VOL. 26, NO. 4
ISSN: 1541-9576
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FOOD PROTECTION TRENDS

SCIENCE AND NEWS FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

APRIL 2007

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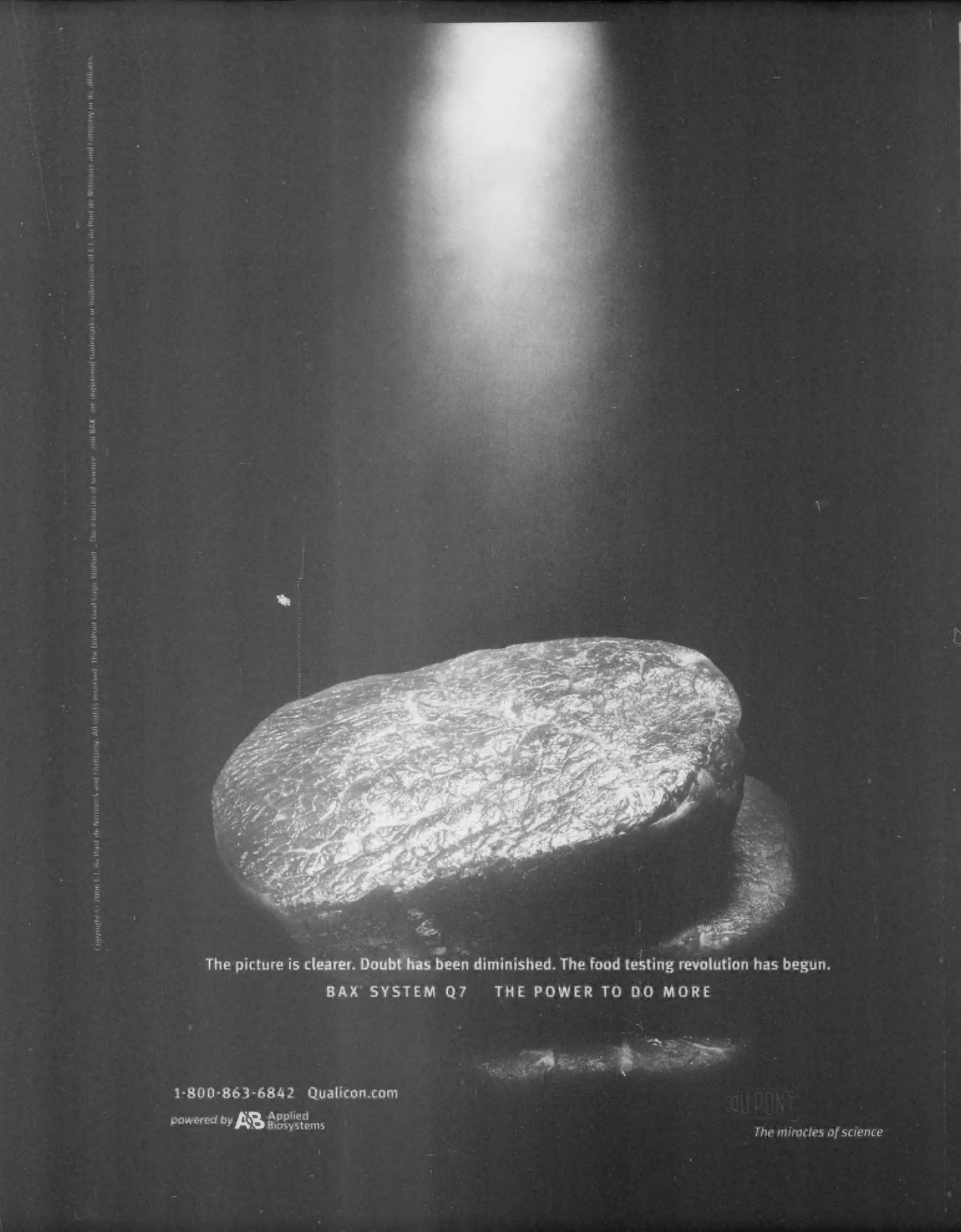
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VOLUME 27, NO. 4

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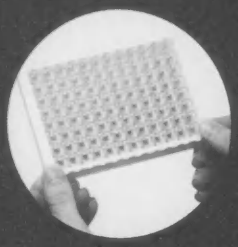

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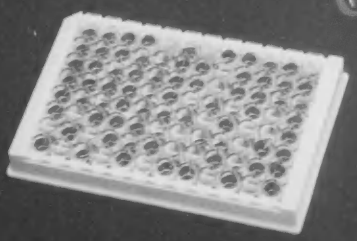

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FOOD PROTECTION TRENDS
SCIENCE AND NEWS FROM THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

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

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

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

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Subscription Rates: ***Food Protection Trends*** is available by subscription for $241.00 US, $256.00 Canada/Mexico, and $271.00 International. Single issues are available for $26.00 US and $35.00 all other countries. All rates include shipping and handling. No cancellations accepted. For more information contact Julie A. Cattanach, Membership Services, International Association for Food Protection.

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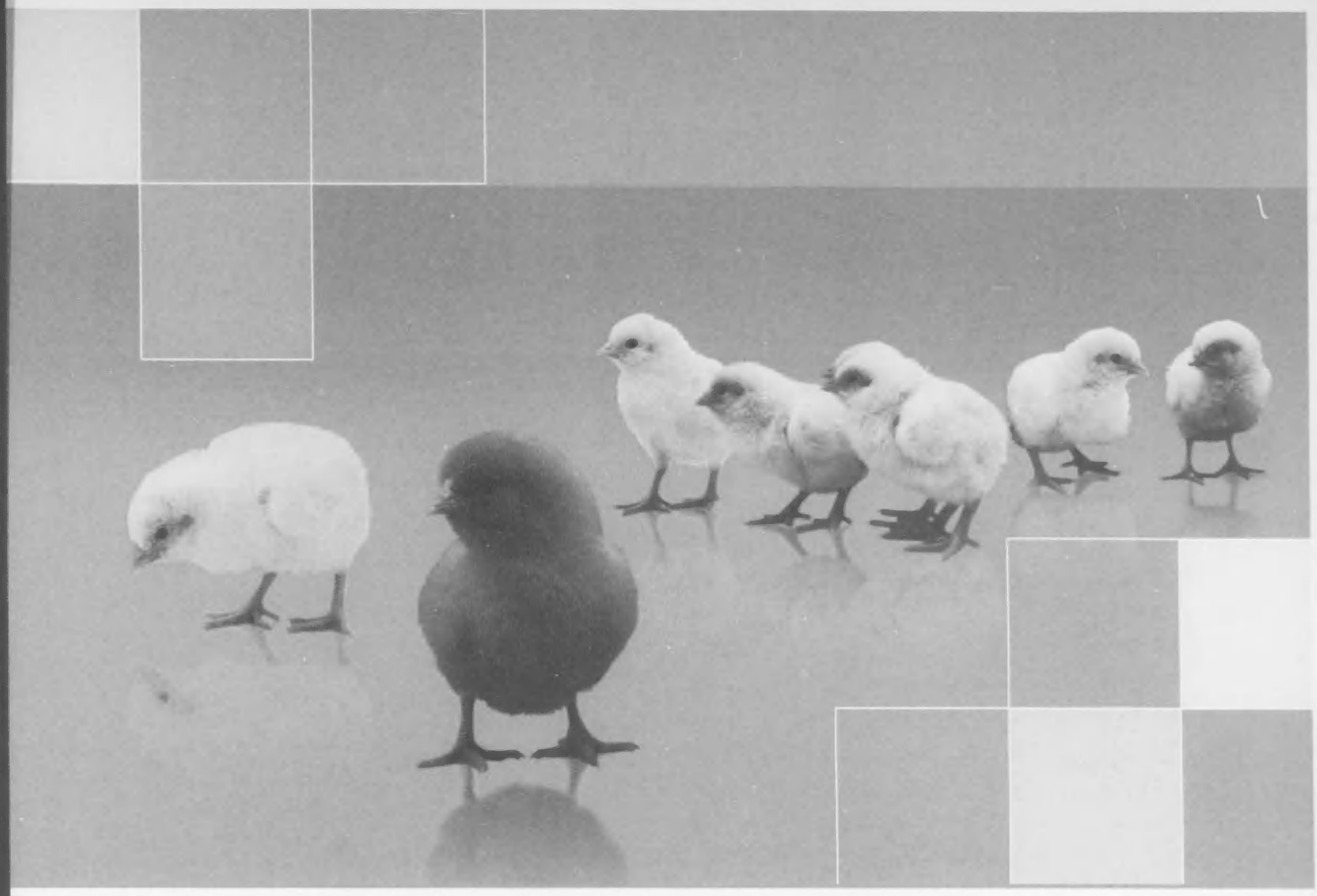
Food Protection Trends is printed on paper that meets the requirements of ANSI/NISO 239.48-1992.



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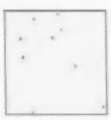
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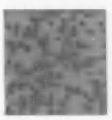
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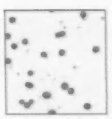
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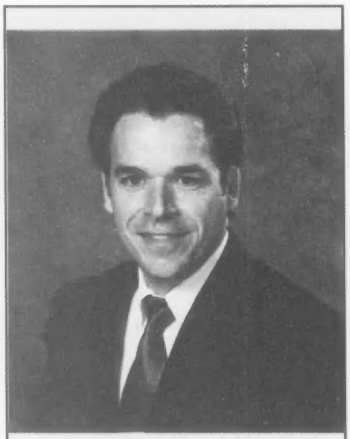


By FRANK YIANNAS
PRESIDENT

"A proper mental perspective or mindset is critical to success in food safety"

As a food safety professional, your success in the area of food safety will depend on a variety of factors, team members, and partnerships. But more than any single thing, for those issues within your span of control or influence, I believe your success is largely dependent on your attitude.

Before you take offense with a commentary on attitude in a scientific journal, let me remind you that scientific method, food safety included, is first and foremost an attitude. That's right – an attitude. It's a mindset to search for scientific facts and evidence rather than simply believing what others report, think or say. A more formal definition states that attitude is a mental perspective.

A proper mental perspective or mindset is critical to success in food safety. Let me summarize three good reasons why I believe a proper attitude is so important for success in food safety.

1. Your attitude will determine your actions.

There is no question about it, our thoughts determine our attitude and our attitude influences our actions. Only when you have a proper attitude concerning food safety will you consistently strive to obtain science-based facts untarnished by personal biases, subjective opinions, or personal agendas. And only with science-based facts, can you consistently make the right risk management decisions. In other words, a right attitude leads to right actions and right actions lead to a safer food supply.

2. Your attitude will determine your influence on others.

Every single day, each one of us will influence those we interact with whether we realize it or not. Remember, the way we get our food from farm to fork, the food system, has become increasingly complex and interdependent on many businesses and individuals. Each organization and person within the system has a shared responsibility for food safety. If you have a negative attitude, trust me – it will be evident to others that you interact with by what you say and do. Instead, demonstrate a positive attitude and your results could increase exponentially because of your positive influence on others. A proper attitude towards food safety is sometimes more caught than taught.

3. Your attitude will determine if you're a fact finder or a fault finder.

Over the course of my career, I have been surprised by the number of times I've heard or read about scientists using the word "fault" when talking about a food safety issue, challenge, or outbreak. However, I was trained to believe that as scientists, we are to be fact finders, not fault finders. There is a big difference between the two. If an incident does occur, a fact finder's mission is to determine the facts of what actually happened to establish how the food became contaminated or why the breakdown occurred and what can be done to prevent a reoccurrence. In contrast, a fault finder is primarily interested in casting

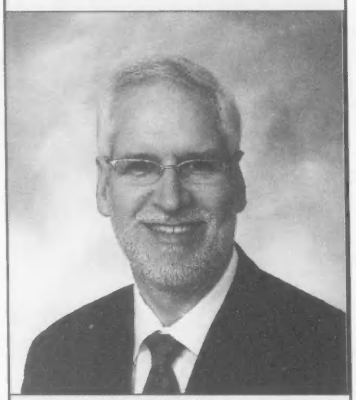
blame even though the facts may be unclear on what happened. As food safety professionals, I believe we should strive to be fact finders, not fault finders and help with providing answers. Remember, casting blame is easy. Offering solutions is generally more difficult.

In closing, remember that among many other things, food safety is also an attitude. So every now and then, perform a food safety attitude check. Our success in advancing food safety worldwide is dependent on it.

Frank

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

"COMMENTARY"
FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE
EXECUTIVE DIRECTOR

"In January, we began a new system of collecting membership dues"

Membership dues. Just the mention of Membership dues brings a variety of thoughts to your mind. Some may think, I'll just pass the invoice to my employer and they'll pay the dues. Others may think, not again, I just paid my dues – especially when you pay from your own funds! This month, I want to bring you up-to-date on IAFP's dues restructure project.

Beginning in January, we began a new system of collecting membership dues. In past years, IAFP's base Membership included a one-year subscription to *Food Protection Trends*. Then, if you were interested, you could pay an additional fee to add the print version of *Journal of Food Protection* plus a little extra for *JFP* Online. Many times over the years we heard from Members wanting to only receive the *Journal of Food Protection*. We also heard from some of our state Affiliate members who were not IAFP Members that felt the base dues for IAFP were too high to allow for their participation.

With those two main challenges, the Board, the Membership Committee and IAFP's staff began thinking about how to address the issues. After much discussion and surveying, the Board adopted a plan to restructure IAFP's Membership dues. The new dues have now been in place for four months. Because an IAFP Membership can begin any month throughout the year, many Members have not been exposed to our new invoice and the selection you must make before renewing your Membership.

When your invoice arrives, the base level Membership ($50 worldwide) is the only amount required to continue your Membership. This entitles you to the new *IAFP Report*, our electronic newsletter. The *IAFP Report* contains pertinent information including sections titled: IAFP Updates, Food Safety News, Regulatory Updates, Research & Reports, and Items of Interest. From these section titles, you can easily see that the *IAFP Report* will contain many items that will add to your knowledge-base of food safety information. The *IAFP Report* allows IAFP to put more current information in your hands faster than what is possible through our print publications.

Then for a small additional fee, you can add *Food Protection Trends* to your Membership. *Food Protection Trends* will continue to contain science-based application articles, our President's column, my column, new Member listings, news and updates along with industry product reviews. We will continue to print information about IAFP's Annual Meetings, European Symposia and other International Symposia. It is appropriate to note that the *IAFP Report* is not designed in any way to replace *Food Protection Trends*. What I am trying to say by this is that *Food Protection Trends* will continue to be a source of pertinent information on protecting the food supply!

Of course, with the *Journal of Food Protection*, you get the latest, peer-reviewed, scientific research articles. With the new dues structure, you may choose to receive the print version of *JFP* or *JFP* Online or both without having to first select *Food Protection Trends*. This appeals to some of our Members as I mentioned at the beginning of this column.

