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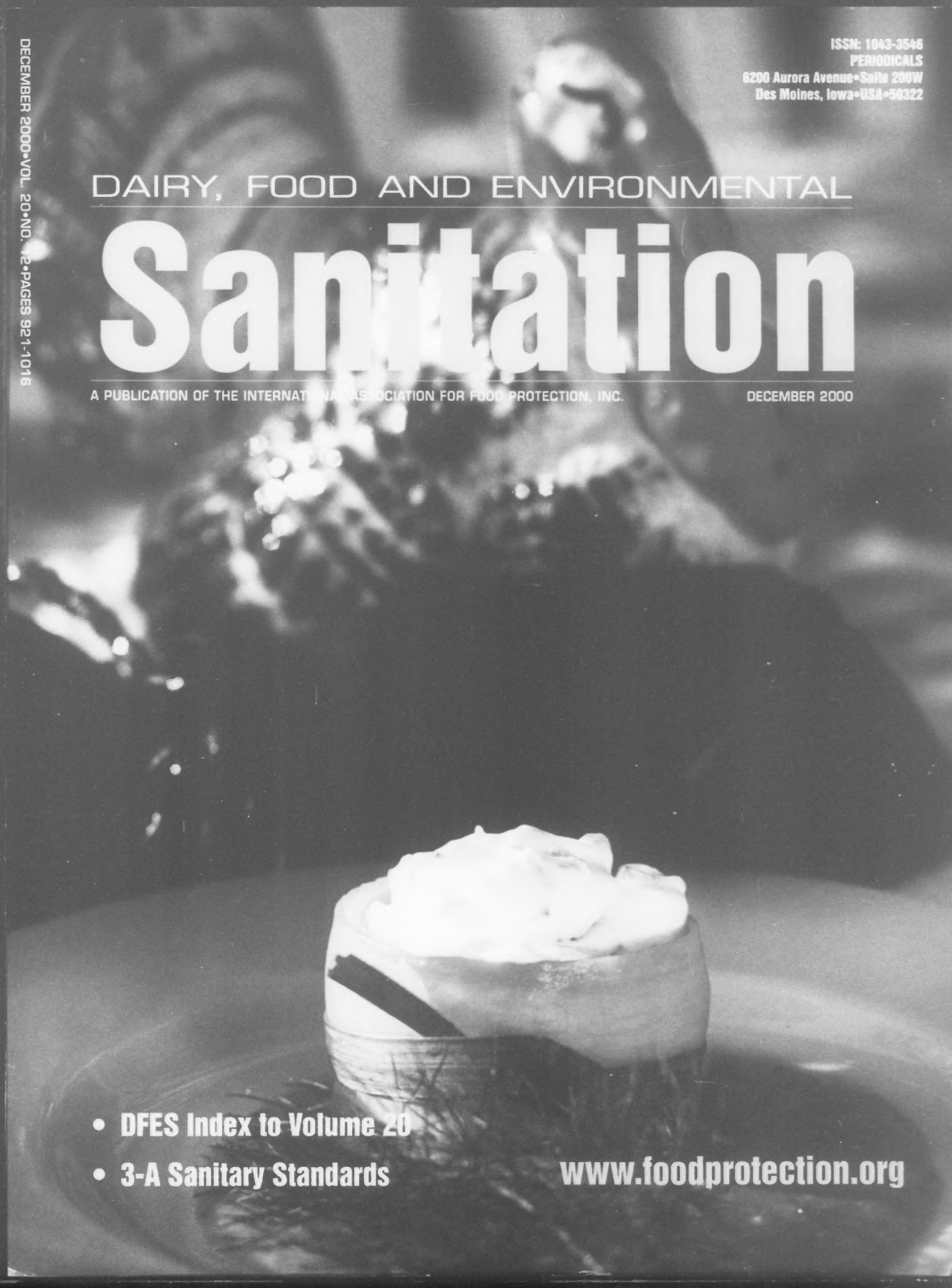
DAIRY, FOOD AND ENVIRONMENTAL

Sanitation

A PUBLICATION OF THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION, INC.

DECEMBER 2000



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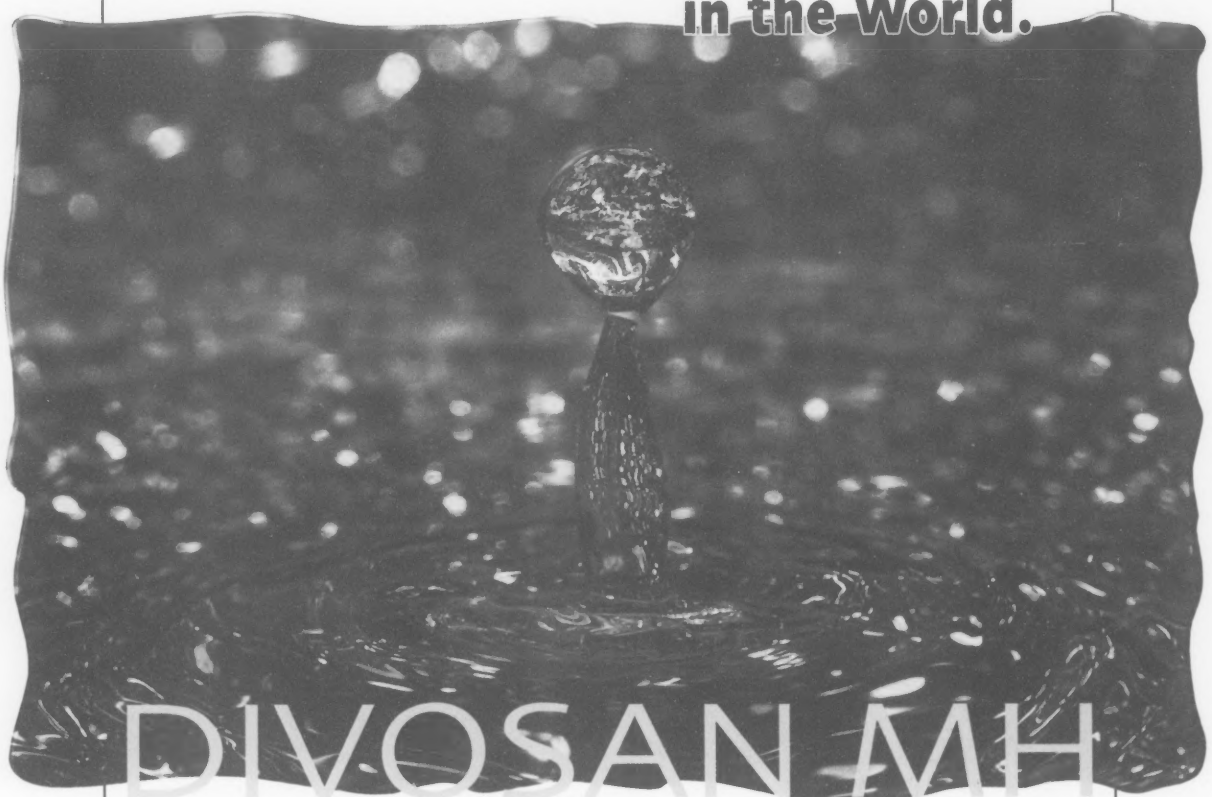

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Sanitation

International Association for Food Protection

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DAIRY, FOOD AND ENVIRONMENTAL

Sanitation

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2002

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My Perspective

By JENNY SCOTT
President

"Be an advocate for food safety"

A couple of weeks ago as I passed the dairy case in my local supermarket, I noticed that the store was selling pasteurized shell eggs. I didn't buy them. Not because they cost more, which they did, but because I still had three eggs at home that were probably about five weeks old (obviously we don't eat a lot of eggs in our household). But I got to thinking about it and decided that when I did need to buy eggs I would buy these. Not because I need the safety they provide – at my house eggs go into baked products, and safety isn't an issue – but because of the principle. I also have thought about irradiated ground beef and decided that I would also buy it when it becomes available in my area, again, not because I want to ensure my hamburgers are safer (I've always preferred them cooked to the hockey puck stage), but again, on principle.

I've changed some of my kitchen habits, too. I'm much more careful about not using the same utensils for raw or partially cooked meat and fully cooked product. I use a clean plate for cooked foods off the grill. I wipe up raw meat juices with a paper towel instead of the sponge. I have a thermometer in my refrigerator. And I keep handwashing soap next to the kitchen sink.

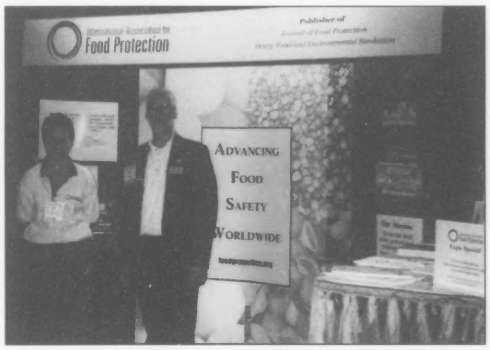
And I wonder why such practices have come to me so late. I've worked in food safety for over twenty years, but some of these practices have been implemented in my household only in the last few years. Maybe I've finally decided to "practice what I preach." And I put the question to you, the Members of the International Association for Food Protection, do you promote safe food handling practices in your homes and when you eat out? Are you an advocate for food safety? Do you determine whether the Caesar salad is made with raw egg? Whether the orange juice is pasteurized? Avoid the sprouts? Order well-done hamburgers? Tell your pregnant friends to ask their doctors about the potential for listeriosis? Of course, many of these questions relate to personal choices and managing your own risk, and I fully support the right to choose. But I hope that in our roles as food safety professionals we do try to set an example, wherever possible and as appropriate (I don't want to suggest that we get up on our soap boxes and preach – it might prove to be counterproductive). And I hope that when foods processed using new food safety technologies appear in the marketplace we will promote them through our purchases so they remain in the marketplace.

Turning to other issues – you should be receiving this in December. Hopefully by then the IAFP Foundation Fund will have reached its goal of $100,000 in 2000, but the way it looks now, there will be a shortfall. Please think about sending a contribution before the end of the year. I noted in my first column in September the many good things the Foundation does with the funds. In particular we want to grow the Foundation so it can continue to bring cutting-edge, cross-disciplinary speakers

to our meeting. We would also like to enhance the international aspect of our program with the assistance of the Foundation Fund. Help your Association build for the future and enhance the programs we provide for you, our Members.

Also going back to that first column, here's a reminder that now is the time to start putting together those nominations for our Association awards. A description of the awards appears in this issue of *Dairy, Food and Environmental Sanitation* and can be found on page 954 and 955. Remember, this year we have a new one – the Maurice Weber Laboratorian Award. It will be presented to an individual for outstanding contributions in the laboratory. This area, which is very important in the field of food safety, has been overlooked in our award structure for too long. Thanks to IAFP Board member Fred Weber, we now have filled that gap. Surely you know someone who deserves the honor of being the first recipient of the Maurice Weber Laboratorian Award – or who deserves to be recognized for contributions to industry (the Harold Barnum Industry Award), for devotion to the ideals and objectives of IAFP (the Harry Haverland Citation Award), for outstanding service to the profession of the sanitarian (the Sanitarian Award), or in the education arena (Educator Award). How about an individual, group or organization with a history of contributions to food safety (the NFPA Food Safety Award)? Do you know of a company (perhaps your own) with outstanding achievement in corporate excellence in food safety and quality? Submit a nomination for the Black Pearl Award. There are many awards, but even more deserving candidates. I urge you to take the time and effort to see that these deserving people don't go unrecognized. It's one more way you can be an advocate for food safety.

Congratulations



Bev Corron and David Tharp staffed the Association booth at the Second NSF International Conference, October 11-13, 2000.

In October 2000, the International Association for Food Protection was a co-sponsor of the Second NSF International Conference and Exhibition in Savannah, Georgia. While exhibiting, we offered a drawing for a one-year Membership with our Association. We are pleased to announce the following winner of the drawing:

Denise Durham
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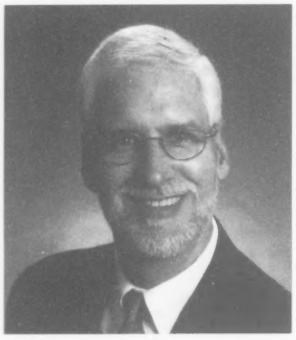
COMMENTARY

FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE
Executive Director

"Do your part to spread the word about the International Association for Food Protection"

This month, I want to cover a number of topics affecting the Association. We will discuss recent Membership growth, our first workshop outside of the United States and Canada, a recent retirement and a new Sustaining Member Program that benefits our Annual Meeting and the IAFP Foundation. Let's begin with the Sustaining Member Program.

From talking with many of our Sustaining Members, we learned they wanted, and were willing to support the Association's mission in additional ways. As we surveyed a sample of Sustaining Members and discussed this idea further, we then developed a tiered plan for supporting IAFP and the Foundation. More details are presented on page 933, so I will just outline program highlights here.

We established three levels of support; base at $750, silver at $2,500, and gold at $5,000. With each level of support payment, the Sustaining Member receives enhanced benefit values such as additional Memberships and reduced cost of exhibiting at the Annual Meeting. The wonderful element of this new program is that a substantial portion of the silver and gold Sustaining Membership fee goes directly to the IAFP Foundation Fund to establish a speaker support mechanism. This will expand our capability of providing travel assistance to Annual Meeting speakers.

Many companies and organizations that are currently Sustaining Members indicated they felt the Annual Meeting provided educational opportunities for their employees at a reasonable cost for many years. They reacted positively when asked if they were willing to join as a gold or silver Sustaining Member knowing that part of their fee went directly to support Annual Meeting speakers. We are encouraged by the immediate support this program has gained and look forward to further growth.

Speaking of growth, our Membership growth has been great to witness. Membership has grown by more than 10% since 1997. Prior to that, we were declining in Member numbers. We feel we can produce additional growth with your help. Help promote Membership in IAFP so that more food safety professionals have access to the same information that you find valuable. Forward names to our office and we will send materials to prospective Members. Easier yet, suggest your colleagues visit the Web site (www.foodprotection.org) to learn more about our Journals and Annual Meeting. Do your part to spread the word about the International Association for Food Protection!

We continue to encourage growth in countries outside of the United States and Canada. Establishing an Affiliate in Mexico allowed us to hold our first workshop outside of the United States and Canada last month. The workshop in Guadalajara, Mexico presented current information on import issues relating to bringing produce into the US. We were pleased with the interest and participant comments and plan to build on this type of international involvement. We look to future international growth that will allow us to continue presentations of workshops and seminars beyond North America.

To close out for this month, I want to make mention of a recent retirement from the 3-A Administrative Symbol Council. At the end of this month, Earl Wright will conclude his service to the Symbol Council. Recently, I attended a dinner in his honor. Earl received recognition for his 30 years of service to the Council. In addition, I was able to present some comments on behalf of IAFP. Earl joined the Association in 1948; he began as Assistant Professor and Extension Specialist in Dairy and Food Science at Iowa State University in 1954; he served as our President in 1973-74 and served 10 years as the Executive Secretary for this Association from 1974 until 1983! Earl received Honorary Life Membership in 1989, the Citation Award in 1997 and was inducted as a Fellow in 1999.

Another fact about Earl that impressed me was his continuous attendance at the past 40 Annual Meetings! Beginning with 1961, he has not missed an Annual Meeting – that is more than dedication! Earl, we appreciate all that you have done for the Association and for the safety of our milk and food supply during your career. We want to see you at many, many more Annual Meetings!

Earl is just one of many mentors and role models that can be found in the Association Membership. I hope you will strive to follow in Earl's footsteps and serve as a leader in the International Association for Food Protection!

Dairy, Food and Environmental Sanitation, Vol. 20, No. 12, Pages 934-943

Prevalence of Unsafe Practices During Home Preparation of Food in Argentina

Alicia N. Califano,[1*] Graciela L. De Antoni,[1] Leda Giannuzzi,[1] and Rodolfo H. Mascheroni[1,2]

SUMMARY

The World Health Organization regards illness resulting from contaminated food as one of the most widespread health problems in the contemporary world. For infants, immunocompromised people, pregnant women, and the elderly, the consequences are potentially fatal. Consumers play an essential role in preventing foodborne diseases, both during food preparation and in the food choices they make. Numerous reports describe what consumers can do to improve food safety in their own households. However, because there is little information reporting the frequency with which certain practices pose sanitary risks in developing countries, it is important to identify unhygienic preparation practices to intensify consumer awareness in those areas. A written questionnaire was prepared to evaluate the occurrence of common errors in food handling: personal practices (handwashing, cross contamination), insufficient cooking or reheating of food, hot and cold ingredient preparation and holding (time, temperature and product handling), general kitchen facilities, and consumption of high risk foods. In all 107 responses analyzed, at least one violation of safety guidelines was reported. Over half of the respondents consume food that includes raw eggs; approximately 20% wash their hands before food preparation "only sometimes" and 32% neglect to wash cutting boards properly after using them with raw meat or poultry; and most subjects (72%) employ unacceptable reheating criteria. The results of this study could prove useful in identifying the most common hazardous practices, with which information consumer education could be intensified. Furthermore, the fact that over 50% of the students and professionals surveyed were in disciplines related to health and food sciences suggests that it is a problem not only of lack of information but also of changing deep-rooted cultural habits.

A peer-reviewed article.

INTRODUCTION

Food is one of the major sources of exposure to pathogenic agents, both chemical and biological, from which no one in developing or developed countries is spared. Foods contaminated with unacceptable levels of hazardous substances impose substantial health risks to consumers and severe economic burdens on individual communities and nations as a whole. In 1983, an Expert Committee convened by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) concluded that illness due to contaminated food is perhaps the most widespread health problem in the contemporary world *(18, 19, 20)*. Foodborne diarrhea remains one of the most common illnesses of childhood as well as the major cause of infant and childhood mortality in developing countries. The World Health Organization reported that, in 1998, 1.8 million children died from diarrheal diseases *(22)*. Not only is foodborne diarrhea a direct cause of sickness and death in developing countries, but also contributes significantly to malnutrition, with subsequently grave consequences for the growth and disease resistance capability of infants and children. Worldwide, between 12 and 13 million children die from the combined effect of malnutrition and infection each year *(20)*.

In industrialized countries, the percentage of people suffering from foodborne diseases each year has been reported to be up to 30% *(21)*. An estimated 6.5 to 33 million cases of foodborne diseases occur annually in the United States and 500 to 9,000 of these cases are fatal *(4)*. Of the 7,458 episodes reported between 1972 and 1987 by the Centers of Disease Control and Prevention (CDC) in the United States, 21% were associated with the preparation of homemade food *(3)*. The number of actual cases is probably higher, in as much as many are not investigated or even reported *(13, 19)*. During the period 1995 to 1998, nineteen Latin American and Caribbean countries reported 31,986 outbreaks of foodborne diseases resulting in a total of 102,842 cases and 191 deaths. In 1,896 of these outbreaks, 39% were attributed to homemade food, 19% to institutional canteens, 6% to restaurants, 13% to schools, and 5% to street vendors *(12)*. Although a great many outbreaks of foodborne diseases remain unreported, the available information suggests that foodborne illnesses are an important health problem in Latin America *(12)*, and may be preventable by educating and informing households in hygienic food handling practices through national mass media campaigns, school education, and similar avenues.

Health is a crucial factor in economic development. In addition to the human suffering caused by foodborne diseases, communities, industries, health care systems, and nations incur economic costs they can ill afford. In the United States, foodborne diseases cost billions of dollars each year. US government sources estimate the cost of human illnesses of this origin to be 6.5 to 9 billion (US dollars). The cost of salmonellosis in England and Wales in 1992 was estimated at between 560 and 800 million US dollars *(20)*.

Food can become contaminated in many ways. Poor standards of hygiene during food preparation and lack of training in food safety are probably the most common factors in foodborne illness. Cultural practices such as the consumption of raw or undercooked foods play a major role in the spread of parasitic diseases. Many people are unaware that raw foods commonly contain pathogens that can cause illness if the food are not thoroughly cooked or handled properly in the kitchen *(1, 24)*. Consumers play a crucial role in preventing foodborne diseases both during food preparation and in their food choice decisions. Raw or undercooked protein foods, such as ground beef, eggs, and molluscan shellfish, have been associated with infections of *Escherichia coli* O157:H7, *Salmonella* spp., and *Vibrio* spp. *(2, 11)*. An extensive bibliography dealing with sanitary conditions to improve food preparation procedures is available. The World Health Organization is particularly active in educating consumers about safe food practices *(8, 14, 15, 16, 17)*. However, there is little information on the frequency with which certain practices are associated with sanitary risks. The available information refers to United States and Australian practices *(6, 7, 9, 10, 23)*, but not to food preparation procedures in Argentina and other Latin American countries. Argentinean cooking and eating habits reflect both the Spanish and Italian origins of most if its population. However, Argentinean cultural habits differ from their European ancestors in certain aspects, such as the significant consumption of beef (> 50kg/inhabitant/year) and the low intake of frozen foods because of their high costs and lack of suitable freezers.

Many school and institutional canteens are managed by volunteers who do not have adequate training, and so the food safety practices of these places would be comparable to those of households. The behavior of people at home is a good indicator of their knowledge about safe cooking procedures and especially about what they consider important. A written questionnaire was answered by 107 volunteers who regularly prepared food in the household. The results of this study could prove useful in identifying the most common hazardous practices and in expanding consumer education programs, not only in Argentina but in other Latin American countries as well.

MATERIALS AND METHODS

We prepared a detailed questionnaire, which was completed anonymously by 107 volunteers. The first part of the questionnaire was aimed at categorizing participants as to sex, age, education level, and occupation. The second part reviewed the personal practices of

TABLE 1. Critical violations[a]: practices that can lead, by themselves, to foodborne illnesses considered in the questionnaire

Violation	Description
Cansumptian af certain faad	raw eggs, meat, paultry ar fish
Crass-contominatian	o) inodequate woshing of vegetables to be used in row salads
	b) cutting boords inodequotely cleoned between uses
	c) kitchen utensils cantacting contaminated surfaces and then used in food preparation
Foiling to wosh honds	o) before starting to cook
	b) ofter gaing to the restroam, tauching the foce or, any ather part of the bady ar ather people, handling garboge or dirty dishes, cleaning the kitchen, using the phone
Law final cooking temperature	faod thermol center temperature below 74°C
Inadequate reheoting af refrigeroted food	maintaining hot food ot temperatures belaw 60°C thot permit rapid microorganism grawth and foiling to ossure thot the thermol center reaches 74°C
Impraper caoling of leftovers	improper combinotion of caaling time ond temperoture (foad shauld be cooled from 60 ta 21°C in 2 hours before being placed in the refrigerotor, ond then fram 21 to 5°C in the following 4 haurs)
Refrigerotian temperature taa high	over 7°C
Hot woter unovoiloble ot sinks	woter temperoture below 43.5°C
Impraper glave usage	not covering bandoges with glaves (moy ollow introduction of pathogenic bocterio to food)
Use of expired ar severely damaged cans	swollen, flowed seols, seoms, rust, or leoks

[a]Adapted farm Daniels (1998)

study participants, to allow evaluation of cross contamination, hand washing, sanitary habits, storage and rotation practices (time and temperature), preparation and storage of hot and cold ingredients (time, temperature and product manipulation), general conditions of the kitchen and consumption of high-risk foods. Practices were grouped as either critical violations or major violations according to Daniels *(6)*. Critical violations are those that can lead, by themselves, to foodborne illnesses or injury (Table 1). Major violations, although frequently cited as contributing factors in foodborne disease occurrence, are not themselves main causes (Table 2).

The survey, composed of both multiple choice and essay questions, is included as Figure 1.

Ten graduate students were given approximately 20 questionnaires each, and were asked to randomly select the respondents among their acquaintances, so as to interrogate approximately the same number of males and females and to equally cover the two age groups considered.

Questionnaries were coded and data were analyzed. Pearson's chi-square tests were performed to determine whether demographic variables were releated to specific practices.

TABLE 2. Major violations[a]: practices frequently cited as contributing factors in foodborne diseases considered in the questionnaire

Violation	Description
Improper thawing procedures	any condition different from: a) in the refrigerator, b) under running water not above 21°C for less than 2 hours, c) in a microwave oven if it is to be cooked immediately
Refreezing cooked meals once they were thawed	in each thawing-freezing cycle, microbial load increases
Refrigeration temperature too high	maintaining food or ingredients between 5 to 7°C
Misuse of common cloth/sponge/towel	separate sponges, rugs and dishtowels should be used to wash utensils, stove, hands and counters. Separate towels should be used to dry dishes and hands. Using them for more than one purpose allows for cross-contamination
Improper garbage disposal practices	garbage cans placed on work surfaces or without lids
Use of expired products	

[a]Adapted from Daniels (1998)

RESULTS AND DISCUSSION

Of the 107 questionnaires analyzed, 60% were answered by individuals 18 to 39 years old, while 40% were over 39 years old. Men comprised only 17% of the survey, because many of the potential male subjects indicated that they do not participate in meal preparation. Table 3 shows sample composition grouped according to gender, age, and education level. Table 4 indicates participant occupations.

To avoid repeating for each practice what was considered acceptable or correct throughout the following discussion, those practices that did not constitute violations as established in Tables 1 and 2 were considered correct or adequate. The "WHO golden rules for safe food preparation" *(21)* were considered additional guidelines.

Figure 2 shows the frequency of some critical violations among the 107 households, in each of which as least one safety violation was reported. Over half of the respondents consumed meals that included raw eggs, particularly mayonnaise and desserts such as ice cream and mousses (53%). None of the subjects indicated consumption of fried eggs. We thought that perhaps they did not consider fried eggs prepared with a runny yolk raw, so we again contacted some of the respondents who had answered that they did not eat raw eggs. During the second interview, 19 of the 30 subjects answered that they ate fried eggs that were potentially harmful. Thus it is possible that the 53% figure is too low.

