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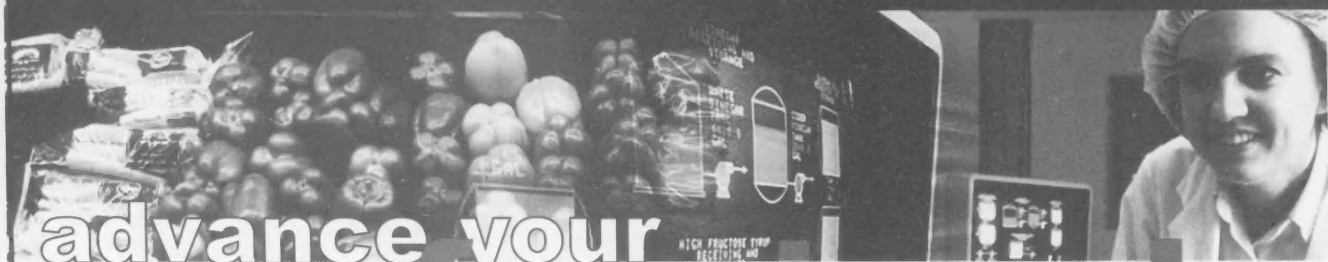
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O. PETER SNYDER (07)	St. Paul, MN
JOHN N. SOFOS (08)	Ft. Collins, CO
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Sustaining Membership provides organizations the opportunity to ally themselves with IAFP in pursuit of *Advancing Food Safety Worldwide*. This partnership entitles companies to become Members of the leading food safety organization in the world while supporting various educational programs that might not otherwise be possible.

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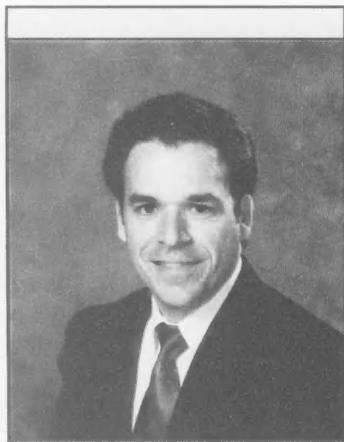
“POINT OF VIEW” FROM YOUR PRESIDENT

If there is one consistent lesson that history teaches us – it’s to “expect the unexpected.” When it comes to the field of food safety this lesson is no exception.

As a food safety professional, when it comes to managing food safety risks within your organization or area of responsibility, your success will be largely dependent on how you deal with day-to-day expected requirements. For example, you may be responsible for overseeing that the food safety management system within your organization is functioning properly, employees are being trained, HACCP checks are being conducted, or samples are being analyzed and, if necessary, the results are being acted upon.

But at times during your career, your success may also be critically dependent on how you deal with an unexpected food safety challenge. You might be able to claim to be surprised with such an occurrence once, but after that you’re simply unprepared.

Understanding the importance of preparing for the unexpected, last year, the IAFP Executive Board came up with the idea of developing an IAFP Rapid Response Series. We realized that some unexpected food safety issues required immediate mobilization, awareness, and education. Waiting to address them one time a year at our Annual Meeting was neither practical nor effective. Accordingly, we decided to create a process that would allow us to mobilize leading experts in the field on short notice, on any breaking and



By **FRANK YIANNAS**
PRESIDENT

“I’m pleased to report that by all accounts our first Rapid Response Symposium was a great success”

unexpected food safety issue, and position IAFP as the “go to” organization to assist with solving the critical food safety issues of our day.

In October of this past year, IAFP held its first ever Rapid Response Symposium titled, *Fresh Leafy Greens, Are They Safe Enough?* The symposium was developed in response to the recent fresh bagged spinach outbreak in the

United States. Our goal was to bring key leaders and stakeholders together to have science-based discussions on what happened, lessons learned, and what can be done to prevent similar occurrences in the future.

I’m pleased to report that by all accounts our first Rapid Response Symposium was a great success. The meeting, which was held in Arlington, Virginia only 3 short weeks after the outbreak was announced, was attended by 119 professionals representing academia, industry, and regulatory. The comments we’ve received have been overwhelmingly positive and gratifying.

Several of the presentations given at the Rapid Response Symposium are posted on our Web site. Please take a moment to review and share them with others. Also, a written report summarizing highlights of the symposium appears on page 942 of this edition of *Food Protection Trends*. Special thanks to Larry Beuchat for taking the lead role in developing the report.

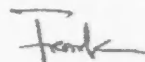
Clearly, putting together a symposium of this scale requires the hard work and contributions of many dedicated members and staff. Special thanks to all of the speakers for sharing their expertise as well as Jeff Farber, Linda Harris, and David Tharp for their efforts in putting together the program. I would also like to thank our sponsors – bioMérieux, DuPont Qualicon, Ecolab, National Restaurant Association, the National Restaurant Association Educational Foundation, Silliker, and the Tech-

nical Committee on Food Microbiology of the Institute of Life Sciences North American Branch for their contributions.

By the time you read this message, the fresh bagged spinach outbreak should be well over. However, the final chapter in this story has yet to be written. There

is still much work to be done as an industry and much to be learned in preventing future outbreaks. But when the final chapter is completed, it should read that IAFP played an important role in bringing key stakeholders together to share information and advance the safety of fresh leafy greens.

Best wishes for peace, joy, and foresight during the coming New Year.



As usual, if you have any questions, comments, or suggestions, please let me know. You can E-mail me at frank.yiannas@disney.com. Until next month, thanks for reading.

OFFICIAL NOTICE

I am in receipt of a Tellers report presenting the results of a vote taken on making changes to the IAFP Constitution. On September 15, 2006 ballots were mailed to all IAFP Members to allow you to vote for or against the amendments to the IAFP Constitution.

The following information was taken from the Tellers report dated November 3, 2006:

Votes cast:	711
Number of valid votes cast:	709
Number necessary for acceptance	355
Number voting to "Approve" changes	696
Number voting to "Not Approve" changes	12
Illegal votes received	3*

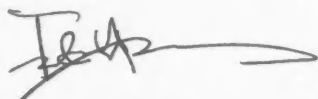
Amarat H. Simonne, IAFP Teller, signed the report.

*Illegal votes: 1 blank, 2 votes marked both "approved" and "not approved"

Therefore, the Amendments to the Constitution (as printed in the May issue of *Food Protection Trends*) have passed. Should you have any questions regarding these changes, you may contact David Tharp, Executive Director, at the IAFP office.

Thank you for taking the time to vote and get involved.

Sincerely



Frank Yiannas

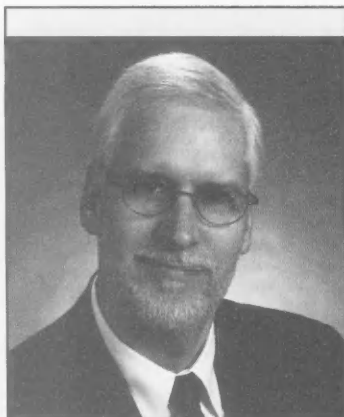
“COMMENTARY” FROM THE EXECUTIVE DIRECTOR

December is always a good time to take a look back at what has been achieved over the past year. This has been a very busy year for IAFP and it is hard to believe that it will draw to an end this month! We began the year with our sights set on IAFP 2006. The Program Committee and Executive Board made the trip to Calgary in February to review more than 550 submitted abstracts along with twenty-some symposia. It was exciting to have everyone together to begin preparations for the Annual Meeting program and even though it was cold, the Committee had a great time interacting in beautiful Calgary.

As we progressed towards IAFP 2006, we began work on finalizing the workshop selections. At the same time, we were completing a DVD that tells the story of IAFP's Foundation. You may recall seeing this DVD at the Opening Session. The Foundation continues to grow and in doing so, continues to be able to support additional projects relating to IAFP's mission. For 2006, four students' travel to Calgary was supported allowing them a “head start” on connecting with food safety colleagues.

Last March, IAFP participated in two shows, the Food Safety Summit and the Food Safety World. Both provided opportunities for IAFP to meet with Members and potential Members in a relaxed, informal setting. We are also able to strengthen our relationships with exhibitors and sponsors.

During the year, we continued to work with the IAFP Student PDG in planning activities for IAFP 2006.



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

***“This has been
a very busy year
for IAFP”***

The student group helped out once again by serving as monitors and assistants during IAFP 2006 sessions. We really appreciate the help they provide at the Annual Meeting! They also held their Annual Luncheon on Sunday and on Tuesday evening, held a student mixer. The Student PDG continues to grow, build momentum and serves an important function within IAFP.

In August, the Annual Meeting took place in Calgary. We didn't know what to expect in “crossing the border” to Canada, but success followed us north! Our exhibit hall was sold out; we had more than 1,700 attendees and a record number of poster presentations. Everyone had a great time in Calgary

and enjoyed the beautiful scenery of the Canadian Rockies!

Not too long after the Annual Meeting concluded, the US spinach outbreak occurred. This prompted IAFP to plan its first ever, Rapid Response Symposium. From the time the spinach recall was issued until the time of our symposium, only three weeks had elapsed. It was the first time to implement IAFP's Rapid Response, but most likely not the last. As other important topics in food safety arise, look to IAFP to respond in a rapid, organized manner.

Then, to end the year, we held the IAFP European Symposium in Barcelona. We were impressed by the number of supporting companies who either exhibited or provided sponsorship support. Because this article is written about 30 days in advance of December, we do not know the final outcome of our European Symposium, but preliminary information looks like we will exceed 100 attendees in Barcelona. We are certainly happy with these results!

During the year, we increased the number of Gold and Silver Sustaining Members and our number of regular Sustaining Members too! We are delighted to have 10 Gold Sustaining Members and 9 Silver Sustaining Members. In total, we now have 86 Sustaining Members in comparison to 82 at the end of 2005 and 72 at the end of 2004. This visible support from leading companies in our field means so very much to all of us at IAFP!

Each December, we release the financial results for our fiscal year end. In this case, results are shown

on page 982 for the fiscal year ending August 31, 2006. We were again successful this year in adding about \$75,000 to our General Fund Balance which now stands at

\$578,000. Our goal is a moving one (as our budget increases), but right now our target is to hold \$1.1 million in our General Fund. This is about one-half of our operating budget.

I want to close this month with wishes to you and your family for a wonderful holiday season and our hope for a safe and prosperous New Year for all.

IAFP President Elect, Dr. Gary Acuff Speaks at the University of Wisconsin-Madison



Dr. Gary Acuff, President-Elect of IAFP and Professor and Head of the Department of Animal Sciences at Texas A&M University, was a featured speaker at the University of Wisconsin-Madison Food Research Institute (FRI), on October 18, 2006. Kathy Glass, a past president of IAFP and a research scientist at the Food Research Institute, introduced Gary and provided the attendees with a summary of IAFP's latest activities, including their sponsorship of the University Speaker Program. Gary's presentation, "Effective Validation of Beef Slaughter Critical Points" was an installment in the Institute's

FRESH (Food Research and Education Seminar Highlights) series. The series offers students, academic and industry researchers, university extension agents, local inspectors, and interested members of the general public, with practical and timely information on food microbiology and safety.



Gary's presentation and the FRI seminar series complement IAFP's mission to advance food safety worldwide. The University of Wisconsin-Madison thanks Gary for his time and IAFP for providing universities with renowned speakers in the field of food protection.



Contact the IAFP office to schedule a presentation at your university.

Attachment of *Listeria monocytogenes* to an Austenitic Stainless Steel with Three Different Types of Surface Finish

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¹Materials Research and Education Center and ²Department of Poultry Science, Auburn University, Auburn, AL 36849, USA; ³ISI Surakarta, Surakarta 57126 Indonesia

SUMMARY

The attachment of *Listeria monocytogenes* to an austenitic stainless steel 304 with three different types of surface finish, i.e., No. 2B (mill), No. 4 (satin), and No. 8 (mirror), has been investigated. The study was based on wettability phenomena, in which the combined properties of a surface, a liquid, and a vapor phase were assumed to play an important role in the attachment of bacteria. A previous study on the effect of accelerated corrosion on bacterial attachment of the same material indeed had shown that wettability plays a key role. In contrast, in the present study the role of wetting phenomena was not clear, indicating that other factors need to be considered. One finding that needs to be explained further is that when the contact angle of the liquid on a surface increased to a certain degree, detachment of bacteria on that surface became more difficult. The results showed that polishing a surface to a certain smoothness may give rise to more adhesion of bacteria. This study also verified that No. 2B (mill) finish is a better choice than the other two for food contact surfaces in limiting the initial attachment of *L. monocytogenes*.

INTRODUCTION

Austenitic stainless steels are the material of choice for sanitary design of food processing equipment (19). Austenitic stainless steels are generally inert, easily cleaned and corrosion resistant (11, 13, 14, 20). Surface finish can impact bacterial attachment either directly or via adhesion of food debris and ease of sanitization, so the use of a suitable surface finish can be of great importance to the hygiene of food contact surfaces (2). Thus, the sanitary standard for austenitic stainless steel intended for food contact is that it must have a surface roughness (R_a) of $\leq 1\mu\text{m}$ (16). Stainless steel surface finishes are produced by three basic methods (1): (i) rolling between polished or textured rolls, (ii) polishing and/or buffing with abrasive wheels, belts, or pads, and (iii) blasting with abrasive grit or glass beads. In the United States, surface finish No. 4 (satin) is preferable, whereas No. 2B (mill) finish is commonly used for equipment in the food industry in Europe (4). The No. 4 (satin) finish is a polished finish produced by initial grinding with relatively coarse abrasives, finished with abrasives of approximately 120 to 150 grit. The No. 2B (mill) finish is a bright finish, which results from cold rolling followed by annealing and descaling and which receives a final light cold rolled pass on polished rolls. In addition to these two

A peer-reviewed article

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TABLE 1. Surface roughness, contact angle measurements, and means of bacterial counts per field of view (FOV) before normalization (BN) and means of bacterial counts after normalization (AN) on the field of view of tested surfaces of No. 2B finish, No. 4 satin, and No. 8 mirror. Different letters in columns indicate significant differences ($P \leq 0.05$). The standard errors of the mean of BN and AN are 6.1 and 6.2 respectively

Steel finish	Surface roughness (nm)	Contact angle (deg)	BN/FOV	AN/FOV
No. 2B	425 ± 2	72 ± 1	70 (A)	79 (A)
No. 4	439 ± 3	79 ± 1	108 (B)	109 (B)
No. 8	39 ± 1	80 ± 1	132 (C)	132 (C)

types of stainless steel surface finishes, it is possible for food contact surfaces to be finished to a No. 8 (mirror) standard, which is the most reflective surface and which is produced by polishing with successively finer abrasives and buffing extensively to remove all grit lines from preliminary steps. In response to increased concern over post-process contamination of ready-to-eat products, the use of "clean room" technology and equipment has been proposed as a means of improving control of attachment of biofilm-prone bacteria in processing facilities (9, 17). However, "clean room", in terms of food processing, is not well defined, although the use of more easily sanitized materials appears to be implied. Moreover, it has been inferred that the use of a highly polished surface finish would limit the adhesion of bacteria (2) and would therefore be applicable to the definition of a "clean room." However, a systematic determination of the ability of foodborne bacteria to initially attach to austenitic stainless steel surfaces of various finishes has not been reported. Therefore, the aim of this study was to compare the initial attachment of *Listeria monocytogenes*, a significant foodborne pathogen, to two common surface finishes, a No. 2B (mill) finish and a No. 4 (satin) finish, and a smoother surface, a No. 8 (mirror) finish. In contrast to previous studies (3, 10, 15) on the effect of surface finish on bacterial attachment, in which bacteria were applied to surfaces via immersion, the present study employed a droplet application procedure.

MATERIALS AND METHODS

Coupon preparation

Sheets of as-received austenitic stainless steel type 304 (305 mm × 305 mm × 1 mm) with a No. 2B finish, a No. 4 satin

finish, and a No. 8 mirror finish were obtained from McMaster-Carr (Atlanta, GA). The surfaces of No. 4 satin finish and No. 8 mirror finish, but not of No. 2B finish, were covered with a plastic film. These sheets were sectioned into coupons of 24 × 9 mm by use of a Buehler ISOMET 2000 Precision Saw (Lake Bluff, IL). For No. 2B finish, coupons were cleaned with acetone twice, for 10 minutes each time, in a sonicator (Cole-Parmer, Vernon Hills, IL). The coupons were sonicated twice in deionized water, for 10 minutes each time, and then were autoclaved at 121°C for 15 minutes. The coupons were then aseptically transferred to sterile Petri dishes matted with a layer of Whatman No. 2 filter paper and dried in a desiccator at 42°C for 24 h before exposure to bacteria. For No. 4 satin finish and No. 8 mirror finish, the plastic films were removed from coupons, which were then soaked for 3 hours and then sonicated (Cole-Parmer, Vernon Hills, IL) twice, for 10 minutes each time in Tape Remover™ liquid (San Diego, CA) to remove any residual glue on the surface. The coupons were soaked for 1 hour and sonicated twice for 10 minutes each time, in hot hand soap solution (70°C). After being rinsed with deionized water to eliminate soap, coupons were soaked in acetone for 15 minutes and then sonicated twice, for 10 minutes each time, in deionized water. The coupons were autoclaved and exposed to bacteria as described above for steels with No. 2B finish.

Cultivation of *L. monocytogenes* in brain heart infusion (BHI)

L. monocytogenes ATCC 19111 was inoculated in BHI and incubated for 24 h at 37°C to obtain ~10⁹ cells/ml of stationary phase cells (based on past experience with growth characteristics of this strain). The test suspension was made by diluting

a 1 ml culture of *L. monocytogenes* (10⁹ cells/ml) in 49 ml BHI to obtain 10⁷ CFU/ml of *L. monocytogenes*.