The most important part of IAFP's Membership dues restructure is that you now have a choice in what form of information you want to receive from your Association. Once the base-level dues are paid, you may select any one or all of the following: *Food Protection Trends*, *Journal of Food Protection* or *JFP* Online. The choice is yours!

Watch your Membership renewal invoice closely and be sure to select the journals that are important to you. Remember, the content of the journals, both *Food Protection Trends* and the *Journal of Food Protection* will remain the same!

If you have found the information useful in the past, you will continue to find the same, high-level, quality, science-based information in each journal.

As Frank Yiannas pointed out in his October 2006 President's column, "We are interested in offering our Members more choice, meeting our Members' needs, and making IAFP as inclusive as possible to food safety professionals all over the world."

If you have any questions about IAFP or the new dues structure, please call the IAFP office or contact us via E-mail. Our contact information is: phone 800.369.6337 or 515.276.3344; E-mail info@foodprotection.org.

ARTICLES

Food Protection Trends, Vol. 27, No. 4, Pages 232–237

6200 Aurora Ave., Suite 200W, Des Moines, IA 50322-2864

International Association for Food Protection

Evaluation of an In-line Sampling System for the Collection of Raw Milk Samples for Official Testing under the Grade "A" Milk Program

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[1]Upstate Farms Cooperative, 7115 W. Main St., Leroy, NY 14482, USA; [2]Food and Drug Administration, 6502 S. Archer Road, Summit Argo, IL 60501, USA; and [3]Dept. of Food Science, Cornell University, Ithaca, NY 14853, USA

SUMMARY

Samples of raw milk collected with an in-line sampling device during the filling of bulk milk tank trucks were compared to samples collected by dipper from the same complete bulk milk tank truck loads after agitation. Comparative samples representing 25 loads of raw milk were tested for standard plate count (SPC), electronic somatic cell count (ESCC), presence of growth inhibitors and milkfat. There were no significant differences in SPC, ESCC or milkfat between samples collected with the in-line sampling device and those collected from the tank truck by the dipper method. Growth inhibitors were not found in any of the samples tested. The results of this study supported previous data submitted to the National Conference on Interstate Milk Shipments and the Food and Drug Administration (FDA) and verified that the in-line sampler gave results equivalent to the traditional dipper method. The evaluation of this supporting data by the FDA resulted in final approval of this in-line sampling device for use in collecting official test samples for the Grade "A" milk program. The importance of the approval of this and other such sampling devices is discussed.

A peer-reviewed article

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TABLE 1. US dairy farm statistics for 1993 and 2003[1]

Year	Total Farms	Number of Milk Cows	Milk Production Per Cow (lbs)	Total Milk Production (Million lbs)	Farms with >200 Milking Cows
1993	157,150	9,581,000	15,722	150,636	6,970 (4.4%)
2003	86,360	9,083,000	18,760	170,394	7,730 (9.0%)

[1]Adapted from Dairy Facts, 2005 edition. International Dairy Foods Association *(2)*.

INTRODUCTION

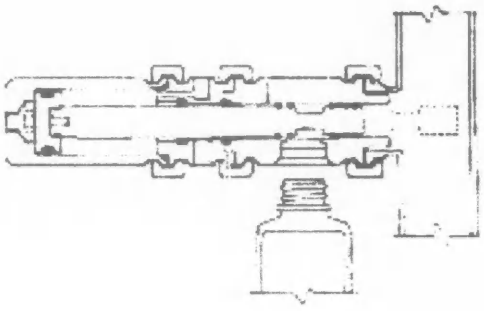
The number of dairy farms in the US has decreased substantially in recent years; there were approximately 45% fewer farms in 2003 compared to 1993 *(2)*. Milk production has continued to rise, however, as average milk output per cow has increased considerably while the total number of milk cows has declined only slightly (Table 1). Many dairy farms have grown in size; in 2003 there were 2,965 farms (3.43%) with over 500 head of cattle, compared to 2,415 such farms (2.06%) in 1998 *(2)*. With increased milk production, larger farms have had to increase the storage capacity for their milk and/or increase milk pick-up frequencies. A practical alternative for raw milk storage on large farms is the direct loading of milk into bulk milk tank trucks *(10)*, which is a practice that has become acceptable under the guidelines of the US Public Health Service Grade "A" Pasteurized Milk Ordinance (PMO) *(3)* and has been approved on a case-to-case basis.

For those farms producing milk for Grade "A" utilization under the National Conference on Interstate Milk Shipments (NCIMS) program or equivalent, every bulk tank of milk must be sampled at each pickup for mandatory periodic testing as outlined in Section 6 of the PMO *(3)*. Required testing includes the standard plate count (SPC) or an acceptable alternative bacterial counting procedure (e.g., plate loop count, BactoScan™ FC), drug residue testing (e.g., for beta-lactam antibiotics) and the somatic cell count (SCC). Producer bulk tanks must also be sampled at each pickup to allow farm trace-back should a tank truck load of milk be found positive for drug residues under the PMO Appendix N Program, Drug Residue Testing and Farm Surveillance *(3)*. Under Appendix N guidelines, all bulk milk tank trucks must be sampled and tested for drug residues using an approved method *(5)*. Samples for official testing, from both farm bulk storage tanks and tank trucks at the receiving plant or station, must be collected by a state regulatory agency permitted hauler/sampler or a permitted receiver. Permitted samplers/receivers are trained to collect samples using sanitary procedures in a manner that results in a representative sample after proper tank agitation.

With increased capacity of farm bulk tanks and the adoption of direct loading into bulk milk tank trucks, proper raw milk agitation and sampling are of concern. Farm bulk tanks are most often sampled from the tank manhole with a sanitized dipper or sterile tube or "straw." Prior to sampling, tank agitation must be performed in such a manner that the sample taken is a homogenous representation of the entire volume of milk. According to Standard Methods for the Examination of Dairy Products *(13)*, farm bulk tanks should be agitated for a minimum of 5 minutes just prior to sampling except when tanks exceed 3,800 liters (1,000 gallons), when agitation must be for a minimum of 10 minutes "or as specified by the tank manufacturer." Fifteen minutes agitation is prescribed if more than 30 minutes has passed since the last addition of milk. While agitation for bulk milk tank trucks at receiving is prescribed *(13)*, it is performed infrequently, as over-the-road transport is often assumed to result in a mixed tank and is accepted practice for tanker "agitation" *(10, 11)*. Data to support these and similar bulk tank agitation guidelines have not been well documented and recommendations from the manufacturer are not always given *(9)*.

As an alternative to traditional dipper sampling procedures, methods have been investigated to collect samples directly from milk lines (i.e., "in-line sampling") before the storage vessel throughout the course of milking. At the 2003 NCIMS biennial conference, proposals to allow the use of in-line sampling devices and supporting data from a study in New York State were submitted to the conference *(1)*. Sampling devices and procedures submitted for approval included an automated piston sample collection system set in the milk line (Isolok® Sampler, Sentry Equipment Corp., Oconomowoc, WI) and two "needle-tube-bag" pressure/gravity flow systems that sample milk through a syringe needle inserted into either a septum (Moseley Ster-E-Ject Sampling System, Moseley Laboratories, Indianapolis, IN) or a membrane (QMI® Aseptic Sampler, Quality Management, Inc., Oakdale, MN) installed in the milk line. Supporting data submitted with each proposal included results of SPC, SCC and drug residue analyses of 100 samples collected with the in-line sampler, compared with samples of the same milk collected by the traditional dipper method. The results were evaluated by the FDA, who concluded that all three samplers provided results equivalent to those of the traditional method. Based on the acceptance of the data, these proposals were conditionally passed by the NCIMS allowing for the use of "approved" in-line samplers for the purpose of collecting official regulatory samples *(4)*. The conditions of this approval were as follows: 1) the operation of the sampling devices must be overseen by a bulk milk hauler/sampler permitted by the State; 2) the FDA requested a third-party study to provide additional data on the performance of the sampling devices currently in use in NY State, and 3) the evaluated in-line samplers were considered approved for use in NY State

FIGURE 1. Cutaway diagram of Isolok® Sampling System showing sampling piston in the dispense position and in the collection position (dotted line) in the milk pipe line (used with permission from Sentry Equipment Corp., Oconomowoc, WI)



until the additional third party data were evaluated by the FDA. This paper reports on the data collected for the third-party study that were submitted to FDA for final approval of the Isolok® sampling device.

MATERIALS AND METHODS

Dairy farm and milk sampling system

All milk samples collected and tested for this study were from one dairy farm located in western New York. The farm milked approximately 600 cows, 3 times per day, in a double 20 parlor. Milk was pumped from the parlor receiver jars to a surge tank and then through a plate cooler that cooled milk to 1.1 to 4.4°C (34 to 40°F). In-line milk samples were collected immediately following the plate cooler with an Isolok® Sanitary Sampler, Model MSA-SA-1 (Sentry Equipment Corp., Oconomowoc, WI). The sampler, collection bottle and associated piping were located in a temperature monitored refrigerator set at 0.0 to 4.4°C (32 to 40°F). After the sampler, an electromagnetic flow meter (PD 340 Flow Transmitter, Proces-Data, Silkeborg, Denmark) and a temperature probe were in place to measure and record milk volume and temperature just prior to its entry into a bulk milk tank truck for transportation to a receiving plant. The Isolok® sampler is an air-actuated piston sampling system designed to collect 0.5 ml/cycle (Fig. 1). The installation included a computer driven automatic cycle controller that for this study was set for one cycle (0.5 ml) for every 26.5 liters (7 gallons) of milk pumped as determined by milk volume input from the flow meter. Milk was collected directly into a sterile 500 ml bottle attached to the sampler. Between milkings, the bottle was capped and the in-line sampling system was hand washed and sanitized before reattaching the sample bottle. Each tank truck load of milk represented 3 milkings. A new sterile sample bottle was attached for each complete load.

Sample collection

For each tank truck load of milk, samples were collected at the farm from the in-line sampler bottle and at the receiving plant directly from the tank truck for comparison analyses. At the farm, a permitted hauler/sampler transferred approximately 90 ml (3 oz) of milk into a sterile sample vial after mixing the in-line sampler bottle by inverting 25 times. A second vial was poured for a temperature control. The in-line sample and temperature control vials were placed in a float in an ice/water bath and transported to the receiving plant with the tank truck. At the plant, the tank truck load was sampled through the manhole by a permitted milk receiver using a sanitized dipper after 15 minutes agitation by recirculation, utilizing the milk pump-out hose. Preliminary milkfat comparisons of samples collected from the top and bottom (sampling port) of the tank truck indicated that an agitation time of 10 minutes achieved homogeneity; 15 minutes agitation was used to ensure sufficient mixing. All collected samples were transported from the receiving plant on ice, with appropriate temperature controls, to an NCIMS, accredited testing laboratory. Comparison samples were collected 2–3 times per week from February to April, 2005.

Laboratory analysis

All in-line samples and tank truck dipper samples were tested for standard plate count (SPC) by use of the poured agar method, electronic somatic cell count (ESCC, Bentley Somacount 300, Bentley Instruments, Chaska, MN), growth inhibitors (Delvotest, DSM Food Specialties USA, Eagleville, PA) and milkfat (Bentley 2000, Bentley Instruments, Chaska, MN). Milkfat results of samples collected from the top (dipper) and bottom (sampling port) of tank trucks were used to confirm adequate mixing. All procedures were performed in duplicate (except the test for milkfat, done as a single test) according to Standard Methods for the Examination of Dairy Products *(12, 13)* and/or the appropriate FDA 2400 series Laboratory Evaluation Form. All procedures were performed in a laboratory and by analysts certified under the NCIMS laboratory program for those procedures.

Statistical analyses

SPC and ESCC data were analyzed using the alternate method procedure specified in Standard Methods for the Examination of Dairy Products *(13)*. To determine if an alternate method can give results equivalent to the standard method, twenty-five samples are tested in duplicate and results with the accepted standard method (i.e., dipper) are compared to those with the alternate method under investigation (i.e., in-line sampler). The mean log values of the 50 counts (25 samples in duplicate) for the two methods cannot differ by more than 0.036. In addition, the sum of the squared log differences between the duplicate counts of each method divided by 50 cannot be greater than 0.005. If the comparison meets these two criteria, the alternate method is considered capable of giving equivalent results. Paired *t*-test analyses were also performed on log SPC, log ESCC and percent butterfat results

TABLE 2. SPC and ESCC values for agitated tank truck dipper samples and in-line samples collected from the same production load [1,2]

	SPC[3]		ESCC × 1000	
Load #[1]	Dipper Sample	In-line Sample	Dipper Sample	In-line Sample
1	96,000	140,000	250	264
2	42,000	49,000	212	218
3	28,000	51,000	252	258
4	9,000	12,000	238	239
5	8,900	20,000	246	263
6	17,000	17,000	239	238
7	21,000	24,000	226	196
8	48,000	42,000	242	240
9	110,000	110,000	230	230
10	2,700	2,900	216	200
11	3,800	3,200	194	203
12	17,000	20,000	246	258
13	22,000	18,000	266	246
14	3,700	2,400	211	199
15	2,700	2,200	232	229
16	5,500	6,700	244	257
17	2,600	2,800	224	230
18	3,100	1,900	214	233
19	48,000	50,000	212	212
20	12,000	13,000	206	210
21	3,400	2,800	190	204
22	20,000	28,000	267	268
23	340,000	290,000	284	308
24	38,000	40,000	252	252
25	1,100	1,100	174	184

[1]For each load number, a sample was collected from the tank after 15 minutes agitation and from the Isolok® in-line sampling device sample bottle representing milk collected during filling of that complete tank truck load. Growth inhibitors as determined by the Delvotest were not detected ("not found") in any of the samples tested.

[2]There were no significant differences ($P > 0.05$) between tank dipper samples and in-line samples for either SPC or ESCC results.

[3]Reported SPC results were calculated according to the guidelines for duplicate plates in Standard Methods for the Examination of Dairy Products, 15th ed. *(12)*.

(Minitab Inc., State College, PA) in comparing results of the tank truck dipper samples to the in-line samples.

RESULTS AND DISCUSSION

The reported results (average of duplicates) comparing SPC and ESCC values of the agitated tank truck dipper samples and the Isolok® in-line samples for 25 loads of milk are shown in Table 2. Data collected resulted in a wide range of results for both SPC and ESCC, whereas individual data points showed good agreement between the dipper samples and the in-line samples in a majority of the loads tested. The presence of growth inhibitors as determined by the Delvotest were not detected ("not found") in any of the samples tested. Differences between the dipper samples and the in-line samples for SPC and ESCC results were not significant ($P > 0.05$) and were within the alternate methods allowance for mean log difference (≤ 0.036) used to evaluate the data *(13)* (Table 3). The submitted data were consistent with the outcome of the initial study *(1)* that found the in-line sampling device to be comparable to the traditional dipper sampling method and was deemed acceptable by the FDA. Based on these results, the Isolok® Sampler was given approval as an alternative sampling method at the 2005 meeting of the NCIMS *(6)*.

