2501 Tape 2—Receiving and Storage**—(22 minute videotape). Make sure only safe food enters your doors! Receiving and storage staff learn what to look for and how to prevent spoilage with proper storage with this video.
- F2502 Tape 3—Service**—(22 minute videotape). Servers are your last safety checkpoint before guests receive food. This video helps you make sure they know the danger signs.
- F2503 Tape 4—Food Production**—(24 minute videotape). Food production tasks cause most food safety problems. Attack dangerous practices at this critical stage with this video training tool.
- F2504 Tape 5—Warewashing**—(21 minute videotape). Proper sanitation starts with clean dishes! With this video, warewashers will learn how to ensure safe tableware for guests and safe kitchenware for co-workers.
- F2039 Food for Thought—The GMP Quiz Show**—(16 minute videotape). In the grand tradition of television quiz shows, three food industry workers test their knowledge of GMP principles. As the contestants jockey to answer questions, the video provides a thorough and timely review of GMP principles. This video is a cost-effective tool to train new hires or sharpen the knowledge of veteran employees. Topics covered include employee practices, including proper attire, contamination, stock rotation, pest control, conditions for microbial growth and employee traffic patterns. Food safety terms such as HACCP, microbial growth niche, temperature danger zone, FIFO and cross-contamination, are also defined. (Silliker Laboratories—2000)

- F2040 Food Irradiation**—(30 minute videotape). Introduces viewers to food irradiation as a new preservation technique. Illustrates how food irradiation can be used to prevent spoilage by microorganisms, destruction by insects, overripening, and to reduce the need for chemical food additives. The food irradiation process is explained and benefits of the process are highlighted. (Turnelle Productions, Inc.) (Reviewed 1998)
- F2045 Food Microbiological Control**—(6-videotapes—approximate time 12 hours). Designed to provide information and demonstrate the application of basic microbiology, the Good Manufacturing Practices (GMPs), retail Food Code, and sanitation practices when conducting food inspections at the processing and retail levels. Viewers will enhance their ability to identify potential food hazards and evaluate the adequacy of proper control methods for these hazards. (FDA-1998)
- F2050 Food Safe—Food Smart—HACCP & Its Application to the Food Industry**—(2-16 minute videotapes). (1)—Introduces the seven principles of HACCP and their application to the food industry. Viewers will learn about the HACCP system and how it is used in the food industry to provide a safe food supply. (2)—Provides guidance on how to design and implement a HACCP system. It is intended for individuals with the responsibility of setting up a HACCP system. (Alberta Agriculture, Food and Rural Development) (Reviewed 1998)
- F2060 Food Safe—Series I**—(4-10 minute videotapes). (1) "Receiving & Storing Food Safely," details for food-service workers the procedures for performing sight inspections for the general conditions of food, including a discussion of food labeling and government approval stamps. (2) "Food-service Facilities and Equipment," outlines the requirements for the proper cleaning and sanitizing of equipment used in food preparation areas. Describes the type of materials, design, and proper maintenance of this equipment. (3) "Microbiology for Foodservice Workers," provides a basic understanding of the microorganisms which cause food spoilage and foodborne illness. This program describes bacteria, viruses, protozoa, and parasites and the conditions which support their growth. (4) "Food-service Housekeeping and Pest Control," emphasizes cleanliness as the basis for all pest control. Viewers learn the habits and life cycles of flies, cockroaches, rats, and mice. (Perennial Education-1991) (Reviewed 1998)
- F2070 Food Safe—Series II**—(4-10 minute videotapes). Presents case histories of foodborne disease involving (1) *Staphylococcus aureus*, (sauces) (2) *Salmonella*, (eggs) (3) *Campylobacter*, and (4) *Clostridium botulinum*. Each tape demonstrates errors in preparation, holding or serving food; describes the consequences of those actions; reviews the procedures to reveal the cause of the illness; and illustrates the correct practices in a step-by-step demonstration. These are excellent tapes to use in conjunction with hazard analysis critical control point training programs. (Perennial Education-1991) (Reviewed 1998)
- F2080 Food Safe—Series III**—(4-10 minute videotapes). More case histories of foodborne disease. This set includes (1) Hepatitis "A", (2) *Staphylococcus aureus* (meats), (3) *Bacillus cereus*, and (4) *Salmonella* (meat). Viewers will learn typical errors in the preparation, holding and serving of food. Also included are examples of correct procedures which will reduce the risk of food contamination. (Perennial Education-1991) (Reviewed 1998)
- F2133 Food Safety First**—(50 minute videotape). This food safety training video presents causes of foodborne illness in foodservice and ways to prevent foodborne illness. Individual segments include personal hygiene and handwashing, cleaning and sanitizing, preventing cross contamination and avoiding time and temperature abuse. Foodhandling principles are presented through scenarios in a restaurant kitchen. (Glo-Germ 1998). Available in Spanish.
- F2090 Food Safety: An Educational Video for Institutional Food Service Workers**—(10 minute videotape). Provides a general discussion on food safety principles with special emphasis on pathogen reductions in an institutional setting from child care centers to nursing homes. (US Department of Health & Human Services-1997)
- Food Safety for Food Service Series I**—An employee video series containing quick, 10-minute videos that teach food service employees how to prevent foodborne illness. This four video series examines sources of foodborne illness, plus explores prevention through awareness and recommendations for best practices for food safety. It also looks at how food safety affects the food service employee's job. (J.J. Keller & Associates-2000)
- F2100 Tape 1—Food Safety for Food Service: Cross Contamination**—(10 minute videotape). Provides the basic information needed to ensure integrity and safety in foodservice operations. Explains proper practices and procedures to prevent, detect and eliminate cross contamination.
- F2101 Tape 2—Food Safety for Food Service: HACCP**—(10 minute videotape). This video takes the mystery out of HACCP for your employees, and explains the importance of HACCP procedures in their work. Employees will come away feeling confident, knowing how to make HACCP work. The seven steps of HACCP and how HACCP is used in foodservice are some of the topics discussed.
- F2102 Tape 3—Food Safety for Food Service: Personal Hygiene**—(10 minute videotape). This video establishes clear, understandable ground rules for good personal hygiene in the foodservice workplace and explains why personal hygiene is so important. Topics include: personal cleanliness; proper protective equipment; correct hand washing procedures; when to wash hands, hygiene with respect to cross contamination and prohibited practices and habits.
- F2103 Tape 4—Food Safety for Food Service: Time and Temperature Controls**—(10 minute videotape). This video examines storage and handling of raw and cooked ingredients, and explains how to ensure their safety. Employees learn how to spot potential problems and what to do when they find them. Topics include: correct thermometer use, cooling, thawing and

heating procedures, food storage procedures, holding temperature requirements, and handling leftovers.

Food Safety for Food Service Series II—An employee video series containing quick, 10-minute videos that boost safety awareness for food service employees and teach them how to avoid foodborne illness. (J. J. Keller & Associates, Neenah, WI—2002)

F2104 Tape 1—Basic Microbiology and Food-borne Illness—(10 minute videotape). Covers four common microorganisms in food, how they get into food, and simple ways to prevent contamination. Stresses the importance of keeping food at the right temperature, having proper personal hygiene, and cleaning and sanitizing work surfaces.

F2105 Tape 2—Handling Knives, Cuts and Burns—(10 minute videotape). Explains why sharp knives are safer than dull ones, provides tips for selecting a good knife, and gives techniques for cutting food safely. Also explains first aid for cuts and burns and the most common causes of burns.

F2106 Tape 3—Working Safely to Prevent Injury—(10 minute videotape). Discusses common lifting hazards and how back injuries can happen. Gives proper lifting and carrying techniques to prevent soreness and injury. Also covers how to prevent slips, trips, and falls.

F2107 Tape 4—Sanitation—(10 minute videotape). Provides tips for good personal hygiene habits, including the proper way to wash your hands, dress, and prepare for work. Also covers cleaning and sanitizing equipment; storing chemicals and cleaning supplies; and controlling pests that can contaminate work areas and food.

F2120 Food Safety: For Goodness Sake, Keep Food Safe—(15 minute videotape). Teaches foodhandlers the fundamentals of safe food handling. The tape features the key elements of cleanliness and sanitation, including: good personal hygiene, maintaining proper food product temperature, preventing time abuse, and potential sources of food contamination. (Iowa State University Extension—1990) (Reviewed 1998)

F2110 Food Safety is No Mystery—(34 minute videotape). This is an excellent training visual for food-service workers. It shows the proper ways to prepare, handle, serve and store food in actual restaurant, school and hospital situations. A policeman sick from food poisoning, a health department sanitarian, and a food-service worker with all the bad habits are featured. The latest recommendations on personal hygiene, temperatures, cross-contamination, and storage of foods are included. (USDA—1987). (Reviewed 1998)

F2130 Food Safety: You Make the Difference—(28 minute videotape). Through five food workers from differing backgrounds, this engaging and inspirational documentary style video illustrates the four basic food safety concepts: handwashing,

preventing cross-contamination, moving foods quickly through the danger zone, and hot/cold holding (Seattle-King County Health Department—1995)

Food Safety Zone Video Series—A one-of-a-kind series that helps get your employees to take food safety issues seriously! These short, to-the-point videos can help make your employees aware of various food hazards, and how they can help promote food safety. The 4 topics are: Basic Microbiology, Cross Contamination, Personal Hygiene, and Sanitation. (J.J. Keller & Associates — 1999). (Also available in Spanish.)

F2125 Tape 1—Food Safety Zone: Basic Microbiology—(10 minute videotape). In this video, food service personnel will gain a deeper understanding of food safety issues and what they can do to prevent recalls and contamination. It describes the different types of bacteria that can be harmful to food, and tells how to minimize bacterial growth through time and temperature controls, personal hygiene practices, and sanitation.

F2126 Tape 2—Food Safety Zone: Cross Contamination—(10 minute videotape). Quickly teach your employees how they can help prevent cross contamination. Employees are educated on why contaminants can be extremely dangerous, cause serious injury, and even death, to consumers of their food products. This fast-paced video will give your employees a deeper understanding of the different types of cross contamination, how to prevent it, and how to detect it through visual inspections and equipment. The emphasis is that prevention is the key to eliminating cross contamination.

F2127 Tape 3—Food Safety Zone: Personal Hygiene—(10 minute videotape). After watching this video, your employees will understand why their personal hygiene is critical to the success of your business. This video teaches employees about four basic good personal hygiene practices: keeping themselves clean, wearing clean clothes, following specific hand washing procedures, and complying with all related work practices. Personnel are also taught that personal hygiene practices are designed to prevent them from accidentally introducing bacteria to food products, and are so important that there are federal laws that all food handlers must obey.