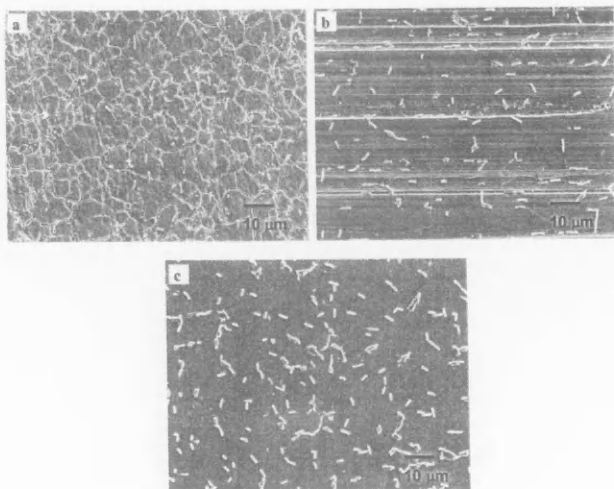
Surface roughness and contact angle measurements

Surface roughness (R_a) measurements were carried out by use of a profilometer Tencor Instrument Alpha Step 200 mode (KLA-Tencor, San Jose, CA). Surface contact angle measurements were performed at 23°C with a Nikon 4 megapixel camera (Nikon USA, Melville, NY) attached to an Olympus Stereo Microscope (Olympus USA, Melville, NY) oriented so as to permit a side view of the droplet and hence a direct contact angle measurement from the recorded image. The sterilized and dried coupons were positioned on a microscope stage for contact angle measurements. A drop consisting of 10 µl of brain heart infusion (BHI) containing 10⁷ CFU/ml of *L. monocytogenes* was deposited on each tested surface (coupon) and photographs taken at 30 s after droplet deposition. Each surface roughness and contact angle reported in the present study is the average of six measurements.

The attachment of *L. monocytogenes* to stainless steel

A drop of 10 µl BHI containing 10⁷ CFU/ml of *L. monocytogenes* was placed on each test surface (coupon). After holding in humid environment for 3 h at 23°C, the samples were washed three successive times with 200 ml of sterile water in a gyro-rotary shaker for 2 min at 100 rpm. After washing, coupons were treated with 2 ml 2% osmium tetroxide for 45 minutes. The clean samples were gold coated using sputter coater (ESM 550X, Hatfield, PA), and examined using scanning electron microscopy (SEM) (JEOL JSM 840, Peabody,

FIGURE 1. Photomicrographs (SEM-secondary electron micrograph) of surfaces following the application of bacterial suspension drop on No. 2B finish, No. 4 satin, and No. 8 mirror



MA) to determine the number of cells of *L. monocytogenes* attached on each test surface.

Statistical analysis

For each surface treatment, six coupons were tested, and a total of 60 fields of view were used in determining bacterial counts. Bacterial counts were analyzed statistically by use of the ANOVA procedure with Duncan's multiple comparison test from the SAS package (SAS Institute Inc., Cary, NC, USA) to determine the significant differences ($P \leq 0.05$) between means of bacterial counts of the tested surfaces.

RESULTS AND DISCUSSION

A comparison of the surface roughness and contact angle values for the three types of surface finish tested in this study is shown in Table 1. Although it is generally accepted that roughness of surfaces strongly affects the measured contact angle (7, 8), the influence of surface roughness on the measured contact angle was not clear in the present study. No. 4 satin and No. 8 mirror finishes had the highest and lowest surface roughness values, respectively, but No. 8 mirror and No. 2B finish had the highest and the lowest contact angle values, respectively.

The number of bacteria attached to No. 8 finish was significantly greater than the numbers attached to No. 4 satin and No. 2B finishes, with the lowest number

of bacteria found on the No. 2B finish (Table 1). Investigating the sole effect of surface finish on the initial attachment is challenging, because it is difficult to separate surface finish from other variables, such as surface roughness, surface wettability, and surface charge, if materials of differing electrical properties are considered. In terms of surface roughness, the result of this study do not fully agree with those of Barnes et al. (3), who reported that the difference in the levels of surface roughness of stainless steel No. 2B and No. 8 finish did not affect the attachment of *L. monocytogenes*. However, it is hard to draw conclusions regarding an effect due solely to roughness in the present study, inasmuch as each surface roughness represents a different surface finish. It appears that there was a correlation between the value of contact angle and the number of bacteria attached to the surface; the greater the value of contact angle of the surface, the greater the number of bacteria on the surface (Table 1), which is in contrast to other studies (5, 12) in which it has been reported that bacterial attachment occurred on surfaces with higher wettability (lower contact angle). This difference may be explained by the fact that when the contact angle of a surface increased to a certain degree, detachment of bacteria on that surface was observed to be more difficult.

In investigations of bacterial attachment with non-immersed exposure such as film, splatter or drop contact (the latter

was used in the present study), surface wettability can play an important role in the initial events leading to attachment of bacteria to the surface (12). Wettability, a characteristic of the combined properties of a surface, a liquid and a vapor phase, is measured as the contact angle, with a lower contact angle corresponding to better wetting (18, 21). Therefore, the surface area covered by droplets of equal composition and volume would vary according to the surface's wettability characteristics (i.e., contact angle). In the present study, the surfaces of higher wettability (No. 2B) allowed distribution of the *L. monocytogenes* suspension over a larger area as compared to surfaces of lower wettability (No. 4 and No. 8). To investigate the influence of differences in contact area, bacterial counts were normalized to account for differences in the surface area of the inoculum due to differences in interfacial energy as reflected in the differences in measured contact angle. The normalization equation was derived on the basis of the spreading of a liquid over the surface of the substrate (6), and is given by the following equations:

$$X' = \frac{S_X}{S} X$$

$$\frac{S_X}{S} = \left(\frac{\sin \theta_X}{\sin \theta} \right)^2 \left(\frac{2 - 3 \cos \theta + \cos^3 \theta}{2 - 3 \cos \theta_X + \cos^3 \theta_X} \right)^{2/3}$$

where X and X' are bacterial count and normalized bacterial count, respectively, on the field of view that needs to be normalized. S_X and θ_X are the surface area and contact angle, respectively, of the inoculum that need to be normalized, and S and θ are the surface area and contact angle, respectively, of the inoculum used as a standard for the normalization. Because of the small differences in contact angle, this normalization of the data did not significantly affect the results (Table 1). As with normalized data, bacterial counts differed among the different surface finishes, with the lowest count occurring on the No. 2B finish and highest count on the No. 8 finish.

In conclusion, the major finding of this study is that polishing a surface to a certain smoothness, which influences wettability, may give rise to more adhesion of bacteria, thereby affecting hygiene and food safety. Also, data from this study verify that a No. 2B finish, the current industry standard, is a good choice for food contact surfaces in limiting the initial attachment of *L. monocytogenes*, compared to smoother finishes of like materials.

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Public Health Inspector Bias and Judgment during Inspections of Food Service Premises

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SUMMARY

Public health inspectors make numerous judgments and decisions during their inspections of food premises. Many of these judgments and decisions are subjective and can be influenced by bias. Nine public health inspectors were interviewed to explore the existence and potential impact of bias in their judgment and decision-making process during inspections of food premises. Several biases that have been identified in prior research and demonstrated to have an impact on professional judgment outside the arena of health inspection were used as a baseline. The findings revealed that certain types of biases were influencing the decision-making processes of public health inspectors and that bias could indeed affect the results of inspections. Recommendations to reduce the impact of bias include training, calibration and area rotation.

INTRODUCTION

The typical responsibilities of the public health inspector with regard to food safety are inspection, enforcement, investigation, and education (10, 11, 20). Much of the food safety focus is directed at food premises, which include a diverse range of establishments such as "full service" and "quick service" restaurants, institutional food service, and mobile food preparation premises. Inspection of these food premises is the primary means of monitoring and ensuring that they comply with provincial and/or federal food safety regulations, as well as with accepted public health practices.

Actual inspections of food premises involve the assessment of the facility's design, structure and upkeep, and of the operators' and employees' food handling practices compared with the standards in pertinent food safety legislation. The American Society for Quality (ASQ) offers a definition of inspection as "measuring, examining, testing and gauging one or more characteristics of a product or service and comparing the results with specified requirements to determine whether conformity is achieved for each characteristic" (1).

Many legislated food safety requirements, such as food storage temperature standards, are objective in nature; however, a significant number are subjective. For example, the assessment of a food-contact surface, wall or floor for cleanliness is subjective and therefore more difficult to assess. Even the evaluation of objective standards is influenced by some

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degree of subjectivity. For example, food handlers' hair must be confined; that said, at what point does a health inspector decide that a food premise is in non-compliance? Would the decision be based on one food handler out of fifty not confining his/her hair – or one out of ten, or one out of five, etc.? In addition to deciding whether or not an observed condition is an infraction, there is a certain degree of discretion as it relates to the inspector deciding which infractions, or how many, to cite on the inspection report. Finally, the inspector's inspection schedule itself is also flexible and can be subject to many changes.

Public health inspectors rely on personal judgment to navigate through the many decisions that are made prior to, during, and after inspections. These judgments, however, are subject to a variety of biases or other influences. A review of the existing research literature dealing with professions other than health inspection revealed that a number of identified biases influenced personal judgments during research, evaluation, and measurement. Similar research specific to public health inspectors could not be found; thus, it is the examination of these non-health inspection biases through a series of interviews with public health inspectors that forms the basis for this study.

The primary objectives of this study are twofold:

1. To determine if factors that contribute to the existence of selected biases or other influences are present during inspections of food premises, and
2. To determine if the selected biases affect the judgments of public health inspectors during inspections.

BACKGROUND

The role and effects of bias on judgment and objectivity have been reported in the areas of financial auditing (5, 13, 25, 26), education (3, 22), research (6, 12, 15) and other areas ranging from police services (18) to orchestra auditions (9). There has been little research related to bias as it pertains specifically to public health inspectors or even to food inspectors or auditors in the private sector. Nonetheless, the potential effects of bias on objectivity and judgment are not fully ignored by the public health or private sector inspection fields; in a general attempt to protect judgment and objectivity, many organizations and agencies include cer-

tain provisions in their internal or professional code of ethics. Some notable examples include:

The Canadian Institute of Public Health Inspectors (CIPHI) Code of Ethics:

"I acknowledge...

- That I have an obligation to the public whose trust I hold and I will endeavor, to the best of my ability, to guard their interests honestly and wisely. I will be loyal to the government division or industry by which I am retained.
- that being loyal to my profession, I will uphold the constitution and bylaws of the Canadian Institute of Public Health Inspectors and will, at all times, conduct myself in a manner worthy of my profession" (4).

The American Society for Quality (ASQ) Code of Ethics:

- Will be honest and impartial.
- Will act in professional matters as a faithful agent or trustee for each employer or client.
- Will inform each client or employer of any business connections, interest, or affiliations which might influence my judgment or impair the equitable character of my services" (1).

The Australia / New Zealand Food Authority (ANZFA) offers an example of how some agencies attempt to address some specific biases and influences that may affect the judgment and objectivity of an auditor. The ANZFA Food Safety Guidance document identifies four factors that may compromise objectivity:

1. Providing a consultancy service to the food business for the food safety program development and/or implementation
2. Providing food safety training courses that include specific advice on addressing food safety issues in a particular food business
3. Any ownership in the food business or ownership by a family member
4. Previous or current employment by the food business (2)

Ten biases or judgment influencers pertaining to fields other than public

health inspection were identified in the research literature. These ten factors form the basis for this study and are described in Table 1.

MATERIALS AND METHODS

Participants and selection

Nine public health inspectors representing four different health units (one to three public health inspectors from each health unit) in southern Ontario were interviewed for this study. For in-depth interview methodology, only eight respondents are needed for gathering data of a comprehensive nature (19). Because qualitative research explores a topic intensively rather than surveying it more superficially, the respondent pool is not intended to represent the larger population. Rather, respondents are chosen in order to give the researcher "... an opportunity to glimpse the complicated character, organization, and logic of culture" (19). The decision to interview nine inspectors, rather than the eight recommended by McCracken (19) was made in an effort to ensure comprehensive, valuable data.

Each participant was interviewed separately and only once. Interviews were between 1.5 and 2 hours in length and were conducted over a three-week period during regular health unit operating hours (8:30 a.m. to 4:30 p.m.).

The selection of participants was based on a desire to obtain results from as diverse a sample as possible within the given geographic area. The participants represented a combination of "experienced" (> 10 years public health experience) and "inexperienced" (< 3 years public health experience) public health inspectors. There were four female and five male participants. The length-of-service standards for "inexperienced" and "experienced" were derived through discussions with public health managers and inspectors in southern Ontario. The following list outlines the four categories included in this study:

- Inexperienced male (IM)
- Inexperienced female (IF)
- Experienced male (EM)
- Experienced female (EF)

Participants were randomly selected from each health unit. In all, three 'inexperienced' male public health inspectors, two 'inexperienced' female public health inspectors, two 'experienced' male public health inspectors, and two 'experienced' female public health inspectors participated in the study.

TABLE I. Selected biases and judgment influencers identified in the research literature

Type of Bias	Description	Examples / Impacts	Source
Availability	<p>Assessment of the frequency or probability of an event based on the ease with which instances or associations come to mind. The more easily these instances / associations come to mind, the more likely they are said to occur. This can lead to severe and systematic errors.</p> <p>Factors affecting retrievability of instances or events include familiarity of information, and salience, vividness or recency of event.</p>	<p>Subjective probability of traffic accidents can rise temporarily when one witnesses an actual accident.</p> <p>Media coverage can distort perceptions of risk.</p> <p><i>Could prolonged media coverage of spectacular issues such as genetic engineering of foods or Bovine Spongiform Encephalopathy (BSE) detract health inspectors from other food safety risk factors, such as biological or chemical risks?</i></p>	Kahneman, Slovic and Tversky (17); Evans (6)
Confirmation	<p>A cognitive process (neither deliberate nor conscious) that results in a tendency to seek information consistent with current beliefs, theories or hypotheses and to avoid the collection of potentially falsifying evidence.</p>	<p>Subjects, prior to hearing a particular lecturer, were given a seven-adjective description of the lecturer. Two different sets of adjectives (one per subject) were distributed. Both were identical except one set included the adjective 'warm' and the other, the adjective 'cold'. This manipulation of descriptors consistently influenced subjects' subsequent judgment of the lecturer.</p> <p><i>Could public health inspector judgment be influenced by opinions formed prior to an initial inspection of a food premises?</i></p>	Evans (6); Innes (15)
Consistency	<p>Attempt to maintain consistency between initial positive feelings about a specific program and subsequent judgment of a program's overall success.</p>	<p>Individuals who undergo significant struggle to gain admission into a group which turns out to be dull and uninteresting may experience dissonance. Since people do not work hard for nothing, they will distort their perceptions of the group in a positive direction in order to reduce any dissonance that results.</p> <p><i>Could public health inspector judgment be affected in subsequent inspections of a food premises that received good results in its first inspection?</i></p>	Innes (15)
Contrast error	<p>The result of allowing the current 'ratee' to be evaluated against the previous 'ratee' rather than against a common standard or criterion.</p>	<p><i>Could a lower standard be applied to inspections of a food premises if the previously inspected food premises performed poorly, or to a higher standard if it performed well?</i></p>	Rater errors/ biases (24); Mills (21)
Effects of intimidation	<p>The delivery of an implied or overt threat in order to influence the 'rater's' evaluation.</p>	<p>With financial auditing, the auditor can be threatened with replacement over disputes or disagreements with the application of accounting principles.</p> <p><i>Could an aggressive or intimidating operator affect public health inspector judgment during an inspection?</i></p>	OICU-IOSCO (23)
Surgency	<p>Distortion, predilection or influence in perception or rating due to physical attractiveness and charisma of the ratee.</p>	<p>Subjects attending teacher evaluation workshops were shown one of two videos. One video consisted of the surgent (attractive, charismatic) conducting an educational session. The second video consisted of a non-surgent (the same person, but dressed less attractively and not behaving charismatically). The surgent's session was perceived as more effective.</p> <p><i>Could décor of the restaurant, attractiveness / friendliness of the staff or of the operator bias the inspector?</i></p>	Newsum (22)
Length of relationship	<p>Impact of duration of relationship on audit outcome. Auditors may become stale in their audit approach, or lose their independence, objectivity and professional skepticism.</p>	<p><i>Could the judgment of the public health inspector be influenced by dealing with an operator of a food premises with whom the inspector has developed a long-term relationship? Would the inspector start to anticipate inspection results and, as a result, fail to observe serious food safety infractions?</i></p>	George (8); Sinason, Jones and Waller (26)
Re-audit	<p>Influence that may result from checking the results of one's own recommendations or work.</p>	<p><i>Could the judgment of a public health inspector concerning how well infractions from a previous inspection were corrected be influenced if he/she were to have provided advice on how to correct those infractions?</i></p>	Australia New Zealand Food Authority (2)
Favoritism under social pressure	<p>Favoring a specific cohort to "satisfy the crowd".</p>	<p>Empirical research showed that Spanish referees systematically favored home teams by shortening close games when the home team was ahead and by lengthening close games when the home team was behind. The mechanism behind this was the referees' desire to satisfy the crowd.</p> <p><i>Could similar pressure on public health inspectors from food premises operators influence the inspection outcome?</i></p>	Garicano, Palacios and Pendergast (7)
Agency theory	<p>Conflicts of interest when individuals attempt to engage in co-operative endeavors because people are, in the end, self-interested.</p>	<p>With agency theory, rationality is identical to self interest. As such, rational individuals will always choose an option that leaves them better off.</p> <p><i>Could self-interest have an impact on a public health inspector's judgment during food premises inspections?</i></p>	Jensen (16)

Research instrument

A written questionnaire (interview schedule) was used during the interview process. Respondent answers were recorded on audio tape for later transcription, thus allowing the researcher to better focus on the questions and the interview process.

The "Long Qualitative Interview" method (19) used for gathering information and for analysis is "a sharply focused, rapid, highly intensive interview process that seeks to diminish the indeterminacy and redundancy that attends more unstructured research processes" (19). This method was selected because its structure, which includes the use of open-ended questions, allows the interviewer to maximize the value of the time spent with each participant. It also allowed for a more detailed and focused view of the research topic. In addition, the less obtrusive nature of the long qualitative interview would promote more open and candid participant responses. Given that the subject of bias could possibly conjure feelings of defensiveness among the participants, this particular characteristic was considered to be quite important.

The long qualitative interview method includes the following four steps:

1. Review of analytical categories and interview design
2. Review of cultural categories and interview design
3. Interview procedure and discovery of cultural categories
4. Interview analysis and discovery of analytical categories

Review of analytical categories and interview design

The first step involved a thorough review of literature in the areas of bias, judgment and public health inspection. The literature review revealed no specific references to public health inspector bias during food premises inspections. However, research related to bias in other professional arenas, such as financial auditing, research and education, was found. This information formed the basis for the remaining process steps.