In addition to the Isolok® Sampler, two other in-line sampling devices were found to be acceptable alternatives for collecting NCIMS regulatory samples by the FDA *(6)*. The Anderson Instrument/Accurate Metering Pneumatic In-Line-Sampler (model PSU, Anderson Instrument Co., Fultonville, NY) and the QMI® Sampling System (Quality Management, Inc., Oakdale, MN) were also given approval on the basis of data from two separate studies submitted to the FDA and

TABLE 3. Alternate Methods summary statistics for SPC and ESCC values for agitated tank truck dipper samples compared to in-line samples collected from the same production load[1]

Test	Sampling Method	Mean Log Diff.	Σ Sq. Log Diff./50
SPC	Dipper	0.0335051	0.0018822
	In-line		0.0012657
ESCC	Dipper	0.0038202	0.0001659
	In-line		0.0002981
	Acceptable Values	≤ 0.036	≤ 0.005

[1]Alternate Method (In-line) is considered able to give equivalent results to the "standard method" if the mean log difference and sum of squared log differences of duplicates divided by 50 are less than or equal to stated acceptable values. The in-line sampler was considered able to provide equivalent results for SPC and ESCC. Based on paired *t*-test analyses there were no significant differences ($P > 0.05$) between dipper and in-line samplers for SPC and ESCC.

TABLE 4. Percent milkfat for agitated tank truck samples, top and bottom, and in-line samples collected from the same production load[1]

	% Milkfat – Tank Sample[1]		% Milkfat
Load #[1]	Top Sample[2]	Bottom Sample	In-line Sample[2]
1	3.64	3.64	3.62
2	3.58	3.58	3.57
3	3.60	3.61	3.70
4	3.55	3.54	3.53
5	3.56	3.56	3.53
6	3.49	3.48	3.51
7	3.73	3.56	3.77
8	3.55	3.57	3.58
9	3.57	3.58	3.56
10	3.58	3.59	3.59
11	3.61	3.62	3.63
12	3.58	3.61	3.62
13	3.66	3.67	3.65
14	3.56	3.56	3.57
15	3.67	3.69	3.67
16	3.56	3.55	3.57
17	3.59	3.60	3.61
18	3.61	3.62	3.62
19	3.56	3.56	3.57
20	3.63	3.63	3.63
21	3.59	3.69	3.57
22	3.72	3.74	3.73
23	3.73	3.71	3.72
24	3.63	3.66	3.63
25	3.59	3.62	3.56
Avg	**3.61**	**3.61**	**3.61**

[1]For each load number, a sample was collected from the top (dipper sample) and bottom (valve sample) of the tank truck after 15 minutes agitation and from the Isolok® in-line sampling device sample bottle representing milk collected during filling of that complete tank truck load.

[2]There were no significant differences ($P > 0.05$) in milk fat percentages between the top dipper samples and the in-line samples.

the NCIMS. Although these approvals are significant to the NCIMS program, the outcome of these evaluations suggests that in-line sampling devices should also be beneficial in non-NCIMS testing and research programs. The QMI® system had previously been evaluated and found useful for collecting samples for testing herd health parameters *(7)* and for component analyses *(8)*. In the present study, no significant difference ($P > 0.05$) was found in the milkfat levels of the Isolok® in-line samples compared to the tank truck dipper samples (Table 4).

The NCIMS approval of in-line sampling systems gives dairy producers and state regulatory agencies alternatives for the collection of producer raw milk samples for official analyses. Under the NCIMS program, other sampling systems must be similarly validated before acceptance, unless the technology used is identical to that already approved. The final acceptance of in-line sampling devices will be the responsibility of each state regulatory agency. Each agency must assure that the devices are installed and operated under Standard Operating Procedures (SOPs) approved by the FDA and the NCIMS. SOPs for the currently approved in-line samplers have been developed *(6)* and cover required installation application and approval procedures and general guidelines for the operational requirements, sanitation, refrigeration, in-line sample collection and the taking of samples from the collection bottle/bag. With proper installation and use, in-line samplers should provide representative samples from most dairy farms but should be especially advantageous to larger farms that are direct loading to bulk milk tank trucks.

PARTICIPANTS AND ACKNOWLEDGMENTS

The authors acknowledge and thank Dean & Phyllis Meyer and Family of Dairy Knoll Farms, who graciously provided the testing ground for this study; Gary Collins, Conflow Technologies and Don Beck, Equipment Installers, for sampler package and installation; Bill Young, Upstate Farms Cooperative Members Services, and Gary Davis, IDC, Inc., for consultation and study participation; personnel of Upstate Farms Rochester (i.e., the plant receiver), Greer Trucking, Inc. and Duncan Milk Hauling (hauling and sampling); Kathryn Boor and Nancy Carey, Cornell University, for critical review and support of the manuscript; Joanna Lynch and Jason Huck, Cornell University, for statistical assistance; and the Dairy Farmers of Upstate Milk Cooperative and the NY State Milk Promotion Advisory Board for their support.

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Food Protection Trends, Vol. 27, No. 4, Pages 238–245

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Food Safety Practices Used at Egg Packing and Egg Products Establishments

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SUMMARY

Each year *Salmonella* Enteritidis (SE) causes thousands of illnesses and hospitalizations from the consumption of undercooked eggs. The egg industry is implementing a variety of practices, in addition to those required by regulation, to help reduce the number of SE illnesses. To characterize food safety practices in the egg industry, we conducted a national mail survey of egg packing and egg products plants. We received 201 surveys from egg packing plants and 60 surveys from egg products plants. The survey collected information on use of specific food safety practices and technologies, microbiological testing practices, and employee food safety training. Many plants have adopted food safety practices not required by current regulations. For example, in the egg packing industry, 67% of eggs are transported from the farm to the plant at or below 45°F, and 52% of eggs are stored for less than one day at the plant. Most egg products plants conduct voluntary microbiological testing (80% of plants) and environmental sampling (73%). Furthermore, half of egg packing plants and 80% of egg products plants have a written self-reported, non-regulatory HACCP plan. The survey findings, along with other data, can be used to characterize current industry practices prior to promulgation of HACCP regulations.

Salmonella Enteritidis (SE) was the second most common *Salmonella* serotype reported to the Centers for Disease Control and Prevention (CDC) in 2003 *(2)*. From 1990 to 2001, SE outbreaks reported to the CDC involved 23,366 illnesses, 1,988 hospitalizations, and 33 deaths. Among the outbreaks reported with a confirmed vehicle of transmission, more than 75% were associated with consumption of undercooked eggs *(1)*. SE contamination in eggs occurs through transovarian infection from the layer or through cracks in the egg shell membrane after contact with chicken feces *(9)*. Thus, SE can be found on the outside of the egg shell, as well as within the egg yolk *(4)*.

These observations prompted federal agencies to include food safety as a focus area of Healthy People 2010, a health promotion and disease prevention agenda. One food safety goal is a reduction of SE illnesses by 50 percent by the year 2010 *(17)*. As a result, federal and state regulatory agencies and industry trade associations are working with industry and consumers to implement

A peer-reviewed article

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farm-to-table interventions to reduce the incidence of egg-related salmonellosis. These interventions include good agricultural practices, voluntary quality assurance programs at the production level, and consumer education on the importance of cooking eggs until both yolks and whites are firm *(15)*. Egg products plants have been required to meet sanitation, labeling, packaging, pathogen testing, and other requirements since 1971 (9 CFR 590). In addition, regulations are now in place requiring shell eggs to be refrigerated during transportation from the packing plant to retail (9 CFR 590.50(a)). Despite these efforts, SE illnesses have increased over the past few years *(3)*.

To meet the objectives of Healthy People 2010 and to achieve further reductions in SE illnesses, the Food Safety and Inspection Service (FSIS) of the US Department of Agriculture (USDA) is considering proposing implementation of Hazard Analysis and Critical Control Point (HACCP)–based systems at egg products plants *(16)*. Egg products plants produce liquid, frozen, and dried egg products. HACCP systems, which provide a scientific basis for preventing food safety hazards and meeting performance standards in relation to pathogen control, are already mandated by FSIS for the meat and poultry industries (9 CFR 417) and by the US Food and Drug Administration (FDA) for seafood (21 CFR 123) and juice (21 CFR 120). For egg packing plants, which wash, grade, and package shell eggs, FSIS has indicated that it intends to initiate outreach efforts to help them safely process shell eggs intended for human consumption or further processing *(16)*.

FSIS contracted with RTI International to collect information on technologies and food safety practices used by the egg packing and egg products industries in the United States *(11)*. The study results, along with other data, provide FSIS with a characterization of current practices and technologies used by these plants for required economic analyses. FSIS is required to conduct appropriate and adequate economic analyses, as mandated by the Regulatory Flexibility Act (RFA), the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), the Unfunded Mandates Act of 1995, the Data Quality Act, and other similar measures. The survey data will allow for accurate comparisons of pre- and post-regulatory industry conditions.

MATERIALS AND METHODS

A nationally representative survey of egg packing and egg products plants was conducted, using a multimodal survey approach. Descriptions of questionnaire development, sampling methods, survey administration, and data analysis procedures follow.

Questionnaire development

Separate questionnaires were developed for egg packing and egg products establishments to account for differences in technologies and microbiological testing practices between these industries. Each questionnaire collected information on the source and age of eggs, storage and refrigeration practices, sanitation practices, and employee training. The questionnaire for egg products establishments also collected information on microbiological testing practices.

A structured, standardized instrument review methodology was used to test the survey instruments. This appraisal evaluates survey questions in relation to the tasks required of respondents to understand and respond to the questions, and the appraisal evaluates the structure and effectiveness of the questionnaire form. We also conducted on-site and telephone interviews with two egg packing plants and two egg products plants of various sizes and geographic locations to pretest the survey instrument, using cognitive interviewing techniques *(20)*. The pretest participants offered suggestions to improve the survey instruments; their primary suggestions were additions of common terminology used in the egg industry. The United Egg Producers (UEP) also reviewed the survey instruments. The survey instruments were subsequently revised based on the pretest findings. The questionnaires and study design were approved by the Office of Management and Budget's (OMB) information collection clearance process.

Sampling methods

A sample of egg packing plants was selected by use of a systematic sampling approach, and a census of egg products plants was conducted because of the relatively small number of plants. The respondent universe included the following establishments all located in the United States:

- egg packing and grading plants–establishments that pack and grade shell eggs (n = 550)
- federally inspected egg products plants–establishments that produce liquid, dried, or frozen egg products (n = 77).

An FSIS database of federally and state-inspected meat, poultry, egg products, and egg packing establishments served as the sampling frame. The database contains plant-level information on volume, annual revenue, number of employees, inspection activities, and contact information from various USDA sources and from infoUSA, a commercial data source for company information *(10)*.

The sample for egg packing plants (n = 356), was systematically selected by means of sorting by plant size (i.e., number of plant employees), geographic location, and availability of telephone number. Systematic sampling ensured a representative sample of plants with these characteristics.

Survey administration

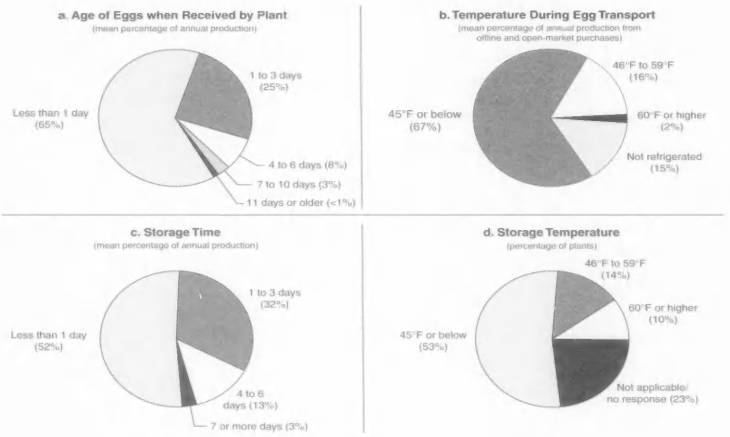
We implemented a variety of procedures aimed at maximizing the survey response rate. Prior to survey administration, UEP sent letters to their membership encouraging participation, and FSIS and the Agricultural Marketing Service (AMS) notified inspection personnel about the survey. The survey was conducted over a 15-week period, from October 2003 to January 2004. Each plant was contacted by telephone to identify the plant manager, and then a letter on FSIS letterhead about the upcoming survey was mailed to the plant manager. We subsequently contacted each plant manager by telephone to identify the target respondent for the survey, mailed a self-administered questionnaire to the target respondent at each plant, and mailed a reminder postcard. We also made a series of telephone calls to nonrespondents, and mailed the questionnaire to them again to encourage participation.

For egg packing plants, we received 201 completed surveys; 66 refused, and 89 plants were ineligible (e.g., out of business,

TABLE 1. Plant characteristics

	Egg Packing Plants (n = 201)	Egg Products Plants (n = 60)
Number of employees (mean)	193	60
Year plant was built (mean)	1980	1970
Square footage of plant (mean)	56,211	73,350
Percentage of plants owned by a company that owns other USDA-inspected plants	38%	68%

FIGURE 1. Refrigeration and storage practices at egg packing plants



do not pack eggs, etc.). Ineligible plants were excluded from the response rate calculations; thus, the response rate for egg packing plants was 75% (201/267). For egg products plants, we received 60 completed surveys; 14 refused, and 3 plants were ineligible. Again, ineligible plants were excluded from the response rate calculations; thus, the response rate for egg products plants was 81% (60/74).

Data analysis

Prior to tabulating the survey data, we conducted data editing and coding and data cleaning. The edited and coded questionnaires were double-keyed (to ensure 100% verification) for quality control purposes. Separate datasets were prepared for egg packing plants and egg products plants.

The survey data were weighted to reflect the selection probabilities of sampled establishments and to compensate for differential non-response *(7)*. Means were computed means for questions that required a numeric response from respondents, and proportions computed for questions that asked respondents to select one or more responses from a list. This analysis was conducted with SAS, a statistical analysis software tool *(12)*.

Reporting domains were defined based on plant size. For egg packing plants, information on number of employees was used to define two size categories: (1) small plants–39 employees or less (n = 166) and (2) large plants–40 or more employees (n = 34). For egg products plants, information on production volume was used to define two size categories: (1) small plants–produce 50 million pounds or less annually (n = 39) and (2) large plants–produce more than 50 million pounds annually (n = 20). Plant size was not available for one egg packing plant and one egg products plant, which were thus excluded from the analysis. We performed a Chi-square to test for statistical significance of the relationship between the variable of interest and plant size. This analysis was conducted using the Stata release 9.1 software package *(13)*.