Only 3% of the respondents answered that they ate raw meat, poultry, or fish; 87% answered negatively and 10% indicated that they ate cured meats and sausages (prosciutto, salami). In a later interview, some participants who had previously answered this question negatively indicated that they were not aware that dry-cured meats could be considered raw. Therefore, the percentage of people that consume high-risk food was greater than the results showed because certain dry-cured, but not heat-treated, products (salami, for example) can be contaminated with such microorganisms as *E. coli* O157:H7, as evidenced by the 1994 outbreaks in the states of Washington and California in the United States *(5)*.

To evaluate the degree of doneness reached during meat preparation, subjects were asked what color (red, pink, or brown) they preferred in the center of their ground meat patties. Most people (85%) preferred brown (well done), 7% preferred pink (medium rare), 3% red (rare), and 5% did not answer. Thus, the risk of foodborne illness associated with consumption of raw ground meat was low, especially considering that Argentineans tend to eat grilled steaks and other meat cuts very well done. However, this risk increased when data on methods of reheating cooked chicken or meat were analyzed. Only 28% reheated chicken and meat to an appropriate internal temperature. When questioned as to how they went about determining when their food was reheated, 55% described such vague criteria such as "when it is done", "by tasting it", "by touching it", etc. Thus the majority of people surveyed (72%) employed unacceptable reheating criteria.

Responses to hand washing questions were shocking: 20% of the

(Continued on page 940)

Figure 1. Questionnaire used in this survey (tronsloted to English)

Age: 18 to 39 yeors old ☐ and over 40 yeors old ☐

Gender: Femole ☐ Mole ☐

Educational level: Elementory school complete or incomplete ☐
High school ☐
College or higher ☐

Occupation: house-chores ☐ teoching ☐
professionol ☐ employee ☐
other:.....

Mark with an X the answers that best reflect your home practices

1) Do you eot foods with row eggs? (homemode moyonnoise, ice-creom, desserts, etcetero)
yes ☐ no ☐

2) When you ore having homburgers at home, do you prefer that the center be:
red ☐ pink ☐ brown ☐

3) Do you eat any food that contoins row meot, chicken or fish? Which?
.....

4) You hove used the cutting boord to cut raw chicken or meot. Before using it again you:

use the boord os is	yes ☐	no ☐
rinse it	yes ☐	no ☐
wipe it with o cloth	yes ☐	no ☐
wash it with soop ond/or bleoch	yes ☐	no ☐
use onother boord	yes ☐	no ☐
don't use boords	yes ☐	no ☐
don't know/not opplicable	☐	

5) Do you wosh your honds before cooking? olwoys ☐ sometimes ☐ never ☐

6) You interrupt your cooking to do ony of the following octions. Do you wash your honds before going back to cook?

use the phone	yes ☐	no ☐
go to the bathroom	yes ☐	no ☐
open the front door and receive mail	yes ☐	no ☐
clean dirty dishes	yes ☐	no ☐
dry clean dishes	yes ☐	no ☐
store vegetobles in the refrigerator	yes ☐	no ☐

7) After using o spoon for stirring o souce, you:

leave it on the kitchen counter	yes ☐	no ☐
leave it on the first spot available	yes ☐	no ☐
leave it in the pot	yes ☐	no ☐
leove it on o clean saucer	yes ☐	no ☐
wosh it every time with detergent ond hot woter	yes ☐	no ☐

other: .....

8) At your sink you have: cold top woter ☐ cold ond hot tap water ☐
don't have running water ☐

9) When preporing o solod with lettuce leoves you:
don't wash the leoves ☐
submerge lettuce head in the sink ☐
seporote the leoves and corefully wosh them under running woter ☐
shake lettuce head under running water ☐
separate the leaves and immerse them in water with a few drops of bleach ☐
Other:.....

Figure 1. (continued)

10) You cut yourself while cooking. You
put an a bandage or adhesive tape ☐ da nathing and keep caoking ☐
put on o bondoge and a glove over it ☐ Other:.....

11) You read the recammended lost date af use:
olways ☐ sometimes ☐ never ☐

12) You notice thot o can you are about ta use presents one of these signs. Would you throw it away without using it?
swollen ☐ flawed seoms ☐
rusted ☐ past dateline ☐
flawed seals ☐ leaks ☐

13) What is the temperature in yaur refrigerotor?
belaw 4°C ☐ between 4 and 7°C ☐
between 7 and 10°C ☐ over 10°C ☐
don't knaw ☐

14) You want ta bake a whale chicken in the aven, but it is frozen. You
thaw it in a micrawove oven ☐ thow it in the refrigeratar avernight ☐
thaw it under warm running water ☐ thaw it under cald water ☐
left it on the kitchen counter to thow, uncovered ☐ cook it without defrosting ☐
left it an the kitchen counter to thaw, wrapped ar cavered ☐
Other:.....

15) You hove
ane-door refrigerotor ☐ two-doors refrigerotor with freezer ☐
refrigeratar and freezer ☐ Other:.....

16) You freeze faad and keep it frozen far.....(manths-days)
Dan't freeze faad ☐

17) What da you da if there is a pawer failure and frazen meat has begun ta thaw?
.....

18) If yau prepare a huge batch af stew or saup and you wont to keep it until next doy you:
stare it in the refrigeratar yes ☐ na ☐
If the answer is **"yes"**, you:
stare it immediately in the refrigeratar after caoking ☐
left it ta caal at raam temperature ☐
cool it under running cald water and refrigerate it afterwards ☐

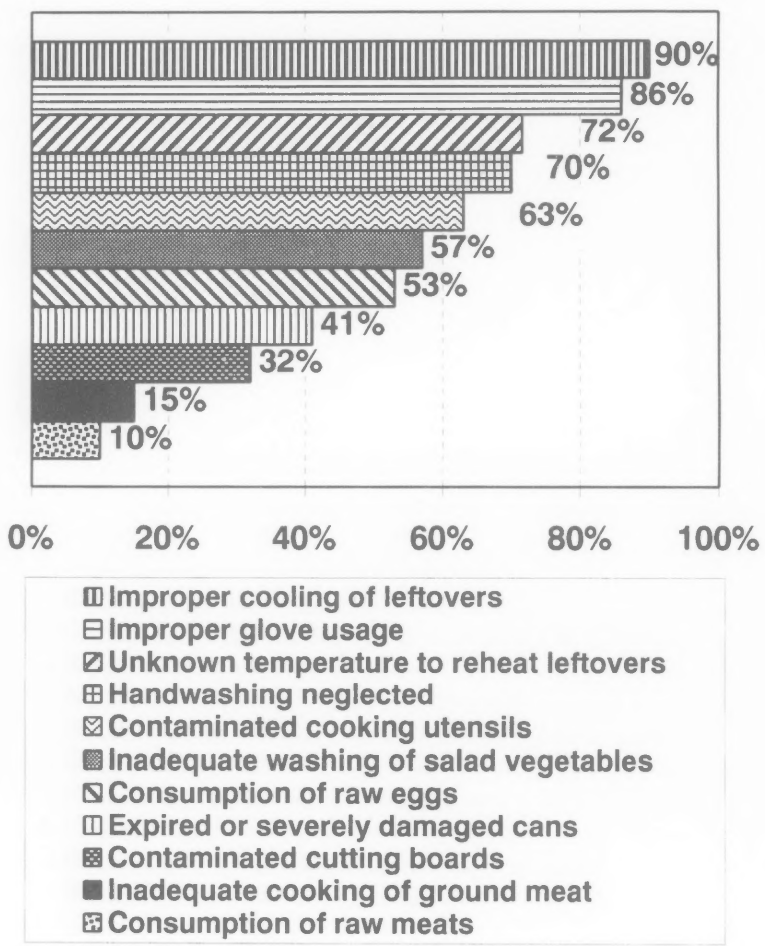
19) How da yau decide when a reheated leftaver is warm enaugh ta cansume?
.....

20) Mork with on X the tawels and/ar claths that are an hand in your kitchen:
apran ☐ hand tawels ☐ paper tawels ☐
dish tawels ☐ dish cloth ☐ spange ☐

21) The gorboge con is ploced:
outside the kitchen ☐ inside the kitchen ☐
aver the kitchen caunter ☐ belaw the kitchen caunter ☐
Other:.....

22) To discard leftavers yau use a garbage can:
with lid ☐ without lid ☐
lined with a dispasable plastic bag ☐ not lined with a disposable plastic bag ☐

Figure 2. Frequency of critical violations among 107 households



participants indicated that they only sometimes washed their hands before food preparation, and 2% never did; 70% did not wash their hands after using the phone while cooking. Effective hand washing was therefore not practiced by a significant proportion of respondents before or during food preparation. Fortunately, 98% of subjects washed their hands after using the rest room. Approximately 97% of the participants have access to sinks with hot water.

Four questions were related to cross-contamination. In question number 9, on different ways to wash lettuce for salads, only 43% of answers reflected correct procedures; 32% percent of respondents did not wash a cutting board with soap or bleach after cutting raw meat or chicken and before using it again, or use a different board, which indicate a high probability of cross-contamination. With regard to cooking utensils in contact with unclean surfaces, 37% leave them in a proper place or wash them after each use. The rest leave spoons on the counter or wherever space is available. Three-quarters of participants (76%) used hand towels or paper towels to dry their hands; the rest (26%) employed aprons or dishtowels. As to what action was taken if a hand injury occurred while cooking, 11% did nothing, 74% washed the injury and covered it with a bandage, but only 14% covered the injury with a rubber glove, which is the correct procedure to avoid food contamination.

Although all subjects used disposable bags in their garbage cans, 20% left garbage cans without lids inside their kitchens, thus risking infestation by insects, specially considering the high summer temperatures usual in the region.

When asked about the temperature of their refrigerator, 40% of the participants responded that they didn't know, while 36% supposed it was between 4° and 7°C, but none had actually measured it with a thermometer, demostrating that this knowledge is seriously lacking. One-door refrigerators in which the temperature of the freezer compartment reaches no lower than 5°C are the most common type in Argentine households. In our sample, 42% owned this type of refrigerator, 40% have two-door refrigerators with freezers that reached -18°C, and 17% had a separate freezer. Approximately 80% of subjects indicated that they froze food and kept it for about one month, including those participants who had a one-door refrigerator. When asked what action they took in the event of defrosted food due to a power failure, 84% answered correctly, while the remaining subjects simply refroze the defrosted food.

When participants were asked how they would defrost a whole chicken before cooking it, 53% indicated they would do so in the refrigerator. However, presented with several defrosting options, 89% also chose potentially dangerous procedures such as "leave it on the kitchen counter until it is defrosted" or "bake the chicken without defrosting it." Apparently, they were either unaware or unconcerned that poultry products frequently carry *Salmonella enteritidis* and that, by failing to inactivate the organism with

Figure 3. Frequency of major violations among 107 households

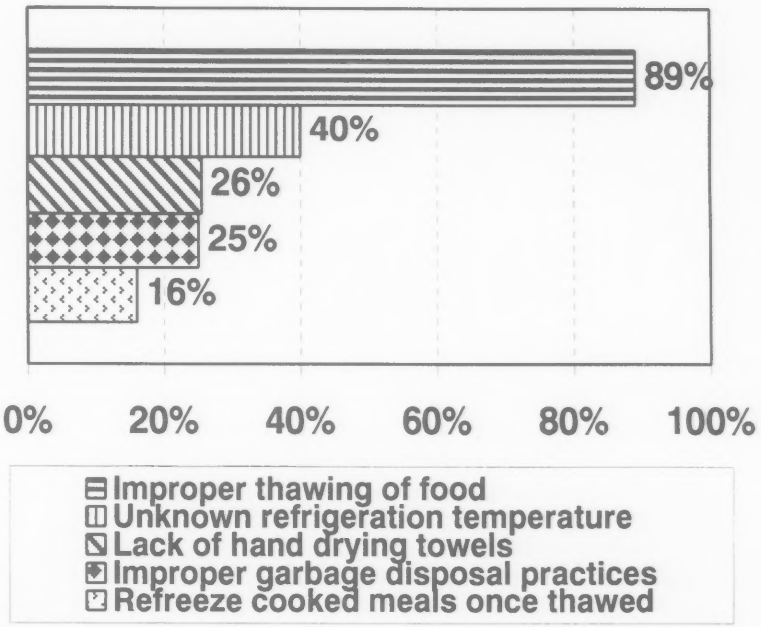


TABLE 3. Sample composition grouped by sex, age and education level

Gender	Age (years)	Education		
		< high school	high school	> high school
Female	18 - 39	0	1	50
	≥ 40	8	7	23
Male	18 - 39	0	0	13
	≥ 40	0	1	4

adequate cooking, they were putting themselves at risk of serious illness. The frequency of some major violations is shown in Figure 3.

Another potential source of temperature abuse of food is the manner in which people handle leftovers. Nearly all the respondents (>100) would keep a large dish of leftover soup or stew in the refrigerator if they planned to eat it the next day. However, 80% of these people cooled the soup or stew to ambient temperature before putting it in the refrigerator. Because the question was very specific about the size and type of leftovers, it should have been obvious that these pots of food would take several hours to reach room temperature, which in the summer could be above 30°C. Thus, the center of the food could remain warm long enough for microorganisms to proliferate to disease-causing levels. In addition, 17% of respondents would put hot food in the refrigerator. This practice could lead to a warming of the refrigerated contents due to the greater heat load that the appliance must overcome.

When it comes to using expired or damaged cans, 76% of those questioned examined the expiration date before using a product. Only 26% of participants would not discard a can unused if it was swollen, rusty, or damaged.

Of the 107 responses analyzed, only 27 did not eat raw eggs or meat, cooked hamburgers until brown in the center, and cleaned cutting boards properly after using them to cut raw meat or chicken. From this group, only 12 (11%) always washed their hands before cooking and positioned cooking utensils so as to avoid contamination. Furthermore, if participants who did not wash lettuce satisfactorily and those who did not examine expiration dates of products were also excluded, the groups was reduced to 10 participants. Of these 10, only 3 cooled meals before putting them in the refrigerator and defrosted food correctly and none of these subjects used gloves to cover an open wound on the hand. Therefore, all participants incurred critical violations of food safety guidelines. In all cases, the percentages of correct or incorrect procedures was independent of age, educational level, and participant occupation. Table 5 shows food consumption and preparation behaviors associated with increased risks of foodborne disease reported in United States *(8, 10)*, Australia *(9)* and Argentina. Argentineans showed a poor awareness of the importance of temperature control during cooling and heating of foods, especially regarding thawing procedures, which was somewhat expected, in as much as widespread frozen food consumption began only about 15 years ago. Besides, food thermometers are not available in ordinary stores or supermarkets so it is practi-

TABLE 4. Sample composition grouped by sex, age and occupation

Gender	Age (years)	Housewife	Professional	Teaching	Employee	Student
Female	18 - 39	0	25	1	3	22
	≥ 40	13	13	10	1	1
Male	18 - 39	0	2	2	1	8
	≥ 40	0	3	0	1	1

TABLE 5. Comparison of food consumption and preparation behaviors associated with increased risks of foodborne disease reported in the United States, Australia and Argentina

	Frequency of violations (%)			
	This work (N = 107)	U.S. survey (8) (N= 106)	U.S. survey (10) (N =1620)	Australian survey (9) (N =1,203)
Eat food with raw eggs	53	–	53	–
Eat raw shellfish	2	–	17	–
Eat raw fish	2	–	8	–
Eat undercooked hamburgers	15	–	20	23.5
Cross-contamination	83	76	–	78.7
Use inadequately cleaned cutting boards	32	–	26	–
Improper glove usage	86	6	–	–
Improper handwashing	70	57	–	74.9
Dry hands with dish towel	26	8	–	18
Refrigeration temperature too high	40 (did not know the temperature)	23	–	67 (did not know the temperature)
Hot ingredient holding to cool or improper cooling of leftovers	90	11	–	86.1
Improper thawing procedures	89	31	–	41.3
Improper reheating procedures	temperature could not be ascertained	–	–	temperature could not be ascertained
Expired or severely damaged cans	41	6	–	–

cally impossible to implement adequate control, even for those who would like to check the internal temperature of foods. Two other potentially important problems arise in regard to glove usage and disposition of damaged/expired cans, where the proportions of incorrect practices are higher than those reported in the United States and Australia. Much should be done in public education regarding these subjects.

Because the sample population in this study is more educated than the general Argentinean population, these findings raise important concerns about domestic food handling practices in Argentinean homes and the level of food safety knowledge in the community. Considering that the educational level of most of the respondents was well above high school and that the majority of students and professionals belonged to disciplines related to health and food sciences, many presumably took these risks simply out of habit, despite being aware of the hazards involved. These results suggest that it is not enough to increase public awareness about food safety but that that it is also necessary to work on a psychological level to change deep-rooted cultural habits.

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Relationship of Molds in Paperboard Packaging to Food Spoilage

J. A. Narciso* and M. E. Parish

SUMMARY

Reported incidences of growth of filamentous fungal organisms in juices held in paperboard cartons is a chronic problem for the juice processing industry that is related to the longer shelf life of refrigerated juices packed in gable-top cartons with oxygen barriers. A review of the process that leads from timber harvest to the final paperboard product suggests several avenues of entrance for fungal contamination. Studies of pulp and paperboard cartons have resulted in isolation of many species of filamentous fungi. Further investigations of citrus juice spoilage have shown the paperboard to be a source of spoilage fungi.

Remedial steps to reduce fungal contamination from food-grade paperboard would include a close examination of pulp during storage, surveillance of environmental parameters (e.g. water, air, machinery) that contain viable mold propagules, and a better understanding of the seemingly sporadic and seasonal nature of carton contamination. The paperboard portion of food containers should be considered one possible source of fungal contamination in foods that are susceptible to fungal spoilage.

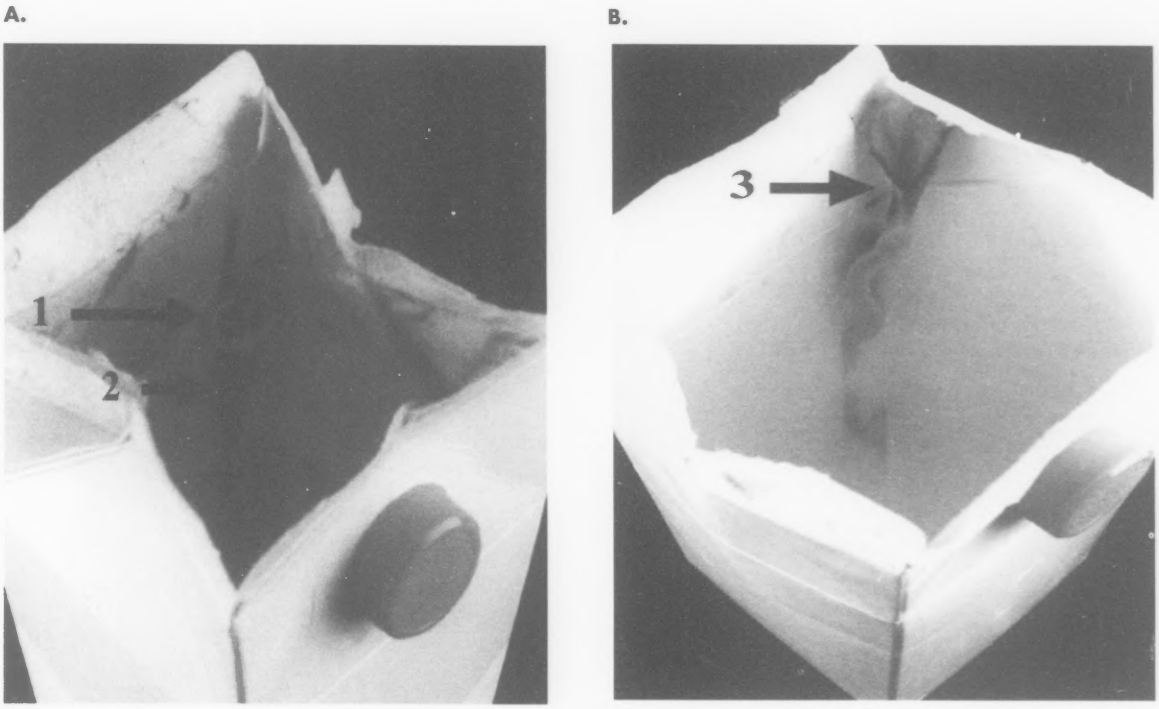
A peer-reviewed article.

INTRODUCTION

Publicity surrounding recent food contamination incidents has served to raise awareness by consumers and the food industry of the important role of microorganisms in food safety and quality. All aspects of food production, from farm to table, are coming under scrutiny as possible routes for microbial contamination of foods. An area that has received little attention is the microbiological quality of paperboard materials used in food packaging. In a 1995 trade article, a United Nations Environmental program highlighted growing concern over food contamination and noted inappropriate packaging as an important source *(1)*. In recent years, our laboratory has investigated several incidents of mold spoilage that involved gable-top cartons and chilled, ready-to-serve (RTS) fruit juices. During the course of these investigations, it was found that fungi within the paperboard portion of gable-top cartons (Fig. 1) are a source of contamination for fruit juices and other foods.

May *(27)* indicates that present microbiological guidelines for food-grade paperboard are based on standards established 50 years ago. Technological changes in paperboard production, food packaging, and microbiological testing within the

Figure 1. Goble-top corton interiors showing fungal growth in two different cortons, A ond B. Arrow 1 indicates *Penicillium* thallus with spores. Arrow 2 shows integration of fungol mycelio with paperboard fibers. Arrow 3 shows destruction of carton 5th ponel by *Cladosporium*



past 50 years strongly suggest the need for reevaluation of these guidelines. Because test methods commonly used to evaluate the microbiological quality of paperboard packaging *(20)* are mainly concerned with the presence of bacteria, they do not provide adequate media or proper preparation of samples and incubation times to assay for filamentous fungi. This review was written to address the issues related to fungal contamination of paperboard and the implications for food spoilage.

PACKAGING BEGINS IN THE FOREST

To better understand the problems involved with paperboard contamination, one must remember that this type of packaging is the final product of a resource harvested from a forest or recycled from previously used paperboard products. Wood is composed of wall material from elongated cells (fibers, tracheids, and vessels). Each of these cell elements is connected through openings called pits. The wall materials contain cellulose, hemicellulose, pectins, proteins, and lignin *(37)*. Wood provides mechanical support for the tree and also functions to transport nutrients and water for plant growth.

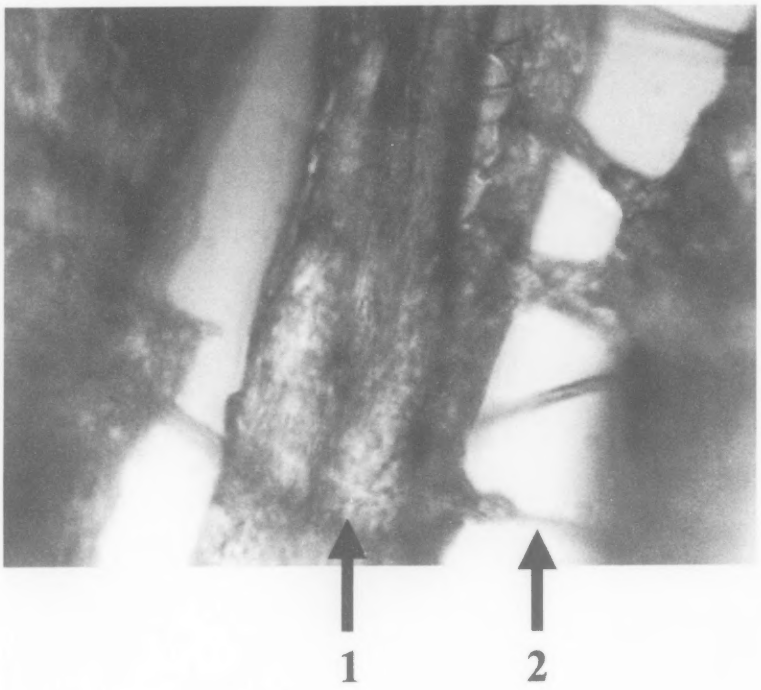
In all trees, there are residual populations of fungi that may be saprophytic or pathogenic to the plant. Some coexist without damaging their plant partner while others actively decompose lignin and cellulose, the chief components in wood pulp used to produce food packaging. At the time of harvest, obviously decayed trees are not taken for pulp production of food grade paper products *(36)*. However, it is not uncommon for trees to be harvested with incipient microscopic decay, i.e., the initial fungal decomposition of lignin and/or cellulose in the tree trunk that is not visually obvious *(2)*. Decay in pulpwood can be generally placed in three categories: (1) rot in pulpwood from decayed trees not properly culled; (2) rot in stored pulpwood that was free from rot when cut; (3) rot in stored pulp that was re-contaminated after processing *(2, 33)*.

Before being sent through the pulping process, harvested timber may be stored for long periods of time (allowing for fungal growth) or used soon afterwards. Most wood used for pulp is debarked before storage or processing because the bark adds undesirable components to the pulp *(37)* and harbors an assortment of fungal organisms *(19)*. It is interesting to note that many of the fungi isolated from bark have also been isolated in the final pulp product *(19)*.

PULPING PROCESS

Pulp is produced from wood by chemical delignification, mechanical separation of fibers, or combinations of chemical and mechanical methods. Although mechanical pulping gives higher yields and is

Figure 2. Individual woad fiber (arraw 1) from macerated paperboard packaging with mycelial cannections (arraw 2) indicating fungal growth



less polluting, the result is lower quality pulps that are unsuitable for paper where high strength properties are necessary *(22)*. About 25% of the world pulp production is done by mechanical means *(22)*.