Review of cultural categories and interview design

The second step involved the identification of cultural categories and relationships among findings in the research literature. It is a reflective process that serves to familiarize the researcher with the materials and issues, while also establishing distance from his/her own cul-

tural assumptions (19). Establishing distance serves to reduce any personal bias the researcher may bring to the process. Of the many biases examined in the literature, ten appeared to be applicable to public health inspectors. Determining if a bias applied to public health inspectors was based somewhat on a review of existing research literature, but primarily on the primary researcher's personal experiences and reflections as a public health inspector.

A pretest of the selected biases and of the wording used to describe them was conducted with public health professionals via a presentation at the Canadian Institute of Public Health Inspector's (C.I.P.H.I.) annual education conference in Toronto, Ontario. Feedback from the attendees both during and after the presentation indicated concurrence with the identified biases and wording.

The ten selected biases were reviewed in order to identify specific cultural categories and relationships. A matrix was created that would allow for more efficient review of those categories and relationships (See Appendix A: Cultural Categories and Relationships Matrix).

The relationship between each cultural category and each bias was considered by the researcher and given a score of 1 to 3, where '3' indicated a strong relationship, '2' a moderate relationship, '1' a weak one and '0' no relationship. Relationships scoring a '3' were deemed appropriate for development of a specific question for the interview.

Interview procedure and discovery of cultural categories

The third step involved the construction of the questionnaire and the administration of the interview. The questionnaire was designed to allow the participants to tell their stories in their own terms. Thus, the questions had to be phrased in a general and nondirective manner (19). To accomplish this, the long qualitative interview method calls for the development of "Grand Tour" questions. These open-ended questions, coupled with the use of specific prompts, allowed the participants to provide free-flowing, candid answers in a more relaxed manner than would have been possible with more formal interviews. The Grand Tour questions were based on the cultural categories and relationships determined in step 2 and listed in the Cultural Categories and Relationships Matrix (See Appendix A). The questions were derived by reviewing each cultural category and determining how to phrase the question to best promote an active discussion in that

particular category. This had to be accomplished without explicitly directing the participant to (or away from) a particular response.

This process allowed participants to speak directly to the cultural categories and relationships developed in previous steps, thus providing insight into the existence and role of biases in their judgment and behavior during food premises inspections.

Interview analysis and discovery of analytical categories

The fourth step involved the analysis of interview data in five distinct stages that transformed the data from observations to conclusions and scholarly assertions.

The first stage of data transformation entailed an initial screening of the interview transcripts in order to identify specific 'utterances' or 'observations' that bore some relevance to findings in the initial literature review. The second stage extended those observations beyond their original form, relating them back to the transcript, and then re-examining them in relation to each other. In the third stage, the observations were developed further, resulting in the emergence of themes and patterns in the context of different types of bias. The fourth stage involved the identification of general themes and their interrelationship within each interview. The final themes from each interview were then brought together to form a series of conclusions.

Criteria for assessing the research

Internal and external validity, reliability and objectivity are typically assessed when evaluating positivist research. However, Hirschman suggests that when evaluating humanistic research, credibility, transferability, dependability and confirmability are more appropriate (14). This research was assessed against those humanistic criteria.

Limitations

As with any research, there are limitations associated with this study.

1. The primary researcher's experience as a health inspector resulted in his forming certain hypotheses prior to conducting this research. Although controlled for, the potential influence of those hypotheses on the analysis and subsequent results of this research should be noted.

2. The interviewees represent a small sample of health inspectors from urban settings in southern Ontario. Therefore, the results cannot be generalized to the population of Canadian health inspectors.
3. Despite the efforts of the researcher to avoid mentioning the term bias during or prior to the interviews, participants were able to determine that the research dealt with bias. As such, participants who perceived themselves as 'above' the influence of bias may have (even unknowingly) altered their responses to the interview questions.
4. This research focuses on the conditions for and the potential of biases to influence behavior, not on the measurement of the actual influence or impact. Additional research is needed in order to explore those elements.

RESULTS

The analysis of the interviews revealed several common themes related to:

1. The presence of factors that contribute to the existence of selected biases or to other influences during inspections of food premises, and
2. The effect of the selected biases on the judgments of public health inspectors during inspections.

Some additional factors that shaped or influenced public health inspector judgment and behavior also emerged.

Given the nature of the interview, participants were not asked to comment directly on specific biases; rather, they were presented with indirect questions that were related to the biases but were designed to allow the health inspector to steer the conversation toward their beliefs and feelings pertaining to the biases or to the conditions required for bias formation. The common themes which represent those beliefs, thoughts and experiences are described below within the context of the original ten biases.

Availability bias

Typically, 'availability bias' is at play when judgments are made using easily remembered or easily retrieved information rather than using all pertinent information (6, 17). Availability bias can influence the formation of heuristics, commonly known as 'rules of thumb'. Participants were asked questions designed to

expose any heuristics they may have. Often, these heuristics were linked to their use of 'intuition' or 'gut feelings' during inspections and to their 'pet peeves'.

The findings suggest that participants utilize a number of different heuristics, as well as their 'instinct' during food premises inspections. It is not clear if the formation of their heuristics or instinct was influenced by availability bias, but heuristics and instincts themselves appear to play a role in the judgements of and decisions made by the participants during inspections.

One participant discussed a rule of thumb that, at the start of an inspection, when kitchen staff scurry around cleaning and tidying, they are trying to hide something. His heuristic may or may not be accurate, yet it may influence subsequent judgments on his part.

[It] just makes me laugh, not really laugh, but you know, they should not think of me that way, they should be ready for you at any time "and obviously, they might be hiding something there, you know, but again they can't hide anything in a matter of minute or two." (Subject A2IM)

The findings also suggest that operator ethnicity and culture played a role in the formation of heuristics, with approximately half the participants drawing links between specific cultural groups and specific poor food safety practices.

"I had many areas, trust me, different cultures, different backgrounds and some better than others, some cultures are better than others. It is to be expected, they're all set in their own way, but it's very challenging, yes...and you can't change them either a lot of times." (Subject A3EF)

It is notable that a heuristic was observed among some of the female participants that male operators within specific cultural groups had 'difficulty' with their female gender. Once again, whether or not this bore any influence on subsequent health inspector behavior is not known.

"...there are difficulties because of the cultural background... me being female and young and that may pose a problem. Sure they may be really nice, but they may be at the same time...they are being nice because they're not taking me seriously, and that's difficult." (Subject B2IF)

"...The old European rules, they don't want to be told by the officer what needs to be done, because I [as a female] am supposed to be at home..." (Subject A3EF)

Most participants felt their inspection was influenced by gut feel or intuition, particularly as it applied to the operators:

"...it's like a lot of my job now goes by instinct..." (Subject C2EM)

Some participants felt they were able to get 'a read' on the operator's integrity level, and if they felt there was an issue with it, they would focus more heavily on looking for infractions during the inspection.

"...it just leads me to be more observant, usually it's just the vibe that you can't describe, you just get it from the operator, his attitude if he acts like he's hiding things from you by speaking another language or something..." (Subject B2IF)

One female participant mentioned how her instincts would warn her when an operator's anger was reaching a dangerous level:

"Or if I feel there's too much of a threat, there's too much anger built up and you've got this feeling inside of you, I left and I reported it." (Subject A3EF)

The findings suggest that 'pet peeves' did not figure prominently during inspections, as many participants did not acknowledge that they had any. For those participants who did, their pet peeves were generally consistent with food safety science, legislation or best practices (e.g., handwashing).

"Again, one thing I love about the job, in many instances, 99% of the time it's so clear cut, it really is. This is the science, the legislation you need to do...the other parts...you are allowed some flexibility, I suppose that's the way I think about it..." (Subject D1EF)

Some participants did discuss pet peeves that were related to the operator's behavior, such as the operator being 'too agreeable' or, as one participant described, a 'yes man'. It is not clear if the formation of these pet peeves was influenced by availability bias.

Confirmation bias

With only one exception, all participants were, in the course of their workplace activities, routinely exposed to information pertaining to specific food premise prior to inspecting them for the first time. This information was obtained primarily through reviewing previous inspection reports and through conversing with the current or past health inspector(s). Often the information was presented in the form of a value judgment or label pertaining to the premises

or to the operator. These value judgments or labels could form the basis of a hypothesis and as such, could create a suitable environment for which confirmation bias can exist and influence inspector judgment.

Some participants acknowledged that their judgment could be, or is, influenced by prior knowledge of an establishment or its operator.

"It's like anything. If someone says this person is [an] absolute awful person to deal with, he's horrible to deal with he's just so obstinate, just negative and never does anything I say. If I form that opinion before I go into a premise, then I am putting them into an unfair disadvantage. One: because it is not based on my judgment and it is not based on anything that is going to happen, it's what happened in the past. I have to affect change in the future, and I don't want to be jaded or prejudiced before I even step into a place." (Subject D1EF)

It should be noted that prior knowledge could bias the inspector toward a favorable response as well as a negative one.

"So, you would go in and you would have this mentality that when you go in there, it's going to be a great inspection." (Subject B2IF)

In order to avoid forming a preconceived notion of a food establishment or operator, a small number of the participants try to avoid forming impressions of food premises prior to conducting their own first inspection.

"We are as inspectors critical in judging people, that's all we do, we do it day in day out and I don't need any help in forming opinions when it comes to personalities. I would rather form my own opinion." (Subject D1EF)

"Actually no, I would go in myself and form my own opinion..." (Subject C2EM)

Consistency bias

Consistency bias results in subsequent evaluations of a particular subject being consistent with the initial evaluation, even though the initial evaluation may have been incorrect or the performance level may have changed. Consistency bias is often related to the reluctance of raters or evaluators to admit that the initial evaluation was incorrect or that

they missed critical pieces of information (15). It is also linked to many of the same factors involved with other biases, such as confirmation bias and availability bias.

When asked about mistakes or omissions made during inspections, the participants appeared to acknowledge and accept those mistakes or omissions and to identify them or to make corrections in subsequent inspections. The following quote illustrates this common sentiment:

"...you're human. You cannot catch everything; you just hope that you're getting all the important things that need to be inspected at the time of the inspection." (Subject A2IM)

However, participants, generally felt that food premises that performed well in their first inspections tended to perform well in subsequent inspections. Poor performing restaurants also tended to stay that way, but had the potential to improve, often under the direction of new management.

"Consistently good stay consistently good." (Subject D1EF)

The findings suggest that although public health inspectors are able to acknowledge their errors and to make corrections during subsequent inspections, there appears to be a general heuristic among most participants relating to consistency in food premises performance. It is possible that this heuristic plays a role in influencing inspector judgments during subsequent inspections of the same food premises.

Contrast error

Contrast error occurs when raters or evaluators assess their subjects, not against a single standard, but against the performance of previous subjects. This could lead to leniency in subsequent evaluations if the first evaluations scored poorly or to tougher evaluations if the previous ones scored well. This is commonly referred to as 'raising or lowering the bar'.

None of the participants in this study stated that they were aware of being more lenient in subsequent inspections if the first inspections conducted that day involved a high number of infractions. Some participants stated that they assess each food premises strictly on the basis of its own merits. The following quotes were in response to questions pertaining to how the participants would approach an inspection when previous inspections on that day had found a very high number of infractions.

"...I think, if you're going to a place that's good, that doesn't change anything. The next place might be bad again and it's the same, you get the same kind of inspection... It's all going back trying to be consistent in the way you approach the places. And of course, if you had a day with lots of bad inspections... I don't think... you might be thinking you're having a bad day or something, but I don't think so... I can go and do three bad places in a row, and then go to the fourth and it's... maybe not even great maybe it's... I'm not going to say it's a horrible place and give them a worse inspection... I don't think that really." (Subject B3IM)

"Oh, yeah, you know what I say to the person, the operator? I say 'You made my day! You made my week!' and they smile, if they are really exceptionally good not in comparison to other places, but they are doing well and so forth, I say, you made my day! Not to compare them with the places I've been in that day - all those pig sties..." (Subject A3EF)

The previous quote also illustrates the general sentiment among the participants that inspections generating few non-compliances or little conflict were viewed positively, despite the acknowledgment that non-compliance and conflict are an expected part of the job.

"No, it's not going to get me down... I still smile and say okay: but you'll be correcting all this... no... unfortunately that's part of the job. Our job is not rosy every day... no, no, if everything is perfect why have us out there, if everything is perfect every day. Life is full of conflicts and full of stress." (Subject A3EF)

However, inspections with many infractions were still viewed as time consuming, mentally 'draining' or frustrating, as is demonstrated in the following quotes.

"Bad inspections are draining. It takes a lot out of me, because I might be tired, right? But it's not that, it's more the mental exhaustion." (Subject B2IF)

"And sure, of course I'm human too. I try to keep that professionalism but if you had to deal with two bad places prior and you go to the third, and they are bad too, you just sort of lose your tolerance a little bit." (B2IF)

Whether or not the participants' tired state influenced subsequent inspection results is not clear, but several of the par-

ticipants did acknowledge adjusting their inspection schedule in order to avoid potentially poor or difficult inspections.

"That's the beauty of our job. There's nothing saying you have to be in that place and that it has to be today...so there's so much flexibility, and if you have a lot of office work, you can lay low." (Subject A11F)

"So you may turn around and say: 'You know what? It was a long draining day. I'm not a robot. I am tired at this point. Maybe I'll just do a low risk call, a variety store, one of my easier, better calls just to balance myself off, and I'll deal with the other ones I may have said I'll do, I'll do them tomorrow.'" (Subject E3EF)

The findings suggest that although the existence of contrast error was not clearly established, the experiencing of multi-infraction inspections or high-conflict inspections was viewed negatively, resulted in some stress to the participant and at times led to inspection schedule changes.

Effects of intimidation

An operator who is perceived by the participant as intimidating will elicit a 'fight', 'flight' or no response, depending on the participant. The nature of the response, while dependent on the participant and on the particular scenario, does not appear to be dependent on the experience level or on the gender of the participant. The participants discussed how they may continue with the inspection, leave or avoid the premises entirely, or even take a more aggressive approach with the intimidating operator. About half of the participants, when describing an intimidating situation, stated that their judgment or behavior would not change. They would merely carry on with the inspection.

"Trying to look back, trying to think about how I felt in this situation – yeah it's upsetting of course, upsetting when [the] operator has tried to intimidate, but I just try to stick to this is why I'm here. This is what I'm doing." I won't try to fuel the fire in the sense that – you know, give attitude back, but I will try hopefully [to] make them understand that I'm there for a reason – I'm doing my job and it would be in their best interest to co-operate." (Subject A11F)

"I don't care if you're good or bad... I've had operators that have thrown frying pans at me...I had one who

drew a knife...and I don't care...I've worked in a kitchen and I don't care how they want to act. For the one who drew a knife – I just basically spun around and said if you want to act childish, then you and I and a police officer can all do the inspection together...I'll take as long as I want or you can just let me finish off the inspection..." (Subject C11M)

Some of the participants even cautioned against taking the behavior of an intimidating or abusive operator personally, since that could influence their judgment and subsequent behavior.

"If you take it personally, you might have a less understanding approach to things, you may be a little biased. Taking things personally may lead to bias and you may just... maybe at the time, they really need that extra time to do something and you may say: 'Well, no. Why should I? We're doing everything by the book and if you treat me that way, I'll show you – this is how we're going to do it'." (Subject B21F)

Some of the 'fight' responses to an intimidating operator would include citing a larger numbers of infractions or insisting that the final report be reviewed with the operator himself rather than being relegated to a subordinate.

"From what inspectors have passed on to me...I'm not sure if government approves it or not but...you know a place has 15 items of non compliance...the fact of not listing all of them and only sticking with the top 6 or top 7 is the way that usually inspections are looked upon. It's a way not to overload an operator. Whereas other places that have 15 items wrong...because the guy's so belligerent with you, you'll write down all 15." (Subject C11M)

In the case where a participant faced an operator who refused to speak with her at the conclusion of a recent inspection, the participant offered the following reflection:

"No, I think...no, I don't think I would have done that now...I would have found him...I would have found his butt..." (Subject D1EF)

A 'flight' may lead to a long-term avoidance of a particular food establishment. It was interesting to note that although none of the participants admitted to having avoided particular food premises, several had examples of other health inspectors who avoided the inspection of certain food premises.

"...Because you'll see many inspectors, I've seen it, where they will literally find ways of not doing an inspection not for months but for years." (Subject D1EF)

Many of the participants who discussed completing their inspection despite the presence of an intimidating or belligerent operator acknowledged that their focus shifted somewhat from the inspection itself to watching out for their own protection.

"...Especially when it gets to the person who threw the frying pan. He came pretty damn close to hitting me so in that case, it wasn't so much as...it was more of a case where I had to continually watch over my back to make sure where he was at the time..." (Subject C11M)

Surgency bias

When asked to discuss either an 'ideal' or 'difficult' operator, none of the participants mentioned operator appearance or attractiveness as an indicator of operator food safety competence or of premises compliance levels. The findings suggest, however, that operator body language and tone were viewed by some participants as indicators of how receptive and co-operative the operator would be to their requests.

"Yeah – like you can see in the body language – they're tense, stiff...yeah – it's obviously, not welcoming... most people have this smile: 'ok, come on in... Go ahead... do your thing... do you want me to come with you?'; that kind of thing. But yeah, a few operators I can say – you know – they try to be intimidating – I just see some variance in their physical [mannerisms]...[A smile]; It's that universal sign of welcome." (Subject A11F)

Length of relationship bias

Participants in general felt that it was important to build rapport with the operator. The inexperienced health inspectors tended to mention the importance of building rapport to a greater extent than the experienced health inspectors. It is notable that the importance of building such rapport was mentioned by all of the male participants; however, it was mentioned by only one of the female participants.

Most participants differentiated between building rapport and building friendships. Becoming too friendly with the operator was viewed as having a negative impact on their objectivity:

"You're there to conduct your job and not to make friends." (Subject A1IF)

Most participants stated that long term relationships with the same food premises operator had a negative effect on their objectivity. It reduced professional scepticism and resulted in the inspector at times anticipating inspection results. It also contributed to the likelihood of developing a relationship with the operator that was too close.