F2128 Tape 4—Food Safety Zone: Sanitation—(10 minute videotape). Don't just tell your employees why sanitation is important, show them! This training video teaches employees about the sanitation procedures that cover all practices to keep workplaces clean, and food produced free of contaminants and harmful bacteria. Four areas covered include personal hygiene, equipment and work areas, use and storage of cleaning chemicals and equipment, and pest control.

- F2134 Food Safety: Fish and Shellfish Safety Video**—(21 minute videotape). Seafood tops the list for foods that can become contaminated with bacteria-causing foodborne illness. This video shows how to protect yourself from fish and shellfish contamination by learning proper selection, storage, preparation and safe consumption. (Chipsbooks Company—2003)
- F2129 Food Technology: Irradiation**—(29 minute videotape). Video covers the following issues: history and details of the irradiation process; effects of irradiation on treated products, and consumer concerns and acceptance trends. Other important concerns addressed include how food irradiation affects food cost, the nutritional food industry, food science and research, and irradiation regulatory industries (such as the Nuclear Regulatory Commission) add insight into the process of irradiation. (Chipsbooks—2001)
- F2135 Get with a Safe Food Attitude**—(40 minute videotape). Consisting of nine short segments which can be viewed individually or as a group, this video presents safe food handling for moms-to-be. Any illness a pregnant woman contracts can affect her unborn child whose immune system is too immature to fight back. The video follows four pregnant women as they learn about food safety and preventing foodborne illness. (US Department of Agriculture—1999)
- F2136 GLP Basics: Safety in the Food Micro Lab**—(16 minute videotape). This video is designed to teach laboratory technicians basic safety fundamentals and how to protect themselves from inherent workplace dangers. Special sections on general laboratory rules, personal protective equipment, microbiological, chemical, and physical hazards, autoclave safety, and spill containment are featured. (Silliker Laboratories Group, Inc., Homewood, IL—2001)
- F2137 GMP Basics: Avoiding Microbial Cross-Contamination**—(15 minute videotape). This video takes a closer look at how harmful microorganisms, such as *Listeria*, can be transferred to finished products. Employees see numerous examples of how microbial cross-contamination can occur from improper traffic patterns, poor personal hygiene, soiled clothing, unsanitized tools and equipment. Employees need specific knowledge and practical training to avoid microbial cross-contamination in plants. This video aids in that training. (Silliker Laboratories—2000)
- F2140 GMP Basics – Employee Hygiene Practices**—(20 minute videotape). Through real-life examples and dramatization, this video demonstrates good manufacturing practices that relate to employee hygiene, particularly hand washing. This video includes a unique test section to help assess participants' understanding of common GMP violations. (Silliker Laboratories—1997)
- F2143 GMP Basics: Guidelines for Maintenance Personnel**—(21 minute videotape). Developed specifically for maintenance personnel working in a food processing environment, this video depicts a plant-wide training initiative following a product recall announcement. Maintenance personnel will learn how GMPs relate to their daily activities and how important their roles are in the production of safe food products. (Silliker Laboratories—1999)
- F2148 GMP-GSP Employee**—(38 minute videotape). This video was developed to teach food plant employees the importance of "Good Manufacturing Practices" and "Good Sanitation Practices." Law dictates that food must be clean and safe to eat. This video emphasizes the significance of each employee's role in protecting food against contamination. Tips on personal cleanliness and hygiene are also presented. (L.J. Bianco & Associates)
- F2150 GMP: Personal Hygiene & Practices in Food Manufacturing**—(14 minute videotape). This video focuses on the personal hygiene of food-manufacturing workers, and explores how poor hygiene habits can be responsible for the contamination of food in the manufacturing process. This is an instructional tool for new food-manufacturing line employees and supervisors. It was produced with "real" people in actual plant situations, with only one line of text included in the videotape. (Penn State—1993)—(Available in Spanish and Vietnamese)
- F2147 GMP Basics: Process Control Practices**—(16 minute videotape). In actual food processing environments, an on-camera host takes employees through a typical food plant as they learn the importance of monitoring and controlling key points in the manufacturing process. Beginning with receiving and storing, through production, and ending with packaging and distribution, control measures are introduced, demonstrated, and reviewed. Employees will see how their everyday activities in the plant have an impact on product safety. (Silliker Laboratories—1999)
- GMP Food Safety Video Series**—This five-part video series begins with an introduction to GMPs and definitions, then goes on to review specific sections of the GMPs: personnel, plant and grounds, sanitary operations, equipment and utensils, process and controls, warehousing, and distribution. Developed to assist food processors in training employees on personnel policies and Good Manufacturing Practices (GMPs), the series includes different types of facilities, including dairy plants, canning factories, pasta plants, bakeries, and frozen food manufacturing facilities. (J.J. Keller—2003)
- F2151 Tape 1-Definitions**—(11:40 minute videotape). Provides the definitions necessary to understand the meaning of the GMPs.
- F2152 Tape 2-Personnel and Personnel Facilities**—(11:20 minute videotape). Covers selection of personnel, delegation of responsibilities, development of plant policies for employees, and operational practices.
- F2153 Tape 3-Building and Facilities**—(15:50 minute videotape). Discusses guidelines for the construction and maintenance of the manufacturing plant and grounds around the plant.
- F2154 Tape 4-Equipment and Utensils**—(12:30 minute videotape). Provides guidelines for the construction, installation, and maintenance of processing equipment.

F2155 Tape 5—Production and Process Controls—(20 minute videotape). Covers establishing a food safety committee, in-house inspections, analysis of raw materials and ingredients, cleaning schedules and procedures, and more.

F2160 GMP: Sources & Control of Contamination during Processing—(20 minute videotape). This program, designed as an instructional tool for new employees and for refresher training for current or reassigned workers, focuses on the sources and control of contamination in the food-manufacturing process. It was produced in actual food plant situations. A concise description of microbial contamination and growth and cross-contamination, a demonstration of food storage, and a review of aerosol contaminants are also included. (Penn State—1995)

GMPs for Food Plant Employees; 5 volume video series based on European standards and regulations—Developed to assist food processors in training employees in the Good Manufacturing Practices. Examples are drawn from a variety of processing facilities including dairy plants, canning facilities, pasta plants, bakeries, frozen food facilities, etc. (AIB International—2003)

F2161 Tape 1—Definitions—(13 minute videotape). Begins with an introduction to the GMPs and traces a basic history of food laws in Europe, ending with the EC Directive 93/43/EEC of June 1993 on the hygiene of foodstuffs.

F2162 Tape 2—Personnel and Personnel Practices—(13 minute videotape). Selecting personnel, delegating responsibilities, developing plant policies for employees and visitors, and establishing operational practices.

F2163 Tape 3—Building and Facilities—(17 minute videotape). Guidelines for the construction and maintenance of the manufacturing facility and grounds around the factory.

F2164 Tape 4—Equipment and Utensils—(13 minute videotape). Guidelines for construction, installation, and maintenance of processing equipment.

F2165 Tape 5—Production/Process Controls—(22 minute videotape). Covers production and process controls, establishing a food safety committee, conducting in-house inspections, analyzing raw materials and ingredients, developing operational methods, establishing cleaning schedules and procedures, creating pest control programs and record keeping.

F2266 HACCP: A Basic Understanding—(32 minute videotape). Explore applications for Hazard Analysis Critical Control Points (HACCP), a system of process controls required by federal and state governments for most areas of the food service industry. Learn to minimize the risk of chemical, microbiological and physical food contamination while focusing on the seven principles of HACCP and the chain of responsibility. (Chipsbooks Company—2003)

F2180 HACCP: Safe Food Handling Techniques—(22 minute videotape). The video highlights the primary causes of food poisoning and emphasizes

the importance of self-inspection. An explanation of potentially hazardous foods, cross-contamination, and temperature control is provided. The main focus is a detailed description of how to implement a Hazard Analysis Critical Control Point (HACCP) program in a food-service operation. A leader's guide is provided as an adjunct to the tape. (The Canadian Restaurant & Foodservices Association—1990) (Reviewed 1998)

F2169 HACCP: Training for Employees — USDA Awareness—(15 minute videotape). This video is a detailed training outline provided for the employee program. Included in the video is a synopsis of general federal regulations; HACCP plan development; incorporation of HACCP's seven principles; HACCP plan checklist, and an HACCP employee training program. (J.J. Keller & Associates—1999)

F2172 HACCP: Training for Managers—(17 minute videotape). Through industry-specific examples and case studies, this video addresses the seven HACCP steps, identifying critical control points, recordkeeping and documentation, auditing, and monitoring. It also explains how HACCP relates to other programs such as Good Manufacturing Practices and plant sanitation. (J.J. Keller & Associates, Inc.—2000)

F2170 The Heart of HACCP—(22 minute videotape). A training video designed to give plant personnel a clear understanding of the seven HACCP principles and practical guidance on how to apply these principles to their own work environment. This video emphasizes the principles of primary concern to plant personnel such as critical limits, monitoring systems, and corrective actions that are vital to the success of a HACCP plan. (Silliker Laboratories Group—1994)

F2171 HACCP: The Way to Food Safety—(53 minute videotape). The video highlights the primary causes of food poisoning and stresses the importance of self-inspection. Potentially hazardous foods, cross-contamination and temperature control are explained. The video is designed to give a clear understanding of the seven HACCP principles and practical guidance on how to apply these principles to a work environment. Critical limits, monitoring systems and corrective action plans are emphasized. The video also provides an overview of foodborne pathogens, covering terminology, the impact of pathogens, and what employees must do to avoid problems. Also described are the sources, causes and dangers of contamination in the food industry. (Southern Illinois University—1997)

F2173 Inside HACCP: Principles, Practices & Results—(15 minute videotape). This video is designed to help you build a more knowledgeable work-force and meet safety standards through a comprehensive overview of HACCP principles. Employees are provided with details of prerequisite programs and a clear overview of the seven HACCP principles. "Inside HACCP" provides short succinct explanations of how HACCP works and places special emphasis on the four principles —monitoring, verification, corrective action, and recordkeeping — in which employees actively participate. (Silliker Laboratories Group, Inc., Homewood, IL—2001)