The chemical pulping process involves reducing stored timber to chips and impregnating them with a cooking liquor composed of various chemicals (depending upon the process) under high temperatures (120-180°C) for 1 to 5 hours. This procedure breaks down the lignin to separate the wood fibers *(37)*. The pulp is filtered and washed with a "white water wash" which consists mainly of intentionally added materials (defoamers, viscosity modifiers, etc.), soluble chemicals (organic and inorganic) from glass filter fibers, water, and contaminating microorganisms *(3)*. In an effort to conserve energy and chemical use and to reduce pollution, the paper industry reuses this rinse water several times *(7)*. As this water is stored between use in retention tanks for up to 2 days at temperatures in the 15-25°C range, high concentrations of microbial populations should not be surprising *(7)*. Some of these microorganisms may have survived the pulping process, but most, because this is not an aseptic process, come in with the additives or from the air or other nondescript sources *(30, 33)*.

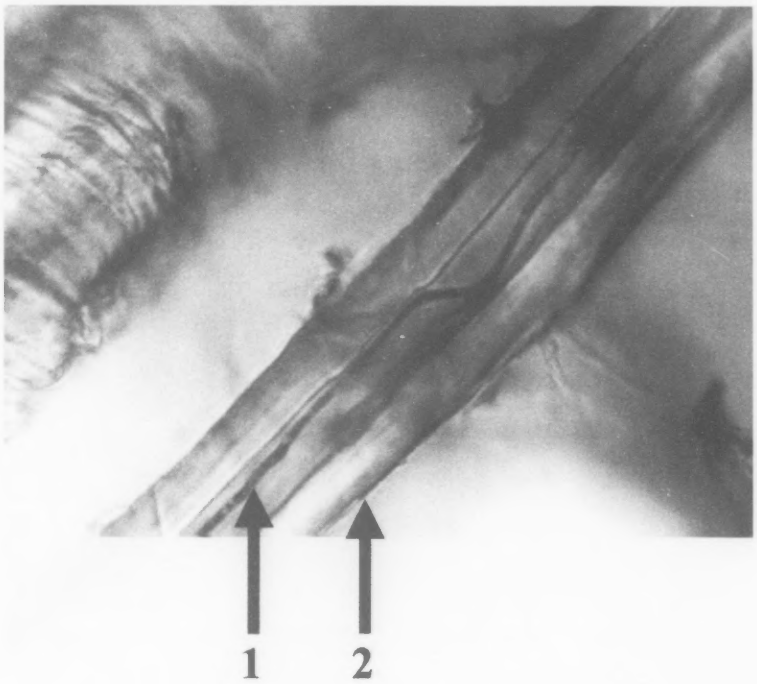
The results of several studies suggest that white water rinsing systems are partially responsible for growth of fungi in processed pulp. Brewer *(6)* found that recirculated process water from a pulp and paper mill does not support fungal growth. However, when added to a basal medium, this water has a stimulatory effect on growth of fungi, compared with the basal medium without the added water. Eveleigh and Brewer *(15)* suggest that bacteria in white water pulp slimes produce substances such as biotin, thiamin and amino acids. These substances, along with available carbohydrates from the pulp, provide a minimal but continuous supply of nutrients for use by filamentous fungi and other microorganisms. These authors have further shown *(16)* that, in closed white water systems, some thermotolerant fungi (e.g., certain species of *Penicillium* and *Paecilomyces*) can exist and become part of the pulp slime.

After the water is removed, the pulp will be further processed for immediate manufacturing purposes or will be stored. Deterioration during storage is serious and causes undesirable stains as well as a breakdown of fibers, resulting in brittleness and loss of strength *(2)*. Oshchepkova *(30)* found that actinomycetes and fungi caused red spots on pulp sheets and a reduction of tensile strength. Russell *(33)* showed that many groundwood-pulp-infecting fungi caused staining: *Trichoderma* (yellow stains with green spore patches), *Penicillium roquefortii* (purple stain), *Cladosporium, Aureobasidium,* and *Trichosporium* (grey blue-grey stains), and *Fusarium* (pink stains).

Numerous studies have shown that pulp has a varied mycoflora. Researchers have found that fungal populations in pulp samples are highly variable and may be seasonal *(2)*. Pulp sampled in June at a mill in New Brunswick, Canada, yielded many colonies of *Phialophora* and *Cephalosporium*, whereas in November primary isolates were *Nodulosporium*, *Rhinocladiella, Torula.* and *Phialophor*a. At a later time in the same study, pulp was overgrown with *Geotrichum (4)*. Tanabe *(40)* consistently found a black spot caused by *Cladosporium cladosporioides* on pulp. Strains of this organism isolated from paperboard cartons grow readily on sterile (autoclaved) carton material without added moisture or nutrients *(29)*.

Wang *(44)* found a large variability in the numbers of isolates from samples taken at 4 paper and pulp mills in New York. Amounts varied from 6,900 colonies per 1 ml of pulp suspension in May to 20 colonies per 1 ml pulp from the same mill four months later. Wang's data showed that isolations of Zygomycetes and Ascomycetes were infrequent and that the majority of organisms iso-

Figure 3. Fungal mycelium (arrow 1) growing inside the lumen of a wood fiber (arrow 2) from macerated paperboard packaging



lated from these mills were Fungi Imperfecti *(44)*. These data are supported by several studies made on isolations of paper and pulp, including our own previous study *(29)*.

Freyschuss *(18)* in Norway isolated *Aureobasidium, Penicillium roquefortii, Aspergillus niger, Trichoderma viride, Paecilomyces variotii,* and *Cladosporium cladosporioides* from pulp. Brewer *(5)* and Eveleigh and Brewer *(15)* found *Penicillium, Paecilomyces, Trichoderma, Phialophora*, *Geotrichum,* and *Rhinocladiella* commonly in pulp.

Fungi in pulp can originate from various sources. Although, it is improbable, some organisms may remain after pulping, protected by a process run at lower temperatures to save energy or by a combination of chemical and mechanical pulping, in which pulp is exposed to high temperatures and caustic chemicals for a shorter time. Most likely, contamination results from reinfection by pulping equipment, processing water, and air contaminants *(30, 33)*.

PAPERBOARD

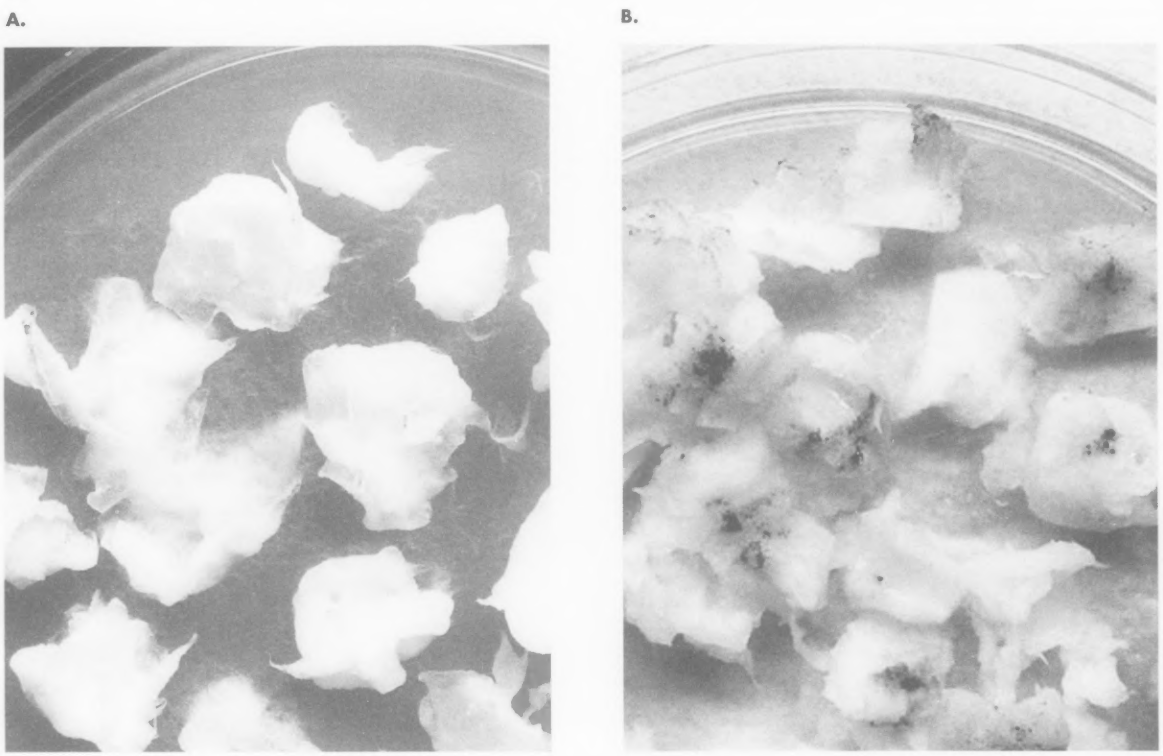
Pulp that is to become paperboard is pressed, dried, coated with polymers, and rolled *(23)*. After it is printed, creased and cut into blanks, paperboard is transported to food processors, where it is fed into filling machines, bottom sealed, filled, and top sealed *(23)*.

At this point, contaminant fungi from the pulp remain in the paperboard fibers. Several studies have shown the mechanism by which the fungi invade individual wood fibers (the term "fibers" here will also include vessels and tracheids). Leonardi et al. *(25)* inoculated pieces of paperboard in the laboratory and used electron microscopy to study the resultant growth. They noted that the fungi penetrated the fibers through pits, randomly located along vessels and tracheids, and ramified throughout neighboring fiber materials, even working through some types of coating on the paperboard. Boyce *(2)* also showed fungal penetration of wood cell walls by use of polarized light microscopy. Our research supports conclusions of Boyce *(2)* and Leonardi et al. *(25)* that hyphae of individual fungal organisms can grow around and through individual fibers from paperboard packages (Fig. 2). Individual hyphal strands lying parallel to the fiber surface can enzymatically degrade wood cell walls, forming troughs to allow entrance into the fiber's lumen *(8, 26)* (Fig. 3). Hyphae can also penetrate wood cell walls via a specialized apex (called a transpressorium) that can bore with enough force to penetrate wood fibers, thin silver or aluminum foils *(26)*.

An investigation was undertaken to answer the question of whether there is viable fungal material, either as spores or mycelia *(29)*, in the fibers of paperboard cartons used in juice manufacturing. Several small carton pieces from 20 unfilled and unformed paperboard cartons were surface sterilized and either placed directly on a growth medium or processed using a modified form of the standard disintegration method for dairy product packaging *(20)*. Over 40 species of 14 genera and 6 sterile mycelium isolates were obtained, indicating the presence of many different viable molds within the paperboard portion of gable-top cartons used for packaging of fruit juices *(29)*. In ongoing studies with juice-filled cartons, those found to contain visible hyphal mats after incubation had the same fungus in both the juice and carton material (Narciso and Parish,unpublished data).

An additional study was conducted to determine the ability of several of these fungal isolates to grow on sterile carton material. Small pieces of carton material were cut from intact, unfilled cartons, macerated in a blender, and autoclaved. Sterile ground carton material was transferred aseptically onto water agar plates and inoculated with spores of those fungi previously isolated from paperboard. After 10 days incubation at 25°C, prolific mycelial and spore production were observed

Figure 4. Plates of sterile macerated paperboard pulp: A. Uninaculated cantral plate, and B. Pulp inaculated with *Cladosporium* sp.



(Fig. 4 and 5), indicating that these fungi could multiply in carton material without additional nutrients.

FUNGAL GROWTH UNDER ADVERSE CONDITIONS

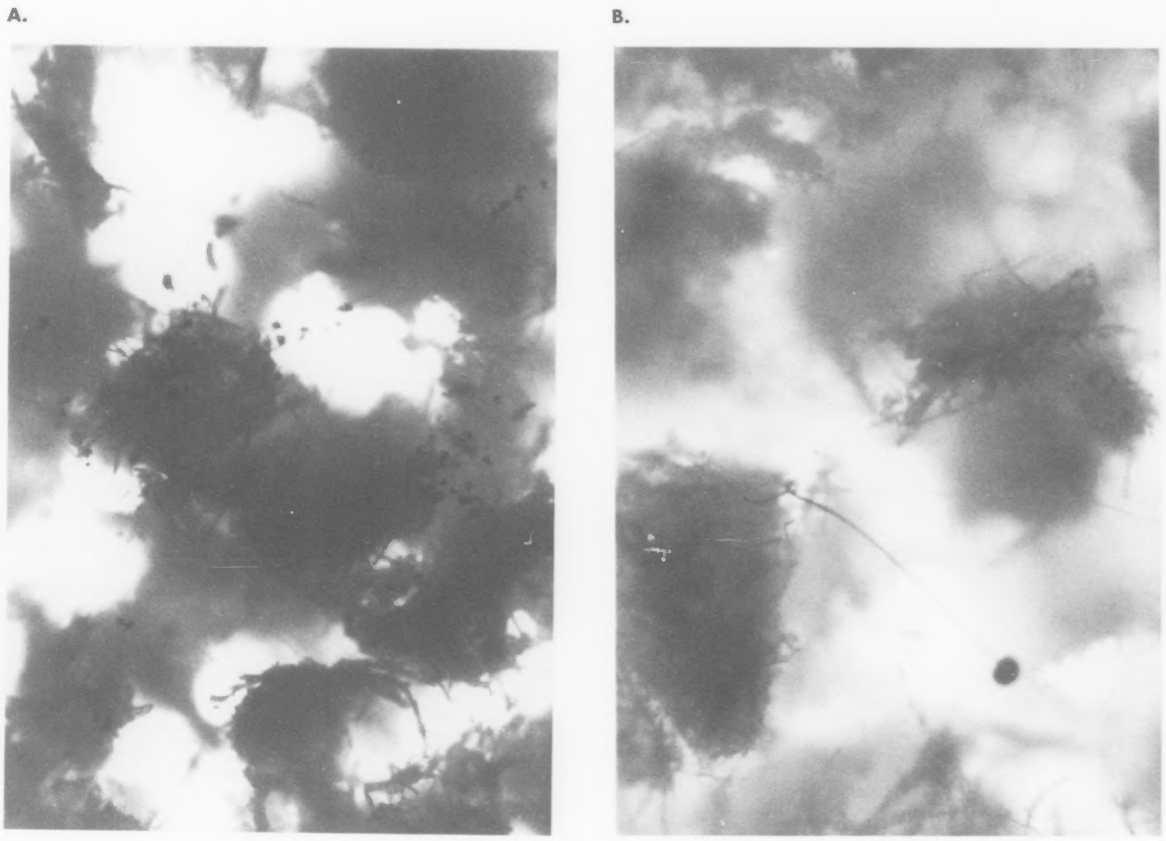
The adaptability of fungi to adverse environmental conditions is well documented; a recent low temperature (20 to -2°C) study of *Penicillium* and *Botrytis* showed that although the germination and morphology of conidia changed, viability did not *(41)*. Conidia of *P. italicum* and *C. cladosporioides,* along with arthrospores of *Geotrichum,* have been shown to germinate on orange juice serum agar at 0°C *(45)*. With respect to the effects of pH, it was found that gradual pH reductions allowed *Aspergillus niger* to grow at pH as low as 1.6 *(31)*. Many fungi may also grow at low moisture or oxygen levels. In a study of *Botrytis,* it was found that germination and host penetration by dry conidia differed from those of wet conidia, but very low moisture did not prevent infection *(11)*. At oxygen levels between 0% and 21%, *Alternaria, Botrytis, Cladosporium,* and *Rhizopus* grew in all treatments except 0% oxygen *(17)*.

Studies of spore survival show that conidia of *Penicillium, Aspergillus*, *Fusarium,* and *Rhizopus* can maintain viability for more than 12 years (dry, at room temperature), with *Rhizopus* sporangiospores remaining viable for up to 22 years *(39)*. Spores are generally the mechanism most researchers associate with fungal survival, but in many cases mycelium imbedded in tissue is very resistant to environmental stresses. It is well known that the mycelium of many plant disease organisms overwinter in plant tissues, sporulating in spring when temperatures and moisture better ensure their survival. Mycelium from basidiomycetes (e.g. *Lenzites* sp.) in woody tissue as well as mycelium of *Colletotrichum* sp. and sclerotia of some *Penicillium* sp. and *Verticillium* sp. have been found to survive longer than conidia at temperatures over 50°C *(39)*.

FOOD SPOILAGE FROM PACKAGING

Fungal spoilage of RTS (ready to serve) chilled citrus juices has increased in importance in recent years due, in part, to the use of gable-top cartons with oxygen barriers. Such packages allow a longer shelf life (>60 days refrigerated) than non-barrier packages (ca. 30 days). This time frame is adequate for mold growth to become visually evident. Mold growth in foods, including citrus juices, has sometimes been attributed to heat-resistant molds that survive processing temperatures. The fungi isolated in our laboratory from spoiled citrus juice have not been heat resistant, indicating that

Figure 5. Grawth af fungi after 10 days an sterile macerated paperbaard cartan material. A. *Cladasparium* shawing mycelia and spares, and B. *Rhizapus* shawing mycelia, sparangiaphares, sparangia and rhizaids



the juice was contaminated after pasteurization. Closer scrutiny of filling systems, mold growth patterns within the package, and isolation of viable molds from filled and unfilled juice cartons suggest that the paperboard portion of the carton is a source of contamination.

Reports of juice spoilage to our laboratory indicate that unskived cartons (with raw paperboard edges exposed to juice) are more prone to mold contamination in a shorter time period than skived cartons (edges folded under and sealed) unless the paperboard is heavily contaminated. This demonstrates that the paperboard is involved in producing mold spoilage in these products. Other researchers have documented this same type of phenomenon. Kolstad et al. *(23)* found raw edges of cartons yielded bacterial organisms in 95% of cases tested. Pirttijarvi et al. *(32)* hypothesized, after isolating more than 200 bacteria from food packaging board, that the raw edges were the main routes for microbes to enter into the food.

Adding to the problem of contaminated pulp in food grade paperboard is the increased use of recycled fibers, a move to conserve paper and reduce waste *(35, 43)*. Under the Code of Federal Regulation (21CFR176.260), pulp from reclaimed fibers may be used in packaging as long as it does not contain any "poisonous or deleterious" substances that could migrate into the food *(9, 28)*. Misko *(28)* suggests that the FDA may have concerns about contamination of recycled fibers by microorganisms and substances such as inks, defoamers, slimicides, optical brightners, coating materials, and adhesives that were not originally made for food-contact use. FDA has established allowable tolerance levels for other unavoidable poisonous or deleterious substances such as PCBs *(10)*. To date, however, FDA has not addressed the issue of microbiological contaminants in recycled fibers. Studies show that recycled fibers in pulp production increases the microbial populations in the final paperboard product. The probability of contamination in paperboard made from recycled paper materials may be 10 times higher than paperboard made from virgin fibers *(34)*. Pirttijarvi et al. *(32)* also attribute recycled fibers to an increase in fungal contamination of food products from paperboard. Until new standards for food grade paperboard are developed, the use of recycled fiber complies with FDA regulations and is acceptable *(43)*.

CONTROL MEASURES

Methods of controlling fungal contamination of food from packaging need closer scrutiny. The use of biocides in food-grade paperboard may be impractical, since they are usually at levels too low to be generally disinfecting *(42)*. Also, numerous fungi can detoxify *(33)* or are not sensitive to many of the organic chemicals used in the manufacture of paperboard packaging *(18, 21)*. Ultraviolet irradiation is variable in efficiency, as the reflectivity and geometry of the surface must be considered *(38)*. Pulse-light treatment of packaging, with pulses 20,000 times the sun's intensity at sea level, have been found to be more effective than UV methods for reducing bacterial surface contamination *(13)*. Heavily melanized mycelia and/or spores are less sensitive than non-pigmented structures to decontamination processes such as UV light exposure *(39)*.

Alternate methods of decontamination include lowering microbial populations by exposure to irradiation. Decontamination of food-grade paperboard by gamma irradiation was introduced more than 40 years ago *(14)*. Later work by Lacey *(24)* revealed that species differed in the amount of radiation exposure needed to suspend growth. *Penicillium* and *Aspergillus* spp. were effectively inhibited by 0.3 to 1.2 kGy, but 12 kGy was needed to inhibit *Fusarium* spp. and yeasts. Organisms in dry environments, such as paperboard, would require a considerably higher dosage of irradiation to incapacitate their growth and development *(12)*.

Many aspects of food contamination by fungi from paperboard packaging need to be addressed. One of these is to investigate the criteria necessary to induce fungi to move from paperboard into the food. Another is to study the effects of storage temperature on these criteria, and to determine if temperature guidelines could be instituted for processors that might effectively control fungal growth for a specified shelf life. A modified efficient method to assess the mycoflora of paperboard packaging is needed for uniform evaluation of this problem. Further work is needed on processes to decontaminate pulp and reduce or eliminate losses or potential illness from contaminated products.

Health conscious consumers of today are increasingly aware of issues in food quality and safety. Federal and University Extension groups that advise consumers on food safety are placing new emphasis on the dangers of consuming foods that have had molds growing in or on them. Rather than recommending that the mold be scraped off, recent guidelines state that moldy foods should be thrown away because toxic substances secreted from fungi into foods have become a possible threat to consumer health.

Studies have shown that placing foods that are free of contamination by fungi into contaminated packaging allows these organisms to migrate into the food. Longer product shelf life gives these organisms time to grow and sporulate, contaminating the product the container holds.

It has become increasingly important for processors to use packaging that is free from contamination. Further studies are needed to evaluate the conditions that encourage fungi to move from paperboard containers into the food and to identify the by-products, if any, that they may be secreting.

By working to understand the relationship between paperboard pulp and food spoilage, the food industry will enhance the confidence of the consumer population it serves.

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In Memory of...

Richard J. Epley
St. Paul, Minnesota

IAFP extends our deepest sympathy to the family and friends of Richard J. Epley who recently passed away.

Richard was a Member of the Association since 1980.

3-A Partners Meet in D.C. to Move Forward with Third-Party Accreditation

Partners in the 3-A Sanitary Standards Program held an open meeting in Washington, D.C. on October 27 to move forward with the development of a new third-party accreditation (TPA) process for 3-A Symbol authorization.

The 3-A Symbol Administrative Council, the International Association of Food Industry Suppliers (IAFIS), the International Association for Food Protection (IAFP), and the International Dairy Foods Association (IDFA) met to accept input from interested parties. The participating groups are working in close cooperation with the US Food and Drug Administration (FDA) and the US Department of Agriculture (USDA) on developing a TPA system.

Under the current self-certification process, the 3-A Symbol Council accepts applications from equipment manufacturers and fabricators for authorization to display the registered 3-A Symbol on their products conforming to these standards. An ongoing concern for a safe food supply prompted 3-A participants to consider additional ways to ensure that equipment design lends itself to producing a safe product. When in place, the TPA system will provide a higher level of confidence in 3-A equipment across all participating groups.

Five working groups reported at the meeting. Each group's scope and objective was defined and discussed. The timeline calls for preliminary workgroup reports to be posted on a 3-A extranet Web site by February 1 for review and comment. Working groups will report their progress to partners of the 3-A Sanitary Standards program at the next scheduled meeting, March 21, 2001 in Orlando, Florida. This meeting will be held in conjunction with the IAFIS Annual Conference and is open to all interested parties.

Four working groups are developing guidelines for auditor qualifications, the auditing process, used/modified equipment issues and an administrative system for handling authorizations. The fifth group will manage ongoing education and communication needs.

Input on this project from the food industry, including food industry suppliers, food processors and manufacturers and sanitarians is welcome. If you are interested in participating on a workgroup, contact one of the individuals listed below. Comments and questions may be submitted online by visiting the 3-A Web site at www.3-a.org, or may be directed to the following participating groups:

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The 55-year-old, 3-A Program formulates standards and practices for the sanitary design, fabrication, installation and cleanability of dairy and food equipment or systems used to handle, process and package consumable products where a high degree of sanitation is required. Standards and practices are developed through the cooperative efforts of industry experts. Equipment manufacturers, fabricators, end users and sanitarians universally accept 3-A criteria.

International Association for
Food Protection

Award Nominations

The International Association for Food Protection welcomes your nominations for our Association Awards. Nominate your colleagues for one of the Awards listed below. You do not have to be an IAFP Member to nominate a deserving professional. To request nomination criteria, contact:

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Phone: 800.369.6337; 515.276.3344
Fax: 515.276.8655
Web site: www.foodprotection.org
E-mail: info@foodprotection.org

Nominations deadline is February 19, 2001. You may make multiple nominations. All nominations must be received at the IAFP office by February 19, 2001.

- Persons nominated for individual awards must be current IAFP Members. Black Pearl Award nominees must be a company employing current IAFP Members. NFPA Food Safety Award nominees do not have to be IAFP Members.
- Previous award winners are not eligible for the same award.
- Executive Board Members and Awards Committee Members are not eligible for nomination.
- Presentation of awards will be during the Awards Banquet at the IAFP Annual Meeting in Minneapolis, Minnesota on August 8, 2001.

Black Pearl Award – Award Showcasing the Black Pearl

Presented in recognition of a company's outstanding achievement in corporate excellence in food safety and quality.

Sponsored by Wilbur Feagan and F&H Food Equipment Company.

Fellows Award – Distinguished Plaque

Presented to individuals for their contribution to the Association and its Affiliates with quiet distinction over a prolonged period of time.

Sponsored by the International Association for Food Protection.

Honorary Life Membership Award – Plaque and Lifetime Membership in IAFP

Presented to Member(s) for their devotion to the high ideals and objectives of IAFP and for their service to the Association.

Harry Haverland Citation Award – Plaque and $1,000 Honorarium

Presented to an individual for years of devotion to the ideals and objectives of IAFP.

Sponsored by DiverseyLever/U.S. Food Group.

Harold Barnum Industry Award – Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the food industry.

Sponsored by NASCO International, Inc.

Educator Award – Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the arena of education in food safety and food protection.

Sponsored by Nelson-Jameson, Inc.

Sanitarian Award – Plaque and $1,000 Honorarium

Presented to an individual for outstanding service to the public, IAFP and the profession of the Sanitarian.

Sponsored by Ecolab, Inc., Food and Beverage Division.