"I'll describe it in two lights. When you're dealing with restaurants or a general premises, I believe the inspector will become... not jaded... you become dulled to the place. Suddenly, things don't seem, things don't stand out any more: 'how's the dishwasher working?'... 'fine'... 'okay, great, move on to the next thing.'" (Subject D1EF)

"...I'm glad they rotate our areas every [x] years, so they [the operators] don't get too comfortable with us, and it's kind of boring when you go to the same place over and over again and you know what to call for even before you get in." (Subject A3EF)

Re-audit bias

Re-audit bias could possibly influence the evaluation process if a health inspector felt a sense of ownership or responsibility over the advice or suggestions he or she gave to the operator in order to correct non-compliances or to improve food safety. The participants acknowledged the importance of providing education and advice to operators but as a rule did not indicate feelings of responsibility for the effectiveness of their advice; although some participants stated they felt a certain level of responsibility for the overall performance of the food premises.

In this sort of situation, re-audit bias is linked to self interest. In particular, re-audit bias could emerge if there is pressure on the inspector to bring about improvements in inspection results in his or her geographic area. While there does appear to be some pressure felt by some of the participants coming from their supervisors to complete their allotted inspections within the requisite time period, none of the participants stated that they felt pressure to demonstrate improvement in inspection scores.

Favoritism under social pressure

Participants indicated that developing a too-close relationship with an operator could impair their objectivity. So-

cial pressure in the form of bullying or intimidation from the operator would often be ignored or would actually result in the inspector increasing the number of infractions cited during the inspection. Some of the participants commented on how some operators would ask in a persistent, yet friendly, manner that the inspector refrain from actually recording the observed infractions. Participants tended to state they rejected such requests.

"...The operator says, 'Please, please don't write that down, I'll do it right away'... then there are the [operators] that get on the defensive right away, who argue with you... give you excuses 'don't write it down, I'll do it right now.' Those are quite difficult..." (Subject A3EF)

Only one participant mentioned a specific example where 'friendly' social pressure was exerted from an operator who, albeit unsuccessfully, tried to alter the course of the inspection. However, as evidenced by the following quote and despite participant comments to the contrary, some participants acknowledged they would indeed show favoritism under certain circumstances.

"With a co-operative operator who is complying with what you're saying. With those people, again, there is favoritism, there's no doubt." (Subject A1IM)

Some of the participants suggested that social pressure also comes from other public health inspectors. One of the experienced health inspectors commented on his observation of general social pressure exerted from health inspectors for others to maintain the cultural status quo. Two of the inexperienced health inspectors commented on incidents in which they felt that experienced inspectors were pressuring them to take a more lax and accommodating approach to inspections. One of these inexperienced inspectors gave an account of an incident in which she had initially felt proud for enforcing regulatory compliance with one particular food establishment:

"I was all excited and felt like this is what it's about. You know... like good - then I came back to work the next day - and this was such a big deal for me and I was discussing it with a couple of inspectors and these are more veterans, older inspectors - and this one lady was like - oh you should not have thrown out the food... in her opinion there was an allowance for that product - then this other guy came into the conversation and said

ob those units are never at 60 - so basically 'get used to it'." (Subject A1IF)

Thus it appears that, to a limited extent, social pressure is exerted on inspectors from operators and from other health inspectors; participants appear to be aware of this. What remains to be determined is whether or not friendly or other forms of social pressure actually result in the showing of favoritism toward operators.

Agency theory

There were no findings to suggest that participants in this study were influenced by agency theory or self interest in their judgments with respect to the inspection of food premises.

The influence of first impressions

In addition to the generation of observations based on the original ten biases, an observation was made that pertained to the influence of 'first impressions'. Findings relevant to that observation are worth noting and therefore included immediately below.

The concept of 'first impressions' is related to that of confirmation and consistency biases in that an inspector's first impressions of a food premises might influence subsequent judgments.

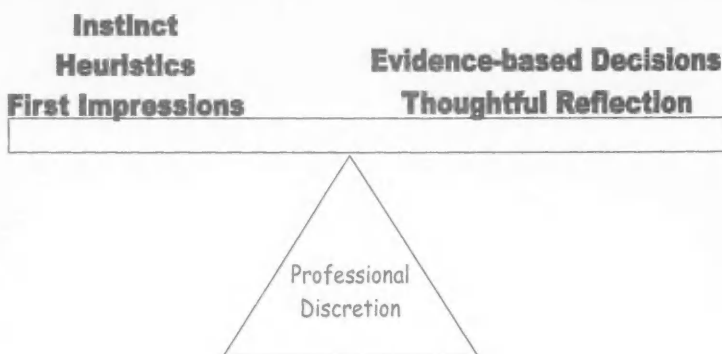
Participants in the study acknowledged that they often formed 'first impressions' of a food premises at an early point in the inspection process. The first impression could be based on the appearance of the premises or the appearance or 'body language' of the operator. In one case, a participant talked about forming an impression of the operator during a phone call that took place even prior to the inspection. About half of the participants used their first impressions to predict the final outcome of the inspection.

"... If the entrance is really dirty, it indicates the rest of the inspection will be a challenge." (Subject A3EF)

When asked about the accuracy of their first impressions as a predictor of inspection outcome, about half of the participants responded that they believed they were accurate, while the other half felt that first impressions could not be relied on. As expressed by one participant concerning the accuracy of first impressions:

"Yeab... there has to be a correlation as far as the inspection..." (Subject C2EM)

FIGURE 1. Judgment balancing act



DISCUSSION

The purpose of this study was to determine if factors exist that could contribute to the existence of selected biases or to other influences during inspections of food premises, and to determine if the selected biases actually do affect the judgments of public health inspectors during inspections.

Based on the participant interviews, the results suggest that a variety of biases may exist and affect health inspector judgment to some degree during the inspection of food premises. The results indicate a more definitive role for biases such as confirmation bias, length of relationship bias, intimidation effect and availability bias, whereas the existence and effect of biases such as surgency bias, self-interest bias, re-audit bias and contrast error are less clear.

The results also suggest a degree of interplay among certain biases. For example, biases such as confirmation bias and surgency bias may work in concert such that any early judgment made of the food premises based on operator appearance may result in the inspector forming an opinion or hypothesis about the establishment itself. This hypothesis could influence the inspector's judgment during the remainder of the inspection. Reducing the effects of some biases should serve to mitigate the effects of others.

At the very least, the conditions under which certain biases can have an impact on judgment formation appear to flourish within the context of the inspection itself as well as within the context of inter-inspector relationships and adherence to individual health unit policy. Thus, public health inspector judgment is prone to bias under some circumstances. As stated earlier, what is not made clear in this study is to what degree biased judg-

ments actually affect the course or the outcome of the inspection. Is the influence of bias actually resulting in well-run establishments being treated too harshly by the inspector, and if so, to what extent? Conversely, are food safety violations going unreported or uncorrected in other establishments, resulting in an increased food safety risk to the public? This question will form the basis for additional research.

RECOMMENDATIONS

The influence of biases on the judgment of public health inspectors must be understood and controlled, but not necessarily eliminated. Despite the potential damage to objectivity and the threat to inspection consistency, the results suggest some benefits associated with the bias. Such benefits include the use of 'gut feelings' or 'instinct' to warn a health inspector of danger. Even the use of heuristics can reveal some food safety risks during the inspection that could otherwise go unnoticed. For this reason, health inspectors perform a delicate balancing act in which factors such as instinct, heuristics and first impressions reside on one side, evidence-based decision making and thoughtful reflection reside on the other, and professional discretion acts as the fulcrum (Fig. 1). Ultimately, it is those health departments that provide adequate and appropriate systems, training and support that will maintain this balance successfully.

Some specific recommendations to health units include the following:

1. Rotate inspection areas on a regular basis. Preventing the development of long-term relationships with operators will help preserve inspector objectivity.

2. Train public health inspectors on the effects of bias. Awareness of the factors that allow biases to form and to influence judgment counteracts their influence to some degree. As Innes stated in her research into threats to research validity: "Knowledge of these biases could help to improve the quality of an evaluation by making people aware of potential validity threats." (15)
3. Provide new inspectors with a thorough orientation and training program to familiarize them with health unit inspection protocols and standards. This is preferable to receiving inconsistent training from a variety of different inspectors who may influence the newer inspectors' interpretation and execution of health unit inspection procedures and policies.
4. Conduct or make available ongoing refresher training for public health inspectors in order to maintain professional and scientific acumen. This would also help to avoid the formation of inaccurate or outdated heuristics.
5. Recognize the influence of social pressure from experienced health inspectors on newer inspectors. Make an effort to determine why health unit policies and procedures are not followed. Either change unrealistic protocols or determine how to bring non-conforming health inspectors into conformance.
6. Implement and reinforce a policy whereby a health inspector who is feeling threatened or intimidated during an inspection must immediately leave the premises. The inspector would be allowed to return and complete the inspection only if accompanied by another inspector or a supervisor. Completing an inspection alone while under duress, despite the inspector's assertions to the contrary, may lead to a poor quality inspection that misses critical infractions.
7. Develop a culture of open communication to enable and encourage health inspectors to approach management with concerns regarding intimidation by operators or conflict with other health inspectors.

APPENDIX A. Cultural categories and relationships matrix

Specific Bias	Cultural Categories								
	Influenced by previous beliefs / knowledge (heuristics)	Influenced by previous Distant judgments	Influenced by Recent judgments	Influenced by relationship with food premises operator (s)	Influenced by eagerness / or lack of to please or to avoid conflict	Influenced by ego / pride / embarrassment	Influenced by self-interest	Influenced by personality or appearance of food premises operator	Influenced by 'gut feeling' or 'intuition'
Availability Biases*	3	1	1	0	0	0	0	0	3
Confirmation Bias	3	2	2	0	0	1	0	0	2
Consistency Bias	1	1	3	0	0	3	0	0	2
Contrast Error	0	0	3	0	1	0	0	0	1
Duration of Relationship Bias	1	1	1	3	2	0	1	1	1
Favoritism under Social Pressure	0	0	0	3	3	0	1	1	1
Effects of Intimidation	0	0	0	3	3	0	0	3	0
Re-audit Bias	0	0	0	0	0	3	3	0	0
Agency Theory (Self Interest Bias)	0	0	0	0	0	1	3	0	0
Surgency Bias	0	0	0	2	2	0	0	3	2

Legend: **3**-Strong relationship **2**-Moderate relationship **1**-Weak relationship **0**-No relationship

*Availability Bias includes several related biases including Vividness Bias / Effect.

8. Develop and implement programs to calibrate public health inspectors. This could include items such as 'shadow inspections' with supervisors, formal reviews or audits of inspection reports and group inspections of selected food premises. Calibration programs help maintain consistent interpretation and execution of health unit inspection protocols.
9. Conduct frequent calibration inspections with public health inspectors in food premises with exemplary food safety practices. This will help to reduce the influence of contrast bias from poorer performing food premises,

- particularly if a health inspector's assigned geographic area is heavily skewed with them.
10. Limit exposure of potential hypothesis-forming information to public health inspectors prior to their first inspection of specific food premises.

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The authors wish to thank the health inspectors who participated so openly and candidly in the interview process. Their efforts will benefit others in the field of public health. In addition, the authors appreciate the support of the participants' management who allowed the participants to partake in the study and showed such an active interest in the research itself.

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First IAFP Rapid Response Symposium



On October 6, 2006, IAFP held its first Rapid Response Symposium – *Fresh Leafy Greens – Are They Safe Enough?* in Arlington, VA. The symposium was held in response to the recent outbreak of bagged spinach that was linked to *E. coli*

O157:H7. IAFP's President, Frank Yiannas and Past President, Jeff Farber set the program. There were more than 100 attendees and they voiced their satisfaction about IAFP's involvement in holding this symposium. A report follows on page 942.



Ellen Morrison, FDA-OEM



Rob Mandrell, USDA-ARS



Robert Buchanan, FDA-CFSAN



Doug Powell, Kansas State University



Michael Lynch, CDC



Alejandro Castillo, Texas A&M University

IAFP would like to extend a special thank you to all speakers and sponsors of this symposium.

Report from IAFP's Rapid Response Symposium *Fresh Leafy Greens — Are They Safe Enough?*

Prepared by Dr. Larry R. Beuchat, University of Georgia

Amidst a growing obesity epidemic in North America, many public health professionals are encouraging consumers to eat more fruits and vegetables, including fresh leafy greens. However, at the same time, fresh produce is being increasingly implicated as a vehicle of foodborne disease. The recent outbreak linked to fresh bagged spinach illustrates this point.

Since 1995, there have been 19 reported outbreaks of foodborne illness in the United States caused by *Escherichia coli* O157:H7 for which lettuce or leafy greens were implicated as the outbreak vehicle. Given these findings, are fresh leafy greens safe enough? Are current measures adequate to ensure their safety? And what are the latest risk management strategies that can be taken to further reduce risk?

In cooperation with United Fresh Produce Association, National Restaurant Association, and International Life Science Institute, the International Association for Food Protection (IAFP) organized a Rapid Response Symposium on *Fresh Leafy Greens – Are They Safe Enough?* The day-long symposium, open to the public, was held on October 6 in Arlington, Virginia. In attendance were 116 individuals from industry, state and federal government agencies, and academia.

The objective of the symposium was to bring leading experts and stakeholders on the topic of fresh leafy greens together for a science-based discussion on the latest findings from a recent spinach-associated outbreak of *E. coli* O157:H7 infections, lessons learned, and current strategies to improve the safety of these types of products.

The symposium was convened promptly at 8:00 a.m. by Frank Yiannas, IAFP President. Jeff Farber, immediate Past President welcomed the attendees and gave a brief overview of the program to follow. He commended the organizers for their rapid response in organizing the symposium, an event evolving from first knowledge only on September 10 of an outbreak *E. coli* O157:H7 infections which was later determined to be associated with fresh bagged spinach.

The morning session consisted of seven presentations describing the evolution of the fresh spinach-associated outbreak. Mike Lynch (Centers for Disease Control and Prevention) gave a detailed account of the epidemiologic investigation. As of October 6, there were 192 cases of infection in 26 states. The range in age of infected individuals was 1 – 84 years, with a median age of 27. Seventy-percent were women. One infected person had died, with the possibility of two other deaths linked to the outbreak. About 30% of *E. coli* O157:H7 isolates from patients had the same PFGE pattern. Ninety-five percent of these patients had eaten fresh spinach. A single production lot could account for the outbreak but the route of contamination was not clear.

Ellen Morrison (FDA/OEM) reviewed the procedures used, in collaboration with CDC, in traceback investigations of foodborne illnesses in general and the spinach-associated outbreak specifically. She stated that fruits and vegetables are extremely difficult to trace back because they are perishable commodities and lot numbers and grower identifications are not routinely used or recorded on shipping

records. She provided a Web site (<http://www.fda.gov/ora/inspect-ref/lgs/epigde/epigde.html>) which outlines in detail the traceback procedures.

An FDA perspective on the spinach outbreak as a part of broader concerns about food safety was presented by Bob Buchanan (FDA/CFSSAN). Reviewing the bigger picture, he reminded the audience that the FDA has led a decade-long initiative to improve the microbiological safety of fresh fruits and vegetables. Leafy greens, tomatoes, cantaloupe, herbs (basil, parsley), and green onions were implicated in 76% of the produce outbreaks that occurred in the United States in 1998–2006. The recent outbreak of *E. coli* O157:H7 infections associated with consuming fresh spinach will likely amplify FDA's commitment to maximize produce safety in the broadest sense.

Tom Stenzel (United Fresh Produce Association) stated that upon learning of the outbreak, industry immediately put into motion a plan to examine what it can do now and long-term to minimize the risk of human disease associated with fresh produce. He stated that through investigations conducted by FDA, CDC, and the California Department of Health Services (CDHS), a single processor appears to be source of contamination. Twenty-seven brands were packed at the same processing plant in Salinas Valley, California. Within 24 hours, the entire commodity (spinach) chain shut itself down. He stated that the entire produce industry breathes with the least common denominator and none of us can allow this to happen again.

A description of the agronomics of spinach production and processing was given by Trevor Suslow (University of California – Davis). Water management, both preharvest and postharvest, is a critical issue. In California, most spinach is spray irrigated. The importance of temperature control during transport and distribution of bagged fresh spinach was emphasized as critical to controlling microbial growth, including growth of *E. coli* O157:H7.

An overview of economics of the spinach-associated outbreak of *E. coli* O157:H7 infections was presented by Linda Calvin (USDA/ERS). Trends in spinach production by geographic location and season were described. Past research on previous produce outbreaks indicates that growers with well established

and documented Good Agricultural Practices were able to recover more rapidly from the economic impacts of the outbreak. The last speaker in the morning session was Doug Powell (Kansas State University). Examples of media analysis and consumer reactions to the outbreak were presented. Particularly entertaining are blogs, most having no credibility, posted on numerous Web sites.

The afternoon session consisted of four presentations focused on updating current fresh leafy greens research findings and raising questions to be answered through future research. Trevor Suslow spoke from an applied research perspective. Among the factors that may impact the microbiological safety of spinach and other produce, but have not been fully defined in terms of potential contribution, are air, water, and soil temperatures and accumulation of *E. coli* O157:H7 in irrigation and run-off water not absorbed by the soil. Relationships between the presence and numbers of microorganisms in flood waters that may be indicative of fecal contamination and safety risks of leafy greens grown in fields affected by these waters are not fully understood. Other issues in need of research attention to determine the level of microbiological safety of leafy greens include the time elapsed between flooding and planting, as well as spacing between plants. Factors influencing the delivery of foodborne pathogens to fields via surface run-off water from areas inhabited by livestock and other domestic animals also need to be further addressed.

Robert Mandrell (USDA/ARS) summarized research findings from several studies conducted in his research unit to determine the presence and persistence of *E. coli* O157:H7 in soil, water, and produce. He noted that the pathogen had been isolated from a single environmental sample taken from a farm on which leafy greens were grown nine months to two years earlier and associated during traceback investigations with three previous outbreaks of *E. coli* O157:H7 infections. MLVA was used in combination with PFGE to assess the relatedness of selected *E. coli* O157:H7 environmental strains and multiple outbreak strains, including the recent spinach outbreak strains. None of the environmental strains were identical by MLVA to the three previous outbreak strains, nor to the recent spinach outbreak strains.

Building on the numerous research needs raised by previous speakers, Alejandro Castillo (Texas A&M University) added to the list a need to better understand the survival and growth characteristics of *E. coli* O157:H7 and other foodborne pathogens on leafy greens in processing environments and after packaging. Work in his laboratory has demonstrated the effectiveness of irradiation in reducing populations of *E. coli* on spinach. The potential of irradiation technologies for enhancing the safety of leafy greens was discussed.