- F2175 Inspecting For Food Safety-Kentucky's Food Code**-(100 minute videotape). Kentucky's Food Code is patterned after the Federal Food Code. The concepts, definitions, procedures, and regulatory standards included in the code are based on the most current information about how to prevent foodborne diseases. This video is designed to prepare food safety inspectors to effectively use the new food code in the performance of their duties. (Department of Public Health Commonwealth of Kentucky-1997) (Reviewed 1999)
- F2190 Is What You Order What You Get? Seafood Integrity**-(18 minute videotape). Teaches seafood department employees about seafood safety and how they can help insure the integrity of seafood sold by retail food markets. Key points of interest are cross-contamination control, methods and criteria for receiving seafood and determining product quality, and knowing how to identify fish and seafood when unapproved substitutions have been made. (The Food Marketing Institute) (Reviewed 1998)
- F2210 Northern Delight-From Canada to the World**-(13 minute videotape). A promotional video that explores the wide variety of foods and beverages produced by the Canadian food industry. General in nature, this tape presents an overview of Canada's food industry and its contribution to the world's food supply. (Ternelle Production, Ltd.) (Reviewed 1998)
- F2240 On the Front Line**-(18 minute videotape). A training video pertaining to sanitation fundamentals for vending service personnel. Standard cleaning and serving procedures for cold food, hot beverage and cup drink vending machines are presented. The video emphasizes specific cleaning and serving practices which are important to food and beverage vending operations. (National Automatic Merchandising Association-1993) (Reviewed 1998)
- F2250 On the Line**-(30 minute videotape). This was developed by the Food Processors Institute for training food processing plant employees. It creates an awareness of quality control and regulations. Emphasis is on personal hygiene, equipment cleanliness and good housekeeping in a food plant. It is recommended for showing to both new and experienced workers. (Available in Spanish) The Food Processors Institute. 1993. (Reviewed 1998)
- F2270 Pest Control in Seafood Processing Plants**-(26 minute videotape). Videotape which covers procedures to control flies, roaches, mice, rats and other common pests associated with food processing operations. The tape will familiarize plant personnel with the basic characteristics of these pests and the potential hazards associated with their presence in food operations. (Reviewed 1998)
- F2280 Principles of Warehouse Sanitation**-(33 minute videotape). This videotape gives a clear, concise and complete illustration of the principles set down in the Food, Drug and Cosmetic Act and in the Good Manufacturing Practices, as well as supporting legislation by individual states. (American Institute of Baking-1993)
- F2271 Preventing Foodborne Illness**-(10 minute videotape). This narrated video is for food service workers, with emphasis on insuring food safety by washing one's hands before handling food, after using the bathroom, sneezing, touching raw meats and poultry, and before and after handling foods such as salads and sandwiches. Safe food temperatures and cross contamination are also explained. (Colorado Dept. of Public Health and Environment-1999)
- F2290 Product Safety & Shelf Life**-(40 minute videotape). Developed by Borden Inc., this videotape was done in three sections with opportunity for review. Emphasis is on providing consumers with good products. One section covers off-flavors, another product problems caused by plant conditions, and a third the need to keep products cold and fresh. Procedures to assure this are outlined, as shown in a plant. Well done and directed to plant workers and supervisors. (Borden-1987) - (Reviewed 1997)
- F2220 Proper Handling of Peracetic Acid**-(15 minute videotape). Introduces peracetic acid as a chemical sanitizer and features the various precautions needed to use the product safely in the food industry.
- F2230 Purely Coincidental**-(20 minute videotape). A parody that shows how foodborne illness can adversely affect the lives of families that are involved. The movie compares improper handling of dog food in a manufacturing plant that causes the death of a family pet with improper handling of human food in a manufacturing plant that causes a child to become ill. Both cases illustrate how handling errors in food production can produce devastating outcomes. (The Quaker Oats Company-1993.) (Reviewed 1998)
- F2310 Safe Food: You Can Make a Difference**-(25 minute videotape). A training video for food-service workers which covers the fundamentals of food safety. An explanation of proper food temperature, food storage, cross-contamination control, cleaning and sanitizing, and handwashing as methods of foodborne illness control is provided. The video provides an orientation to food safety for professional foodhandlers. (Tacoma-Pierce County Health Department-1990). (Reviewed 1998)
- F2320 Safe Handwashing**-(15 minute videotape). Twenty-five percent of all foodborne illnesses are traced to improper handwashing. The problem is not just that handwashing is not done, the problem is that it's not done properly. This training video demonstrates the "double wash" technique developed by Dr. O. Peter Snyder of the Hospitality Institute for Technology and Management. Dr. Snyder demonstrates the procedure while reinforcing the microbiological reasons for keeping hands clean. (Hospitality Institute for Technology and Management-1991) (Reviewed 1998)
- F2325 Safe Practices for Sausage Production**-(3 hour videotape). This videotape is based on a series of educational broadcasts on meat and poultry inspections at retail food establishments produced by the Association of Food and Drug Officials (AFDO) and USDA's Food Safety and Inspection Service (FSIS), along with FDA's Center for Food Safety and Applied Nutrition. The purpose of the broadcast was to provide training to state, local, and tribal sanitarians on processes and procedures that are being utilized by retail stores and restaurants, especially those that were usually seen in USDA-inspected facilities. The program will cover the main production steps of sausage products, such as the processes of grinding, stuffing, and smoking, and typical equipment used will be depicted. Characteristics of different types of sausage

(fresh, cooked and smoked, and dry/semi-dry) will be explained. Pathogens of concern and outbreaks associated with sausage will be discussed. The written manual for the program is available at www.fsis.usda.gov/fofo/hrds/STATE/RETAIL/manual.htm. (1999)

- F2460 Safer Processing of Sprouts**—(1 hour and 22 minute videotape). Sprouts are enjoyed by many consumers for their taste and nutritional value. However, recent outbreaks of illnesses associated with sprouts have demonstrated a potentially serious human health risk posed by this food. FDA and other public health officials are working with industry to identify and implement production practices that will assure that seed and sprouted seed are produced under safe conditions. This training video covers safe processing practices of sprouts including growing, harvesting, milling, transportation, storage, seed treatment, cleaning and sanitizing, sampling and microbiological testing. (CA Dept. of Health Services, Food and Drug Branch; U.S. Food and Drug Administration, and the Centers for Disease Control and Prevention – 2000)
- F2330 Sanitation for Seafood Processing Personnel**—(20 minute videotape). A training video suited for professional foodhandlers working in any type of food manufacturing plant. The film highlights Good Manufacturing Practices and their role in assuring food safety. The professional foodhandler is introduced to a variety of sanitation topics including: (1) foodhandlers as a source of food contamination, (2) personal hygiene as a means of preventing food contamination, (3) approved food storage techniques including safe storage temperatures, (4) sources of cross-contamination, (5) contamination of food by insects and rodents, (6) garbage handling and pest control, and (7) design and location of equipment and physical facilities to facilitate cleaning. (Reviewed 1998)
- F2340 Sanitizing for Safety**—(17 minute videotape). Provides an introduction to basic food safety for professional foodhandlers. A training pamphlet and quiz accompany the tape. Although produced by a chemical supplier, the tape contains minimal commercialism and may be a valuable tool for training new employees in the food industry. (Clorox-1990) (Reviewed 1998)
- F2341 Science and Our Food Supply**—(45 minute videotape). Becoming food safety savvy is as easy as A-B-C! This video includes step-by-step journey food travels from the farm to the table; the Fight BAC™ Campaign's four simple steps to food safety, clean, cook, separate (combat cross contamination), and chill, and the latest in food safety careers. Other topics covered include understanding bacteria, food processing and transportation, and the future technology of food processing. (FDA-Center for Food Safety and Applied Nutrition-2001)
- F2350 ServSafe® Steps to Food Safety**—The ServSafe food safety series consists of six videos that illustrate and reinforce important food safety practices in an informative and entertaining manner. The videos provide realistic scenarios in multiple industry segments. English and Spanish are provided on each tape. (National Restaurant Association Education Foundation –2000)
- Step One: Starting Out with Food Safety**—(12 minute videotape). Defines what foodborne illness is and how it occurs; how foods become unsafe; and what safety practices to follow during the flow of food.

Step Two: Ensuring Proper Personal Hygiene—(10 minute videotape). Introduces employees to ways they might contaminate food; personal cleanliness practices that help protect food; and the procedure for thorough handwashing.

Step Three: Purchasing, Receiving and Storage—(12 minute videotape). Explains how to choose a supplier; calibrate and use a thermometer properly; accept or reject a delivery; and store food safely.

Step Four: Preparing, Cooking, and Serving—(11 minute videotape). Identifies proper practices for thawing, cooking, holding, serving, cooling and reheating food.

Step Five: Cleaning and Sanitizing—(11 minute videotape). Describes the difference between cleaning and sanitizing; manual and machine warewashing; how sanitizers work; how to store clean items and cleaning supplies; and how to setup a cleaning program.

Step Six: Take the Food Safety Challenge: Good Practices, Bad Practices — You Make the Call!—(35 minute videotape). Challenges viewers to identify good and bad practices presented in five short scenarios from different industry segments.

- F2430 Smart Sanitation: Principles & Practices for Effectively Cleaning Your Food Plant**—(20 minute videotape). A practical training tool for new sanitation employees or as a refresher for veterans. Employees will understand the food safety impact of their day-to-day cleaning and sanitation activities and recognize the importance of their role in your company's food safety program. (Silliker Laboratories Group-1996)
- F2370 Supermarket Sanitation Program—"Cleaning & Sanitizing"**—(13 minute videotape). Contains a full range of cleaning and sanitizing information with minimal emphasis on product. Designed as a basic training program for supermarket managers and employees. (1989) (Reviewed 1998)
- F2380 Supermarket Sanitation Program—"Food Safety"**—(11 minute videotape). Contains a full range of basic sanitation information with minimal emphasis on product. Filmed in a supermarket, the video is designed as a basic program for manager training and a program to be used by managers to train employees. (1989) (Reviewed 1998)
- F2390 Take Aim at Sanitation**—(8 minute videotape). This video features tips on food safety and proper disposal of single service items. Also presented is an emphasis on food contact surfaces as well as the manufacture, storage and proper handling of these items. (Foodservice and Packaging Institute, Inc.-1995). (Available in Spanish)
- F2391 Understanding Foodborne Pathogens**—(40 minute videotape). Explore the major causes of foodborne illness and review the practices used to minimize the risk of contracting or spreading a foodborne disease. Learn about microorganisms associated with foodborne illness such as parasites, viruses, fungi and bacteria. Study ways to reduce harmful pathogens through proper handling, storage and cooking. (Chipsbooks Company-2003)
- F2410 Wide World of Food Service Brushes**—(18 minute videotape). Discusses the importance of cleaning and sanitizing as a means to prevent and control foodborne illness. Special emphasis is given to proper

cleaning and sanitizing procedures and the importance of having properly designed and constructed equipment (brushes) for food preparation and equipment cleaning operations. (1989) (Reviewed 1998)

- F2420 Your Health in Our Hands—Our Health in Yours**—(8 minute videotape). For professional foodhandlers, the tape covers the do's and don'ts of foodhandling as they relate to personal hygiene, temperature control, safe storage and proper sanitation. (Jupiter Video Production—1993). (Reviewed 1998)

