

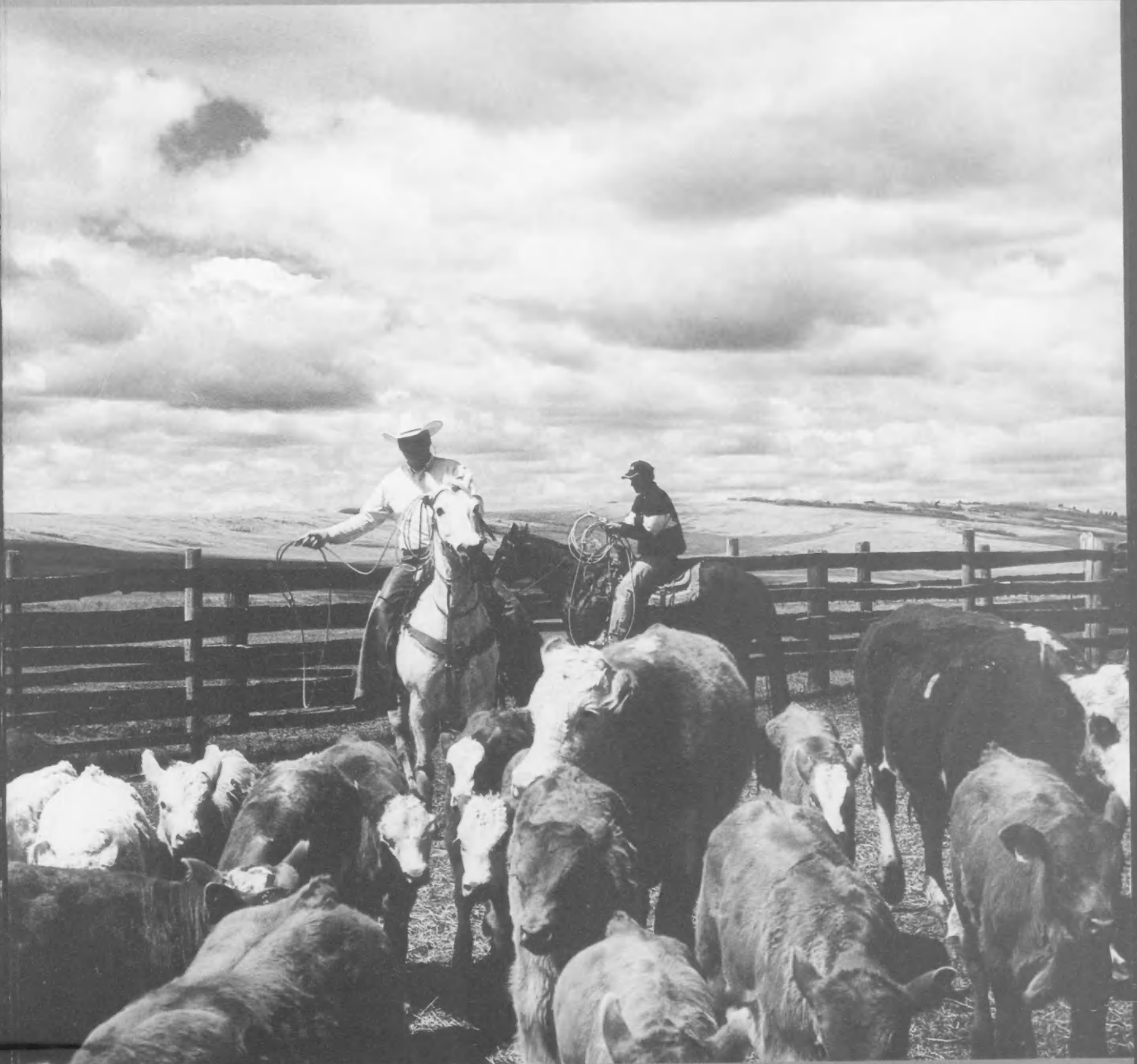
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# FOOD PROTECTION TRENDS

SCIENCE AND NEWS FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

JUNE 2006



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We live in a global economy and the way food is grown, processed, and handled can impact people around the world. From a public health perspective, it often provides unique challenges to food safety professionals. Combine these issues with the complexity of protecting the food supply from food security threats and the challenges seem overwhelming. However, with your support the Foundation can make an impact on these issues. Funds from the Foundation help to sponsor travel for deserving scientists from developing countries to our Annual Meeting, sponsor international workshops, and support the future of food scientists through scholarships for students or funding for students to attend IAFP Annual Meetings.

The Foundation is currently funded through contributions from corporations and individuals. A large portion of the support is provided from the Sustaining Members of IAFP. The Sustaining Membership program is a unique way for

organizations to partner with the Association. Contact the Association office if you are interested in this program.

Support from individuals is also crucial in the growth of the Foundation Fund. Contributions of any size make an impact on the programs supported by the IAFP Foundation. Programs currently supported by the Foundation include the following:

- Student Travel Scholarships
- Ivan Parkin Lecture
- John H. Silliker Lecture  
(Funded through a contribution from Silliker, Inc.)
- Travel support for exceptional speakers at the Annual Meeting
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It is the goal of the Association to grow the Foundation to a self-sustaining level of greater than \$1.0 million by 2010. This will allow the Foundation to provide additional programs in pursuit of our goal of *Advancing Food Safety Worldwide*!

# FOOD PROTECTION TRENDS

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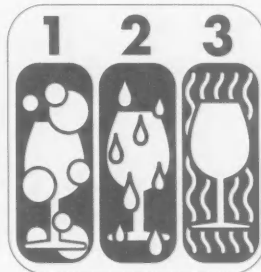
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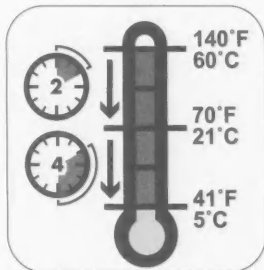
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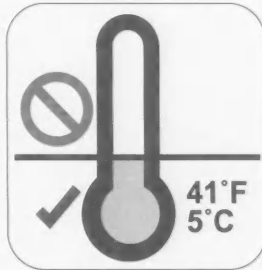
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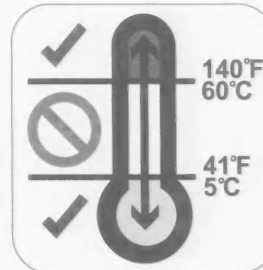
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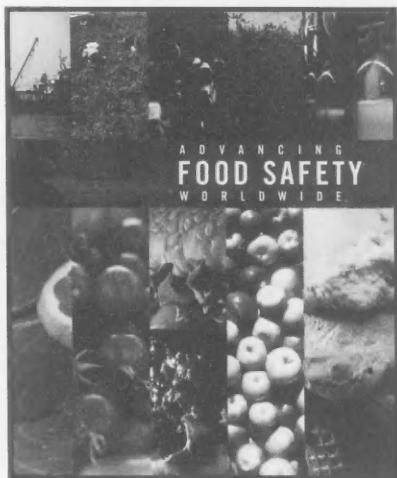
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**Seiberling Associates, Inc.**, Dublin, OH; 614.764.2817

**The Steritech Group, Inc.**, San Diego, CA; 858.535.2040

**Strategic Diagnostics Inc.**, Newark, DE; 302.456.6789

**Texas Agricultural Experiment Station**, College Station, TX; 979.862.4384

**United Fresh Fruit & Vegetable Association**, Washington, D.C.; 202.303.3400

**Walt Disney World Company**, Lake Buena Vista, FL; 407.397.6060

**Zep Manufacturing Company**, Atlanta, GA; 404.352.1680

# “PERSPECTIVES FROM NORTH OF THE 49TH”

**A**s I am writing this column, I am up in the clouds cruising at 35,000 feet. I am still in a state of euphoria as all IAFP staff and Executive Board Members took part in a wonderful full day strategic planning session in Des Moines, Iowa. We also had the great pleasure of welcoming our new incoming Secretary, Vickie Lewandowski and our Affiliate Council Secretary, Maria Teresa Destro, to our meeting. We had our last strategic planning session a short 2-years ago, and, as was pointed out by David Tharp at the beginning of our session, we already reached many of the goals that we hoped to achieve in a 3–5 year time frame! This was a great way to start the day, realizing that we had achieved so much in a short 2-year period.

The “Future Search Process” as our strategic planning was called, consisted of various stages. We started off the day with an account of the history of IAFP and how the Association was started back in 1911 by a group of dairy and milk inspectors, two of whom were from outside the United States (one from Canada and one from Australia). As an aside, for those of you who are not aware, the history of the Association is neatly summarized in our booklet entitled *IAFP History 1911–2000*. The first step, as mentioned above, focused on the past. We then focused on the present, as organizations need to be aware of what is happening in their internal, as well as external environments. Then we examined some of the critical issues facing IAFP, defined as the internal or external factors or trends that pose opportunities or threats to IAFP



By **JEFFREY FARBER**  
PRESIDENT

***“The ‘Future Search Process’ as our strategic planning was called, consisted of various stages”***

during the next 3–5 years. Next, we focused on the future, setting the past aside and designing an ideal future for the organization, while identifying the key actions and milestones needed to make our new vision a reality. A gap analysis was then done to compare where we are now with where we want to be. The final steps consisted of planning and selecting key issues to pursue and developing specific action plans to overcome any potential obstacles or to pursue opportunities. We had great input and enthusiasm in the room and many excellent ideas arose.

We discussed ideas around seven major themes, which we had prioritized from a larger list. These included (1) international growth; (2) communications; (3) outreach: education and policy; (4) the IAFP Foundation; (5) financial growth; (6) Affiliates and (7) the Annual Meeting.

In terms of international growth, we felt a very strong need to develop our international presence. A survey will be conducted to find out the views of our international Members and face-to-face discussions will be held at IAFP 2006. We also need to keep up the momentum started by our first international meeting, which was held in Prague last year, and hold an international meeting every year. Another area discussed was to show our presence at other international meetings, either by co-sponsoring or exhibiting at the meetings. In addition, our dues restructure planned for January 2007 will make it easier to attract and keep International Members.

For the Foundation, many of you are aware that we have produced a DVD highlighting the Association and the Foundation. We have also produced print material to go along with the DVD (as an aside we will be showcasing the video at our Annual Meeting!). Now that we have all this great material, we are developing a plan for how we are going to roll this out when we go to visit potential donors. The Board felt that we need some professional help in terms of a training session for how we approach companies for donations. For this themed area, we also talked about having a tiered recognition program for our Foundation contributors.

For the Communications theme, we discussed a number of issues. Among the top ideas was the possibility of having a dedicated Editor for our new electronic newsletter, which will be starting up officially around the first of the New Year. We would also like to use more teleconferences for our PDG groups, etc., as well as make more use of video conferencing and web casting for our workshops and meetings.

A "translation strategy" was also discussed for some of our printed and/or educational material. For example, having some of our applied booklets or white papers available in Spanish. An idea arose that we should be examining the benefits of having our own "IAFP Press" to publish books. Lastly, we want to enhance the "Members Only" section of our Web site.

With regards to outreach: education and policy, an idea was to have a trial run for our rapid response series, so that we could just "press a button" when we want to organize a one-day symposium on a very hot topic. We also are strongly considering expanding our student travel scholarships, as well as setting up an IAFP expert network. Our University Speaker Program will continue to be promoted.

We want to reach out more to our Affiliates and conduct a survey to determine and more closely tailor the needs of the individual Affiliates. It was discussed that our dues restructuring will help enormously with IAFP Membership growth from the Affiliates. We would also like to produce new promotional materials for the Affiliates and consider some permanent displays for them.

In relation to financial growth, some seminal thoughts included

job postings on the IAFP Web site, getting advertising revenue from our new e-newsletter, being more creative with our sponsorships to maximize value and expanding our auction items.

For our Annual Meeting, some of the dialogue revolved around adding more discussion to the symposia, surveying members to find the best "novel" ideas for the formatting of future Meetings, as well as having the Board re-evaluate the schedule and all aspects of the Meeting on a regular basis.

This is just a minor snapshot of our strategic session. As you can well imagine, we had a very busy and fruitful day, one that energized each and every one of us. As I have said often in this column, the future of IAFP is looking very bright and this is mainly due to all the great work and hard efforts of David Tharp, Lisa Hovey and the whole IAFP staff! Keep up the great work everyone! I will keep you updated on the progress of our strategic planning as we make progress on it.

#### **Dr. J's Science Corner:**

- A very interesting project entitled the "New Orleans Mold Project" is comprised of a group of mycologists, engineers, imaging experts and software designers. One of the objectives of the group is to try and identify molds in real-time, and one of the ways they are doing this is by generating spectral patterns for mold speciation by a process called hyperspectral imaging. Because of its tropical climate and persistent moisture, New Orleans

has had to deal with fungal disease issues for a long time.

- A recent US survey of the best scientific organizations to work for in 2006 found that the top 5 most important employee satisfaction factors for employees were (1) personal job satisfaction; (2) providing the equipment and services needed to do the job; (3) contributions being appreciated along with good teamwork; (4) companies setting and adhering to high ethical standards and (5) adequate funding (for research).
- Some new research on the benefits of calcium in relation to women's bone health has shown that calcium does work, but only if taken regularly
- An important study on "chronic fatigue syndrome" has shown that there appears to be a clear "biologic basis" for the syndrome and physical changes in certain genes do occur
- As recently reported in a Canadian Medical Journal, another in the line of herbal remedies that might react with other medications is chamomile, which is known to contain coumarin, an anti-coagulant. Taking too much chamomile may be dangerous if a patient is already taking a blood thinner such as warfarin.

As always, I can be reached by E-mail at [jeff\\_farber@hc-sc.gc.ca](mailto:jeff_farber@hc-sc.gc.ca) and would love to hear from you!

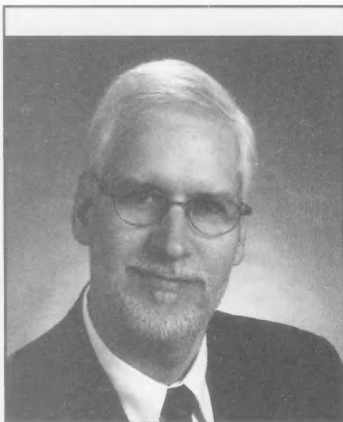
Have a great month.

## “COMMENTARY” FROM THE EXECUTIVE DIRECTOR

This month I thought it might be interesting to answer the question; how does IAFP fulfill its mission of “providing food safety professionals worldwide with a forum to exchange information on protecting the food supply?” The easy answer and most visible ways in which we fulfill our mission are through our journals and Annual Meeting. Of course the two journals are *Food Protection Trends* and the *Journal of Food Protection*. Each of these journals is distributed worldwide to more than 3,000 Members or subscribers.

From a survey taken in 2001, we found that both journals were passed on to other interested readers bringing our audience to more than 9,000 for *FPT* and over 11,000 for *JFP*. This is a huge audience with which we share our science-based information for food safety professionals! We rely on many authors to provide this information for our publications and we are very happy to have so many willing participants. Everyone working in this arena realizes that keeping all food products safe from contamination keeps consumer confidence at a high level and that is why it is so important to continue this free sharing of information.

Our Annual Meeting continues to thrive due to its very focused nature. We are determined to meet the needs of food safety professionals working to protect the food supply (around the world). Again, the science-based information presented by individuals is why professionals attend our meeting. This would not be possible without active participation from our Professional Development Groups (developing symposia) and individ-



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

***“The Board and staff of IAFP work hard to assist and improve the profession of food safety professionals at all levels”***

uals submitting technical papers for presentation.

Another, more recent method of sharing information is through our meeting held last October in Prague. It was the first time ever that IAFP held a meeting outside of North America! As you can see on the next page, we are planning our second European Symposium on Food Safety to be held in Barcelona at the end of November. Additional details will be available next month and on the IAFP Web site.

So, those are the visible ways IAFP supports food safety professionals, but you might ask, is that all IAFP does? No way! We participate in many additional programs that support the profession. Since 1999, we have supported a speaker program for all IAFP Affiliates. Affiliate organizations may request one of the IAFP Board Members to come to their meeting to present a topic of interest before their audience. At the same time, the Board Members are able to interact with food safety professionals at a state or local level (some of who are unable to attend IAFP Annual Meeting) and inform them about IAFP, our journals and our Annual Meeting.

About two years ago, we expanded on the Affiliate Speaker Program and made IAFP Board Members available to colleges and universities under what we call our University Speaker Program. Board Members are called upon to visit universities where they are able to present pertinent information on food science and food safety while doing so under the umbrella of IAFP. Again, they are able to share information about IAFP so that students become familiar with the organization and our journals. This has been a very successful program when used.

Recently, IAFP was contacted by Occupational Information Networks, Data Collection Program (O\*NET) to assist in updating a job description for microbiologists. This is a very scientific and in-depth search into developing job descriptions that can be used by many different users for many purposes. O\*NET is operated by

the United States Department of Labor and serves as the United States' primary source of occupational information. The O\*NET Data Collection Program is conducted by Research Triangle Institute (RTI) on behalf of the United States Department of Labor and is designed to provide data that are valid, reliable, current, and regularly updated. We were happy to help out and see this as a service to the profession.

A few months ago, I was contacted by leaders of a multi-agency, US project working with a delegation of 15 food safety officials from China. The organizers wanted IAFP to talk with the delegation about developing food safety professionals and describe where IAFP fits within this puzzle. I enlisted

the help of our Past President, Jim Dickson since he is located in Ames at Iowa State University (only 35 miles from IAFP's offices).

Jim gave a presentation on attracting students to food safety related programs and educating them at universities such as Iowa State. My presentation focused on our mission of providing food safety professionals with a forum to exchange information about protecting the food supply. You may view pictures and a short write up from the evening we spent with the Chinese delegation. They are shown on page 401.

In addition to those programs expanded on above, IAFP supports the Partnership for Food Safety Education, the 3-A Sanitary Standards, the Conference for Food Protection and other similar groups.

We make it a point to get out and meet with Members and prospective Members at shows such as the Food Safety World and Food Safety Summit and we plan to participate this fall in a couple of new endeavors. One new area of participation will be with a retail foodservice food safety conference that holds a goal to improve communication across boundaries.

As you can see, there are a number of ways, in addition to the most visible ones, that IAFP builds on its mission. I hope this has been informative for you as an IAFP Member. We want you to know that we are more than just journals and an Annual Meeting. The Board and staff of IAFP work hard to assist and improve the profession of food safety professionals at all levels!

# Announcing

## *IAFP's 2nd European Symposium on Food Safety*

November 30–December 1, 2006

Barcelona, Spain

Watch our Web site at [www.foodprotection.org](http://www.foodprotection.org)  
for additional information.

# Effectiveness and Efficiency of Official Food Control Interventions in Restaurant Establishments

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## SUMMARY

The methodology proposed by official bodies for adopting decisions regarding foodstuffs is risk analysis, and the first step in performing this is the identification of non-desirable events. The deficiencies or irregularities that exist in food establishments are non-desirable events that the official food control services must detect. Following this criterion, the aim is to determine the effectiveness and efficiency of the official control services. This is an ecological study in which the unit of study is time and the study subjects are restaurant establishments. A time-series analysis was carried out with the use of multivariate auto-regressive linear regression models. The results showed that the activity varied between the health districts. The activity is affected mainly by the irregularities, and to a lesser extent by the census. The trend of irregularities is a decrease in three of the four districts, and is directly related to the frequency of visits paid to the establishments.

It can therefore be concluded that interventions by the official food control services succeed in reducing the number of irregularities. The study of the irregularities over time is a useful tool to obtain necessary information in the management of official food control programs.

## INTRODUCTION

Foodborne illnesses are a major cause of morbidity in Andalusia (Spain), where between 1996 and 2000 a total of 1,135 food-related outbreaks were recorded, with 10,800 cases of illness and 1,149 hospitalizations. Approximately 40% of these illnesses were due to outbreaks originating in public food establishments, the majority (over 60%) being restaurants (3). In the province of Granada, between 1993 and 2002 (data for the city of Granada not included) a total of 107 outbreaks originating in public establishments were recorded, affecting 1,680 people. A total of 58% of the outbreaks originated in restaurants, representing 60% of the total number of cases in the province (28).

Of all the participants in the food chain, the main elements responsible for ensuring that food is safe for human consumption are the food producers and handlers (11, 18). The appropriate authorities, in turn, are responsible for ensuring that the producers and handlers meet their obligations, and as such have to establish systems of control and ensure that they are properly applied (11, 18).

The official control of food products is regulated by the EEC directive 89/397 (9), and transposed to Spanish law through Royal Decree 50/1993 (25), and can be defined as those measures taken

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by the appropriate authorities to ensure that food products comply with existing regulations so as to prevent risks to public health, guarantee the compliance of commercial transactions and protect the interests of consumers, which includes ensuring that the public is well informed. Official control consists of one or more of the following operations (9, 25):

- Inspection
- Sample taking and analysis
- Staff hygiene control
- Examination of written and documentary material
- Examination of the verification systems eventually applied by the companies and the results obtained from them

When the Health Services in Andalusia perform an operation in an establishment and any non-compliance is detected, the information must be recorded in the "Basic Food Information Network" (BFIN), a document drawn up every two months by the regional Health Department.

Studies on Public Health food safety interventions (both training exercises and inspection/control activities) use various parameters to measure the results of these activities, such as the emergence of food-originated outbreaks (13, 16), a reduced microbial load (17), decreased risk levels in the establishments (6), the acquisition of knowledge (15) or an improvement in the hygienic conditions of the food establishments (5, 8, 15, 20). The results of three systematic revisions confirm the effectiveness of these interventions (7, 14, 19).

Given that the authorities use risk analysis (11) and risk management (1) to make decisions regarding food, and that the first step lies in identifying undesirable events, it seems reasonable to assume that one result of any official control activity is the detection of any element of non-compliance (undesirable events), especially deficiencies related to significant hazards. Therefore, the greater the number of deficiencies or instances of non-compliance detected, the more effective the official control, and the more deficiencies or instances of non-compliance detected with the least investment of resources, the more efficient the official control, although this would obviously lead to improved hygienic conditions of the food establishments. In other words, this would lead to a drop in the number of instances of non-compliance, as well as being more efficient.

This study aims to determine the effectiveness and efficiency of the official control services in the province of Granada from 1993 to 2002, with the detection of deficiencies or non-compliance considered a result of official activity.

## MATERIALS AND METHODS

An ecological study of temporal series, in which the unit of study is time (two months) and the subjects of the study are restaurants, was performed according to the classification in the Basic Food Information Network.

The study was done on the official control activity of the Health Services in the province of Granada on restaurant establishments between 1993 and 2002. During this period, the official control on restaurants followed a program and action protocol established by the General Management for Public Health and Community Participation of the regional Department of Health (2).

Collective dining halls (institutional dining facilities) were excluded from the study, as they were not considered restaurant establishments as defined by the BFIN; also excluded were all establishments in the city of Granada, because in Granada the official control of foodstuffs is a municipal responsibility, and the Provincial Delegation of the regional Health Department receives no information on the city's activity.

The variables used to produce the temporal series models are as follows:

**Trend:** built using the unit of study (two monthly period), with values assigned from 1 to 60, depending on when the record was taken.

**Quadratic trend:** trend squared.

Sine-cosine transformations:

**Sine 1 ....6:**  $\sin(2^*3.1416*trend^*1/6).....\sin(2^*3.1416*trend^*6/6)$

**Cosine 1....6:**  $\cos(2^*3.1416*trend^*1/6).....\cos(2^*3.1416*trend^*6/6)$

The sine-cosine variables capture the oscillations of the series.

**Delays 1...16:** auto-regressive terms. The following formula was applied to calculate each dependent variable:  $delay1=lag(Y,1)$ ,  $delay2=lag(Y,2)$ , ... $delay16=lag(Y,16)$ .

**Seasonal variation:** two category types were used – four-month and six-month periods. The first four-month period covers the records from January to April, the second from May to August, and the third from September to December. For the six-month periods, semester 1 covers January to June, and semester 2 July to December.

**Geographic range:** Health District in which the registered control activities were carried out. There were four of these: Costa-Alpujarra (Health District I), Baza-Guadix (Health District II), Granada Norte-Granada Sur (Health District III) and Loja-Santa Fe (Health District IV).

**Census:** number of establishments.

**Outbreaks:** number of food-related outbreaks originating in a public establishment, in which the epidemiological analysis suggests the foodstuff as the source of illness.

Official control activities were measured by use of the following variables:

- **Total visits:** number of visits to establishments within the temporal unit.

- **Visits-establishment:** frequency, number of visits per establishment during the temporal unit.

The results of the control activity are the detected and recorded instances of non-compliance, which were measured using the following variable:

- **Deficiencies:** sum of the visits to establishments where different types of deficiencies or instances of non-compliance were observed, classed according to the BFIN categories. These categories were changed halfway through the period.

For the analysis of the official control activity data and results, other factors were taken into account that may have affected this relationship, such as food regulations (EEC Directive 43/93 (10, 26)), labor measures (Law 8/1997 (23)), health policies (Health Act (24)) and organizational measures (unification of Health Districts):

**Health Act (23):** Considered to have come in force as of 1999.

**Law 8/1997 (26):** The year 2001 was used as a reference point for when Decrees 394 (21) and 395 /2000 (22), which develop the Law, came into force.

**EEC Directive 93/43 (20):** The year 1997 was used as a reference point, when the "program for the implementation and development of the ARPCPC" (4) (auto-control program) was put into effect in order to comply with the requirements of the directive.

**Unification of Health Districts:** The moment a single register appeared with information from two districts was used as a reference point.

The information was obtained from the records of the Basic Food Informa-

**TABLE 1. Basic food information network**

	Establishments <sup>1</sup>			
	Butcher	Bakery	Restaurant	Collec. dining hall
1. Number of establishments				
2. Number of establishments visited				
3. Number of visits to establishment				
4. Total document of inspection drawn up				
5. Document of inspection drawn up where violations is cited				
6. Cause <sup>2</sup> :				
Hygienic Condition Installations.....				
Hygienic Condition Foodhandler.....				
Hygienic Manipulation.....				
Hygienic Condition Storage.....				
Hygienic Condition Transport .....				
Labelling and Documents.....				
Higienic Condition Raw Material.....				
Higienic Condition Finished Product.....				
Quality Conditions.....				
Others.....				
7. Number of samples collected:				
Prospective.....				
Due.....				
8. Number of samples sent laboratory				
9. Seizure: Food.....				
Number.....				
Cause.....				

<sup>1</sup>There are 36 categories of establishments

<sup>2</sup>These categories had been changed halfway through the period

tion Network, the register of the Andalusian Epidemiological Vigilance System (provincial gazette) and the outbreak register book. These registers are located at the Provincial Delegation of the Regional Health Department in Granada. Table 1 integrates the components of the BFIN. "Census" information was collected by item 1, "total visits" information was

collected by item 3, "visits-establishments" was obtained from the quotient between item 3 and item 1, and "deficiencies" information was collected by item 6; the rest of the items were not evaluated in this study.