Dave Gombas (United Fresh Produce Association) was the last speaker of the session. He presented an industry perspective on research, asking the question, "Where we are, and where do we go from here?" Documents providing guidance on good agricultural practices (GAPs) to minimize risks of pathogens on leafy greens and other produce were cited as having a positive impact on safety. He stated that there is no evidence that GAPs and commodity specific guidelines, properly

applied, are not sufficient to assure fresh produce safety. Many of the research needs raised by other speakers were reiterated. In addition, the need for validating observations from laboratory experiments in field and processing environments was stressed. It was also pointed out that applications of solutions must be consistent with market realities.

A brief roundtable discussion focusing on the way forward concluded the symposium. Several salient points were clearly made. The FDA wants 100% compliance with GAPs. The FDA also wants all growers to realize that they are producing food, not just a crop. The industry as a continuum, including growers, processors, wholesalers, retailers, and food service is responsible for the microbiological safety of produce delivered to the consumer.

Dr. Larry R. Beuchat is a research professor in the Center for Food Safety and Department of Food Science and Technology at the University of Georgia, Griffin, GA.

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- Monthly listing of your organization in *Food Protection Trends* and *Journal of Food Protection*
- Discount on advertising
- Exhibit space discount at the Annual Meeting
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- Link to your organization's Web site from the Association's Web site
- Alliance with the International Association for Food Protection

Gold Sustaining Membership \$5,000

- Designation of three individuals from within the organization to receive Memberships with full benefits
- \$750 exhibit booth discount at the IAFFP Annual Meeting
- \$2,000 dedicated to speaker support for educational sessions at the Annual Meeting
- Company profile printed annually in *Food Protection Trends*

Silver Sustaining Membership \$2,500

- Designation of two individuals from within the organization to receive Memberships with full benefits
- \$500 exhibit booth discount at the IAFFP Annual Meeting
- \$1,000 dedicated to speaker support for educational sessions at the Annual Meeting

Sustaining Membership \$750

- Designation of an individual from within the organization to receive a Membership with full benefits
- \$300 exhibit booth discount at the IAFFP Annual Meeting





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:

International Association for Food Protection
6200 Aurora Ave., Suite 200W
Des Moines, Iowa 50322-2864, USA
Phone: 800.369.6337; 515.276.3344
Fax: 515.276.8655
Web site: www.foodprotection.org
E-mail: info@foodprotection.org

Nominations deadline is March 12, 2007.

You may make multiple nominations. All nominations must be received at the IAFP office by **March 12, 2007**.

- ◆ Persons nominated for individual awards must be current IAFP Members. Black Pearl Award nominees must be companies employing current IAFP Members. GMA-FPA 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 IAFP 2007 – the Association's 94th Annual Meeting in Lake Buena Vista, Florida on July 11, 2007.

Nominations will be accepted for the following Awards:

Black Pearl Award

Award Showcasing the Black Pearl, *Sponsored by Wilbur Feagan and FEH Food Equipment Company*
Presented in recognition of a company's outstanding commitment to, and achievement in, corporate excellence in food safety and quality.

Fellow Award

Distinguished Plaque

Presented to Member(s) who have contributed to IAFP and its Affiliates with distinction over an extended period of time.

Honorary Life Membership Award

Plaque and Lifetime Membership in IAFP

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

Harry Haverland Citation Award

Plaque and \$1,500 Honorarium, *Sponsored by Zep Manufacturing Co.*

Presented to an individual for many years of dedication and devotion to the Association ideals and its objectives.

Harold Barnum Industry Award

Plaque and \$1,500 Honorarium, *Sponsored by Nasco International, Inc.*

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

Elmer Marth Educator Award

Plaque and \$1,500 Honorarium, *Sponsored by Nelson-Jameson, Inc.*

Presented to an individual for dedicated and exceptional contributions to the profession of the Educator.

Sanitarian Award

Plaque and \$1,500 Honorarium, *Sponsored by Ecolab Inc.*

Presented to an individual for dedicated and exceptional service to the profession of Sanitarian, serving the public and the food industry.

Maurice Weber Laboratorian Award

Plaque and \$1,500 Honorarium, *Sponsored by Weber Scientific*

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

International Leadership Award

Plaque, \$1,500 Honorarium and Reimbursement to attend IAFP 2007, *Sponsored by Cargill, Inc.*

Presented to an individual for dedication to the high ideals and objectives of IAFP and for promotion of the mission of the Association in countries outside of the United States and Canada.

Food Safety Innovation Award

Plaque and \$2,500 Honorarium, *Sponsored by 3M Microbiology*

Presented to a Member or organization for creating a new idea, practice or product that has had a positive impact on food safety, thus, improving public health and the quality of life.

GMA-FPA Food Safety Award

Plaque and \$3,000 Honorarium, *Sponsored by GMA-FPA*

This Award alternates between individuals and groups or organizations. In 2007, the award will be presented to a individual in recognition of a long history of outstanding contributions to food safety research and education.

Call for Abstracts



IAFP 2007

The Association's 94th Annual Meeting

July 8-11, 2007

Lake Buena Vista, Florida

General Information

1. Complete the Abstract Submission Form Online.
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 individuals may submit. However, one of the authors must deliver the presentation.
4. Accepted abstracts will be published in the Program and Abstract Book. Editorial changes may be made to accepted abstracts at the discretion of the Program Committee.
5. Membership in the Association is not required for presenting a paper at IAFP 2007.

Presentation Format

1. Technical — Oral presentations will be scheduled with a maximum of 15 minutes, including a two to four-minute discussion. LCD projectors will be available and computers will be supplied by the convenors.
2. Poster — Freestanding boards will be provided for presenting posters. Poster presentation surface area is 48" high by 96" wide (121.9 cm x 243.8 cm). Handouts may be used, but audiovisual equipment will not be available. The presenter will be responsible for bringing pins and velcro.

Note: The Program Committee reserves the right to make the final determination on which format will be used for each presentation.

Instructions for Preparing Abstracts

1. All abstracts must be written in English.
2. All abstracts must be approved and signed off by all authors before submission.
3. Title — The title should be short but descriptive. The first letter in each word in the title and should be capitalized.
4. Authors — List all authors using the following style: first name or initials followed by the surname.
5. Presenter Name and Title — List the full name and title of the person who will present the paper.
6. Presenter Address — List the name of the department, institution and full postal address (including zip/postal code and country).

7. Phone Number — List the phone number, including area, country, and city codes of the presenter.
8. Fax Number — List the fax number, including area, country, and city codes of the presenter.
9. E-mail — List the E-mail address for the presenter.
10. Format preferred — Check the box to indicate oral or poster format. The Program Committee reserves the right to make the final determination of presentation format.
11. Category — The categories are used by the Program Committee to organize the posters and technical sessions. Please check the box which best describes the category for which the abstract is suitable.
12. Developing Scientist Awards Competition — Check the box to indicate if the presenter is a student wishing to be considered in this competition. The student will make the initial submission, and IAFP will E-mail the abstract to the major professor, who will complete the submission process. For more information, see "Call for Entrants in the Developing Scientist Awards Competitions."
13. Abstract — Key the abstract into the web-based system. In addition, a double-spaced copy of the abstract, typed in 12-point font in MS Word, should be E-mailed to IAFP at the time of submission. Use no more than 300 words. Abstracts are most often rejected because of a failure to follow the instructions below.

In addition to following these instructions, authors should carefully review the sections on selection criteria and rejection reasons as well as the sample abstracts (available online) before submitting the abstract. Original research abstracts MUST be in the following format:

Introduction: State the reason for pursuing this work (2-3 sentences)

Purpose: State the purpose or objectives of the study (1-2 sentences)

Methods: State the methodology used in the study (2-3 sentences). The methods should be specific enough that researchers in the same or similar field would understand the basic experimental design or approach.

Results: Describe the results obtained in the study (2–3 sentences). NOTE: Specific results, with statistical analysis (if appropriate), MUST be provided. A statement of “results pending” or “to be discussed” is not acceptable and will be grounds to abstract rejection. Results should be summarized, do NOT use tables or figures.

Significance: State the significance of the findings to food safety and/or public health (1–2 sentences) NOTE: Do not include reference citations in the Abstract. Please see sample abstracts for further guidance on abstract structure.

Education abstracts MUST present an improvement or innovation on a proven method in order to educate others (about a food protection related topic). There should be a way to measure the outcomes and substantiate the improvements and/or outcomes. If measured, the sample size should be sufficiently large to represent the intended population.

Abstract Submission

Abstracts submitted for IAFP 2007 will be evaluated for acceptance by the Program Committee. Please be sure to follow the 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.

Abstracts must be received no later than January 16, 2007. Completed abstract and information must be submitted online. Use the online submission form at www.foodprotection.org. In addition, a double-spaced copy of the abstract, typed in 12-point font in MS Word, should be E-mailed to IAFP at the time of submission. You will receive an E-mail confirming receipt of your submission.

Selection Criteria

1. Abstracts must be structured as described above.
2. Abstracts must report the results of original research pertinent to the subject matter. Papers should report the results of new, applied studies dealing with: (i) causes (e.g., microorganisms, chemicals, natural toxicants) and control of all forms of foodborne illness; (ii) causes (e.g., microorganisms, chemicals, insects, rodents) and control of food contamination and/or spoilage; (iii) food safety from farm-to-fork (including all sectors of the chain including production, processing, distribution, retail, and consumer phases); (iv) novel approaches for the tracking of foodborne pathogens or the study of pathogenesis and/or microbial ecology; (v) public health significance of foodborne disease, including outbreak investigation; (vi) non-microbiology food safety issues (food toxicology, allergens, chemical contaminants); (vii) advances in sanitation, quality control/assurance, and food safety systems; (viii) advances in laboratory methods; and (ix) food safety risk assessment. Papers may also report subject matter of an educational 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.

Rejection Reasons

1. Abstract was not prepared according to the “Instructions for Preparing Abstracts.” This includes abstracts that are too lengthy.
2. Abstract reports inappropriate or unacceptable subject matter.
3. Abstract is not based on accepted scientific or educational practices and/or the quality of the research or scientific/educational approach is inadequate.
4. Potential for the approach to be practically used to enhance food safety is not justified.
5. Work reported appears to be incomplete and/or data and statistical validity are not presented. Percentages alone are not acceptable unless sample sizes (both numbers of samples and sample weight or volume) are reported. Detection limits should be specified when stating that populations are below these limits. Indicating that data will only appear in the presentation without including them in the abstract is NOT acceptable.
6. Abstract was poorly written or prepared. This includes spelling and grammatical errors or improper English language usage.
7. Results have been presented/published previously.
8. Abstract was received after the deadline for submission.
9. Abstract contains information that is in violation of the International Association for Food Protection Policy on Commercialism.
10. Abstract subject is similar to other(s) submitted by same author. (The committee reserves the right to combine such abstracts.)
11. Abstracts that report research that is confirmatory of previous studies and/or lacks originality will be given low priority for acceptance.

Deadlines and Notification Dates

- Abstract Submission Deadline: January 16, 2007.
- Submission Confirmations: Within 48 hours of submission.
- Acceptance/Rejection Notification: February 28, 2007.

Contact Information

Questions regarding abstract submission can be directed to Tamara P. Ford, 515.276.3344 or 800.369.6337; E-mail: tford@foodprotection.org

Program Chairperson

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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 April 30, 2007.
7. Entrants who are full time students, with accepted abstracts will receive a complimentary, one-year Student Membership with *JFP* Online.
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 copy of the abstract will be E-mailed to the major professor for final approval.
9. You must also specify full-time student or part-time student.

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 April 30, 2007. Only competition finalists will be judged at the Annual Meeting and will 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 are expected to be present at the banquet where the award 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 receive a complimentary, one-year Membership including *Food Protection Trends*, *Journal of Food Protection*, and *JFP* Online.

Policy on Commercialism

for Annual Meeting Presentations

1. INTRODUCTION

No printed media, technical sessions, symposia, posters, seminars, short courses, and/or other related types of forums and discussions offered under the auspices of the International Association for Food Protection (hereafter referred to as 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 express 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 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 conclu-

sions 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 not be publishable because it is proprietary to the author's agency or company or to the user. However, the scientific principles and validation of performance parameters must be described for such products or services. Conclusions and/or comparisons may be made only 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 convener, 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 convener to verify that all graphics to be shown have been cleared by Program Committee chairperson, session convener, 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 convener, 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 convener that a violation or violations have occurred or are occurring, he or she will publicly 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 technical reviewers, session convenors, and/or staff may all 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.

The Perfect Fit



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Many job seekers and employers are discovering the advantages of shopping online for industry jobs and for qualified candidates to fill them. But the one-size-fits-all approach of the mega job boards may not be the best way to find what you're looking for. **IAFP Career Services** gives employers and job seeking professionals a better way to find one another and make that perfect career fit.

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December 2006

Fellow IAFP Members:

As we prepare for a new year, I want to encourage you to become involved in the International Association for Food Protection's Committees and Professional Development Groups (PDGs). From personal experience, I can tell you that participation in IAFP's Committees and PDGs is truly a win-win. Through your involvement, you can help provide guidance and information for the Association, your profession, and fellow IAFP Members. And while you are helping the Association and others, you'll be networking with leading experts in the field, learning from their experiences, and developing valued relationships.

Committees and PDGs are a vital component of IAFP. They meet during the Annual Meeting and share information throughout the year via conference calls or E-mail. Therefore, even if you're unable to attend IAFP 2007 in Lake Buena Vista, Florida, your involvement is still possible. Please review the list of Committees and PDGs and their respective mission statements listed on the following pages. If you find one that sounds interesting, simply contact the IAFP office to let us know which group you want to join. Getting started is really that simple.

For those of you who have participated in our Committees or PDGs in the past, I want to thank you for your service and encourage you to stay involved. Your continued participation is important to the success of the Association.

As usual, your comments, questions, and suggestions are welcomed. Please do not hesitate to contact the IAFP office or myself if we can be of help.

In closing, remember that learning is a lifelong journey. I invite you to take an important step in this journey by getting involved in IAFP's Committees or PDGs. Together we'll learn from one another and help *Advance Food Safety Worldwide*.

Best Regards,

J. Stan Bailey
Vice President, IAFP

"Our mission is to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply."
Publisher of the *Journal of Food Protection* and *Food Protection Trends*

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IAFP COMMITTEES, PROFESSIONAL DEVELOPMENT GROUPS, TASK FORCE, AND AFFILIATE COUNCIL MISSION STATEMENTS

STANDING COMMITTEES

FPT Management Committee

The mission of the FPT Management Committee is to provide guidance to the Executive Board on matters concerning *Food Protection Trends*.

JFP Management Committee

The mission of the JFP Management Committee is to provide guidance to the Executive Board on matters concerning the *Journal of Food Protection*.

Program Committee

The mission of the Program Committee is to develop the Annual Meeting program, evaluate abstracts, identify symposia and speakers, identify all sessions' convenors, and oversee Developing Scientist Awards Committee.

SPECIAL COMMITTEES

3-A Committee on Sanitary Procedures

The mission of the 3-A Committee on Sanitary Procedures is to serve as IAFP representatives to the 3-A Sanitary Standards Committee; to review and provide comments on proposed changes and revisions to the 3-A Sanitary Standards.

Audiovisual Library Committee

The mission of the Audiovisual Library Committee is to review and evaluate audiovisual materials for accuracy and appropriateness of content, make recommendations regarding the purchase of audiovisual materials, and provide guidance on matters concerning the AV Library.

Awards Committee

The mission of the Awards Committee is to select recipients for the IAFP awards.

Black Pearl Selection Committee

The mission of the Black Pearl Selection Committee is to select the recipient of the Black Pearl Award.

Committee on Control of Foodborne Illness

The mission of the Committee on Control of Foodborne Illness is to review information on epidemiology and control of communicable diseases of primary concern to food safety and related areas, and prepare manuals and articles addressing investigation of control of food safety-related problems.

Constitution and Bylaws Committee

The mission of the Constitution and Bylaws Committee is to review and study the Constitution and Bylaws of IAFP and make recommendations to the Executive Board for changes to be considered for submission to the Membership for ratification.

Developing Scientist Awards Committee

The mission of the Developing Scientist Awards Committee is to select finalists and judge the Developing Scientist Awards Competition at the IAFP Annual Meeting.

Fellows Selection Committee

The mission of the Fellows Selection Committee is to solicit nominations and make recommendations to the Executive Board for eligible Members to be confirmed as Fellows by the Executive Board.

Foundation Committee

The mission of the Foundation Committee is to oversee IAFP Foundation monies, solicit gifts to the Foundation, and identify and fund programs which further the goals and objectives of the Association.

Membership Committee

The mission of the Membership Committee is to develop strategies to retain current members and attract new members.

Nominating Committee

The mission of the Nominating Committee is to select and submit names of nominees for the office of Executive Board Secretary for election by the IAFP Membership.

Past Presidents' Committee

The mission of the Past Presidents' Committee is to serve as an advisory committee to the Executive Board.

Tellers Committee

The mission of the Tellers Committee is to count and certify the results of each election and other membership votes.

PROFESSIONAL DEVELOPMENT GROUPS

Applied Laboratory Methods PDG

The mission of the Applied Laboratory Methods PDG is to provide a forum for the exchange and sharing of information related to the development and use of laboratory methods for the analysis of food and related commodities.

Beverage PDG

The mission of the Beverage PDG is to provide a forum to discuss and develop symposia on issues facing the beverage industry.

Dairy Quality and Safety PDG

The mission of the Dairy Quality and Safety PDG is to promote the production and processing of safe, high quality dairy products and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

Food Chemical Hazards and Food Allergy PDG

The mission of the Food Chemical Hazards and Food Allergy PDG is to facilitate communication on topics in food toxicology including food allergens.

Food Hygiene and Sanitation PDG

The mission of the Food Hygiene and Sanitation PDG is to provide information on the developments in hygiene and sanitation in the food industry.

Food Law PDG

The mission of the Food Law PDG is to provide an international forum for the exchange of information on the scientific issues associated with food laws, regulations and policy.

Food Safety Education PDG

The mission of the Food Safety Education PDG is to provide IAFP members and their clientele information on food safety education.