RESULTS

Table 1 provides information on key plant characteristics for responding egg packing and egg products establishments. The average age of egg packing plants is 26 years, and the average age of egg products plants is 36 years. On average, egg packers have more employees than egg products plants, despite their smaller facilities. We present selected results for each type of establishment below. For brevity, some results are discussed but not presented in the tables or figures.

Egg packing plants

The age and temperature of eggs are key factors in pathogen control in egg packing plants *(6)*. Figure 1 shows the age and temperature distribution of eggs as they are transported to and stored at the plant prior to packing. Sixty-five percent of eggs received are less than 1 day old from the time of lay, and 25% of eggs received are between 1 and 3 days old (see Fig. 1a). The vast majority of packing plants (98%) receive all of their eggs when they are 3 days old or less from the time of lay. This is because 92% of packed eggs are from company-owned or contracted layer facilities located at the same premises (i.e., inline) or within 25 miles of the packing plant; thus, there is little or no transportation time. Forty-one percent of packing plants receive 100% of their eggs from on-site (i.e., inline) layer facilities.

Refrigeration at an ambient temperature of 45°F or below slows the growth and development of SE *(18)*. For this reason, current regulations mandate that eggs must be refrigerated at 45°F or below upon delivery at retail establishments and institutions (9 CFR 509.50(a)). Although current regulations do not require that eggs be refrigerated during transportation to the plant or before processing, 67% of eggs are transported at temperatures of 45°F or below (see Fig. 1b), and 61% of plants refrigerate all of their eggs at 45°F during transportation. About 50% of eggs are stored for less than 1 day and 32% of eggs are stored for 1 to 3 days (see Fig. 1c). Further, 95% of plants store all of their eggs for 3 days or less prior to packing. About 50% of plants store eggs at 45°F or below prior to packing (see Fig. 1d).

Productivity gains in the egg packing industry are likely due directly to increased automation of the packing process *(19)*.

TABLE 2. Food safety plans, sanitation practices, and food safety training for egg packing plants

	Small (%) (< 40 employees) (n = 166)	Large (%) (40 or more employees) (n = 34)	*P* value	Total (%)[a] (n = 201)
Food Safety Plans and Quality Control Measures				
Has a written HACCP plan	42	88	0.000	50
Has a written quality assurance plan	52	82	0.002	57
Has a written sanitation plan	48	88	0.000	55
Has operations audited by independent, nongovernment, third party auditor	47	64	0.076	50
Has a quality control department	60	80	0.023	63
Sanitation Practices				
Conducts preoperative sanitation inspections daily or more frequently	70	91	0.014	73
Thoroughly cleans washing and candling equipment daily or more frequently	87	91	0.501	88
Thoroughly cleans grading and packing equipment daily or more frequently	76	97	0.007	80
Routinely conducts a midshift cleanup	40	62	0.016	43
Conducts a separate cleanup shift	87	97	0.143	88
Food Safety Training				
Conducts on-the-job training for new hires	68	68	0.989	68
Conducts on-the-job training for current employees	62	61	0.939	62
Conducts formal training for new hires	15	20	0.454	16
Conducts formal training for current employees	16	27	0.163	18
Has employees with formal HACCP training	35	59	0.012	39

[a]The total number of respondents equals the sum of small and large plants, plus one respondent for which plant size was not available

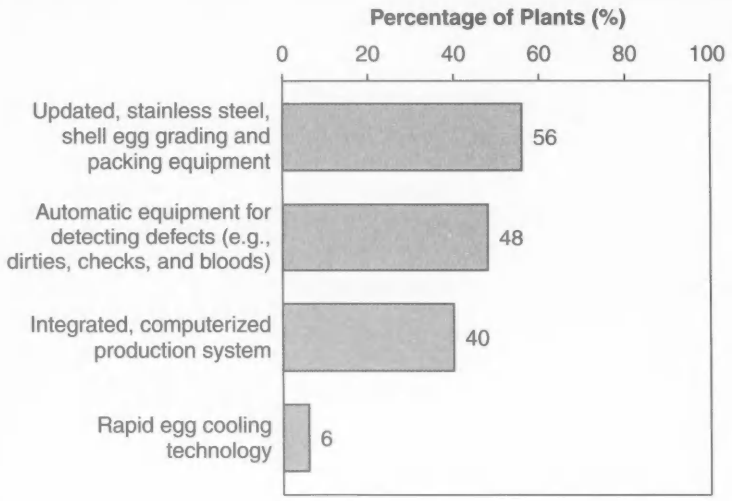
For example, processes such as stacking and destacking egg trays, loading eggs into washers, weighing eggs, and checking for cracks are now automated and controlled by computer systems. As shown in Fig. 2, about half of the packing plants surveyed use updated stainless steel equipment and employ technologies to automatically check for defective eggs. Forty percent have integrated, computerized production systems. However, few use rapid egg-cooling technology.

Table 2 compares other food safety and sanitation practices among small and large packing plants. Although egg packing plants are not required to have written food safety plans, about half of all egg packing plants have a written HACCP plan, quality assurance plan, and sanitation plan. Large plants (82% to 88%) are more likely than small plants (42% to 52%) to have written food safety plans ($P < 0.002$). Similarly, large plants (80%) are more likely than small plants (60%) to have quality control departments ($P = 0.023$).

Both small and large plants commonly conduct sanitation inspections and clean equipment on a daily basis. Seventy-three percent of packing plants conduct preoperative sanitation inspections daily or more frequently. Of those, over 90% inspect loaders, conveyors, washer compartments, nozzles, brushes, scales, egg packing equipment, processing rooms, coolers, and storage areas during their preoperative sanitation inspections. When sanitation problems are discovered, 85% of packing plants begin corrective actions on the same day before the next shift starts.

Most plants thoroughly clean washing, candling, grading, and packing equipment daily or more frequently. Large plants are more likely to conduct a midshift cleanup ($P = 0.016$). Seventy-one percent of packing plants use chlorine to clean plant equipment.

FIGURE 2. Technologies used by egg packing plants



Egg-packing plants primarily use informal, on-the-job training to teach new hires and current employees about food safety. Large plants are more likely to have sent their employees to formal HACCP training ($P = 0.012$).

Egg products plants

Shell eggs received by products plants come from a variety of sources. About one-third of the eggs are from inline layer facilities, one-third from company-owned or contracted facilities (i.e., offline facilities), and one-third from open-market purchases. However, many egg products plants receive shell eggs from only one type of facility: 14% of plants receive all of their eggs from inline layer facilities, 9% receive all of their eggs from offline facilities, and 20% receive all of their eggs from open-market purchases. Twenty-two percent of the eggs received are less than 1 day old from the time of lay, and 33% of eggs received are between 1 and 3 days old. Seventy percent of egg products plants use restricted eggs, which are undergrades because of dirt, stains, or cracked shells. One-third of these restricted eggs are 7 days or older when received by the plant.

Figure 3 shows the temperature distribution of eggs as they are transported and stored at egg products plants. Almost 60% of eggs are transported to the plant at temperatures at or below 45°F (see Fig. 3a). Further, forty-three percent of plants transport all of their eggs to the plant at 45°F or below. Eighty percent of eggs are stored for 3 days or less (see Fig. 3b). The egg inventory at a products plant turns quickly, with 95% of plants storing all eggs for less than 3 days before processing. However, only 30% of plants report that they store eggs at temperatures at or below 45°F (see Fig. 3c), and nearly one-half temper eggs to ambient room temperature before breaking.

Eighty-two percent of plants produce egg products that are shipped to another plant for further processing, and 48% of egg products plants produce a final product. Liquid egg product is the most common type of egg product, with an average volume of 30 million pounds per year.

Use of advanced technologies is not prevalent in the egg products industry. Only 17% use liquid egg concentrating technology, and less than 2% use an in-shell pasteurization process. Further, only 22% of egg products plants use advanced pasteurization technology, or environmentally controlled packaging systems, and 30% use integrated, computerized processing systems.

Table 3 compares food safety, sanitation, microbiological testing practices, and employee training among small and large egg products plants. No statistically significant differences at the 5% significance level were observed for small and large plants. Seventy-four percent of small plants and 90% of large plants have a written self-reported, non-regulatory HACCP plan; of those, the pasteurization of liquid eggs is the most common critical control point. However, the HACCP plans currently adopted may differ from HACCP requirements under the proposed egg safety regulation.

Nearly all egg products plants conduct sanitation inspections of product contact zones daily or more frequently. Many also conduct sanitation inspections of nonproduct contact zones daily or more frequently (82%). The majority of egg products plants operate a separate cleanup shift (90%) and midshift cleanups (93%). Half of all plants sanitize their drains at least once per day. Chlorine is most often used as a sanitizing agent (93%).

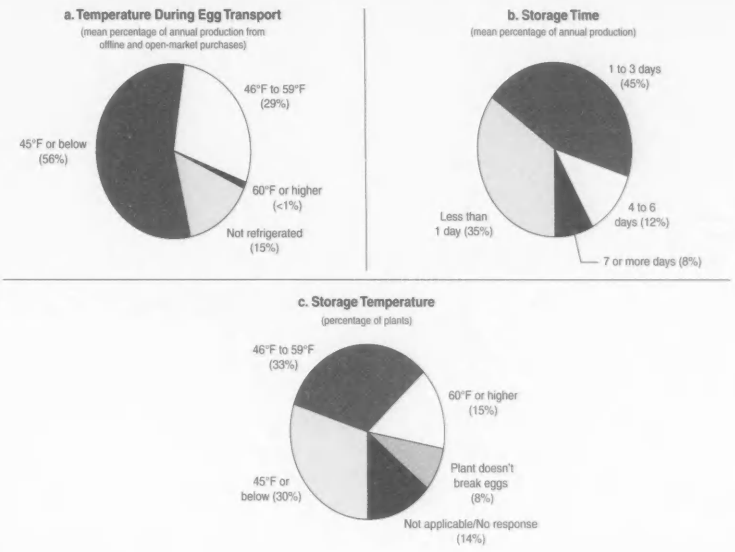
FSIS currently requires testing for *Salmonella* in pasteurized liquid and frozen egg products *(14)*. Eighty percent of egg products plants conduct microbiological testing in addition to the mandatory testing required by FSIS. Plants most commonly test for generic *E. coli* (75%) in prepasteurized egg product, because generic *E. coli* can be an indicator organism for pathogenic bacteria. Of those that conduct microbiological testing, 62% test for *Salmonella* species, and 38% test for SE and *Listeria monocytogenes*. Seventy-three percent of plants conduct environmental sampling, with 40% testing for *Listeria* species at least once per week. Traditional cultural methods and rapid methods are the most common forms of testing for both product testing and environmental sampling.

On-the-job training is the most common form of food safety training in egg products plants, with more than 50% of plants requiring this type of training. More than 40% of plants require formal food safety training for new hires and current employees, using prepared materials and following a specific outline designed by plant personnel or trained professionals. Further, more than 80% of plants have employees with formal HACCP training, although this is not yet a regulatory requirement.

DISCUSSION

This study surveyed egg packers and egg products plants to collect information on food safety technologies and practices.

FIGURE 3. Refrigeration and storage practices at egg products plants



This was a nationally representative survey with high response rates, approximately 80%. The data are self-reported and the extent of self-reporting bias is unknown; however, the results provide a unique and comprehensive view of how the industry is responding to concerns about egg safety.

Many egg packing and products plants have adopted various food safety practices and technologies that are not required by regulations. Adoption is more widespread among larger egg packing plants. However, we do not have data indicating that large egg packing plants produce a safer product. In contrast to the differences seen in egg packing plants, no differences in food safety practices were observed between small and large egg products plants.

Many factors influence pathogen control within an egg packing or egg products plant. One factor is the age of the plant. Ideally, eggs move through the dirtiest areas of the plant prior to processing, and then to the cleanest areas near packaging, without traffic patterns of employees, carts, and crates overlapping these areas. However, in older facilities, the likelihood of these optimal traffic patterns is less *(8)*. This study shows that the average age of egg packing and egg products plants are 26 and 36 years, respectively. Thus, a review of a plant's product flow and traffic patterns may be useful when the plant's HACCP plan is established or evaluated.

The age of a plant may also be an indicator of the level of technologies employed by the plant. The use of advanced technologies in the egg packing and egg products industries is not widespread. In the egg packing industry, 40% of plants use integrated, computerized systems, whereas only 30% of plants in the egg products industry use such systems.

Although eggs have natural mechanisms to avoid microbial contamination, these natural mechanisms degrade over time, making the age of eggs when packed or processed another important factor in pathogen control *(5)*. The increasing prevalence of inline systems has contributed to the practice of eggs being packed or processed soon after receipt, thus minimizing storage time. Eighty percent of eggs are stored for three days or less prior to packing or processing.

Most egg packers clean their washing, candling, grading, and packing equipment on a daily basis. However, the survey did not address cleanliness of scales, which can be an area for cross-contamination. Currently scales cannot be wet-cleaned because of equipment design, but equipment manufacturers are working to resolve this issue.

Egg products plants are somewhat less likely than egg packing plants to refrigerate eggs during transport to the plant and during storage prior to processing. This may be because of the lack of regulations requiring them to do so, or the lack of facilities, or because the egg later goes through a pasteurization or kill step. However, egg products plants are more likely than egg packing plants to have written food safety plans and to conduct daily sanitation inspections. Egg products plants are also more likely to send their employees to formal HACCP training and to emphasize formal food safety training. These increased food safety practices may be the result of continuous FSIS inspection in egg products plants.

The survey findings, along with other data, can be used to characterize current industry practices prior to HACCP regulations being considered for egg packing and processing plants.

ACKNOWLEDGMENTS

This work was funded by the US Department of Agriculture, Food Safety and Inspection Service (contract no. 43-3A94-2-5018). All views expressed here are those of the authors and not necessarily of USDA/FSIS. The authors acknowledge David Kendall, University of Virginia's College at Wise, for his assistance with survey development and Jeff Franklin and Nadia Paoli, RTI International (RTI), for their assistance with survey administration. The authors also acknowledge Peter Siegel, RTI, for his assistance with the sample design and survey weights.