OTHER

- M4010 Diet, Nutrition & Cancer**—(20 minute videotape). Investigates the relationship between a person's diet and the risk of developing cancer. The film describes the cancer development process and identifies various types of food believed to promote and/or inhibit cancer. The film also provides recommended dietary guidelines to prevent or greatly reduce the risk of certain types of cancer.
- M4020 Eating Defensively: Food Safety Advice for Persons with AIDS**—(15 minute videotape). While HIV infection and AIDS are not acquired by eating foods or drinking liquids, persons infected with the AIDS virus need to be concerned about what they eat. Foods can transmit bacteria and viruses capable of causing life-threatening illness to persons infected with AIDS. This video provides information for persons with AIDS on what foods to avoid and how to better handle and prepare foods. (FDA/CDC—1989)
- M4030 Ice: The Forgotten Food**—(14 minute videotape). This training video describes how ice is made and where the critical control points are in its manufacture, both in ice plants and in on-premises locations (convenience stores, etc.); it documents the potential for illness from contaminated ice and calls

on government to enforce good manufacturing practices, especially in on-premises operations where sanitation deficiencies are common. (Packaged Ice Association—1993)

- M4050 Personal Hygiene & Sanitation for Food Processing Employees**—(15 minute videotape). Illustrates and describes the importance of good personal hygiene and sanitary practices for people working in a food processing plant. (Iowa State—1993)
- M4060 Psychiatric Aspects of Product Tampering**—(25 minute videotape). This was presented by Emanuel Tanay, M.D. from Detroit, at the fall 1986 conference of CSAFDA. He reviewed a few cases and then indicated that abnormal behavior is like a contagious disease. Media stories lead to up to 1,000 similar alleged cases, nearly all of which are false. Tamper-proof packaging and recalls are essential. Tampering and poisoning are characterized by variable motivation, fraud and greed. Law enforcement agencies have the final responsibilities. Tamper proof containers are not the ultimate answer. (1987)
- M4070 Tampering: The Issue Examined**—(37 minute videotape). Developed by Culbro Machine Systems, this videotape is well done. It is directed to food processors and not regulatory sanitarians or consumers. A number of industry and regulatory agency management explain why food and drug containers should be made tamper evident. (Culbro—1987)
- M4071 Understanding Nutritional Labeling**—(39 minute videotape). Learn why the government initiated a standardized food labeling system and which foods are exempt. Explore each component listed on the label including cholesterol, carbohydrates, protein, fat, health or nutritional claims, serving size, percentage of daily value, and standard calorie reference/comparison. (Chipsbooks Company—2003)

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- ☐ D1050 Food Safety: Dairy Details
- ☐ D1060 Frozen Dairy Products
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- ☐ D1120 Milk Processing Plant Inspection Procedures
- ☐ D1125 Ohio Bulk Milk Hauling
- ☐ D1130 Pasteurizer - Design and Regulation
- ☐ D1140 Pasteurizer - Operation
- ☐ D1150 Processing Fluid Milk (slides)

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- ☐ E3060 EPA Test Methods for Freshwater Effluent Toxicity Tests (Using Ceriodaphnia)
- ☐ E3070 EPA Test Methods for Freshwater Effluent Toxicity Tests (Using Fathead Minnow Larva)
- ☐ E3075 EPA: This is Superfund
- ☐ E3080 Fit to Drink
- ☐ E3110 Garbage: The Movie
- ☐ E3120 Global Warming: Hot Times Ahead
- ☐ E3125 Good Pest Exclusion Practices
- ☐ E3128 Integrated Pest Management (IPM)
- ☐ E3130 Kentucky Public Swimming Pool & Bathing Facilities
- ☐ E3131 Key Pests of the Food Industry
- ☐ E3161 The Kitchen Uncovered: Orkin Sanitized EMP
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FOOD

- ☐ F2260 100 Degrees of Doom...The Time & Temperature Capers
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- ☐ F2008 A Recipe for Food Safety Success
- ☐ F2009 Basic Personnel Practices
- ☐ F2440 Cleaning & Sanitizing in Vegetable Processing Plants: Do It Well, Do It Safely!
- ☐ F2010 Close Encounters of the Bird Kind
- ☐ F2013 Control of *Listeria monocytogenes* in Small Meat and Poultry Establishments
- ☐ F2015 Controlling *Listeria*: A Team Approach
- ☐ F2111 Controlling *Salmonella*: Strategies that Work
- ☐ F2037 Cooking and Cooling of Meat and Poultry Products (2 Videos)
- ☐ F2030 "Egg Games" Foodservice Egg Handling and Safety
- ☐ F2020 Egg Handling & Safety
- ☐ F2021 Egg Production
- ☐ F2026 Emerging Pathogens and Grinding and Cooking Comminuted Beef (2 Videos)
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- ☐ F2500 Tape 1 - Food Safety Essentials
- ☐ F2501 Tape 2 - Receiving and Storage
- ☐ F2502 Tape 3 - Service
- ☐ F2503 Tape 4 - Food Production
- ☐ F2504 Tape 5 - Warewashing
- ☐ F2039 Food for Thought - The GMP Quiz Show
- ☐ F2040 Food Irradiation
- ☐ F2045 Food Microbiological Control (6 Videos)
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- ☐ F2060 Food Safe - Series I (4 Videos)
- ☐ F2070 Food Safe - Series II (4 Videos)
- ☐ F2080 Food Safe - Series III (4 Videos)
- ☐ F2133 Food Safety First
- ☐ F2090 Food Safety: An Educational Video for Institutional Food-Service Workers
- ☐ F2100 *Food Safety for Food Service - Series I*
- ☐ F2101 Tape 1 - Cross Contamination
- ☐ F2102 Tape 2 - Personal Hygiene
- ☐ F2103 Tape 3 - Time and Temperature Controls
- ☐ F2104 *Food Safety for Food Service - Series II*
- ☐ F2105 Tape 1 - Basic Microbiology and Foodborne Illness
- ☐ F2106 Tape 2 - Handling Knives, Cuts and Burns
- ☐ F2107 Tape 3 - Working Safely to Prevent Injury
- ☐ F2108 Tape 4 - Sanitation
- ☐ F2109 Food Safety: For Goodness Sake, Keep Food Safe
- ☐ F2110 Food Safety: No Mystery
- ☐ F2130 Food Safety: You Make the Difference
- ☐ F2125 Food Safety Zone: Basic Microbiology
- ☐ F2126 Food Safety Zone: Cross Contamination
- ☐ F2127 Food Safety Zone: Personal Hygiene
- ☐ F2128 Food Safety Zone: Sanitation
- ☐ F2134 Food Safety: Fish and Shellfish Safety Video
- ☐ F2135 Get With a Safe Food Attitude
- ☐ F2129 Food Technology: Irradiation
- ☐ F2136 GLP Basics: Safety in the Food Micro Lab
- ☐ F2137 GMP Basics: Avoiding Microbial Cross-Contamination

- ☐ F2140 GMP Basics: Employee Hygiene Practices
- ☐ F2143 GMP Basics: Guidelines for Maintenance Personnel
- ☐ F2148 GMP - GSP Employee
- ☐ F2150 GMP: Personal Hygiene and Practices in Food Manufacturing
- ☐ F2147 GMP Basics: Process Control Practices
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- ☐ F2154 Tape 3: Building and Facilities
- ☐ F2155 Tape 4: Equipment and Utensils
- ☐ F2160 Tape 5: Production and Process Controls
- ☐ F2161 GMP: Sources & Control of Contamination during Processing
- ☐ F2161 *GMPs for Food Plant Employees: 5 Volume Video Series Based on European Standards and Regulations*
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- ☐ F2161 Tape 2: Personnel and Personnel Facilities
- ☐ F2163 Tape 3: Building and Facilities
- ☐ F2164 Tape 4: Equipment and Utensils
- ☐ F2165 Tape 5: Production/Process Controls
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- ☐ F2180 HACCP: Safe Food Handling Techniques
- ☐ F2169 HACCP: Training for Employees - USDA Awareness
- ☐ F2172 HACCP: Training for Managers
- ☐ F2170 The Heart of HACCP
- ☐ F2171 HACCP: The Way to Food Safety
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- ☐ F2220 Proper Handling of Peroxidic Acid
- ☐ F2250 Purely Coincidental
- ☐ F2310 Safe Food: You Can Make a Difference
- ☐ F2320 Safe Handwashing
- ☐ F2325 Safe Practices for Sausage Production
- ☐ F2460 Safe Processing of Sprouts
- ☐ F2350 Sanitation for Seafood Processing Personnel
- ☐ F2340 Sanitizing for Safety
- ☐ F2341 Science and Our Food Supply
- ☐ F2350 SERVSAFE® Steps to Food Safety (6 Videos)
- ☐ F2430 Smart Sanitation: Principles & Practices for Effectively Cleaning Your Food Plant
- ☐ F2370 Supermarket Sanitation Program - "Cleaning & Sanitizing"
- ☐ F2380 Supermarket Sanitation Program - "Food Safety"
- ☐ F2390 Take Aim at Sanitation
- ☐ F2391 Understanding Foodborne Pathogens
- ☐ F2410 Wide World of Food-Safety Brushes
- ☐ F2420 Your Health in Our Hands - Our Health in Yours

OTHER

- ☐ M4010 Diet, Nutrition & Cancer
- ☐ M4020 Eating Defensively: Food Safety Advice for Persons with AIDS
- ☐ M4030 Ice: The Forgotten Food
- ☐ M4050 Personal Hygiene & Sanitation for Food Processing Employees
- ☐ M4060 Psychiatric Aspects of Product Tampering
- ☐ M4070 Tampering: The Issue Examined
- ☐ M4071 Understanding Nutritional Labeling



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Marshfield Clinic Laboratories
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UPDATES

Farmer John Names New Vice President to Oversee Food Safety

Clougherty Packing Co., maker of Farmer John brand meats, named Martha Hudak-Roos as its new vice president of technical services.

Hudak-Roos has more than 20 years experience in the meat processing industry and will be responsible for the company's food safety and quality assurance programs, as well as its product development initiatives and laboratory services.

Before joining Clougherty, Hudak-Roos was manager of quality systems and food safety for Foster Farms. She has also served as president of Technical Food Information Spectrum Inc., a food safety and quality consulting firm.

Andrew Flanders Joins Steritech Group as Vice President of National Accounts

Andrew Flanders, Ph.D., has been named vice president of national accounts for The Steritech Group, Inc., one of the premier providers of food safety and environmental hygiene services in North America. He brings to the position more than 20 years of experience in the fields of quality assurance, safety and certification.

In his new role, Dr. Flanders' duties will consist of consulting, support for advancements in Steritech's GMP (Good Manufacturing Practices) program, and account management in the areas of food safety and auditing. Previously, he

served as the director of operations at SGS, a global food safety auditing company. While there, he overhauled and managed operations related to the evaluation of quality and safety of foods for a wide variety of clients, involving more than 80 food laboratories and teams in 35 countries.

Dr. Flanders holds food safety instructor certifications from ServSafe (USA) and the Chartered Institute of Environmental Health (UK). He is also a certified Hazard Analysis Critical Control Point (HACCP) auditor and trainer.

Dr. Flanders earned his doctoral degree in food science from the University of South Bank in London.