Fruit and Vegetable Safety and Quality PDG

The mission of the Fruit and Vegetable Safety and Quality PDG is to provide a forum to discuss items of interest to the safe production of fruit and vegetable products and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

Meat and Poultry Safety and Quality PDG

The mission of the Meat and Poultry Safety and Quality PDG is to provide a forum to discuss items of interest to the safe production of meat and poultry products and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

Microbial Risk Analysis PDG

The mission of the Microbial Risk Analysis PDG is to facilitate communication on the topic of microbial risk analysis (MRA), promote application and use of MRA and encourage research and data reporting methods that support MRA.

Retail Food Safety and Quality PDG

The mission of the Retail Food Safety and Quality PDG is to provide the retail food safety industry worldwide with information to prepare and serve safe food.

Seafood Safety and Quality PDG

The mission of the Seafood Safety and Quality PDG is to provide a forum to discuss items of interest to the safe production of seafood products and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

Student PDG

The mission of the Student PDG is to provide students of food safety with a platform to enrich their experience as members of IAFP.

Viral and Parasitic Foodborne Diseases PDG

The mission of the Viral and Parasitic Foodborne Diseases PDG is to promote awareness of non-bacterial causes of foodborne disease by encouraging food safety professionals and others to seek education and training that will enable them to contribute to preventing non-bacterial foodborne infections and outbreaks.

Water Safety and Quality PDG

The mission of the Water Safety and Quality PDG is to provide a forum to discuss items as to the role the safety and quality of water plays globally in the farm-to-table chain and to develop program topics and symposia for presentation at the IAFP Annual Meetings.

TASK FORCE

Rapid Response Task Force

The mission of the Rapid Response Task Force is to identify developing conditions affecting food safety and organize meetings on these issues to educate IAFP members.

AFFILIATE COUNCIL

The Affiliate Council is an advisory body to the IAFP Board, represents Affiliate Associations' interests, responsible for IAFP Awards Committee, interchanges ideas and recommendations on programs, awards and procedures between Affiliates and the Board.



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UPDATES

Silliker Announces New Positions

Silliker has announced the following promotions: Matt DeWitt was promoted to director of the Silliker, Inc., Modesto, CA, laboratory. He most recently served as operations manager at the northern California lab; Cathy Davidson was named director of the Silliker, Inc. Northeast Laboratory in Allentown, PA. Prior to joining Silliker, she served as a quality control manager for Bel / Kaukauna USA, and Dr. Mathew Lau was named general manager of Singapore and Southeast Asia Operations. He is responsible for recruiting staff and managing all aspects of business operations, including customer relationships, financial performance, government relations, and strategic planning. Prior to joining Silliker, Dr. Lau served as lead researcher at the Nanyang Polytechnic's Applied Research Group in Singapore.

Prairie Farms Dairy, Inc. Appoints New Chief Executive

The Board of Directors of Prairie Farms Dairy, Inc. has appointed Edward L. Mullins as executive vice president and chief executive officer. Mr. Mullins' appointment follows Roger D. Capps, who served as CEO of the dairy cooperative from October 2000 until his death on July 15, 2006.

Mr. Mullins becomes only the fourth chief executive in the sixty-eight year history of this Midwest dairy food processor and distributor. He joined Prairie Farms Dairy in 1980, working in retail dairy sales. Throughout his twenty-six years with the company, Mr. Mullins has worked alongside former CEO, the late Leonard J. Southwell, as well as Roger

Capps in various key management capacities. Since September 2003, Mr. Mullins had served as senior vice president, reporting to Mr. Capps.

In accepting the assignment, Mr. Mullins stated, "I am honored to have the confidence and support of the Board of Directors in appointing me as chief executive officer. I am fortunate to have worked with two icons in the dairy industry such as Roger Capps and Leonard Southwell. My job will be to build upon their great legacy in a way that would make them proud everyday."

Novazone Names David Cope President and Chief Executive Officer

Novazone, a provider of clean technology solutions for food and water including advanced, ozone-based applications, has announced the appointment of David Cope to the position of president and chief executive officer, effective immediately. Previously, Mr. Cope held the company's chief marketing officer position, and succeeds Paul White.

With more than 25 years of engineering, sales, marketing and executive management experience for high profile technology businesses, Mr. Cope joined Novazone in 2004 adding a new dimension and perspective to building a successful company. Under Mr. Cope's leadership, the company will accelerate its focus on developing new and differentiated clean technology solutions that will enable customers worldwide to deliver high quality food and water products without the use of harmful chemicals.

"Increased consumer awareness, demand for organic food and supporting legislative acts around the world are only a few examples of

the market drivers that demonstrate today's demand for fresh and safe food and water. Providing a suite of clean technology solutions that directly address these needs is our focus, and I am pleased to have an opportunity to take Novazone to the next level," said Mr. Cope.

Prior to joining Novazone in 2004, Mr. Cope worked with the venture community providing strategy, marketing and executive management consulting for public and private companies. Previously, Mr. Cope was president and CEO of BizGenics and held a variety of executive positions at Extricity (acquired by Peregrine), Marimba, Illustra (acquired by Informix) and IBM. His activities and accomplishments have led to a number of venture, finance and industry-based public speaking engagements and accolades including Red Herring's Best Marketing of the Year Award in 1997. Mr. Cope's published work includes bio-nutrition and ergonomics in *Omni* magazine, and a contributor to Arthur C. Clarke's, "July 20, 2019, Life in the 21st Century," which focuses on future sports and nutritional trends.

Mr. Cope holds a bachelor's degree in chemistry and biochemistry from San Jose State University. In addition, he participated in Harvard's Advanced Executive Management program.

Sargento Foods Makes Several Appointments to the Consumer Products Division

Lou Gentine has been appointed as the president of the consumer products division at Sargento. He will report to president and chief customer officer Bob Clouston.

UPDATES

Mr. Gentine obtained his bachelors of business from the University of Notre Dame and masters of business from Loyola University, joined the Sargento family in 2000 after three years as a commercial lender with American National Bank. During his tenure at the Chicago-based institution, he was responsible for managing 30 middle-market companies, most of them family-owned

After returning as an associate marketing manager at Sargento six years ago, Louie was promoted to business team manager in 2001. "During that time, he actively participated in the creative development process that led to several successful

marketing campaigns. Louie has demonstrated his readiness for expanded responsibility with each passing year," Lou Gentine said.

In July 2003, he was appointed production manager at Sargento. He replaces Mike Gordy, who was named senior vice president of New Channel Development.

Mark Gumm is the new senior director of traditional retail sales. He had been the director of sales for traditional retail. Previous to that position, he was the director of sales in alternate channels. He has served progressively responsible positions in sales and marketing during his 10 years with Sargento, and recently

completed his MBA from Concordia University.

Mike Sokol has been elevated to the senior director position in alternate channels sales. Mr. Sokol formerly served as director of sales in alternate channels and is currently pursuing his MBA at Concordia University. He has been with Sargento for 13 years in various sales positions.

"Mike has managed a number of alternate channel customers, while also having a great deal of experience dealing with traditional retail, extreme value, convenient stores, drug and mass merchandisers. He has a strong track record and brings valuable experience and knowledge to his new role," Gentine said.

Announcing

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Base membership plus the flexibility of choosing what **YOU** want as part of your membership package.

Watch for this on your next renewal
or call the Association office for details.

3-A SSI Initiates Canvasses for New Pharmaceutical Equipment Standards

3-A Sanitary Standards, Inc. (3-A SSI) announces its intent to establish canvasses on proposed standards for equipment and materials used for Active Pharmaceutical Ingredient (API) manufacturing. 3-A SSI is an ANSI accredited standards developer organization. Canvasses will be conducted on three draft documents:

- General Glossary of Terminology Used in Pharmaceutical 3-A® Standards,
- Pharmaceutical 3-A® Sanitary/Hygienic Standards for Materials for Use in Process Equipment and Systems, and
- Pharmaceutical 3-A® End Suction Centrifugal Pumps for Active Pharmaceutical Ingredients

Individuals interested in reviewing the draft standards or participating in the canvass should contact 3-A SSI. A copy of this announcement, contact information for 3-A SSI and information on canvass group participation are available at the 3-A SSI Web site at <http://www.3-a.org> under 'Standards, Actions and Public Review Drafts', or go directly to <http://www.3-a.org/actions/actions.htm>. The closing date for the canvass is December 15, 2006.

The new draft standards are under development by the Pharmaceutical Equipment Standards (P3-A) Steering Committee of 3-A SSI. The

committee oversees the development of new standards for equipment used in the production of APIs. Details on the P3-A Steering Committee and the scope of the new standards for API equipment/materials relative to other standards or industry guidelines are available at the 3-A SSI Web site at <http://www.3-a.org> under 'Pharmaceutical 3-A Standards', or go to <http://www.3-a.org/pharma/index.htm>.

Researchers Improve Methods for Detecting *Listeria*

Agricultural Research Service (ARS) scientists in Wyndmoor, PA, are improving methods to detect foodborne pathogens like the potentially deadly *Listeria monocytogenes*.

Quick, accurate, cost-effective methods for detecting pathogenic bacteria—essential to ensuring a safe food supply—are part of ARS safety research highlighted in the current issue of *Agricultural Research* magazine.

Listeriosis, the illness caused by *L. monocytogenes* infection, affects around 2,500 people in the United States every year, and kills about 500. Newborns, seniors, pregnant women and individuals with compromised or weakened immune systems are particularly susceptible.

Most methods for detecting harmful foodborne bacteria rely on antibodies, which are proteins used by the immune system to fight infections and foreign bodies. Because these antibodies target very specific infections, researchers can use them to identify and locate specific pathogens.

Antibodies vary in their degree of specificity. Current antibody-based methods for detecting *L. monocytogenes* can't distinguish this bacterium from the mixture of harmless bacteria found in most foods, according to Shu-I Tu, research leader of the Microbial Biophysics and Residue Chemistry Research Unit at the ARS Eastern Regional Research Center in Wyndmoor.

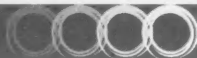
A molecular method called "phage display" uses bacteria and bacterial viruses, or phages, to quickly select antibodies to detect pathogens. Now ARS microbiologist George C. Paoli and chemist Jeffrey D. Brewster have employed phage display to isolate an antibody fragment that binds specifically to *L. monocytogenes*.

The researchers' success demonstrates that antibody phage display can be used to select antibodies for pathogen detection, even where traditional methods have proved inadequate.

New Crisis Management Centre Launched by FAO

Dr. Jacques Diouf, director-general of the United Nations Food and Agriculture Organization inaugurated a new FAO Crisis Management Centre (CMC) to fight Avian Influenza outbreaks and other major animal health or food health-related emergencies.

"The CMC represents a significant leap forward in FAO's ability to help Member Nations prevent and cope with disease outbreaks," Dr. Diouf said. Set up in collaboration with the Paris-based World



Organization for Animal Health and located at FAO's Rome headquarters, the Centre brings rapid-response capacity to transboundary animal and plant diseases, and can also react quickly to emergencies involving plant pests or food safety.

Supported by advanced communications technology, the Centre operates around the clock, seven days a week with a staff of up to 15 specialists and veterinarians. Disease information is monitored and updated from around the globe continuously. When a suspected outbreak is reported, CMC can dispatch its experts to any hot-spot in the world in under 48 hours.

"Three years into the Avian Influenza crisis, FAO and the international community can draw some satisfaction, and some relief, in the progress made to contain a most deadly menace to the health of animals and humans across the globe," Dr. Diouf said.

Although the disease remains a potent threat in Indonesia and Africa, and Eastern Europe and the Caucasus are still vulnerable, elsewhere in the world the situation has improved, he noted.

"But despite the encouraging and very real progress made, it does not mean we can lower our guard," Dr. Diouf warned.

"Only when H5N1 has been totally eradicated will the Sword of Damocles, or more pessimistically the time-bomb, of a human pandemic be removed," Dr. Diouf added.

"One of the lessons FAO has learned in three years of leading the international fight against Avian Influenza is that speed is of the essence," Dr. Diouf declared. "Alert must be lightning-quick. Reaction must be immediate in combating a disease which can move, across borders and continents, terrifyingly fast."

The CMC is headed by Dr. Karin Schwabenbauer, former chief veterinary officer of the German Federal Republic. Her deputy, Dr. Gary L. Brickler, is seconded from USDA Veterinary Services.

Responses to animal health emergencies will be under the responsibility of FAO's chief veterinary officer, Dr. Joseph Domenech. Operational support to the CMC will be provided by FAO's emergency and rehabilitation division.

The United States has provided 5.1 million dollars and three veterinarians for the Centre. Other contributors include the Federal Republic of Germany, France, Sweden, Switzerland, Norway, Saudi Arabia, China, Greece and Jordan.

Hide-washing Improves Beef Safety

A practical, effective cattle-washing system that reduces levels of pathogens on cattle hides, lessening the likelihood that the pathogens will get onto the meat and be consumed by humans, has been developed by Agricultural Research Service (ARS) scientists in Clay Center, NE.

The system could help reduce pathogens such as *Escherichia coli* O157:H7, which causes nearly 73,000 illnesses and 60 deaths every year, according to the Centers for Disease Control and Prevention (CDC).

Although *E. coli* O157:H7 can harm humans, cattle can carry it without adverse effects, according to researchers at the ARS Roman L. Hruska US Meat Animal Research Center (USMARC) in Clay Center. ARS research showed that the pathogens tend to gather on the animals' hides, which becomes a problem if those bacteria then come

into contact with meat during hide removal.

In the hide-washing process, the hide-on carcass is cleaned in a high-pressure water washing cabinet to remove excess organic matter, then sprayed with an antibacterial compound. In field trials, the process significantly reduced the number of samples that tested positive for *E. coli* O157:H7.

USMARC director Mohammad Koochmaraie estimates that about 40 percent of the feedlot-raised beef cattle processed in the United States now undergo hide-on carcass-washing treatment, a development that benefits both beef companies and consumers.

The US Department of Agriculture's Food Safety and Inspection Service reported that the incidence of *E. coli* O157:H7-positive ground beef samples collected fell by 43.3 percent after the beef industry began using the washing cabinets. The CDC also noted significant reductions in illnesses caused by *E. coli* and the pathogens *Listeria*, *Campylobacter*, *Yersinia* and *Salmonella*.

Read more about this research in the October 2006 issue of *Agricultural Research* magazine, which highlights ARS food safety research, available online at: <http://www.ars.usda.gov/is/AR/archive/oct06/beef1006.htm>.

"Bad-guy" Bacterium's Genetic Structure Probed

Inner workings of a food-poisoning organism called *Campylobacter lari* have been uncovered in greater detail than ever before by Agricultural Research Service (ARS) scientists in California. Their forays into the genetic makeup, or genome, of this little-known pathogen reveal new



details about the structure, or sequence, of its genes.

Research microbiologist William G. Miller of the agency's Produce Safety and Microbiology Research Unit led the investigation, working forward from a rough draft of the genome prepared earlier for ARS by The Institute for Genomic Research, Rockville, MD. Miller is based at the ARS Western Regional Research Center in Albany, CA.

C. lari is a cousin of the better-known *C. jejuni*, another "bad-guy" bacterium. *C. jejuni* causes millions of cases of diarrhea every year, according to Miller. Food poisoning outbreaks occurring in some other countries have been attributed to *C. lari* and have attracted the attention of US food safety researchers and public health professionals.

The new knowledge about the structure of *C. lari* genes could open the door to innovative strategies that snafu the microbe's ability to infect us.

Read more about this and other ARS food safety research in the October 2006 issue of *Agricultural Research* magazine, online at <http://www.ars.USDA.gov/is/AR/archive/oct06/campylo1006.htm>.

Researchers Develop Technologies to Devour Food Pathogens

Purdue University researchers are developing two inexpensive technologies that may be able to prevent future foodborne illness, such as the recent outbreak of *E. coli* in contaminated spinach.

Together, these technologies rapidly detect and eradicate foodborne pathogens. The first method uses a laser to detect and identify many types of bacteria, and is about three times faster and one-tenth as expensive as current technology.

"A second innovation uses chlorine dioxide gas to kill pathogens on produce, fresh fruits and vegetables. This would be a large step up from current technologies, which mainly involve washing and scrubbing, and cannot completely rid a product of a pathogen like *E. coli*," said Richard Linton, a professor of food science.

"We can use the laser technology to detect problems more quickly, determine exactly what the pathogen is and where it came from. As for using this gas as a disinfectant, I would say that in my 13 years of doing research, it is 10,000 to 100,000 times more effective than any process I have seen," Linton said.

While different in nature, the methods have the common goal of keeping food safe and preventing people from getting sick, and have each progressed to the point where they could be commercialized, Linton said. Patents are pending on both technologies, and the laser technology is available for licensing.

Linton says there is a definite need for these new methods. "Current technologies are insufficient to prevent foodborne illness," he said. "In the present system, once produce is contaminated with something like *E. coli*, that's it."

Arun Bhunia, also a professor of food science, leads the team that developed the laser-based technology, called "Bacteria Rapid Detection Using Optical Scattering Technology." The process works by shining a laser through a petri dish containing bacterial colonies. A computer program determines the type of bacteria by analyzing how light is refracted – a unique "scatter pattern."

Bhunia has shown his technology is capable of recognizing *Listeria monocytogenes*, a microbial pathogen that is the leading cause of foodborne illness. The pathogen has a

high mortality rate, one in five, and kills about 500 people each year. *E. coli*, which has the second highest mortality rate, kills less than 1 percent of those infected.

"This is a really exciting technology," Bhunia said. "I definitely believe it could help save lives, which is our ultimate goal."

Industry has shown interest in Bhunia's technology, as well as the chlorine dioxide work done by Linton and the project's co-leader, Mark Morgan, a professor of food science.

"We are currently working on an industrial tunnel system to apply the gas to produce," Morgan said. His team is also investigating using the gas to sterilize processing equipment. "This would be very helpful, as it could speed up the sterilization process and eliminate the heat energy currently used for such processes."

Previous results have shown the gas to be highly effective at killing microbial pathogens. The largest obstacle remaining is optimizing the system to dispense the appropriate amount of chlorine dioxide, Morgan said. Enough of the gas must be deployed to kill the pathogens, but too much can cause a decrease of quality in the product, such as browning of leafy greens.

"If the product is safe, but nobody will eat it, that's not what we want," Linton said. "We are always thinking in terms of, 'Will this work for industry?' In this case, I believe the answer is yes. I would like to see this technology used regularly by industry in a couple years from now."