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TABLE 3. Food safety plans, sanitation, microbiological testing, and food safety training for egg products plants

	Small (%) (≤50 million lbs) (n = 39)	Large (%) (>50 million lbs) (n = 20)	*P* value	Total (%)[a] (n = 60)
Food Safety Plans and Quality Control Measures				
Has operations audited by an independent, non-government, third-party auditor	82	85	0.778	83
Has a quality control department	80	90	0.317	83
Has a written HACCP plan	74	90	0.167	80
Has the following processes designated as critical control points in HACCP plan:				
Pasteurizing liquid eggs	72	56	0.247	67
Packaging finished products	41	17	0.087	31
Storing finished products	38	28	0.484	33
Sanitation Practices				
Conducts sanitation inspections of product-contact zones daily or more frequently	92	95	0.701	93
Conducts sanitation inspections of non-product-contact zones daily or more frequently	77	90	0.231	82
Sanitizes drains daily or more frequently	49	55	0.652	52
Routinely conducts a midshift cleanup	95	90	0.488	93
Conducts a separate cleanup shift	90	95	0.683	90
Microbiological Testing Practices				
Of plants that conduct voluntary microbiological testing				
Tests for *Salmonella* species	63	60	0.872	62
Tests for *Salmonella* Enteritidis	47	20	0.087	38
Tests for generic *E. coli*	75	73	0.904	75
Tests for *Listeria monocytogenes*	31	53	0.158	38
Conducts environmental sampling	74	70	0.725	73
Food Safety Training				
Conducts on-the-job training for new hires	59	40	0.176	52
Conducts on-the-job training for current employees	59	35	0.089	52
Conducts formal training for new hires	33	55	0.117	42
Conducts formal training for current employees	36	60	0.085	43
Has employees with formal HACCP training	80	90	0.317	83

[a]The total number of respondents equals the sum of small and large plants, plus one respondent for which plant size was not available

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In Memory of...

Dr. Nobumasa Tanaka
Delmar, New York

IAFP would like to extend our deepest sympathy to the family and friends of Dr. Nobumasa (Nobi) Tanaka who passed away in February 2007.

IAFP will always have sincere gratitude for his contributions to the Association and the profession.

Highlights of the Executive Board Meeting
January 28–29, 2007
Lake Buena Vista, Florida

The following is an unofficial summary of actions from the Executive Board Meeting held at Walt Disney World on January 28–29, 2007.

Approved the following:

- Minutes of November 9, 2006 Executive Board Meeting
- Minutes of November 9, 2006 Executive Session Board Meeting
- Allergen Icons for plant use
- IAFP Logo Use Policy

Discussed the following:

- E-mail votes taken since the last meeting
- Revision to the Procedures to Investigate Foodborne Illness, 2007 Revision
- Paper on Food Worker Hygiene
- Committee appointments for IAFP 2007
- IAFP 2007 program and workshop review
- Local arrangements update for IAFP 2007
- Ivan Parkin and John Silliker Lecturers for IAFP 2007
- Tours and special events for IAFP 2007
- IAFP 2007 Committee meeting schedule
- IAFP's future plan document
- Financial and survey results from IAFP's 2006 European Symposium
- Planning for IAFP's Third European Symposium to be held fall of 2007
- Participation in China International Food Safety and Quality 2007
- Future schedule of International Symposium to be held by IAFP
- Succession planning
- Board Member self-evaluation
- Update on Member dues restructure
- Review of the *IAFP Report*
- *FPT* cover redesign progress
- Page charges for *JFP*
- *JFP Online* posting back issues
- Participation in the Retail Foodservice Consortium
- WHO-NGO Update
- Support for ISOPOL XVI
- Support of and participation in 3-A Sanitary Standards, Inc.
- IAFP 2010 site selection
- Electronic Secretary election to begin in 2008

Reports received:

- *Food Protection Trends*
- *Journal of Food Protection*
- IAFP Web site
- Membership
- Advertising update
- Board Members attending Affiliate meetings
- *Affiliate View* newsletter
- Future Annual Meeting schedule
- Exhibiting (IAFP On the Road)

Next Executive Board meeting – April 12–13, 2007.

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[1] Data on file, Diagnostic Systems, Sparks, MD 21152, USA.

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World Technology Ingredients manufactures five different brands of product, each designed to profitably enhance selected performance attributes of a wide variety of foods. The product lines are: *IONAL, Myosol, MOstatin, TenderIn, Marinal and FlavorIn.*

IONAL Products

The *IONAL* brands of antimicrobials consist of three basic product lines: *IONAL, IONAL Plus* and *IONAL LC* – all based upon blends of buffered citrates alone or in combination with diacetate or acetate. Since it's approval as an antimicrobial for meats and poultry in 1995 extensive research has been conducted into the use of buffered citrates to inhibit the growth of pathogenic and nonpathogenic bacteria in/on raw and ready to eat meats and poultry.

IONAL is straight buffered sodium or potassium citrate. As the name implies it increases ionic strength. In muscle protein systems this equates to increased marinade/brine retention and yield during processing with less moisture migration and purge in the finished package.

IONAL Plus products are buffered citrates with diacetate or acetate. It primarily is used to increase the shelf life of perishable foods, especially raw marinated meats, fish and poultry. Typically incorporation of *IONAL Plus* into a food system will double the products shelf life.

IONAL LC products are buffered citrates with diacetate or acetate which have been specifically formulated to inhibit the growth of pathogenic bacteria such as *Listeria monocytogenes* in/on foods, especially ready to eat meats. Studies have also shown it to be an effective means of inhibiting the outgrowth of *Clostridium perfringens*.

Myosol Products

Myosol branded liquid phosphates; Myosol and *Myosol Plus* are performance enhanced functional ingredients designed to improve product/process yield and meat tenderness. *Myosol* brand phosphates are supersaturated tetrapotassium pyrophosphate solutions which are pH optimized to meet your specific needs. They are readily soluble in cold water and instantaneously reactive in meat systems.

MOstatin Products

MOstatin brand products are all natural, consumer friendly, clean label ingredients designed to enhance the retention qualities of marinades in muscle foods and inhibit the growth of pathogens and spoilage microorganisms in a wide array of food systems. MO for microorganism; statin for stasis or no growth. There are four basic product lines of *MOstatins*: *MOstatin LV, MOstatin V, MOstatin VE, and MOstatin LVE*. *MOstatins* have been successfully used as a CCP for *Listeria* in ham. They have also performed successfully against this pathogen of public health significance in refrigerated salads and soups.

MOstatin LV

MOstatin LV is an all natural blend of lemon juice concentrate and vinegar designed to enhance the organoleptic properties of foods while inhibiting a broad spectrum of bacteria, yeast and molds. *MOstatin LV* increases the water holding capacity of muscle protein systems. At low concentrations *MOstatin LV* does not have any flavor impact on the finished product. At higher concentrations, its slight citric taste enhances the natural flavors of meats, fish, poultry and vegetables.

MOstatin V

MOstatin V is a buffered vinegar product designed to inhibit a broad spectrum of bacteria, yeast and molds in foods. At low concentrations *MOstatin V* does not have any flavor impact on the finished product. At higher concentrations it yields a slight vinegar taste and odor.

MOstatin VE

MOstatin VE is a buffered vinegar system with native tapioca or potato starch designed to enhance/increase marinade retention in ready to eat muscle foods while inhibiting a broad spectrum of bacteria, yeast and molds. At low concentrations *MOstatin VE* does not have any flavor impact on the finished product. At higher concentrations it yields a slight vinegar taste and odor.

MOstatin LVE

MOstatin LVE is on all natural blend of lemon juice concentrate, vinegar and native tapioca or potato starch. It is designed to increase cook yield of ready to eat muscle foods while inhibiting pathogen and nonpathogenic bacteria, yeast and molds.

Marinal Products

Marinal brand marinades are customized systems designed to deliver maximum performance at an affordable cost. They are specially formulated to maximize the interactions between substrate, process and packaging in order to achieve the customers' desired performance objectives.

TenderIns

TenderIns are all natural, consumer friendly, clean label alternatives to phosphates for use in muscle foods. *TenderIns* are derived from fruit juices and vegetable bi-products. They are species specific products – each formulated to accommodate the different functional characteristics encountered by different muscle foods: a.k.a. beef, chicken, pork, turkey or fish.

TenderIn L

TenderIn L is the liquid form of *TenderIns*, each custom blended to meet the specific performance requirements of a wide range of food systems.

TenderIn DL

TenderIn DL is processed lemon juice concentrate dried onto a rice flour carrier designed to increase the cook yield of ready to eat meats and overall viscosity of food systems. The rice flour is a specialty blend formulated to deliver the optimum amylose and amylopectin concentrations. Its unique properties in cooked systems make *TenderIns* a viable alternative to phosphates.

FlavorIns

FlavorIns are all natural flavor systems derived from fruit, vegetable and vinegar based ingredients designed to enhance to organoleptic attributes of food systems throughout the shelf life of a product. They are available in both a dry and liquid form depending upon the desired functionality in the finished product.

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The Walt Disney Co.
Glendale

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Pacific Ozone Technology
Benicia

Benson J. Yee
California Dept. of Public Health
Sacramento

DELAWARE

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University of Delaware
Newark

DISTRICT OF COLUMBIA

Angela D. Hartman
GMA/FPA
Washington

Dawanna James-Holly
University of the District of Columbia
Washington

Lillie Monroe-Lord
University of the District of Columbia
Washington

FLORIDA

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Walt Disney World
Lake Buena Vista

Tod J. Godfrey
Wal-Mart Stores, Inc.
St. Johns

Jennifer C. Lahnoudi
Walt Disney World
Lake Buena Vista

GEORGIA

Daniel J. Sankey
Wal-Mart Stores, Inc.
Grovetown

ILLINOIS

Susan A. Estes
PepsiCo
Barrington

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Merisant
Manteno

Gregory A. Pallaske
US Foodservice
Rosemont

Tim Parish
PepsiCo
Barrington

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Iowa State University
Ames

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NEW SUSTAINING MEMBERS

Julie Funk
Michigan State University–ProMS in Food Safety
East Lansing, Michigan

UPDATES

Silliker Names Laboratory Director

Patricia Ortiz was named laboratory director of Silliker, Inc. – Georgia in Stone Mountain, GA. Prior to joining Silliker, she worked for several large food companies in various positions of increasing responsibility including Schwans, Inc., Givaudan, Inc. and Coors Brewing Company.

Griffith Laboratories Names President and General Manager

Griffith Worldwide president and CEO, Hervé de la Vauvre, recently announced Chris Savage's new position to be effective as of January 29, 2007.

As the former president of Griffith Laboratories Central and South America, Mr. Savage was praised by de la Vauvre for having been "very successful in leading our Central and South American region to record levels of financial and business growth."

Mr. Savage has extensive experience with Griffith Laboratories, including 11 years at the Canada facility. His experience includes leadership of the company's International Trade Division, which included responsibility for a large North American sales region and also a brief period with R&D leadership.

Jennifer Convery was promoted to general manager. As a 14-year veteran of Griffith Laboratories, Jennifer brings to this position strong leadership skills and managerial experience. She has held sales management positions within Griffith Laboratories, as well as with Johnson & Johnson and General Mills. Her love for and commitment to the food industry has resulted in over 20 years of experience in the field.

In her new position, Ms. Convery will be responsible for the management of commercial and manufacturing operations of Griffith Laboratories USA.

Q Laboratories, Inc. Announces New Appointments

Erin Crowley has been appointed to the position of microbiology R & D laboratory supervisor. Ms. Crowley will be responsible for all functions of the R&D laboratory, such as AOAC validation studies, (including AOAC-RI and Official Methods of Analysis), internal validation studies, method development and validation and other special projects. She holds a bachelor's of science degree from the University of Cincinnati and a master's degree from Tuft's University in Medford, MA.

Patrick Bird has been appointed microbiology R&D project leader. Mr. Bird holds a bachelor's of science degree from The Ohio State University. His duties will include administering individual research and development studies, projects and validations with the Q Laboratories, Inc., R&D laboratory and coordinating staff responsibilities and functions.

Bacou-Dalloz Appoints New Management Team at Perfect Fit Glove

Steve Spotts was recently named vice president and general manager of Perfect Fit Glove.

Mr. Spotts has been with the Bacou-Dalloz organization for 9 years and brings extensive product management, product engineering, marketing and knowledge of the PPE industry to his new role.

NEWS

3-A SSI Announces Authorized 3-A Symbol Holders

3-A Sanitary Standards, Inc. (3-A SSI) recently updated its public Web site information on current 3-A Symbol authorizations to assist regulatory sanitarians, processors and equipment fabricators. The new information shows the most current database of authorized 3-A Symbol holders. A separate list of discontinued 3-A Symbol holders also appears on the 3-A SSI Web site. This information lists the reason for discontinuation, such as equipment is no longer in production, the equipment was consolidated 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 3-A Chair Greg Marconnet (Kraft Foods), "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. 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."

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.

Cooperative, Non-Competitive Approach to Food Safety and Inspection Yields Meat Safety Improvements, AMI Says in Hill Testimony

A cooperative approach to food safety and inspection between industry and government and the meat industry's vote to make food safety a non-competitive issue have yielded significant, measurable results, according to Mark Dopp, senior vice president of regulatory affairs and general counsel at the American Meat Institute (AMI). Mr. Dopp made his comments in testimony delivered to the House Committee on Appropriations Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies.

Dopp called the 1990s a "pivotal period" for the industry. During the early part of the decade, *E. coli* O157:H7 moved into the food safety spotlight and became the number one enemy in the meat industry. In the later part, *Listeria monocytogenes* also emerged as a threat.

"It was a time of both crisis and progress and it was a period when we recognized publicly what we knew intuitively: that optimal food safety was good not just for our customers, it was good for our businesses," Mr. Dopp said.

According to Mr. Dopp, AMI petitioned USDA to mandate HACCP (Hazard Analysis Critical Control Point) plans in all federally inspected meat plants. AMI ran an intensive HACCP training program to prepare the industry for the coming mandate.

"During that period also, our Board of Directors recognized that our collective knowledge was more powerful than the knowledge companies possessed individually. Thus, the AMI Board voted to make food safety a non-competitive issue. What that means is that when it comes to information about food safety that AMI member companies have developed or discovered, they share it with each other without hesitation. Simply put, good ideas get better when they are adopted widely."

AMI also reinvigorated its research foundation with millions of voluntary contributions from AMI members. They had two key goals in mind: reducing and ultimately eliminating *E. coli* O157:H7 in fresh beef products and *Listeria monocytogenes* in ready-to-eat products. The Foundation launched a host of new training efforts based upon the collective knowledge and best practices in the meat industry to reduce pathogenic bacteria.

He noted that the incidence of *E. coli* O157:H7 in ground beef products is down by 80 percent over the last five years. Likewise, *E. coli* O157:H7 infections are down sharply, according to the Centers for Disease Control and Prevention. Similarly, the incidence of *Listeria monocytogenes* in ready-to-eat meat and poultry products is down by 70 percent and illnesses caused by *Listeria* are also down. Consistent with these results, the number of meat and poultry recalls, and the pounds of product involved in those recalls, are down dramatically. The AMI

Foundation has now added *Salmonella* and *Campylobacter* to its list of targeted organisms.

In his testimony, Mr. Dopp acknowledged a recent Government Accountability Office (GAO) report that critiqued federal food safety regulation and coordination.

"We certainly welcome increased coordination among federal agencies that will make meaningful improvements in the safety and security of the food supply. Given the demonstrated food safety progress that has been made in the meat and poultry industry in collaboration with USDA, the meat industry would approach any efforts to reallocate resources or reorganize federal oversight with both an open mind and a heavy dose of caution. Before any such changes occur we want to be sure that they accelerate – and do not derail – food safety progress and public health outcomes," he said.