An analysis of temporal series was carried out by use of auto-regressive multivariate linear regression models. The

models were created by first entering the trend variable and quadratic trend. If the latter was significant, it was kept in the model; otherwise it was removed and, one by one, with the same methodology, the variables sine 1 and cosine 1 up to sine 6 and cosine 6 were entered (these variables capture oscillations in the series over time), followed by the seasonal

**TABLE 2. Time series. Restaurants. Total visits**

Health Districts	R squared	ANOVA (sig)	Variables	B	P (signif)	Confidence interval (95%)	
I	.781	.000	(Constant)	-134.758	.107	-299.888	30.372
			trend	4.662	.102	-.968	10.291
			sine4	7.338	.691	-29.623	44.300
			cosine4	-83.656	0.13	-148.921	-18.390
			4-mth period 2	243.595	.002	91.882	395.308
			4-mth period 3	167.988	.004	56.349	279.267
			census	.108	.166	-.046	.263
			deficiencies	.436	.052	-.004	.876
			outbreaks	1.205	.950	-37.417	39.827
			Health Act	-42.421	.377	-138.111	53.268
			Directive 93/43	-62.037	.302	-181.779	57.706
Law 8/97*	-50.867	.294	-147.450	45.717			
II	.809	.000	(Constant)	74.177	.134	-23.703	172.057
			trend	-3.203	.106	-7.116	.710
			trend 2	7.717E-03	.834	-.066	.082
			sine5	8.064	.339	-8.726	24.855
			cosine5	-5.361	.500	-21.232	10.509
			census	.157	.009	.041	.273
			deficiencies	.840	.000	.432	1.248
			outbreaks	17.564	.097	-3.299	38.428
			Health Act	26.982	.295	-24.341	78.304
			Directive 93/43	47.053	.081	-6.043	100.149
			Law 8/97*	-4.208	.021	-89.566	81.149
III	.817	.000	(constant)	-123.420	.203	-315.679	68.838
			trend	13.137	.000	7.261	19.013
			trend 2	-.137	.012	-2.44	-.031
			census	.216	.072	-.020	.453
			deficiencies	1.564	.000	1.128	2.001
			outbreaks	7.415	.538	-16.635	31.465
			Health Act	-73.357	.232	-195.198	48.484
			Directive 93/43	-208.493	.000	-291.773	-125.212
			Law 8/97	15.016	.738	-74.921	104.953
			unification	-36.033	.562	-160.264	88.198
			IV	.728	.000	(Constant)	-80.114
trend	7.900	.006				2.407	13.392
trend 2	-.116	.023				-.214	-.017
sine4	23.862	.027				2.778	44.945
cosine4	-17.365	.106				-38.595	3.865
census	.295	.000				.146	.444
deficiencies	1.146	.000				.627	1.666
outbreaks	31.237	.204				-17.604	80.078
Health Act*	-55.712	.121				-126.768	15.344
Directive 93/43	-49.979	.215				-130.035	30.077
Law 8/97	-3.022	.944				-89.026	82.981

\*Coincides with the unification of the Health Districts

Dependent variable: total visits

variables (four-month and six-month periods). Only the statistically significant variables ( $P < 0.05$ ) were kept in the models. The rest of the variables were then entered, all at once, and were kept in the models even if they were not significant. Before completion of the model, it was checked to ensure that the series was well adjusted, by producing a sequence graph for the dependent variable and the predicted values, and the remainders were auto-correlated. In the event that auto-correlation was observed, the corresponding delays were entered into the model, leaving only the significant ones. Remainder normality was also checked by using the Kolmogorov-Smirnov test on a sample; if the remainders did not meet the criterion of normality, the model was rebuilt with the neperian logarithm of the dependent variable.

Two different trend analysis models were developed for each of the study variables (total visits, deficiencies) for each district, thus obtaining 8 models.

## RESULTS

### Total visits (Table 2)

The observed trend for the total number of visits is quadratic in districts III and IV, in the form of an inverse parabola. In district I, activity is seasonal, with the least activity taking place in the first four-month period and the most activity in the second.

The total number of visits is directly associated with the number of establishments in districts II and IV, and with the number of deficiencies detected in all the districts ( $P = 0.052$  in district I).

The enforcement of EEC directive 93/43 gives an inverse association in district III.

The models explain between 73% and 82% of the temporal evolution of the activity in these establishments.

### Deficiencies (Table 3)

The number of deficiencies detected in districts I, III and IV shows a decreasing linear trend. Seasonal variation is observed in districts I and IV, with the second four-month period being the one during which the most establishments with deficiencies were recorded, and the first when the fewest were registered.

In all the districts, the frequency of deficiencies is directly associated with the number of visits made to the establish-

ments, and the increase of deficiencies with each new visit per establishment ranges from 143 to 275.

In district IV, the enforcement of the Health Act (which coincided with the unification of the Loja and Santa Fe districts) and of Law 8/1997 is directly associated with the number of deficiencies.

The models have an explanation percentage ranging from 45% to 86%.

## DISCUSSION

Previous descriptive analysis (28) suggested that the districts differed with regard to trend and seasonal variation, so analysis was carried out separately for the establishments in each district. This analysis strategy allowed series in each district to be examined without making assumptions that might not actually be true, although the difference between the districts could not be quantified.

In view of the results obtained, it can be said that the official control activity varies from one district to another, although in all of them there is a fundamental relationship to the number of irregularities detected, so that activity increases when more deficiencies are detected. The activity is associated to a lesser extent with the number of establishments; this association appears in two of the four districts. This makes sense when it is considered that these are establishments with low control frequencies (28) and with fewer than two visits per year (a mean of 1.4–1.7 visits per year during the year of study) (Table 4), so that it is the conditions of the establishment that determine whether a new control visit is made or not. It can thus be observed that in the two districts that show a positive correlation between the number of existing establishments and the number of actual visits, the deficiency quota per establishment and year is less (0.27 in both, in contrast to 0.43 and 0.72 in the other two districts) (Table 4). When there are few deficiencies detected to motivate the activity of an official control, the actual existence of the establishments themselves motivates the activity.

The restaurant program (2) establishes a once-yearly visit to the establishments, increasing to between two and four for those with highest risk. An explanation for the seasonal variation in district I lies in principle with the same restaurant program which has its compliance period during the summer months (July to October). However, this does not occur in the

rest of the health districts, which leads to the consideration of adjusting the programs to the specific conditions of each district.

Considering the drop in number of instances of non-compliance, the effective result of this type of intervention, the decreasing trend of the number of irregularities observed in the models of the deficiencies in three of the four districts shows the effectiveness of the official control. This coincides with assertions by other authors (7, 14, 19) regarding the effectiveness of health inspections in establishments. The trend of deficiencies in each district shows greater effectiveness in district I than in the rest of the health districts. It could be thought that this drop is due to the decrease in the number of visits made, but the models for the total number of visits show that this is not the case. It was not possible to do an analysis of each different deficiency type, because these categories had been changed halfway through the period, which made it impossible to know if the deficiencies most highly related to significant hazards decreased or not.

The positive association in all the districts between the frequency of visits and the number of irregularities detected would seem an undesirable outcome, but, as mentioned in the introduction, we must consider one of the results of official control activity to be the detection of irregularities; therefore, more control activity must take place so that more deficiencies may be detected and be considered an indicator of the effectiveness of these control services. Studies relating to the effectiveness of the official control in the detection of instances of non-compliance suggest that it is indeed effective (7, 13, 27), although there may be instances that cannot be detected through official control (16, 17).

When we analyze data between the health districts in table 4, we can conclude that district I is the most efficient, because it has obtained the best results with the least possible investment of resources (1.4 visits per establishment per year, (0.72 deficiencies detected per establishment per year, and the biggest drop in the number of deficiencies, decreasing trend:  $-5.40$ ). Riben et al. (19) state that more than two inspections per year do not improve activity results. In the Food Standards Agency Code of Practice (12), inspection frequencies are established as from at least once every six months to at least once every 5 years, depending on the classification of the particular establishment.

**TABLE 3. Time series. Restaurants. Deficiencies**

Health Districts	R squared	ANOVA (sig)	Variables	B	P (signif)	Confidence interval (95%)	
I	.864	.000	(Constant)	62.618	.008	17.442	107.794
			trend	-5.397	.002	-8.666	-2.128
			sine4	-6.362	.581	-29.374	16.650
			cosine4	-97.517	.000	-126.669	-68.365
			4-mth period 2	237.630	.000	170.640	304.620
			4-mth period 3	153.995	0.00	98.753	209.238
			visits establishm.	201.882	.014	43.057	360.708
			Health Act	31.629	.284	-27.093	90.531
			Directive 93/43	57.092	.129	-17.325	131.509
Law 8/97*	39.499	.195	-20.931	99.929			
II	.447	.000	(Constant)	-19.601	.258	-54.009	14.807
			trend	.763	.329	-.792	2.317
			sine5	10.455	.060	-.465	21.376
			cosine5	-10.217	.044	-20.148	-.285
			visits establishm.	179.760	.000	85.261	274.258
			Health Act	-25.959	.067	-53.754	1.836
			Directive 93/43	-1.357	.939	-36.970	34.257
			Law 8/97*	-8.261	.555	-36.171	19.648
III	.681	.000	(constant)	-2.042	.877	-28.504	24.420
			trend	-1.798	.032	-3.440	-.156
			visits establishm.	275.183	.000	208.456	341.909
			Health Act	29.414	.284	-25.147	83.975
			Directive 93/43	37.383	.075	-3.969	78.736
			Law 8/97	-8.185E-02	.996	-29.518	29.354
			unification	25.720	.345	-28.422	79.862
IV	.518	.000	(Constant)	-8.769	.540	-37.354	19.816
			trend	-1.659	.024	-3.091	-.227
			sine3	-15288.846	.560	-67666.612	37088.921
			cosine3	1.022	.880	-12.545	14.589
			4-mth period 2	25.273	.002	9.967	40.579
			4-mth period 3	14.936	.067	-1.109	30.980
			visits establishm.	143.701	.000	80.602	206.801
			Health Act*	48.880	.001	22.594	75.166
			Directive 93/43	11.102	.503	-22.033	44.236
Law 8/97	28.172	.043	.899	55.444			

\*Coincides with the unification of the Health Districts

Dependent variable: Deficiencies

The implementation of the auto-control program to meet directive 93/43 (10) (transposed to Spanish law by Royal Decree 2207/1995 (26)) does not seem to have affected the official control activity in restaurant establishments, which in only one district is associated negatively with the total number of visits. Furthermore, there is no association between the implementation of this program and the num-

ber of deficiencies detected, even when it is precisely a regulation directly affecting food establishments norms, and other studies confirm this relation (20). This could be explained by a lack of real implementation of the auto-control systems in the companies.

Other types of norms – 1-labor (Law 8/1997 (23)), 2- political (Health Act (24)), 3- organizational (unification of districts)

do not seem to have had a great impact on the activity and its results, which in principle suggests that such measures have not been successful. These results can be explained by taking into account that, apart from the first norms, none of them specifically aims to improve the official control of foodstuffs. The labor measures affected two types of professionals, namely pharmacists and veteri-

**TABLE 4. Modification of the deficiencies by Health District**

Health District	I	II	III	IV
Visits per establishm. and year <sup>1</sup>	1.41	1.37	1.53	1.67
Visits/year <sup>1</sup>	1508.61	952.11	1260.84	970.42
Deficiencies per establishm. and year <sup>1</sup>	0.72	0.27	0.43	0.27
Deficiencies/year <sup>1</sup>	773.16	188.11	352.32	158.95
Increase of the deficiencies for each new visit per establishment and year	201.88	179.76	275.18	143.70
Trend of deficiencies	- 5.40	Not significant	- 1.80	- 1.66

<sup>1</sup>Data extracted from Vinuesa F. Actividad de control oficial de alimentos, resultados y consecuencias en la provincia de Granada (1993–2002). (Official control of foodstuffs activity, results and consequences in Granada 1993–2002). [Dissertation. Granada: Escuela Andaluza de Salud Pública, 2003.]

nary surgeons, affecting pharmacists to a greater extent, who now take part in ever fewer interventions.

The results obtained in this study affirm that in restaurant establishments that have mean frequencies of between 1 and 2 visits per year, official control interventions succeed in reducing the number of deficiencies.

The methodology used and the results obtained show that the study of these variables over time is a useful tool for obtaining information needed to manage official foodstuff control programs. It would be interesting to apply the methodology from the point of view of risk management and to consider not only the probability of an instance of non-compliance and its degree of seriousness, but also its trend.

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# Food Safety Practices of Vendors at Farmers' Markets in Florida

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## SUMMARY

The number of farmers' markets in the United States (US) has grown dramatically in recent years, increasing 111% between 1994 and 2004. Many participants of federal food assistance programs aimed at helping those in susceptible population groups, such as pregnant women, children, and the elderly, purchase from vendors at farmers' markets. Therefore, it is important to evaluate how well-informed these vendors are about food safety practices and issues and where they get their information about food safety. Such an evaluation of Florida's farmers' markets is the goal of this study. The objective is to identify the need for and priorities of educational programs in this area. Two farmers' markets in each Florida Extension district were included in the study. A closed response, 15-item self-completed questionnaire was used to evaluate farmers' training in food safety practices and their attitudes about the importance of food safety training and information. A total of 47 vendors returned the completed surveys. Overall, more than 50 per cent of the vendors who responded sell produce-related items. Other outlets for their products include produce stands, U-pick operations, and restaurants. Even though more than 50% of the respondents think that food safety is important for their operation, only 32% have completed food safety training. The majority of the respondents provide their own farm labor. When asked about the FDA's "Guide to Minimize Microbial Food Safety Hazards for Fresh Produce (GAPs)," 44% of the vendors were not aware of this publication. The results of this study will provide insights for educators who want to develop food safety educational programs for these producers, most of whom are small farmers.

## INTRODUCTION

The number of farmers' markets in the United States (US) has grown dramatically in recent years, increasing 111% between 1994 and 2004 (9). This growth shows that farmers' markets are an important venue for a growing number of farmers, particularly those with small-to medium-size operations. According to the 2004 National Farmers Market Directory, there are more than 3,700 farmers' markets operating in the United States (9). Farmers' markets are probably the most important direct marketing channel for US producers, and the importance of farmers' markets to farm income will probably rise as revenues from these markets grow (7). Although farmers' markets are found in every state, the number of markets per 100,000 people and the duration of operation varies.

Having been a part of American society since the 1600s, farmers' markets have played an important role in the development of US agriculture (7). Throughout the years, the farmers' market has retained a basic structure of stalls in a defined area, where individual producers sell their products to the consumer. In addition to their function as a direct market channel, farmers' markets serve as a place for 'face-to-face' interactions between producers and consumers (3, 4).

The growth of farmers' markets over the past decade has benefited small farm operators, consumers, and some urban communities. Small farm operators, defined as farmers who earn less than \$250,000 in annual receipts and who rely primarily on family labor and management to run the farm, account for 94% of all farms in the United States (10). The mar-

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ket, a direct sales venue for farmers, may account for a large or small proportion of total farm revenue. It provides access to locally grown produce for consumers, as well as the opportunity to interact with the grower. Farmers' markets often provide ready access to fresh, nutritious food that is not always available through traditional supermarkets (8).

A total of 74 farmers' markets are in operation in Florida, of which 13 are state farmers' markets run by the Florida Department of Agricultural and Consumer Services (2). These markets specialize in fresh Florida produce; more than 25 million units of fresh fruits and vegetables, valued at more than \$225 million, are sold through Florida farmers' markets annually (2). The services provided vary from market to market. However, the main purpose of these markets is to help market Florida farm products. Some markets require that the vendor actually produce the product him/herself. Others permit vendors to sell products grown on other farms. These markets provide information, modern facilities, and leadership, thereby ensuring a reasonably priced and high quality product to the consumer, as well as a fair return to the producer. The farmers' markets in Florida maintain national safety standards for food handling. However, each market has its own regulations about the types of products that can be sold and additional food safety procedures, beyond those required by federal regulations, which must be followed.

In recent years, many federal food assistance programs have provided incentives to buy products from vendors at farmers' markets. Some 58% of markets participate in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the food stamp program, and state or local nutrition programs (11). In addition, 25% of the markets participate in food gleaning programs for needy families (9). In 2004, the USDA initiated a new program called *The Seniors Farmers' Market Nutrition Program* (SFMNP), which awarded \$16.7 million in grants to 38 States, the District of Columbia, six Indian Tribal Organizations, and Puerto Rico to provide coupons to low-income seniors, who can use them to buy eligible foods at farmers' markets, roadside stands, and community supported agriculture programs (CSAs). The projects funded through these grants have developed creative partnerships that use the infrastructure of farmers' markets to expand services to seniors, benefiting over 700,000 low-income seniors. To help eliminate

barriers to access, several programs through partnerships with senior centers provide seniors with transportation to and from the markets, or have arranged for local growers to take their produce directly to senior housing facilities. In fiscal year 2003, fresh, nutritious, locally grown fruits, vegetables, and herbs were available from 13,000 farmers at 2,000 farmers' markets, 1,700 roadside stands, and over 200 CSAs (9). Federal food assistance programs have made it easier for farmers' market vendors to serve susceptible populations, such as children under five, pregnant women, and the elderly.

According to the Centers for Disease Control and Prevention (5), foodborne diseases cause an estimated 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in the United States each year. No foodborne illnesses associated with farmers' markets have been reported to date. A recent report by Cohen et al. (2005) (1) revealed a high adoption rate by New England growers of the Good Agricultural Practices recommended to reduce microbial contamination. However, the growth of farmers' markets provides additional impetus for Land Grant institutions to provide those who market through farmers' markets with the training about food safety that they need and want. Because information about the food safety educational needs of vendors at these markets is limited, the objectives of this study were to (1) assess the kinds of products sold at farmers markets, focusing on the relative importance of fresh produce, (2) evaluate vendors' sources of knowledge regarding food safety practices, (3) determine the importance that vendors place on information and training about food safety practices, and (4) identify educational gaps that can be corrected through food safety educational programs.

## METHODS AND MATERIALS

### Sample population

Names and contact information for the market managers for farmers' markets in Florida were obtained from the Florida Department of Agricultural and Consumer Services (FDACS), excluding the State Farmers' Markets. The latter were excluded from the sampling frame because they often serve as points for building consolidated loads and as sites of wholesale rather than direct consumer marketing. Florida has five Extension Administrative Districts, and in this study markets were selected in each District, because the kinds of fresh produce that move

through these markets vary greatly. Further, this was an effort to include a larger number of vendors in order to increase the total number of respondents. County Extension faculty members were asked to provide an assessment of the size and general vitality of the markets in their areas of responsibility. Based on the information available from FDACS and county Extension faculty members, four markets per Extension district were chosen as potential sites for the research, and each market manager was contacted by telephone during the month of January 2004. Of those, 10 were selected for the final sample, two per District. The market managers were asked to take responsibility for distributing a questionnaire to be completed to each vendor in the market, to collect the completed questionnaires, and to return them to the University of Florida campus during the months of March and April, 2004. Twenty questionnaires were mailed to each manager, although some markets had fewer than 20 vendors who participated on a regular basis.

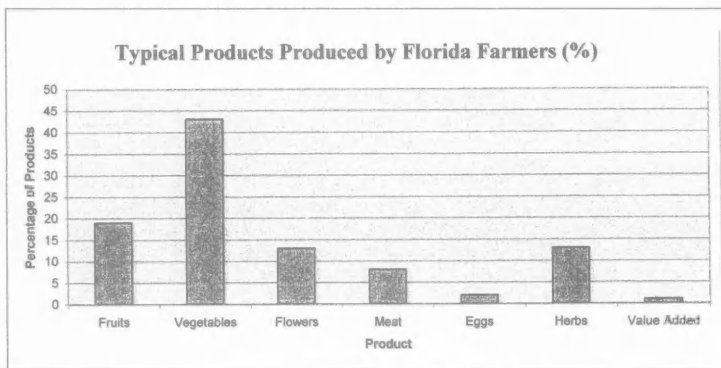
A questionnaire to be self-completed using a close response format was used (see appendix). The questions covered six key topics: (1) product type and marketing venue; (2) importance of different market venues to total farm sales (farmers' market, roadside stands, etc.); (3) source of information about food safety; (4) importance of food safety issues and training for the farm operator/vendor; (5) primary source of farm labor; and (6) key topics and presentation format that would be of most interest in any training about food safety. The 15-item questionnaire was approved under the protocol covering research involving human subjects, protocol UFIRB 2001-U-770. Overall, 47 completed surveys from vendors, representing a response rate of 24% based on 200 vendors, were received. This response rate is considered acceptable for this type of research design. However, this rate may be higher than would have been expected, because not all markets had 20 vendors present on the day that the questionnaire was distributed. Some managers returned unused questionnaires, but others did not. Therefore, it was impossible to calculate the true response rate.

## RESULTS AND DISCUSSION

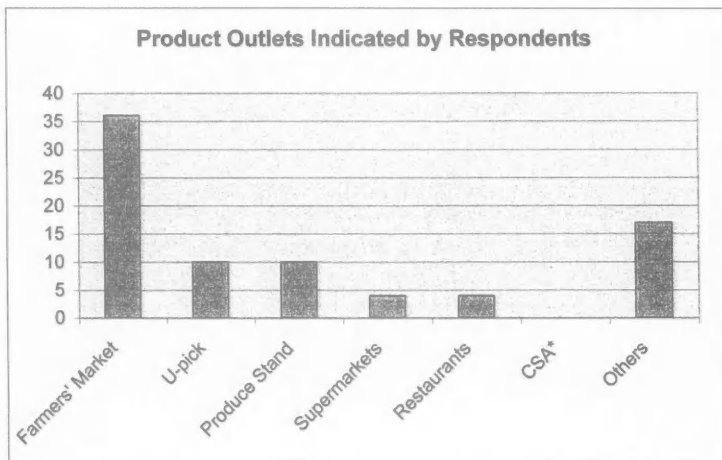
### What are the major products sold at farmers' markets?

Produce forms the bulk of the products sold at farmers' markets in Florida

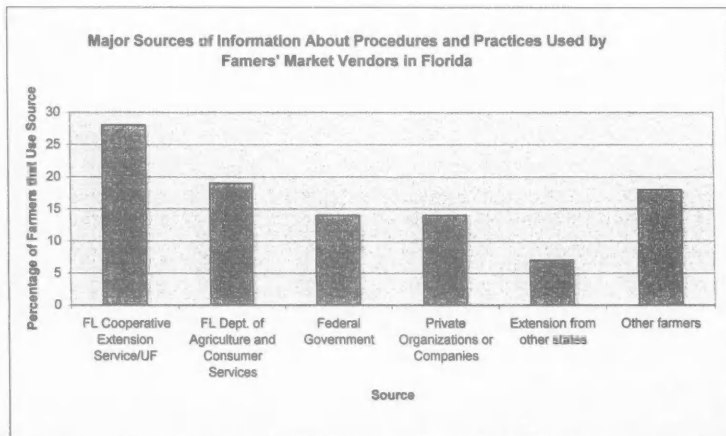
**FIGURE 1.** Percentage of products sold by vendors at Florida farmers' markets based on the survey in this study



**FIGURE 2.** Outlets of products indicated by respondents in the survey. \*CSA stands for Community Supported Agriculture. "Others" refers to other types of marketing not mentioned on the survey form



**FIGURE 3.** Sources of information obtained by respondent vendors at Florida's farmers' markets



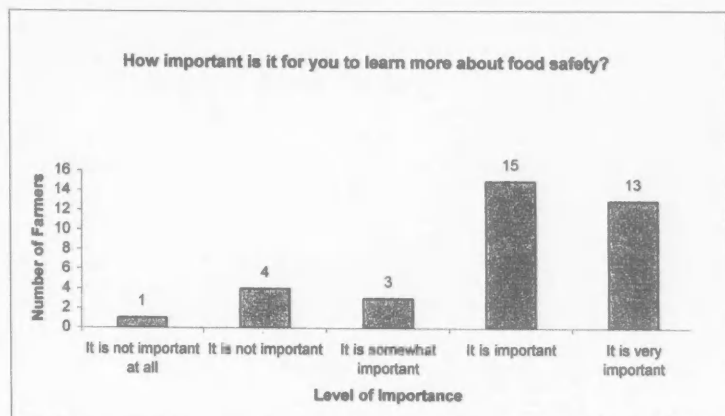
(Fig. 1). Vegetables are the most commonly sold (47%), followed by fruits (19%), herbs (13%) and flowers (13%). Only a few vendors sell other products, such as meat, eggs and value-added products. The top three outlets for respondents' products are farmers' markets, produce stands, and U-pick operations (Fig. 2). Other outlets included restaurants, supermarkets, and "others." The term "others" refers to market venues not listed in the questionnaire. Although the questionnaire did not ask the respondents to specify what "others" are, some respondents indicated unconventional outlets such as "yard sales" and "friends" on the survey form as other outlets for their products.

According to the CDC, at least 12% of foodborne illness outbreaks were linked to fresh produce items in the 1990s. Although fresh produce is considered a low risk product compared to raw foods of animal origin, an increase in produce-related foodborne illness outbreaks has prompted increased interest among producers, health professionals, researchers, educators, and consumers. Because of the predominance of the produce products sold at farmers' markets, one of the educational programs for vendors and produce stand operators should focus on produce safety.

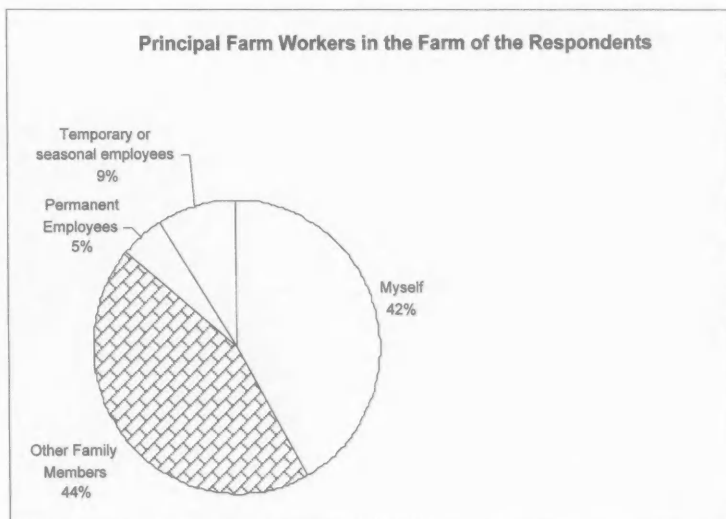
### Where do vendors get their information about food safety?

Vendors were asked to identify major sources of information about practices and procedures used to help ensure microbial safety of the products from their farms. The most common response was the Florida Cooperative Extension Service (28%) (Fig. 3). Other sources of information included the Florida Department of Agriculture and Consumer Services (19%), the federal government (14%), private organizations (14%), and Cooperative Extension from other states (7%). Some vendors also obtained information from other farmers (18%). Private organizations are consulting firms, producer associations, and companies who sell products to farmers. The responses showed that the majority of vendors consistently used information from reputable sources. Vendors were asked how familiar they are with the FDA publication "Guide to Minimize Microbial Food Safety Hazards of Fresh Fruits and Vegetables" (GAPs). Forty-four percent of respondents were not familiar with this publication, and only 11% actually used the publication on a regular basis.

**FIGURE 4.** How vendors at Florida farmers' market value the importance of learning about food safety



**FIGURE 5.** Principal farm workers on farms owned by respondents in survey



A few questions were asked about specific production practices. Vendors were asked if they apply any soil amendments to the land where fresh fruits and vegetables are produced. Three possible choices (compost, manure, and sludge or other biosolids) could be selected. Forty-six and 40% of respondents used compost and manure, respectively, while only 13% used sludge or biosolids. The answers indicate that food safety educational programs for this group should include the safe and proper use of manure as a soil amendment. It is notable that certified organic producers must meet the handling requirements in the National Organic Standards (NOS). Educational pro-

grams on food safety for organic producers must include the NOS requirements. Thus, the vendors were asked what percentages of their products are certified organic. To our surprise, 83% of them did not sell any certified organic products. Only 11% of the vendors have all of their produce certified, and 6% have only half of their produce certified.