Maurice Weber Laboratorian Award – Plaque and $1,000 Honorarium

Presented to an individual for outstanding contributions in the laboratory, recognizing a commitment to the development of innovative and practical analytical approches in support of food safety.

Sponsored by Weber Scientific

NFPA Food Safety Award – Plaque and $3,000 Honorarium

Presented to an individual, group, or organization in recognition of a long history of outstanding contribution to food safety research and education.

Sponsored by National Food Processors Association.

Call for Abstracts

International Association for
Food Protection

IAFP 2001
The Association's 88th Annual Meeting
August 5-8, 2001
Minneapolis, Minnesota

General Information

1. Complete the Abstract Submission Form.
2. All presenters must register for the Annual Meeting and assume responsibility for their own transportation, lodging, and registration fees.
3. There is no limit on the number of abstracts registrants may submit. However, the presenter must present their presentations.
4. Accepted abstracts will be published in the Program and Abstract Book. Editorial changes will be made to accepted abstracts at the discretion of the Program Committee.
5. Photocopies of the abstract form may be used.
6. Membership in the Association is not required for presenting a paper at the International Association for Food Protection Annual Meeting.

Presentation Format

1. Technical – Oral presentations will be scheduled with a maximum of 15 minutes, including a two to four minute discussion. LCD and 35-mm slide projectors will be available. Other equipment may be used at the presenter's expense. Prior authorization from the office must be obtained. Overhead projectors will not be allowed.
2. Poster – Freestanding boards will be provided for presenting posters. Handouts may be used, but audiovisual equipment will not be available. The presenter will be responsible for bringing pins and velcro.

Instructions for Preparing Abstracts

1. Title – The title should be short but descriptive. The first letter in each word in the title and proper nouns should be capitalized.
2. Authors – List all authors using the following style: surname followed by a comma then the first name.
3. Presenter Name & Title – List the full name and title of the person who will present the paper.
4. Presenter Address – List the name of the department, institution and full postal address (including zip/postal code and country).
5. Phone Number – List the phone number, including area, country, and city codes of the presenter.
6. Fax Number – List the fax number, including area, country, and city codes of the presenter.
7. E-mail – List the E-mail address for the presenter.
8. Format preferred – Check the box to indicate oral or poster format. The Program Committee makes the final decision on the format of the abstract.
9. Developing Scientist Awards Competitions – Check the box to indicate if the paper is to be presented by a student in this competition. A signature and date is required from the major professor or department head. See "Call for Entrants in the Developing Scientist Awards Competitions."
10. Abstract – Type abstract, Double-spaced in the space provided or on a separate sheet of paper using a 12-point font size. No more than 250 words.

Abstract Submission

Abstracts submitted for the International Association for Food Protection 88th Annual Meeting in Minneapolis, Minnesota August 5-8, 2001 will be evaluated for acceptance by the Program Committee. Please be sure to follow format instructions above carefully; failure to do so may result in rejection. Information in the abstract data must not have been previously published in a copyrighted journal.

Submit your abstract to the office. Abstracts must be received no later than January 8, 2001.

Return the completed abstract form through one of the following methods:

1. Regular mail: Abstracts may be sent by post or express courier along with a disk copy (text or MS Word™ format) to the following address:

   Abstract Submission
   International Association for Food Protection
   6200 Aurora Avenue, Suite 200W
   Des Moines, lowa 50322-2863, USA
2. E-mail: Submit via E-mail as an attached text or MS Word™document to abstracts@foodprotection.org.
3. Online: Use the online abstract submission form located at www.foodprotection.org.

Selection Criteria

1. Abstracts must accurately and briefly describe:
   (a) the problem studied and/or objectives;
   (b) methodology;
   (c) essential results; and
   (d) conclusions and/or significant implications.
2. Abstracts must report the results of original research pertinent to the subject matter. Papers should report the results of applied research on: food, dairy and environmental sanitation; foodborne pathogens; food and dairy microbiology; food and dairy engineering; food and dairy chemistry; food additives and residues; food and dairy technology; food service and food administration; quality assurance/control; mastitis; environmental health; waste management and water quality. Papers may also report subject matter of an educational and or nontechnical nature.
3. Research must be based on accepted scientific practices.
4. Research should not have been previously presented nor intended for presentation at another scientific meeting. Papers should not appear in print prior to the Annual Meeting.
5. Results should be summarized. Do not use tables or graphs.

REJECTION REASONS

1. Abstract was not prepared according to the "Instruction for Preparing Abstracts."
2. Abstract does not contain essential elements as described in "Selection Criteria."
3. Abstract reports inappropriate or unacceptable subject matter, is not based on accepted scientific practices, or the quality of the research or scientific approach is inadequate.
4. Work reported appears to be incomplete and/or data are not presented. Indication that data will be presented is not acceptable.
5. The abstract was poorly written or prepared including spelling and grammatical errors.
6. Results have been presented/published previously.
7. The abstract was received after the deadline for submission.
8. Abstract contains information that is in violation of the International Association for Food Protection Policy on Commercialism.

PROJECTED DEADLINES/NOTIFICATION

Abstract Submission Deadline: January 8, 2001.
Acceptance/Rejection Notification: March 1, 2001.

CONTACT INFORMATION

Questions regarding abstract submission can be directed to Bev Corron, 515.276.3344 or 800.369.6337; E-mail: bcorron@foodprotection.org.

Program Chairperson:

Stan J. Bailey
USDA-ARS-RRC
P.O. Box 5677
Athens, GA 30604-5677
Phone: 706.546.3356
Fax: 706.546.3771
E-mail: jsbailey@ars.usda.gov

Abstract Form

DEADLINE: Must be Received by January 8, 2001

Follow instructions on page 956

(1) Title of Paper _____

_____

(2) Authors _____

_____

(3) Full Name and Title of Presenter _____

_____

(4) Institution and Address of Presenter _____

_____

(5) Phone Number: _____

(6) Fax Number: _____

(7) E-mail: _____

(8) Format preferred: ☐ Oral ☐ Poster ☐ No Preference

NOTE: Selected presentations may be recorded (audio or visual). The Program Committee will make the final decision on presentation format.

(9) Developing Scientist Awards Competitions ☐ Yes Graduation date: _____

Major Professor/Department Head approval (signature and date): _____

(10) TYPE abstract, DOUBLE-SPACED, in the space provided or on a separate sheet of paper using a 12-point font size. No more than 250 words.

Call for Entrants in the Developing Scientist Awards Competitions

Supported by the International Association for Food Protection Foundation

The International Association for Food Protection is pleased to announce the continuation of its program to encourage and recognize the work of students and recent graduates in the field of food safety research. Qualified individuals may enter either the oral or poster competition.

Purpose

1. To encourage students and recent graduates to present their original research at the Annual Meeting.
2. To foster professionalism in students and recent graduates through contact with peers and professional Members of the Association.
3. To encourage participation by students and recent graduates in the Association and the Annual Meeting.

Presentation Format

Oral Competition – The Developing Scientist Oral Awards Competition is open to graduate students enrolled or recent graduates from M.S. or Ph.D. programs or undergraduate students at accredited universities or colleges. Presentations are limited to 15 minutes, which includes two to four minutes for discussion.

Poster Competition – The Developing Scientist Poster Awards Competition is open to students enrolled or recent graduates from undergraduate or graduate programs at accredited universities or colleges. The presenter must be present to answer questions for a specified time (approximately two hours) during the assigned session. Specific requirements for presentations will be provided at a later date.

General Information

1. Competition entrants cannot have graduated more than a year prior to the deadline for submitting abstracts.
2. Accredited universities or colleges must deal with environmental, food or dairy sanitation, protection or safety research.
3. The work must represent original research completed and presented by the entrant.
4. Entrants may enter only one paper in either the oral or poster competition.
5. All entrants must register for the Annual Meeting and assume responsibility for their own transportation, lodging, and registration fees.
6. Acceptance of your abstract for presentation is independent of acceptance as a competition finalist. Competition entrants who are chosen as finalists will be notified of their status by the chairperson by June 1, 2001.
7. All entrants with accepted abstracts will receive complimentary, one-year Association Membership, which includes their choice of *Dairy, Food and Environmental Sanitation* or *Journal of Food Protection*.
8. In addition to adhering to the instruction in the "Call for Abstracts," competition entrants must check the box to indicate if the paper is to be presented by a student in this competition. A signature and date is required from the major professor or department head.

Judging Criteria

A panel of judges will evaluate abstracts and presentations. Selection of up to ten finalists for each competition will be based on evaluations of the abstracts and the scientific quality of the work. All entrants will be advised of the results by June 1, 2001.

Only competition finalists will be judged at the Annual Meeting and will be eligible for the awards. All other entrants with accepted abstracts will be expected to be present as part of the regular Annual Meeting. The presentations will not be judged and they will not be eligible for the awards.

Judging criteria will be based on the following:

1. Abstract – clarity, comprehensiveness and conciseness.
2. Scientific Quality – Adequacy of experimental design (methodology, replication, controls), extent to which objectives were met, difficulty and thoroughness of research, validity of conclusions based upon data, technical merit and contribution to science.
3. Presentation – Organization (clarity of introduction, objectives, methods, results and conclusions), quality of visuals, quality and poise of presentation, answering questions, and knowledge of subject.

Finalists

Awards will be presented at the International Association for Food Protection Annual Meeting Awards Banquet to the top three presenters (first, second and third places) in both the oral and poster competitions. All finalists will receive a complimentary Awards Banquet ticket and are expected to be present at the banquet where the awards winners will be announced and recognized.

Awards

First Place – $500 and an engraved plaque
Second Place – $300 and a framed certificate
Third Place – $100 and a framed certificate

Award winners will also receive a complimentary, one-year Membership including *Dairy, Food and Environmental Sanitation* and *Journal of Food Protection*.

Policy on Commercialism

1. INTRODUCTION

No printed media, technical sessions, symposia, posters, seminars, short courses, and/or all related type forums and discussions offered under the auspices of the International Association for Food Protection (hereafter referred to as to Association forums) are to be used as platforms for commercial sales or presentations by authors and/or presenters (hereafter referred to as authors) without the expressed permission of the staff or Executive Board. The Association enforces this policy in order to restrict commercialism in technical manuscripts, graphics, oral presentations, poster presentations, panel discussions, symposia papers, and all other type submissions and presentations (hereafter referred to as submissions and presentations), so that scientific merit is not diluted by proprietary secrecy.

Excessive use of brand names, product names or logos, failure to substantiate performance claims, and failure to objectively discuss alternative methods, processes, and equipment are indicators of sales pitches. Restricting commercialism benefits both the authors and recipients of submissions and presentations.

This policy has been written to serve as the basis for identifying commercialism in submissions and presentations prepared for the Association forums.

2. TECHNICAL CONTENT OF SUBMISSIONS AND PRESENTATIONS

2.1 Original Work

The presentation of new technical information is to be encouraged. In addition to the commercialism evaluation, all submissions and presentations will be individually evaluated by the Program Committee chairperson, technical reviewers selected by the Program Committee chairperson, session convenor, and/or staff on the basis of originality before inclusion in the program.

2.2 Substantiating Data

Submissions and presentations should present technical conclusions derived from technical data. If products or services are described, all reported capabilities, features or benefits, and performance parameters must be substantiated by data or by an acceptable explanation as to why the data are unavailable (e.g., incomplete, not collected, etc.) and, if it will become available, when. The explanation for unavailable data will be considered by the Program Committee chairperson and/or technical reviewers selected by the Program Committee chairperson in order to ascertain if the presentation is acceptable without the data. Serious consideration should be given to withholding submissions and presentations until the data are available as only those conclusions that might be reasonably drawn from the data may be presented. Claims of benefit and/or technical conclusions not supported by the presented data are prohibited.

2.3 Trade Names

Excessive use of brand names, product names, trade names, and/or trademarks is forbidden. A general guideline is to use proprietary names once and thereafter to use generic descriptors or neutral designations. Where this would make the submission or presentation significantly more difficult to understand, the Program Committee chairperson, technical reviewers selected by the Program Committee chairperson, session convenor, and/or staff will judge whether the use of trade names, etc., is necessary and acceptable.

2.4 "Industry Practice" Statements

It may be useful to report the extent of application of technologies, products, or services, however, such statements should review the extent of application of all generically similar technologies, products, or services in the field. Specific commercial installations may be cited to the extent that their data are discussed in the submission or presentation.

2.5 Ranking

Although general comparisons of products and services are prohibited, specific generic comparisons that are substantiated by the reported data are allowed.

2.6 Proprietary Information (See also 2.2.)

Some information about products or services may be proprietary to the author's agency or company, or to the user and may not be publishable. However, their scientific principles and validation of performance parameters must be described. Conclusions and/or comparisons may only be made on the basis of reported data.

2.7 Capabilities

Discussion of corporate capabilities or experiences are prohibited unless they pertain to the specific presented data.

3. GRAPHICS

3.1 Purpose

Slides, photographs, videos, illustrations, art work, and any other type visual aids appearing with the printed text in submissions or used in presentations (hereafter referred to as graphics) should be included only to clarify technical points. Graphics which primarily promote a product or service will not be allowed. (See also 4.6.)

3.2 Source

Graphics should relate specifically to the technical presentation. General graphics regularly shown in, or intended for, sales presentations cannot be used.

3.3 Company Identification

Names or logos of agencies or companies supplying goods or services must not be the focal point of the slide. Names or logos may be shown on each slide so long as they are not distracting from the overall presentation.

3.4 Copies

Graphics that are not included in the preprint may be shown during the presentation only if they have been reviewed in advance by the Program Committee chairperson, session convenor, and/or staff, and have been determined to comply with this policy. Copies of these additional graphics must be available from the author on request by individual attendees. It is the responsibility of the session convenor to verify that all graphics to be shown have been cleared by Program Committee chairperson, session convenor, staff, or other reviewers designated by the Program Committee chairperson.

4. INTERPRETATION AND ENFORCEMENT

4.1 Distribution

This policy will be sent to all authors of submissions and presentations in the Association forums.

4.2 Assessment Process

Reviewers of submissions and presentations will accept only those that comply with this policy. Drafts of submissions and presentations will be reviewed for commercialism concurrently by both staff and technical reviewers selected by the Program Committee chairperson. All reviewer comments shall be sent to and coordinated by either the Program Committee chairperson or the designated staff. If any submissions are found to violate this policy, authors will be informed and invited to resubmit their materials in revised form before the designated deadline.

4.3 Author Awareness

In addition to receiving a printed copy of this policy, all authors presenting in a forum will be reminded of this policy by the Program Committee chairperson, their session convenor, or the staff, whichever is appropriate.

4.4 Monitoring

Session convenors are responsible for ensuring that presentations comply with this policy. If it is determined by the session convenor that a violation or violations have occurred or are occurring, he or she will publically request that the author immediately discontinue any and all presentations (oral, visual, audio, etc.), and will notify the Program Committee chairperson and staff of the action taken.

4.5 Enforcement

While both technical reviewers, session convenors, and/or staff may check submissions and presentations for commercialism, ultimately it is the responsibility of the Program Committee chairperson to enforce this policy through the session convenors and staff.

4.6 Penalties

If the author of a submission or presentation violates this policy, the Program Committee chairperson will notify the author and the author's agency or company of the violation in writing. If an additional violation or violations occur after a written warning has been issued to an author and his agency or company, the Association reserves the right to ban the author and the author's agency or company from making presentations in the Association forums for a period of up to two (2) years following the violation or violations.

Journal of Food Protection Seeks Scientific Co-editor

Dr. Larry Beuchat will resign his position as Scientific Editor effective December 31, 2001. To allow for a smooth transition, the *Journal of Food Protection* is conducting a search for a new co-editor to assume the duties and responsibilities before Dr. Beuchat's departure.

Candidates, including individuals from outside of North America, are encouraged to submit their names and C.V. for consideration. A monthly stipend to cover out-of-pocket expenses is provided. Complimentary registration to the Association's Annual Meeting, as well as travel, lodging and meal expense to attend the Meeting is also provided.

Please review the "Duties and Responsibilities" for the Scientific Co-editor and, if interested in the position, forward your name and C.V. to the Selection Committee Chairperson:

Dr. Donald Conner
Auburn University
Department of Poultry Science
236 Ann Upchurch Hall
Auburn, AL 36849-5416 USA

C.V.s must be received not later than March 1, 2001.

Duties and Responsibilities for the Scientific Co-editor

The *JFP* Scientific Co-editor works closely with the IAFP editorial staff to manage the peer-review process for manuscripts submitted for publication in *JFP*. Essentially, the co-editor serves as the intermediary between manuscript reviewers and authors. Primary duties include: assignment of reviewers for submitted manuscripts; evaluation of reviewers' comments; determination of scientific acceptability of manuscripts; and timely communication with authors, reviewers and IAFP staff. Final decisions on acceptance or rejection of manuscripts are the responsibility of the Scientific Co-editor. Scientific Co-editors also determine the sequence of manuscripts for each *JFP* issue. This position is accountable to the *JFP* Management Committee; thus, the Scientific Co-editor is required to prepare and submit an annual report for presentation to the *JFP* Management Committee.

IAFP Member Gloria Swick Visits Ukraine

IAFP Member Gloria Swick (middle) with Dimitri Prikhodko, Agricultural Specialist (left) and Svetlana Yariga, Administrative Assistant (right).

While visiting Ukraine in October, 2000, Gloria I. Swick, M.S.A., R.S., Affiliate Delegate from Ohio, met with Dimitri Prikhodko, Agricultural Specialist, and Svetlana Yariga, Administrative Assistant, at the USDA/FAS at the Embassy of the United States of America in Kyiv, Ukraine. Ms. Swick invited food safety professionals in Ukraine to join the International Association for Food Protection. She emphasized the importance of all nations sharing information and working together in order to provide a safe, wholesome food supply worldwide.

Additional IAFP informational packets were mailed to Mr. Prikhodko and Ms. Yariga to share with others in food production and food safety throughout Ukraine.

Packets of information containing samples of the publications and Membership information are available from the Association office in Des Moines, Iowa, to Members wishing to extend personal invitations to other professionals to join IAFP.

New Members

AUSTRALIA

Stefan U. Fabiansson
Bureau of Rural Sciences
Kingston, ACT

CANADA

Alex Kassianenko
M.G.I. Packers Inc.
Kitchener, Ontario

Anna Piesik
Food Assure Laboratory Ltd.
Vancouver, British Columbia

ICELAND

Birna Gudbjorsdottir
Icelandic Fisheries Laboratories
Reykjavik

MEXICO

Laura Tobilla Lalo
Congeladora America S. A. de C.V.
Jacaona, Michoacan

UNITED STATES

Alaska

Chris Toftleberg
Municipality of Anchorage
Anchorage

Arkansas

Tammy McFate
ConAgra Frozen Foods, Batesville

California

James R. Gorny
International Fresh-cut Produce Association, Davis

District of Columbia

Robert Frappier
Giant Food, Inc., Washington

Florida

Gillian Folkes
University of Florida, Gainesville

Lisa Vann
Gainesville

Idaho

Denise M. Smith
University of Idaho, Moscow

Illinois

Denise Durham
United Distillers and Vintners North America, Plainfield

Iowa

Roger Lenius
Swiss Valley Farms, Waverly

Mark H. Love
Iowa State University, Ames

Kansas

Benjamin C. Soy
Kansas Dept. of Health and Environment, Dodge City

Kentucky

Steven Bowling
International Inflight Food Service Association, Louisville

Maine

Marvin E. Garrick
State of Maine, Bangor

New Jersey

Eva Rodriguez
Tropical Cheese Industries
Perth Amboy

New York

William H. Young
Upstate Farms Cooperative, Inc.
Leroy

North Carolina

Jennifer M. Birkenhauer
University of North Carolina at Charlotte, Charlotte

Ohio

Todd M. Schuesler
John Morrell & Co., Springdale

Oregon

Dan L. Vargo
FSA, Portland

South Carolina

Kim Weeks
Capsugel, Greenwood

Virginia

Marina V. Collins
FST, Virginia Tech, Blacksburg

Wisconsin

Suzanne E. Phelps
University of Wisconsin-Eau Claire
Eau Claire

Tom E. Scola
Brakebush Brothers, Inc., Westfield

New Sustaining Member

Edith H. Garrett
International Fresh-cut Produce
Alexandria, Virginia

Affiliate Officers

ALABAMA ASSOCIATION FOR FOOD PROTECTION

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Pres. Elect, Tollie Haley Meggs ..... Tuscaloosa
Past Pres., Ed Mabry ..... Cowarts
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Sec'y. Treas., Patricia Lindsey ..... Cullman
Delegate, Tom McCaskey ..... Auburn

Mail all correspondence to:
Patricia Lindsey
Cullman County Health Dept.
P.O. Box 1678
Cullman, AL 35056-1678
256.734.0243
E-mail: cchd@hiwaay.net

ALBERTA ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SANITARIANS

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Mail all correspondence to:
Lynn M. McMullen
University of Alberta
Dept. of Ag., Food and Nutritional Science
4-10 Ag. For. Center
Edmonton, Alberta T6G 2P5 Canada
780.429.6015
E-mail: lynn.mcmullen@ualberta.ca

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Sec'y, Ernst Schoeller ..... North Vancouver
Treas., John Boyce ..... Vancouver
Delegate, Clive Kingsbury ..... Surrey

Mail all correspondence to:
Clive Kingsbury
J. M. Schneider
5523 - 176th St.
Surrey, BC V3S 4C2
604.576.1191 ext. 3740
E-mail: Ckingsbury@home.com

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2nd Vice Pres., Dawn Stead ..... Woodland Hills
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Recording Sec'y. Frances Valles ..... Ontario
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Mail all correspondence to:
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Dairy Research and Information Center
University of California-Davis
Food Science and Technology
One Shields Ave.
Davis, CA 95616-8598
530.752.2192
E-mail: jcbruhn@ucdavis.edu

CAPITAL AREA FOOD PROTECTION ASSOCIATION

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Vice Pres., Jianghong Meng ..... College Park, MD
Sec'y./Treas., Brett Podoski ..... Washington, D.C.
Delegate, Faye Feldstein ..... Washington, D.C.

Mail all correspondence to:
Brett W. Podoski
FDA-CFSAN
200 C St., SW
Washington, D.C. 20204
202.401.2377
E-mail: brett.podoski@cfsan.fda.gov

CAROLINAS ASSOCIATION FOR FOOD PROTECTION

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Past Pres., Susan Grayson ..... Cary, NC
Sec'y., Jeff Rhodehamel ..... Duncan, SC
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Treas., John Rushing ..... Raleigh, NC
Delegate, Beth Johnson ..... Columbia, SC

Mail all correspondence to:
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S.C. DHEC Bur. of Labs
2809 Knightbridge Road
Columbia, SC 29223-2126
803.935.6201
E-mail: johnsoem@columb68.dhec.state.sc.us

CONNECTICUT ASSOCIATION OF DAIRY AND FOOD SANITARIANS, INC.

Pres., Colleen Mears ..... Windsor Locks
Vice Pres., David Herrington ..... Middlefield
Sec'y., Donald Shields ..... Hartford
Treas., Kevin Gallagher ..... Hartford
Delegate, Satyakam Sen ..... Bristol

Mail all correspondence to:
Kevin Gallagher
Dept. Consumer Protection (Food Div.)
State Office Bldg., Rm #167
165 Capitol Ave.
Hartford, CT 06106
860.713.6186

FLORIDA ASSOCIATION FOR FOOD PROTECTION

Pres., Frank Yiannas ..... Lake Buena Vista
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Vice Pres., Bennett Armstrong ..... New Port Richey
Past Pres., Roy E. Costa ..... Orlando
Sec'y., Sharon Grossman ..... Orange City
Treas., Bill Thornhill ..... Winter Haven
Delegate, Peter Hibbard ..... Orlando

Mail all correspondence to:
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Environmental Health
Walt Disney World
P.O. Box 10,000
Lake Buena Vista, FL 32830-1000
407.397.6060
E-mail: frank_yiannas@wda.disney.com

GEORGIA ASSOCIATION OF FOOD AND ENVIRONMENTAL SANITARIANS

Pres., Sid Camp ..... Atlanta
Past Pres., Pam York ..... McDonough
Sec'y., Todd Silberg ..... Duluth
Treas., James C. Camp ..... Newnan
Delegate, David Fry ..... Lilburn

Mail all correspondence to:
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Goldkist
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Atlanta, GA 30346-2397
770.206.6888
E-mail: pamela.metheny@goldkist.com

IDAHO ENVIRONMENTAL HEALTH ASSOCIATION

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Pres. Elect, Angela Markham ..... Pocatello
Past Pres., Rich Gabriel ..... Moscow
Sec'y. Treas., Dee Dawson ..... Pocatello
Delegate, Frank Isenberg ..... Boise

Mail all correspondence to:
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Bureau of Env. Health and Safety
P.O. Box 83720
Boise, ID 83720-0036
208.334.5947
E-mail: isenberg@idhw.state.id.us

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Sec'y., Pat Callahan ..... Carlinville
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Mail all correspondence to:
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11920 So. 74th Ave.
Palos Heights, IL 60463
773.722.7100
E-mail: noates@elgindairy.com

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Pres. Elect, Rhonda Madden ..... Indianapolis
Vice Pres., Robert Lewis ..... Shelbyville
Past. Pres., Dave Lamm ..... Indianapolis
Treas., J. Lloyd Grannan ..... Indianapolis
Sec'y., Janice Wilkins ..... Muncie
Delegate, Helene Uhlman ..... Hammond

Mail all correspondence to:
Helene Uhlman
Hammond Health Dept.
649 Conkey St., East
Hammond, IN 46324
219.853.6358

IOWA ASSOCIATION FOR FOOD PROTECTION

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Vice Pres. Pro Tem, Jimmy Clark ..... Seymore
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UpDates

Elgin Dairy Appoints New Controller

Elgin Dairy Foods, Inc., recently announced the appointment of John Czukiewski in the position of controller.