FSIS Proposes Timeline for Risk-based Inspection in Processing Plants

USDA Under Secretary for Food Safety Dr. Richard Raymond has announced a timetable for introducing more robust risk-based inspection in processing plants, proposing to begin in April with 30 locations representing about 254 establishments and potentially expanding to approximately 150 locations by the end of 2007.

To better protect public health, the Food Safety and Inspection Service (FSIS) intends to better utilize the information regularly collected by inspection program personnel at processing establishments to improve food safety. By taking into account the relative risk of what each processing plant produces and how each plant is controlling risk in its operations, FSIS will more effectively allocate inspection resources to those processing plants needing it the most, while continuing daily inspection at all processing facilities. The level of inspection at a processing plant will be based on a number of objective factors such as public health-related inspection noncompliances and FSIS microbiological testing results and will be updated each month so that inspection resources can be adjusted as conditions change. This enhanced inspection system will be more proactive in terms of preventing human illness and will yield greater confidence that meat, poultry and egg products are safe. Risk-based inspection in processing establishments has benefited from the input and expertise of all stakeholders during its development.

"To continue to prevent foodborne illness, we have to improve our prevention capabilities, not just respond quickly after an outbreak occurs. Our inspectors visit every one of these plants every day and that won't change. What will change is we will no longer be treating every plant like every other plant in terms of its adverse public health potential and we will start using the information and the inspection expertise we already have in ways that better protect consumers," Dr. Raymond said.

Dr. Raymond noted that incorporating risk prevention more thoroughly into inspection activities has been an ongoing process at FSIS, from the implementation of the Hazard Analysis Critical Control Point (HACCP) system in 1998 to the 2006 *Salmonella* reduction initiative.

Dr. Raymond said that gradually implementing risk-based inspection will ensure that all aspects of the program can be thoroughly evaluated and revised as needed before it is expanded nationwide. He added that the open and transparent process that has characterized the initiative will continue with the scheduling of a series of technical briefings to discuss the use of production volume, industry data, non-compliance records, expert elicitations and foodborne disease attribution data as part of a more robust risk-based inspection system.

Manual Dishwashing Study Digs up Dirt on Dish Cleanliness

New research at Ohio State University answers an infectious question about eating at restaurants: How clean are manually washed dishes?

Jaesung Lee and Melvin Pascall found that even when they washed dishes in cooler-than-recommended water, numbers of bacteria on the dishware dropped to levels accepted in the Food and Drug Administration's Food Code. They also found that certain foods—especially cheese and milk—can be safe havens for bacteria when dried onto dishware. Lipstick, however, proved to be dangerous to bacteria.

"After washing, there were lipstick stains still left on a few glasses, but it was the least hospitable substance for bacteria," Mr. Pascall said. "It seems to have antimicrobial properties, which was a big surprise to us."

Mr. Lee, a doctoral candidate of food, agricultural and biological engineering, and Mr. Pascall, assistant professor of food science and technology, published their findings in the *Journal of Food Engineering*.

When restaurants manually wash dishes, they follow a three-step process: Dishes are washed and scrubbed in soapy water, rinsed with clean water, and finally soaked in water containing germ-killing sanitizers. But employees often use water that is cooler than 110°F—the minimum washing temperature recommended by the FDA—because it is uncomfortably hot. The FDA also requires that washing cause a 100,000-fold drop in amounts of bacteria on those dishes.

To investigate effective lower-temperature dishwashing tactics, the researchers coated dishes individually with cheese, eggs, jelly, lipstick, and milk, and then added *Escherichia coli* and *Listeria* innocua bacteria. Contaminants like *E. coli* and *L. innocua* can survive for long periods of time if they make their way into food dried onto dishes. If those dishes aren't thoroughly washed, they can sometimes cause foodborne disease outbreaks.

After letting the food dry on to the dishes for an hour—a plausible wait in a busy restaurant dish room—they gave each utensil a few scrubs per side and measured the amount of microscopic organisms still clinging to the dishes.

Mr. Lee and Mr. Pascall discovered that washing dishes in hot dish water, followed by soaking in extra sanitizers, eliminated almost all of the bacteria on them, even when coated with dried-on cheese. But dishes washed in soapy room-temperature water, rinsed, and then weakly sanitized with ammonium-based chemicals also achieved FDA-acceptable results.

The find is important because acceptable sanitization can be achieved with cooler dishwashing water, as dishes washed in room-temperature water and then rinsed in more-concentrated sanitizers achieved results comparable to higher-temperature alternatives.

"We wanted to show that employees could use a more comfortable washing technique and still get clean dishes. We were able to do that, and we did it by using different combinations of washing, rinsing, and sanitizing," Mr. Pascall said.

But all dishes are not created equal. Compared to ceramic plates, steel knives, spoons, and plastic trays, steel forks seemed to be the best home for bacterial contaminants.

"The prongs of forks actually shield food from the action of scrubbing. Taking extra time to wash forks is a good idea, especially those covered with sticky foods like cheese," Mr. Pascall said.

Although cheesy forks were the most problematic utensil, milk dried onto glasses protected bacteria more than any other food. Mr. Pascall explained that milk is a good growth medium in the laboratory, but why it adheres to glass so well isn't clearly understood.

"Milk is an area of research we'd like to explore further. We want to find ways to safely and quickly remove milk dried on glasses," Mr. Pascall said.

The research aimed to explore restaurant dishwashing conditions, but Mr. Pascall explained that homeowners can benefit from the findings, too.

"Leaving food on eating utensils and dishes could easily cause bacteria to grow on them, especially if it's moist. The best thing you can do is wash your dishes off right away, before the food dries. It saves washing time and gets rid of places where bacteria can survive drying and washing," Mr. Pascall said.

Retail Meat Analyzed for Parasites

A recently completed survey of meats for a common microscopic parasite found none in raw beef and poultry and a low level in pork. The study focused on the parasite *Toxoplasma gondii*, which commonly infects animals and humans worldwide, and was conducted by scientists with the US Department of Agriculture (USDA) and the Centers for Disease Control and Prevention (CDC).

The study was led by scientists Dolores E. Hill and Jitender P. Dubey of USDA's Agricultural Research Service (ARS) and was published in *The Journal of Parasitology*. Hill and Dubey are experts in parasitology research at ARS' Henry A. Wallace Beltsville (MD) Agricultural Research Center (BARC).

The scientists analyzed samples of retail meat obtained from nearly 700 stores nationwide. More than 6,000 samples–2,000 each of pork, chicken and beef–were purchased from stores in 28 major US geographic areas. Each sample weighed a minimum of 2.2 pounds, for a total of more than 14,000 pounds of meat tested.

None of the raw beef and chicken meat samples contained live *T. gondii* parasites, based on a controlled analysis. In raw pork from retail meat cases nationwide, the prevalence of live *T. gondii* parasites was estimated at a low 0.4 percent, or about four per 1,000 samples.

"The survey shows that beef and chicken have negligible amounts of the parasite, while pork has extremely low levels that are effectively eliminated by proper cooking," said microbiologist Mark Jenkins, with ARS' Animal Parasitic Disease Laboratory at BARC.

Besides the consumption of undercooked meat, another route of *T. gondii* infection is exposure to egg-like oocysts in the feces of infected cats. A rodent- or bird-eating cat that has *T. gondii* in its body expels millions of infectious-stage oocysts of the parasite during a week or two.

The parasite can seriously damage developing fetuses and persons with weakened immune systems, such as those infected with HIV, according to experts. Infants born to mothers who become infected for the first time just before or during pregnancy are at risk of developing severe toxoplasmosis due to *T. gondii* exposure.

The hardy encapsulated oocysts create the risk of infection when deposited in soil, sand and litter boxes or near farm animal feed. To reduce risk of infection, wash hands well after outdoor activities and after handling raw meat, and don't eat undercooked meat.

For more tips on reducing the risk of infection, go to: www.cdc.gov/ncidod/dpd/parasites/toxoplasmosis/factsht_toxoplasmosis.htm.

Rutgers Survey: Public Response to the Contaminated Spinach Recall of 2006

To investigate the public's reactions to the *E. coli*-contaminated spinach recall in September 2006, the Food Policy Institute at Rutgers University interviewed 1,200 Americans by telephone during November 2006. "The results of the nationwide telephone survey describe the level of consumer awareness and knowledge of the recall and foodborne illness. The results also provide insight into consumer behavior during the recall and likely future behavior in response to the recall."

Although the survey showed that the majority of consumers did stop eating spinach during the recall, "fewer Americans were aware of important details related to the recall. Many were confused about the types of spinach affected, the organism that caused the contamination, the symptoms of the resulting illness, and perhaps most significantly, whether or not the recall had ended. As a result, the data suggest that there were also some unintended consequences of the recall."

The survey and accompanying press release may be found on the Food Policy Institute Web site at http://www.foodpolicyinstitute.org.

INDUSTRY PRODUCTS

Torrey Pines Scientific, Inc.

Torrey Pines Scientific Has Announced Its New EchoTherm™ High Capacity Chilling/Heating Dry Baths

These units are capable of handling a large variety of sample blocks with the largest sample capacities available. The IC30 (-10°C to 100°C) and IC30XT (-20°C to 100°C) can freeze, chill, or heat samples in a variety of sample blocks.

Blocks are available to hold 0.5 ml to 50 ml centrifuge tubes, test tubes, vials, assay plates, and even round-bottom flasks.

The units can freeze, chill, or heat 64–1.5 ml centrifuge tubes, 9–50 ml centrifuge tubes, or even 4–250 ml flasks on just some of the large variety of sample blocks available.

The IC30s are Peltier-Driven and have digital display and control to 1°C, 30-day count down timer in hours/minutes/seconds, data logger, and RS232 I/O port to collect data or to control the units by computer.

The units measure 8.5" (21.6 cm) wide x 10" (24.5 cm) deep × 4" (10.2 cm) tall. They come complete with chiller/heater module, universal power supply, AC line cord for the country of use, and instruction manual. They are UL, CSA, and CE compliant.

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Gainco Introduces Enhancements to Its Blue Ribbon Service Program

Gainco announces new enhancements to its Blue Ribbon Service program providing national maintenance and repair for weighing and yield tracking equipment. Among the services provided by Blue Ribbon Service are 24/7/365 live help-desk support, remote diagnostics support, emergency response services and an emergency parts program – all provided by highly trained company employees. Licensed, certified technicians are on-call at all times for troubleshooting support or to handle unforeseen emergencies, with Spanish-speaking technicians available.

Tiered service agreement packages are now offered by Blue Ribbon Service, with flexible terms to meet the specific needs of individual processing facilities, including time-and-materials service packages, remote diagnostics packages, scale calibration packages, and full-service packages. All work is performed by Blue Ribbon Service's own certified-service technicians, and all work and materials are fully warranted.

Scale calibration agreements offered by Blue Ribbon Service encompass all types of weighing equipment including bench, floor and pit scales. The agreements can be designed as weekly, monthly or quarterly programs. Blue Ribbon Service technicians check, span and calibrate all scales, providing Scale Inspection Reports as well as Certificates of Calibration for all scales. Introduced in 2006, more than 40 poultry and meat plants have already signed up for these programs.

Blue Ribbon Service also offers remote diagnostic programs covering selected Gainco capital equipment and systems such as overhead sizing and distribution systems, classifier systems, and YieldPlus™ yield management systems. With remote access, Blue Ribbon Service can observe each system in operation, then define and implement proper maintenance solutions, including advising if a system upgrade or parts replacement is necessary. Emergency spare parts kits are also available for these and other Gainco capital equipment.

The recent enhancements to Gainco's Blue Ribbon Service program are designed to solve the service and maintenance needs of individual processing plants, enabling processors to optimize the allocation of their maintenance budget and resources. Our service technicians gain an intimate knowledge of each plant's equipment and operating history, enabling them to develop a highly effective maintenance plan along with comprehensive record-keeping for customers to conform to NIST and state government test and reporting requirements.

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Koch Equipment Introduces New Vacuum Chamber Packaging Machine, Koch 800

Koch Equipment LLC announced their new Koch 800 double chamber vacuum-packaging machine designed for the meat and poultry, seafood, produce, dairy and medical/pharmaceutical industries.

Steve Kingeter, vice president of sales and marketing, commented, "The Koch 800 vacuum-packaging machine is designed with several quality standard features, providing customers everything they need without paying extra for options, such as 10 mm wide-band seals, a 10-hp vacuum pump and stainless steel construction. By adding this machine to our product offering, we're providing a high-quality, economical vacuum-packaging solution to customers with mid-range production requirements."

Koch Equipment LLC is a full-line manufacturer and distributor of equipment for meat production, food processing, packaging, and labeling. A one-stop shop for vacuum-chamber packaging machines, skin packaging machines, modified atmosphere-packaging machines, labelers, rollstock parts, accessories, and service, as well as a full range of processing equipment including stuffers, bowl cutters, injectors, mixers, grinders, tumblers, dicers, smokehouses, and kill floor equipment

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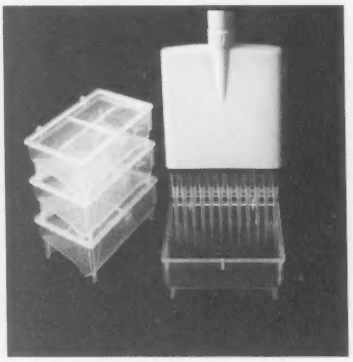

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Airscrubbers International Announces a Complete Line of Equipment for Disinfection and Deodorization

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Airscrubbers International manufactures equipment which eliminates bacteria through the use of a combination of UVC lamps and patented-pending reactors. AIET technology works by eliminating the organic particulates not filtering or capturing them.

While the elimination of bacteria is the primary function, a secondary benefit is the removal of odors.

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Eriez metal detector/checkweigher systems are available in numerous configurations to suit a wide variety of production industries from small parts manufacturers to large-packaged food processors.

Checkweigher models TSC 350, Sonic 350, 4693i and 4693 handle capacities from .002 lbs to 200 lbs (1g to 90.7 kg) with speeds from 40 to 350 units per minute.