Atkinson Oversees Ansell Food Processing and Food Service Division

Scott Atkinson has been named business development manager for the Food Processing and Food Service Division of Ansell Occupational Healthcare. He will be responsible for developing strategies that meet market and customer needs, segmenting Ansell opportunities, sales support and creating awareness of the Ansell brand in key verticals.

Atkinson brings more than 14 years of marketing experience to Ansell, with a background in strategic planning, market segmentation, communications and product development. He was previously operations marketing manager with Host Marriott Services, and was the director of marketing with two venture capital based start-up companies. He also served as

marketing manager with The Rouse Company.

A graduate of West Chester University, Atkinson earned a bachelor of science degree in marketing. He is a certified marketing director and is presently completing his master's degree in business administration from Temple University's Fox School of Business.

Doug Sevedge Joins Fristam Pumps

Fristam Pumps is pleased to announce Doug Sevedge has joined the company as materials manager.

Doug holds a B.A. degree from Moody Bible Institute, Chicago and has 25-years of experience in purchasing and materials. He is a long-time member of the Institute for Supply Management (formerly NAPM) and is a certified purchasing manager.

As materials manager, Doug will be responsible for coordinating Fristam's supply chain management activities.

Q Laboratories, Inc. Names New Microbiology Group Leader

Susan Bogar has been appointed to the position of microbiology group leader of Q Laboratories, Inc. Susan has been an analyst of Q Laboratories, Inc. for the past 5 years. She will be responsible for the day-to-day operations of the microbiology laboratory as well as coordinating all client service activities.

Compound in Salsa May Fight Food Poisoning

Researchers have identified a compound in cilantro, a key flavor component of salsa and a variety of other dishes, that kills harmful *Salmonella* bacteria and shows promise as a safe, natural food additive that could help prevent foodborne illness, according to a joint study by US and Mexican researchers.

Although previous studies by the researchers showed that salsa has antibacterial activity, this new study represents the first time that they have isolated any of the antibacterial compounds from it. Their study appeared in the May 26 issue of the *Journal of Agricultural and Food Chemistry*, a peer-reviewed publication of the American Chemical Society.

The compound "dodecenal" was isolated from the fresh leaves of cilantro, or coriander, one of the main ingredients found in salsa, along with tomatoes, onions and green chilies. The compound also is found in the seeds of cilantro. Both leaves and seeds contain about the same amount of dodecenal, but the leaves are used more abundantly in salsa.

In laboratory tests, dodecenal was twice as potent as the commonly used medicinal antibiotic gentamicin at killing *Salmonella*, a frequent and sometimes deadly cause of foodborne illness, the researchers say. It is the only naturally occurring antibacterial that is more effective than gentamicin against *Salmonella*, they claim.

"We were surprised that dodecenal was such a potent antibiotic. Most natural antibacterial agents found in food generally have weak activity. The study suggests that people should eat more salsa with their food, especially fresh salsa," says study leader Isao Kubo, Ph.D., a chemist with the University of California, Berkeley.

In addition to dodecenal, about a dozen other antibiotic compounds were isolated from fresh cilantro that show some activity against a variety of harmful bacteria. Salsa likely contains even more antibacterial compounds that have not yet been identified, according to Kubo.

The findings could lead to expanded use of dodecenal as a tasteless food additive to prevent foodborne illness, perhaps as a protective coating for meats in processing plants, or even as a general purpose disinfectant to be used in cleaning and hand washing, Kubo says. But don't rely on salsa alone to safeguard your food: There's only a small amount of the potent antibacterial in a typical serving. "If you were eating a hot dog or hamburger," explains Kubo, "you would probably have to eat an equivalent weight of cilantro to have an optimal effect against food poisoning."

The researchers say that their lab does not plan to market dodecenal as a bacteria fighter or test it further to see if it works in humans. But they acknowledge that their findings are attractive for industry and others wanting to develop better ways to combat foodborne illness.

Dodecenal also shows promise in side-stepping the growing problem of antibiotic resistance. The researchers believe the compound works by destroying the cell membrane of bacteria, similar to the way soap kills bacteria. As the compound does not appear to interfere with any of the protein-manufacturing machinery of the cell, as occurs with many commercial antibiotics, bacteria are less likely to develop resistance to it, Kubo says.

Whether you choose to eat salsa with your tacos, chips or chicken, keep in mind that there's no substitute for proper storage, handling and cooking of any food in order to prevent foodborne illness, according to health experts.

The University of California, Berkeley, and the University of California Institute for Mexico and the United States (UC MEXUS) provided funding for this study. Kubo's associates in this study were Ken-ichi Fujita, Aya Kubo and Ken-ichi Nihei, of UC Berkeley, and Tetsuya Ogura, of Universidad Autonoma de Guadalajara, Mexico.

Food Safety, Animal and Plant Health Portal Launched

FAO has launched the International Portal for Food Safety, Animal and Plant Health at a Regional Conference on Food Safety for Asia and the Pacific. The Portal will enable a speedy and authoritative search for current food safety and food quality standards, regulations and other relevant official materials from a single search tool.



The actual information is maintained by the competent national institutions, relevant standard setting bodies and international agencies such as the Codex Alimentarius Commission, the International Plant Protection Convention, the Organization for Animal Health (OIE), FAO, WHO and the World Trade Organization (WTO).

"The Portal provides accurate and easily accessible information on food safety and quality trade standards, which will make it easier for developing countries to upgrade their food safety systems so they can take advantage of export opportunities," said FAO assistant director-general Hartwig de Haen.

According to Louise Fresco, FAO assistant director-general, agriculture, "The Portal will continue to build up information and will eventually be one of the world's most comprehensive sources of information on standards, regulations and other official information related to food safety, animal health and plant health. Through it, decision-makers, professionals and the public-at-large will have fast direct access to information that is essential to improve food safety as well as protect animal and plant health."

The International Portal on Food Safety, Animal and Plant Health currently contains more than 15,000 items, many translated into multiple languages and each described using a set of keywords supported by a powerful free text search.

According to Mike Robson, the Portal designer and manager, "This new Portal offers a unique and powerful capacity to disseminate information to users worldwide. The Portal meets a need for a

reliable source of official information on regulations and standards, without the background of spurious "hits" found using conventional search tools. It will help improve consumer protection, the health of plants and animals and facilitate trade by letting traders and countries know exactly what safety regulations must be met to export their products safely."

The Portal search engine provides rapid full text retrieval of documents in their original language. It was built using the open source Lucene software and has been designed to be as accessible as possible using slow dial-up connections.

FAO said it is encouraging all national authorities who have standards, regulations and other supporting materials published on the Web to take advantage of the Portal's features and link their information alongside that provided by other countries and by standard-setting bodies.

FAO, the United States of America, the Netherlands and Norway provided funding for the development of the Portal. FAO will manage the infrastructure of the Portal and its further development and maintenance guided by an interagency task force, but the information will remain the property of each contributing organization.

FDA Finalizes Rule on Administrative Detention of Suspect Food

The Food and Drug Administration has announced the final rule establishing procedures for administrative

detention of food under the authority of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act). This new authority applies to food for which the agency has credible evidence or information that it presents a threat of serious adverse health consequences or death to humans or animals.

"These regulations lend an additional layer of protection to our defenses against bioterrorism. The rule strengthens the security of our food supply by enabling us to act more quickly and effectively to prevent potentially contaminated food from reaching consumers," said secretary of health and human services Tommy G. Thompson.

The Bioterrorism Act authorized the FDA to administratively detain suspect food as soon as it was enacted. The final regulation clarifies the agency's administrative detention procedures and the process for appealing the detention order.

"Identifying and removing contaminated food from the food supply is an essential part of responding to terrorist acts. This rule describes how the FDA can hold food in place while it initiates legal action in court to seize it and permanently remove it from commerce. Alternately, our experts can determine that the food is safe, and the detention order may be terminated. Either way, consumers are protected," said Dr. Lester M. Crawford, acting FDA commissioner.

Under the final rule, FDA may detain an article of food on the strength of credible evidence or information resulting from an inspection, examination, or investi-



gation. The rule requires a detention order to be approved by the FDA district director of the district where the detained article of food is located, or by a higher official. A copy of the detention order would be given to the owner, operator, and/or agent in charge of the place where the article of food is located, and to the owner of the food provided the owner's identity can be determined readily. If FDA issues a detention order for an article of food located in a vehicle or other carrier, the agency also must provide a copy of the detention order to the shipper of record and the owner and operator of the vehicle or other carrier provided the owner's identity can be determined readily.

The final rule requires detained articles of food to be held in secure locations, as determined by FDA. The food may not be transferred from the place where it has been ordered detained, or from the place where the detained article has been removed without FDA approval, until FDA terminates the detention order, or the detention period expires. A detention may not exceed 30 days, and violation of a detention order is a prohibited act.

The new rule implements one of four key provisions of the Bioterrorism Act that are primarily designed to ensure the safety and security of food. Two other important regulations implementing the Act were issued by the FDA on October 10, 2003. These two interim final rules require that all domestic and foreign facilities that manufacture, process, pack or hold food that will be consumed in the US to register with the FDA, and that the agency receive a prior notification of all food imported or offered for import into the US

regardless of whether it will be consumed in the US. FDA plans to issue shortly the fourth final rule, which will cover the establishment and maintenance of records to allow for the identification of the immediate previous sources and immediate subsequent recipients of food to help FDA track food implicated in future emergencies.

These rules are part of the FDA's continuing effort to ensure the safety and security of the nation's food supply. While the administrative detention authority applies to both domestic and imported food, FDA envisions using it primarily for food already in domestic commerce, since the agency and CBP have other authorities that also apply to imported food.

Seafood Safety Regulations Will Soon Be National and Enforceable

Food Standards Australia New Zealand (FSANZ) has released a report for public comment containing a blueprint for maintaining the reputation of the safety of Australian seafood. The report contains a scientific evaluation of the safety of seafood, options for the management of seafood safety and a draft standard (regulation) proposed for incorporation into the Australia New Zealand Food Standards Code.

Seafood sold in Australia is safe and nutritious and is an important part of the diet. The vast majority of seafood businesses are already working to the levels of food safety management required by the proposed standard. Australian

governments are committed to a continual improvement to the safety of our food. This is why, in 2002, the ministerial council with oversight for Australia's food decided to adopt a whole-of-chain approach to food regulation, ensuring that food safety is addressed from the beginning of its production, to the point of its consumption.

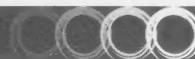
Existing standards in the Code already apply food safety requirements to the manufacturing and retail end of the food chain. This new draft standard, called a Primary Production and Processing Standard, proposes to extend mandatory food safety requirements in the Code to the primary production and processing of seafood. Standards will also be developed for other food sectors such as dairy and meat.