Mr. Czukiewski graduated with a Bachelor of Science in accountancy from DePaul University in 1993. He brings an extensive array of skills to his new position at Elgin Dairy Foods, Inc., along with years of experience working with some of the food industry's top names including United Distillers Manufacturers, Barton Beers Inc., The Quaker Oats Company, and most recently, the Diamond Nut Company of California.

Silliker Names Edward Hughes Chief Financial Officer

Edward Hughes was named Chief Financial Officer (CFO) of Silliker Laboratories Group, Inc. and Silliker bioMérieux. He will report to CEO and president Russell S. Flowers. Hughes is responsible for the organization's North American and European business operations and managing the successful integration of mergers and acquisitions into the worldwide Silliker network.

Prior to joining Silliker, Hughes was vice president of finance at Goodman Fielder Ingredients. In addition, he has served in senior level financial management positions for many leading international companies including Rhône-Poulenc Rorer and the FMC Corporation. A graduate of Widener University with a master's in business administration, he has an extensive international background in accounting, budgeting, financial reporting, tax planning, and mergers and acquisitions.

The National Registry of Food Safety Professionals Appoints Vice President

Ed Brosman has been appointed vice president of business development of EHT, LLC, owner of The National Registry of Food Safety Professionals. The Registry is a national membership organization that specializes in food safety education/ certification in all sectors of foodservice including restaurants, hotels, schools, and retail.

Ed is a graduate of The Florida State University College of Business/Hospitality Administration. He has owned several successful food service companies in the areas of restaurants, catering and manufacturing and was previously employed by Pillsbury's S & A Restaurant Group.

Philippe Jachnik, New President of IDF

At the World Dairy Summit 2000 held in Dresden (Germany) from 16-20 September 2000, Philippe Jachnik, head of Professional and International Relations at the French Dairy Processors' Association (ATLA), was elected unanimously to a four year term as president of the IDF, the International Dairy Federation.

Philippe Jachnik, joined the dairy sector in 1980 when he became secretary of the European Dairy Association (EDA, which was called Assilec at the time) for a five-year period. He was then employed by the FNCL (French Dairy Cooperatives) where he became the deputy director, before being taken on at ATLA when it was founded early in the 1990s.

Mastering several languages, Philippe Jachnik, MBA Insead 1979, has done graduate and post-graduate studies in France (IEP Strasbourg), Belgium (College of Europe, Bruges) and Sweden (International Graduate School, Stockholm).

Tanaka to take Japan Professorship

Nobumasa (Nobi) Tanaka, Ph.D., president of US-Japan Science Consulting Services, Inc. will assume a position as the professor of food safety, department of food science, Niigata College of Pharmacy in Niigata, Japan. This is a newly created department, which will open in April of 2002. Dr. Tanaka is conducting a search for an assistant professor (Jo-Kyoju) with expertise in food microbiology and food safety. In addition, the candidate must be fluent in Japanese, have a good working knowledge of food microbiology, and will be expected to run research programs in food safety areas as well as teach a laboratory course. The assistant professor is expected to assume a full professorship in about four years.

Dr. Tanaka joined the International Association for Food Protection (IAFP) in 1982 and is an active Member. He is also a member of IFT, ASM and AOAC. Contact Dr. Tanaka by E-mail at ntanaka@albany.net with interest in the Jo-Kyoju position.

New Partnership Bolsters Food Safety

The United States Department of Agriculture (USDA) scientists will join forces with industry researchers to more closely study the effects of irradiation on food quality and food safety. The federal scientists, with USDA's Agricultural Research Service, have entered into a 5-year agreement with Ion Beam Applications' (IBA) Food Safety Division located in Memphis, TN. The ARS scientists work in the Food Safety Research Unit at the agency's Eastern Regional Research Center.

ARS is the chief scientific research agency of USDA. "ARS specialists are leaders in conducting research on using ionizing radiation to minimize pathogens in foods. Our research findings helped lead to major food irradiation regulation by the Food Safety Inspection Service (FSIS) and the Food and Drug Administration (FDA)," said ARS Administrator Floyd P. Horn.

FSIS and FDA have approved use of irradiation to reduce harmful microorganisms on poultry and red meats, including beef, lamb and pork. For the past 40 years, FDA has been evaluating the safety of foods treated with radiation and has not found any consumer health risks associated with eating low-dose irradiated foods.

Ionizing radiation kills bacterial pathogens through the use of either gamma rays produced by cobalt and cesium atoms, or machine-produced X-rays and electrons.

2001 Samuel J. Crumbine Award Criteria

The Foodservice & Packaging Institute, Inc. (FPI) announced the availability of the criteria for the 2001 Samuel J. Crumbine Award for Excellence in Food Protection at the Local Level, which annually recognizes excellence in food protection services at public health agencies in the United States and Canada.

The winner of the Award is selected by an independent panel of food protection practitioners composed of representatives from leading public health and environmental health associations, past Crumbine Award winners, a consumer advocate, and a food industry representative. The jury makes its award selection each spring in a judging process administered by FPI.

Entries for the Crumbine Award competition are limited to US and Canadian local government public health agencies (county, district, city, town, or township) that provide food protection services to their communities under authority of a statute or ordinance. Past winners may apply five years after receiving the award.

Named for one of America's most renowned health officers and health educators – Samuel J. Crumbine, M.D. (1862-1954) – the Award has elevated the importance of food protection programs within local public health agencies and has inspired excellence in the planning and delivery of those services. The Crumbine Award was first offered in 1955 and has been presented almost every year since then.

The Crumbine Award is supported by the Conference for Food Protection, in cooperation with the American Academy of Sanitarians, Association of Food & Drug Officials, Foodservice & Packaging Institute, Inc., International Association for Food Protection, International Food Safety Council, National Association of County and City Health Officials, National Environmental Health Association, National Sanitation Foundation International, and Underwriters Laboratories, Inc.

All entries must be postmarked by March 15th, 2001.

For more information about the Crumbine Award, including the 2001 criteria, visit FPI's Web site at www.fpi.org or, contact Lynn Rosseth at FPI 703.527.7505; lrosseth@fpi.org.

Secret to *Listeria*'s Virulence Provides Clues to Workings of Other Deadly Intracellular Pathogens, UC Berkeley Scientists Report

Many deadly microbes have learned that the key to launching an infection is not to kill your host – at least not too quickly. Now, scientists at the University of California, Berkeley, have discovered how one microbe, *Listeria monocytogenes*, is able to manage this.

In a paper in an issue of *Science*, Daniel A. Portnoy, professor of molecular and cell biology in the campus's College of Letters & Science and professor of infectious diseases in the School of Public Health, along with postdoctoral fellow Amy L. Decatur, describe the trick these bacteria use to live comfortably inside a cell until they're ready to break out and spread the infection to other cells.

The finding could have implications beyond this one bacteria, which causes a deadly disease called listeriosis. "The world's top three infectious killers – AIDS, tuberculosis and malaria – all are caused by pathogens that ensconce themselves snugly inside cells and live to wreak havoc. Yet, these intracellular pathogens have been hard to study. There are no effective vaccines for any of these diseases, in part because it is difficult to study intracellular pathogens. *Listeria* is a great model system for studying the host-pathogen interaction of these intracellular bugs," Portnoy said.

Listeria is a common but deadly bacterium that in recent years has made headlines as a contaminant of hot dogs, cheese, cole slaw and other food stuffs, causing more than two thousand infections every year and 500 deaths.

Though it hits immune-compromised people the hardest, its overall fatality rate is about 20 percent. *Listeria* bacteria establish an infection by inducing immune system cells, mostly scavenger cells called phagocytes, to corral and swallow them, so that they end up encased in a bubble within the body of the cell. The bacteria would be benign if they remained isolated in the vacuole, because the cell can kill them there. But they eventually break out and take over the host cell's machinery to spread the infection. What makes *Listeria* virulent is a pore-forming toxin that allows the bacteria to break through the wall of the vacuole and enter the cell's innards, Portnoy said. A big question has always been why the toxin, listeriolysin O, doesn't also rupture and kill the cell, exposing the bacteria to the immune system.

Several years ago, a post-doctoral fellow in Portnoy's lab compared listeriolysin O to a similar pore-forming toxin called perfringolysin O, from the extracellular bacteria *Clostridium perfringens*, which cause gangrene. Sian Jones and Portnoy found that if they substituted perfringolysin O for *Listeria's* normal toxin, the altered bacteria were able to punch their way out of a vacuole, but then they killed the host cell. This made *Listeria* totally avirulent, Portnoy said, because the immune system efficiently mopped up the exposed bacteria.

Portnoy and Decatur compared the genetic sequences of the two toxins and found that listeriolysin O contains an extra bit of protein that looks just like a tag found in a range of organisms from yeast to humans, and which often tells the cell a protein is trash and should be chopped up and recycled. The tag is referred to as a PEST sequence, signifying the four amino acids characteristic of the tags.

Listeria bacteria apparently stole the tag and placed it on the toxin so that the host cell's clean-up crew recognizes it and targets it for destruction before it has a chance to make pinholes in the cell membrane. "It's a great example of how bacteria have taken advantage of the host's biology to enhance their pathogenicity," Portnoy said.

The two scientists elegantly demonstrated how critical this PEST sequence is to the virulence of *Listeria*. When they mutated the PEST tag so the cell no longer recognized it, the mutant bacteria quickly killed off the host cells. The mutant *Listeria* proved 10,000 times less virulent in mice than the wild *Listeria* bacteria.

Apparently, immune system cells eliminated the mutant bacteria once they killed off their host cell.

New Approach to Diagnosis, Treatment of Chronic Ciguatera Poisoning

An existing neurotoxicologic test and a cholesterol-lowering drug have promise for diagnosis and treatment of chronic ciguatera, a type of fish poisoning that until recently has been very difficult to diagnose and treat, Dr. Ritchie Shoemaker reported at the annual meeting of the American Society for Tropical Medicine and Hygiene.

Ciguatera is caused by a dinoflagellate toxin carried by several species of reef fish that is not destroyed by cooking. The toxin can produce gastrointestinal, cardiac, and neurologic symptoms. It is acquired only from eating affected fish, not from other types of environmental exposure. The explosive onset of an acute ciguatera illness can be readily identified clinically, but there is no consistent mechanism available to confirm the diagnosis in chronic cases. Symptoms of chronic ciguatera also include extreme fatigue, often incorrectly labeled as chronic fatigue syndrome. Diagnosing any neurotoxin-mediated illness usually requires identifying a biomarker, but there is no such serologic test for chronic ciguatera. Early diagnosis must involve a physiologic test as a biomarker because otherwise we have no way of demonstrating the toxin in people.

We now have the potential for a simple bedside physiologic test, called visual contrast sensitivity (VCS), that measures the ability to visually discriminate among white, black, and gray. It is used by the US Air Force and others as a superior method of vision testing. "The test is portable, reproducibly reliable, inexpensive, and suitable

for screening," said Dr. Shoemaker, of the Pfiesteria Illness Center, McCready Outpatient Systems, Pocomoke, MD.

Most of the illnesses are acquired from eating predator fish, such as grouper, jack, barracuda, and snapper. The disease occurs in tropical areas worldwide. "However, the disease can occur in nonendemic areas, in any place in which affected fish are imported. Cases have occurred in such places as Kiawah Island, South Carolina, and in a fancy restaurant in New Orleans. The difficulty in such isolated cases is that no definitive diagnosis can be confirmed by epidemiologic studies. The test for ciguatoxin in fish itself is fairly expensive and has a high percentage of false negatives and false positives," said Dr. Shoemaker.

The diagnostic test is based on the ability of the eye to discern contrast among white, gray, and black, which is impaired in the presence of a neurotoxin. A unique deficit in detecting visual contrast was found in 10 patients with possible chronic ciguatera and not found in controls. A similar deficit has been found in individuals affected by the neurotoxin produced by Pfiesteria piscicida and morphologically related dinoflagellates, he noted.

Treatment with cholestyramine in doses approved by the FDA for lowering cholesterol resulted in the correction of the visual contrast sensitivity deficit in these patients and abatement of chronic symptoms, some of which had been present for more than 10 years. The maximum time to recovery was 12 weeks. The same deficit and successful treatment of symptoms was demonstrated in five patients symptomatic for 3 weeks after they ate grouper while on vacation in the Bahamas, he reported. "All these results suggest that VCS testing has great promise for successful use as a screening tool and as a tool for monitoring response to therapy."

The molecular structure of cholestyramine, an ion exchange resin, matches receptors on the toxin so they fit together as a lock and key, effectively inactivating the toxin. The drug has been used clinically to treat a number of neurotoxin-related syndromes, Dr. Shoemaker said. A clinical trial evaluating its clinical efficacy more extensively is under way.

Initial symptoms of ciguatera lead most people to believe they have food poisoning. Neurologic symptoms develop later. They include a metallic taste in the mouth (a hallmark of the disease), burning sensations in the arms and legs, reversal of hot and cold sensations, and a decrease in mental acuity. "Because these symptoms are rather nonspecific, ciguatera is rarely diagnosed in nonendemic areas," he said.

Worldwide, the number of annual cases is estimated between 300,000 and 1 million. Statistics have been skewed for years because of under-reporting, he noted.

Cornell Food Science Summer Scholars Program Gives Undergraduate Students Research Experience

The Cornell Food Science Summer Scholar program was offered for the first time in the summer of 2000 by the Cornell Institute of Food Science. The primary goal of this program was to provide undergraduate students with an opportunity to conduct independent research in food science. An additional objective was to expose non-food science majors to educational and career opportunities in food science.

Thirteen undergraduate students from universities across the United States spent 10 weeks during the summer of 2000 conducting research with faculty members affiliated with the Cornell Institute of Food Science. Some of the participating students were food science majors, but most were from fields as diverse as computer science, chemistry, and biology.

The program was sponsored by participating faculty members as well as by the International Food Network, Inc., General Mills, the Louis Pasteur Lectureship Fund, the Cornell Institute of Food Science, and the New England Grain and Feed Council. Through these contributions, Cornell was able to provide each student with a $3,000 summer stipend.

The Cornell Institute of Food Science is currently accepting applications for the 2001 summer program. For more information on the Cornell Summer Undergraduate program and for 2001 application materials, visit www.foodscience.cornell.edu/fsscholars.htm or contact Martin Wiedmann by phone (607.254.2838) or by E-mail (mwl6@cornell.edu).

New Report Says Antimicrobial Resistance an Ecological Issue

Antimicrobial agents are used for everything from fighting disease to protecting crops to producing food animals, and not enough is understood about the impact of resistance on the environment as a whole. A new report from the American Academy of Microbiology, "Antimicrobial Resistance: An Ecological

Perspective," takes a broad view of the problem of increasing resistance to antimicrobials and its consequences for human, animal, and environmental health.

Resistance is a natural result of the ability of bacterial cells to adapt. Over-use and misuse of antimicrobials and the widespread use of disinfectants in household products may speed the process, but over time, even the careful use of antimicrobial agents will lead to resistant bacteria. As existing antimicrobial agents decline in effectiveness, infections will be more difficult and expensive to treat. Epidemics will become harder to control, and water, animals, and crops will be affected.

"Antimicrobial Resistance: An Ecological Perspective," provides an overview of the current situation and offers specific recommendations for future scientific research, surveillance programs, and education efforts. The document presents the conclusions of a panel of 30 scientists that spent several days deliberating the issues. The meeting brought together researchers in the environmental and agricultural sciences, infectious disease specialists, pharmaceutical industry representatives, and public health officials to take an inclusive view of problems and offer solutions. The report is available online, and can be downloaded free of charge from the American Academy of Microbiology. Just visit: www.asmusa.org/acasrc/aca1.htm.

Salmomella enterica Serotype *Enteritidis* in Table Egg Layers in the United States

More table egg producers are routinely testing for SE than 5 years ago, according to a study by the USDA's National Animal Health Monitoring System (NAHMS).

Salmonella enterica serotype *Enteritidis*, commonly known as SE, is a key topic of interest for the United States table egg layer industry. NAHMS conducted the Layers '99 national study to contribute to the knowledge base on this health issue and to obtain an overview of layer health and management that will help the industry address other educational and research topics. SE results are presented in *Salmonella enterica* serotype *Enteritidis* in Table Egg Layers in the United States, a report released in October 2000.

NAHMS collected data from a statistically-valid sample of table egg layers from 15 states Alabama, Arkansas, California, Florida, Georgia, Indiana, Iowa, Minnesota, Missouri, Nebraska, North Carolina, Ohio, Pennsylvania, Texas, and Washington. Producers from 252 farm sites provided management data related to SE during March and April 1999. Layers +99 results showed that while just under 16% of farm sites routinely tested for SE in 1994, this percentage had risen to 58% in 1999. In fact, in 1994, 84% of farm sites in Alabama, Florida, Georgia, and North Carolina had SE testing programs.

From May through October 1999, environmental samples were collected from manure, egg belts, elevators, and walkways throughout 200 of the layer houses and tested for SE. Overall, SE was found in environmental samples in 7% of layer houses, and NAHMS estimated regional prevalence ranging from 0 to 17%. House mice collected in 129 of the layer houses were also tested for SE.

Just under 4% of the mice cultured were positive. The prevalence of SE in mice from environmentally positive houses was nearly four times that of mice from environmentally negative houses.

Other highlights:

- A total of 17 environmental samples were collected from each of 200 layer houses for culture. Overall, SE was found in 7.1% of layer houses.
- Flocks less than 60 weeks of age were 4.7 times more likely to test positive than older, unmolted flocks. Flocks that were 0-16 weeks post-molting were 9.3 times more likely to test positive compared to flocks that were 60 or more weeks of age and unmolted, but flocks more than 16 weeks post-molt had very little increased risk.
- None of the houses tested positive for SE on farms where the feeders or hoppers were cleaned and disinfected between each flock or where cages, walls, and ceilings were washed between each flock, whether or not they were fumigated.
- Houses with a high rodent index were more likely to have SE found within the house than houses with a low rodent index.
- Overall, 3.7% of house mice cultured were positive for SE.
- The percentages of farm sites where either finished feed or feed ingredients were tested for SE ranged from 28.8% of farm sites in the Central region to 80.7% of farm sites in the West.
- Only 15.7% of farm sites routinely tested for SE in 1994, whereas 58.0% of farm sites routinely tested for SE in 1999.

- Over one-half (56.1%) of farm sites participated in a SE quality assurance program. Over one-half (55.0%) of farm sites that participated in a SE quality assurance program had an inspection by someone not associated with the farm (i.e., independent third-party verification).

All Layers '99 study results, including the SE report, are posted at www.aphis.usda.gov/vs/ceah/cahm (see Poultry).

FSIS Action Will Increase Microbiological Sampling of Ready-to-Eat Meat and Poultry Products

In order to encourage producers of ready-to-eat meat and poultry products to incorporate microbiological sampling into their food safety plans, the USDA's Food Safety and Inspection Service's new Directive focuses federal testing on companies that do not have such sampling as part of their plans. Ready-to-eat products, such as hot dogs, luncheon meats, and certain kinds of sausage, are required to be free of illness-causing microbial hazards.

FSIS will maintain at least its current level of sample collection and analysis nationwide each year to ensure that companies are creating ready-to-eat products without harmful microbial hazards. The sampling program is one way the agency verifies that a company's science-based preventive food-safety plan, known as the Hazard Analysis and Critical Control Point plan, and their Standard Sanitation Operating Procedures are effective.

"By following a strategy that encourages industry to test, there will be much more product testing overall—as well as environmental sampling—than FSIS could ever do on its own," said FSIS Administrator Thomas J. Billy. Ready-to eat products are subjected to FSIS testing for *Listeria monocytogenes* and *Salmonella*, and some, such as certain kinds of pepperoni, are analyzed for *E. coli* O157:H7 and staphylococcal enterotoxin as well.

To encourage plants to test their products, FSIS inspectors will not carry out routine scheduled sampling in a plant that incorporates a testing protocol into its HACCP plan or SSOP, as appropriate, and tests its products at least monthly, or conducts regular testing of non-food contact and food-contact surfaces in addition to testing product every three months.

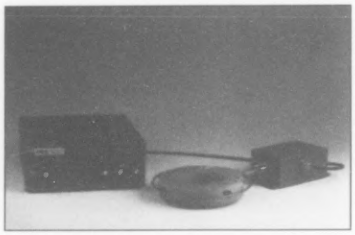
Positive findings from these industry testing programs must be addressed by plants in accordance with the corrective and preventive action requirements found in the HACCP and SSOP regulations. FSIS inspectors will verify these requirements are being met, including choosing to sample at any time at the agency's discretion.

If a sample of product taken by FSIS indicates the presence of a disease-causing microbial hazard, FSIS inspectors verify that the plant has taken the appropriate corrective and preventive measures as set out in the HACCP and SSOP regulations. During any corrective and preventive actions, the plant or FSIS may need to take additional samples. Also, the Directive provides inspectors the opportunity to take follow-up samples once the corrective and preventive actions have been implemented to verify the continued effectiveness of the plant's actions.

Regardless of whether the testing is done by the company or by FSIS, if product testing positive has been distributed, FSIS will request that the company conduct a recall. FSIS does not have the legal authority to mandate recalls.

"This Directive is another step in clearly defining the respective responsibilities of industry and FSIS. Industry is responsible for producing safe food, while federal inspectors are in processing plants daily to verify that this responsibility is being met," Billy said. FSIS has undertaken substantial changes in meat and poultry inspection since 1996 with the implementation of HACCP, resulting in dramatic decreases in foodborne illnesses attributed to meat and poultry.

Industry**Products**



Whatman, Inc.

Low Volume, Short Lag-Time Sample Filters from Whatman, Inc.

A new, line of Balston® stainless steel sample filters designed specifically to protect process analyzers and monitoring equipment are now available from Whatman, Inc.

The models 31S6, 31G, 41S6, 41G, and the 91S6 remove solids and liquids from gases with 99.99% efficiency at 0.01 µm, and solid particulate removal from liquids to .2 µm. These filters protect analyzers from sample impurities which are the most frequent cause of maintenance problems for instruments in an industrial environment.

These new filters are lower in cost than the Balston conventional stainless steel filter line. They are also more compact in design resulting in a smaller internal volume and faster sampling times.

The new improved design requires no tools to change the filters. Other design features include 1/2" NPT ports, maximum temperature of up to 400°F, and maximum pressure of up to 500 psig.

To satisfy the extremely wide range of requirements for analyzer sample filters, Whatman also supplies complete lines of Balston filter housings in teflon®, monel, and other corrosion-resistant materials, plus a choice of high efficiency filter elements which are inert to virtually all liquids and gases.

Whatman, Inc., Tewksbury, MA

Reader Service No. 321

New Sigma-Aldrich 3× Flag™ System Delivers 10-20 Times Greater Sensitivity for Recombinant Protein Detection

Sigma-Aldrich announces the introduction of the 3×FLAG System, an improved method for expressing, purifying and detecting recombinant proteins. Fusing three tandem FLAG epitopes to a recombinant protein, the 3×FLAG System provides a three-fold increase in the signal at saturation, resulting in 10 to 20 times greater sensitivity than current methods.

"This is a further enhancement of the best commercially available epitope tagging system," said Bill Brizzard, technical transfer manager, and the former lead researcher on the original FLAG development team. "3×FLAG is an enabling tool that will positively impact research by speeding the discovery process so scientists will generate results more easily."

In the original FLAG System the eight amino acid FLAG sequence is fused to the recombinant protein when expressed from a pFLAG vector. The FLAG tag works by allowing highly specific anti-FLAG antibodies and affinity resins to detect, immunoprecipitate and purify the recombinant protein. While this technology is preferred when working with recombinant proteins expressed at a high level in bacteria, a common problem has been detection of epitope tagged fusion proteins expressed at low levels in mammalian cells. The increased sensitivity of the 3×FLAG system overcomes this problem.

Sigma-Aldrich Corporation, St. Louis, MO

Reader Service No. 322

Dangerous Pathogen Identification Capability

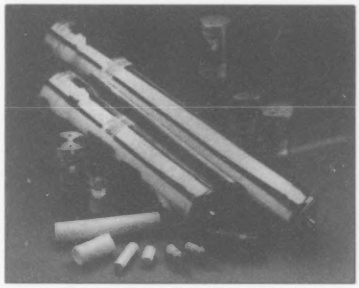
Biolog, Inc. has announced the release of the MicroLog™ Dangerous Pathogen (DP) Database Supplement. With this product laboratories now have the capability to identify a number of important pathogenic bacteria.

In recent years there has been increased international attention on the potential of using dangerous pathogens as possible biological weapons. The Biolog DP Database provides microbiologists with the capability to identify and characterize the organisms that public health officials (including the US Centers for Disease Control and Prevention) have deemed as being of primary importance in bioterrorism monitoring efforts. The DP Database is used with Biolog's popular MicroLog Microbial Identification/Characterization system to identify the following dangerous pathogens: *Bacillus anthracis*, *Brucella melitensis*, *Yersinia pestis*, *Francisella tularensis*, *Burkholderia mallei*, and *Burkholderia pseudomallei*.

The DP Database Supplement adds to the current capabilities of the MicroLog system that allows microbiologists to accurately identify over 1,400 species/genera of anaerobic and aerobic bacteria and yeast.

Biolog, Inc., Hayward, CA

Reader Service No. 323



Wireless Data Corporation

New High RPM Transducer Telemetry System from Wireless Data Corporation

Wireless Data Corporation introduces the new Model 2100 high RPM data coupler.

The Model 2100 is a clamp-on, short range r.f. telemetry system which can be used to measure rotational torque, torsional vibrations, bending strains, thrust, acceleration, pressure, load, and temperatures on rotating shafts. The system requires no mechanical modification to the existing shafting. Reliable and accurate data can be obtained via strain gages, RTDs, pressure transducers, piezoresistive accelerometers, and other full bridge transducers.

Installation requires only 1.25" of clear shafting (axially), and introduces minimal weight and volume to the overall mechanical system. The Model 2100 is capable of operation from DC to 13,500 RPM, at temperatures up to 125°C, and is immune to vibration and shock found in industrial and aerospace applications, including actual flight conditions on high performance aircraft and helicopters.