#### Where do vendors rank food safety as a priority?

Vendors were asked if they had ever completed a food safety training program. Sixty percent said no, while 32% said yes (8% did not answer). Then they were

asked how confident they are about their understanding of food safety practices. More than 50% of the respondents indicated that they are very confident about their food safety practices. Additionally, they were asked how important it is for them to learn more about food safety. Eighty-two percent of respondents rated food safety as "important" or "very important," and only a small percentage rated it as "low" (Fig. 4).

Respondents were asked how confident they are that the people who work on their farms understand food safety practices. Almost all (90%) of the respondents indicated that it is "very important" for the people who work on their farms to understand food safety practices. These answers indicated that the respondents have a positive attitude about the importance of food safety, even though they are not familiar with the FDA GAPs. They are willing to learn more about the subject.

#### Who works on the farm and what training do they need?

The majority of people working on the respondents' farms are family members or the vendor him/herself (Fig. 5). A very small percentage of the respondents hire permanent or temporary employees. This result differs from that found in previous studies conducted by Simonne et al. (2005) (6) in which larger farms and producers in Florida were contacted; larger farms and producers in that study utilized a high percentage of Hispanic workers. In this study, when the respondents were asked what formats for training they preferred, the majority preferred printed materials (63%), followed by in-person training (23%) and the internet (14%). A great majority (89%) preferred English, while 11% preferred Spanish.

#### CONCLUSION

More than 50% of vendors at Florida farmers' markets sell produce-related items. Other outlets for their products include produce stands, U-pick operations and restaurants. The majority of vendors use either compost or manure as soil amendments on land used for growing produce. Even though more than 50% think food safety is important for their operation, only 32% of respondents have completed food safety training. The majority of the respondents perform their own farm labor, or have family members as the primary labor source, while very few ven-

## Food Safety Practices

Food safety is an issue of growing importance to both producers and consumers. We have all seen the news stories about outbreaks of foodborne illnesses. Producers want to do their best to enhance food safety and consumers want to be sure that the food they consume is healthy and safe. The purpose of this questionnaire is to identify issues about food safety that you and other farmers would like to know more about. We will use your advice as a framework to develop an educational program for producers and consumers. Your opinion is valuable to us and we appreciate your taking time to fill out this questionnaire. We have included information about ourselves at the end of the survey and would like you to contact us if you have any questions or comments.

1. Which of the following kinds of crops or animal products do you produce? Check all that apply.

Fruits                       Vegetables                       Flowers  
 Meat                         Eggs                                 Herbs  
 Value added food items like dried fruit, spices, jams, sauces, etc.

2. How do you market your products? Check all that apply.

Farmers' market            [ less than 25%    25-50%    50-75%    more than 75%]  
 U-pick                        [ less than 25%    25-50%    50-75%    more than 75%]  
 Restaurants                [ less than 25%    25-50%    50-75%    more than 75%]  
 Supermarkets                [ less than 25%    25-50%    50-75%    more than 75%]  
 Produce stand                [ less than 25%    25-50%    50-75%    more than 75%]  
 CSA                            [ less than 25%    25-50%    50-75%    more than 75%]  
 Others

3. Do you apply any of the following soil amendments to the land where fresh fruits and vegetables are produced? Check all that apply.

Compost                       Manure                       Sludge or other biosolids

4. What, if any, percentage of your production is **Certified Organic**?

None                       <50%                       >50%                       All

5. What are your **major** sources of information about practices and procedures used to help make sure that the fresh fruits and vegetables that you sell are at low risk of contamination by pathogenic **microbes**? Check all that you consider a **major** or **very important** source of information.

Florida Cooperative Extension Service or the University of Florida  
 Florida Department of Agriculture and Consumer Services (FDACS)  
 Federal government (FDA, USDA, etc.)  
 Information from private organizations or companies (like producer associations or companies that sell products for farmers)  
 Extension from some state besides Florida  
 Other farmers

6. How familiar are you with the FDA (Food and Drug Administration) publication called *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables*? Check one.

I do not know this publication.  
 I know about it, but I have never really read it or used it.  
 I have reviewed the *Guide*.  
 I am fairly familiar with the *Guide*.  
 I use the information in the *Guide* regularly.

7. Have you ever completed a food safety training program?

Yes                       No

8. How confident are **you** with understanding the practices of food safety? Check one.

- Not at all confident.
- Not very confident.
- Somewhat confident.
- Confident.
- Very confident.

9. How important is it for **you** to learn more about food safety? Check one.

- It is not important at all.
- It is not important.
- It is somewhat important.
- It is important.
- It is very important.

10. How confident are **the people who work on your farm** with understanding the practices of food safety? Check one.

- Not at all confident.
- Not confident.
- Somewhat confident.
- Confident.
- Very confident.

11. How important is it for the **people who work on your farm** to learn more about food safety? Check one.

- It is not important at all.
- It is not important.
- It is somewhat important.
- It is important.
- it is very important.

12. Which of the following topics regarding food safety are most important to you? Rank in order from 1–5. (1 is most important, 5 is least important.)

- Pest control       Facility sanitation       Temperature control
- Worker hygiene       Produce sanitation washes

13. Who are the principal workers on you farm? Check all that apply.

- Myself       Other family members
- Permanent employees       Temporary or seasonal employees

14. Which kind of training program would best meet your needs? Check one.

- Written (printed materials)       Internet based       In person

15. What languages would you like to see publications in? Check all that apply.

- English       Spanish       Haitian – Creole
- Other (list)

dors use permanent or temporary workers. A sizeable percentage of vendors (44%) were not familiar with the FDA's "Guide to Minimize Microbial Food Safety Hazards for Fresh Produce (GAPs)." The majority of the vendors showed interest in food safety and are willing to learn more. The results provide insight for educators who want to develop food safety educational programs for these growers. Extension needs to produce tools that both the consumer and the producer can use successfully. Farmers' markets provide an excellent opportunity for educational programming, because the venue provides an opportunity for supplier and consumer to interact with each other during the learning experience.

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# Preharvest Processes for Microbial Control in Cattle

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## SUMMARY

This study was conducted to determine the effectiveness of single and multiple preharvest intervention strategies on prevalence of *Escherichia coli* O157 on/in cattle before transport to harvest. Cattle from 24 pens [approximately 200 head of cattle (419 kg) per pen] were randomly allocated (3 pens/treatment) to one of eight treatments: Control (CT; No treatment), Bovamine (Bov; a *Lactobacillus acidophilus* NPC-747 dietary product), NEOMIX (Neo; feeding of neomycin sulfate), an *E. coli* O157:H7 bacterin vaccine (Vac), and all combinations of the single treatments. Treatment of cattle with Bov and Vac began 60 d preharvest, while Neo was administered for 3 d, followed by a 24 h withdrawal period, immediately before harvest. Fecal and hide samples were randomly collected from 25 animals per pen, fecal samples by rectal palpation, and hide samples by sponge-swabbing a 500 cm<sup>2</sup> area over the dorsal-thorax region. All cattle were sampled within a 10-day time period and samples were collected no more than 48 h before harvest. Results showed that CT cattle had the highest prevalence of *E. coli* O157 (45.8 and 40.3%, for fecal and hide samples, respectively), while treated cattle presented numerically lower prevalences. Neo was the most effective single intervention; treated animals had *E. coli* O157 prevalence of 0.0 and 8.5%, in feces and on hides, respectively. Bov- and Vac-treated animals pathogen prevalence levels were 13.3 and 14.7%, respectively, in fecal samples and 22.7 and 20.0%, respectively, on hides. When Bov, Vac, and Neo were used in combination, pathogen prevalence in fecal and hide samples were 2.7 and 6.7%, respectively. A preliminary antibiotic susceptibility study of *E. coli* O157 isolates recovered from feces of cattle treated with Neo showed no increased resistance to a panel of 21 antibiotics when compared to isolates from untreated cattle; however, because of a lack of power, differences were not likely to be identified. This preliminary study demonstrated that preharvest mitigation strategies used singly or in combination may be effective in reducing prevalence of *E. coli* O157 in market-ready feedlot cattle.

## INTRODUCTION

Extensive research has identified post-harvest beef carcass decontamination strategies that have proven useful in minimizing prevalence of *Escherichia coli* O157:H7 (11, 15, 25, 29). Studies also have investigated intervention technologies that may control the pathogen in live cattle and the environment.

Other researchers (6, 10, 27) have evaluated the effects of dietary shifts on *E. coli* O157:H7 populations immediately before slaughter; however, neither dietary changes nor feeding management practices generated statistically significant or consistent findings. Studies have indicated that *E. coli* O157:H7 can survive in water troughs for up to two weeks (20, 26), but research to assess the influence of chlorination of livestock drinking water has shown it to be minimally effective and not practical in application (19).

Washing cattle with chlorinated water (8) before slaughter may be only minimally effective in reducing pathogen loads on hide surfaces. Barham et al. (2) reported that the incidence of *E. coli* O157:H7 on cattle after transport to the slaughter facility from the feedlot actually decreased, but that incidence of *Salmonella* spp. more than doubled after transport.

It may be possible to use feed additives (e.g., sodium chlorate) in cattle diets to effectively reduce prevalence of *E. coli* O157:H7 (1, 9). Sodium chlorate, however, has not been approved for use in animal diets. Since 1971, neomycin sulfate has been licensed to be used to

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treat bacterial enteritis in cattle, horses, sheep, swine, goats, cats, turkeys, chickens, ducks, and mink (NADA 011-315); however, until recently, its effectiveness as a means of reducing *E. coli* O157:H7 in cattle feces was undetermined. Elder et al. (12) showed a reduction in prevalence of *E. coli* O157:H7 in feces of cattle that received neomycin sulfate for 48 h and then were allowed a 24 h withdrawal; they shed significantly lower *E. coli* biotype 1 and *E. coli* O157:H7 populations in their feces. However, after 5 days of neomycin withdrawal, *E. coli* biotype 1 populations returned to near pretreatment levels, but *E. coli* O157:H7 populations remained almost undetectable.

Probiotic bacteria are those that beneficially affect the host by improving its microbial balance, including eliminating or reducing microorganisms that are carried by the host and that are harmful to humans (34). However, in place of the term probiotic, the US FDA has required feed manufacturers to use the term "direct-fed microbial" (18) which has been defined as "a source of live, naturally occurring microorganisms" (31). Zhao et al. (34) reported that probiotic bacteria could be effective in reducing prevalence of *E. coli* O157:H7 in cattle. In addition, others (16) demonstrated effective isolation of colicinogenic *E. coli* strains that were inhibitory to *E. coli* O157:H7. More recently, Brashears et al. (6) demonstrated methodology for developing competitive exclusion products (i.e., *Lactobacillus acidophilus*-based direct-fed microbials) to be fed to cattle to inhibit the growth and proliferation of *E. coli* O157:H7. In a feeding trial utilizing these competitive exclusion products (*Lactobacillus acidophilus* strain NPC 747), it was shown that shedding of *E. coli* O157:H7 in feces of finishing beef cattle was decreased (6). Most recently, Younts-Dahl et al. (32) reported that cattle administered a high level of *Lactobacillus acidophilus* (a combination of strains NP 51 and NP 45) were 57 and 79% less likely to have an *E. coli* O157-positive fecal and hide sample, respectively, than were controls.

Finally, vaccines also have been proposed as a new pathogen reduction strategy that could minimize colonization of *E. coli* O157:H7 in bovine intestines. Research in a typical cattle feedlot setting has shown that vaccination is effective in reducing prevalence of the pathogen from 21.3% in control cattle to 8.8% in vaccinated cattle (24).

The objective of the present study was to evaluate the effectiveness of various preharvest interventions designed to

reduce carriage and shedding of *E. coli* O157 in market-ready commercial feedlot cattle.

## MATERIALS AND METHODS

The Colorado State University Animal Care and Use Committee evaluated all proposed methodologies before initiation of this study and granted a food and fiber exemption.

### Experimental design

This study was conducted in a commercial feedlot in Eastern Colorado in early spring and utilized 24 pens of cattle (approximately 200 head of (419 kg) cattle per pen) that were randomly allocated to allow for eight treatment groups that were replicated three times. The eight treatments were as follows: (1) control (CT); (2) Bovamine Rumen Culture (Bov); (3) NEOMIX® AG 325 Medicated Premix (Neo); (4) a prototype Fort Dodge Animal Health Bovine *E. coli* O157:H7 Bacterin (Vac); (5) a treatment combination of Vac plus Bov; (6) a treatment combination of Vac plus Neo; (7) a treatment combination of Neo plus Bov; and (8) a treatment combination of Vac plus Bov plus Neo. For cattle in the CT treatment, no interventions were administered. Bovamine Rumen Culture (treatment 2) is a *Lactobacillus acidophilus* probiotic produced by Nutrition Physiology Corporation (Amarillo, TX) which contains a minimum of  $2 \times 10^{10}$  CFU/g of *Lactobacillus acidophilus* and *Propionibacterium freudenreichii*. This particular mixture of Bovamine (blue label with red writing, no product code given) was portrayed by Nutrition Physiology Corporation to our research team as containing an elevated level of *Lactobacillus acidophilus* NPC 747 that was reported by Brashears et al. (5) to reduce shedding of *E. coli* O157:H7 in feces of cattle. Bovamine was fed to cattle receiving that treatment for the duration of the study.

Neomycin sulfate (325 g/0.45 kg) (treatment 3) is the active ingredient of NEOMIX® AG 325 Medicated Premix, produced by Pharmacia & Upjohn Company (now Pfizer Animal Health; Exton, PA). The NEOMIX® AG 325 Medicated Premix was fed according to the label instructions for use in Type C medicated solid feed at slightly below the recommended dosage. Cattle were fed 10 mg of NEOMIX per 0.45 kg of body weight. NEOMIX® AG 325 Medicated Premix was added to "hammermill" (ground) corn at a concentration of 19.2 kg of NEOMIX per 909.01 kg of medicated feed, or 1.6 kg of

NEOMIX per 909.01 kg of complete feed. This neomycin sulfate concentration fell within the recommended range of 0.25 to 2.25 kg per 909.01 kg of neomycin sulfate in the complete feed diet. The NEOMIX® AG 325 Medicated Premix was fed for three days, four days before harvest, and was removed from the diet 24 h before harvest to meet withdrawal requirements.

An experimental *E. coli* O157:H7 vaccine produced by Fort Dodge Animal Health (Fort Dodge, IA) (treatment 4) was administered at the onset of the study and again 30 days later; USDA-FSIS granted slaughter permits for the cattle vaccinated with the experimental vaccine 30 days after the last vaccination was administered. The vaccine was described by Fort Dodge Animal Health as an experimental bacterin that was formulated by use of a proprietary dual adjuvant system that stimulated a strong immune response while maintaining safety. Adjuvants were selected based on preliminary screening of several complex adjuvant systems. Experimental inactivated bacterin contained the immune dominant antigens of *E. coli* O157:H7, including intimin and lipopolysaccharides, and stimulated host immune system T cells and B cells to elicit humoral antibody and some cell mediated immunity (CMI) factors.

### Sample collection

Samples were collected, within a time span of 10 days for all treatments, randomly from 25 cattle per pen, 12 to 48 h before transport to a commercial slaughter facility. Fecal samples were obtained by palpating the rectum and collecting at least 10 g of feces from each animal by use of a clean plastic palpation glove. Hide samples were collected from the same animal from which feces were obtained by swabbing approximately 500 cm<sup>2</sup> of the dorsal midline of the thorax (17) with a prehydrated sponge kit (International BioProducts, Bothell, WA). All samples then were transported to the Pathogen Reduction Laboratory in the Department of Animal Sciences at Colorado State University.

### Microbiological analysis

Following the procedures of Barkocy-Gallagher et al. (3), hide and fecal samples were suspended in 75 or 90 ml, respectively, of tryptic soy broth (TSB; Difco, Becton Dickinson & Co., Sparks, MD), incubated for 2 h at 25°C and then for 6 h at 42°C, and left overnight at 4°C.



**TABLE 1. Presumptive<sup>1</sup> prevalence (%) of *E. coli* O157 isolates by replicate (pen)<sup>2</sup> and treatment from hide, fecal, or a combination of hide plus fecal samples collected from cattle exposed to one of eight preharvest intervention treatments**

Control or Treatment	Hide			Fecal			Hide or Fecal		
	Pen 1	Pen 2	Pen 3	Pen 1	Pen 2	Pen 3	Pen 1	Pen 2	Pen 3
Control	66.7	8.7	44.0	87.5	4.3	44.0	95.8	13.0	60.0
Bovamine	0.0	8.0	60.0	0.0	24.0	16.0	0.0	32.0	64.0
NEOMIX	14.3	12.0	0.0	0.0	0.0	0.0	14.3	12.0	0.0
Vaccine	16.0	16.0	28.0	16.0	0.0	28.0	28.0	16.0	52.0
Vaccine + Bovamine	4.2	44.0	4.0	91.7	8.0	0.0	91.7	52.0	4.0
Vaccine + NEOMIX	12.0	4.0	4.0	80.0	0.0	0.0	84.0	4.0	4.0
NEOMIX + Bovamine	23.8	0.0	0.0	0.0	4.0	0.0	23.8	4.0	0.0
Vaccine + Bovamine + NEOMIX	12.0	0.0	8.0	0.0	4.0	4.0	12.0	4.0	12.0

<sup>1</sup>Isolates are considered presumptive positive when morphologically typical colonies are *E. coli* O157 latex positive and indole-positive.

<sup>2</sup>Pen served as the experimental unit (n = 3/treatment/sample type). These data represents the percentage of the 25 *E. coli* O157 presumptive-positive hide, fecal and hide plus fecal samples per pen.

**TABLE 2. Percent prevalence (and, in parentheses, the difference from the control) of presumptive<sup>1</sup> positive *E. coli* O157 isolates from hide, fecal, or a combination of hide plus fecal samples collected from cattle exposed to one of eight preharvest intervention treatments**

Control or Treatment	% Presumptive Positive <i>E. coli</i> O157 isolates		
	Hide	Fecal	Hide or Fecal
Control	40.3	45.8	56.9
Bovamine	22.7 (17.6)	13.3 (32.5)	32.0 (24.9)
NEOMIX	8.5 (31.8)	0.0 (45.8)	8.5 (48.4)
Vaccine	20.0 (20.3)	14.7 (31.1)	32.0 (24.9)
Vaccine + Bovamine	16.4 (23.9)	32.9 (12.9)	48.0 (8.9)
Vaccine + NEOMIX	6.7 (33.6)	26.7 (19.1)	30.7 (26.2)
NEOMIX + Bovamine	7.1 (33.2)	1.3 (44.5)	8.6 (48.3)
Vaccine + Bovamine + NEOMIX	6.7 (33.6)	2.7 (43.1)	8.0 (48.9)

<sup>1</sup>Isolates are considered presumptive positive when morphologically typical colonies are *E. coli* O157 latex positive and indole-positive.

*Escherichia coli* O157 enrichment was followed by immunomagnetic bead separation, which consisted of a 30-min incubation (on a rocker at room temperature) of 1 ml aliquots of the enriched fecal and hide samples plus 100 µl protamine (50 µg/ml filter-sterilized solution; Sigma, St. Louis, MO), plus 20 µl of anti-O157 immunomagnetic beads (Dyna-

Laboratories, Lake Success, NY). The beads were washed three times with 1 ml of phosphate buffered saline (PBS)/0.05% Tween 20 (Sigma) on a magnetic separation rack, and then resuspended in 100 µl of PBS/0.05% Tween 20. Fifty microliters of the bead suspension was spread plated onto sorbitol MacConkey agar (Difco) plates supplemented with cefixime

(0.05 mg/l) and potassium tellurite (2.5 mg/l, Dynal Laboratories, ctSMAC). The remaining 50 µl was plated on Rainbow-plus agar (Biolog, Inc., Hayward, CA) containing 0.8 µg/ml of potassium tellurite (Sigma-Aldrich, St. Louis, MO) and 20 µg/ml novobiocin (Sigma). The supplements were added to improve selectivity, as suggested by the manufacturer.

**TABLE 3.** Descriptive statistics for zones of inhibition (mm) relating to antibiotic susceptibility/resistance patterns for multiple classes of antibiotics against *E. coli* O157 isolates recovered from fecal samples collected from feedlot cattle receiving either no (control; n = 25) or subsequent pre-harvest microbiological intervention strategies (Neo treated; n = 21)

Antimicrobial	Zones of Inhibition (mm)							
	Control <sup>a</sup>				Treated <sup>b</sup>			
	Average	SD	Min	Max	Average	SD	Min	Max
<b>Aminoglycosides:</b>								
Amikacin	22.9	1.1	20	25	22.7	0.8	21	24
Gentamicin	22.6	0.7	21	23	22.1	0.7	21	23
Kanamycin	21.9	0.9	19	23	22.0	0.8	19	23
Neomycin	19.0	0.8	18	21	19.0	0.8	18	21
Netilmicin	26.0	1.1	22	27	26.0	1.0	23	27
Streptomycin	17.8	1.0	15	19	17.7	0.8	16	19
Tobramycin	22.2	0.9	19	23	22.3	0.8	20	23
<b>β-Lactam/β-Lactamase inhibitors:</b>								
Amoxicillin-clavulanic acid	21.2	1.1	19	23	21.4	1.1	18	23
Ampicillin	18.7	0.7	18	21	19.7	1.2	17	21
<b>Cephalosporins:</b>								
Cefoxitin	25.2	1.3	23	29	26.0	1.2	23	27
Ceftiofur	25.9	1.2	23	28	26.9	1.0	25	29
Ceftriaxone	31.2	1.3	28	34	31.7	1.4	28	35
Cephalothin	18.6	1.0	17	22	19.5	1.3	17	21
Chloramphenicol	21.6	1.4	19	25	21.0	1.4	19	25
Florfenicol (chloramphen. derive.)	22.2	1.7	19	25	20.4	1.7	18	26
<b>Fluoroquinolones:</b>								
Ciprofloxacin	33.6	3.5	24	39	34.0	2.1	28	37
<b>Macrolides:</b>								
Erythromycin	9.9	0.5	9	11	10.1	1.5	9	16
Tilmicosin	10.5	1.0	9	13	9.9	1.6	6	14
<b>Sulfonamides:</b>								
Sulfasoxazole	21.9	1.3	19	24	22.6	1.0	20	26
Tetracycline	22.3	1.1	19	25	23.3	1.4	20	26
Trimethoprim and Sulfamethoxazole	30.2	1.3	28	33	30.2	1.47	27	33

<sup>a</sup>*E. coli* O157 isolates recovered from cattle that did not receive a preharvest intervention treatment.

<sup>b</sup>*E. coli* O157 isolates recovered from cattle treated with either the experimental Fort Dodge Animal Health *E. coli* O157 vaccine and NEOMIX (neomycin sulfate) or from cattle treated with a combination of Bovamine (a product containing *Lactobacillus acidophilus*), Fort Dodge Animal Health *E. coli* O157 vaccine and NEOMIX (neomycin sulfate).

Both ctSMAC and Rainbow-plus agar plates were incubated for 18 h at 35°C. Following incubation, up to five presumptive *E. coli* O157 colonies were picked from the ctSMAC and Rainbow-plus agar plates and screened with the Dry Spot O157 latex test (Oxoid, Ogdensburg, NY). Colonies generating a positive reaction to the latex test were subsequently streaked

onto ctSMAC for purity (24 h; 35°C). From ctSMAC, morphologically typical sorbitol-negative colonies were tested for their indole reaction by inoculating into 1% tryptone broth (Fisher Scientific, Fair Lawn, NJ, BAM) and incubating at 35°C for 24 h, following which 0.3 ml of Kovac's reagent (bioMérieux Vittek, Inc., Hazelwood, MO) was added for the indole reaction.

#### Antibiotic susceptibility

Presumptive isolates of *E. coli* O157 recovered from feces of cattle receiving no treatment (n = 25, control) or from feces of cattle that were treated with Neo in any combination of treatments (n = 21, treated), were tested to compare antimicrobial resistance characteristics.

**TABLE 4. Classification of antibiotic susceptibility (resistant, intermediate and susceptible) and number of *E. coli* O157 isolates recovered from feedlot cattle receiving either no Neo (control; n = 25) or subsequent pre-harvest microbiological intervention strategies (Neo treated; n = 21)**

Antimicrobial	Level of Resistance					
	Resistant		Intermediate		Susceptible	
	Control	Treated <sup>a</sup>	Control	Treated <sup>a</sup>	Control	Treated <sup>a</sup>
<b>Aminoglycosides</b>						
Amikacin	0	0	0	0	25	21
Gentamicin	0	0	0	0	25	21
Kanamycin	0	0	0	0	25	21
Neomycin	0	0	0	0	25	21
Netilmicin	0	0	0	0	25	21
Streptomycin	0	0	0	0	25	21
Tobramycin	0	0	0	0	25	21
<b>β-Lactam/β-Lactamase inhibitors</b>						
Amoxicillin-clavulanic acid	0	0	0	0	25	21
Ampicillin	0	0	0	0	25	21
<b>Cephalosporins</b>						
Cefoxitin	0	0	0	0	25	21
Ceftiofur	0	0	0	0	25	21
Ceftriaxone	0	0	0	0	25	21
Cephalothin	0	0	3	2	22	19
Chloramphenicol	0	0	0	0	25	21
Florfenicol (chloramphen. derive.)	0	0	0	1	25	20
<b>Fluoroquinolone</b>						
Ciprofloxacin	0	0	0	0	25	21
<b>Macrolides</b>						
Erythromycin	25	20	0	0	0	1
Tilmicosin	15	16	10	4	0	1
<b>Sulfonamide</b>						
Sulfasoxazole	0	0	0	0	25	21
<b>Tetracycline</b>						
Trimethoprim/sulfonamide	0	0	0	0	25	21
Trimethoprim and Sulfamethoxazole	0	0	0	0	25	21

(n = 25) or that received Neo pre-harvest (Neo treated; n = 21).

<sup>a</sup>*E. coli* O157 isolates recovered from cattle that did not receive a preharvest intervention treatment.

<sup>b</sup>*E. coli* O157 isolates recovered from cattle treated with either the experimental Fort Dodge Animal Health *E. coli* O157 vaccine and NEOMIX (neomycin sulfate) or from a combination of Bovamine (a product containing *Lactobacillus acidophilus*), Fort Dodge Animal Health *E. coli* O157 vaccine and NEOMIX (neomycin sulfate).

No *E. coli* O157 isolates were recovered from cattle that were treated solely with NEOMIX (Neo). Therefore, antimicrobial susceptibility of *E. coli* O157 isolates exposed to Neo was determined by using those isolates recovered from cattle treated with Neo in combination with Vac and Bov. Antimicrobial susceptibility was determined using the disk diffusion method in accordance with NCCLS (23) standards. Briefly, *E. coli* O157 isolates were transferred onto trypticase soy agar containing 5% sheep blood (Difco) and then incu-

bated for 24 h at 35°C. Following incubation, the BBL Prompt system was used to produce a standard inoculum of  $1 \times 10^8$  CFU/ml (Becton Dickson Microbiology Systems, Sparks, MD). After standardization, the inoculum was spread onto two Mueller-Hinton agar (Difco) plates, at which time the antimicrobial disks were dispensed and tamped into place. Antimicrobial disks were BBL Sensi-Discs (Becton Dickson Microbiology Systems, Sparks, MD). Antimicrobial susceptibility testing was conducted by use of the

following 21 different antimicrobials (concentrations) and combinations: amikacin (30 µg), ampicillin (10 µg), cefoxitin (30 µg), cephalothin (30 µg), ceftiofur (10 µg), ceftriaxone (30 µg), chloramphenicol (30 µg), ciprofloxacin (5 µg), erythromycin (15 µg), florfenicol (30 µg), gentamicin (10 µg), kanamycin (30 µg), neomycin (30 µg), netilmicin (30 µg), streptomycin (10 µg), sulfisoxazole (250 µg), tetracycline (30 µg), tilmicosin (15 µg), tobramycin (10 µg), and combinations of amoxicillin/clavulanic acid (20 µg /10 µg) and

trimethoprim/sulfamethoxazole (1.25 µg/23.75 µg). After incubation for 17 ± 1 h at 35°C, plates were removed and a computerized plate reader (BIOMIC® Giles Scientific, Santa Barbara, CA) was used to measure the respective zones of inhibition for each of the antimicrobials tested.