The development of this draft standard was undertaken by FSANZ in partnership with the seafood industry and other government agencies. A Standard Development Committee (SDC) was established to provide advice and technical assistance to the process, with representatives from industry, government and consumer groups.

The proposed standard will apply to imported seafood as well as domestically produced products. It is the latest initiative by industry and government to manage food safety in the seafood industry.

Based on a scientific evaluation, FSANZ has prepared three options for a new nationally consistent management system to maintain the safety of seafood. It has also developed a draft standard for the industry, based on the preferred option.

The options and draft standard appeared in a P265 Draft Assessment Report, which was made available July 21, 2004.



Effects of Extended Storage on Eggs

Egg quality and usefulness are safely maintained beyond the sell-by date if the eggs are stored properly, according to Agricultural Research Service scientists in Athens, GA.

Processing and Meat Quality Research Unit tested the quality and functionality of table eggs during a 10-week storage time, long beyond the current 30-day industry standard for storing eggs on the store shelf. Properly refrigerated and handled, eggs are considered safe for consumption for four to five weeks beyond the sell-by date.

Musgrove looked at bacteria like *Salmonella*, *Escherichia*, *Enterobacter*, *Klebsiella* and *Yersinia*

that can contaminate eggshells and, if handled or processed improperly, remain on eggs when they reach the consumer. However, Musgrove found that after washing and packaging, eggs showed no bacteria of the *Enterobacteriaceae* family until the fifth week after processing. Washing eggs according to current guidelines removes bacteria from their surface, reducing the chances of microbes getting into the eggs once they are cracked in preparation for consumption.

An egg's shell and membranes under the shell provide a barrier that limits the ability of organisms to enter. A natural protective coating, called the cuticle, helps to preserve freshness and prevent microbial contamination of the egg. This coating is damaged or removed by

processing, but a thin layer of oil may be applied during processing to help preserve internal quality. The eggs are then placed in cold storage and shipped. Jones studied the functionality of the eggs during 10 weeks of storage. Eggs are found in a wide range of foods, including baked goods and mayonnaise.

Over time, eggs can lose their ability to fluff up an angel food cake or make creamy mayonnaise, but according to Jones, they didn't show a marked decrease in quality during the 10-week test period.

Read more about the research in the June issue of *Agricultural Research* magazine, available on the World Wide Web at: <http://www.ars.usda.gov/is/AR/archive/jun04/egg0604.htm>.

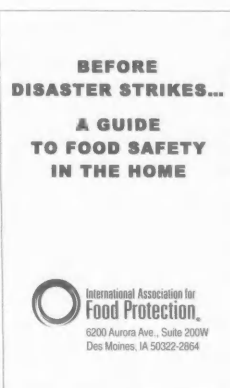
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Hardy Diagnostics

Hardy Diagnostics Introduces the SystemSure II™

The SystemSure II™ is a low-cost instrument for ATP bioluminescence hygiene testing. This palm-sized instrument is the smallest and lightest (only 260 gm; 17 x 17 x 3 cm) luminometer available today. Sensitive, the SystemSure II™ can detect ATP down to 1 femtomole. The Luminometer's menu-driven operation from the keyboard is simple to operate and can store up to 500 results. Programmable pass/fail levels are included in the system's internal software. Data is easily downloaded to Microsoft Excel. The SystemSure II™ combines simplicity, compact size, and an economical price. Designed to be used with the Ultrasnap™ ATP swab.

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Santa Maria, CA
www.hardydiagnostics.com

R & F Laboratories Offers New Line of Chromogenic Media

R & F Laboratories is introducing a line of chromogenic medium used to isolate and identify pathogenic bacteria. All media have either received patents or are in the patent application process. The first medium is R & F® *Listeria monocytogenes* Chromogenic Plating Medium which has been licensed from Biosynth. This plating medium uses the chromogen 5-Bromo-4-chloro-3-indoxyl-myoinositol-1-phosphate to detect the virulence factor phosphatidylinositol phospholipase C found in *L. monocytogenes* and *L. ivanovii*. These two *Listeria* species form turquoise colonies on the plating medium, whereas the other *Listeria* species produce white colonies. The R & F® *Listeria monocytogenes* Chromogenic Plating Medium is FDA recommended and has been collaboratively validated by the FDA using 8 laboratories. In addition, R & F® *Listeria monocytogenes* Confirmatory Medium and acid from rhamnose can be used to easily differentiate *L. monocytogenes* from *L. ivanovii* within 6 hours.

R & F® *Escherichia coli* O157:H7 Chromogenic Plating Medium (formally BCM® *Escherichia coli* O157: H7(+) agar) uses a patented detection system for the isolation of *E. coli* O157:H7. This plating medium utilizes a series of chromogens and an enhancer for the detection of β -galactosidase coupled with sugar fermentation and a pH indicator to isolate *E. coli* O157:H7. Therefore, a β -glucuronidase positive *E. coli*

O157:H7 would not produce a false negative reaction. This plating medium has been on the market for 5 years and extensively investigated by many laboratories throughout the world with excellent results.

R & F® *Bacillus cereus/Bacillus thuringiensis* Chromogenic Plating Medium uses the chromogen, 5-Bromo-4-chloro-3-indoxyl-myoinositol-1-phosphate for the detection of phosphatidylinositol phospholipase C. *Bacillus cereus/Bacillus thuringiensis* produce flat dull turquoise colonies on this patented plating medium after 24 hours of incubation. Colony enumeration and isolation are easier on the R & F® *Bacillus cereus/Bacillus thuringiensis* Chromogenic Plating Medium than traditional *Bacillus cereus* agars because of higher selectivity and formation of discrete, non-coalescing colonies.

R & F® *Salmonella* Chromogenic Plating Medium uses a series of chromogens and an enhancer for the detection of β -galactosidase and sugar fermentation quite unique for *Salmonella enterica* strains. This patent applied for plating medium isolates *S. Typhi* as well as other *Salmonella* serovars (subsp. I, II, IV, IIIa, IIIb, IV and VI) while either differentiating from or inhibiting the growth of many similar bacteria.

R & F® *Bacillus anthracis* Chromogenic Plating Medium detects the virulence factor phosphatidylcholine phospholipase C, by using 5-Bromo-4-chloro-3-indoxyl-choline-phosphate hydrolysis. This patented-plating medium can differentiate *B. anthracis* from the closely related

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INDUSTRY PRODUCTS

Bacillus cereus/Bacillus thuringiensis strains and other bacilli after a 24 to 48 hour incubation period. This chromogenic plating medium has been investigated by the bioterrorism division of the FDA and found to be superior to other traditional plating medium for isolating *B. anthracis*.

Chromogenic plating media for the detection of *Enterobacter sakazakii*, *Shigella sonnei/Shigella boydii*, all *Shigella* species, enter-invasive *Escherichia coli*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa* will arrive in the near future.

R & F Laboratories
630.293.4000
West Chicago, IL
www.rf-labs.com

New Test for *Listeria* Genus Sets Pace in Sanitation and Food Safety Faster Identification of *Listeria* with PCR-based Test from Roche Diagnostics

Listeriosis in humans is the second major foodborne disease worldwide. The genus *Listeria* (which includes six different species) is ubiquitous and associated with a large variety of environmental and food materials.

Therefore, the screening for the genus *Listeria* is largely regarded as an indicator of sanitation and as an early warning of potential presence of pathogenic species. Traditional, microbiological testing methods often are very time-consuming (up to 4 days) and some are neither sensitive nor specific enough.

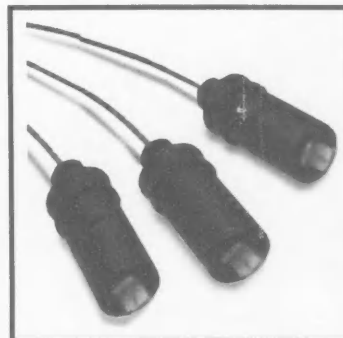
The new LightCycler foodproof *Listeria* Genus Detection Kit from Roche Applied Science detects

rapidly *Listeria* DNA that is isolated from enrichment cultures inoculated with food sample material. The presence of the pathogenic species *Listeria monocytogenes* in positive samples might be further confirmed by using the LightCycler *Listeria monocytogenes* Detection Kit. Beyond supplying a rapid result, the LightCycler System provides highly sensitive and specific detection for the food industry. The LightCycler foodproof *Listeria* Genus Detection Kit also minimizes the risk of sample contamination and false-positive as well as false-negative results. The test is another step to complete Roche Applied Science's product portfolio in the field of food safety.

"The LightCycler foodproof *Listeria* Genus Detection Kit extends the molecular food safety testing portfolio of the LightCycler System," states Volker Pfahlert, Head of Roche Applied Science. "Our test kits today enable its user to identify *Salmonella*, *Listeria*, *E. coli*, beer-spoiling microorganisms, and genetic modified food ingredients."

The bacteria *Listeria* is typically transmitted to humans through the ingestion of contaminated food such as raw milk, dairy products, meat, and raw vegetables. Most of these foods have relatively short shelf lives and food industries need to fasten in-process control to prevent in-house contaminations. Therefore, the need for a rapid, accurate, and sensitive method like the LightCycler foodproof *Listeria* Genus Detection Kit is a major food safety issue.

Roche Diagnostics
317.521.7159
Indianapolis, IN
www.roche-diagnostics.us



Walchem Corporation

Walchem Corporation Introduces the WCT and WBL Controllers

Walchem Corporation announces that WCT and WBL controllers are now capable of powering a Hall Effect style water meter sensor. Options for the WFP Series flowmeter include a low frequency (less than 10 Hz) contacting head meter, or a high frequency (10-300 Hz) paddlewheel. Paddlewheel sensors cost less than contacting head meters in pipe sizes greater than two inch diameter. The solid state Hall Effect sensors last longer than the mechanical reed switch sensors.

The WFP Series is perfect for chemical proportioning applications, and readily interfaces with Walchem's WebMaster® series controllers.

WFP flowmeters are impeller-type insertion meters designed for use in pipe sizes of 1/2" to 8". High quality jewel bearings and nickel-bound tungsten carbide shaft are used, creating superior low-flow performance. The rotation of the rotor is detected by a non-drag Hall-effect sensor. Output is a pulse-type square wave, which can be sent up to 2000 feet (610 meters)

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INDUSTRY PRODUCTS

without a transmitter. Mounting fittings and sensors are available in PVC.

Low frequency Hall Effect sensors simply connect it to the controller (power, input and ground). Selecting "Feed" on water meter mode and programming the volume per contact of the meter completes the process.

Paddlewheel sensors connect to the controller (power, input and ground). "Feed" is selected on Paddlewheel mode and pulses are programmed per volume (K Factor) of the meter. In order to change the electronic filtering used on the input to support the paddlewheel frequency, a jumper must be moved on the front panel processor board.