The unique, patented CAT feature (Calibrate AnyTime), permits automatic shunt calibration, even while the shaft is rotating, thus insuring continuous accurate readings. The Model 2100 system also features the PowerGuard indicator, which informs the operator of system power status without having to stop the shaft and uncover connections for a voltmeter measurement.

Wireless Data Corporation, Mountain View, CA

Reader Service No. 324

Versatile Digital Microscope Camera from Zeiss

Carl Zeiss, Inc. introduces the new SV Micro universal digital camera for microscopy with an excellent price/performance ratio. The camera can be used for all applications from biomedical to materials analysis and quality assurance. Because it generates perfect image quality in both black/white and color, the camera can be used for routine and research applications. Its excellent dynamics make this camera ideal for bright-field, DIC or phase-contrast imaging techniques.

The SV Micro uses modern sensor technology and in combination with an integrated color filter wheel offers clear advantages over 1 DDC chip and 3 CCD chip cameras in both resolution and image quality. By sampling the color values for each of the three-color channels in the same position, it is possible to achieve brilliant color with perfect resolution without color interpolation.

The online image appears on the monitor as a live and full-format image in black/white. This means that the focus and frame can be easily adjusted. SV Micro can perform image acquisition at two different resolution levels, in black/white as well as in color. The images can be saved to your computer in a matter of seconds.

The SV Micro is easy to operate using the AxioVision digital image processing and archiving software. Integrated microscope control allows the entire process from recording to archiving the image to be done efficiently and consistently using one program.

SV Micro can be used on any microscope with a C-mount and can also be employed for photomicrography with standard objectives. The standard SCSI connection to the PC ensures that the camera can be connected easily without the need for more complex changes to your computer's hardware.

Carl Zeiss, Inc., Thornwood, NY

Reader Service No. 325

Avoid Microbial Cross-Contamination with New Silliker Video

"Avoiding Microbial Cross-Contamination," the new employee training video from Silliker Laboratories, teaches food plant workers how to prevent the transfer of harmful microorganisms to finished products.

During a typical work day, the video illustrates how microorganisms can be passed on to finished products by improper employee traffic patterns, equipment, unsanitized tools, poor personal hygiene, and more. According to the Centers for Disease Control, poor personal hygiene of food workers is one of the leading reported practices contributing to foodborne disease outbreaks.

The video, which is available in English and Spanish, provides an overview of the origin of microorganisms, how microorganisms enter the plant environment, and the threat microbial cross-contamination poses to food safety. Food industry recognized GMP principles are used throughout the video to teach employees how to prevent common and sometimes costly cross-contamination occurrences.

Used alone or in conjunction with other GMP training materials, "Avoiding Microbial Cross-Contamination" is a cost-effective and practical tool to train staff.

The video is available for $189 and is the fifth installment in Silliker Laboratories' popular GMP training series. Complimentary videos in the series include: "Food for Thought – The GMP Quiz Show," ($209), "Employee Hygiene Practices," "Guidelines for Maintenance Personnel," and "Process Control Practices" ($189 each). All five are available in English and Spanish and include a free facilitator's training guide. To order visit the Silliker Web site at www.silliker.com or call 800.829.7879.

Silliker Laboratories Group, Inc., Thornwood, NY

Reader Service No. 326

DNA Isolation from Food System from Promega Saves Time with Greatly Simplified Handling

The Wizard® Magnetic DNA Purification System for Food resolves the problem of lengthy purification procedures and variable DNA quality using patented Magnesil™ Paramagnetic Particle (PMP) technology. DNA purified from food provides the starting point for PCR testing for GMO (genetically modified organisms) in many foods. However, the variability encountered in different food matrices can lead to extensive processing steps and poor yield and quality of DNA hindering accurate PCR analysis. The Wizard® Magnetic DNA Purification System for Food:

Saves time: A 70% savings in time over other methods of food DNA purification.

Easy to use: Simplified handling with Magnesil™ PMPs and minimal centrifugation steps.

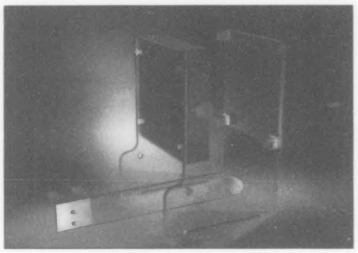
Versatile and robust: Validated with a broad variety of food samples and quality controlled for consistent PCR amplification.

The Wizard® Magnetic DNA Purification System for Food improves economy in four ways: DNA purification is completed in one-quarter the time compared to other methods, the decrease in time saves labor costs, the kit format reduces overall consumable costs, and the ability to automate the system increases efficiency as a greater number of samples may be processed per experiment.

This new system purifies genomic DNA from a wide variety of foods including corn and soy seeds, processed foods such as cornmeal, corn starch, soy flour, cornflakes, soy milk, tofu and food samples with low DNA content and difficult technical obstacles such as soy lecithin and vegetable oils. The system provides highly pure DNA suitable for detection of GMO in food. For corn meal, as many as 100 PCR amplifications may be performed per sample.

Promega Corporation, Madison, WI

Reader Service No. 327



CEA Instruments, Inc.

New IAQ Unit Monitors CO_2 Plus More from CEA Instruments, Inc.

The newly expanded GD-444 Series of personal-size, infrared carbon dioxide analyzers can now also measure and display temperature and relative humidity levels. Other gas sensors such as carbon monoxide (CO) or oxygen (O_2) can also be added. Carbon dioxide full ranges up to 1%, 10%, or 100% are available with auto-ranging or single range resolution.

Weighing less than a pound, the GD-444 Series includes an internal sample pump, backlight, adjustable alarms, digital display, outputs, and numerous push button options. Standard accessories include a battery charger, AC power supply, tubing, and manual. Carrying cases, calibration kits, and a built in datalogger with cable and software are some of the optional accessories available.

The GD-444 Series is applicable for use in office ventilation systems, cooling systems, hazardous environments, laboratory and research projects, food related industries, breweries, mushroom growing, greenhouse horticulture, welding, and various other applications where carbon dioxide or IAQ levels need monitoring.

CEA Instruments, Inc., Emerson, NJ

Reader Service No. 328

Dairy, Food and Environmental Sanitation, Vol. 20, No. 12, Pages 981-986

3-A® Sanitary Standards for Filters Using Single Service Filter Media, Number 10-04

Formulated by
International Association of Food Industry Suppliers (IAFIS)
International Association for Food Protection (IAFP)
United States Public Health Service (USPHS)
The Dairy Industry Committee (DIC)
United Stated Department of Agriculture – Dairy Programs (USDA)
The European Hygienic Equipment Design Group (EHEDG)

It is the purpose of the IAFIS, IAFP, USPHS, DIC, USDA, and EHEDG in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. Milk, milk product, and other comestibles filter specifications heretofore or hereafter developed which so differ in design, materials, and fabrication or otherwise as not to conform to the following standards but which, in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of the IAFIS, IAFP, USPHS, DIC, USDA, and EHEDG at any time. The 3-A Sanitary Standards and 3-A Accepted Practices provide hygienic criteria applicable to equipment and systems used to produce, process, and package milk, milk products, and other perishable foods or comestible products. Standard English is the official language of 3-A Sanitary Standards and 3-A Accepted Practices.

A **SCOPE**

A1 These standards cover sanitary aspects of enclosed filtration equipment that uses single service filter media for filtering milk and milk products.

A2 In order to conform to these 3-A Sanitary Standards, filters shall comply with the following design, material, and fabrication criteria.[1]

B **DEFINITIONS**

B1 *Product*: Shall mean milk and milk products, or other comestibles.

B2 *Filter*: Shall mean enclosed filtration equipment that uses single service filter media during the transmission of milk and milk products.

B3 **Surfaces**

B3.1 *Product Contact Surface*: Shall mean all surfaces that are exposed to the product, or from which liquid may drain, drop, or be drawn into the product.

B3.2 *Nonproduct Contact Surface*: Shall mean all other exposed surfaces.

B4 **Cleaning**

B4.1 *Mechanical or Mechanically Cleaned*: Shall mean soil removal by impingement, circulation, or flowing chemical detergent solutions and water rinses onto and over the surfaces to be cleaned by mechanical means in equipment or systems specifically designed for this purpose.

B4.2 *Manual (COP) Cleaning*: Shall mean soil removal when the equipment is partially or totally disassembled. Soil removal is effected

[1]Use current revisions or editions of all referenced documents cited herein.

with chemical solutions and water rinses with the assistance of one or a combination of brushes, nonmetallic scouring pads and scrapers, high or low pressure hoses and tank(s) which may be fitted with recirculating pump(s), and with all cleaning aids manipulated by hand.

B5 *Easily or Readily Removable*: Shall mean quickly separated from the equipment with the use of simple hand tools if necessary.

B6 *Inspectable*: Shall mean all product contact surfaces can be made available for close visual observation.

B7 *Simple Hand Tools*: Shall mean implements normally used by operating and cleaning personnel such as a screwdriver, wrench or mallet.

B8 *Nontoxic Materials*: Shall mean those substances which under the conditions of their use are in compliance with applicable requirements of the Food, Drug, and Cosmetic Act of 1938, as amended.

B9 *Corrosion Resistant*: Shall mean the surface has the property to maintain its original surface characteristics for its predicted service period when exposed to the conditions encountered in the environment of intended use, including expected contact with product and cleaning, sanitizing, or sterilization compounds or solutions.

C MATERIALS

C1 Metals

C1.1 Product contact surfaces shall be of stainless steel of the American Iron and Steel Institute (AISI) 300 (except 301 and 302) Series[2] or corresponding Alloy Cast Institute[3] (ACI) types (See Appendix, Section E), or metal which under conditions of intended use is at least as corrosion resistant as stainless steel of the foregoing types, and is nontoxic and nonabsorbent.

C2 Nonmetals

C2.1 Rubber and rubber-like materials may be used for gaskets, sealing applications, and parts having the same functional purposes.

C2.1.1 Rubber and rubber-like materials, when used for the above-specified application(s), shall conform to the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-.

C2.2 Plastic materials may be used for gaskets, sealing applications, and parts having the same functional purposes.

C2.2.1 Plastic materials, when used for the above-specified application(s), shall conform to the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-.

C2.3 Cotton, linen, or synthetic materials may be used for single service filter media. These materials shall be nontoxic, nonshedding, relatively insoluble, and shall not impart a flavor to the product.

C3 Nonproduct Contact Surfaces

C3.1 All nonproduct contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion resistant. If coated, the coating used shall adhere. All nonproduct contact surfaces shall be relatively nonabsorbent, durable, and cleanable. Parts removable for cleaning having both product contact and nonproduct contact surfaces shall not be painted.

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[2]The data for this series are contained in the *AISI Steel Products Manual, Stainless & Heat Resisting Steels*, Table 2-1. Available from the American Iron and Steel Society, 186 Thorn Hill Road, Warrendale, PA 15086. Phone: (724) 776-1535.

[3]Steel Founders Society of America, Cast Metal Federation Building, 455 State Street, Des Plaines, IL 60016. Phone: (708) 299-9160.

[4]Criteria for hygienic welds may be found in AWS/ANSI D18.1 – *Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications*. Available from the American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126. Phone: (305) 443-9353, fax: (305) 443-7559, e-mail: info@amweld.org; and EHEDG Doc. 9 – Welding Stainless Steel to Meet Hygienic Requirements. Available from the European Hygienic Equipment Design Group, Ellen Moens, Avenue Grand Champ 148, 1150 Brussels, Belgium. Phone: +32 2 761 7408; Fax: +32 2 763 0013; e-mail: moens@nsf.org.

D **FABRICATION**

D1 **Surface Texture**

D1.1 All product contact surfaces shall have a finish at least as smooth as a No. 4 ground finish on stainless steel sheets and be free of imperfections such as pits, folds, and crevices in the final fabricated form, except for the single service filter media. (See Appendix, Section F.)

D2 **Permanent Joints**

D2.1 All permanent joints in metallic product contact surfaces shall be continuously welded.[4]

D2.1.1 Permanent joints shall produce product contact surfaces, which are at least as smooth as a No. 4 ground finish on stainless steel sheets and which are free of imperfections such as pits, folds, and crevices.

D3 **Cleaning and Inspectability**

D3.1 A filter, excluding single-service filter media, that is to be mechanically cleaned shall be designed so that the product contact surfaces of the filter and all nonremoved appurtenances thereto can be mechanically cleaned and are easily accessible, readily removable, and inspectable.

D3.2 Product contact surfaces not designed to be mechanically cleaned shall be easily accessible for cleaning and inspection either when in an installed position or when removed. Demountable parts shall be readily removable.

D4 **Draining**

D4.1 Product contact surfaces shall be self-draining except for normal clingage.

D5 **Fittings**

D5.1 All sanitary fittings and connections shall conform to the applicable provisions of the 3-A Sanitary Standards for Sanitary Fittings for Milk and Milk Products, Number 63-.

D6 **Gaskets**

D6.1 Gaskets having a product contact surface shall be removable.

D6.2 Gasket retaining grooves in product contact surfaces shall be no deeper than their width.

D7 **Radii**

D7.1 All internal angles of less than 135° on product contact surfaces shall have radii of not less than 1/16 in. (1.59 mm), except that:

D7.1.2 Radii in standard O-ring grooves shall be as specified in Appendix, Section G.

D7.1.3 Radii in nonstandard O-ring grooves shall be those radii closest to a standard O-ring as specified in Appendix, Section G.

D7.1.4 Radii in grooves in gaskets or gasket retaining grooves shall be those provided for in Section D5.1.

D8 **Threads**

D8.1 There shall be no threads on product contact surfaces.

D9 **Springs**

D9.1 Any coil spring having product contact surfaces shall have at least 3/32 in. (2.38 mm) openings between coils, including the ends when the spring is in a free position.

D10 **Perforated Product Contact Surfaces**

D10.1 Perforations in the filter medium support shall be not less than 3/32 in. (2.38 mm) in diameter and shall be readily accessible for cleaning. All perforations shall be free of burrs.

D11 **Nonproduct Contact Surfaces**

D11.1 Nonproduct contact surfaces shall have a smooth finish, be free of pockets, crevices, and be readily cleanable, and those surfaces to be coated shall be effectively prepared for coating.

APPENDIX

E **STAINLESS STEEL MATERIALS**

Stainless steel conforming to the applicable chemical composition ranges established by AISI[2] for wrought products (Table 1), or by ACI[3] for cast products (Table 2), should be considered in compliance with the requirements of Section C1 herein. Where welding is involved, the carbon content of the stainless steel should not exceed 0.08%.

TABLE 1

WROUGHT PRODUCTS TYPICALLY USED			
UNS #	ASTM[5]	AISI/SAE[2]	Properties
S30300	A-582	303	Free-Machining S.S.; Austenitic
S30400	A-276 A-666	304	Austenitic S.S.
S30403	A-276 A-666	304L	Low Carbon Austenitic S.S.
S31600	A-276 A-666	316	Austenitic S.S. plus Mo*
S31603	A-276 A-666	316L	Low Carbon Austenitic S.S. plus Mo*

*Molybdenum

TABLE 2

CAST PRODUCTS			
UNS #	ASTM[5]	ACI[3]	Common Names
J92500	A-351 A-743 A-744	CF-3	Cast 304L
J92800	A-351 A-743 A-744	CF-3M	Cast 316L
J92600	A-351 A-743 A-744	CF-8	Cast 304
J92900	A-351 A-743 A-744	CF-8M	Cast 316
J92180	A-747	CB7 Cu – 1	Cast 17-4 PH
J92110	A-747	CB7 Cu –2	Cast 15-5 PH
N26055	A-494	CY5Sn BiM	Alloy 88
J92701	A-743	CF-16F	Free Machining Austenitic S.S.

F **PRODUCT CONTACT SURFACE FINISH**

Surface finish equivalent to 150 grit or better as obtained with silicon carbide properly applied on stainless steel sheets is considered in compliance with the requirements of Section D1 herein. A maximum R_a of 32 µin, (0.80 µm), when measured according to the recommendations in American National Standards Institute (ANSI)/American Society of Engineers (ASME)[6].

G **O-RING GROOVE RADII**

TABLE 3

Groove Radii Dimensions for Standard O-Rings			
O-Ring Cross Section, Nominal (AS568[7])	O-Ring Cross Section, Actual (AS 568)	O-Ring Cross Section, Actual (ISO 36011[8])	Minimum Groove Radius
1/16 in.	0.070 in.	1.80 mm	0.016 in. (0.406 mm)
3/32 in.	0.103 in.	2.65 mm	0.031 in. (0.787 mm)
1/8 in.	0.139 in.	3.55 mm	0.031 in. (0.787 mm)
3/16 in.	0.210 in.	5.30 mm	0.062 in. (1.575 mm)
1/4 in.	0.275 in.	7.00 mm	0.094 in. (2.388 mm)

H **ENGINEERING DESIGN AND TECHNICAL CONSTRUCTION FILE**

The following is an example of an engineering design and technical construction file (EDTCF) to be maintained by the fabricator as evidence of complying with 3-A Sanitary Standards or 3-A Accepted Practices. (The file may contain more or less information as applicable to the equipment or system.)

H1 **Purpose**

H1.1 To establish and document the material, fabrication, and installation (where appropriate) requirements for the engineering design and technical construction files for all products, assemblies, and sub-assemblies supplied by the manufacturer thereof to be in compliance with the sanitary criteria found in 3-A Sanitary Standards or 3-A Accepted Practices. It is recommended that the engineering and construction file or files be submitted with applications for 3-A Symbol use authorization.

[5]Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Phone: (610) 832-9500.

[6]Available from the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017-2392. Phone: (212) 705-7722.

[7]The document establishing these standard dimensions is Aerospace Standard (AS) 568, published by SAE, 400 Commonwealth Drive, Warrendale, PA 15086. Phone: (412) 776-4970).

[8]The document establishing these standard dimensions is ISO 3601-1: 1988 (E), published by the International Organization for Standardization (ISO), 1 Rue de Varembe, Case Postale 58, CH 1 1211, Geneva, Switzerland. Phone: (41-22-734-1240)

H2 **Scope**

H2.1 This EDTCF applies to equipment specified by:

H2.1.1 3-A Sanitary Standards for Milk and Milk Products Filters Using Single Service Filter Media, Number 10-.

H3 **Responsibilities**

H3.1 This EDTCF is maintained by: The Engineering Manager (or other company official) {name and title of responsible official} is responsible for maintaining, publishing, and distributing this EDTCF.

H3.2 Implementation: All divisions, specifically development engineering, standards engineering, sales engineering, and product departments are responsible for implementing this EDTCF.

H4 **Applicability**

H4.1 The 3-A Sanitary Standards and 3-A Accepted Practices are voluntarily applied as suitable sanitary criteria for dairy and food processing equipment. 3-A Sanitary Standards are referenced in the Grade A Pasteurized Milk Ordinance: "Equipment manufactured in conformity with 3-A Sanitary Standards complies with the sanitary design and construction standards of this Ordinance."

H5 **References**

H5.1 List any additional regulations that apply to the equipment or system covered by this EDTCF.

H5.2 Date of conformity or 3-A Symbol Authorization and certificate number, if authorized.

H6 Design and Technical Construction File

H6.1 The Engineering Design and Technical Construction File may consist of the following:

a. an overall drawing of the subject equipment;
b. full detailed drawings, accompanied by any calculations, notes, test results, etc. required to check the conformity of the equipment with the 3-A Standards or 3-A Practices;
c. a list of:
   (1) the essential requirements of the standards or practices; tests carried
   (2) other technical specifications, which were used when the equipment was designed;
d. a description of methods adopted;
e. if essential, any technical report or certificate obtained from a competent testing body or laboratory;
f. any technical report giving the results of out internally by Engineering or others;
g. documentation and test reports on any research or tests on components, assemblies and/or the complete product to determine and demonstrate that by its design and construction the product is capable of being installed, put into service, and operated in a sanitary manner (optional);
h. a determination of the foreseeable lifetime of the product (optional);
i. a copy of the instructions for the product (Instruction Manuals/Instruction Books);
j. for serial manufacturing, the internal measures that will be implemented to insure that the equipment will continue to be manufactured in conformity with the provisions of the 3-A Sanitary Standards or 3-A Accepted Practices;
k. engineering reports;
l. laboratory reports;
m. bills of material;
n. wiring diagrams, if applicable;
o. sales order engineering files;
p. hazard evaluation committee reports, if executed;
q change records;
r. customer specifications;
s. any notified body technical reports and certification tests;
t. copy of the 3-A Symbol authorization, if applicable.

H6.2 The file does not have to include detailed plans or any other specific information regarding the sub-assemblies, tooling, or fixtures used for the manufacture of the product unless a knowledge of them is essential for verification of conformity with the basic sanitary requirements found in 3-A documents.

H6.3 The documentation referred to in H6.1 above need not permanently exist in a material manner in the EDTCF, but it must be possible to assemble them and make them available within a period of time commensurate with its importance (one week is considered reasonable time). As a minimum, each product EDTCF must physically contain an index of the applicable documents of H6.1 above.

H6.4 The EDTCF may be in hard copy or software form.

H7 **Confidentiality**

H7.1 The EDTCF is the property of the manufacturer and is shown at their discretion, except that all or part of this file will be available to the 3-A Symbol Council or a regulatory agency for cause and upon request.

H8 **File Location**

H8.1 The EDTCF shall be maintained at {location}.

H9 **File Retention**

H9.1 The EDTCF (including all documentation referred to in H6.1) shall be retained and kept available for 12 years following the date of placing the product in use or from the last unit produced in the case of series manufacture.

These standards had editorial and technical changes and are effective November 12, 2000.

Dairy, Food and Environmental Sanitation, Vol. 20, No. 12, Pages 987-998

3-A® Sanitary Standards for Equipment for Packaging Viscous Products, Number 23-03

Formulated By
International Association of Food Industry Suppliers (IAFIS)
International Association for Food Protection (IAFP)
United States Public Health Service (USPHS)
The Dairy Industry Committee (DIC)
United Stated Department of Agriculture – Dairy Programs (USDA)
The European Hygienic Equipment Design Group (EHEDG)

It is the purpose of the IAFIS, IAFP, USPHS, DIC, USDA, and EHEDG in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. Viscous products packaging equipment specifications heretofore or hereafter developed which so differ in design, materials, and fabrication or otherwise as not to conform to the following standards but which, in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of the IAFIS, IAFP, USPHS, DIC, USDA, and EHEDG at any time. The 3-A Sanitary Standards and 3-A Accepted Practices provide hygienic criteria applicable to equipment and systems used to produce, process, and package milk, milk products, and other perishable foods or comestible products. Standard English is the official language of 3-A Sanitary Standards and 3-A Accepted Practices.

A SCOPE

A1 These standards cover the sanitary aspects of unitized equipment for holding, opening, forming, dispensing, filling, closing, sealing, or capping containers for viscous products, or wrapping viscous products, and all parts essential to these functions. The equipment shall perform one or more of the following functions:

1. Holding the container preparatory to further processing
2. Opening the container
3. Forming the container
4. Dispensing a preformed container
5. Applying and sealing a supplementary fitment
6. Other processing equipment, as defined herein
7. Filling the container
8. Closing the container
9. Sealing the container
10. Capping the container
11. Wrapping the container
12. Applying a tamper-evident security seal.

The equipment shall start at the point(s) where the product, container, container blank, container material or wrapping material first enters the equipment. The equipment shall end where the packaged product exits the unitized equipment.

A2 These standards do not pertain to the container, to free-standing container forming equipment or to other equipment such as labelers, printers, daters, cappers, applicators of supplementary fitments or devices or wrappers not furnished as part of the unitized equipment, nor shall it apply to fillers of nonviscous products.

A3 In order to conform to these 3-A Sanitary Standards, equipment for packaging viscous products shall comply with the following design, material, and fabrication criteria and the applicable documents referenced herein[1].

[1]Use current revisions or editions of all referenced documents cited herein.

B **DEFINITIONS**

B1 *Product:* Shall mean viscous comestibles such as frozen desserts, cottage cheese, sour cream, yogurt, butter, spreads, cream cheese, processed cheese and other similar viscous products, including added ingredients.

B2 *Viscous:* Shall mean semifluid product which is pumpable or flowable at packaging condition.

B3 *Container:* Shall mean a single service packaging enclosure or material being formed into the package, including its body, cap, cover, fitment or closure, and a wrapper or other structure, capable of holding the product.

B4 *Mechanical Holding, Opening, Forming, and Dispensing Equipment:* Shall mean the equipment for performing all or part of the following integral functions of feeding, holding, forming, seaming, opening and dispensing the containers.

B5 *Mechanical Filling Equipment:* Shall mean the equipment for filling the container with the product.

B6 *Mechanical Capping, Closing, Sealing, and Wrapping Equipment:* Shall mean the equipment for capping, closing, sealing the container and applying the security seal, or wrapping the product.

B7 *Other Processing Equipment:* Shall mean product handling equipment such as pumps, mixers, blenders, hoppers, ingredient feeders, and texturizers, integral to the filler equipment, which process, treat, flavor or add supplements to the product immediately prior to filling.

B8 *Unitized:* Shall mean the connection, assembly, or attachment of functional subunits, in a permanent manner (e.g., welding or with fasteners), to form the complete machine.

B9 **Surfaces**

B9.1 *Product Contact Surfaces:* Shall mean all surfaces which are exposed to the product, surfaces from which liquids may drain, drop, or be drawn into the product or into the container, and surfaces that touch the product contact surfaces of the container.

B9.2 *Nonproduct Contact Surfaces:* Shall mean all other exposed surfaces.

B9.2.1 *Splash Contact Surfaces:* Shall mean all other nonproduct contact surfaces that during normal use are subject to accumulation of soil and which require routine cleaning.