Both technologies have the potential to help prevent foodborne illness, Linton said, but he also noted that following proper agricultural practices is as important, if not more important, for food safety.



Since *E. coli* or *Escherichia coli* is found in the intestines of warm-blooded animals, it does not naturally contaminate most produce. Therefore, following more stringent sanitary policies, as well as practicing better manure and water management, can go a long way to help prevent future outbreaks, Linton said.

E. coli is especially problematic because it only takes as few as 10 cells to infect humans. Other pathogens, like *Salmonella*, need thousands or millions of cells to cause infection.

As of September 26, 183 cases of illness were reported due to spinach contamination with a virulent strain of *E. coli*.

"What is happening is unacceptable," Linton said.

Bhunja's technology is further described in an article published this summer in the *Journal of Biomedical Optics*. Linton and Morgan have been working with chlorine dioxide for years, and have several published studies, one of which appeared in the *Journal of Food Protection* in 2004.

'Failed' Experiment Yields a Biocontrol Agent That Doesn't Trigger Antibiotic Resistance

A failed experiment turned out to be anything but for bacteriologist Marcin Filutowicz.

As he was puzzling out why what should have been a routine procedure wouldn't work, he made a discovery that led to the creation of a new biological tool for destroying bacterial pathogens — one that doesn't appear to trigger antibiotic resistance.

The discovery also led to the startup of a promising new biotechnology firm that has already brought

Wisconsin a dozen new, high-paying, highly skilled jobs. Filutowicz is a professor of bacteriology in the University of Wisconsin-Madison College of Agricultural and Life Sciences.

His inspiration came one morning in 1999 when he was puzzling over a failed experiment. A researcher in his lab had been trying to insert two different mutations into an ordinary bacterial plasmid, a routine task for the experienced scientist, but every attempt failed to produce a live bacterium.

Plasmids are circular DNA molecules that are different from chromosomal DNA, the genetic material that encodes the instructions for life in all cells. Plasmids are small, non-chromosomal DNA molecules. They are common in bacteria. The genes in plasmids often encode information that confers some selective advantage to their hosts, such as the ability to resist antibiotics.

Plasmids are useful tools for genetic engineering. It is relatively easy for a scientist to alter a plasmid's genetic makeup and then transfer the plasmid into a bacterium. The host bacterium then replicates the recombinant plasmid and transfers copies of it to other bacteria in a process called conjugation.

As he investigated the failed experiment, Filutowicz, who has spent two decades studying how plasmid replication is regulated, made a critical observation. A plasmid with one or the other of the benign mutations persisted, although it replicated a little more frequently than a mutation-free plasmid. How could it be, he wondered, that a bacteria with both mutations could not survive? The professor surmised that when the two mutations were brought together, the plasmid carrying them

became harmful by over-replicating within the bacterium, ultimately destroying it.

"And I thought, this is very cool!" recalls Filutowicz. "I didn't observe any survival or further resistance to over-replication, even though typically when bacteria are exposed to harmful agents like antibiotics, resistant strains emerge. Nothing with the killer plasmid survived."

The next step was to engineer a strain of bacteria that could suppress over-replication of the key plasmid. This so-called "Trojan horse" could then be used to spread the killer plasmid via conjugation to targeted bacterial pathogens that lacked the ability to resist over-replication.

"We harnessed this plasmid," thought Filutowicz. "Now, how can we use it?"

The answer came in 1999, when he filed a disclosure through the Wisconsin Alumni Research Foundation, which patents the discoveries of UW-Madison researchers and licenses technology to industry. Filutowicz believed so strongly in the potential of the basic work done in his lab that he, along with professor of oncology Richard Burgess, started a company called ConjuGon "because you conjugate and it's gone!" to develop the technology and ultimately bring it to human trials, which are currently planned for 2007 or 2008. A patent for his discovery has just been issued.

"We see a broad application for this work," he explains. "We can build things that don't exist in nature. It's a versatile concept that doesn't apply to just one antimicrobial agent."

Filutowicz and Burgess, wine enthusiasts who are as comfortable fermenting grapes as they are transforming bacterial plasmids, partnered with students from the Weinert



Applied Ventures Program at the UW-Madison School of Business to develop a plan for ConjuGon. One of the students, Sal Braico, ultimately became chief operating officer of the company. "Sal learned about biology and got experience with a start-up, and Dick and I got business expertise. It was a great partnership," Filutowicz says.

In addition to federal funding from the National Science Foundation and the Department of Defense, the company has also attracted so-called angel funding

from outside investors. Filutowicz and Burgess are not on the payroll of the research park company themselves, but they are proud that ConjuGon employs other people and has created 12 high-paying and highly skilled jobs for the Madison area.

Because of that, says Filutowicz, ConjuGon is helping to ensure the future of microbial sciences at the UW-Madison. "We have one of the largest and most prominent communities of microbiologists in the country on the UW-Madison campus. It's important to provide

jobs and opportunities in Madison for people who train here," he says.

And beyond helping to expand Wisconsin's booming biotechnology sector, success at ConjuGon will ultimately help nurture future scientific innovations from the university.

"Because WARF is the licensor of my patent, and the company is a licensee, ConjuGon, if successful, will ultimately support more UW research," Filutowicz explains. A powerful, long-reaching impact – all from an idea that originated in a failed experiment.

Congratulations...

In September 2006, the International Association for Food Protection participated at the Food Safety Conference, "Reaching At-Risk Audiences and Today's Other Food Safety Challenges" in Denver, CO. While exhibiting, we offered a drawing for a one-year Membership with our Association and a free registration to our Annual Meeting. We are pleased to announce the following winners of the drawing:

IAFP Membership

Lynn Nakamura-Tengan
University of Hawaii at Manoa
Kahului, HI

IAFP 2007 Annual Meeting Registration

Dina B. Ellorin
County of San Diego
San Diego, CA

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**Did you know
IAFP has Affiliate
Organizations
across the United
States and other
countries?**

See page 954 of this issue
for additional information.

INDUSTRY PRODUCTS



Torrey Pines Scientific, Inc.

New Range of Analog Stirring Hot Plate

Torrey Pines Scientific, Inc. announces its new line of Analog Hot Plates, Stirrers and Stirring Hot Plates. These units feature compact size, 6" square (15.24 cm) solid, flat, white, ceramic heater tops with temperature range to 450°C which is attainable in about 2 minutes. Ideally suited for strong stirring of aqueous solutions up to 2.5 liters with a range from 100 to 1500 rpm. The overall dimensions are 10"(25.4 cm) deep by 7"(17.78 cm) wide by 4.5"(11.43 cm) tall. The ST1 Stirrer comes with an aluminum top with a silicon rubber foam pad on it to prevent vessels from creeping when vigorously stirred.

These units can support more than 35 pounds (13.5 kg) on the plate surface, and are designed to keep spills out of the chassis. They have all controls mounted well in front of the heater surfaces to protect against accidental burns. All units are available in 100VAC/50Hz, 115VAC/60Hz, 220VAC/60Hz and 230VAC/50Hz. They are fused for safety and are sup-

plied with user's manual and detachable line cord for the country of use. All units are UL, CSA and CE rated.

Torrey Pines Scientific, Inc.

866.573.9104

San Marcos, CA

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Bio-Rad's RAPID'E. coli 2™ Agar Granted Performance Tested Method Status by AOAC Research Institute

RAPID'E. coli 2 agar, manufactured by Bio-Rad Laboratories, was granted Performance Tested Method status by the AOAC Research Institute (certificate # 050601). RAPID'E. coli 2 is a chromogenic medium for detection and enumeration of *E. coli* and other coliform bacteria in food in 24 hours. It is a rapid method producing accurate and easy-to-read results. Current methods for enumeration of *E. coli* and coliform bacteria can be costly and laborious. The use of chromogenic substrates in media has led to development of faster and easier methods for detection, differentiation and enumeration of target bacteria.

RAPID'E. coli 2 is validated for enumeration of *E. coli* and other coliform bacteria in raw ground beef, raw boneless pork, fermented sausage, processed ham, processed turkey, frozen turkey breast, raw ground chicken, cottage cheese, processed ricotta cheese, unpasteurized raw milk, and dry infant formula. It is validated at two incubation temperatures, 37°C

and 44°C (cottage cheese and processed ricotta cheese are only validated at 37°C only).

The principle of RAPID'E. coli 2 medium relies on simultaneous detection of two enzymatic activities, Beta-D-Glucuronidase (GLUC) and Beta-D-Galactosidase (GAL). The medium contains two chromogenic substrates. One substrate is specific to GAL and results in blue green coloration of colonies positive for this enzyme and one substrate is specific to GLUC and results in violet coloration of colonies positive for this enzyme. Coliforms, other than *E. coli*, (GAL+/GLUC-) form blue to green colonies while, specifically, *E. coli* (GAL+/GLUC+) form violet colonies. A count of total coliforms can be obtained by adding the number of blue colonies and the number of violet colonies. Differentiation of coliforms and specifically *E. coli* is carried out by observing a simple color change reaction. Observation of gas bubbles for differentiation is not necessary.

Bio-Rad Laboratories

800.424.6723

Hercules, CA

www.foodscience.bio-rad.com

Warnex Receives NPIP Approval for Salmonella Test – Test Approved by USDA's National Poultry Improvement Plan

Warnex Inc. has announced that its *Salmonella* test used with the Warnex™ Rapid Pathogen Detection System has been approved by the

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The publishers do not warrant, either expressly or by implication, the factual accuracy of the products or descriptions herein, nor do they so warrant any views or opinions offered by the manufacturer of said articles and products.

INDUSTRY PRODUCTS

US Department of Agriculture's (USDA) National Poultry Improvement Plan (NPIP).

The objective of the National Poultry Improvement Plan is to provide a cooperative industry-state-federal program through which new technology can be effectively applied to the improvement of poultry and poultry products. The plan consists of a variety of programs intended to prevent and control poultry diseases.

The Warnex *Salmonella* test for environmental samples was independently validated by NPIP-approved laboratories, which concluded that the Warnex test performed as well as or better than the two NPIP-approved microbiological reference methods. In addition, the test performed just as well with pooled samples, which can increase a plant's testing efficiency and significantly reduce testing costs.

"Our new sample pooling feature clearly illustrates our commitment to innovation aimed at improving our clients' efficiency. This, in addition to NPIP approval which provides further regulatory and scientific validation of our tests, will help reduce the barrier to entry for major poultry clients and encourage adoption," said Mark Busing, President and CEO of Warnex.

The Warnex Rapid Pathogen Detection System offers a versatile detection and quantification platform, using real-time PCR technology combined with proprietary genetic markers and software, to rapidly and accurately determine the presence of pathogens in a sample. The system allows for the simultaneous detection of multiple pathogens and processing of samples within 3 to 48 hours, a sig-

nificant improvement over traditional microbiology tests that require 5 to 7 days.

According to the US Centers for Disease Control and Prevention (CDC), an estimated 1.4 million cases and 500 deaths occur in the United States annually due to *Salmonella* infections. Salmonellosis, an infection caused by eating food contaminated with *Salmonella*, causes symptoms such as diarrhea, fever, vomiting and abdominal cramps, lasting usually 4 to 7 days. In some cases, it may cause blood infection and even death, if untreated.

Warnex Inc.
450.663.6724

Laval, Quebec, Canada
www.warnex.ca

Real Time Web-based Temperature Monitoring/Alarm Service from Next Control Systems

Next Control Systems LLC, is pleased to announce an affordable internet-based remote sensing / alarm service. The service is "always on" and posts temperature/environmental data onto a secure web site in real time. The web site is accessible via web browser and password. Data transmission is via wireless communication link to our service centre where it is maintained online and archived. Wireless communication link to our centre is available from anywhere in the world.

Alarm conditions should they occur, are handled by trained operators 24/7/365. Alarm notifications to user supplied contact list are via voice, email and pager with complete audit

trail. Alarm records are also posted on web pages.

Some of the benefits to users:

- no system to manage
- product loss avoidance
- a centralized automated approach to temperature logging from multiple sites worldwide
- accurate online temperature records for quality assurance purposes
- access from anywhere at any-time by key managers
- no phone lines or DSL links needed

Data transmission and communications costs are included with the service.

The on-site hardware, Tutela (Latin for care and safeguarding) is a plug and play device with built in wireless communications interface. The system is scalable from a minimum of 4 inputs to hundreds. Installation is less than a day. Data transmission and communications costs are included with the service.

Customers include food retail, industrial, and medical enterprises.

Next Control Systems

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Gainco's YieldPlus™ for Breast Trimming and Portioning Improves Meat Yield, Throughput and Quality

With Gainco's new YieldPlus™ System for Breast Trimming and Portioning, poultry processors can dramatically reduce their labor requirements in breast meat processing

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INDUSTRY PRODUCTS

operations, while also achieving measurable improvements in portion control consistency, product yields, throughput and quality.

YieldPlus™ brings together advanced product distribution and data collection systems from Gainco with the yield improving and labor saving technologies of Bettcher Industries' AirShirz® air-powered scissors. Breast portions are automatically distributed for further processing into fillets, tenders or nuggets and tracked by individual operator station, thereby allowing poultry processors to hold their employees accountable for individual performance in the areas of yield, portion control consistency, quality and productivity.

The YieldPlus™ system allows for maximum flexibility as well as consistency in processing breast meat products in varying specs (e.g., size, shape and weight), while the user-friendly interface makes pre-programming of orders and jobs a snap. Moreover, with the YieldPlus™ system in place on the processing floor, meat quality is improved by eliminating the incidence of bone fragments or cartilage at the system's built-in quality control stations.

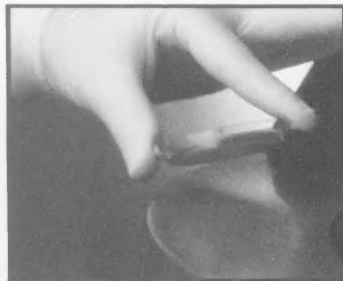
The YieldPlus™ system incorporates Gainco's rugged DuraWeigh® bench scales featuring IP69K-rated Infiniti™ weight indicators for the ultimate in protection from harsh chemical washdowns, water ingress and condensation. The system's ingenious open-frame construction eliminates water puddling and guards against corrosion and the buildup of bacteria, thereby enhancing food product safety.

In addition to its precision-weighting capabilities, the YieldPlus™ system delivers information reports and sum-

maries instantly – including highly valuable comparative reporting per operator station. Data generation has never been faster or easier, and all data can be archived for historical tracking and analysis. The system is also network-interface capable for remote access and monitoring. RF transmission of data eliminates hard-wiring requirements, thereby allowing for flexible set-up and preservation of the integrity of the system's "smart" operating elements.

The modular design of the YieldPlus™ system for breast trimming and portioning allows Gainco to meet the individual needs of different processors. For example, the system can be constructed with single or dual-sided operator stations – all the way up to 24 operator stations per system.

Gainco, Inc.
800.467.2828
Gainesville, GA
www.gainco.com



Hardy Diagnostics

Hardy Diagnostics Offers Contact Plates for Environmental Monitoring

The contact plate from Hardy Diagnostics is a petri dish with a diameter of 60 mm, slightly overfilled with a nutrient agar. The petri plate

has a grid molded into the bottom to aid in the counting of microorganisms. The Tryptic Soy Agar with Lecithin and Tween contact plate is useful in monitoring total microbial contamination and to assist in determining surface sanitation. Tryptic Soy Agar provides amino acids and other nitrogenous compounds making it a nutritious medium for many microorganisms. Germicidal or disinfectant residue (quaternary ammonia compounds, hexachlorophene, and ethanol) is neutralized by the addition of Lecithin and Tween. TSA with Lecithin and Tween is available as a 15 x 60 mm contact plate. For cleanroom applications, TSA with Lecithin and Tween contact plates are available double bagged and gamma irradiated.

Hardy Diagnostics
800.266.2222
Santa Maria, CA
www.hardydiagnostics.com

Balston Steam Filters Remove Contaminants from Steam in Food Processing

Balston® Steam Filters that permit direct steam contact with food are now available from Parker Hannifin Corp.

Balston Steam Filters remove 98+% of 0.1 micron particles and 100% of all visible particles from steam. Liquid condensate is removed at the same efficiency as for solid particles. Models are available to handle flow rates of up to 3,000 lbs/hr.

Other benefits of Balston Steam filters include: Reduction in steam condensate mixing with the food products when steam is used for agitating, mixing or cooking; significant

Be sure to mention, "I read about it in Food Protection Trends"!

INDUSTRY PRODUCTS

reduction in carryover of boiler feedwater chemicals into the food product, causing taste and odor problems; greatly reduced maintenance requirements for valves, cookers, heat exchangers, and other equipment.

Balston Steam Filters are in full compliance with the requirements of the US Food, Drug and Cosmetic Act. They meet the regulations for Indirect Food Additives used as Basic Components for Repeated Use Food Contact Surfaces as specified in 21 CFR Part 177, and Current Good Manufacturing Practices, 21 CFR Part 110. Balston Steam Filters have also been accepted by the USDA for use in federally inspected meat and poultry plants. They are also in full compliance with the 3-A Accepted Practices (Number 609-00) for producing steam of culinary quality, and they are in full compliance with the requirements of the Health Protection Branch of Health and Welfare Canada.

Parker Hannifin Corporation
978.858.0505
Haverhill, MA
www.parker.com/balston

HACCP Food Safety Thermometer Introduced by Metris Instruments

Metris Instruments LLC has introduced the model TCT303F thermometer for food temperature monitoring, food safety and HACCP monitoring. Designed specifically for food service applications, the compact, lightweight TCT303F allows food professionals to quickly scan the surface of hot or cold foods for an instantaneous surface temperature reading on the large back-lit LCD



Metris International LLC

display or insert the probe to measure internal temperature. The TCT303F features separate "scan" and "probe" measurement buttons to perform temperature readings with the infrared or contact probe. Bright green and red warning lights (LEDs) indicate whether the measured temperature is within "safe" HACCP temperature limits. A green light indicates safe hot and cold holding temperatures, while potentially unsafe temperatures activate a red light.

Colonies of organisms multiply rapidly when food temperature is neither too cold nor too hot. Organisms most frequently implicated in cases of foodborne illness multiply most prolifically in the temperature "danger zone" from 41°F to 140°F. The TCT303F provides the accuracy recommended by the FDA Food Code of $\pm 2^\circ\text{F}$ ($\pm 1^\circ\text{C}$) over the entire HACCP critical temperature range.