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Remel

Remel Announces Availability of New and Improved Dilution Bottles

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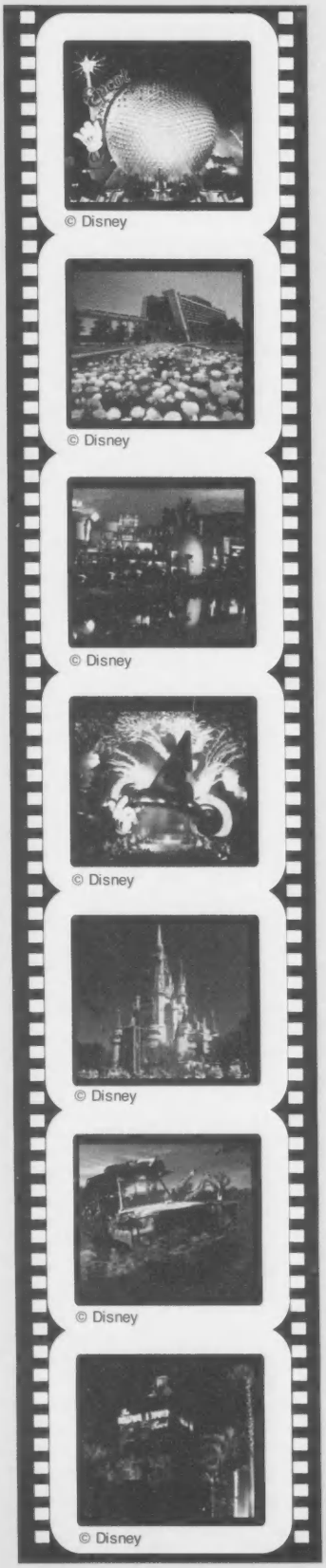

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Ivan Parkin Lecture

Sunday, July 8

6:00 p.m.

Reflections on 41 Years as a Food Microbiologist

Mr. Carl S. Custer
USDA-FSIS-OPHS-MD-MIB
Bethesda, Maryland

Mr. Carl Custer started his food microbiology career in 1966 as a tech, then as a graduate student for Dr. Carl Vanderzant at Texas A&M. In 1972, he joined the APHIS microbiology laboratory in Maryland rising to run the special projects laboratory where his primary projects were on *Clostridium botulinum*.

In 1980, promotion led Mr. Custer to Washington, D.C., working on the microbiological aspects of regulatory development. This exposed him to the interactions of politics and science in food safety regulatory promulgation. His primary contributions, with the aid of ARS, were in policies and standards for stabilization and inactivation.

Inheriting trichina projects exposed Mr. Custer to ninetieth century regulatory policy and hazard analysis. Trichina also opened up the world of uncooked ready-to-eat ethnic and traditional meat products. His primary contributions, with the support of ARS and academics, were in fermented sausages, dry-cured hams, jerky, and basturma.

Mr. Custer's experience with traditional food processes led AFDO in recruiting him to assist in developing their retail processing manual and its subsequent versions. He also helped present the AFDO retail processing workshops. Mr. Custer has also trained FSIS inspectors on sampling listeriae and the FSIS hotline staff on microbiology.

Mr. Custer has served on various IAFP Committees and Professional Development Groups (PDGs) and is a past chair of the Meat and Poultry Safety and Quality PDG. He is currently chair of the Nominating Committee and serves as Affiliate Council Secretary.

After 34 years of federal service, Mr. Custer retired in March 2007. In addition to part-time consulting, he will be pursuing his other interests including motorcycle restoration and touring, gardening, woodworking, cooking, and fine alcoholic beverages.

John H. Silliker Lecture

Wednesday, July 11

4:00 p.m.

Trends in Food Safety Management

Dr. Terry A. Roberts
Food Safety and Hygiene Consultant
Reading, England

A Fellow of the Institute of Food Science and Technology (FIFST), and Officer of the British Empire (OBE), Dr. Terry Roberts earned his B.A. (1957) and Ph.D. (1961) in Pharmacy from the University of London, and later his M.A. (1967) from the University of Cambridge. Retired since 1994, his growing list of contributions to food safety began during his tenure with the Institute of Food Research (IFR) now centralized in Norwich, England. Initially appointed to IFR's former Low Temperature Research Station in Cambridge, Dr. Roberts moved with the station to the Meat Research Institute in Langford (Bristol), where he became head of microbiology and spent the remainder of his IFR career at the Reading Laboratory.

Dr. Roberts was a member of the International Commission on Microbiological Specifications for Foods (ICMSF) for more than two decades, serving as Chairman his last nine years while co-editing five books in the ICMSF series "Microorganisms in Foods." He was a two-term consultant for both the World Health Organization and the International Atomic Energy Agency. In 1995, Dr. Roberts' committee involvement expanded to the UK Advisory Committee on Microbiological Safety of Foods and the EU Scientific Committee for Veterinary Measures Related to Public Health. His work with the European Food Safety Authority Panel on Biological Hazards continues today.

Published research by Dr. Roberts encompasses the topics of food irradiation; slaughterhouse hygiene; death and survival in relation to food safety; food preservation and spoilage; botulism in animals; microbiological safety of foods with emphasis on *C. botulinum*; the role of sodium nitrite in controlling *C. botulinum*; molecular and genetic inter-relationships of the *C. botulinum* group; and developing predictive modeling of microbial pathogens.

IAFP 2007 PRELIMINARY PROGRAM

SUNDAY, JULY 8

Opening Session – 6:00 p.m. – 7:00 p.m.

Ivan Parkin Lecture – *Reflections on 41 Years as a Food Microbiologist*
Carl S. Custer, USDA-FSIS-OPHS-MD-MIB, Bethesda, Maryland

MONDAY, JULY 9

Morning – 8:30 a.m. – 12:00 p.m.

Symposium Topics

- S1 Foodborne Disease Update
- S2 Vaccination Strategies to Control Foodborne Pathogens from Farm-to-Table
- S3 Food Defense Research and Application
- S4 Outreach Programs to Promote Dairy Products and Their Safety Around the World

Roundtable Topics

- RT1 Using HACCP to Innovate New Processes in Retail Food Operations
- RT2 The Management and Control of Chemical Hazards in Food

Technical Session

- T1 Laboratory Methods

Poster Session

- P1 Dairy, Seafood, Produce and Education

Afternoon – 1:30 p.m. – 5:00 p.m.

Symposium Topics

- S5 Measuring and Motivating Safe Food-handling Practices at Home, Retail and Food Service
- S6 Long-term Sequelae of Pathogens with Recognized or Potential Transmission by Food
- S7 The DaVinci Code of Auditing: Reaching the Holy Grail of One Global Standard
- S8 Recent Pivotal Decisions of the National Conference on Interstate Milk Shipments

Roundtable Topic

- RT3 Water Emergencies: Too Much, Too Little, Too Late and What is the Plan?

Technical Session

- T2 Produce and Seafood

Poster Session

- P2 Meat and Poultry

TUESDAY, JULY 10

All Day – 8:30 a.m. – 8:00 p.m.

Interactive Session

A Mystery Outbreak–What to Do When It Happens to You!

Session 1:	8:30 a.m. – 10:00 a.m.
Session 2:	10:30 a.m. – 12:00 p.m.
Session 3:	1:30 p.m. – 3:00 p.m.
Session 4:	3:30 p.m. – 5:00 p.m.
Session 5:	6:30 p.m. – 8:00 p.m.

Morning – 8:30 a.m. – 12:00 p.m.

Symposium Topics

- S9 What's the Future of Foodborne Pathogen Detection?
- S10 The Impact of Emerging Food Trends on Food Safety
- S11 Food Allergies: A Growing Food Safety Concern
- S12 The Wrath of Vibrio's "Past, Present and Future"

Special Interest Session

Salmonella Growth, Persistence and Survival in Low Moisture Foods and Their Environments – Strategies for Control

Technical Session

- T3 Antimicrobials, Sanitation and Non-Microbial Food Safety

Poster Session

- P3 Epidemiology and Risk Assessment, Novel Laboratory Methods, 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

- S13 Pre-Harvest Food Safety: Another Critical Consideration for Assuring the Safety of the Food Supply
- S14 Critical Issues in the Investigation of Outbreaks of Foodborne Illness Involving Food Workers
- S15 Balancing Cultural and Religious Norms and Food Safety
- S16 Microbial Biofilms and Biofilm Control

Technical Sessions

- T4 Dairy
- T5 Pathogens

Poster Session

- P4 Beverages and Water, Antimicrobials, Sanitation and Non-Microbial Food Safety

WEDNESDAY, JULY 11

Morning – 8:30 a.m. – 12:00 p.m.

Symposium Topics

- S17 Lettuce and Leafy Greens: Problems, Actions and Issues
- S18 Preparing Scientists for the Legal Aspects of a Crisis: Step into an Interactive Mock Trial and Learn How to Become an Expert Witness
- S19 Applications of "omics" Technologies for Food Safety and Security
- S20 Food Safety @ the Speed of Thought – Creating Virtual Networks

Roundtable Topics

- RT4 With Over 100 Years of Experience in Food Safety, We Think…
- RT5 Panel on the Science Behind Temperature Control of Potentially Hazardous and High Risk Food

Technical Session

- T6 Meat and Poultry

Poster Session

- P5 Food Defense, Pathogens and General Microbial

Afternoon – 1:30 p.m. – 3:30 p.m.

Symposium Topics

- S21 Spoilage and Its Control in Meat Products
- S22 Mitigating Spoilage Risks in Ready-to-Drink Beverages
- S23 Emerging Issues Affecting Dairy Product Quality and Safety

Roundtable Topic

- RT6 Food Safety Laws: Political Science or Food Science

Technical Sessions

- T7 Epidemiology and Risk Assessment
- T8 Education

4:00 p.m. – 4:45 p.m.

John H. Silliker Lecture – *Trends in Food Safety Management,*
Terry A. Roberts, Ph.D., Food Safety Hygiene Consultant, Reading, England

Note: Unauthorized video, still photography or audio recording will not be allowed.

Subject to chang

IAFP 2007 NETWORKING OPPORTUNITIES

IAFP FUNCTIONS

AFFILIATE EDUCATIONAL SESSION
Saturday, July 7 • 4:00 p.m. – 5:00 p.m.

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

WELCOME RECEPTION
Saturday, July 7 • 5:00 p.m. – 6:30 p.m.

Reunite with colleagues from around the world as you socialize and prepare for the leading food safety conference. Everyone is invited!

COMMITTEE MEETINGS
Saturday, July 7 • 3:00 p.m. – 4:30 p.m.
Sunday, July 8 • 7:00 a.m. – 5:00 p.m.

Refreshments sponsored by Springer

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 committees or PDGs. Everyone is invited to attend.

STUDENT LUNCHEON
Sunday, July 8 • 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
Sunday, July 8 • 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
Sunday, July 8 • 6:00 p.m. – 7:00 p.m.

Join us to kick off IAFP 2007 at the Opening Session. Listen to the prestigous Ivan Parkin Lecture delivered by Carl S. Custer.

CHEESE AND WINE RECEPTION
Sunday, July 8 • 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
Sunday, July 8 through Wednesday, July 11

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)
Monday, July 9 • 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
Monday, July 9 • 12:00 p.m. – 1:00 p.m.

Sponsored by JohnsonDiversey

Tuesday, July 10 • 12:00 p.m. – 1:00 p.m.

Sponsored by SGS North America

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

EXHIBIT HALL RECEPTIONS
Monday, July 9 • 5:00 p.m. – 6:00 p.m.

Sponsored by DuPont Qualicon

Tuesday, July 10 • 5:00 p.m. – 6:00 p.m.

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)
Tuesday, July 10 • 6:00 p.m. – 7:00 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)
Tuesday, July 10 • 7:00 p.m. – 9:30 p.m.

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

BUSINESS MEETING
Tuesday, July 10 • 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
Wednesday, July 11 • 4:00 p.m. – 4:45 p.m.

The John H. Silliker Lecture will be delivered by Dr. Terry A. Roberts.

AWARDS BANQUET
Wednesday, July 11 • 7:00 p.m. – 9:30 p.m.

Bring IAFP 2007 to a close at the Awards Banquet. Award recipients will be recognized for their outstanding achievements and the gavel will be passed from Frank Yiannas, M.P.H. to Incoming President, Dr. Gary R. Acuff.

IAFP 2007
Event Information

EVENING EVENTS

American Adventure at *Epcot*®
Monday, July 9 • 6:30 p.m. – 10:00 p.m.
Sponsored by DuPont Qualicon

Travel backstage *Epcot*® where you will be escorted to the American Adventure Rotunda. Relive America's glorious past in the beautiful setting of a classic 18th century American Rotunda. A reception-style dinner will be offered as you enjoy the magnificent setting. The finale of the evening takes you outside to an exclusive dessert party in a viewing area overlooking the World Showcase Lagoon. Here, experience the premier night-time spectacular at *Epcot*®, *IllumiNations: Reflections of Earth*. This one-of-a-kind show tells its story and touches the spirit by combining video technology, water fountains, lasers, special lighting effects, and pyrotechnics, all programmed to an original musical score. A perfect finish to your *Epcot*® Adventure.

IAFP Foundation Fundraiser – Adventurers Club at Downtown Disney®
Tuesday, July 10 • 6:30 p.m. – 9:30 p.m.

This will be a night to remember! You will be transported to Downtown Disney® and escorted through the streets of Pleasure Island to the Adventurers Club. The entertainment here is outrageous as the world's most eccentric explorers welcome you to their legendary club of the 1930s. Swap tall tales with a marvelously mad professor, a dashing daredevil pilot, a frisky French maid, and other characters while you enjoy live shows featuring everything from talking masks and a floating head to a ghostly piano. A reception-style buffet will be offered while the show happens all around you. At the conclusion of the event you will have the option to remain at Downtown Disney® and experience all of the clubs of Pleasure Island or return to the *Contemporary* Resort.

GOLF TOURNAMENT

Golf Tournament at *Disney's Magnolia* Golf Course
Saturday, July 7 • 6:30 a.m. – 12:30 p.m.

Join your friends and colleagues for a relaxing round of golf before IAFP 2007. Step onto the first tee and into the shoes of champions. These beautifully manicured links, designed by Joe Lee, are named for an abundance of fragrant Magnolias. Elevated tees, spacious greens and tranquil water hazards immerse you in a natural setting fit for a fulfilling round of championship golf. Enhance your on-course experience with the latest GPS Technology in each golf cart. *Disney's Magnolia* has provided a backdrop for the PGA Tour's elite for over 30 years. A classic Florida golf course, complete with a Mickey Mouse bunker!

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

DAYTIME TOURS

Kennedy Space Center
Saturday, July 7 • 8:30 a.m. – 4:30 p.m.

Each year, millions of visitors make the trek to Kennedy Space Center, NASA's launch headquarters, where many of mankind's greatest accomplishments take place. Your exploration starts with a world-renowned tour where you see many NASA landmarks, including the massive launch pads, the gigantic Vehicle Assembly Building, the awe-inspiring Apollo/Saturn V Center and the International Space Center. View 10-story high rockets from all eras of space exploration in the Rocket Garden, walk through a full-size Space Shuttle mock-up, enjoy IMAX Theater space films on gigantic five-story screens and see an actual Gemini program capsule on display. You will also have lunch with an astronaut. Share in the excitement of space exploration through the eyes and personal stories of one of NASA's best while enjoying a buffet meal. You will have an inspiring day at Kennedy Space Center!

NOTE: Government-issued photo identification is required.

Merritt Island Airboat Excursion
Sunday, July 8 • 9:00 a.m. – 3:00 p.m.