B10 **Cleaning**

B10.1 *Mechanical Cleaning or Mechanically Cleaned:* Shall denote cleaning solely by circulation and/or flowing chemical detergent solutions and water rinses onto and over the surfaces to be cleaned, by mechanical means.

B10.2 *Manual (COP) Cleaning:* Shall mean soil removal when the equipment is partially or totally disassembled. Soil removal is effected with chemical solutions and water rinses with the assistance of one or a combination of brushes, nonmetallic scouring pads and scrapers, high or low pressure hoses and tank(s) which may be fitted with recirculating pump(s), and with all cleaning aids manipulated by hand.

B11 **Surface Modifications**

B11.1 *Surface Treatments:* Shall mean a process whereby chemical compositions or mechanical properties of the existing surface are altered. There is no appreciable, typically less than 1 µm, build-up of new material; or removal of existing material.

B11.1.1 Surface treatments include:

1. Mechanical (shot peening[2], polishing)
2. Thermal (surface hardening laser, electron beam)

[2]MIL-S-13165C (1), November 1991, *Military Specification: Shot Peening of Metal Parts.* Available from Standardization, Document Order Desk (Department of Navy), 700 Robbins Avenue, Building 4, Section D, Philadelphia, PA 19111-5094. Phone: (215) 697-2179.

[3]Federal Specification #QQ-C-320B for Chromium Plating (Electrodeposited), June 1954 with Amendment 4 on April 10, 1987. Federal Specification #QQ-N-290A for Nickel Plating (Electrodeposited), November 12, 1971. Available from the General Services Administration, Federal Supply Services Bureau, Specification Section, 470 East L'Enfant Plaza, Suite 8100, Washington, D.C. 20407. Phone: (202) 755-0325.

3. Diffusion (carburizing, nitriding)
4. Chemical (etching, oxidation)
5. Ion Implantation
6. Electropolishing

B11.2 *Coatings:* Shall mean the results of a process where a different material is deposited to create a new surface. There is appreciable, typically more than 1 µm, build-up of new material. The coating material does not alter the physical properties of the substrate.

B11.2.1 Coating processes include:

1. Chemical (conversion coatings)
2. Engineering Plating (e.g., Electrodeposition[3] gold)
3. Thermal spraying (e.g., flame, plasma, arc spray)
4. Physical Vapor Deposition
5. Chemical Vapor Deposition
6. Overlays and Encapsulation

B12 *Bond*: Shall mean the adhesive or cohesive forces holding materials together. This definition excludes press and shrink fits.

B13 *Arithmetical Mean (R_a):* Shall be the arithmetical mean of the absolute values of the profile departure within a sampling length[4].

B14 *Sanitizing or Sanitization:* Shall mean a process applied to a cleaned surface which is capable of reducing the numbers of the most resistant human pathogens by at least 5 $\log_{10}$ reductions (99.999%) to 7 $\log_{10}$ reductions (99.99999%) by applying accumulated hot water, hot air, or steam, or by applying an EPA-registered sanitizer according to label directions. Sanitizing may be effected by mechanical or manual methods.

B15 *Supplementary Fitment or Device:* Shall mean any component or assembly which is attached to the container. Examples include but are not limited to pour spouts, closures, handles and tamper evident seals.

B16 *Sterilization:* Shall mean a process effected by heat, chemicals, or other mechanical means that destroys all vegetative bacteria and inactivates relevant bacterial spores.

B17 *Easily or Readily Removable:* Shall mean quickly separated from the equipment with the use of simple hand tools if necessary.

B18 *Easily or Readily Accessible:* Shall mean a location which can be safely reached by personnel from the floor, platform, or other permanent work area.

B19 *Inspectable:* Shall mean all product contact surfaces can be made available for close visual observation.

B20 *Simple Hand Tools:* Shall mean implements normally used by operating and cleaning personnel such as a screwdriver, wrench, or mallet.

B21 *Nontoxic Materials:* Shall mean those substances which under the conditions of their use are in compliance with applicable requirements of the Food, Drug, and Cosmetic Act of 1938, as amended.

B22 *Corrosion Resistant:* Shall mean the surface has the property to maintain its original surface characteristics for its predicted service period when exposed to the conditions encountered in the environment of intended use, including expected contact with product and cleaning, sanitizing, or sterilization compounds or solutions.

C MATERIALS

C1 Metals

C1.1 All product contact surfaces shall be of stainless steel of the American Iron and Steel Institute (AISI) 300 Series[5], (except 301 and 302), or corresponding Alloy Cast Institute (ACI) types[6] or metal which under conditions of intended use is at least as corrosion resistant as stainless steel of the foregoing types, and is nontoxic and nonabsorbent. (See Appendix, Section E.)

[4]Additional information on arithmetical mean (R_a) is contained in ANSI B.46.1-1978. Available from The American National Standards Institute, 1430 Broadway, New York, NY 10018. Phone: (212-354-3300).

[5]The data for this series are contained in the *AISI Steel Products Manual, Stainless & Heat Resisting Steels*, Table 2-1. Available from the American Iron and Steel Society, 410 Commonwealth Drive, Warrendale, PA 15086. Phone: (412) 776-1535.

[6]Steel Founders Society of America, Cast Metal Federation Building, 455 State Street, Des Plaines, IL 60016. Phone: (708) 299-9160.

C1.2 Surfaces for holding, forming, opening, dispensing, closing, capping, sealing, or wrapping equipment which touch the product contact surfaces of the container or from which liquids may drain, drop or be drawn into the container made of the materials provided for in C1.1 may have their product contact surfaces modified by surface treatments.

C1.3 Surfaces for holding, forming, opening, dispensing, closing, capping, sealing, or wrapping equipment which touch the product contact surfaces of the container or from which liquids may drain, drop or be drawn into the container may be covered by a coating of electroless nickel alloy conforming to applicable provisions of military specification MIL-C-26074 E, as amended[7].

C2 **Nonmetals**

C2.1 Rubber or rubber-like materials may be used for filling nozzles, plungers, compression-type valve plugs, gaskets, diaphragms, O-rings, rollers, belts, sealing rings, slingers, drip shields, protective caps for sanitary connections, container opening, dispensing, forming, capping, wrapping and closing parts, filler valve parts, seals, short flexible tubing, agitators, agitator seals, scrapers, rotors, augers, impellers, mixing paddles, stators and housings and parts having the same functional purposes, may be made of, or covered with, rubber or rubber-like materials.

C2.1.1 Rubber and rubber-like materials when used for the above-specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-.

C2.2 Plastic materials may be used for filling nozzles, plungers, compression-type-valve plugs, gaskets, O-rings, diaphragms, rollers, belts, sealing rings, slingers, drip shields, agitator seals, agitator bearings, scrapers, protective caps for sanitary connections, container opening, dispensing, forming, capping, wrapping and closing parts, filler valve parts, self- adhesive release surfaces, seals, short flexible tubing, short connectors, viewing ports, rotors, agitators, augers, impellers, mixing paddles, stators and housings and parts having the same functional purposes, may be made of, or covered with, plastic materials.

C2.2.1 Plastic materials when used for the above-specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-.

C2.3 Rubber and rubber-like materials and plastic materials having product contact surfaces shall be of such composition as to retain their surface and conformation characteristics when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment, or sterilization.

C2.4 The adhesive, if used, on bonded rubber and rubber-like materials and bonded plastic materials shall be nontoxic[8].

C2.5 Rubber and rubber-like materials and plastic materials having product contact surfaces that are a bonded coating or a covering shall be of such composition as to retain their surface and conformation characteristics when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment or sterilization.

C2.6 When materials having certain inherent functional properties are required for specific applications, such as rotary seals and container forming parts, carbon and/or ceramic materials may be used. Carbon and ceramic materials shall be inert, nonporous, nontoxic, nonabsorbent, insoluble, resistant to scratching, scoring and distortion when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment or sterilization.

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[7]MIL-C-26074E, August 22, 1993. *Military Specification: Coatings, Electroless Nickel Requirements For.* Available from Standardization, Document Order Desk (Department of Navy), 700 Robbins Avenue, Building 4, Section D, Philadelphia, PA 19111-5094. Phone: (215) 697-2167.

[8]Adhesives shall comply with 21 CFR 175 - Indirect Food Additives: Adhesives and Components of Coatings. Document for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Phone: (202) 512-1800.

C3 **Sterilizability**

C3.1 In a processing system to be sterilized by heat and operated at a temperature of 250°F (121°C) or higher, all materials having product contact surface(s) used in the construction of the packaging equipment and nonmetallic component parts shall be such that they can be (1) sterilized by saturated steam or water under pressure (at least 15.3 psig or 106 kPa) at a temperature of at least 250°F (121°C) and (2) operated at the temperature required for processing.

C4 **Nonproduct Contact Surfaces**

C4.1 Nonproduct contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion resistant. If coated, the coating used shall adhere. Nonproduct contact surfaces shall be relatively nonabsorbent, durable, and cleanable. Parts removable for cleaning having both product contact and nonproduct contact surfaces shall not be painted.

D **FABRICATION**

D1 **Surface Texture**

D1.1 All product contact surfaces shall have a finish at least as smooth as a No. 4 ground finish on stainless steel sheets and be free of imperfections such as pits, folds, and crevices in the final fabricated form (see Appendix, Section F), except that:

D1.1.1 Surfaces used to apply sterilizing chemicals to the product contact surfaces of the package shall have a surface finish at least as smooth as an R_a finish of 125 µin. (3.18 µm).

D2 **Permanent Joints**

D2.1 Permanent joints in metallic product contact surfaces shall be continuously welded[9].

D2.2 Hoses with permanently attached sanitary fittings when used for short flexible connections shall comply with 3-A Sanitary Standards for Hose Assemblies for Milk and Milk Products, Number 62-.

D3 **Bonded Materials**

D3.1 Bonded rubber and rubber-like materials and bonded plastic materials having product contact surfaces shall be bonded in a manner that the bond is continuous and mechanically sound, so that when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment, the rubber and rubber-like material or the plastic material does not separate from the base material to which it is bonded.

D4 **Coatings**

D4.1 Coatings, if used, shall be free from surface delamination, pitting, flaking, spalling, blistering, and distortion when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment or sterilization.

D4.2 The minimum thickness of electrodeposited coatings shall not be less than 0.0002 in. (0.005 mm) for all product contact surfaces.

D4.3 The minimum thickness of a coating of electroless nickel alloy, as specified in C1.3 shall not be less than 0.002 in. (0.05mm).

D4.4 Plastic or rubber and rubber-like materials, when used as a coating, shall be at least 0.001 in. (0.025 mm) thick.

D5 **Cleaning and Inspectability**

D5.1 Packaging equipment that is to be mechanically cleaned shall be designed so that the product contact surfaces of the packaging equipment and all nonremoved appurtenances thereto can be mechanically cleaned and are easily accessible, readily removable, and inspectable.

D5.2 Product contact surfaces not designed to be mechanically cleaned shall be easily accessible for cleaning and inspection either when in an installed position or when removed. Demountable parts shall be readily removable.

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[9]Criteria for hygienic welds may be found in AWS/ANSI D18.1 – *Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications*. Available from the American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126. Phone: (305) 443-9353; fax: (305) 443-7559; E-mail: info@amweld.org; and EHEDG Doc. 9 – Welding Stainless Steel to Meet Hygienic Requirements. Available from the European Hygienic Equipment Design Group, Ellen Moens, Avenue Grand Champ 148, 1150 Brussels, Belgium. Phone: +32 2 761 7408; fax: +32 2 763 0013; E-mail: moens@nsf.org.

D6 **Draining**

D6.1 All product contact surfaces shall be self-draining except for normal adherence. The bottom of the filler bowl or hopper shall have a minimum slope of 1/8 in. per ft (10 mm per m) toward the plane of the outlet(s).

D6.2 All filler bowls and product hoppers shall be effectively enclosed or covered and covers shall be self-draining.

D7 **Openings and Covers**

D7.1 Filler bowls or product hoppers not designed for mechanical cleaning or sterilization with pressurized steam shall be equipped with covers which (1) shall be sufficiently rigid to prevent buckling, (2) if provided with handles, the handles shall be adequate, durable, conveniently located and of sanitary design, welded in place or formed into the cover materials, and, (3) unless gasketed and clamped, shall have downward flanges not less than 3/8 in. (9.52 mm) along all edges. The edges of all cover openings shall extend upward at least 3/8 in. (9.52 mm) or be fitted with a permanently attached sanitary pipeline connection conforming to D14.

D7.2 Nonremovable covers for filler bowls or product hoppers or other assemblies (1) shall be of a type that can be opened and maintained in an open position, (2) shall be designed to be self-draining when in the closed position, (3) shall be designed so that when the covers are in any open position, liquid from the exterior surface shall not drain into the product, or on to a product contact surface, and (4) shall be designed so that when in the fully open position condensation from the underside of the cover will not drain into the product or onto a product contact surface. Covers of openings that will be held in place by gravity or vacuum may be of the lift-off type and may be provided with a clamp(s) or other device(s) to maintain them in position.

D8 **Agitators**

D8.1 Agitator shaft openings through the bridge or top enclosure shall have a minimum diameter of 1 in. (25.4 mm) on packaging equipment which requires removal of the agitator shaft for cleaning, or be of a diameter that will provide a 1 in. (25.4 mm) minimum annular cleaning space between the agitator shaft and the inside surface of the flange for the opening on packaging equipment which does not require removal of the agitator for the cleaning. A shield that can be raised or dismantled to permit the cleaning of all its surfaces shall be provided with means to protect against the entrance of dust, oil, insects and other contaminants into the packaging equipment through the annular space around the agitator shaft.

D8.2 Agitators, mixing paddles and similar devices, if not designed for mechanical cleaning, shall be readily accessible for manual cleaning and inspection either in an assembled position or when removed. A seal for a shaft, if provided, shall be of a packless type, sanitary in design, and durable, with all parts readily accessible for cleaning.

D9 **Accessibility**

D9.1 The packaging equipment shall be so designed that adjustments necessary during the operation may be made without raising or removing the product hopper or filler bowl cover(s).

D9.2 Packaging equipment for aseptic or extended shelf-life operation shall be designed so that adjustments necessary during the operation may be made without jeopardizing the sterility of the unit.

D10 **Shafts and Bearings**

D10.1 Shafts of packaging equipment shall have a seal that is of a packless type and is sanitary in design, and shall be readily accessible and inspectable.

D10.2 Where a shaft passes through a product contact surface, the portion of the opening surrounding the shaft shall be protected to prevent the entrance of contaminants.

D10.3 Bearings having a product contact surface shall be of a nonlubricated type.

D10.4 Lubricated bearings, including the permanently sealed type, shall be located outside the product contact surface with at least 1 in. (25.4 mm) clearance open for inspection between the bearing and any product contact surface.

D11 **Gaskets**

D11.1 Gaskets having a product contact surface shall be removable or bonded.

D11.2 Grooves in gaskets shall be no deeper than their width, unless the gasket is readily removable and reversible for cleaning.

D11.3 Gasket grooves or gasket retaining grooves in product contact surfaces for removable gaskets shall not exceed 1/4 in. (6.35 mm) in depth or be less than 1/4 in. (6.35 mm) wide except those for standard O-rings smaller than 1/4 in. (6.35 mm) cross-section and those provided for in the sanitary fittings specified by Section D15.

D12 Radii

D12.1 All internal angles of less than 135° on product contact surfaces shall have radii of not less than 1/4 in. (6.35 mm) except that:

D12.1.1 Smaller radii may be used when they are required for essential functional reasons, such as those in filler nozzles, paper scoring devices, mandrels and forming molds. In no case shall such radii be less than 1/32 in. (0.794 mm).

D12.1.2 The radii in gasket retaining grooves and grooves in gaskets shall be not less than 1/8 in. (3.18 mm), except for those for standard 1/4 in. (6.35 mm) and smaller O-rings, and those provided for in the sanitary fittings specified in D15.

D12.1.3 Radii in standard O-ring grooves shall be as specified in Appendix, Section H.

D12.1.4 Radii in nonstandard O-ring grooves shall be those radii closest to a standard O-ring as specified in Appendix, Section H.

D12.2 The minimum radii for fillets of welds in product contact surfaces shall be not less than 1/4 in. (6.35 mm) except that the minimum radii for such welds may be 1/8 in. (3.18 mm) when the thickness of one or both parts joined is less than 3/16 in. (4.76 mm).

D13 Guards and Other Safety Devices

D13.1 Covers, diverting aprons, shields, or guards shall be provided as necessary and shall be so designed and located to prevent liquid or other contaminants from draining or dropping into the container or product, or onto product contact surfaces, except that:

D13.1.1 Shields and guards may not be required in equipment designed for aseptic or extended shelf-life operation if the assembly is of sanitary design and the system provides a controlled environment such as an enclosure pressurized with sterile air or inert gas, or an environment controlled by flowing air rendered sterile by incineration, filtration, irradiation, or other means provided that fill lines and filler bowls shall be located or otherwise protected so that condensate drippage into open containers is precluded.

D13.2 Guards required by a safety standard shall be readily removable for cleaning and inspection.

D13.3 Each fill valve or valve block shall have a deflector shield installed at the lowest practical location in such a manner that it will collect the maximum amount of condensate draining from the exterior of the valve or valve block and discharge it to waste away from the open container, except that:

D13.4 Deflector shields may not be required in a system sanitarily designed to prevent the formation of condensate in critical areas. The formation of condensate in critical areas can be prevented by (1) maintaining a valve block temperature higher than the dew point of its operating environment, by either warming the valve block or chilling the ambient air, (2) dehumidifying the ambient air, or (3) maintaining a flow of unsaturated air, across the valve block, of sufficient volume and velocity to prevent the formation of condensate.

D14 Threads

D14.1 There shall be no threads on product contact surfaces except as provided for in Section D15 and D20.2.

D15 Fittings and Valves

D15.1 Sanitary fittings and valves shall conform to the applicable provisions of the 3-A Sanitary Standards for Sanitary Fittings for Milk and Milk Products, Number 63-; 3-A Sanitary Standards for Plug-Type Valves for Milk and Milk Products, Number 51-; 3-A Sanitary Standards for Compression-Type Valves for Milk and Milk Products, Number 53-; 3-A Sanitary Standards for Diaphragm-Type Valves for Milk and Milk Products, Number 54-; 3-A Sanitary Standards for Ball-Type Valves for Milk and Milk Products, Number 68-; 3-A Sanitary Standards for Caged-Ball Valves for Milk and Milk Products, Number 66-; 3-A Sanitary Standards for Rupture Discs for Milk and Milk Products, Number 60-; 3-A Sanitary Standards for Thermoplastic Plug-Type Valves for Milk and Milk Products, Number 52-; 3-A Sanitary Standards for Hose Assemblies for Milk and Milk Products, Number 62-; except that materials conforming to C2.1.1 or C2.2.1 may be used for caps of sanitary design for the protection of terminal ends of sanitary tubes.

D16 **Sight and Light Openings**

D16.1 All sight and light openings, if provided, shall conform to 3-A Sanitary Standard for Sight and Light Windows and Sight Indicators in contact with Milk and Milk Products, Number 65-.

D17 **Sensors and Sensor Connections**

D17.1 All sensors or sensor connections having product contact surfaces shall conform to the 3-A Sanitary Standard for Sensors and Sensor Fittings and Connections Used on Fluid Milk and Milk Products Equipment, Number 74-.

D18 **Refractometers**

D18.1 All optical sensor devices used shall conform to the 3-A Sanitary Standard Refractometers and Energy-Absorbing Optical Sensors for Milk and Milk Products, Number 46-.

D19 **Sanitary Tubing**

D19.1 All metal tubing shall comply with the applicable provisions for welded sanitary product pipelines found in the 3-A Accepted Practices for Permanently Installed Sanitary Product Pipelines and Cleaning Systems with Amendment, Number 605-, and with 3-A Sanitary Standards for Polished Metal Tubing for Dairy Products, Number 33-.

D20 **Ancillary Equipment**

D20.1 Flow meters, if used, shall conform to the applicable provisions of 3-A Sanitary Standards for Flow Meters for Milk and Milk Products, Number 28-.

D20.2 Pumps, if used, shall conform to the applicable provisions of 3-A Sanitary Standards for Centrifugal and Positive Rotary Pumps for Milk and Milk Products, Number 02- or 3-A Sanitary Standards for Homogenizers and Pumps of the Plunger Type, Number 04-.

D20.3 When provided by the manufacturer, equipment for producing air under pressure and/or air piping which is supplied as an integral part of the filling equipment shall comply with the applicable provisions of the 3-A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-.

D20.4 If coding and/or dating is to be performed, coding and/or dating devices shall be designed, installed and operated such that these operations are performed in such a manner that open or unsealed containers are not subject to contamination. If shielding is provided, it shall be properly designed and installed to preclude contamination of open containers.

D20.5 Variegators, ingredient feeders and similar equipment, when provided by the manufacturer shall meet all applicable sections of this standard.

D21 **Sterilization Systems**

D21.1 Packaging equipment used in a processing system to be sterilized by heat and operated at a temperature of 250°F (121°C) or higher shall comply with the following additional criteria:

D21.1.1 The construction shall be such that all product contact surfaces can be (1) sterilized by saturated steam or water under pressure (at least 15.3 psig or 106 kPa) at a temperature of at least 250°F (121°C) and (2) operated at the temperature required for processing.

D21.1.2 Packaging equipment that has product contact surface(s) to be used in such a processing system, not designed so that the system is automatically shut down if the product pressure in the system becomes less than that of the atmosphere and cannot be restarted until the system is re-sterilized, shall have a steam or other sterilizing medium chamber surrounding the valve stems in the sterile areas, if required to maintain sterility. The packaging equipment shall be constructed so that the steam chamber or other sterilizing medium chamber may be exposed for inspection.

D21.1.3 Where steam or other sterilizing medium is used, the connection(s) on the packaging equipment shall be such that the steam lines or other sterilizing medium lines can be securely fastened to the packaging equipment. The packaging equipment shall be constructed so that the steam or other sterilizing medium chamber may be exposed for inspection.

D21.1.4 The seal(s) in packaging equipment designed to be used in a processing system to be sterilized by heat and operated at a temperature of 250°F (121°C) or higher shall be between the product contact surface and the steam or other sterilizing chamber.

D21.1.5 Steam used as the sterilizing medium of product contact surfaces, when produced or transported within the unitized equipment, shall meet the criteria for culinary steam as specified in 3-A Accepted Practices for a

Method of Producing Steam of Culinary Quality, Number 609-.

D22 **Springs**

D22.1 Coil springs having product contact surfaces shall have at least 3/32 in. (2.38 mm) openings between coils including the ends when the spring is in a free position. Coil springs shall be readily accessible for cleaning and inspection.

D23 **Supports**

D23.1 The means of supporting packaging equipment shall be one of the following:

D23.1.1 If legs are used they shall be smooth with rounded ends or with a flat, load-bearing foot suitable for sealing to the floor, and have no exposed threads. Legs made of hollow stock shall be sealed. Legs shall provide a minimum clearance between the lowest part of the base and the floor of not less than 6 in. (152.4 mm).

D23.1.2 If casters are used they shall be of sufficient size to provide a clearance between the lowest part of the base and the floor of not less than 6 in. (152.4 mm). Casters, if provided, shall be easily cleanable, durable and of a size that will permit easy movement of the packaging equipment.

D24 **Nonproduct Contact Surfaces**

D24.1 Nonproduct contact surfaces shall be smooth, free of pockets and crevices and be readily cleanable and those to be coated shall be effectively prepared for coating.

D24.2 Nonproduct contact surfaces shall have a smooth finish, free of pockets and crevices, and be cleanable and those surfaces to be coated shall be effectively prepared for coating. Exposed threads shall be minimized. Exposed braided coverings of cable or hose shall not be used. No continuous or piano-type hinges shall be used on the equipment or its control cabinets. Electrical and utility connections shall be as remote as practical from the product areas. Riveted nameplates or appendages shall not be used. Socket head cap screws shall not be used. Knurled surfaces shall not be used. Nameplates shall be welded or effectively sealed to the equipment. Supporting structures, braces, catwalks, stairs, handrails and guards are not considered as nonproduct contact surfaces of the equipment and are considered as part of the building structure. Panels or doors shall be provided to allow easy access to the interior of the equipment. They shall be constructed in a manner that will prevent air entrance. Use of hinges, wing nuts, latches, and similar easy-opening fastening devices are recommended to allow easy access without special tools.

D24.3 There shall be no exposed threads on splash contact surfaces, except that:

D24.3.1 Exposed threads are permitted on removable clamps or other components which can be easily removed for cleaning.

D24.3.2 Exposed threads are permitted when required for essential functional reasons. Such exposed threads shall be easily accessible for cleaning.

APPENDIX

E **STAINLESS STEEL MATERIALS**

Stainless steel conforming to the applicable composition ranges established by AISI for wrought products (Table 1), or by ACI for cast products (Table 2), should be considered in compliance with the requirements of Section C1 herein. Where welding is involved, the carbon content of the stainless steel should not exceed 0.08%. The first reference cited in C1 sets forth the chemical ranges and limits of acceptable stainless steel of the 300 Series.

TABLE 1

WROUGHT PRODUCTS TYPICALLY USED			
UNS #	ASTM[10]	AISI/SAE[2]	Properties
S30300	A-582	303	Free-Machining S.S.; Austenitic
S30400	A-276 A-666	304	Austenitic S.S.
S30403	A-276 A-666	304L	Low Carbon Austenitic S.S.
S31600	A-276 A-666	316	Austenitic S.S. plus Mo*
S31603	A-276 A-666	316L	Low Carbon Austenitic S.S. plus Mo*

*Molybdenum

[10]Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Phone: (610) 832-9500.