### Statistical analysis

Data from the *E. coli* O157 analyses were reported as percentages of hide, fecal, or hide plus fecal (when either was positive) samples testing positive for the pathogen per pen. Since both the hide and fecal samples came from the same animal, the animal was considered positive if either the hide or the fecal sample was positive. Differences in percentages of positive samples among the seven treatments and the control were evaluated with a chi-square goodness of fit test. Data representing percentage prevalence of *E. coli* O157 isolates were analyzed by use of the Frequency Procedure of SAS (SAS Inc., Cary, NC, Version 8.2e, 2003). Differences between frequencies associated with the different pathogen intervention strategies were determined by calculating the chi-square statistic. For the antibiotic susceptibility testing, differences between means, standard deviations and the minimum and maximum zones of inhibition for each isolate were calculated with PROC GLM, using the Hotellings *t*-test procedure of SAS (SAS Inc., Cary, NC, Version 8.2e, 2003).

### RESULTS AND DISCUSSION

*Escherichia coli* O157 was isolated from 85 (14.5%), 95 (16.2%), and 166 (28.3%) of the 586 fecal, hide and hide plus fecal (when either the hide or fecal sample was positive, but not necessarily both) samples, respectively, in this study. Using pen as the experimental unit, the main effect of treatment did not prove to be statistically relevant ( $P > 0.05$ ; Table 1). In light of these findings, data are discussed in this study as trends.

One of the difficulties in field studies that test for the prevalence of *E. coli* O157:H7 is an elusive dynamic of the pathogen. Smith (30) reported that the proportion of cattle shedding *E. coli* O157:H7 within a single population during summer months can vary from 1 to 80%. With such large variation among pens in *E. coli* O157:H7 prevalence within any given time, one might conclude that variation observed among replicates for hide and fecal samples in this study was

to be expected (Table 1). The problem of highly variable prevalence data in *E. coli* O157:H7 field studies might be resolved in future studies by enumerating pathogen levels in or on cattle, which would offer greater insight regarding effects of treatments on the reduction or proliferation of the pathogen.

When pen prevalence within treatments and between replicates (each individual pen) was averaged, mean *E. coli* O157 prevalences of 40.3, 45.8 and 56.9% were detected for hide, fecal, and hide plus fecal samples, respectively, for control animals (Table 2). Exposure to pre-harvest intervention treatments lowered the prevalence of *E. coli* O157 by at least 17.6, 12.9 and 8.9%, respectively, for hide, fecal, and hide plus fecal samples, and by as much as 33.6, 45.8, and 48.9%, respectively. Additionally, Neo, Vac + Neo, Neo + Bov, or Vac + Bov + Neo treated animals had the lowest *E. coli* O157 prevalence on hides.

As a single intervention, or in combination with other treatments, Neo was the treatment with the lowest prevalence of the pathogen in fecal samples when compared to controls. These data are similar to those reported by Elder et al. (12), in which nearly all the neomycin treated calves had undetectable levels of *E. coli* O157 for up to 5 days. Variability of pen response found in the four experimental treatments that included Neo (Table 1) may be explained by the possible existence of persistent shedders within pen, combined with the known existence of variability within cattle populations.

When used singly, Bov and Vac had similar pathogen prevalence levels of 17.6 and 20.3%, respectively, on hide samples and 32.5 and 31.1%, respectively, in fecal samples. Treatments with Bov in this study produced slightly greater differences from the controls in prevalence of *E. coli* O157 compared to those reported by others (5, 32). In addition, compared to controls, animals treated with the *E. coli* O157:H7 vaccine had slightly lower prevalence of *E. coli* O157 than that reported by Potter et al. (24). In comparison with using each of the treatments alone (Bov, Neo or Vac), the combination of any two of the treatments resulted in animals with lower pathogen levels than the control on hide samples; in contrast, when compared to the control, the combination of any two treatments resulted in a higher prevalence of the pathogen in fecal samples. The combination of all three interventions (Vac + Bov + Neo) generated the lowest numerical pathogen prevalence on hides and in feces.

In this study, no statistical differences in antibiotic susceptibility/resistance patterns of *E. coli* O157 recovered from feces of control and Neo treated cattle (Table 3) were detected; however, it should be noted that because of the relatively low number of isolates and the high number of antibiotics tested, the experiment lacked sufficient power to accurately detect statistical differences. In general, of the 21 antibiotics used in this study, 17 were effective in controlling growth of *E. coli* O157 recovered from the feces of feedlot cattle (Table 4). All but one *E. coli* O157 isolate from Neo treated cattle, and all isolates from control cattle, were resistant to erythromycin. In addition, 60 and 76% of isolates from control and treated cattle, respectively, were resistant to tilmicosin. For cephalothin, intermediate resistance was shown in 12 and 9% of isolates from control and treated cattle, respectively. From the isolates and resulting susceptibility data collected in this study, treatment with neomycin sulfate for three days before harvest did not appear to influence the antibiotic susceptibility/resistance patterns of *E. coli* O157 recovered from the feces of cattle that received neomycin sulfate immediately (4 days) before harvest.

Even though early studies of antibiotic resistance showed that *E. coli* O157 isolates were sensitive to antibiotics, recent studies have shown a trend toward increased resistance to antibiotics. In particular, compared to strains isolated from humans and other livestock species, higher percentages of resistant strains of *E. coli* O157 come from cattle (22). In agreement with the findings of this study, sources report that *E. coli* O157 strains show little or no in vitro susceptibility to erythromycin (4, 13, 14). Studies have shown *E. coli* O157 to acquire resistance to antibiotics more rapidly than *Salmonella* spp. (4). In contrast to the findings of this experiment, numerous sources have reported multiple resistance patterns of *E. coli* O157 to tetracycline, streptomycin, sulfamethoxazole, ampicillin, chloramphenicol, and gentamicin (21, 22, 28, 33). This could be explained by the assumption that the cattle used in this study did not receive excessive treatment with these antibiotics; therefore, it could be assumed that no resistance was formed by the organisms collected from the cattle in this study. Conversely, it could be concluded that the susceptibility of *E. coli* O157 strains collected from the cattle in this study was nondependent on antibiotic treatment.

Data from this preliminary study indicate that preharvest pathogen prevalence was lower in animals following application of mitigation interventions for *E. coli* O157 on hides and in the feces of treated cattle. Additional studies should be conducted to statistically validate the effectiveness of these treatments in lowering prevalence of *E. coli* O157 on the hides and in the feces of cattle. More importantly, research should be conducted to determine if these preharvest interventions strategies impact the microbiological quality of carcasses post-processing. Further research should be conducted to identify supply-chain cattle management systems that could effectively minimize prevalence of *E. coli* O157 at all stages of beef cattle production. Additional research should be conducted to determine antibiotic susceptibility/resistance of *E. coli* O157 after extended use as a feedlot additive. One potential disadvantage of applying preharvest intervention strategies in the feedlot is the added cost incurred by the producer.

## ACKNOWLEDGMENTS

This project was funded in part by beef and veal producers and importers through their \$1-per-head checkoff and was produced for the Cattlemen's Beef Board and state beef councils by the National Cattlemen's Beef Association. In addition, we would like to acknowledge financial assistance from the Colorado State University Agricultural Experiment Station. Finally, we thank Laura L. Behrends, Ifigenia Geornaras and colleagues at the Pathogen Reduction Laboratory at the Center for Red Meat Safety in the Department of Animal Sciences at Colorado State University.

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## Attention Students

Mark your calendar to  
attend the SPDG Student Mixer at IAFP 2006

Hyatt Regency Calgary  
Tuesday, August 15  
7:00 p.m. – 9:00 p.m.

# IAFP Participates in Second World Trade Organization Sanitary/Phytosanitary (WTO SPS) Leadership Development Program for the People's Republic of China



On April 13, David Tharp, IAFP Executive Director and Dr. James Dickson, Professor at Iowa State University and IAFP Past President, met with 15 government officials from the People's Republic of China to talk about development of food safety professionals worldwide. David presented information on how associations, specifically IAFP, help bring together food safety professionals to share information on protecting the food supply. Jim's presentation focused on attracting students to food safety related programs and then educating them at universities such as Iowa State.

The Chinese delegation participated in an eight-week program organized by the US Department of Agriculture's Foreign Agriculture Service (FAS), in coordination with the US Trade Representative (USTR) and operating agencies with direct food safety responsibility and with the United States agriculture and food industry. The operating agencies include the Food and Drug

Administration (FDA), the Food Safety Inspection Service (FSIS), the Animal and Plant Health Inspection Service (APHIS), the Grain Inspection Service, the Seafood Inspection Program, the Environmental Protection Agency (EPA), and other agencies. The Joint Institute manages the leadership development program for Food Safety and Applied Nutrition (JIFSAN) of the University of Maryland and the US Food and Drug Administration.

The Chinese multi-agency team is comprised of officials covering the full range of implementation responsibilities, including general management of food safety policy and programs, industrial process supervision, inspection and testing, science application in food safety, risk assessment and analytic support services, and development of the food safety profession and its professional development. Agencies represented include General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ), Certification and Accreditation Administration of the People's Republic of China, China National Institute

of Standardization, Ministry of Commerce, Ministry of Health, Ministry of Agriculture, State Forestry Bureau, and Legislative Affairs Office of the State Council.

IAFP was honored to be asked to participate with this prominent group of leaders and pleased to have provided information to help lead to a safer food supply for our world.



(Left to right): Roseanne Freese, FAS/USDA; Zeng Yuan, Ministry of Health; Tian He, State Forestry Bureau; Judy Quigley, JIFSAN; Meng Dong, AQSIQ; Zao Minggang, AQSIQ; and Nie Dake, AQSIQ.

Standing (left to right): Zhao Minggang, AQSIQ; Bao Junkai, AQSIQ; and Fang Qing, AQSIQ. Sitting (left to right): Patricia R. Sheikh, FAS/USDA; and Shi Xiaowei, AQSIQ.



# Call for Symposia

## IAFP 2007

July 8-11  
Lake Buena Vista, Florida

The Program Committee invites International Association for Food Protection Members and other interested individuals to submit a symposium proposal for presentation during IAFP 2007, July 8-11, 2007 in Lake Buena Vista, Florida.

### WHAT IS A SYMPOSIUM?

A symposium is an organized, 3 1/2-hour session emphasizing a central theme relating to food safety and usually consists of six presenters each giving 30-minute presentations with a 30-minute break between the third and fourth presentation. Short symposia with three or four 30-minute presentations are also possible. Round-table discussion forums, which are 90 minutes in length with 2-3 brief presentations (10-15 minutes each), a formal question and answer session, followed by time for audience participation, are also acceptable.

Symposia may include a discussion emphasizing a scientific aspect of a common food safety and quality topic, issues of general interest relating to food safety and microbiological quality, a report of recent developments, an update of state-of-the-art methodologies, or a discussion of basic and applied research in a given area. The material covered should include current work and the newest findings. Symposia will be evaluated by the Program Committee for relevance to current science and to Association Members. Proposals may be prepared by individuals, groups of individuals, committees, or professional development groups (PDGs).

### SUBMISSION INSTRUCTIONS

To submit a symposium proposal, read all the information on this page, paying close attention to the "Symposium Selection Procedure" on the next page, then complete the "Symposium Proposal." Follow all instructions when making a submission. Your suggested presenters need not be confirmed at this stage, only identified.

### SYMPOSIUM PROPOSAL DEADLINE

Send symposium proposals to the Association office no later than August 7, 2006 or submit to the IAFP registration desk at IAFP 2006 by Tuesday, August 15, 2006 at 10:00 a.m. At the submitter's option, the submitter may discuss their proposal with the Program Committee at 7:00 a.m. on Wednesday, August 16.

The Program Committee will review submitted symposia at the conclusion of the IAFP 2006 Annual Meeting to decide which symposia will be selected for further development. Organizers will be notified as to the status of their proposal by September 29, 2006.

Symposia selected for further development should be completed and sent to the IAFP office by January 16, 2007. **FINAL DECISIONS ABOUT ACCEPTANCE AND CONTENT OF SYMPOSIA FOR PRESENTATION AT IAFP 2007 WILL BE MADE BY THE PROGRAM COMMITTEE DURING THEIR JANUARY 2007 MEETING.**

Symposia organizers and potential moderators and speakers should understand that not all symposia selected for further development will be accepted as submitted. The IAFP Program Committee reserves the right to reject poorly organized symposia, and/or to review symposia, including proposed subjects and speakers, and make modifications based on providing the most comprehensive and balanced forum. The organizer will be notified of the final results by February 28, 2007.

### PRESENTERS WHO ARE NOT MEMBERS

The International Association for Food Protection does not reimburse invited presenters for travel, hotel, or other expenses incurred during the Annual Meeting. However, invited presenters who are not Association members will receive a complimentary Annual Meeting registration. Presenters who are Association Members are expected to pay normal registration fees.



## ASSOCIATION FOUNDATION SPONSORSHIP

The International Association for Food Protection Foundation has limited funds for travel sponsorship of presenters. After final acceptance of the symposium (February 2007), symposia organizers may make requests in writing to the Executive Director. Requests are reviewed on an individual and first-come-first-served basis. The maximum funding grant will be \$750 per presenter (\$1,250 if outside North America). Organizers are welcome to seek funding from other sources and the Association will provide recognition for these groups in our program materials. Organizers are asked to inform the Association if they obtain outside funding.

## SYMPOSIUM SELECTION PROCEDURE

The primary focus of the symposium selection procedure is to provide a balanced educational program for attendees of the IAFP Annual Meeting. To achieve this goal, symposia may be combined or modified by the Program Committee during their August 2006 or February 2007 review, as appropriate, to prevent overlap of topics among competing symposia. The Program Committee also reserves the right to suggest alternative speakers and/or topics in an effort to round out symposia or discussion forums. During the symposia selection process, only the most relevant and promising symposia proposed by groups and individuals will be selected for further development.

### *Guidelines for tentative acceptance:*

- I. Proposed symposia must be pertinent to IAFP Members and PDGs. Priority will be given to symposia that address one or more of the following program areas:
    - Safety and Microbial Quality of Foods (dairy, meat and poultry, seafood, produce, water)
    - Viruses and Parasites, Retail Food Safety, Epidemiology and Public Health
    - Non-Microbiology Food Safety Issues (food toxicology, allergens, chemical contaminants)
    - General-Applied Food Safety Microbiology (for example, advances in sanitation, lab methods, quality assurance, food safety systems)
    - General-Food Protection for the Future (risk analysis, emerging pathogens, biotechnology, predictive models, etc.)
  - Developments in Food Safety Education
  - Other pertinent food protection topics may be considered if space is available
2. In addition to addressing pertinent program areas, symposia accepted for further development should:
    - Be new, emerging and/or address areas not covered in last 2 years
    - If covered in last 2 years, provide new information that warrants another symposium
  3. Symposium submissions must include:
    - Titles that clearly convey the topics to be covered
    - Topics that are unique to prevent overlap of basic information among speakers
    - Names of suggested speakers from a variety of backgrounds, such as industry, regulatory, academic researchers, or consumer perspective (as appropriate)
    - Suggested speakers who are knowledgeable and good communicators
  4. Special consideration will be given to symposium submissions that:
    - Are directly applicable or provide viable safety options for food manufacturers, including small to medium size manufacturers
    - Bring an international (outside of North America) focus or viewpoint to the meeting
    - Attract/involve students
    - Attract/involve local affiliate members who would not otherwise attend the Annual Meeting (e.g., regional specialties like shellfish issues for Gulf States)
    - Would attract members of a new PDG or program area that IAFP is trying to develop or encourage
  5. Other considerations for selecting symposia for further development:
    - Proposals must be submitted to the IAFP office by August 7, 2006 or the IAFP registration desk at IAFP 2006 by 10:00 a.m. on Tuesday, August 15, 2006
    - The Program Committee reserves the right to limit the number of sessions devoted to a single program area to provide a balanced program

- If relevant topics are proposed by more than one submission, the Program Committee will make the final decision to combine or modify symposia as appropriate to avoid overlap of topics among competing symposia. In this case, organizers may be asked to work with one another to combine symposia
  - Due to space and time limitations, only the most relevant and promising proposals (as modified by the Program Committee) will be selected for further development as full sessions (typically consisting of six 30-minute presentations), short sessions (typically consisting of three or four 30-minute presentations) or roundtable discussions (90 minutes in length with two or three brief presentations and question and answer session). Again, the Program Committee will make final decisions regarding symposia format and length
  - Three sessions will be reserved for symposia sponsored by our partner, the International Life Science Institute North America (ILSI, N.A.). The ILSI N.A. symposia address topics that are of general interest to IAFP meeting attendees, focus on emerging food safety issues and technologies, and provide a global perspective
  - Additional sessions may be added at the discretion of the Program Committee to accommodate emerging issues
6. Final decisions on symposia selection will be made at the January 2007 Program Committee Meeting.
- Symposia recommended for further development should be submitted, in finalized form, to the IAFP office by January 16, 2007. This includes symposium title, abstract, convener and speaker information (name, contact information, and proposed title of presentation). Organizers are encouraged to contact and get preliminary confirmation from speakers in advance of submitting the final symposium application. However, full confirmation of speakers, and acceptance of symposia, will be provided after the January 2007 Program Committee meeting (organizers will be notified by February 28, 2007). The IAFP Program Committee reserves the right to review symposia, including proposed subjects and speakers, and make modifications in order to provide the most comprehensive and balanced program. Invited symposium speakers need to be aware of this when they are contacted.

**WHO TO CONTACT:**

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# Symposium Proposal

## IAFP 2007

July 8-11

Lake Buena Vista, Florida

Title: \_\_\_\_\_

Organizer's Name: \_\_\_\_\_

Committee or PDG Submitting Proposal: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

Topic — Suggested Presenter, Affiliation (Example: 1. HACCP Implementation — John Smith, University of Georgia)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

Suggested Convenors: \_\_\_\_\_

Topic Area:

- Food Safety/Microbial Quality (list commodities) \_\_\_\_\_
- Foodborne Viruses and Parasites
- Retail Food Safety
- Epidemiology and Public Health
- Food Safety (Non-Microbiology Issues)
- General – Advances in Technology Applications
- General – Emerging Issues
- Education
- Other \_\_\_\_\_

Attach a short statement describing the relevance of the symposium to IAFP attendees and how this symposium is unique compared to topics previously presented at IAFP 2006 and IAFP 2005.

Signature of Organizer: \_\_\_\_\_

Submit by August 7, 2006 to:

IAFP — Symposium Proposal  
6200 Aurora Ave., Suite 200W  
Des Moines, IA 50322-2864, USA

or

Submit in person during IAFP 2006  
to the IAFP registration desk by  
Tuesday, August 15, 2006 at 10:00 a.m.

or Contact:

Tamara Ford  
International Association for Food Protection  
6200 Aurora Ave., Suite 200W  
Des Moines, IA 50322-2864, USA  
Phone: 800.369.6337; 515.276.3344  
Fax: 515.276.8655  
E-mail: [tford@foodprotection.org](mailto:tford@foodprotection.org)



## GOLD SUSTAINING MEMBER PROFILE



**b**ioMérieux is a leading global company that specializes in the field of *in vitro* diagnostics for medical and industrial applications. bioMérieux designs, develops, manufactures and markets systems used in clinical applications for the diagnosis of infectious diseases and other pathologies, and in industrial applications for the microbiological analysis of food, pharmaceutical, cosmetic, platelets and some tissue-based products. Today bioMérieux has more than 5,300 employees worldwide and is present in more than 130 countries.



**T**o understand bioMérieux's commitment to the public health sector, you first need to know its unique history. Marcel Mérieux, a chemist, trained with the father of microbiology, Louis Pasteur. Combining his strengths in chemistry and microbiology, Marcel Mérieux later founded the Institute of Mérieux where various animal and human vaccines were developed. His son, Charles Mérieux became a doctor of medicine and later built on his father's foundations with joint ventures and acquisitions including *api*, Vitek Systems and Organon Teknika, further strengthening bioMérieux's expertise in the diagnosis of infectious diseases. The strong partnerships of engineering and microbiology and the combination of service-oriented company philosophies helped set bioMérieux apart from other diagnostic companies.

From bioMérieux's beginning in the field of infectious disease diagnostics, it was only a matter of time before the company would dedicate resources to the development of products for the improvement of food safety and food quality hereby playing a critical role in ensuring the safety of the public health. A separate division, bioMérieux INDUSTRY, was created and has been providing food processors with innovative testing solutions for more than 20 years.

The full range of bioMérieux innovation encompasses prepared media and microbiology testing systems, including the VITEK® and VITEK® 2 Compact identification

systems, *api*® manual identification systems, VIDAS® Automated Pathogen Detection Systems, BacT/ALERT® 3D Microbial Detection System and air IDEAL® environmental air sampling system. Innovations from bioMérieux INDUSTRY provide enhanced operational efficiency and help control the cost of manufacturing as well as ensure the highest level of product safety.

bioMérieux cannot remain competitive without investing in tomorrow. A consistent 12–13% of annual revenues are re-invested to support bioMérieux's commitment to the advancement of public health and safety. Our goal is to work with top leaders in the industry in an effort to create partnerships with microbial experts, universities and our customers to ensure that our products meet the highest expectations of the market. Such efforts have seen the introduction of the FoodExpert-ID®, bioMérieux's first molecular multi-detection test specific for food and feed analysis. Further commitment to the food industry is seen in the development of the TEMPO® system, the first automated solution for microbial enumeration. Our leading-edge research continues to broaden the realm of industrial microbiological control.

bioMérieux INDUSTRY's goal is to achieve complete customer satisfaction. Part of that commitment is through our Customer Service and Customer Support Hotlines along with a team of highly skilled Client Consultants and Field Service Engineers to train and support our customers' application and use of bioMérieux products.

Over the years, we have seen our relationships grow with our customers and with leaders in the food safety community such as that with IAFF. Today, we are a Gold Member sponsor and we are proud to promote IAFF in its endeavors as it provides a format of free technical exchange between suppliers like bioMérieux, food companies, and local, state and federal agencies. It is our goal not only to supply diagnostic tools for the food industry but also to be partners and educators in their endeavors to ensure public safety through our food supply.

For more information about bioMérieux's food safety and quality solutions, visit [www.foodsafetyandquality.com](http://www.foodsafetyandquality.com) or call us at 1.800.634.7656.



## GOLD SUSTAINING MEMBER PROFILE



**bpi**  
technology  
inc.

Expect a higher standard

**B**eef Products, Inc., the world's leading manufacturer of boneless lean beef, is headquartered in the heartland of America, Dakota Dunes, South Dakota. Since its inception in 1981, BPI has operated with one simple guideline, to be the best at what we do. This drive to be a leader within the beef industry has resulted in continuous development of new processing techniques, sanitation programs, and food safety innovations. BPI's dedication to quality and innovation spans over two decades of proven leadership in the lean meat manufacturing industry. At BPI and affiliated companies, we expect a higher standard of ourselves and, consequently, deliver a higher standard for our customers.

**P**roducing 80,000 pounds of production a week in its beginnings, BPI's products are now found in over two-thirds of all ground beef produced in the United States each year. With current production of over 9 million pounds per week, BPI is clearly the leading manufacturer of boneless lean beef in the world. With continued process improvements, we anticipate production to reach 10 to 12 million pounds per week within the next year.

At BPI, food safety is more than an afterthought. Food safety is a critical element in the design and construction of each BPI facility. Food safety is so vital that nearly 20% of the total cost to construct BPI's South Sioux City facility went directly into sanitation and food safety related items. For example, outside air is washed, refrigerated, and sanitized before entering the processing room. The chilled air creates positive pressure within the processing room that, we believe, prevents contaminated air from entering the processing area. This eliminates the need for refrigeration coils, which can harbor bacteria.

That commitment to food safety carries through all aspects of production and beyond. BPI's finished product sampling and testing program is the most rigorous in the industry, assuring our customers of product quality and safety. The sampling and testing program was recently evaluated by Iowa State University Microbiology and Statistics departments in conjunction with BPI's re-assessment of its HACCP plans. The reviewers commented that:

*BPI's sampling and testing program is currently the most rigorous program in the industry I am aware of... The sampling and testing program managed by BPI is in fact statistically superior to (other programs sometimes referred to by USDA as models for the industry), with higher probabilities of detection at all projected population levels for E. coli O157:H7.*

BPI is committed not only to the safety of BPI's own product, but also in assisting our customers produce assured, safe products. That is why our customers are invited to take part in the BPI® Test and Hold Buy Back Guarantee.

If a US processor uses BPI® Boneless Lean Beef Trim-mings in any of their formulations at a minimum of 15% inclusion, and

- all other raw materials meet industry expectations, and
- the processor conducts BPI audited facility environmental analysis, and
- uses our recommended grinding and blending methods, and
- is willing to test and hold for *E. coli* O157:H7 using our extensive sampling and testing methods, then...

If any evidence of *E. coli* O157:H7 is found in these tests, we will buy back that production.

By maintaining our focus on BPI's core values of communication, cooperation, and innovation, BPI will continue to be the leading supplier of high-quality lean beef to the meat industry.

To learn more about BPI, please visit us at <http://www.beefproducts.com>.



## GOLD SUSTAINING MEMBER PROFILE

*The Coca-Cola Company*

**F**ounded in 1886, The Coca-Cola Company is the world's largest beverage company. With more than 400 brands, including diet and regular carbonated soft drinks, fruit juices and fruit drinks, water, sports and energy drinks, teas and coffees, and milk- and soy-based beverages, we are continuously introducing new products and packaging options that expand the choices we offer consumers for enjoyment, refreshment, nourishment, and hydration.



**M**ore than a billion times a day, in 200 countries around the world, thirsty people reach for the beverages of The Coca-Cola Company. They expect great taste and the highest quality in every serving. Our promise at The Coca-Cola Company to deliver quality products is the most important commitment we make.

Delivering the quality our consumers expect requires consistent and flawless execution. The Coca-Cola Quality System (TCCQS) is our branded quality management structure reflecting our integrated approach to managing quality, the environment, and health and safety. This worldwide initiative involves all of our business units and every aspect of our business. Everyone associated with the

Coca-Cola system is expected to maintain the highest standards of quality in products, processes and relationships. Developed by a global, cross-functional team and endorsed by senior managers along with our top bottling partners, The Coca-Cola Quality System is the framework around which the Coca-Cola system coordinates and guides its activities, drives continuous improvement and relentlessly strives for quality and safety in everything we do.

Our goal is to continuously keep pace with new regulations, and industry best practices, marketplace conditions, and ever-changing customer and consumer expectations. Today there is an increased awareness of the importance of food safety, not only in manufacturing, but also throughout the entire supply chain. By refining our requirements, we further ensure that we embody the most up-to-date, stringent processes and protocols.