Professionals involved in food-handling operations such as food service, cooking, cooling, storage and transportation are responsible for maintaining food at its proper tem-

perature, and minimizing the time during which it's held in the "danger zone." Watertight and washable, the TCT303F is designed to easily and quickly obtain temperature measurements of food to ensure safe conditions.

The TCT303F food thermometer offers features and performance characteristics not offered by other food thermometers including:

- Non-contact measurement range: -67 to 482°F (-55 to 250°C); Accuracy: $\pm 2^\circ\text{F}$ (1°C)
- Probe measurement range: -67 to 626°F (-55 to 330°C); Accuracy: $\pm 1^\circ\text{F}$ (0.5°C)
- 0.5°F (0.2°C) display resolution
- GO/NO-GO HACCP temperature check
- Rugged K-type thermocouple probe (faster and more reliable than RTD probe)
- Bright white LED illuminates measured surface area
- "Lock" mode permits continuous temperature scan without continuously holding a button
- Error messages appear on LCD if measured or ambient temperature is out of range
- N.I.S.T. traceable factory calibration
- Lightweight (weighs about 3.5 oz.)

Specifically designed for food service professionals, the TCT303F is so small and lightweight you can keep the TCT303F ready in your pocket to easily verify that cold food is cold and hot food is hot. The unit uses inexpensive AAA batteries (included) and features auto power-off.

Metris Instruments LLC
866.844.3674
Los Gatos, CA
www.metrisinst.com

Be sure to mention, "I read about it in *Food Protection Trends*!"

COMING EVENTS

JANUARY

- **11, The Society for Applied Microbiology Winter Meeting**, Royal Society, Carlton House Terrace, London. For more information, go to www.sfam.org.uk/janmeet.php.
- **21-24, NMC 46th Annual Meeting**, Marriott Riverwalk, San Antonio, TX. For more information, call 608.848.4615; E-mail: nmc@nmconline.org.
- **23-25, Kentucky Association for Milk, Food and Environmental Sanitarians Annual Educational Conference**, Hyatt Hotel, Lexington, KY. For more information, contact Matt Rhodes at 502.574.6550; E-mail: matt.rhodes@louisvilleky.gov.
- **24-26, International Poultry Expo and International Feed Expo**,

Georgia World Congress Center, Atlanta, GA. For more information, call 770.493.9401 or go to www.ipe07.org.

FEBRUARY

- **4-8, Dairy Technology Workshop**, Randolph Associates, Inc., Birmingham, AL. For more information, call 205.595.6455; E-mail: HERConsult@aol.com.
- **24-28, AFFI Frozen Food Convention**, Monterey, CA. For more information, call AFFI at 703.821.0770; E-mail: affi-con@affi.com.

MARCH

- **14-15, Arizona Environmental Health Association Meeting**, Phoenix, AZ. For more information, contact Mohammed Heydari at 602.

867.1780; E-mail: president@azeha.org.

- **20-23, ISOPOL XVI**, Marriott Riverfront Hotel, Savannah, GA. For more information, contact Terry Reamer at 240.485.2776; E-mail: terry.reamer@aphl.org.
- **27-30, Michigan Environmental Health Association's 63rd Annual Education Conference**, Radisson Plaza, Kalamazoo, MI. For more information, contact Kristen Schweighofer at 734.222.3968; E-mail: schweigk@washtenaw.org.

APRIL

- **11, The Society for Applied Microbiology Spring Meeting**, Manchester Metropolitan University, London. For more information, go to www.sfam.org.uk/springmeeting.html.

IAFP UPCOMING MEETINGS

JULY 8-11, 2007
Lake Buena Vista, Florida

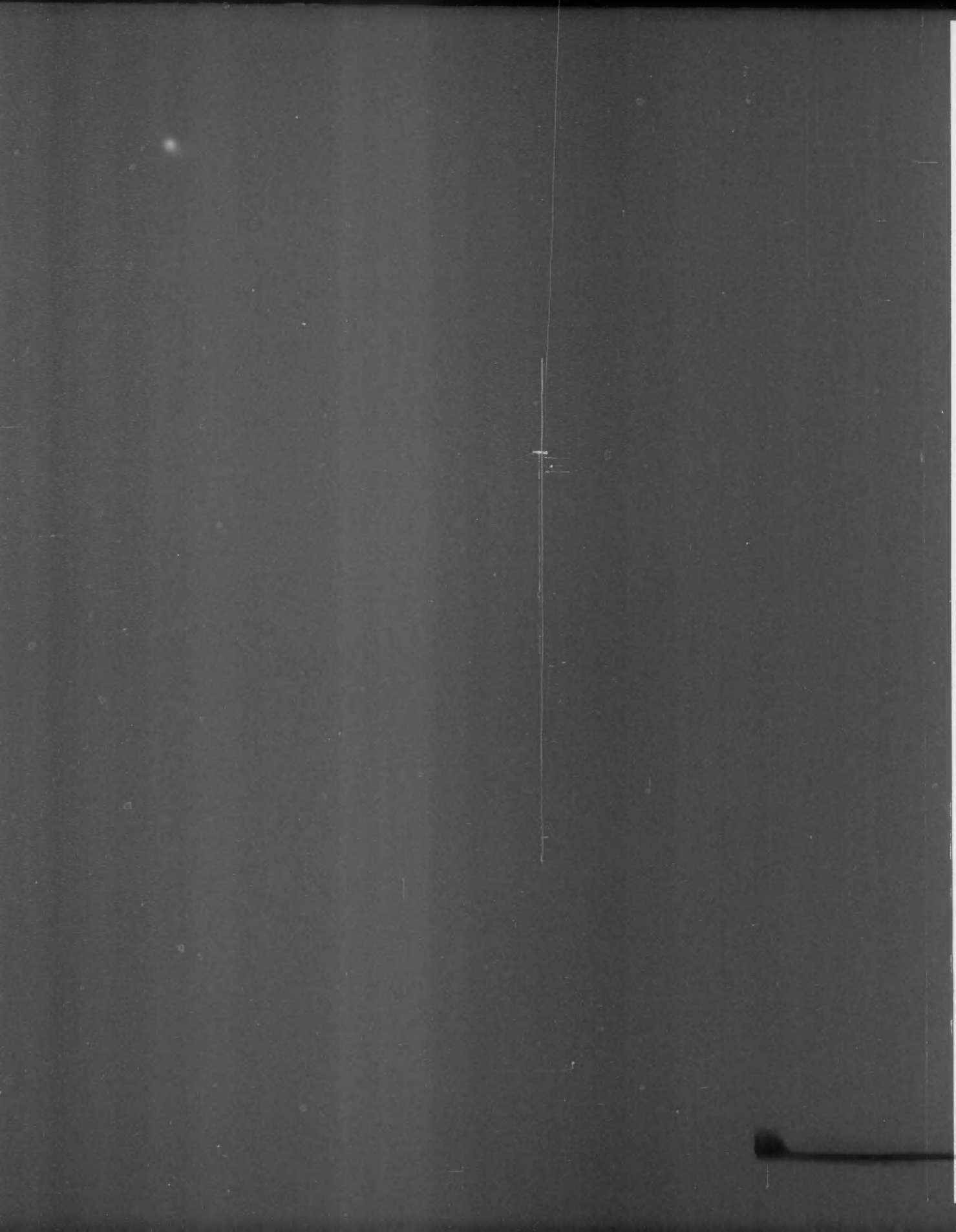
AUGUST 3-6, 2008
Columbus, Ohio

JULY 12-15, 2009
Grapevine, Texas

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



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**INTERNATIONAL ASSOCIATION
FOR FOOD PROTECTION**

**General Fund Statement of Activity
For the Year Ended August 31, 2006**

Revenue:

Advertising	\$121,305
Membership & Administration	534,719
Communication	784,046
Annual Meeting	832,415
Workshops	50,604
Total revenue	\$2,323,089

Expense:

Advertising	109,380
Membership & Administration	679,497
Communication	808,623
Annual Meeting	601,549
Workshops	48,530
Total expense	\$2,247,579

Change in General Fund: \$75,510

Net Assets as of 8/31/06:

General Fund	578,245
Foundation Fund	367,192
Restricted Fund	47,282
Speaker Travel Fund	78,920
Total net assets	\$1,071,639

ADVERTISING INDEX

Penn State University	944
Quality Management, Inc.	Inside Back Cover
University of Maryland	Inside Front Cover



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Guidelines are a first step, but more than anything, everyone – from the person harvesting the spinach to the person selling the spinach – must be compelled to take food safety seriously, even in the absence of an outbreak.

That means changing the culture of food safety; and marketing shapes culture.

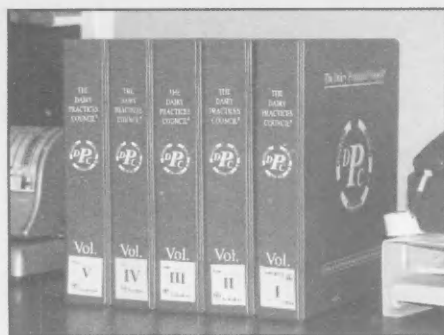
American culture is awash in what Molly O'Neil calls food pornography, in which basics such as cooking and eating have been transformed to voyeurism and fantasy (watch the Food Network), describing food with "prose and recipes so removed from real life that they cannot be used except as vicarious experience."

The current culture of food (and food porn) needs to be replaced by a culture of safe food, grounded in microbiology. The blather about natural, local and wholesome food needs to be replaced by advertisements for microbiologically safe food.

The American economy is driven by competition and the produce sector should compete for the food dollar in grocery stores and restaurants across the country, using safety as a selling point. The farmers or company that uses the best science to keep poop off the plate, and couples that with employee commitment, will capture the imagination of a hungry public.

May the best food safety system win.

Dr. Douglas Powell is scientific director of the Food Safety Network at Kansas State University and Ben Chapman is a PhD student at the University of Guelph in Canada. They are the authors of, most recently, a book chapter entitled, Implementing On-Farm Food Safety Programs in Fruit and Vegetable Cultivation, in the recently published, *Improving the Safety of Fresh Fruit and Vegetables*. <http://www.woodheadpublishing.com/en/book.aspx?bookID=831>; dpowell@ksu.edu; www.foodsafety.ksu.edu.



IAFP Offers "Guidelines for the Dairy Industry" from The Dairy Practices Council®

This newly expanded Five-volume set consists of 80 guidelines.

- 1 Planning Dairy Freestall Barns
- 2 Effective Installation, Cleaning, and Sanitizing of Milking Systems
- 3 Selected Personnel in Milk Sanitation
- 4 Installation, Cleaning, & Sanitizing of Large Parlor Milking Systems
- 5 Directory of Dairy Farm Building & Milking System Resource People
- 6 Natural Ventilation for Dairy Tie Stall Barns
- 7 Sampling Fluid Milk
- 8 Good Manufacturing Practices for Dairy Processing Plants
- 9 Fundamentals of Cleaning & Sanitizing Farm Milk Handling Equipment
- 10 Maintaining & Testing Fluid Milk Shelf-Life
- 11 Sediment Testing & Producing Clean Milk
- 12 Tunnel Ventilation for Dairy Tie Stall Barns
- 13 Environmental Air Control and Quality for Dairy Food Plants
- 14 Clean Room Technology
- 15 Milking Center Wastewater
- 16 Handling Dairy Products from Processing to Consumption
- 17 Prevention of & Testing for Added Water in Milk
- 18 Fieldperson's Guide to High Somatic Cell Counts
- 21 Raw Milk Quality Tests
- 22 Control of Antibacterial Drugs & Growth Inhibitors in Milk and Milk Products
- 23 Preventing Rancid Flavors in Milk
- 24 Troubleshooting High Bacteria Counts of Raw Milk
- 25 Cleaning & Sanitation Responsibilities for Bulk Pickup & Transport Tankers
- 27 Dairy Manure Management From Barn to Storage
- 28 Troubleshooting Residual Films on Dairy Farm Milk Handling Equipment
- 29 Cleaning & Sanitizing in Fluid Milk Processing Plants
- 30 Potable Water on Dairy Farms
- 31 Composition & Nutritive Value of Dairy Products
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- 33 Brucellosis & Some Other Milkborne Diseases
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- 92 HACCP - Principle Number One: Hazard Analysis
- 93 HACCP - Principles 2 & 3 Critical Control Points & Critical Limits
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- 101 Farmers Guide To Somatic Cell Counts In Cattle
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- 103 Approving Milk and Milk Product Plants for Extended Runs
- 105 Sealing Bulk Milk Truck Tanks

IAFP has agreed with The Dairy Practices Council to distribute their guidelines. DPC is a non-profit organization of education, industry and regulatory personnel concerned with milk quality and sanitation throughout the United States. In addition, its membership roster lists individuals and organizations throughout the world.

For the past 37 years, DPC's primary mission has been the development and distribution of educational guidelines directed to proper and improved sanitation practices in the production, processing, and distribution of high quality milk and milk products.

The DPC Guidelines are written by professionals who comprise six permanent task forces. Prior to distribution, every guideline is submitted for approval to the state regulatory agencies in each member state. Should any official have an exception to a section of a proposed guideline, that exception is noted in the final document.

The guidelines are renowned for their common sense and useful approach to proper and improved sanitation practices. We think they will be a valuable addition to your professional reference library.

If purchased individually, the entire set would cost \$367.00. We are offering the set, packaged in five looseleaf binders for \$265.00.

Information on how to receive new and updated guidelines will be included with your order.

To purchase this important source of information, complete the order form below and mail or fax (515-276-8655) to IAFP.

Please enclose \$265 plus \$17 shipping and handling for each set of guidelines within the U.S. Outside U.S., shipping will depend on existing rates. Payment in U.S. \$ drawn on a U.S. bank or by credit card.

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- D1020 Causes of Milkfat Test Variations
- D1030 Cold Haul Effects
- D1040 Filter Extraction Method for Determination of Raw Milk
- D1050 Dairy Plant
- D1055 Food Safety: Dairy Details
- D1060 Frozen Dairy Products
- D1070 The Gerber Bacterial Test
- D1080 High-Temperature, Short-Time Pasteurizer
- D1090 Managing Milking Quality
- D1100 Mastitis Prevention and Control
- D1105 Milk Hauling Training
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- D1120 Milk Processing Plant Inspection Procedures
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- D1140 Pasteurizer: Operation
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- D1170 3-A Symbol Council
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- E3110 Garbage: The Movie
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- E3128 Integrated Pest Management (IPM)
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- E3131 Key Pests of the Food Industry
- E3135 Physical Pest Management Practices
- E3135 Plastics Recycling Today: A Growing Resource
- E3140 Putting Aside Pesticides
- E3150 Radon
- E3160 RCRA-Hazardous Waste
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- E3170 Table 1 - Changes in the Remedial Process: Clean-up Standards and State Involvement Requirements
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- E3190 Table 3 - Enforcement & Federal Facilities
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- E3230 Table 6 - Research & Development: Closing Remarks
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- E3239 Sink a Germ
- E3245 Wash Your Hands
- E3250 Waste Not: Reducing Hazardous Waste
- E3251 Would Your Restaurant Kitchen Pass Inspection?
- E3260 Swabbing Techniques for Sampling the Environment and Equipment

FOOD

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- F2155 Table 5 - Production and Process Controls
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- F2165 Table 5 - Production Process Controls
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THOUGHTS ON TODAY'S FOOD SAFETY...



Don't Eat Poop

Douglas Powell
Kansas State University
Manhattan, Kansas

Benjamin Chapman
University of Guelph
Guelph, Ontario, Canada

That's the first rule of public health. And the first company that can assure consumers they aren't eating poop on spinach, lettuce, tomatoes and any other fresh produce, will make millions and capture markets across the country.

The recent outbreak of *E. coli* O157:H7 on bagged spinach which sickened over 200 and killed four was the tipping point: for farmers dealing with collapsed markets; for retailers who say they are now going to get serious about questioning their suppliers; and, for consumers who now realize that fresh produce is a significant source of foodborne illness and are voting with their wallets and their forks – how can they know if the leafy stuff is safe? Or tomatoes? Or cantaloupes, carrots and any other fresh produce?

After decades of refusing to publicly advertise food safety differences – my spinach is safer than your spinach because these are the things I do on my farm and I can show you the data – retail and food service chains may finally be forced to do just that.

And the sooner the better.

Fresh fruits and vegetables are good for us; we should eat more. Yet fresh fruits and vegetables are one of, if not the most, significant source of foodborne illness today in North America. Because fresh produce is just that – fresh, and not cooked – anything that comes into contact is a possible source of contamination.

With an estimated 76 million illnesses and 5,000 deaths in the United States each and every year from foodborne illness, that's just too much.

For the 380 people who have been sickened by spinach, lettuce and maybe tomatoes in three separate outbreaks since August, and for a healthy fresh produce business, the farm, now more than ever, must be the first line of defense.

Some in the farm-to-fork food safety system want more of the same: stronger checks of good agricultural practices on the farm (which have been available but not necessarily followed or enforced since 1998); more research on how dangerous bugs get on or in healthy produce; more vague press releases.

The definition of crazy is doing the same thing and expecting a different result. After 400 outbreaks of foodborne illness associated with fresh produce in the past 15 years, after 20 outbreaks of deadly *E. coli* on lettuce and spinach in the past 10 years, and after eight years of happy talk about food safety on the farm, it's time for something new.

Asking for government regulation, like the Western Growers Association did earlier this week, is not the answer. Too much public money is already being spent to fix private sector problems. The fresh produce industry must accept its responsibility to market a safe product.

Successful and safe fresh produce suppliers of the future, and their marketers at grocery stores and restaurants will:

- embrace food safety from farm to fork;
- anticipate that, even with the best plans, food safety outbreaks will happen;
- have a proactive way to publicly state, this is how we do everything we can to reduce risk;
- demonstrate compassion;
- test to verify that food safety procedures are working the way they are supposed to;
- take responsibility and not blame consumers when produce makes them sick; and,
- keep their product out of David Letterman's top 10 list.

Continued on page 983

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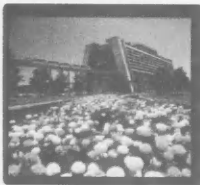
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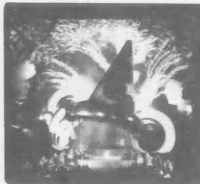
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