Walchem Corporation
508.429.1110
Holliston, MA
www.walchem.com

Onset Introduces Stainless Steel Temperature Data Logger for Industrial Applications

Onset Computer Corporation has introduced the HOBO U12 Stainless Temp Logger, a stainless steel, food-grade data logger designed for food and beverage, pharmaceutical, autoclave, and other industrial applications where high-accuracy temperature data is critical. The logger, which fits into a standard-sized beverage bottleneck, measures and records temperatures from 40 to 125°C and can withstand process conditions from pasteurization to flash freezing and wash down.

"In applications such as food processing, beverage pasteurization, and pharmaceutical storage, there's

a great need for high-accuracy temperature logging at a low cost," said Joanna Phillips, product marketing manager for Onset. "Our new Stainless Temp Logger provides the ideal combination of performance and ruggedness at a significantly lower price than comparable logging solutions."

In addition to offering high accuracy, the U12 Stainless Temp Logger provides highly stable readings by virtue of an internal glass bead thermistor. The logger also offers a direct USB interface for high-speed data offloading, a 43K measurement capacity, and a pressure rating of 2200 psi for autoclave and underwater applications.

For plotting and analyzing data, Onset offers its easy-to-use GreenLine® software package. GreenLine enables users to launch and readout the loggers with point-and-click simplicity, and offers real-time monitoring capability on a PC. The software also offers a number of other convenient features, such as the ability to view multiple channels from a single logger on one graph, and one-click conversion of data for easy upload into Microsoft® Excel software.

Onset Computer Corporation
1.800.LOGGERS
Bourne, MA
www.onsetcomp.com/hobo

Hannay's SSN800 Ideal for Mounting in Confined Sanitary Spaces

The SSN800 series stainless steel hose reel features a narrow frame that makes it ideal for mounting in smaller spaces. With no paint to chip and no potential

for rust and corrosion, these reels are ideal for the food and beverage, dairy, pharmaceutical and cosmetics industries. Typical applications include washdown, chemical transfer, potable water, food ingredient transfer and even fire protection.

The SSN800 is constructed of fine grade 304 stainless frames, discs and drum. It handles single ID hose from 3/4-in to 1-in, and can accommodate pressures to 1000 psi and temperatures from +20°F to +400°F (-7°C to +204°C). The SSN800 has a heavy-duty spring motor with self-contained rewind power, and a non-sparking ratchet assembly locks the reel when the desired length of hose has been payed out.

Hannay Reels Inc.
1.877.GO.REELS
Westerlo, NY
www.hannay.com

Shat-R-Shield Releases Two New Options in Safety-coated Lighting

Shat-R-Shield has released two new products to help manufacturers solve their lighting needs, a Teflon® coated halogen PAR lamp and a Teflon® coated ultraviolet germicidal fluorescent lamp. Both products feature Shat-R-Shield's unique, skin-tight safety coating, which protects products and employees from glass shards, gases and other lamp elements if a lamp is broken or dropped.

The Teflon® coated halogen PAR lamp is ideal for industrial applications, office environments, food processing plants, retail environments and restaurants. The Shat-R-Shield coating resists chemical contamination and degradation, as well as breakage from

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thermal shock caused by rain or snow, hot and cold liquids, and hot weld splatters. The lamps also are easy to clean because particles will not stick to the Teflon® coating. Other features include:

- Reduced energy costs — Since halogen lamps produce more light with fewer watts than conventional lamps, it is possible to save energy by using a lower wattage lamp to replace a higher wattage lamp.
- Bright, white halogen light — Because halogen light has a higher color temperature than incandescent light, halogen lighting appears whiter and brighter.
- Vibrant, natural-looking colors — Halogen lighting helps make products look their best because it produces stable consistent color, offering better color renderings.
- Longer Life — Standard incandescent 38 PAR lamps have a rated life from 750 hours to 2000 hours. Halogen PARs are rated between 2,500–4,500 hours depending on wattage and the incorporation of the new infrared technology.

Shat-R-Shield's ultraviolet germicidal fluorescent lamps feature a special UV transmitting glass that is protected by the company's Teflon® coating. UV lights are used to kill microorganisms both in the air and in water and have been proven a safe, effective and cost-efficient way to control contamination in a variety of settings. The light

penetrates microbe cells and damages the cells' DNA, effectively killing the contaminants. Germicidal lamps are helpful for any company that needs to eliminate germs and bacteria to guard against product contamination, for example:

- Water treatment plants for water purification;
- Bottled water manufacturers for water purification;
- Pharmaceutical laboratories to help control airborne and surface contaminants;
- Hospitals in air ducts to sanitize air in waiting rooms, clinics, research facilities, etc.;
- Any sterile production areas where molds, mildew, bacteria, viruses, etc. could jeopardize a product.

Shat-R-Shield is a certified Teflon® applicator. Halogen PARs are available in wattages ranging from 60w to 250w with the most popular 90w being a stock item. Due to the range of germicidal lamp sizes and configurations, these lamps are custom ordered and do not include compact fluorescents.

Shat-R-Shield
704.633.2100
Salisbury, NC
www.shat-r-shield.com

Viking Announces Pumps Designed to Tackle the Toughest Edible Oil Processing Applications

Viking Pump provides pumping solutions that effectively address the needs of the most exacting edible oil applications—Viking's Universal Seal Series Internal Gear Pumps, which offer heavy duty capabilities designed to

handle the viscous liquids that characterize edible oil processing. Capable of 24/7 operation under the toughest conditions, Universal Seal Series pumps are energy efficient and require little maintenance, enabling longer periods of operation without downtime for the refinery or mill.

Viking pumps are used throughout the extraction, refining, and modification processes in both physical and chemical refining systems, as well as terminal and truck pump applications. Requirements can range from low NPSH to high pressure to high temperature, as well as processing of by-products such as gums, soap stocks, and FFA distillates. All can be handled by the Universal Seal series, which provides exceptional flexibility and reliability.

The variety of sizes, materials, and options available with Universal Seal Series pumps make them suitable for a broad range of liquids and applications, which minimizes the number of different types of pumps required in a facility and simplifies maintenance. Capacities range up to 1,500 gpm, and material options include cast iron, ductile iron, steel externals, and stainless steel, with jacketing options for melting solids before start-up. To help eliminate downtime, the Universal Seal pump accepts a variety of shaft seals, allowing the user to apply the seal that is best for the job. Also, the pumps are self-priming and the direction of flow can be reversed, enabling more flexibility in laying out the process.

Viking Pump
319.266.1741
Cedar Falls, IA
www.vikingpump.com

Be sure to mention, "you saw it in Food Protection Trends"!

Systemate Numafa's Springdale Sole Cleaner a Compact, Cost Efficient Solution

Systemate Numafa's Springdale Sole Cleaner offers a cost-effective solution for the low volume cleaning and sanitizing of boot bottoms.

Photocells on either end of the Springdale activate rotation of the two large bottom brushes. Working at a safe and comfortable speed, the brushes are effective in cleaning debris out of the grooves of boots, work shoes and tennis shoes. After the last person passes through the cleaner, a timing mechanism shuts off the machine.

The Springdale can be used for wet or dry operation. When used for wet operation, sanitizing solution and water is constantly metered and atomized rather than sprayed. This allows the Springdale to conserve water and chemicals.

A trough captures contaminated fluids and debris, which is discharged through a two-inch drain to the floor. The slip-in brush assembly makes daily cleaning of the brushes an easy task.

The compact Springdale is six foot three inches long and is all stainless steel in construction.

Systemate Numafa offers a line of boot washers to meet a variety of sanitation needs. Other models include the Beaver Falls, Beaver Hill, Beaver Forest, and Orlando boot washers.

Systemate Numafa has manufactured and developed cleaning

systems since 1977. The company provides high-capacity, fully automated cleaning systems as well as stand-alone systems. Systemate Numafa's product line also includes cleaning vats, containers, racks, smoke trees, smoke sticks, smoke screens, wooden and plastic pallets, totes, lugs and baskets.

Systemate Numafa NA

800.240.3770

Canton, GA

www.numafa.com

Sigma Introduces New ProteoMass™ Guanidination Kit

Sigma-Aldrich Corporation has launched a new ProteoMass™ Guanidination Kit (Product code MS0100) for enhancing MALDI-MS sensitivity. The innovative, new ProteoMass Guanidination Kit enables researchers to increase the sensitivity of their MALDI-MS analyses, achieve higher sequence coverage, and identify sample peptides with greater confidence.

MALDI-MS is the preferred analytical instrument for many proteomics researchers. Tryptic peptides are identified by characteristic masses; the more peptides identified, the greater the certainty of analytical accuracy. In typical analyses, peptides generated during proteolytic digestion with C-terminal Arginine residues are ionized preferentially over peptides with C-terminal Lysine residues, leading to compromised sequence coverage

and limited confidence during peptide mass fingerprint analysis. The ProteoMass Guanidination Kit efficiently and conveniently converts C-terminal Lysine residues to homo-arginine, increasing MALDI sigma strength and producing enhanced sequence coverage.

Using the ProteoMass Guanidination Kit, researchers have observed dramatic increases in peak intensity, often as great as 10-fold. Additionally, many peaks previously unobserved are easily detectable following treatment with this new kit. In 100% of proteins analyzed, sequence coverage increased using the kit.

"The ProteoMass Guanidination kit has made a major impact in proteomics-based analyses," commented Steven Cockrill, Senior Analytical R&D Scientist at Sigma-Aldrich. "Within various research studies, we've experienced a vastly improved signal from lysine-containing peptides and the commensurate increases in sequence coverage and confidence in protein identification. Moreover, there have been instances where the kit was a true lifesaver, allowing the detection of crucial but low abundance or poorly-ionizing peptides. The kit has demonstrated applicability for routine utility through robust and reproducible chemistry, and is now a mainstay product in our laboratory for those critical sample analyses."

Sigma-Aldrich Corporation

314.771.5765

St. Louis, MO

www.sigma-aldrich.com

Be sure to mention, "you saw it in Food Protection Trends"!