The Coca-Cola Company exists to benefit and refresh everyone it touches. For us, quality is more than just something we taste, see, and measure. It shows in our actions everyday. In addition to providing quality beverages, we contribute to communities around the world through our commitments to education, health, wellness, the environment, and diversity. We strive to be a good neighbor – consistently shaping our business decisions to improve the quality of life in the communities where we do business.



## GOLD SUSTAINING MEMBER PROFILE



**T**hrough its commitment to providing the best science available and its heritage of DuPont innovation, DuPont Qualicon delivers practical solutions that help food, pharmaceutical and personal care companies around the world protect their products, productivity and brands.



### DuPont Qualicon Helps Improve the Quality and Safety of Food, Pharmaceuticals and Personal Care Products

**T**he DNA-based BAX<sup>®</sup> system is a fast, accurate way to detect bacteria and other microbes in food—from raw ingredients to finished products. The BAX<sup>®</sup> system is used around the world for food safety testing, receiving international approvals from AFNOR, NordVal, Swiss National Food Association, Health Canada, Brazil and Japan. The United States Department of Agriculture Food Safety and Inspection Service (USDA FSIS) has adopted the BAX<sup>®</sup> system as its testing method for *Salmonella*, *Listeria monocytogenes* and *E. coli* O157:H7. AOAC has certified the BAX<sup>®</sup> system as an Official Method<sup>SM</sup> for detecting *Salmonella* and *Listeria monocytogenes*, and a Performance Tested<sup>SM</sup> method for detecting *E. coli* O157:H7 in beef and fruit juice. Assays are also available for detecting *Listeria* species, *Enterobacter sakazakii* and *Campylobacter jejuni/coli*.

In addition to food safety testing, labs can now perform food quality testing on the same platform. The new BAX<sup>®</sup> system PCR assay for yeast and mold allows you to set the threshold for taking action according to your lab's

experience with the food type. Results on enriched samples are available in just 48 hours. DuPont Qualicon, in alliance with Applied Biosystems, recently introduced the BAX<sup>®</sup> System Q7. This next-generation product combines the ease-of-use and superior performance of the original BAX<sup>®</sup> system with new PCR technologies for an advanced system with tremendous technological flexibility.

The new BAX<sup>®</sup> Q7 cyclor offers total compatibility with current assays and advanced capabilities for future assays. For example, because the BAX<sup>®</sup> Q7 cyclor can detect up to five different dyes, multi-target testing in the same sample is possible. The system is faster—completing 40 PCR cycles in less than 2 hours—and it can utilize both real-time and end-point detection, according to the needs of the assay.

DuPont Qualicon also markets the patented RiboPrinter<sup>®</sup> system, the world's only automated DNA fingerprinting instrument that can be used to rapidly pinpoint sources of bacteria in food, pharmaceuticals, and personal care products. Electronic linking provides microbial information and knowledge networking capabilities for public health agencies, industry, universities and research centers. This enables the sharing of genetic RiboPrint<sup>™</sup> patterns for organisms, making it faster and easier to help keep people safe in every corner of the world.

For more than 200 years, DuPont has been the leader in delivering science-based solutions that provide significant business value. DuPont Qualicon, a global leader in DNA-based diagnostic solutions, is part of that strong tradition. The BAX<sup>®</sup> and RiboPrinter<sup>®</sup> systems have proven to be a powerful part of the quality control and quality assurance processes for major food, pharmaceutical and personal care product companies around the world, providing them with a competitive edge today and well into the future.

For more information, visit [www.qualicon.com](http://www.qualicon.com) or call 1.800.863.6842.



## GOLD SUSTAINING MEMBER PROFILE

# ECOLAB®

**E**colab Inc., based in St. Paul, Minnesota is the leading global developer and marketer of premium cleaning, sanitizing, pest elimination, maintenance and repair products and services for the world's hospitality, institutional, food processing and food retail markets. Around the world, the company operates directly in 70 countries, employing more than 21,000 associates, and reaches customers in roughly 100 other countries through distributors, licensees and export operations.

**F**ounded in 1923, Ecolab circles its customers with value-added cleaning, sanitation and service solutions through 10 complementary business units. This strategy translates directly into the company's ability to help customers achieve safer food, hygienic surfaces and clean, sanitary surroundings. Innovative solutions such as automated dispensing systems, specialized detergents and EPA-registered sanitizers combine with service excellence to provide customers with uncompromised cleanliness and operational efficiency.

Ecolab uses an integrated systems approach to food safety and brand protection issues, providing customers with intervention at multiple sites throughout the "farm to fork" continuum. Ecolab associates' expertise in agricultural production, food processing and foodservice, as well as its premium cleaning and sanitation products and programs, help reduce the risk of contamination throughout an operation and provide reliable and efficient methods for maximizing food safety and quality.

At the start of the food chain, Ecolab Food & Beverage associates provide customers with premium cleaning and sanitation products, programs and expertise in food production environments. For example, the Ecolab Livestock Disease Intervention® (LDI) program is aimed at helping control cross contamination within animal production facilities, between such facilities, and between production facilities and processing plants. Ecolab also provides complete udder health, hoof management and fly control programs for dairy production facilities.

Reducing pathogens and other microbial counts on food surfaces in the processing stage, meanwhile, improves the quality and shelf life of food products such as meat, poultry, seafood, fruits and vegetables. These patented food surface treatments are effective solutions for minimizing microbial contamination during processing.

Contamination at any point in a food processing operation can shut down plant operations, costing customers time and money. The Ecolab Pest Elimination Division, therefore, provides custom-designed programs to meet the individual needs of food and beverage processing plants, as well as foodservice and food retail businesses. The emphasis is on sanitation, structural concerns within a facility and preventative exclusion services in every aspect of the food production process.

Once the food supply reaches foodservice vendors, the Institutional and Kay divisions offer numerous high-quality, patented product solutions to help prevent many of the leading causes of foodborne illnesses. These include products to improve employee hygiene practices, sanitize kitchen equipment used to prepare or serve food, as well as high-performance detergents and cleansers to sanitize every surface within a facility. In fact, Ecolab personnel hygiene programs provide comprehensive, worker-focused hygiene systems including hand cleaners and sanitizers, doorway sanitizing systems for food processors, state-of-the-art, no-touch dispensers and employee training.

The last phase of food safety and brand protection deals with a comprehensive intervention program that focuses on compliance. EcoSure<sup>SM</sup> Advanced QA Services, an Ecolab quality assurance food safety management program, helps customers establish a routine program of self-inspection, provide comprehensive employee training and conducts periodic independent audits to help identify areas in need of improvement. It also brings Ecolab's commitment to its customers full circle.





## GOLD SUSTAINING MEMBER PROFILE



**K**raft Foods is a global leader in branded foods and beverages with 2005 net revenues of more than \$34 billion. Built on more than 100 years of quality and innovation, Kraft has grown from modest beginnings to become the largest food and beverage company in North America and the second largest in the world, marketing many popular brands in more than 150 countries around the globe. The Kraft brand portfolio is one of the strongest of any packaged goods company with more than fifty \$100 million brands and five \$1 billion brands (*Kraft* branded products, *Jacobs* and *Maxwell House* coffees, *Oscar Mayer* meats, *Philadelphia* cream cheese, and *Post* cereals). Our global brands include *Kraft*, the number one cheese brand in the world, as well as our best-known brand for salad and spoonable dressings, packaged dinners, barbecue sauce, and other products, *Philadelphia*, the world's number one brand of cream cheese, *Jacobs* and *Maxwell House* coffees, *Toblerone* chocolates, *Oreo* cookies, *Ritz* crackers, and *Crystal Light/Clight* and *Tang* beverages.



**T**he history of Kraft dates back to 1903, when with \$65 in capital, a rented wagon, and a horse named Paddy, J. L. Kraft started purchasing cheese at Chicago's Water Street wholesale market and reselling it to local merchants. From that first idea of selling wholesale cheese to stores, Kraft has been a company built on innovation. Through the years many people have contributed to the success of Kraft—and its numerous predecessor companies, some of which trace their heritage back to the 1700s. These contributions

have resulted in numerous breakthrough ideas, such as the 1898 introduction of the *Uneeda* biscuit, which featured the first "inner-seal" packaging; the 1906 launch of *Kaffee Hag*, the first decaffeinated coffee; the 1927 introduction of *Kool Aid*, the first successful powdered soft drink; the 1950 introduction of *Kraft Deluxe*, the first commercially packaged process-cheese slices; the 1995 launch of *DiGiorno Rising Crust* pizza, revolutionizing the frozen pizza category, and the 2004 introduction of the *Tassimo* hot beverage system.

Kraft's company vision of "Helping People Around the World Eat and Live Better" captures the essence of who we are. To our more than 98,000 employees operating in 68 countries worldwide it tells what we care about and what we strive to do each and every day. This vision captures the importance of health and wellness, but it also embodies all the ways we can eat and live better, such as the enjoyment of a dessert, the convenience of a microwave meal, the safety and value of our products and the services and solutions we provide. Kraft is proud of its long association with IAFP. The goals of IAFP are consistent with Kraft's company vision and Kraft's long heritage of producing safe and wholesome food.

To learn more about Kraft please visit us at [www.kraft.com](http://www.kraft.com).



## GOLD SUSTAINING MEMBER PROFILE



**M**arriott International, Inc. (MAR:NYSE) is a leading worldwide hospitality company with more than 2,700 lodging properties, totaling approximately 499,000 rooms, including more than 10,000 vacation ownership villas, in the United States and 66 other countries and territories. The company is headquartered in Washington, D.C. It is ranked as the lodging industry's most admired company and one of the best places to work for by Fortune® magazine. In fiscal year 2005, Marriott International reported sales from continuing operations of \$11.6 billion, and the company had approximately 143,000 employees at year-end 2005. For more information, please visit the web site at [www.marriott.com](http://www.marriott.com).

**M**arriott Hotels & Resorts (full-service, 507 hotels including 16 conference centers and 35 JW Marriott Hotels); Renaissance Hotels & Resorts (quality, 137 hotels); Bulgari Hotel & Resorts (luxury, 1 hotel); The Ritz-Carlton (luxury, 59 hotels); Courtyard (upper-moderate, 692 hotels); Residence Inn (extended-stay, 490 inns); SpringHill Suites (upper-moderate all-suite, 137 hotels); TownePlace Suites (mid-price extended-stay, 122 hotels); Fairfield Inn (lower-moderate, 524 inns); Marriott Vacation Club International, The Ritz-Carlton Club, Horizons by Marriott Vacation Club and Grand Residences by Marriott (vacation ownership resorts, 44 resorts); and Marriott Executive

Apartments (upscale serviced apartments, 17 properties). In addition, the Marriott ExecuStay brand provides furnished apartment units in more than 45 major markets, and Marriott Golf manages 60 golf courses at 45 facilities around the world.

J.W. Marriott, Jr., is chairman of the board and chief executive officer and William J. Shaw is president and chief operating officer.

The company's common stock (ticker symbol: MAR) is listed on the New York Stock Exchange and other US exchanges.

Note: Statistics are as of December 30, 2005.

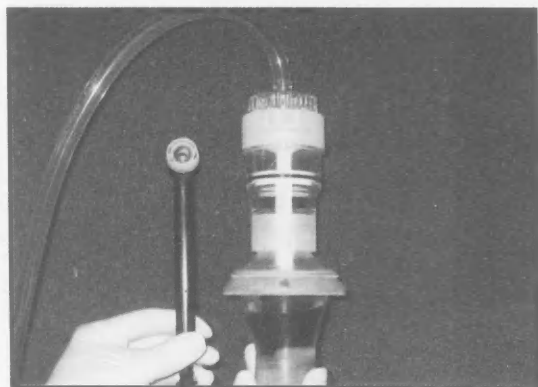


## GOLD SUSTAINING MEMBER PROFILE



Safeguard Our Precious Resources

**M**icrobial-Vac Systems, Inc. is in the business of saving lives by manufacturing and marketing advanced pathogen collection and concentration technology. MSI technology will significantly improve the capabilities of our soldiers, first responders and food safety monitoring teams, to locate and identify sources of bio-threat agent contamination of infectious diseases.



**M**icrobial-Vac Systems, Inc. (MSI) is an innovative new company specializing in Pathogen Collection and Concentration Technology. This Idaho Company has developed and is manufacturing the Microbial-Vac (M-Vac) Collection System and Rotary Activated Concentration (RAC) System. These systems are revolutionary in that they can increase the probability of finding pathogens on large and various textured surfaces up to a 1,000 times better than current methods. Rapid Detection Companies will benefit from the advanced collection abilities of the M-Vac as well as the time-saving concentration characteristics of the RAC System to showcase their technology in same-day detection.

Dr. Bruce J. Bradley first began developing the M-Vac in response to the *E. coli* outbreak in the mid 1990s. Having been raised on a cattle ranch he surmized that the problem was in sampling. From there he developed a non-destructive meat sampling device and secured nine contracts and grants through the Small Business Innovative Research (SBIR) program. Dr. Bradley was working through his microbiology testing laboratory, Rocky Mountain Resource Labs, Inc. in Jerome, Idaho. In 2002 Dr. Bradley moved all his research into a new corporation named Microbial-Vac Systems, Inc. which includes patents issued in the United States, Mexico, New Zealand, Australia, and seven European countries. Patents are pending in Brazil and Canada.

The need for the RAC System became apparent after 9/11 when the overload on laboratories became the stumbling block to rapid location and detection of pathogens. Culture had been the preferred method of detection. However, with the advancement in Rapid Detection technology, concentrated liquid samples were what most detection methods needed.

These technologies were developed for food sampling, but were found to be equally effective in environmental sampling for agents of bio-terrorism. Small amounts over large diverse surfaces are the ideal situations for these two systems to leave the other methods behind whether the detection is by culture, DNA or other rapid detection methods.



# NEW MEMBERS

## AUSTRALIA

**Dayna L. Swiatek**  
University of Melbourne  
Kensington, Victoria

## BRAZIL

**Lina A. Alegro**  
University of São Paulo  
São Paulo

**Eb Chiarini**  
University of São Paulo  
São Paulo

**Luciana Maria Ramires Esper**  
State University of Campinas,  
UNICAMP  
Campinas, São Paulo

## CANADA

**Valeria C. Netto**  
University of Guelph  
Guelph, Ontario

**Wendy Palmer**  
Dairytown Products, Ltd.  
Sussex, New Brunswick

**Trevor States**  
Sobeys  
Mississauga, Ontario

**Gord Whitney**  
Power Packaging  
Mississauga, Ontario

**Sarah M. Wilson**  
University of Guelph  
Guelph, Ontario

## COLOMBIA

**Aida J. Martinez**  
Universidad De Los Andes  
Bogota

## DENMARK

**Anne Gravesen**  
Danisco A/S  
Brabrand

## FRANCE

**Soizick F. Le Guyader**  
IFREMER  
Nantes

## JAPAN

**Phunsiri Suthiluk**  
University of Tsukuba  
Tsukuba, Ibaraki

## MACEDONIA

**Pavle V. Sekulovski**  
Faculty of Veterinary Medicine  
Skopje

## NEW ZEALAND

**C. Bates**  
Poultry Vet Services  
Otahuhu, Auckland

**Shirley D. Jones**  
Institute of Environmental Science  
& Research Ltd.  
Christchurch, Canterbury

## NICARAGUA

**Manuel E. Cervantes**  
University for International Cooperation  
Masaya, Masaya

## PORTUGAL

**Joao C. Fernandes**  
Escola Superior De Biotecnologia  
Vila Nova De Famalicao, Braga

## SOUTH AFRICA

**Ina Jordaan**  
Dairy Standard Agency  
Silverton, Pretoria

## UNITED KINGDOM

**Alec L. Kyriakides**  
Sainsbury's Supermarkets Ltd.  
London

## UNITED STATES

### ALASKA

**Ronald S. Klein**  
Alaska Dept. of Environmental  
Conservation  
Anchorage

### ARKANSAS

**Melissa A. Drummonds**  
Safe Foods Corporation  
Rogers

### CALIFORNIA

**Brian U. Kim**  
University of California-Davis  
Davis

### CONNECTICUT

**Linda Shaffer**  
State of Connecticut  
Hartford

### FLORIDA

**Cheryl Gendics**  
Variety Foods  
Oakland Park

### GEORGIA

**Laura R. Green**  
RTI International/CDC  
Atlanta

### IDAHO

**Blain C. Hope**  
Microbial-Vac Systems, Inc.  
Jerome

**Jared Maughan**  
Microbial-Vac Systems, Inc.  
Jerome

### ILLINOIS

**Christine M. Petersen**  
Avenida  
Plano



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# NEW MEMBERS

## INDIANA

**Christie A. Menze**  
Indiana Environmental Health Assn.  
Indianapolis

## IOWA

**Ned A. Rucker**  
Ecolab Food & Beverage  
Waverly

## KENTUCKY

**Scott Nethery**  
Louisville Metro Health Dept.  
Louisville

## MARYLAND

**Ligia V. Da Silva**  
University of Maryland—Eastern Shore  
Princess Anne

## MINNESOTA

**Petra S. Hochmuth**  
Ecolab, Inc.  
Eagan

**Julie A. Kuruc**  
University of Minnesota  
Shoreview

## MISSISSIPPI

**Karen C. Dazo**  
Mississippi State University  
Starkville

## MISSOURI

**David Grellner**  
City of Jefferson  
Jefferson City

## NEW JERSEY

**Larry L. Hood**  
JohnsonDiversey Consulting  
Bridgewater

## NORTH CAROLINA

**Anjum Basher**  
Newell Rubbermaid  
Huntersville

## OHIO

**Fran F. Moller**  
T. Marzetti Co.  
Columbus

## OKLAHOMA

**Kalpana Kushwaha**  
Oklahoma State University  
Stillwater

## PENNSYLVANIA

**Marlen E. Koro**  
Drexel University  
Philadelphia

**Monica J. Pena**  
Keystone Food Products  
Easton

## TEXAS

**Leslie D. Thompson**  
Texas Tech University  
Lubbock

**Tim D. Woods**  
Tony Downs Foods  
Madelia

## VIRGINIA

**Thomas E. Crow**  
Fairfax Co. Health Dept.  
Fairfax

## WASHINGTON

**Dan Lynn**  
Ozone International, LLC  
Bainbridge Island

**Jeff Pontier**  
Spokane Produce Inc.  
Spokane

## WISCONSIN

**Gene Ketterhagen**  
August Winter & Sons, Inc.  
Appleton

**Luke D. Peterson**  
University of Wisconsin-Madison  
Madison

**Dennis L. Seman**  
Kraft  
Madison

# UPDATES

## Catherine Nnoka Joins NCFST

Catherine Nnoka has been appointed director of operations support at NCFST. As director of operations support at NCFST, Ms. Nnoka will direct, manage, and lead general management and operational support for NCFST's nonscientific business functions. She will plan and direct member relations, information technology, communications and library resources in accordance with overall organizational strategies. She will work with FDA to meet operational needs. She will formulate policies, short-and long-term strategies, procedures, and systems to provide operational support for NCFST's business functions.

Ms. Nnoka comes to the Center from the International Life Sciences Institute (ILSI) North America where she served as associate director and program head of the food safety program. At ILSI, she managed numerous technical committees, subcommittees, task forces, and working groups employing a broad range of strategies to address a variety of food safety and nutrition issues, including acrylamide, aspartame, bioterrorism and food defense, diet and behavior, food allergy, food labeling, food microbiology, food toxicology, fructose, functional foods, lead in foods, macronutrient substitution, and oral health. At one time, Ms. Nnoka also managed the Allergy and Immunology Institute of ILSI, working with physicians and research scientists on a grant program to support basic research on adverse immunologic reactions to food and efforts to improve public education and awareness of allergic diseases.

Before going to ILSI, Ms. Nnoka was senior program associate with the Washington-based International

Council on Education for Teaching. There, she ran a government-funded international intern program, and managed the boards of director and trustees, traveled extensively overseas as a spokesperson for the organization, planned and organized 15 international conferences (including several aboard the *S.S. Universe*, a floating university program Semester at Sea), and led five overseas study tours. Ms. Nnoka also worked as a bilingual secretary for an accounting firm in Monte Carlo.

Ms. Nnoka received her education in the US and abroad. She is a magnum cum laude graduate of Georgetown University with a Bachelor of Science degree. She attended Westtown School (a Quaker boarding school), Simon's Rock Early College, and the University of Nice, France. She received a Presidential Recognition Award from the International Association for Food Protection (IAFP) for her contributions to its Annual Meeting programs in 2001 and the Harold Barnum Industry Award for service to IAFP, industry, government, education, and the public in 2005. In 2005, she also received a Special Citation Award from the Director of the US Food and Drug Administration's Center for Food Safety and Applied Nutrition for advancing food safety, food defense, and applied nutrition, fostering the exchange of knowledge among industry, academic, and government scientists through leadership of ILSI scientific committees, and providing invaluable assistance to the agency.

## Michael Vaszily Tapped to Lead Shredded Cheese and Refrigerated Snacks Categories for Sargento

Sargento Foods Inc. has announced the hiring of Michael G. Vaszily as senior brand manager of its consumer products division,

with responsibility for refrigerated snacks and shredded cheese.

"I'm looking forward to continuing and building on the Sargento family tradition of delivering high quality, innovative new products that fulfill our consumers' needs," said Mr. Vaszily. Mr. Vaszily earned his MBA from Marquette University in 2000.

Before joining the Sargento family in December, Mr. Vaszily was the global products innovation manager for Spectrum Brands, where he helped reshape the Remington shaving and grooming product line. He also was a brand manager for Heinz Ketchup at Heinz, and for Ziploc at S.C. Johnson.

"Michael has a proven track record with consumer products," said Lou Gentine, Sargento CEO. "He is an outstanding manager, and his proactive management style makes him one of the best in the industry."

## Multisorb Technologies International Appoints Mark E. Celmer to Chief Executive Officer

Multisorb Technologies International (Multisorb) has announced the appointment of Mark E. Celmer to chief executive officer. Mr. Celmer assumes this position in addition to his role as president. Multisorb's founder, John S. Cullen remains chairman.

Multisorb is an integrated set of corporate entities including Multisorb Technologies Inc. (Buffalo, USA), Multisorb Technologies Ltd. (Warrington, England), Multisorb Technologies Asia, Active-Pak Automation and Eagle Chemical Company.

Under Mr. Celmer's leadership, Multisorb has significantly expanded operations globally, especially in overseas markets such as Europe,

# UPDATES

India, China, Southeast Asia and South America. This expansion has come on the heels of significant growth in its US operations.

"Over the past six years Mark has helped significantly expand our global presence," remarked John S. Cullen. "I have great confidence that he will enable Multisorb to further develop innovative technologies and deliver outstanding service to our customers worldwide. Mark will be instrumental in extending the company's 45-year legacy of innovation in sorbent technology."

## Onset Computer Corporation Appoints Jack Sample as President

Onset Computer Corporation, a supplier of battery-powered data loggers and weather stations, has appointed Jack Sample as president.

Mr. Sample brings more than 28 years of sales, marketing, and operations management experience to Onset, having most recently served as the company's director of sales and marketing. Prior to joining Onset in 2002, Mr. Sample spent 24 years with Hewlett-Packard and Agilent

Technologies, where he held numerous management positions in the United States and Europe.

## DFA Farmer Delegates Elect 2006 Board of Directors

At the 2006 Annual Delegate Meeting of Dairy Farmers of America, Inc. (DFA) held in Kansas City, MO, DFA's dairy-farmer delegates approved the seating of 28 member-nominees to the cooperative's 51-person board of directors. This year, five are new to DFA's board.

The five newly seated board directors include:

- Craig Edler, dairy farmer-member from Browntown, WI
- Dan Kerschen, dairy farmer-member from Garden Plains, KS
- Doug Krickenbarger, dairy farmer-member from West Alexandria, OH
- Urban Mescher, dairy farmer-member from Maria Stein, OH, and
- Rod Wenstrom, dairy farmer-member from Fergus Falls, MN

## Wayne Chemical Announces New CEO

Wayne Chemical Company, Inc. has named Thomas Fahey as chief executive officer. Fahey joins Wayne Chemical from WestAgro, Inc., Kansas City, MO where he was president of the Industrial Sales Group which markets industrial chemicals to the food and dairy industry. Prior to WestAgro, Mr. Fahey was the dairy industry manager of Henkel Chemicals.

## Doug Vann Joins Computerway Food Systems

Doug Vann has joined Computerway Food Systems as an electronics engineer.

Mr. Vann is responsible for building, repairing and troubleshooting Computerway's electronic products.

Mr. Vann holds an A.A. in electronic engineering technology. He currently attends North Carolina A&T University, where he is pursuing a B.A. in electronics and computer technology.

[www.foodprotection.org](http://www.foodprotection.org)

## Single Minimum Internal Temperature Established for Cooked Poultry

The Food Safety and Inspection Service (FSIS) has advised consumers that cooking raw poultry to a minimum internal temperature of 165°F will eliminate pathogens and viruses.

The single minimum internal temperature requirement of 165°F was recommended by the National Advisory Committee on Microbiological Criteria for Foods (NACMCF).

"The Committee was asked to determine a single minimum temperature for poultry at which consumers can be confident that pathogens and viruses will be destroyed. The recommendation is based on the best scientific data available and will serve as a foundation for our programs designed to reduce foodborne illness and protect public health," said Under Secretary for Food Safety Dr. Richard Raymond.

Scientific research indicates that foodborne pathogens and viruses, such as *Salmonella*, *Campylobacter* and the avian influenza virus, are destroyed when poultry is cooked to an internal temperature of 165°F. FSIS recommends the use of a food thermometer to monitor internal temperature. In addition, consumers should follow important tips for handling raw poultry. These tips can be summarized in three words, clean, separate and chill. Clean means to wash hands and surfaces often; separate means to keep raw meat and poultry apart from cooked foods; chill means to refrigerate or freeze foods promptly.

FSIS will use the NACMCF recommendation to further guide consumers in the preparation of poultry products to ensure microbiological safety. While the NACMCF has established 165°F as the minimum temperature at which bacteria and viruses will be destroyed, consumers, for reasons of personal preference, may choose to cook poultry to higher temperatures.

Consumers with food safety questions can call the toll-free USDA Meat and Poultry Hotline at 888.674.6854. Recorded food safety messages are available 24 hours a day at [http://www.fsis.usda.gov/Food\\_Safety\\_Education/Ask\\_Karen/index.asp#question](http://www.fsis.usda.gov/Food_Safety_Education/Ask_Karen/index.asp#question).

## 3-A SSI Upgrades Public Information on 3-A Symbol Holders and Announces Draft Standards for Public Review

3-A Sanitary Standards, Inc. (3-A SSI) recently expanded the public information available on current 3-A Symbol authorizations to assist regulatory sanitarians, processors and equipment fabricators. The new information shows the reason for discontinuation of a 3-A Symbol authorization, such as the equipment no longer being in production, the consolidation of equipment in another 3-A Symbol authorization resulting from a change in company ownership, or the failure of the holder to maintain the authorization in accordance with the terms and

conditions for use of the 3-A Symbol.

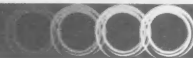
According to Dean Girton (Girton Manufacturing Co., Inc.), chair of the 3-A Symbol Authorization Advisory Committee, "Due to industry consolidation, product withdrawals, and other reasons, many products no longer maintain a 3-A Symbol authorization and the new information helps interested parties understand why some licenses have been discontinued. Interest in products holding 3-A Symbol authorization is now higher than ever because most licensees have obtained a Third Party Verification (TPV) inspection required to maintain their authorization."