TABLE 2

CAST PRODUCTS			
UNS #	ASTM[10]	ACI[3]	Common Names
J92500	A-351 A-743 A-744	CF-3	Cast 304L
J92800	A-351 A-743 A-744	CF-3M	Cast 316L
J92600	A-351 A-743 A-744	CF-8	Cast 304
J92900	A-351 A-743 A-744	CF-8M	Cast 316
J92180	A-747	CB7 Cu – 1	Cast 17-4 PH
J92110	A-747	CB7 Cu –2	Cast 15-5 PH
N26055	A-494	CY5Sn BiM	Alloy 88
J92701	A-743	CF-16F	Free Machining Austenitic S.S.

F **PRODUCT CONTACT SURFACE FINISH**

Surface finish equivalent to 150 grit or better as obtained with silicon carbide properly applied to stainless steel sheets is considered in compliance with the requirements of Section D1 herein. A maximum R_a of 32 µin. (0.8 µm), when measured according to the recommendations in American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME)[11] B46.1 - *Surface Texture*, is considered to be equivalent to a No. 4 finish.

G **CULINARY STEAM**

Steam used as the sterilizing medium for product contact surfaces should meet the criteria for culinary steam as specified in the 3-A Accepted Practices for a Method of Producing Steam of Culinary Quality, Number 609-.

[11]Available from the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017-2392. Phone: (212) 705-7722.

H **O-RING GROOVE RADII**

TABLE 3

Groove Radii Dimensions for Standard O-Rings			
O-Ring Cross Section, Nominal (AS 568[12])	O-Ring Cross Section, Actual (AS 568)	O-Ring Cross Section, Actual (ISO 3601-1[13])	Minimum Groove Radius
1/16 in.	0.070 in.	1.80 mm	0.016 in. (0.406 mm)
3/32 in.	0.103 in.	2.65 mm	0.031 in. (0.787 mm)
1/8 in.	0.139 in.	3.55 mm	0.031 in. (0.787 mm)
3/16 in.	0.210 in.	5.30 mm	0.062 in. (1.575 mm)
1/4 in.	0.275 in.	7.00 mm	0.094 in. (2.388 mm)

I **ENGINEERING DESIGN AND TECHNICAL CONSTRUCTION FILE**

The following is an example of an engineering design and technical construction file (EDTCF) to be maintained by the fabricator as evidence of complying with 3-A Sanitary Standards or 3-A Accepted Practices. (The file may contain more or less information as applicable to the equipment or system.)

I1 **Purpose**

I1.1 To establish and document the material, fabrication, and installation (where appropriate) requirements for the engineering design and technical construction files for all products, assemblies, and sub-assemblies supplied by the manufacturer thereof to be in compliance with the sanitary criteria found in 3-A Sanitary Standards or 3-A Accepted Practices. It is recommended that the engineering and construction file or files be submitted with applications for 3-A Symbol use authorization.

[12]The document establishing these standard dimensions is Aerospace Standard (AS) 568, published by SAE, 400 Commonwealth Drive, Warrendale, PA 15086. Phone: (412) 776-4970).

[13]The document establishing these standard dimensions is ISO 3601-1: 1988 (E), published by the International Organization for Standardization (ISO), 1 Rue de Varembe, Case Postale 58, CH 1 1211, Geneva, Switzerland. Phone: (41-22-734-1240).

I2 **Scope**

I2.1 This EDTCF applies to equipment specified by:

I2.1.1 3-A Sanitary Standards for Equipment for Packaging Viscous Dairy Products, Number 23-.

I3 **Responsibilities**

I3.1 This EDTCF is maintained by: The Engineering Manager (or other company official) **{name and title of responsible official}** is responsible for maintaining, publishing, and distributing this EDTCF.

I3.2 Implementation: All divisions, specifically development engineering, standards engineering, sales engineering, and product departments are responsible for implementing this EDTCF.

I4 **Applicability**

I4.1 The 3-A Sanitary Standards and 3-A Accepted Practices are voluntarily applied as suitable sanitary criteria for dairy and food processing equipment. 3-A Sanitary Standards are referenced in the Grade A Pasteurized Milk Ordinance: "Equipment manufactured in conformity with 3-A Sanitary Standards complies with the sanitary design and construction standards of this Ordinance."

I5 **References**

I5.1 List any additional regulations that apply to the equipment or system covered by this EDTCF.

I5.2 Date of conformity or 3-A Symbol Authorization and certificate number, if authorized.

I6 **Design and Technical Construction File**

I6.1 The Engineering Design and Technical Construction File may consist of the following:

a. an overall drawing of the subject equipment;
b. full detailed drawings, accompanied by any calculations, notes, test results, etc. required to check the conformity of the equipment with the 3-A Standards or 3-A Practices;
c. a list of:
   (1) the essential requirements of the standards or practices;
   (2) other technical specifications, which were used when the equipment was designed;
d. a description of methods adopted;
e. if essential, any technical report or certificate obtained from a competent testing body or laboratory;
f. any technical report giving the results of tests carried out internally by Engineering or others;
g. documentation and test reports on any research or tests on components, assemblies and/or the complete product to determine and demonstrate that by its design and construction the product is capable of being installed, put into service, and operated in a sanitary manner (optional);
h. a determination of the foreseeable lifetime of the product (optional);
i. a copy of the instructions for the product (Instruction Manuals/Instruction Books);
j. for serial manufacturing, the internal measures that will be implemented to insure that the equipment will continue to be manufactured in conformity with the provisions of the 3-A Sanitary Standards or 3-A Accepted Practices;
k. engineering reports;
l. laboratory reports;
m. bills of material;
n. wiring diagrams, if applicable;
o. sales order engineering files;
p. hazard evaluation committee reports, if executed;
q change records;
r. customer specifications;
s. any notified body technical reports and certification tests;
t. copy of the 3-A Symbol authorization, if applicable.

I6.2 The file does not have to include detailed plans or any other specific information regarding the sub-assemblies, tooling, or fixtures used for the manufacture of the product unless a knowledge of them is essential for verification of conformity with the basic sanitary requirements found in 3-A documents.

I6.3 The documentation referred to in I6.1 above need not permanently exist in a material manner in the EDTCF, but it must be possible to assemble them and make them available within a period of time commensurate with its importance (one week is considered reasonable time). As a minimum, each product EDTCF must physically contain an index of the applicable documents of I6.1 above.

16.4 The EDTCF may be in hard copy or software form.

17 **Confidentiality**

17.1 The EDTCF is the property of the manufacturer and is shown at their discretion, except that all or part of this file will be available to the 3-A Symbol Council or a regulatory agency for cause and upon request.

18 **File Location**

18.1 The EDTCF shall be maintained at **{location}**.

19 **File Retention**

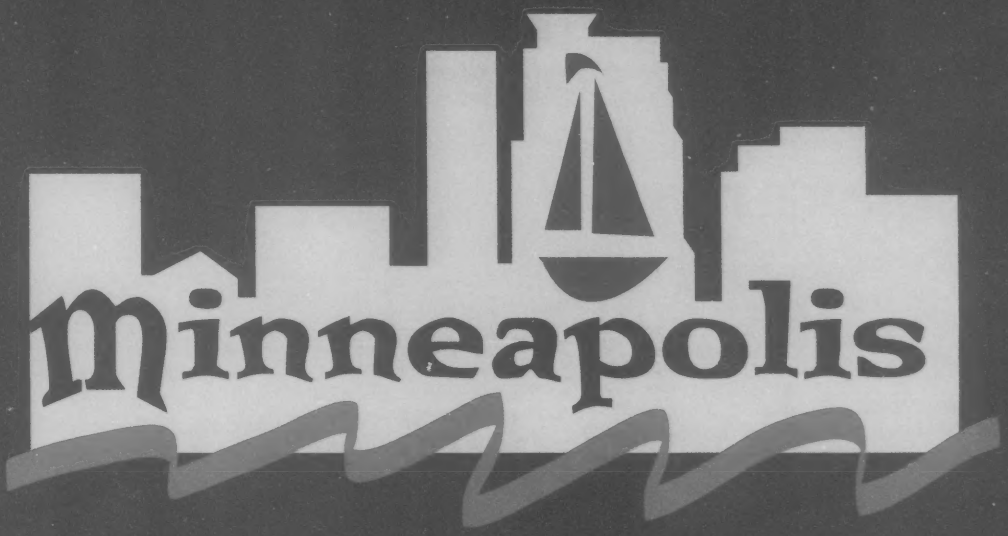
19.1 The EDTCF (including all documentation referred to in 16.1) shall be retained and kept available for 12 years following the date of placing the product in use or from the last unit produced in the case of series manufacture.

These standards had editorial changes and are effective November 12, 2000.

The index and/or table of contents has been removed and photographed separately within this volume year.

For roll film users, this information for the current volume year is at the beginning of the microfilm. For a prior year volume, this information is at the end of the microfilm.

For microfiche users, the index and/or contents is contained on a separate fiche.



IAFP 2001

88th Annual Meeting

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International Association for Food Protection

Hilton Minneapolis

ComingEvents

JANUARY

·20-21, **New HACCP Workshop for International Poultry Processors,** Atlanta, GA. Sponsored by The US Poultry and Egg Association. Leading the workshop will be Dr. S. F. Sarge Bilgili and Dr. Donald E. Conner. For more information, contact US Poultry & Egg Association, phone: 770.493.9401; fax: 770.493.9257; E-mail: training@poultryegg.org.

·26, **Capital Area Food Protection Association Meeting** being held at the National Food Processor's Association office, Washington, D.C. For further information, contact Brett Podoski at 202.205.4231.

·29-31, **Second NSF International Conference on Indoor Air Health,** Radisson Deauville, Miami Beach, FL. For additional information, contact Cherrie Bacon at phone: 734.827.6865; fax: 734. 827. 6840/6831; E-mail: bacon@nsf.org.

FEBRUARY

·6-8, **Food Safety Microbiology,** Rutgers University, New Brunswick, NJ. This course offers information on the microbiology of food, organisms that commonly cause foodborne illness, and how to minimize the risks of having these pathogens in your product. For additional information, contact Rutgers University, phone: 732.932. 9271; fax: 732.932.1187; E-mail: ocpe@aesop.rutgers.edu.

·11-14, **National Mastitis Council 40th Annual Meeting,** Reno, Nevada. For additional information, contact NMC, phone: 608. 224.0622; fax: 608.224.0644; E-mail: nmc@nmconline.org.

·13, **Georgia Association of Food and Environmental Sanitarians Meeting,** held at Salvation Army Temple, Atlanta, GA. For more information, contact Sid Camp at 770.938.3823.

·13-14, **Introduction to Microbiological Criteria and Sampling Plans,** Las Vegas, NV. This course is designed to help food industry professionals develop cost-effective and statistically valid microbiological sampling plans. For additional information, contact Silliker Laboratories Group, Inc., at 800.829.7879 or fax 708.957.8405.

·13-16, **26th Annual Better Process Control School,** on the UC-Davis campus, Davis, CA. The school is designed for low-acid food cannery employees, retort operators and seam closure operators. Personnel from agencies regulating the food processing industry, as well as canning industry management personnel who need certification or a technical update are encouraged to attend. For more information, call 800.752.0881.

·20-22, **Kentucky Association of Dairy, Food and Environmental Specialists,** Executive West, Louisville, KY. For additional information, contact Tim Wright at 606.873.4541, or Kenny Ratliff at 502.255.7701.

·21-22, **California Association of Dairy and Milk Sanitarians Industry Conference,** Sheraton FairPlex, Pomona, CA. For further information, contact John Bruhn at 530.752.2192.

·26-27, **Principles of Warehouse Sanitation,** Manhattan, KS. Helping sanitarians and managers meet customer expections and comply with federal laws and regulations. For additional information, contact AIB, phone: 785.537.4750; fax: 785.537.1493.

·26-28, **Food Irradiation 2001 Conference,** Washington, D.C. This conference on food safety will be directed at food safety managers and executives, import/export firms, growers, ranchers, and food processors wishing to integrate this technology into an overall food safety program for meats, poultry, produce, spices, eggs and/or processed foods. For further information, contact Janine Scheld, Intertech, phone: 207.781.9617; fax: 207.781.2150; E-mail: jscheld@ intertechusa.com.

MARCH

·14-16, **Idaho Environmental Health Association Annual Spring Conference,** Owyhee Plaza Hotel, Boise, ID. For further information, contact Angela Markham at 208.233.9080 ext. 231.

·14-16, **Michigan Environmental Health Association's 57th Annual Educational Conference,** Holiday Inn West, Lansing, MI. For further information, contact Keith Krinn at 248.424.7099.

·16, **Controlling *Listeria* in Your Plant,** Oak Brook, IL. Designed to assist quality assurance, sanitation, and operations personnel in understanding how *Listeria* grows in food plants. For additional information, contact Silliker Laboratories Group, Inc., at 800.829. 7879 or fax 708.957.8405.

·17-19, **United Fresh Fruit and Vegetable Association International Convention,** Tampa, FL. For additional information, phone 703.836.3410.

·21, **3-A Third Party Accreditation Meeting,** Disney's Yacht & Beach Club Resort, Orlando, FL. Contact Philomena Short at 703. 761.2600.

·22, **Ontario Food Protection Association Spring Meeting,** Delta Meadowvale, Mississauga, Ontario, Canada. For further information, contact Glenna Haller at 519.823.8015.

·22-25, **International Association of Food Industry Suppliers Annual Conference,** Disney's

Yacht & Beach Club Resort, Orlando, FL. Contact Dorothy Brady at 703.761.2600.

APRIL

·4-6, **Missouri Milk, Food and Environmental Health Association Annual Educational Conference,** Ramada Inn, Columbia, MO. For additional information, contact Steve St. Clair at 573.221.1166.

·5-7, **International Fresh-cut Produce Association 14th Annual Conference,** Phoenix, AZ. For more information, call Stephanie Grunenfelder at 703.299.6282.

·16, **3-A Sanitary Standards Committee Annual Meeting,** Sheraton Four Points Hotel, Milwaukee Airport. For more information, contact Tom Gilmore at 703.761.2600; E-mail: tgilmore@iafis.org or Philomena Short at 703.761.2600; E-mail: pshort@iafis.org.

·24-30, **16th International Trade Fair for Packaging Machinery, Packaging and Confectionery Machinery,** Düsseldorf, Germany. For more information, contact Messe Düsseldorf North America, phone: 312.781.5180; Fax: 312.781.5188.

·26, **Guelph Food Technology Centre Trade Show — Innovation & Change in the Food Industry.** For further information, contact Cliona Reeves at phone: 519.821.1246; fax: 519.836.1281; E-mail: gftc@uoguelph.ca.

MAY

·14-16, **Practical HACCP for Food Processors,** Oak Brook, IL. Designed for food processors of all types. For additional information, contact Silliker Laboratories Group, Inc., at 800.829.7879 or fax 708.957.8405.

·15-16, **Pennsylvania Association of Milk, Food and Environmental Sanitarians Annual Conference,** Nittany Lion Inn, University Park, PA. For further information contact, Gene Frey at 717.397.0719.

JUNE

·4-6, **Texas Association of Milk, Food and Environmental Sanitarians Annual Meeting,** Holiday Inn South, Austin, TX. For further information, contact Ron Richter at 979.845.4409.

·10-14, **Values in Decisions on Risk Symposium,** held in Stockholm. The symposium will address the role of experts, media and regulators in complex decisions. For further information, contact Kjell Andersson, phone: 46.8.510.14755; fax: 46.8.510.14756; E-mail: kjell.andersson@karintakonsult.se.

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Career Services Section

Technical Director of Education

Chicago, IL

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EOE M/F

Sanitation Manager

Requirements:

Two or more year degree in environmental science or related field a plus. 4 or more years of experience in food or beverage manufacturing. Computer literate in Word and Spreadsheet applications. Supervisory experiences. Spanish a plus.

Job Description:

The Sanitation Manager reports to the Plant Superintendent. S/he is the Sanitation team's manager, directing and planning their day to day activities of sanitation on 3 shifts. Plant operates with 2-bakery production shift. The sanitation manager works closely with the QA manager to ensure all food safety requirements are met. S/he has frequent contact with the health and AIB inspectors. Deals with PCO provider and chemical provider and oversees chemical purchases and Right to Know materials for Plant. The Sanitation Manager is responsible for keeping plant, ground and equipment at the high level of sanitation and cleanliness that complies with a regulatory and company standards.

Ann. Salary Range: $36,000 to $42,000 depending on experience.

Contact:

Mary Pint
VICOM
300 Lake Hazeltine Drive
Chaska, MN 55318
Phone: (952) 448-2150 EXT 256
Fax: (952) 448-6320
E-mail: mary.pint@vicorpinc.com

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- ❒ F2250 On the Line
- ❒ F2270 Pest Control in Seafood Processing Plants
- ❒ F2280 Principles of Warehouse Sanitation
- ❒ F2290 Product Safety & Shelf Life
- ❒ F2220 Proper Handling of Peracidic Acid
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- ❒ F2310 Safe Food: You Can Make a Difference
- ❒ F2320 Safe Handwashing
- ❒ F2325 Safe Practices for Sausage Production
- ❒ F2460 Safer Processing of Sprouts
- ❒ F2330 Sanitation for Seafood Processing Personnel
- ❒ F2340 Sanitizing for Safety
- ❒ F2350 SERVSAFE® Serving Safe Food (4 Videos)
- ❒ F2360 SERVSAFE® Serving Safe Food Second Edition (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
- ❒ F2410 Wide World of Food Service 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
- ❒ M4040 Legal Aspects of the Tampering Case
- ❒ M4050 Personal Hygiene & Sanitation for Food Processing Employees
- ❒ M4060 Psychiatric Aspects of Product Tampering
- ❒ M4070 Tampering: The Issue Examined

Visit our Website at www.foodprotection.org for detailed tape descriptions

ADVERTISING INDEX

INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

General Fund Statement of Activity for the Year Ended August 31, 2000

Revenue:	
Advertising	$ 111,597
Membership & Administration	410,921
Communication	606,147
Annual Meeting	409,424
Workshops	30,515
Total revenue	1,568,604
Expense:	
Advertising	90,929
Membership & Administration	550,440
Communication	546,242
Annual Meeting	335,265
Workshops	23,678
Total expense	1,546,554
Change in General Fund	$ 22,050
Net Assets as of 8/31/00:	
General Fund	(16,552)
Foundation Fund	86,608
Restricted Fund	48,414
Total net assets	$ 118,470

International Association for Food Protection

6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org

SHIP TO: (Please print or type. All areas must be completed in order to process.)

Member # _____

First Name _____ M.I. _____ Last Name _____

Job Title _____ Company _____

Mailing Address _____

(Please specify: ❒ Home ❒ Work)

City _____ State or Province _____

Postal Code/Zip + 4 _____ Country _____

Telephone # _____ Fax # _____

E-mail _____

BOOKLETS

Quantity	Description	Member or Gov't. Price	Non-Member Price	TOTAL
	Procedures to Investigate Waterborne Illness—2nd Edition	$10.00	$20.00	
	Procedures to Investigate Foodborne Illness—5th Edition	10.00	20.00	

SHIPPING AND HANDLING – $2.00 (US) $4.00 (Outside US)
Each additional booklet $1.00

Multiple copies available at reduced prices.

Phone our office for pricing information on quantities of 25 or more.

Shipping/Handling _____
Booklets Total _____

OTHER PUBLICATIONS

Quantity	Description	Member or Gov't. Price	Non-Member Price	TOTAL
	Pocket Guide to Dairy Sanitation (minimum order of 10)	$ .50	$ .75	
	Before Disaster Strikes...A Guide to Food Safety in the Home (minimum order of 10)	.50	.75	
	*Developing HACCP Plans – A Five-Part Series (as published in *DFES*)	15.00	15.00	
	*Surveillance of Foodborne Disease – A Four-Part Series (as published in *JFP*)	18.75	18.75	
	*Annual Meeting Abstract Book Supplement (year requested _____)	25.00	25.00	
	*IAFP History 1911–2000	25.00	25.00	

SHIPPING AND HANDLING – Guide Booklets – per 10 $2.50 (US) $3.50 (Outside US)
*Includes shipping and handling

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TOTAL ORDER AMOUNT _____

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Fax: 515.276.8655
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Web site: www.foodprotection.org

MEMBERSHIP APPLICATION

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6200 Aurora Avenue, Suite 200W
Des Moines, IA 50322-2863, USA
Phone: 800.369.6337 • 515.276.3344
Fax: 515.276.8655
E-mail: info@foodprotection.org
Web site: www.foodprotection.org

MEMBERSHIP DATA:

Prefix (❒ Prof. ❒ Dr. ❒ Mr. ❒ Ms.)

First Name _____ M.I. _____ Last Name _____

Company _____ Job Title _____

Mailing Address _____

(Please specify: ❒ Home ❒ Work)

City _____ State or Province _____

Postal Code/Zip + 4 _____ Country _____

Telephone # _____ Fax # _____

E-mail _____

MEMBERSHIP CATEGORIES:

	US	Canada/ Mexico	International
❒ **Membership with *JFP & DFES*** ◀ **BEST VALUE** (12 issues of the *Journal of Food Protection* and *Dairy, Food and Environmental Sanitation*)	$150.00	$175.00	$220.00
❒ **Membership with *DFES*** (12 issues of *Dairy, Food and Environmental Sanitation*)	$90.00	$100.00	$115.00
❒ **Sustaining Membership** (Includes advertising and exhibit discounts and more! Contact the Association office for additional benefits)	$750.00	$750.00	$750.00
***Student Membership**			
❒ *JFP* and *DFES*	$75.00	$100.00	$145.00
❒ *Journal of Food Protection*	$45.00	$60.00	$90.00
❒ *Dairy, Food and Environmental Sanitation*	$45.00	$55.00	$70.00

***Student verification must accompany this form**

All Prices Include Shipping & Handling

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$ _____

US FUNDS on US BANK

(Prices effective through August 31, 2001)

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Exp. Date _____

Signature _____

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Ontario, K2E 7K3 Canada.
Phone: (800) 267-6391.
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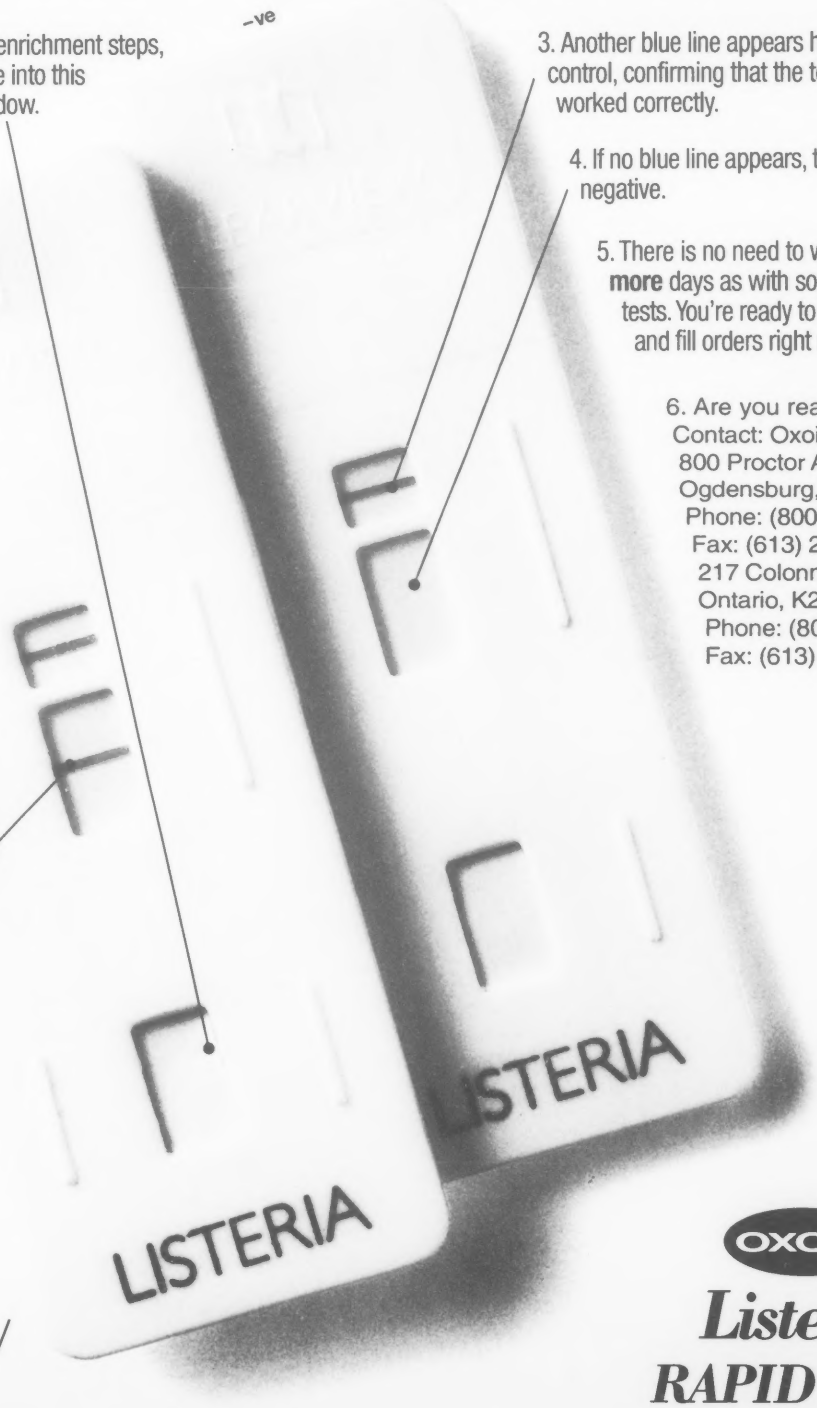

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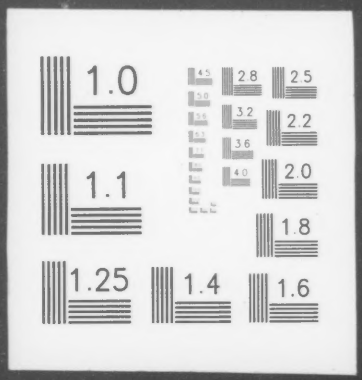
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