COMING EVENTS

SEPTEMBER

- **1-2, Micrology II: Sanitation**, Guelph Food Technology Centre, Guelph, Ontario, Canada. For more information, contact Marlene Inglis at 519.821.1246; E-mail: minglis@gftc.ca.
- **1-3, Food Safety and HACCP in the 21st Century: From Theory to Practice**, Conrad Hotel, Bangkok, Thailand. Co-sponsored by IAFP. For more information, contact Chris Jones at 44.161.736.9172; E-mail: www.who.int/en.
- **9, HACCP: A Management Summary**, Guelph Food Technology Centre, Guelph, Ontario, Canada. For more information, contact Marlene Inglis at 519.821.1246; E-mail: minglis@gftc.ca.
- **12-14, FPMA (Food Processing Machinery Association) Annual Conference**, Hamburger University, Oak Brook, IL. For more information, call 800.331.8816 or go to www.foodprocessingmachinery.com.
- **12-15, International Symposium on Problem of Listeriosis (ISOPOL)**, Uppsala, Sweden. For more information, go to www.conference.slu.se/isopol.
- **14, Georgia Association for Food Protection Annual Fall Meeting**, ZEP Manufacturing, Atlanta, GA. For more information, contact Mark Norton at 404.656.3621; E-mail: mnorton@agr.state.ga.us.
- **14, Meat Industry Suppliers Alliance (MISA) Fall Operators Conference**, Hamburger University, Oak Brook, IL. For more information, call 800.331.8816 or go to www.foodprocessingmachinery.com.
- **15-16, ServSafe® for the Food Industry, Food Service & Retail**, Guelph Food Technology Centre, Guelph, Ontario, Canada. For more information, contact Marlene Inglis at 519.821.1246; E-mail: minglis@gftc.ca.
- **19-22, American Association of Cereal Chemists (AACC) and the Tortilla Industry Association (TIA) Meeting**, San Diego Convention Center, San Diego, CA. For more information, contact AACC at 651.454.7250; E-mail: aacc@scisoc.org.
- **19-23, 118th AOAC Annual Meeting**, Adam's Mark Hotel, St. Louis, MO. For more information, call 301.924.7077 or go to www.aoac.org.

- **20-24, International Conference on Food Safety**, Adelaide, South Australia. For more information, contact the conference convenor at 61.2.9684.1975; E-mail: conference@haccptown.com.
- **21-22, Upper Midwest Dairy Industry Association Annual Meeting**, Holiday Inn, St. Cloud, MN. For more information, contact Gene Watnaas at 218.769.4334; E-mail: saantaw@prtcl.com.
- **21-23, New York State Food Protection Association Annual Meeting**, Sheraton Four Points Hotel, Buffalo, NY. For more information, contact Janine Lucia at 607.255.2892; E-mail: jgg3@cornell.edu.
- **22-23, Fifth Annual Illinois Food Safety Symposium**, Hotel Pere Marquette, Peoria, IL. For more information, contact Jayne Nosari at 217.785.2439; E-mail: jnosari@idph.state.il.us.
- **28, Washington Association for Food Protection Annual Conference**, Campbell's Resort, Chelan, WA. For more information, contact Bill Brewer at 206.363.5411; E-mail: billbrewer1@juno.com.
- **28-29, Wisconsin Association for Food Protection Annual Meeting**, Ho-Chunk Casino & Hotel Convention Center, Wisconsin Dells, WI. For more information, contact Randy Daggs at 608.837.2087; E-mail: rdaggs@juno.com.
- **28-Oct. 2, World Dairy Expo 2004**, Madison, WI. For more information, go to www.worlddairyexpo.com.
- **29, Sanitary Facility Design Workshop**, Nashville, TN. For more information, contact American Meat Institute Foundation at 703.841.2400 or go to www.meatami.com.
- **29-Oct. 1, Wyoming Environmental Health Association Annual Educational Conference**, Great Divide Lodge, Breckenridge, CO. For more information, contact Roy Kroeger at 307.633.4090; E-mail: roykehs@laramiecounty.com.
- **29-Oct. 1, Bev Expo 2004**, Tampa Convention Center, Tampa, FL. For more information, go to www.bevexpo.com.

OCTOBER

- **5-7, ASTM Committee E27 on Hazard Potential of Chemicals**, Omni Shoreham, Washington, D.C. For more information, contact Scott Orthey at 610.832.9730; E-mail: sorthey@astm.org.
- **6, Alberta Association for Food Protection Annual Meeting**, University of Alberta Faculty Club, Edmonton, Alberta, Canada. For more information, contact Lynn McMullen at 780.492.6015; E-mail: lynn.mcmullen@ualberta.ca.
- **6-8, Kansas Environmental Health Association Annual Fall Meeting**, Best Western Inn, McPherson, KS. For more information, contact Cynthia Kastens at 620.842.6000; E-mail: ckastens@sedgwick.gov.
- **7-8, Advanced HACCP**, St. Louis, MO. For more information, contact ASI Food Safety Consultants at 800.477.0778 ext. 113; E-mail: jhuge@asifood.com.
- **11-12, Food Safety Conference 2004**, Gold Coast Convention and Exhibition Centre, City, Country? For more information, go to www.foodsafetyconference.com.au.
- **12-13, Associated Illinois Milk, Food and Environmental Sanitarians Annual Fall Meeting**, Stoney Creek Inn, East Peoria, IL. For more information, contact Terry Fairfield at 815.490.5570; E-mail: terry_fairfield@deanfoods.com.
- **12-14, Applied Extrusion Workshop**, University of Nebraska Food Processing Center, Lincoln, NE. For more information, contact Pauline Galloway at 402.472.9751; E-mail: pgalloway2@unl.edu.

IAFP UPCOMING MEETINGS

AUGUST 14-17, 2005
Baltimore, Maryland

AUGUST 13-16, 2006
Calgary, Alberta, Canada

JULY 8-11, 2007
Lake Buena Vista, Florida

COMING EVENTS

- **17-20, UW-River Falls 24th Food Microbiology Symposium**, "Current Concepts in Foodborne Pathogens and Rapid and Automated Methods in Food Microbiology," University of Wisconsin-River Falls, WI. For more information, call 715.425.3704; E-mail: foodmicro@uwrf.edu.
- **19, Metropolitan Association for Food Protection Annual Meeting**, Rutgers, Cook College, New Brunswick, NJ. For more information, contact Carol Schwar at 908.689.6693; E-mail: cschwar@entermail.net.
- **19-20, 9th Annual Dairy Cleaning and Sanitation Short Course**, Cal Poly Dairy Products Technology Center, San Luis Obispo, CA. For more information, contact Laurie Jacobson at 805.756.6097; E-mail: ljacobso@calpoly.edu.
- **19-20, Sensory Techniques**, CCFRA Technology Ltd., Chipping Campden, Glos, UK. For more information, contact Chantal Gilbert at 44.1386.842256; E-mail: training@campden.co.uk.
- **19-21, 2nd International Symposium on Spray Drying of Milk Products**, Maryborough House Hotel, Maryborough Hill, Douglas, Cork, Ireland. For more information, call 353.25.42237; E-mail: spraydrying2004@moorepark.teagasc.ie.
- **20-22, Florida Association for Food Protection Annual Educational Con-**

ference, Adam's Mark Hotel, Clearwater Beach, FL. For more information, contact Marjorie Jones at 561.871.7405; E-mail: marjorie.jones@avendra.com.

- **25-26, Brazil Association for Food Protection Annual Fall Meeting**, Conselho Regional de Quimica, São Paulo, Brazil. For more information, contact Maria Teresa Destro at 55.113.091.2199; E-mail: mtdestro@usp.br.
- **25-29, Dairy Technology Workshop**, Birmingham, AL. For more information, call 205.595.6455; E-mail: us@randolphconsulting.com.
- **28-30, North Dakota Environmental Health Association Annual Fall Meeting**, Seven Seas Conference Center, Mandan, ND. For more information, contact Debra Larson at 701.328.1291; E-mail: djlarson@state.nd.us.

NOVEMBER

- **3-4, Implementing Listeria Intervention and Control Workshop**, Chicago, IL. For more information, contact American Meat Institute Foundation at 703.841.2400 or go to www.meatami.com.
- **4-5, Lead Auditor**, Atlanta, GA. For more information, contact ASI Food Safety Consultants at 800.477.0778 ext. 113; E-mail: jhuge@asifood.com.
- **5-6, Mexico Association for Food Protection Annual Fall Meeting**,

Guadalajara, Jalisco, Mexico. For more information, contact Lydia Mota De La Garza at 01.5794.0526; E-mail: dra_lydia_mota@lei.com.mx.

- **7-11, FPMA (Food Processing Machinery Association) Expo**, McCormick Place, Chicago, IL. For more information, call 800.331.8816 or go to www.foodprocessingmachinery.com.
- **9-10, Principles of Food Safety Auditing/Inspection**, Four Points Sheraton Hotel Chicago O'Hare, Chicago, IL. For more information, contact AIB at 785.537.4750; or go to www.aibonline.org.
- **9-10, Principles of Food Safety Auditing/Inspection**, Atlanta, GA. For more information, contact AIB at 785.537.4750 or go to www.aibonline.org.
- **18, Ontario Food Protection Association Annual Fall Meeting**, Stage West, Mississauga, Ontario. For more information, contact Gail Evans Seed at 519.463.6320; E-mail: ofpa_info@worldchat.com.

DECEMBER

- **1-2, Food Plant Sanitation**, GFTC, Guelph, Ontario, Canada. For more information, contact GFTC at 519.821.1246; E-mail: gftc@gftc.ca.
- **6-10, Diploma in Food Hygiene and Safety**, GFTC, Guelph, Ontario, Canada. For more information, contact GFTC at 519.821.1246; E-mail: gftc@gftc.ca.

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www.foodprotection.org**



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CAREER SERVICES SECTION



Technical Education Program Manager An Industry Leader in Food Safety

Silliker, Inc., a global leader in food microbiology and chemistry testing, auditing, education and consulting has a career opportunity for an individual with expertise in the areas of food safety and employee training. Our Technical Education Services Division is experiencing significant growth and we are searching for a strong Program Manager to develop and manage Silliker public courses and work directly with clients to develop customized courses. The ideal applicant possesses a Ph.D. or M.S. in Food Safety, Microbiology, or a related field, with 7+ years of food safety, GMPs, and/or HACCP program experience in a plant or industry association. Experience developing technical presentations and employee training programs is required. Experience with a variety of food processing technologies, and USDA and FDA requirements are a plus. Strong computer skills are necessary including Word, Excel, and PowerPoint. Excellent written communication and presentation skills are needed. The successful individual is self-directed and has excellent project management skills. An aptitude for coordinating and collaborating with technical experts is essential. Silliker offers a competitive salary and benefits. The position is based in the HQ in the Chicago suburbs. Some travel required. Interested applicants can apply online: www.silliker.com, Career Opportunities, or by fax: (708) 957-3798. EOE M/F

CAREER SERVICES SECTION

List your open positions in *Food Protection Trends*. Special rates for this section provide a cost-effective means for you to reach the leading professionals in the industry. Call today for rate information.

Ads appearing in *FPT* will be posted on the Association Web site at www.foodprotection.org at no additional cost.

Send your job ads to Donna Bahun at dbahun@foodprotection.org or to the Association office: 6200 Aurora Ave., Suite 200W, Des Moines, IA 50322-2864; Phone: 800.369.6337; 515.276.3344; Fax: 515.276.8655.



International Association for
Food Protection®

IAFP Members

Did you know that you are eligible to place an advertisement if you are unemployed and looking for a new position? As a Member benefit, you may assist your search by running an advertisement touting your qualifications.

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Journal of Food Protection®

ISSN: 0362-028X
Official Publication



International Association for
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