The lists of current and discontinued 3-A Symbol holders are available on the 3-A SSI Web site at <http://www.3-a.org/symbol/holders.htm>. "We update both lists every four to six weeks," says Tim Rugh, executive director of 3-A SSI, citing the high interest among regulatory sanitarians, processors and fabricators for current information. "Because most 3-A Symbol holders have obtained a TPV inspection, there is stronger reliance on the 3-A Symbol among all parties," he said.

3-A Sanitary Standards, Inc. has announced the availability of three new or revised 3-A Sanitary Standards for public review and comment. The new draft documents include the following:

T-61-01, Steam Injection Heaters – A revision to the current standard would allow the use of perforations, subject to specific criteria, in product contact surfaces of steam injectors that are round, square, obloid, or rectangular. Comments due June 6, 2006.





**T-88-00, Machine leveling Feet & Supports** – The proposed new standard covers the sanitary aspects of machine leveling feet and supports used on equipment in a wet processing area of dairy, food and other comestible products plants, including dry processing areas cleaned with water. Comments due June 5, 2006.

**T-40-01, Bag Collector Testing Procedure for Filter Bags and Interfaces of Filter Bags and Tube Sheets** – This testing protocol to be added to the current standard specifies procedures to compare the cleanliness of filter bags mechanically cleaned-in-place against similar filter bags that are removed and laundered. Comments were due June 6, 2006.

## Researchers Use Mass Spectrometry to Detect Norovirus Particles

Scientists have used mass spectrometry for decades to determine the chemical composition of samples but rarely has it been used to identify viruses, and never in complex environmental samples. Researchers at the Johns Hopkins Bloomberg School of Public Health recently demonstrated that proteomic mass spectrometry has the potential to be applied for this purpose. Using a two-step process, researchers successfully separated, purified and concentrated a norovirus surrogate from a clinical sample within a few hours. Nano-spray mass spectrometry was used to demonstrate the feasibility of detecting norovirus particles in the purified concentrates.

Human norovirus is responsible for an estimated 23 million cases of gastrointestinal illness in the United

States each year. This pathogen is a particular problem aboard cruise ships. The researchers believe that their mass spectrometric method could potentially be used for bio-defense and public health preparedness as a tool for rapidly detecting norovirus — a category B bioterrorism agent — and other viral public health threats. The study is published in the April 2006 edition of *Applied and Environmental Microbiology*.

In simplified terms, mass spectrometry is essentially a scale for weighing molecules. A laser turns a sample into ionized particles, which are then accelerated in a vacuum toward a detector. The time lapsed prior to registering on the detector helps researchers determine the mass—or weight—of the particles. By targeting characteristic particles, or peptides, belonging to the viral coat protein, the virus can be positively identified by matching the results to entries in genetic databases.

In the Hopkins study, the researchers analyzed a stool sample treated with virus-like particles, which closely resemble norovirus but are noninfectious. Using mass spectrometry, the researchers were able to detect the norovirus capsid protein down to levels typically found in clinical specimens from sick individuals.

“This is the first report of the use of mass spectrometry for the detection of norovirus,” said David R. Colquhoun, lead author of the study and research fellow with the Johns Hopkins Center for a Livable Future. “This is a significant step towards using mass spectrometry as an environmental surveillance tool for the detection of pathogenic human viruses in complex environmental samples such as human and animal waste.”

Typically, bacteria and viruses are identified by cultivation on selective media and cell lines. However, this process does not work for human norovirus, which cannot be cultured outside the human body.

Rolf Halden, Ph.D., assistant professor in the Department of Environmental Health Sciences and senior author of the study, pointed out that proteomic mass spectrometry is appealing because it has the potential to identify different types and strains of viruses regardless of whether their presence is suspected or not. “Unlike other processes, we do not need to know what we are looking for in advance. Any pathogen whose genetic information is contained in online genetic databases represents a suitable potential target. This makes the technique ideal for situations where you have an emerging infectious agent or pathogenic strain, such as in a potential terrorist attack,” said Halden.

Authors David R. Colquhoun, Kellogg J. Schwab and Rolf U. Halden are with the Department of Environmental Health Sciences at the Johns Hopkins Bloomberg School of Public Health. Robert N. Cole is the director of the Mass Spectrometry and Proteomics Facility at the Johns Hopkins School of Medicine.

## Common Practices at Petting Zoos Put Visitors at Risk

While petting zoos pose a risk for gastrointestinal illness, most visitors aren't aware that simple prevention measures could prevent infection. In addition, some engage in behaviors that might increase their risk of



infection according to several studies being presented this week at the International Conference on Emerging Infectious Diseases.

Researchers from the CDC released the results of a case-control study of an outbreak of *E. coli* O157:H7 associated with two Florida petting zoos, in which they interviewed visitors who did and did not get sick to identify which behaviors were predictors of infection. Some behaviors that were most strongly associated with illness were feeding a cow or goat, touching a goat and stepping in manure or having manure on your shoes. Not surprisingly, simple hand-washing after visiting the petting zoo, including lathering with soap and washing hands before eating and after visiting the petting zoo, were found to protect against infection.

"There is an increasing incidence of reported outbreaks of illness associated with petting zoos over the years. People need to be aware of these risks and take the appropriate precautions such as washing their hands after visiting," says Fred Angulo of the Centers for Disease Control and Prevention (CDC).

Unfortunately, according to two other studies being presented at the meeting this week, many visitors do not even engage in this simplest of preventive measures. Researchers from the South Carolina Department of Health and Environmental Control conducted an observational survey of visitors to a petting zoo at the 2005 South Carolina state fair. Despite the availability of numerous handwashing facilities and posted warnings regarding risk factors, approximately 28% of people observed exiting the petting zoo did not wash their hands.

In a similar survey, researchers from the Tennessee Department of Health monitored the use of hand-

sanitizer stations at the exits of petting zoos in middle Tennessee. Of the 1,700 visitors, approximately 62% did not use the hand-sanitizer station after visiting the petting zoo. Both studies also noted that a sizeable percentage of petting zoo visitors were also engaging in a number of other risky behaviors. The most common risky behavior observed by the South Carolina researchers was visitors bringing food or drink items into the petting zoo with them. In the Tennessee survey one in five visitors was observed eating or drinking in the petting zoo. "Our petting zoo had a lot of signage warning of risk factors and people still brought in food and drink, failed to wash their hands and otherwise engaged in behaviors that put them at risk for infection," says Dan Drociuk, an author on the South Carolina survey.

Angulo notes that the lack of handwashing is not entirely the fault of the petting zoo visitors. "Most petting zoo visitors do not know that there is a risk and are not informed that there is a risk. Signs do not work. People need to be told by another human being to wash their hands."

To help address the risks associated with petting zoos, the CDC has entered a partnership with the National Association of State Public Health Veterinarians to develop a compendium of measures to prevent disease associated with animals in public settings. The compendium, which includes specific recommendations for managing contact between animals and people visiting a petting zoo environment, is published annually in the CDC publication *Morbidity and Mortality Weekly Report*. The 2005 compendium can be found online at [http://www.cdc.gov/mmwr/preview/mmwrhtml/](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5404a1.htm)

[rr5404a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5404a1.htm). The 2006 compendium will be published later this year.

## Take a Fresh Look at Food Safety – Check Out the New Evolution of [fightbac.org](http://fightbac.org)

The Partnership for Food Safety Education has introduced a new evolution of its popular Web site [www.fightbac.org](http://www.fightbac.org). Fully searchable, the site offers significantly improved navigation and new downloads for food safety educators and for young people.

The Partnership's research shows that people turn to the web for information on safe food handling. With a goal to reduce incidence of foodborne illness nationwide, the Partnership expects this new web-based tool to better serve consumers, food safety educators, and the media in their search for the most credible and up-to-date information on safe food handling.

If you sign up on the site to be a BAC Fighter, you will receive monthly e-cards on a variety of safe food handling and general food safety topics. Sign up today at [www.fightbac.org](http://www.fightbac.org).

For more information on the Web site and on sponsorship opportunities with the Fight BAC!® campaign, contact Shelley Feist at 202.220.0651.

## Novel Vaccine Approach Stimulates Protective Immunity Against *Listeria*

When bacterial pathogens attack the surface of a cell, vaccine-induced antibodies can mount a formidable



defense and fend off the bad bugs. The trouble comes when antibodies cannot recognize the pathogen because the bacteria have infected the cell and are hidden, growing inside the cell's wall.

To mount a defense against these cloaked attackers, Darren Higgins, associate professor of microbiology at Harvard Medical School, and H.G. Archie Bouwer, immunology research scientist at the Earle A. Chiles Research Institute and Portland VA Medical Center, have developed a vaccine strategy for generating an attenuated strain of an intracellular bacterial pathogen. The study appeared in the PNAS online early edition the week of March 20, 2006. The vaccine approach could also protect against other intracellular bacterial pathogens, such as tularemia.

The team has initially applied their strategy to *Listeria monocytogenes*, which affects the most vulnerable humans — the chronically ill, the elderly, pregnant women, and young children, who are susceptible to a serious infection caused by eating food contaminated with the bacteria. In the United States, an estimated 2,500 persons become seriously ill with the infection each year. Of these, 500 die.

After absorption by antigen-presenting cells, the attenuated *Listeria* strain does not replicate, and is readily killed. Unlike other attenuated *Listeria* strains that do not replicate in host cells, vaccine studies in animals showed that the new strain provided protection from challenge with a virulent, disease-causing, *Listeria* strain.

"For the first time, an attenuated strain of *Listeria* that does not replicate in an animal and does not require any manipulation of the bacterium or host prior to immunization still provides protective immunity," Higgins said.

The team found the replication-deficient vaccine strain of *Listeria* was cleared rapidly in both normal and immunocompromised mice. At the same time, a required class of T-cells — coordinators of the immune system — was stimulated following immunization. As a result, animals immunized with the vaccine strain were resistant to 40 times the lethal dose of virulent *Listeria*.

"In theory, we could apply this vaccine strategy to other bacterial pathogens like *Salmonella*," said Higgins. "All we need is to use existing strains that do not replicate inside host cells."

The new *Listeria* vaccine was based on a 2002 study performed by the Higgins group in which they developed killed *E. coli* strains as vehicles for delivering antigens to professional antigen presenting cells in the body. In the prior study, Higgins showed that the *E. coli*-based vaccines protected mice from developing tumors when challenged with melanoma producing cells.

"We have now taken our *E. coli*-based cancer vaccine work and expanded it into infectious disease areas," Higgins said. "Our *Listeria* studies demonstrate the potential to generate vaccine strains of bacteria that are effective, yet safe for both healthy and immunocompromised individuals."

The Higgins and Bouwer team is continuing to improve and expand their approach to other intracellular bacteria.

### Researchers Discover Botulism Toxin's Insidious Route Into Nerve Cells

**B**otulinum neurotoxin A can be either the greatest wrinkle remover or one of the world's most potent biological weapons. To perform either job,

however, the toxin must first find a way to enter cells.

But understanding how the toxin — one of seven neurotoxins produced by the bacterium *Clostridium botulinum* — enters nerve cells has proved elusive for scientists. Despite a decade-long search for the receptor by labs around the world, researchers had come up empty handed.

Now, a research team led by Howard Hughes Medical Institute (HHMI) researcher Edwin R. Chapman reports that it has identified the cellular receptor for botulinum neurotoxin A. The group's work was published in the March 16, 2006, edition of *Science-Express*, which provides electronic publication of selected science papers in advance of print. The finding offers important new insights that suggest how the toxin shuts down nerve cells with deadly efficiency.

In the clinic, the toxin, which is also known as botox, is used to treat forehead wrinkles, migraine headaches, urinary retention, eye muscle disorders, and excessive sweating. The same toxin also has more nefarious uses, and is considered a potential bioterror threat because it can kill people by paralyzing motor nerves in diaphragm muscles, causing breathing to stop. Lack of knowledge about the identity of the cell surface receptor that botulism toxin A uses to invade nerve cells has hindered the development of new antidotes to the toxin.

"People thought that since these were the most potent toxins known to humans, it would be easy to find the receptors," said Chapman, whose HHMI laboratory is at the University of Wisconsin-Madison. However, only a handful of proteins had been identified that



appeared to interact with the toxin. But none of these proteins turned out to be the receptor, he said.

According to Chapman, researchers had long known how botulinum neurotoxin A attacks the nerve cell's internal molecular machinery. But the identity of the neuronal surface protein that the toxin recognized and used to gain entry into the cell was unknown.

"We decided to study the entry route used by these toxins first," said Chapman. Using cultured neurons and mouse diaphragms as model systems, postdoctoral fellow Min Dong and Felix Yeh in Chapman's laboratory, revealed that the neurotoxin enters neurons when empty synaptic vesicles are being recycled from the cell surface to the cell's interior. Synaptic vesicles are sac-like cargo carriers in neurons that haul neurotransmitters from the cell's interior to the synapses, which are the junctions between neurons. At the synapse, neurotransmitters are released, triggering nerve impulse in neighboring neurons.

"Our uptake experiments with all the toxins showing that many of them are taken up through synaptic vesicles made our life simple,

because almost all synaptic vesicle proteins had already been identified by our colleagues. Furthermore, there are only a handful of synaptic vesicle proteins that contain domains that are exposed on the cell surface," said Chapman.

Thus, when Dong and Yeh screened the major vesicle proteins for binding to the neurotoxin, they found a high level of specific binding to one called SV2. Furthermore, the researchers found they could block the toxin's action in neurons by adding the piece of the SV2 protein that they had discovered was the SV2 protein's binding site to the toxin.

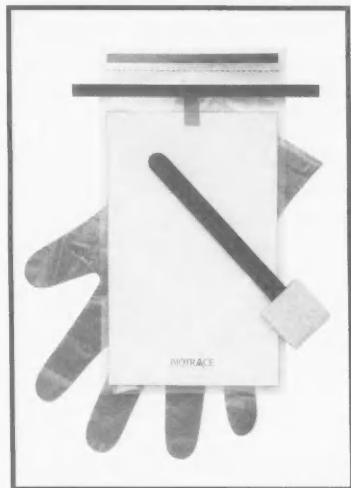
The researchers then proceeded to study the interaction between the toxin and SV2 in cell cultures, tissues and in whole mice. Co-author Roger Janz of the University of Texas-Houston Medical School supplied the Wisconsin researchers with knockout mice that lacked certain versions of SV2. The Wisconsin group found that the neurons that lack SV2 do not take up botox, but they do take up the toxin when SV2 is expressed. These findings demonstrated that SV2 is the functional receptor for Botox, Chapman said.

Other key mouse experiments were done in the laboratory of co-authors Eric Johnson and William Tepp in the Food Research Institute at the University of Wisconsin. They found that mice engineered to lack versions of the SV2 protein showed significantly longer survival times than did normal mice when exposed to the toxin.

The identification of SV2 as the neurotoxin A receptor raises the possibility of designing protective drugs that would interfere with the toxin's action, said Chapman. He said his laboratory will aid such efforts by concentrating on developing a more detailed understanding of the molecular interaction between the toxin and its receptor.

Chapman said that this finding and others' studies on the botulinum neurotoxins have revealed why they are models of lethal efficiency. "The cool thing is that the neurotoxin receptor is on actively recycling synaptic vesicles, so the toxin targets only active neurons and shuts them down," he said. "There is no wasted toxin, because once a nerve terminal is shut down, it doesn't take up any more toxin. That leaves more toxin around to enter nerve terminals that have yet to be inhibited. That's pretty clever."

# INDUSTRY PRODUCTS



Biotrace International

## Biotrace Leads the Way in Environmental Sampling

**B**iotrace International has a comprehensive range of environmental sampling products to provide the food industry with improved solutions for microbial and pathogen testing.

The range includes a choice of sponges and swabs available dry or pre-moistened with a variety of broths and buffers to neutralize the effect of cleaning chemicals and maximize the survival of damaged or stressed microorganisms.

The HydraSponge™ and SpongeSicle™ products utilize sterile, durable biocide-free sponges that help to ensure organism viability after sample collection. HydraSponge™ is a sturdy sponge designed for sampling large surface areas. SpongeSicle® has a large sponge head and a blue plastic handle,

which allows the user to collect a sample without direct contact with the sponge. It is especially useful for collecting samples from hard-to-reach areas.

Both products are supplied in Biotrace's patented "perforation free" sample bag guaranteeing sterility of the sampling device until the point of sampling. The dual laminate film used in the construction of the sample bag is strong and puncture resistant.

To increase visibility on the production floor, the sponges are yellow and the tear-away portion of the sample bag and gloves are bright blue (both products are available with or without gloves).

Other sampling options in the Biotrace range include RediSwab™ and the TECRA® ENVIROSWAB™. The RediSwab is a 9 cm long dacron-tipped swab pre-filled with a choice of enrichment broth or neutralizing solution in various fill volumes to allow for qualitative or quantitative use. The ENVIROSWAB is pre-moistened with a specially formulated transport medium to maximize the survival of damaged or stressed microorganisms. One of the main advantages of the ENVIROSWAB is that both the pre-enrichment and the incubation steps can be performed in the ENVIROSWAB tube.

Biotrace International offers a complete line of the products needed to check the safety and quality of food production processes; these include rapid pathogen, toxin and allergen kits, products for environmental and car-

ness sampling, dilution and enrichment, and ATP testing that gives a "real time" assessment of plant sanitation.

**Biotrace International**

800.729.7611

Bothell, WA

[www.biotrace.com](http://www.biotrace.com)

## Ecolab Announces Its Tsunami 100 Product to Reduce Pathogens in Fruit and Vegetable Process Waters

**E**colab Inc. has announced that its Tsunami 100 product was recently registered by the US Environmental Protection Agency to reduce 99.9 percent of pathogens in process waters used to clean fruits and vegetables. It is the only EPA-registered antimicrobial water additive product on the market that can make such a claim.

Tsunami 100 works against the dangerous pathogens *Escherichia coli* O157:H7, *Listeria monocytogenes* and *Salmonella* Enterica in fruit and vegetable processing waters. In addition, it provides control of spoilage and decay-causing non-public health organisms present on the surfaces of post-harvest, fresh-cut and processed fruits and vegetables so product spoilage is minimized and shelf life is enhanced.

"Health standards involved in fresh produce processing are becoming more and more stringent as consumption of fresh produce by health-conscious consumers rises to an all time high," said John Tengwall, vice president of marketing for Ecolab's Food & Beverage Division.

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

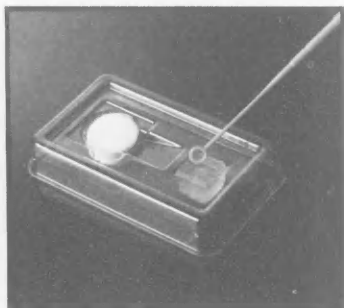
*The publishers do not warrant, either expressly or by implication, the factual accuracy of the products or descriptions herein, nor do they so warrant any views or opinions offered by the manufacturer of said articles and products.*

## INDUSTRY PRODUCTS

Tsunami 100 has low reactivity with organics and soils in process wash waters, making it easier to maintain a consistent dosage for microbial control. It is a versatile product that can be successfully applied in all major processing steps, including multi-stage flumes, chill tanks, coolers and washing in fresh cut, post harvest and further processed facilities.

Tsunami 100 can be used on vegetables and fruits, both whole and cut, with no rinse required. Tsunami 100 is not for use as a hard surface food contact sanitizer.

**Ecolab Inc.**  
651.293.2233  
St. Paul, MN  
[www.ecolab.com](http://www.ecolab.com)



*Hardy Diagnostics*

### Hardy Diagnostics Offers New MycoVue™ System

The Hardy Diagnostics MycoVue™ is a ready-to-use, diagnostic slide culture system for identifying fungi. It streamlines the identification of fungi by its microscopic morphological appearance. Accurate identification of filamentous fungi is based on the microscopic examination of sporulating parts of a colony since each species has a characteristic morphology in the arrangement of its spores and

fruiting bodies. The MycoVue™ System provides the laboratorian with a standardized, comprehensive method that eliminates time-consuming preparations and technical difficulties encountered with the classical slide culture technique. It simplifies the slide culture method by providing all the necessary components for this procedure in one ready-to-use disposable unit. The system comes complete with a protective lid and a built-in humidifying chamber. The device is designed to fit easily onto a microscope stage, thereby allowing direct viewing of the developing fungus through the device, thus eliminating the disruption of the fungal colony. If desired, the cover slip can be removed and stained for further evaluation or preservation. The MycoVue™ is offered with your choice of two media formulations: Potato Flake Agar or SABHI™ Agar with Chloramphenicol – for the inhibition of contaminating bacteria.

**Hardy Diagnostics**  
800.266.2222  
Santa Maria, CA  
[www.hardydiagnostics.com](http://www.hardydiagnostics.com)

### Bilsom Upgrades Viking™ Series Earmuffs with Air Flow Control™ Technology

Bilsom has upgraded its popular Viking™ Series noise-blocking earmuffs to incorporate its patented Air Flow Control™ technology (AFC), which delivers optimal attenuation across all frequencies without increasing earcup size or weight. Viking Series multi-position headbands give workers the flexibility to wear their earmuffs over-the-head, behind-the-head, or under-the-chin, allowing them to be worn with hard hats, face shields, respirators, and other PPE.

“Our Air Flow Control technology has proven so effective we’re extending it to other products in the Bilsom® Noise Blocking earmuff segment,” said Bill Sokol, vice president strategic marketing for the Bacou-Daloz Hearing Safety Group. “As sound travels through the air in our AFC earcups, a patented baseplate chamber and high-tech non-woven layer manage the flow of air inside the earmuff to control how sound reaches the ear,” Sokol explained. “The result is better, more consistent overall attenuation across all frequencies and in almost all industrial noise environments without increasing earcup size or weight.”

Air Flow Control Technology has boosted attenuation on the V1 model from 23 to 25, and V2 model from 25 to 27. Attenuation on V3 remains at 29, though with improved lower frequency attenuation.

Designed to provide all-day comfort, Viking Series V2 and V3 earmuffs feature a dual-headband design with an inner ventilated band for better positioning and breathability, and a non-deforming outer headband that minimizes pressure on the head. An improved attached elastic headband strap provides additional comfort and helps to ensure attenuation when earmuffs are worn in other than over-the-head positions.

Snap-in ear cushions make replacement quick and easy, and dielectric construction with rugged ABS plastic makes Viking Series earmuffs suitable for almost all workplaces, and especially for electrical and mining environments.

**Bacou-Daloz Hearing Safety Group**  
800.430.5490  
San Diego, CA  
[www.hearingportal.com](http://www.hearingportal.com)

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

## INDUSTRY PRODUCTS



Eagle Foodservice

### New UniWall® Counter System from Eagle Improves Lead Times and Simplifies Foodservice Installations

The new UniWall® counter system from the SpecFAB Division of Eagle Foodservice Equipment is a revolutionary step forward in simplifying kitchen and other foodservice installations. The unique, powerful turn-key design of the UniWall® system integrates retaining wall elements with counters, thereby eliminating many of the problems and installation delays that foodservice projects typically face in their final stages.

UniWall® allows specifiers or designers to lay out counters, serving lines and bars that are NSF-approved with factory pre-plumbed and/or UL-listed wiring options. The heart of the UniWall® system is its 12-gauge galvanized stud wall with horizontal utility chase openings for running beverage, plumbing and electrical lines – all accessible through easy-access front panels. Each prefabricated counter-and-wall system is designed, wired and plumbed for water, sewer

and electricity according to each installation's specific needs. The UniWall® system also serves as a structural wall element, replacing the need to build retaining walls at the job site.

Because each UniWall® system is designed and built to individual project specs, installation time at the job site is dramatically reduced. This also means that the need to retain expensive specialized electrician and plumbing labor to be on hand during the installation process is significantly reduced. Moreover, since UniWall® is classified as equipment, it qualifies for a reduced amortization schedule as compared to onsite construction.

Eagle's UniWall® counter system is an ideal solution for many foodservice installations such as bars, chef-preparation stands and concession stands. When used in dishwashing stations, UniWall® eliminates the need for building a permanent wall supporting the dish pass-through area. When used in cafeteria serving lines, UniWall® acts as a great support for tray slides. UniWall® systems have been installed in schools, theaters, casinos, sports facilities and restaurants. In fact, practically any installation where there is a need to run plumbing, electrical or mechanical lines in fabricated equipment is a natural application for the system.

The "plug and use" aspects of UniWall® deliver other benefits, too. All piping and wiring is already completed and positioned within UniWall's specially designed channels, thereby eliminating the need to drill holes in the equipment onsite. On-site labor technicians hook up the connections with the main electrical and plumbing service, thereby simplifying as well as shortening the installation process. (It

also reduces the chance of making errors in the wiring and plumbing.)

Since Eagle's UniWall® design provides such easy access to the conduit and piping, equipment serviceability is improved. Plus, if future plans ever call for changing the equipment floor plan of the kitchen space, UniWall® is easy to move and can be repositioned and reused, with no need to build new retaining walls.

The sleek aesthetics of the UniWall® system represent a further improvement over traditional retaining wall structures. The durable construction featuring type 304 stainless steel components is more attractive, with component dimensions able to be matched far more precisely (no more out-of-plumb areas to contend with as so often happens when fitting components to wood or concrete retaining walls). Eagle also offers its own custom millwork and other aesthetic detailing – including Wilsonart® laminate, Corian® solid surface, over-shelf systems, sneeze guards and drop-in mechanical units such as food wells – to deliver distinctive designs according to each customer's preferences.

**Eagle Foodservice**  
800.441.8440  
Clayton, DE  
[www.eaglegrp.com](http://www.eaglegrp.com)

### Independent Study Finds AirOcare Technology Eliminates *Listeria* on Produce and Stainless Steel Surfaces

An independent laboratory study found that AirOcare's air purification technology quickly eliminates populations of *Listeria* on fruits and

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

## INDUSTRY PRODUCTS

vegetables in produce storage facilities, food processing plants, shipping containers, supermarket display cases, and other environments. The study also verified that *Listeria* on stainless steel surfaces is also destroyed by the AirOcare system. The study was conducted by Food Safety & Process Technology, a well known and respected company that provides independent analysis for the food processing industry.

"Tested under varying relative humidity and treatment times, the AirOcare unit reduced levels of *Listeria monocytogenes* by over 99 percent, in as little as thirty minutes," says Dr. Rick Falkenberg, president of Food Safety & Process Technology. "And after 24 hours, the AirOcare treatment had virtually eliminated all colony forming units of the bacteria, even though we used extremely large concentrations of bacteria well beyond anything that is in a food storage or processing environment. The study clearly demonstrates the effectiveness of AirOcare reactive oxygen species on mitigating *Listeria monocytogenes* populations."

AirOcare commissioned the independent research to confirm what its own internal scientific studies, and hundreds of loyal customers, have already found: that AirOcare's patented technology, which uses reactive oxygen species (ROS), effectively kills bacteria such as *Listeria*, fungi, viruses, molds, mildews, and hundreds of other contaminants, without harming humans, animals, food, or the environment.

The laboratory study was conducted by comparing the growth of *Listeria* in two chambers with equal

humidity, temperature, and stainless steel surfaces. Five gram pieces of yellow pepper in each chamber were populated with 10 million colony forming units (CFU) of *Listeria*. One chamber was treated with an AirOcare air purification unit, and the other was not. *Listeria* levels in both chambers were measured at regular intervals and at different relative humidity levels found in the food industry.

The AirOcare chamber experienced almost 99.9% reductions in *Listeria* after just 30 minutes, 99.99% reductions after 8 hours, and 99.9999% reductions or a reduction from 10 million colonies to 100 or less after 48 hours. Concentrations of the bacteria at these high levels are not found in industry, and are used to scientifically demonstrate the ability of the treatment to destroy large concentrations. This assures that the statistical significance of a treatment is properly reported.

Reductions were equally as dramatic when *Listeria* was placed on the two most common types of stainless steel to simulate surfaces in food processing and retail locations, trucks, and containers.

The tests demonstrated the importance of this new tool for the entire food industry to address food safety and spoilage concerns. The AirOcare unit substantially reduced the levels and risks of *Listeria monocytogenes* in as little as 30 minutes of exposure and destroyed approximately 99% of the *Listeria* in that short period, proving its effectiveness in continuously reducing dangerous bacteria in food storage and processing.

"This study, performed by an industry-leading third party institution,

proves what we've long known: that our equipment is not only effective against airborne pathogens—in this case *Listeria*—but also against pathogens on produce and hard surfaces," says Bob McDonald, president and CEO of AirOcare, the international leader in air and food purification and sanitation systems for the agricultural, grocery, food service, and hospitality industries. "That's good news for produce growers, food processors, shippers, end retailers, and the entire fresh food supply chain. Food safety has become an urgent issue industry-wide, and our air purification technology is a proven way companies can ensure consumers get the freshest, safest food products."

**AirOcare**

888.368.2232

Rockville, MD

[www.AirOcare.com](http://www.AirOcare.com)

### TCP Reliable Adds Pre-qualified Shippers for Cold Chain

TCP Reliable engineers have developed a solution for shipping temperature-sensitive products without the need for expensive and time-consuming testing. The TimeSaver 24 is a pre-qualified shipping container conforming to ISTA 7D Summer and Winter Weather shipping conditions using the same packout configuration. It is reusable and is designed to maintain the critical 2–8 temperature range for up to 24 hours. The TimeSaver series of shippers includes 48-hour and 72-hour versions.

**TCP Reliable**

732.346.9200 ext. 118

Edison, NJ

[www.tcpreliable.com](http://www.tcpreliable.com)

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



# NEW...

## IAFP Foundation Fundraisers

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The Deane House Mystery from History is a unique, interactive dinner theatre. Characters from the past play out a mystery, loosely based on local history while guests play detective, trying to figure out “who dunnit.” During Act I, enjoy a leisurely cocktail in the Captain’s Room while the characters mingle with the crowd. The Narrator explains the rules of the game, how the evening will proceed and makes formal introductions. Guests then move to the main dining room where Act II unfolds during soup and salad service... and concludes with a murder. After a sumptuous entrée, explore the house, eaves-dropping and listening for further clues. As the curtain comes down on Act III, return to the dining room where dessert is served. At this point “guesses” are revealed and the murder is solved.

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Located in Fish Creek Provincial Park, the Ranche is acclaimed for its commitment to exceptional dining experiences. Executive Chef Alistair Barnes and his team offer discriminating dinners, fresh baked bread, the finest meat, poultry and fish, naturally raised game (from their own game ranch!), fresh vegetables and mouth-watering desserts.

***A portion of your registration fee from the two IAFP Foundation Fundraising activities will be donated to the Foundation.***

To register see the IAFP Registration Form.



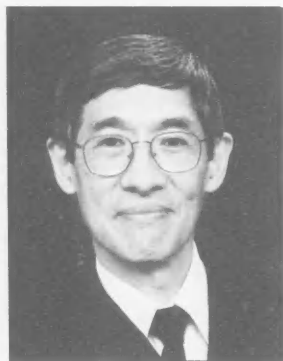
# Ivan Parkin Lecture

**Sunday, August 13  
6:00 p.m.**

**"A Progress Paradox: If We Have the Safest Food Supply,  
Why am I Working so Hard?"**

***Dr. Arthur P. Liang***

**Acting Associate Director for Food Safety  
National Center for Zoonotic, Vectorborne, and Enteric Diseases  
Centers for Disease Control and Prevention  
Atlanta, Georgia**



**D**r. Arthur Liang is director of the Food Safety Office, at the Centers for Disease Control and Prevention, National Center for Infectious Diseases (CDC/NCID). He is a former

CDC Epidemic Intelligence Service officer and former chief of the Communicable Disease Division at the Hawaii Department of Health. Dr. Liang currently serves on the Executive

Committee of the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) and is the CDC advisor to the Board of Directors of the Association of Food and Drug Officials (AFDO). He is also a member of the Preventive Medicine Residency Advisory Committee for the Walter Reed Army Institute of Research, a fellow and member of the Board of Regents of the American College of Preventive Medicine. He is board certified in General Preventive Medicine and Public Health. Dr. Liang earned his BA from Oberlin College, an MPH in International Health and Epidemiology from the University of Hawaii, and his MD from the University of Maryland.

***Join us at the Wine and Cheese Reception  
in the Exhibit Hall following the Ivan Parkin Lecture.***

*(The Wine and Cheese Reception is sponsored by Kraft Foods)*



# John H. Silliker Lecture

Wednesday, August 16

3:45 p.m.

## "Rising From the Ocean Bottom – The Evolution of Microbiology in the Food Industry"

**Dr. William H. Sperber**

Senior Corporate Microbiologist

Cargill, Inc.

Wayzata, Minnesota



**O**n a wintry Wisconsin afternoon in 1941, a future microbiologist drew his first breath and cried, "I hope you washed your hands!" Some years later, after completing undergraduate majors in zoology and chemistry, William Sperber earned his M.S. (1967) and Ph.D. (1969) degrees in microbiology from the University of Wisconsin at Madison. In his subsequent employment with major food companies he has become one of the world's experts in designing and controlling the microbiological safety and quality of foods.

Several of Dr. Sperber's innovations in graduate school were the development of M-Broth and the Enrichment-Serology procedure for *Salmonella* detection, which became a forerunner of ELISA-based technologies. At Best Foods in 1970, twelve years before the Tylenol® incident, he led the

development of the first tamper-evident packaging feature for a consumer food product. Hired in 1972 to conduct the first hazard analyses for consumer food products in Pillsbury's novel HACCP system, Dr. Sperber led Pillsbury's microbiology and food safety programs until 1995. At that time he joined Cargill, where he remains employed today on a post-retirement basis as Senior Corporate Microbiologist and "Global Ambassador for Food Safety," promoting principles of food safety and public health, beginning with the most important principle, "Wash Your Hands!"

A former chair of the IFT Division of Food Microbiology and the Food Microbiology Research Conference, Dr. Sperber was appointed five times by the US Secretary of Agriculture to the National Advisory Committee on Microbiological Criteria for Foods. The author of numerous publications and presentations, he is currently developing several book chapters and co-editing a new Compendium on the Microbiological Spoilage of Foods and Beverages, still "trying to make the world safer for people who eat." Bill and his wife, Renate, enjoy gardening, bicycling, books, music, and travel.



# IAFP 2006 Preliminary Program

## SUNDAY, AUGUST 13

Opening Session – 6:00 p.m.–7:00 p.m.

- Ivan Parkin Lecturer – “A Progress Paradox: If We Have the Safest Food Supply, Why am I Working so Hard?” – Arthur P. Liang, Ph.D., CDC, Atlanta, GA, USA

## MONDAY, AUGUST 14

Morning – 8:30 a.m. – 12:00 p.m.

### Symposium Topics

- Making Foods Safer: How Outbreaks Can Influence Change
- Bacterial Resistance to Antimicrobials: Current Trends and Future Perspectives
- The Canadian Approach to Food Safety
- Verification of Sanitary Design of Food Equipment
- Practical Risk Assessment in the Food Industry

### Technical Session

- Applied Laboratory Methods and Meat and Poultry

Poster Session (9:30 a.m. – 1:30 p.m.)

- Food Toxicology, Education and General Microbiology

Afternoon – 1:30 p.m. – 5:00 p.m.

### Symposium Topics

- Foodborne Viruses and Foodborne Viral Infections: Disease Burden, Epidemiology, Detection and Transmission
- Surrogate Microorganisms: Selection, Use and Validation
- Spores, Spores, and More Spores...What is Spoiling My Ready-to-Drink (RTD) Beverage? Is It *Alicyclobacillus* or Heat Resistant Mold?
- Biosecurity at Retail

### Round-Table Topics

- Issues Regarding Raw Milk Sales and Consumption
- Refrigerated Ready-to-Eat (RTE) Foods: Microbiological Concerns and Control Measures

### Technical Session

- Education and Dairy

Poster Session (2:00 p.m. – 6:00 p.m.)

- Dairy, Meat and Poultry

## TUESDAY, AUGUST 15

Morning – 8:30 a.m. – 12:00 p.m.

### Symposium Topics

- Disaster Preparedness and Response
- Symposium on *Enterobacter sakazakii*
- *Campylobacter* – From Gate to Plate
- Hygiene and Sanitation Solutions to Manage Evolving Risks
- International Food Law – A Global Overview

### Technical Session

- Pathogens and Antimicrobials

Poster Session (9:30 a.m. – 1:30 p.m.)

- Seafood and Applied Laboratory Methods

Afternoon – 12:15 p.m. – 1:00 p.m.

- IAFP Business Meeting

Afternoon – 1:30 p.m. – 5:00 p.m.

### Symposium Topics

- Foodborne Disease Update
- Contamination of Ready-to-Eat (RTE) Foods: Transfer and Risk – *Listeria monocytogenes* and Other Microorganisms
- Role and Application of International Standards in Supporting Food Safety Management and Testing
- A New Crack at Egg Safety: From the Hen House to Your House
- Cleaning and Sanitation for Retail Food Safety – Identifying the Issues

### Technical Session

- Risk Assessment and Epidemiology

Poster Session (2:00 p.m. – 6:00 p.m.)

- Pathogens and Produce

## WEDNESDAY, AUGUST 16

Morning – 8:30 a.m. – 12:00 p.m.

### Symposium Topics

- Public Health and Environmental Impact Assessments in the Aftermath of Hurricanes Katrina and Rita
- Assuring Microbiological Safety of Organic Products
- Symposium on *Salmonella*: The Saga Continues

### Technical Sessions

- Education
- Pathogens and Antimicrobials – *Listeria*

Poster Session (9:30 a.m. – 1:30 p.m.)

- Risk Assessment and Antimicrobials

Afternoon – 1:30 p.m. – 3:30 p.m.

### Symposium Topics

- How Risk Managers Decide on Risk from Different National Perspectives
- Symposium on Food Allergen Control at Retail and Foodservice
- Quality Control in Research Labs
- Hot Topics in Food Safety

### Round-Table Topic

- Water Safety and Quality: Global Water – HACCP Issues

### Technical Session

- Produce

Afternoon – 3:45 p.m. – 4:30 p.m.

- John H. Silliker Lecturer – “Rising From the Ocean Bottom – The Evolution of Microbiology in the Food Industry” – William H. Sperber, Ph.D., Cargill, Wayzata, MN, USA

Subject to change



# IAFP 2006 Networking Opportunities

## IAFP FUNCTIONS

### **WELCOME RECEPTION**—Hyatt Regency Calgary

Saturday, August 12 • 4:30 p.m. – 5:30 p.m.

Sponsored by Orkin Commercial Services

Welcome to IAFP 2006 and to the beautiful city of Calgary. Reunite with colleagues from around the world as you socialize and prepare for the leading food safety conference. Everyone is invited!

### **AFFILIATE RECEPTION**—Hyatt Regency Calgary

Saturday, August 12 • 5:30 p.m. – 7:00 p.m.

Affiliate Officers and Delegates plan to arrive in time to participate in this educational reception. Watch for additional details.

### **COMMITTEE MEETINGS**—Hyatt Regency Calgary

Saturday, August 12 • 1:00 p.m. – 5:00 p.m.

Sunday, August 13 • 7:00 a.m. – 5:00 p.m.

Refreshments Sponsored by Springer New York LLC

Committees and Professional Development Groups (PDGs) plan, develop and institute many of the Association's projects, including workshops, publications, and educational sessions. Share your expertise by volunteering to serve on any number of committees or PDGs. Everyone is invited to attend.

### **STUDENT LUNCHEON**—Hyatt Regency Calgary

Sunday, August 13 • 12:00 p.m. – 1:30 p.m.

Sponsored by Texas A&M Agriculture, Department of Animal Science, Food Safety

The mission of the Student PDG is to provide students of food safety with a platform to enrich their experience as Members of IAFP. Sign up for the luncheon to help start building your professional network.

### **EDITORIAL BOARD RECEPTION**—Hyatt Regency Calgary

Sunday, August 13 • 4:30 p.m. – 5:30 p.m.

Editorial Board Members are invited to this reception to be recognized for their service during the year.

### **OPENING SESSION**

#### **AND IVAN PARKIN LECTURE**—Telus Convention Centre

Sunday, August 13 • 6:00 p.m. – 7:00 p.m.

Join us to kick off IAFP 2006 at the Opening Session. Listen to the prestigious Ivan Parkin Lecture delivered by Dr. Arthur P. Liang.

### **CHEESE AND WINE RECEPTION**—Telus Convention Centre

Sunday, August 13 • 7:00 p.m. – 9:00 p.m.

Sponsored by Kraft Foods

An IAFP tradition for attendees and guests. The reception begins in the Exhibit Hall immediately following the Ivan Parkin Lecture on Sunday evening.

### **IAFP JOB FAIR**—Telus Convention Centre

Sunday, August 13 through Wednesday, August 16

Employers, take advantage of recruiting the top food scientists in the world! Post your job announcements and interview candidates.

### **COMMITTEE AND PDG CHAIRPERSON BREAKFAST**

(By invitation)—Hyatt Regency Calgary

Monday, August 14 • 7:00 a.m. – 9:00 a.m.

Chairpersons and Vice Chairpersons are invited to attend this breakfast to report on the activities of your committee.

### **EXHIBIT HALL LUNCH**—NEW!—Telus Convention Centre

Monday, August 14 • 12:00 p.m. – 1:00 p.m.

Sponsored by JohnsonDiversey

Tuesday, August 15 • 12:00 p.m. – 1:00 p.m.

Sponsored by SGS North America

Stop in the Exhibit Hall for lunch and business on Monday and Tuesday.

### **EXHIBIT HALL RECEPTIONS**—Telus Convention Centre

Monday, August 14 • 5:00 p.m. – 6:30 p.m.

Sponsored by DuPont Qualicon

Tuesday, August 15 • 5:00 p.m. – 6:00 p.m.—NEW!

Join your colleagues in the Exhibit Hall to see the most up-to-date trends in food safety techniques and equipment. Take advantage of these great networking receptions.

### **PRESIDENT'S RECEPTION** (By invitation)—Hyatt Regency Calgary

Monday, August 14 • 6:30 p.m. – 7:30 p.m.

Sponsored by Fisher Scientific

This by invitation event is held each year to honor those who have contributed to the Association during the year.

### **PAST PRESIDENTS' DINNER** (By invitation)—Hyatt Regency Calgary

Monday, August 14 • 7:30 p.m. – 10:00 p.m.

Past Presidents and their guests are invited to this dinner to socialize and reminisce.

### **BUSINESS MEETING**—Telus Convention Centre

Tuesday, August 15 • 12:15 p.m. – 1:00 p.m.

You are encouraged to attend the Business Meeting to keep informed of the actions of YOUR Association.

### **JOHN H. SILLIKER LECTURE**—Telus Convention Centre

Wednesday, August 16 • 3:45 p.m. – 4:30 p.m.

The John H. Silliker Lecture will be delivered by Dr. William H. Sperber.

### **AWARDS BANQUET**—Hyatt Regency Calgary

Wednesday, August 16 • 7:00 p.m. – 9:30 p.m.

Bring IAFP 2006 to a close at the Awards Banquet. Award recipients will be recognized for their outstanding achievements and the gavel will be passed from Dr. Jeffrey Farber to Incoming President Frank Yiannas, M.P.H.



# IAFP 2006 Event Information

## EVENING EVENTS

### NEW – IAFP Foundation Fundraisers

#### Murder Mystery Dinner at the Deane House

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## GOLF TOURNAMENT



#### Golf Tournament at The Links of GlenEagles

Saturday, August 12 • 7:30 a.m. – 4:00 p.m.

Join your friends and colleagues for a relaxing round of golf, Canadian Rocky style, before IAFP 2006. From the very first tee at The Links of GlenEagles, you know you’ve made the right choice for your day of golf. On every hole there are panoramic Rocky Mountain views as a backdrop to one of Canada’s most superb golf courses. At The Links of GlenEagles you will find a pristine course – lush green fairways, the brilliant white sand bunkers and exciting changes in elevation.

Designer Les Furber, one of Canada’s greatest golf designers, carved this course into the rugged foothills just as they run up to the Rocky Mountains. Portions of the course run along a cliff some 200 feet above the Bow River Valley. The course offers a grand visual experience as well as a golfing adventure. It’s a round you will talk about for months afterward.

Price includes transportation, greens fees with cart, range balls, lunch and prizes.

## DAYTIME TOURS

#### The Best of Lake Louise and Banff

Saturday, August 12 • 8:00 a.m. – 5:00 p.m.



For over a century, explorers have been making the trip to the incredible towering mountain peaks and icy blue glaciers, which are the highlights of Banff National Park. As you depart the urban city of Calgary, you will pass through the rolling wheat fields and into the foothills before entering the majestic beauty

of the Canadian Rockies. Once in Banff National Park, the journey continues along the winding Bow Valley Parkway passing Hole-in-the-Wall, Johnston Canyon and magnificent Castle Mountain. At Lake Louise, enjoy free time to discover this special place with outdoor pursuits: hike, rent a canoe, or try horseback riding. If you prefer, the Fairmont Chateau Lake Louise has various shops, lounges, restaurants, and fabulous architecture that will impress for hours. The rich history and beauty of Lake Louise will last in memory for years to come! Rejoin the group to enjoy a delicious lunch before departing the Chateau for the second half of the tour.

The next part of the adventure in the Rockies leads to beautiful Banff! This tour features the spray of cool waterfalls, an optional ascent up a mountain, a taste of local history and a chance to spy on wildlife – complete in one afternoon! To start, feel the power of the Bow Falls and the beauty that surrounds it just below the Fairmont Banff Springs Hotel. Continue exploring some of the best views in town – Surprise Corner on Tunnel Mountain Drive, the Hoodoos (oddly shaped pillars of glacial rock) and Mount Norquay's winding road. Next stop at the Cave and Basin Centennial Center – the birthplace of Canada's national parks where the guide will provide interesting tidbits on Banff's rich natural and human history. Before returning to Calgary, enjoy some free time to explore the many unique cafes, boutiques, and shops in downtown Banff or take a relaxing stroll through the tranquil Cascade gardens.

*Optional:* For those not wanting to stop downtown, the coach will continue on to Sulphur Mountain where guests can take the gondola up to the 7,500 foot summit of the mountain and enjoy a panoramic view of the entire Bow Valley as well as explore the interpretive trail that winds atop the mountain. Gondola admission is not included in the tour price.

### The Complete Calgary Tour

Sunday, August 13 • 10:00 a.m. – 4:00 p.m.



Spend today exploring the exciting attractions of Calgary. This thriving business center combines the friendly atmosphere of the old west with the aggressive style of a modern cosmopolitan center. The day will be highlighted by stops at historical locations, unique neighborhoods and scenic viewpoints. Start at the Calgary Tower that features spectacular views of Calgary and the Canadian Rockies as well as a new glass floor attraction. Visit Heritage Park where the sights and sounds of Canada's exciting pioneer west has been recreated; enjoy a tour onboard an authentic steam train followed by lunch in one of the historical buildings. Last, make a stop at Canada Olympic Park, an internationally-renowned winter training facility and home to the world's largest Olympic Hall of Fame!

### Drumheller and the Badlands

Monday, August 14 • 8:00 a.m. – 4:00 p.m.



Wind whines through the stubble of brush over a dry valley, its whispers joined only by the incessant creaking of crickets and the occasional clacking of grasshoppers' wings. This is the Badlands of Alberta! As the landscape changes, you will feel as though you've stepped back in time – way back to prehistoric time! The highlight of this tour will be at the Royal Tyrrell Museum of Paleontology in Drumheller. This museum is a major exhibition and research center, and one of the largest paleontological museums in the world. It displays more than 200 dinosaur specimens, the largest number under one roof anywhere. Most of the dinos on display were found in Alberta; the majority just outside in Dinosaur Provincial Park and Drumheller. Following a tour of the museum, enjoy the unique landscape of some of the many self-guided trails and a leisurely lunch.

### Art Walk

Tuesday, August 15 • 10:00 a.m. – 1:30 p.m. (Lunch not included)

Downtown Calgary isn't all concrete and glass – it's also home to some of Calgary's best-known art galleries. These gems will be explored on a walking tour of downtown. Stops will include the Stephen Lowe Art Gallery featuring Western and Asian fine art paintings and sculptures by more than 65 artists; Diana Paul Galleries, where some of Canada's most renowned contemporary impressionists are featured; Gainsborough Galleries, opened in 1923, the longest-running art gallery in the city; and Wallace Galleries, representing accomplished Canadian and international contemporary visual artists.

The tour will end at Art Central – Calgary's newest addition to the art scene, with three floors of bright open space housing art galleries and artists studios. A short tour highlighting the main attractions on each floor will be followed by a demonstration in one of the artist's studios.

Following the tour, explore Art Central, enjoy a delicious lunch (not included) in one of the trendy downtown restaurants, or continue exploring Calgary's artistic offerings.

### Yoga and Cooking Class

Wednesday, August 16 • 9:45 a.m. – 2:00 p.m.

Today is dedicated to the issues of health and vitality that are so prevalent in the Western Canada lifestyle. Start the day with a private session at one of the trendy downtown yoga studios. The local instructor will lead an hour-long vinyasa yoga class. This popular form of yoga focuses on integrating breath and movement, awareness and alignment, and strength and flexibility in daily life. The result is improved circulation, a light and strong body, and a calm mind.

After class, depart for the Cookbook Company, Calgary's culinary hub. The culinary classroom plays host to over 200 cooking classes, wine classes, specialty dinners and workshops each year. The body and mind theme will be carried forward into this culinary adventure with the cooking of a delicious and healthy vegetarian lunch with the local yoga and cooking guru.

## POST MEETING ACTIVITY

### Outdoor Adventure in Kananaskis

Thursday, August 17 • 8:30 a.m. – 2:30 p.m.

Welcome to the REAL WEST! Transfer by exclusive coach to Kananaskis Country for a morning of activities in the beautiful Canadian Rockies.

Tucked away in the spectacular Kananaskis Valley, Boundary Ranch is the perfect setting for an Alberta Barbecue. Lunch at Boundary Ranch offers the opportunity to relax and watch the trail rides leave the corral, get involved in activities like horseshoes or roping or take a picturesque stroll through the mountains surrounding the ranch. There is always a lot to see and do! Wander through the unique log and cedar facilities and enjoy western hospitality at its finest! Consider the additional activities offered for a small fee. Optional activities:

- Biking in Kananaskis
- Voyageur Canoe Ride
- Kananaskis Hiking Tours
- Horseback Trail Ride at Boundary Ranch
- Whitewater Rafting on the Kananaskis River





**IMPORTANT!** Please read this information before completing your registration form.

### MEETING INFORMATION

Register to attend the world's leading food safety conference.

Full Registration includes:

- Technical Sessions
- Symposia
- Poster Presentations
- Ivan Parkin Lecture
- John H. Silliker Lecture
- Exhibit Hall Lunch (Mon.-Tues.)
- Awards Banquet
- Exhibit Hall Admittance
- Cheese and Wine Reception
- Exhibit Hall Reception (Mon.-Tues.)
- Program and Abstract Book

### 4 EASY WAYS TO REGISTER

Complete the Attendee Registration Form and submit it to the International Association for Food Protection by:



**Online:** [www.foodprotection.org](http://www.foodprotection.org)



**Fax:** 515.276.8655



**Mail:** 6200 Aurora Avenue, Suite 200W  
Des Moines, IA 50322-2864, USA



**Phone:** 800.369.6337; 515.276.3344

The early registration deadline is July 12, 2006. After this date, late registration fees are in effect.

### REFUND/CANCELLATION POLICY

Registration fees, less a \$50 administration fee and any applicable bank charges, will be refunded for written cancellations received by July 28, 2006. No refunds will be made after July 28, 2006; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 23, 2006. Event and tour tickets purchased are nonrefundable.



International Association for  
**Food Protection**®

### EXHIBIT HOURS

<b>Sunday, August 13, 2006</b>	7:00 p.m. – 9:00 p.m.
<b>Monday, August 14, 2006</b>	9:30 a.m. – 6:30 p.m.
<b>Tuesday, August 15, 2006</b>	9:30 a.m. – 6:00 p.m.

### DAYTIME EVENTS – Lunch included

<b>Saturday, August 12, 2006</b>	8:00 a.m. – 5:00 p.m.
The Best of Lake Louise and Banff	
<b>Sunday, August 13, 2006</b>	10:00 a.m. – 4:00 p.m.
The Complete Calgary Tour	
<b>Monday, August 14, 2006</b>	8:00 a.m. – 4:00 p.m.
Drumheller and the Badlands	
<b>Tuesday, August 15, 2006</b>	10:00 a.m. – 1:30 p.m.
Art Walk (Lunch not included)	
<b>Wednesday, August 16, 2006</b>	9:45 a.m. – 2:00 p.m.
Yoga and Cooking Class	

### EVENING EVENTS

<b>Sunday, August 13, 2006</b>	
Opening Session	6:00 p.m. – 7:00 p.m.
Cheese and Wine Reception	7:00 p.m. – 9:00 p.m.
<i>Sponsored by Kraft Foods</i>	
<b>Monday, August 14, 2006</b>	
Exhibit Hall Reception	5:00 p.m. – 6:30 p.m.
<i>Sponsored by DuPont Qualicon</i>	
<b>Tuesday, August 15, 2006</b>	
Exhibit Hall Reception	5:00 p.m. – 6:00 p.m.
<b>NEW – IAFP Foundation Fundraisers</b>	
Murder Mystery Dinner at the Deane House	6:30 p.m. – 10:00 p.m.
Dinner at The Ranche	6:30 p.m. – 10:00 p.m.
<b>Wednesday, August 16, 2006</b>	
Awards Banquet Reception	6:00 p.m. – 7:00 p.m.
Awards Banquet	7:00 p.m. – 9:30 p.m.

### POST MEETING ACTIVITY

<b>Thursday, August 17, 2006</b>	
Outdoor Adventure in Kananaskis	8:30 a.m. – 2:30 p.m.

### GOLF TOURNAMENT

<b>Saturday, August 12, 2006</b>	
Golf Tournament at The Links of GlenEagles	7:30 a.m. – 4:00 p.m.

### HOTEL INFORMATION

Hotel reservations can be made online at [www.foodprotection.org](http://www.foodprotection.org). See page 439 for additional hotel information.





# IAFP 2006 Registration Form



6200 Aurora Avenue, Suite 200W  
Des Moines, IA 50322-2864, USA  
Phone: 800.369.6337 • 515.276.3344  
Fax: 515.276.8655  
E-mail: info@foodprotection.org  
Web site: www.foodprotection.org

Member Number: \_\_\_\_\_

First name (as it will appear on your badge) \_\_\_\_\_ Last name \_\_\_\_\_

Employer \_\_\_\_\_ Title \_\_\_\_\_

Mailing Address (Please specify:  Home  Work) \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_ Country \_\_\_\_\_ Postal/Zip Code \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_ E-mail \_\_\_\_\_

Regarding the ADA, please attach a brief description of special requirements you may have.

IAFP occasionally provides Attendees' addresses (excluding phone and Email) to vendors and exhibitors supplying products and services for the food safety industry. If you prefer NOT to be included in these lists, please check the box.

## PAYMENT MUST BE RECEIVED BY JULY 12, 2006 TO AVOID LATE REGISTRATION FEES

### REGISTRATION FEES:

Registration \_\_\_\_\_  
 Association Student Member \_\_\_\_\_  
 Retired Association Member \_\_\_\_\_  
 One Day Registration\*  Mon.  Tues.  Wed. \_\_\_\_\_  
 Spouse/Companion\* (Name): \_\_\_\_\_  
 Children 15 & Over\* (Names): \_\_\_\_\_  
 Children 14 & Under\* (Names): \_\_\_\_\_  
 \*Awards Banquet not included  
 Additional Awards Banquet Ticket (Wednesday, 8/16) \_\_\_\_\_  
 Student Luncheon (Sunday, 8/13) \_\_\_\_\_

### MEMBERS

\$ 395 (\$ 445 late)  
 \$ 80 (\$ 90 late)  
 \$ 80 (\$ 90 late)  
 \$ 215 (\$ 240 late)  
 \$ 55 (\$ 55 late)  
 \$ 25 (\$ 25 late)  
 FREE  
 \$ 50 (\$ 60 late)  
 \$ 5 (\$ 15 late)

### NONMEMBERS

\$ 597 (\$647 late)  
 Not Available  
 Not Available  
 \$ 330 (\$355 late)  
 \$ 55 (\$ 55 late)  
 \$ 25 (\$ 25 late)  
 FREE  
 \$ 50 (\$ 60 late)

### TOTAL

\_\_\_\_\_  
 \_\_\_\_\_  
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 \_\_\_\_\_  
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### NEW IAFP FOUNDATION FUNDRAISERS:

#### Tuesday, 8/15

Murder Mystery Dinner at the Deane House \$ 130 (\$140 late)  
 Dinner at The Ranche \$ 145 (\$155 late)

### # OF TICKETS

\_\_\_\_\_  
 \_\_\_\_\_

### DAYTIME EVENTS - Lunch included

Golf Tournament (Saturday, 8/12) \$ 135 (\$145 late)  
 The Best of Lake Louise and Banff (Saturday, 8/12) \$ 130 (\$140 late)  
 The Complete Calgary Tour (Sunday, 8/13) \$ 105 (\$115 late)  
 Drumheller and the Badlands (Monday, 8/14) \$ 115 (\$125 late)  
 Art Walk - Lunch not included (Tuesday, 8/15) \$ 42 (\$ 52 late)  
 Yoga and Cooking Class (Wednesday, 8/16) \$ 90 (\$100 late)  
 Outdoor Adventure in Kananaskis (Thursday, 8/17) \$ 82 (\$ 92 late)

Optional: Select one activity per person

		Qty.
<input type="checkbox"/> Biking	\$ 93 (\$103 late)	_____
<input type="checkbox"/> Canoe Ride	\$ 56 (\$ 66 late)	_____
<input type="checkbox"/> Hiking	\$ 51 (\$ 61 late)	_____
<input type="checkbox"/> Horseback Riding	\$ 57 (\$ 67 late)	_____
<input type="checkbox"/> Rafting	\$ 61 (\$ 71 late)	_____

### PAYMENT OPTIONS:

Check Enclosed



TOTAL AMOUNT ENCLOSED \$ \_\_\_\_\_  
US FUNDS on US BANK

Credit Card # \_\_\_\_\_

Expiration Date \_\_\_\_\_

Name on Card \_\_\_\_\_

Signature \_\_\_\_\_

Check box if you are a technical, poster, or symposium speaker.

**JOIN TODAY AND SAVE!!!**  
 (Attach a completed Membership application)

**EXHIBITORS DO NOT USE THIS FORM**



# IAFP 2006 Workshops

WORKSHOP 1	WORKSHOP 2	WORKSHOP 3
<b>Saturday, August 12</b> 8:00 a.m. to 5:00 p.m.	<b>Saturday, August 12</b> 8:00 a.m. to 5:00 p.m.	<b>Friday, August 11</b> <b>Saturday, August 12</b> 8:00 a.m. to 5:00 p.m.
<b><i>Developing and Improving Your Food Microbiology Laboratory</i></b>	<b><i>Methods, Methods Everywhere but Which is Right for Me? Selection and Verification of Methods</i></b>	<b><i>Global Food Standards: Food Safety Auditing</i></b>

## Workshop 1 – Developing and Improving Your Food Microbiology Laboratory

This workshop will present ways to operate a food microbiology laboratory more effectively and efficiently. You will learn in a friendly and interactive environment, the critical elements of a food microbiology testing laboratory. Also, laboratory layout as it applies to efficiency and data quality will be addressed. Workshop participants will learn how to build technical competence through training and the three pillars of quality. Analysis of variables to be considered when determining whether to build or up grade an internal microbiology laboratory including a review of experiences and challenges with in-house testing will be presented. The workshop will include time for a roundtable discussion and a binder of information to reinforce the practical experience gained during the workshop for future use.

### Topics:

- Critical Elements of Food Microbiology Testing Laboratories
- Building Technical Competency: Training and the Three Pillars of Quality
- Laboratory Layout Considerations
- Developing an In-House Microbiology Laboratory? Factors to Consider

### Instructors:

Donna Christensen, Canadian Food Inspection Agency, Calgary, Alberta, Canada  
Dave Evanson, Silliker Inc., Homewood, IL, USA  
Timothy Freier, Cargill Corporate Food Safety and Regulatory Affairs, Minneapolis, MN, USA  
Jeffrey Kornacki, Ph.D., Kornacki Microbiology Solutions, LLC, McFarland, WI, USA

### Organizers:

Jeffrey Kornacki, Ph.D., Kornacki Microbiology Solutions, LLC, McFarland, WI, USA  
Pamela Wilger, M.S., Cargill, Wayzata, MN, USA

### Intended Audience

Laboratory personnel or microbiologists in small to medium sized laboratories or companies

## Workshop 2 – Methods, Methods Everywhere but Which is Right for Me? Selection and Verification of Methods

Selecting the analytical tool(s) for microbiological analysis that best meets your needs is a critical task. With so many choices, how do you decide? This workshop will teach you everything that you ever wanted to know about selecting a microbiological method that is “fit for purpose.” You will experience a demonstration of an AOAC “on-line” learning center and get a better understanding of the various international approaches to method validation schemes. Speakers will address practical considerations in method selection both for large corporate labs, as well as for single manufacturing site labs. The concept of uncertainty of measurement as a key component of method verification will be addressed from a microbiologist’s viewpoint. Using the Mexican and Canadian experiences, expectations of accrediting authorities for method verification will also be detailed. There will be ample time provided for open discussion and each of the presentations will include a list of available resources to help the attendees with the decision making process.

### Topics:

- Worldwide Method Validation – Have It Your Way – The AOAC RI Learning Center Approach
- Death, Taxes and Uncertainty...A Simple Microbiologist’s View
- How to Choose a Method: Practical Considerations
- Expectations of an Accrediting Body – A Canadian Perspective
- Expectations of an Accrediting Body – A Mexican Perspective

### Instructors:

Michael Brodsky, Brodsky Consultants, Thornhill, Ontario, Canada  
Donna Christensen, Canadian Food Inspection Agency, Calgary, Alberta, Canada  
Armida Zuniga-Estrada, Public Health State Laboratory, Pachuca City, Hidalgo, Mexico  
Robin Kalinowski, National Center for Food Safety and Technology, Summit Argo, IL, USA  
Deborah McKenzie and Maria Nelson, AOAC Research Institute, Gaithersburg, MD, USA

### Organizers:

Christine Aleski, Ann Arbor, MI, USA  
George Wilson, BD Diagnostics, Sparks, MD, USA

### Intended Audience

Microbiologists, Lab supervisors and managers, QA personnel and analysts or anyone responsible for selecting laboratory methods in a food production, processing or analytical environment

## Workshop 3 – Global Food Standards: Food Safety Auditing

In today’s global food market it is vital that there are food safety standards in place that can be used by companies in determining a supplier base for their foodstuffs. To this end there has been an increase in the development and evolution of Global Food Safety Standards. The recently launched ISO 22000 Standard is the latest in the range of standards. Currently, the most widely used is the British Retail Consortium (BRC) Global Standard–Food. This is used by approved Certification Bodies as the standard to audit against in ensuring a consistent, safe food supply. The Standard covers a wide range of topics including, HACCP, Quality Management Systems, Factory Environment Standards, Product Control, Process Control and Personnel. One of the problems with auditing is ensuring consistency between auditors. This workshop will cover all aspects of both the Standard and auditing techniques to guarantee consistency.

**This course is certified by the British Retail Consortium and is recognized as the required Internal Auditor training for any company seeking certification. Successful delegates will receive a recognized certificate.**

### Topics:

- Summary of the standard
- Global food standard audit concepts
- Types of audit
- The auditor
- Auditor skills
- Audit report writing
- Reporting audit results to management

### Instructors:

Gordon Hayburn, University of Wales Institute, Cardiff, UK  
Louise Fielding, University of Wales Institute, Cardiff, UK  
David Lloyd, University of Wales Institute, Cardiff, UK

### Organizer:

Gordon Hayburn, University of Wales Institute, Cardiff, UK

### Intended Audience

Quality/Technical managers, Internal Systems auditors, consultants, food safety professionals and academics



# IAFP 2006 Workshop Registration Form

- Workshop 1 – Developing and Improving Your Food Microbiology Laboratory – Saturday, August 12**
- Workshop 2 – Methods, Methods Everywhere but Which is Right for Me? Selection and Verification of Methods – Saturday, August 12**
- Workshop 3 – Global Food Standards: Food Safety Auditing – Friday and Saturday, August 11–12**

First Name (will appear on badge)

Last Name

Company

Job Title

Address

City

State/Province

Country

Postal Code/Zip +4

Area Code & Telephone

Fax

E-mail

Member #

Check Enclosed



Total Amount Enclosed

(US Funds on US Bank) \$

Account Number

Signature

Expiration date

### REGISTRATION

Payment must be received by July 21, 2006 to avoid late registration rates.

WORKSHOP 1	Early Rate		Late Rate		WORKSHOP 2	Early Rate		Late Rate		WORKSHOP 3	Early Rate		Late Rate	
	IAFP Member	\$295.00	\$370.00	IAFP Member		\$320.00	\$395.00	IAFP Member	\$465.00		\$540.00	IAFP Member	\$465.00	\$540.00
NonMember	\$395.00	\$470.00	NonMember	\$420.00	\$495.00	NonMember	\$565.00	\$640.00	NonMember	\$565.00	\$640.00			

#### GROUP DISCOUNT:

Register 3 or more people from your company and receive a 15% discount. Registrations must be received as a group.

#### Refund/Cancellation Policy

Registration fees, less a \$50 administrative charge, will be refunded for written cancellations received by July 28, 2006. No refunds will be made after that date; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 21, 2006. The workshop may be cancelled if sufficient enrollment is not received by July 21, 2006.

For further information, please contact the Association office at 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: [jcattnach@foodprotection.org](mailto:jcattnach@foodprotection.org).

### 4 Easy Ways to Register

To register, complete the Workshop Registration Form and submit it to the International Association for Food Protection by:



Online: [www.foodprotection.org](http://www.foodprotection.org)



Phone: 800.369.6337; 515.276.3344



Fax: 515.276.8655



Mail: 6200 Aurora Avenue, Suite 200W, Des Moines, IA 50322-2864, USA



# REQUEST FOR ACCOMMODATIONS

## INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

### 93rd ANNUAL MEETING

August 13 - 16, 2006  
Calgary, Alberta, Canada

#### INSTRUCTIONS

Online housing will open on **December 1, 2005.**

#### INTERNET:

Visit the International Association for Food Protection website at [www.foodprotection.org](http://www.foodprotection.org) to make your reservation.

#### FAX:

Only fully completed forms will be accepted by fax at **403-262-3809**. Use one form per individual request.

#### MAIL:

Housing forms can be mailed to:  
Tourism Calgary IAFP Housing  
#200, 238-11 Ave. SE  
Calgary, Alberta, Canada T2G 0X8

#### IMPORTANT

Requests for reservations must be received prior to **July 20, 2006** in order to guarantee convention room prices. You must cancel your room prior to July 20, 2006. Cancellations after July 20th will result in a \$25.00 USD cancellation fee.

1. Rooms will be assigned in a first-come, first-served basis. Reservations can be made online or by mail or fax.

2. An acknowledgement of your reservation will be sent to you. Please review all information for accuracy. If you have booked online you will be sent an acknowledgement automatically. For all faxed reservations, a confirmation will be sent within 72 hours of reservations being processed; mailed confirmations will take 10-14 days. You may also check your reservation, regardless of how you have booked, by logging onto [www.foodprotection.org](http://www.foodprotection.org) and selecting the Passkey housing link. You will not receive a separate confirmation from the hotel.

3. Reservations not secured with a credit card, will require a deposit in Canadian funds to be sent directly to the assigned hotel. You will be advised what hotel to make the money order payable to.

4. Reservation modifications & changes can be made online until **August 7, 2006** or be sent in writing to Tourism Calgary prior to the date above. After August 7, 2006, please contact the hotel directly regarding changes or cancellations.

5. All hotel accommodations will be subject to a 4% Alberta Tourism Levy and a 7% Federal Goods and Services Tax (GST). A 1% Destination Marketing Fee may also apply.

6. All room rates are quoted in Canadian funds.

#### GUEST INFORMATION

For best availability, make your reservation via internet ([www.foodprotection.org](http://www.foodprotection.org)) or by fax (403) 262-3809.

Arrival Date \_\_\_\_\_ Departure Date \_\_\_\_\_

#### Attention Exhibitors:

**NOTE:** Change of exhibit hours. Exhibit hall will close at 6:00 PM on Tuesday with teardown immediately following.

Mr.  Ms.  Mrs.

First Name: \_\_\_\_\_

Last Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Province: \_\_\_\_\_

Zip/Postal Code: \_\_\_\_\_ Country: \_\_\_\_\_

Email address: \_\_\_\_\_

Daytime Ph: ( ) \_\_\_\_\_ Fax: ( ) \_\_\_\_\_

#### HOTEL SELECTION

Please select hotel from list below in order of preference (ie. 1st, 2nd, 3rd choice etc.).

CHOICE	HOTEL	RATES
_____	Calgary Marriott	\$174.00 CAD
_____	Fairmont Palliser	\$195.00 CAD
_____	Hyatt Regency	\$175.00 CAD

All rooms are standard rooms with one or two beds.

# of Occupants in room \_\_\_\_\_ List Occupants Names: \_\_\_\_\_

# of Beds Requested \_\_\_\_\_

(Note: extra charges will apply for more than two people in a room)

Special Room Requirements:

Disability requiring special services  Non-smoking  Smoking

#### DEPOSIT INFORMATION

A first night's deposit is mandatory to guarantee rooms. (See instructions & information for other payment options.)

VISA  American Express  Diner's Club  Mastercard

Card Number: \_\_\_\_\_ Expiry Date: \_\_\_\_\_

Name on Credit Card: \_\_\_\_\_

Cardholder's Signature\*: \_\_\_\_\_

\*Necessary to process reservations

#### Complete and return this form by fax or mail to:

Tourism Calgary - Calgary Convention & Visitors Bureau  
200, 238 11 Ave. S.E., Calgary, AB Canada T2G 0X8  
Tel: (403) 263-8510 • Fax: (403)262-3809

For more information on Calgary visit:

[www.tourismcalgary.com](http://www.tourismcalgary.com)

*Tourism* **CALGARY**  
CALGARY CONVENTION & VISITORS BUREAU

# THE Black Pearl AWARD

RECOGNITION FOR CORPORATE EXCELLENCE IN FOOD SAFETY AND QUALITY



The Black Pearl Award is presented annually to a company for its efforts in advancing food safety and quality through consumer program, employee relations, educational activities, adherence to standards and support of the goals and objectives of the International Association for Food Protection. We invite you to nominate your company for this prestigious recognition. Contact the Association office for nomination information.

*Presented by*

**The International Association  
for Food Protection**

*Proudly sponsored by*

**Wilbur S. Feagan and  
F&H Food Equipment Company**

## Black Pearl Recipients

**2006 Ecolab Inc.**  
St. Paul, Minnesota

**2005 DuPont**  
Wilmington, Delaware

**2004 Jack in the Box Inc.**  
San Diego, California

**2003 Wegmans Food Markets Inc.**  
Rochester, New York

**2002 Darden Restaurants**  
Orlando, Florida

**2001 Walt Disney World Company**  
Lake Buena Vista, Florida

**2000 Zep Manufacturing Company**  
Atlanta, Georgia

**1999 Caravelle Foods**  
Brampton, Ontario, Canada

**1998 Kraft Foods, Inc.**  
Northfield, Illinois

**1997 Papetti's of Iowa  
Food Products, Inc.**  
Lenox, Iowa

**1996 Silliker, Inc.**  
Homewood, Illinois

**1995 Albertson's Inc.**  
Boise, Idaho

**1994 H-E-B Grocery Company**  
San Antonio, Texas

# STUDENT FUNDRAISER!



**P**urchase an IAFP 2006 T-shirt or Polo Shirt from the Student PDG to help raise money in support of our Students. Pre-ordered T-shirts are \$20.00 and Polo shirts are \$30.00. Shirts will be available for pick-up from the SPDG booth throughout IAFP 2006. All order forms are due by July 1, 2006.

If you choose to pay by credit card, make sure you include the amount to be charged. If you are paying by check, make checks payable to IAFP and enclose the check with your order form. Please mail order forms for receipt by July 1, 2006 for pre-orders.

Please return order form to:



**International Association for  
Food Protection**

6200 Aurora Avenue, Suite 200W  
Des Moines, IA 50322-2864, USA  
Phone: 800.369.6337 • 515.276.3344  
Fax: 515.276.8655  
E-mail: info@foodprotection.org  
Web site: www.foodprotection.org

## IAFP SPDG Shirt Order Form

Name \_\_\_\_\_

Title \_\_\_\_\_

Mailing Address \_\_\_\_\_

City \_\_\_\_\_

State/Province \_\_\_\_\_

Country \_\_\_\_\_

Postal/Zip \_\_\_\_\_

Telephone \_\_\_\_\_

Fax \_\_\_\_\_

E-mail \_\_\_\_\_

Quantity _____	T-shirts	S <input type="checkbox"/>	M <input type="checkbox"/>	L <input type="checkbox"/>	XL <input type="checkbox"/>	\$20.00
	Polo shirts	S <input type="checkbox"/>	M <input type="checkbox"/>	L <input type="checkbox"/>	XL <input type="checkbox"/>	\$30.00

**PAYMENT OPTIONS:**



Check or Money Order Enclosed

**TOTAL AMOUNT ENCLOSED \$** \_\_\_\_\_

US FUNDS on US BANK

Credit Card # \_\_\_\_\_

Name on Card \_\_\_\_\_

Signature \_\_\_\_\_ Expiration Date \_\_\_\_\_



## Contribute to the Ninth Annual IAFP Foundation Silent Auction Today!

The Foundation of the International Association for Food Protection will hold its Annual Silent Auction during IAFP 2006, the Association's 93rd Annual Meeting in Calgary, Alberta, Canada, August 13-16, 2006. The Foundation supports:

- ◆ Student Travel Scholarships
- ◆ Ivan Parkin Lecture
- ◆ John H. Silliker Lecture (Funded through a contribution from Silliker, Inc.)
- ◆ Travel support for exceptional speakers at the Annual Meeting
- ◆ Audiovisual Library
- ◆ Developing Scientist Competition
- ◆ Shipment of *JFP* and *FPT* journals to developing countries through FAO

Support the Foundation by donating an item today. A sample of items donated last year included:

- |   |   |
|---|---|
| ◆ 3-Month Membership<br><i>"Cheese of the Month Club"</i> | ◆ <i>Food Microbiology Fundamentals<br/>    and Frontiers</i> |
| ◆ Mickey Mouse Statue                                     | ◆ Godiva Chocolate Gift Basket                                |
| ◆ PepsiCo Gift Bag  | ◆ Pearl Necklace  |
| ◆ Assorted Wines  | ◆ McCormick Spice Rack  |
| ◆ Cow Parade Figurines                                    | ◆ Train Set   |

Complete the form and send it in today.



-----

Description of Auction Items \_\_\_\_\_

Estimated Value \_\_\_\_\_

Name of Donor \_\_\_\_\_

Company (if relevant) \_\_\_\_\_

Mailing Address \_\_\_\_\_

(Please specify:  Home  Work)

City \_\_\_\_\_ State or Province \_\_\_\_\_

Postal Code/Zip + 4 \_\_\_\_\_ Country \_\_\_\_\_

Telephone # \_\_\_\_\_ Fax # \_\_\_\_\_

E-mail \_\_\_\_\_

**Return to:**

Donna Gronstal  
International Association for Food Protection  
6200 Aurora Avenue, Suite 200W  
Des Moines, IA 50322-2864, USA  
800.369.6337; 515.276.3344  
Fax: 515.276.8655  
E-mail: [dgronstal@foodprotection.org](mailto:dgronstal@foodprotection.org)



International Association for  
**Food Protection**®



# COMING EVENTS

## JULY

- **3-6, SFAM Summer Conference —“Living Together” Polymicrobial Communities**, Apex International Hotel, Edinburgh, United Kingdom. For more information, E-mail: meetings@sfam.org.uk; or go to [www.sfam.org.uk](http://www.sfam.org.uk).
- **10-11, Certified HACCP Auditor (ASQ)**, Guelph Food Technology Centre, Guelph, Ontario, Canada. For more information, call Marlene Inglis at 519.821.1246; E-mail: [gftc@gftc.ca](mailto:gftc@gftc.ca).
- **10-13, Better Process Control Schools**, Louisiana State University, Baton Rouge, LA. For more information, call Dr. Michael Moody at 225.578.5207; Fax: 225.578.5300.
- **14-21, XXVI International Workshop/Symposium on Rapid Methods and Automation in Microbiology**, Manhattan, KS. For more information, contact Daniel Y.C. Fung at 785.532.1208; E-mail: [dfung@ksu.edu](mailto:dfung@ksu.edu).
- **16-19, 43rd Annual Florida Pesticide Residue Workshop**, Hilton Walt Disney World, Orlando, FL. For more information, contact Gail Parker at 850.410.3057; E-mail: [parker@gdoacs.state.fl.us](mailto:parker@gdoacs.state.fl.us).
- **16-19, 8th Annual Foodborne Pathogen Analysis Conference**, Hilton Walt Disney World, Orlando, FL. For more information, contact Yvonne Hale at 850.414.0408; E-mail: [haley@doacs.state.fl.us](mailto:haley@doacs.state.fl.us).
- **18, United Kingdom Association for Food Protection Second Annual Meeting**, J. Sainsbury Place, London. For more information, contact Gordon Hayburn at 44.0.292041.6456; E-mail: [ghayburn@uwic.ac.uk](mailto:ghayburn@uwic.ac.uk).
- **24-26, Microbiology and Engineering of Sterilization Processes**, University of Minnesota, St. Paul, MN. For more information, contact Ann Rath at 612.626.1278.

## AUGUST

- **11-12, IAFP 2006 Workshops**, Calgary, Alberta, Canada.  
**Workshop 1: Developing and Improving Your Food Microbiology Laboratory**  
**Workshop 2: Methods, Methods Everywhere but Which is Right for Me? Selection and Verification of Methods**  
**Workshop 3: Global Food Standards: Food Safety Auditing**  
For more information, see page 438 of this issue or contact Julie Cattanach at 800.369.6337 or E-mail: [jcattanach@foodprotection.org](mailto:jcattanach@foodprotection.org).
- **13-16, IAFP 2006 Annual Meeting**, Calgary, Alberta, Canada. For more information, see page 435 of this issue or contact Julie Cattanach at 800.369.6337 or E-mail: [jcattanach@foodprotection.org](mailto:jcattanach@foodprotection.org).

## SEPTEMBER

- **5-9, China Brew & Beverage 2006**, China International Exhibition Centre, Beijing, China. For more information, call 852.2865.2633; E-mail: [elaine@bitf.com.hk](mailto:elaine@bitf.com.hk).
- **19-21, New York State Association for Food Protection Annual Meeting**, Wyndham Hotel, Syracuse, NY. For more information, contact Steve Murphy at 607.255.2893; E-mail: [scm4@cornell.edu](mailto:scm4@cornell.edu).
- **19-21, 3rd International Symposium Milk Genomics & Human Health**, Brussels, Belgium. For more information, contact Jennifer Giambroni at 322.733.9888; E-mail: [info@cdrf.org](mailto:info@cdrf.org).
- **20-21, Seventh Annual Illinois Food Safety Symposium**, Hotel Pere Marquette, Peoria, IL. For more information, contact Jane Nosari at 217.785.2439; E-mail: [jnosari@idph.state.il.us](mailto:jnosari@idph.state.il.us).
- **26-28, Washington Association for Food Protection**, Campbells Resort, Lake Chelan, WA. For more information, contact Stephanie Olmsted at 425.455.8953; E-mail: [stephanie.olmsted@safeway.com](mailto:stephanie.olmsted@safeway.com).

## OCTOBER

- **9-13, Wisconsin Cheese Technology Short Course**, University of Wisconsin-Madison, Madison, WI. For more information, contact Dr. Bill Wendorff at 608.263.2015 or go to [www.cdr.wisc.edu](http://www.cdr.wisc.edu).
- **10-11, Associated Illinois Milk, Food and Environmental Sanitarians**, Stoney Creek Inn, East Peoria, IL. For more information, contact Steve DiVencenzo at 217.785.2439; E-mail: [sdvince@idph.state.il.us](mailto:sdvince@idph.state.il.us).
- **11-13, 2006 Food Safety Conference**, Grand Hyatt Hotel, Washington, D.C. For more information, contact Stacy Fitzgerald-Redd at 202.452.8444; E-mail: [sfitz@fmi.org](mailto:sfitz@fmi.org).
- **14-17, 26th Food Microbiology Symposium**, University of Wisconsin-River Falls, River Falls, WI. For more information, call 715.425.3704 or go to [www.uwrf.edu/food-science](http://www.uwrf.edu/food-science).
- **18-19, Iowa Association for Food Protection Annual Meeting**, Quality Inn, Ames, IA. For more information, contact Phyllis Borer at 712.754.2511; E-mail: [borerp@ampi.com](mailto:borerp@ampi.com).

## NOVEMBER

- **1, Ohio Association of Food and Environmental Sanitarians**, Ohio Dept. of Agriculture, Reynoldsburg, OH. For more information, contact Gloria Swick-Brown at 614.466.7760; E-mail: [gloria.swick-brown@odh.ohio.gov](mailto:gloria.swick-brown@odh.ohio.gov).

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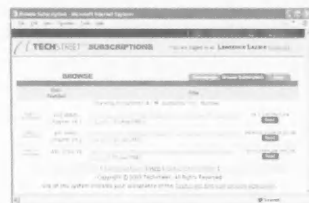
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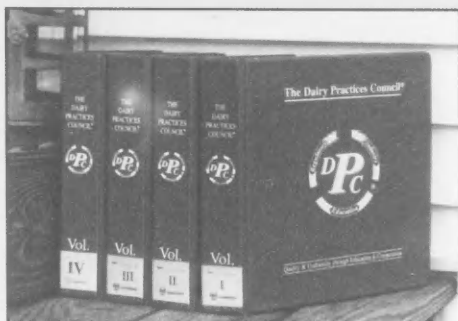
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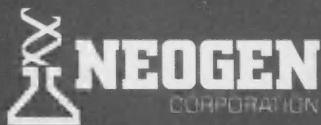


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