Merritt Island National Wildlife Refuge is certified as the greatest endangered wildlife experience in North America. Our first stop is at the visitors' center for a 20-minute orientation film. Then, take an easy one-hour nature walk through one of the diverse, critical hardwood hammock habitats. Infused with wildlife, more than 1,000 species of plants are found throughout the refuge. Enjoy a picnic lunch at the refuge before heading to the Manatee over-look area. Then it's off to St. John's River for refreshments and gator tail. Certified eco-guides and Coast Guard captains will then take you on a 30-minute airboat tour through central Florida's everglades. Binoculars will be supplied for your viewing pleasure.

***Disney* Behind-the-Scenes Tour – Innovation in Action**
Monday, July 9 • 9:00 a.m. – 12:00 p.m.

When most people hear the name "Walt Disney," they think of *Mickey Mouse*, classic movies, and theme parks. What they often don't think of, or even know about, are his many innovative ideas that eventually led to the creation of the *Walt Disney World*® Resort. Innovation in action highlights Walt's many accomplishments and takes you on an unforgettable journey where you will see, first-hand, how Disney makes "magic"! Tour places most Guests never get to see including:

- *The Walt Disney World*® Nursery and Tree Farm – See how Disney horticulturists create world-famous topiaries.
- Textile Services – Visit the new state-of-the-art laundry facility, one of the largest in the world.
- Main Street, U.S.A.® – Discover how Walt's life and film career heavily influenced this turn-of-the-century location.
- The "Utilidor" System – Journey beneath the *Magic Kingdom*® Park to visit support systems located in the "tunnel."

NOTE: You must be 16 years old and carry a government-issued photo identification. There is walking involved, so comfortable shoes are recommended and attire should be suitable for current weather conditions.

***Disney* Behind-the-Scenes Tour – Gardens of the World**
Tuesday, July 10 • 9:00 a.m. – 12:00 p.m.

Everywhere you look at the *Walt Disney World*® Resort, the trees, shrubs and flowers play a vital role in setting the stage for recreation, entertainment, and beauty. Disney landscaping has become a recognized show in itself, providing color and enjoyment throughout the year. Your horticulture instructor turns *Epcot*® into a living classroom, using facilities "on stage" to describe the basic process of plant design and how it is incorporated in the landscape for the World Showcase pavilions. In addition, you will learn how you can apply many of these design elements to theme your home garden.

NOTE: You must be 16 years old and carry a government-issued photo identification. There is walking involved, so comfortable shoes are recommended and attire should be suitable for current weather conditions.

***Disney* Cooking Class – Now That's a Panini**
Wednesday, July 11 • 10:30 a.m. – 1:30 p.m.

The sights, sounds and wonderful aromas of a Disney cooking demonstration will make your mouth water! A Disney Chef will share some great ideas for creating magical meals on your grill at home. A sample of items include: cigar shrimp, jerk skewered chicken, balsamic glazed portobello mushroom skewers, tequila and lime beef quesadillas and pizzas sweet and savory. You will not go away hungry!

FIELD TOURS

Food Safety is Magical, But It Doesn't Magically Happen
Saturday, July 7 or Thursday, July 12
9:00 a.m. – 12:00 p.m.

During this tour, you will learn about the world-class food safety program at the *Walt Disney World*® Resort. This tour will include a presentation on the theory and operational aspects of Disney's food safety program, followed by a walking tour of one of the largest food service operations on property to illustrate the application of principles.

Behind the Seeds Tour
Saturday, July 7 or Thursday, July 12
9:00 a.m. – 12:00 p.m.

Get "up close and personal" with plants, insects and fish to explore and discover how scientists are working on innovative technology to support the future of food production. You will learn about the use of aquaculture in production of fish and shellfish, innovative plant-growing techniques and the use of predator insects to control pests.

Reedy, Set, Go – Behind the Scenes of Environmental Services
Thursday, July 12 • 9:00 a.m. – 12:00 p.m.

Go behind the scenes of the Reedy Creek Improvement District Environmental Services lab. This tour will include an overview of the history of the Reedy Creek Improvement District, a discussion of the essential role they play in monitoring the environment on and around the *Walt Disney World*® Resort property and a tour of the environmental services laboratory operations.

Food Irradiation Facility Tour
Thursday, July 12 • 8:30 a.m. – 11:30 a.m.

This is your opportunity to tour the Food Technology Service, Inc. facility. Food Tech was constructed as the nation's first commercial food irradiation company. Since 1992, the facility has been the leader in processing irradiated produce, poultry, and meat products for processors, retailer, and foodservice companies.

Food Tech has a long history of partnering with its customers to educate, introduce and implement irradiation as a food safety tool. Don't miss this exciting opportunity to see a working gamma food irradiation plant and learn more about this technology.

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

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 June 5, 2007. After this date, late registration fees are in effect.

CANCELLATION POLICY

Registration fees, less a $50 administration fee and any applicable bank charges, will be refunded for written cancellations received by June 22, 2007. No refunds will be made after June 22, 2007; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after July 16, 2007.

Event and tour tickets purchased are nonrefundable.

International Association for Food Protection®

EXHIBIT HOURS

Sunday, July 8, 2007	7:00 p.m. – 9:00 p.m.
Monday, July 9, 2007	10:00 a.m. – 6:00 p.m.
Tuesday, July 10, 2007	10:00 a.m. – 6:00 p.m.

DAYTIME EVENTS

Saturday, July 7, 2007	8:30 a.m. – 4:30 p.m.
Kennedy Space Center (Lunch included)	
Sunday, July 8, 2007	9:00 a.m. – 3:00 p.m.
Merritt Island Airboat Excursion (Lunch included)	
Monday, July 9, 2007	9:00 a.m. – 12:00 p.m.
Disney Behind-the-Scenes Tour–Innovation in Action	
Tuesday, July 10, 2007	9:00 a.m. – 12:00 p.m.
Disney Behind-the-Scenes Tour–Gardens of the World	
Wednesday, July 11, 2007	10:30 a.m. – 1:30 p.m.
Disney Cooking Class – Now That's a Panini (Lunch included)	

EVENING EVENTS

Sunday, July 8, 2007	
Opening Session	6:00 p.m. – 7:00 p.m.
Cheese and Wine Reception *Sponsored by Kraft Foods*	7:00 p.m. – 9:00 p.m.
Monday, July 9, 2007	
Exhibit Hall Reception *Sponsored by DuPont Qualicon*	5:00 p.m. – 6:00 p.m.
Monday Night Social – American Adventure at *Epcot*® *Sponsored by DuPont Qualicon*	6:30 p.m. – 10:00 p.m.
Tuesday, July 10, 2007	
Exhibit Hall Reception	5:00 p.m. – 6:00 p.m.
IAFP Foundation Fundraiser – *Disney's* Adventurers Club	6:30 p.m. – 9:30 p.m.
Wednesday, July 11, 2007	
Awards Banquet Reception	6:00 p.m. – 7:00 p.m.
Awards Banquet	7:00 p.m. – 9:30 p.m.

FIELD TOURS

Saturday, July 7, 2007 (Limited number of tickets available)	
Food Safety is Magical, But It Doesn't Magically Happen	9:00 a.m. – 12:00 p.m.
Behind the Seeds Tour	9:00 a.m. – 12:00 p.m.
Thursday, July 12, 2007 (Limited number of tickets available)	
Food Safety is Magical, But It Doesn't Magically Happen	9:00 a.m. – 12:00 p.m.
Behind the Seeds Tour	9:00 a.m. – 12:00 p.m.
Reedy, Set, Go – Behind the Scenes of Environmental Services	9:00 a.m. – 12:00 p.m.
Food Irradiation Facility Tour	8:30 a.m. – 11:30 a.m.

GOLF TOURNAMENT

Saturday, July 7, 2007	
Golf Tournament at *Disney's Magnolia* Golf Course	6:30 a.m. – 12:30 p.m.

HOTEL INFORMATION

Hotel reservations can be made online at www.foodprotection.org.

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 2007 Registration Form

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 E-mail) 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 JUNE 5, 2007 TO AVOID LATE REGISTRATION FEES

REGISTRATION FEES:	MEMBERS	NONMEMBERS	TOTAL
Registration	$ 405 ($ 455 late)	$ 615 ($ 665 late)	
Association Student Member	$ 80 ($ 90 late)	Not Available	
Retired Association Member	$ 80 ($ 90 late)	Not Available	
One Day Registration* ❒ Mon. ❒ Tues. ❒ Wed.	$ 220 ($ 245 late)	$ 340 ($ 365 late)	
Spouse/Companion* (Name): _____	$ 60 ($ 60 late)	$ 60 ($ 60 late)	
Children 15 & Over* (Names): _____	$ 25 ($ 25 late)	$ 25 ($ 25 late)	
Children 14 & Under* (Names): _____	FREE	FREE	
*Awards Banquet not included			
Additional Awards Banquet Ticket – Wednesday, 7/11	$ 50 ($ 60 late)	$ 50 ($ 60 late)	
Student Luncheon – Sunday, 7/8	$ 10 ($ 15 late)		
DAYTIME EVENTS		**# OF TICKETS**	
Golf Tournament – Saturday, 7/7 (Lunch included)	$ 165 ($ 175 late)		
Kennedy Space Center – Saturday, 7/7 (Lunch included)	$ 99 ($ 109 late)		
Merritt Island Airboat Excursion – Sunday, 7/8 (Lunch included)	$ 110 ($ 120 late)		
Disney Behind-the-Scenes Tour–Innovation in Action – Monday, 7/9	$ 105 ($ 115 late)		
Disney Behind-the-Scenes Tour–Gardens of the World – Tuesday, 7/10	$ 104 ($ 114 late)		
Disney Cooking Class – Now That's a Panini – Wednesday, 7/11	$ 50 ($ 60 late)		
EVENING EVENTS			
Monday Night Social – American Adventure at *Epcot*® – Monday, 7/9	$ 45 ($ 55 late)		
IAFP Foundation Fundraiser – *Disney's* Adventurers Club – Tuesday, 7/10	$ 150 ($ 160 late)		
FIELD TOURS			
Saturday, 7/7 (Limited number of tickets available)			
Food Safety is Magical, But It Doesn't Magically Happen	$ 10		
Behind the Seeds Tour	$ 10		
Thursday, 7/12 (Limited number of tickets available)			
Food Safety is Magical, But It Doesn't Magically Happen	$ 10		
Behind the Seeds Tour	$ 10		
Reedy, Set, Go – Behind the Scenes of Environmental Services	$ 10		
Food Irradiation Facility Tour	$ 10		

PAYMENT OPTIONS: ❒ VISA ❒ MasterCard ❒ Discover

TOTAL AMOUNT ENCLOSED $ _____
US FUNDS on US BANK

❒ Check Enclosed

Credit Card # _____

Expiration Date _____

Name on Card _____

Signature _____

Refunds subject to cancellation policy

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

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

EXHIBITORS DO NOT USE THIS FORM

IAFP 2007 WORKSHOPS

WORKSHOP 1	WORKSHOP 2	WORKSHOP 3	WORKSHOP 4
Environmental Sampling of Food and Water – Wet Lab	**Creating a Food Safety Management System (FSMS)**	**Predictive Microbiology as a HACCP Validation and Support Tool**	**Controlling *Listeria monocytogenes* in Ready-to-Eat Meat and Poultry Products: A Train-the-Trainer Workshop**
Friday and Saturday, July 6–7	Saturday, July 7	Saturday, July 7	Saturday, July 7

Workshop 1 – Environmental Sampling of Food and Water – Wet Lab – Friday and Saturday, July 6–7

Organized in cooperation with the Applied Methods PDG

This course is designed for laboratory technical staff, laboratory managers, supervisors and quality assurance managers and others responsible for making decisions about sampling plans and corrective actions in response to data retrieved in food production facilities. Topics of discussion and demonstrations include food and ingredient sampling plans, sample compositing schemes, and environmental swabbing and sampling in a production facility, to include air and water testing. The workshop program will include demonstration by vendors and opportunity for laboratory hands-on experience. The workshop will provide a close networking environment for discussion with instructors and other participants as well as a binder of information to reinforce the practical experience gained during the workshop.

Topics:

- Principles and Applications of Sampling for Foods and Food Environments: Challenges and Opportunities
- New and Novel Approaches to Sampling the Environment with Method Demonstrations
- Environmental Sampling Plans, Compositing Methodology, Frequency and Corrective Action
- Pathogen Specific vs. Standard Hygiene Monitoring
- ATP and Allergen Testing Discussions and Demonstrations
- Laboratory Hands-on Experience Including Related Methodologies via Vendor Demonstration

Intended Audience

Microbiologists, quality assurance and laboratory personnel, especially professionals in small- to medium-sized laboratories or companies

Instructors:

Bruce Bradley, Microbial-Vac, Jerome, ID, USA
Larry Cohen, Kraft Foods, Inc., Glenview, IL, USA
Tim Freier, Cargill, Minneapolis, MN, USA
Charles Gerba, University of Arizona-Tempe, Tuscon, AZ, USA
Elliot Ryser, Michigan State University, East Lansing, MI, USA
Jeff Kornacki, Kornacki Microbiology Solutions Inc., McFarland, WI, USA
Purnendu C. Vasavada, University of Wisconsin-River Falls, River Falls, WI, USA

Organizers:

Jeff Kornacki, Kornacki Microbiology Solutions Inc., McFarland, WI, USA
Purnendu C. Vasavada, University of Wisconsin-River Falls, River Falls, WI, USA

Laboratory Host:

Roseann S. White, University of Central Florida, Orlando, FL, USA

Workshop 2 – Creating a Food Safety Management System (FSMS) – Saturday, July 7

Ongoing public concerns regarding the safety of the food supply have not abated. Stimulated by a steady stream of food safety incidents and resultant media attention, today's consumers have lost confidence in some sectors of the food supply. Consumers want assurances the food they buy is safe to eat, regardless of where it was grown, raised, or manufactured. They are asking questions about the integrity of the food supply – how is food safety maintained? Who is providing the assurance? Who is validating and verifying the systems implemented?

Retailers and food service corporations, sensitive to the demands of their customers, now require their food suppliers implement better and more consistent food safety and quality management systems (and this is not to be confused with "just having an audit").

The purpose of this workshop is to raise awareness of the need for food suppliers to implement credible food safety management systems. Information will be provided on the different food safety management systems that suppliers can choose from. The content will cover the importance of gaining management commitment, outline how to develop and implement a food safety management system and finally how to validate and verify the food safety controls implemented. Further instruction will be provided on how to conduct internal audits (self assessment) and to prepare for the external audit.

A panel session at the end of the day will enable participants to further discuss the topics covered.

Topics:

- Why Do You Need a FSMS?
- Choosing the Food Safety Standard That Meets Your Business Needs and the Needs of Your Customer
- Where are You and Where Do You Want to Be?
- Documenting and Implementing Your FSMS – A Case Study
- Validating and Verifying the FSMS – Internal and External Audits

Intended Audience

Retailers, manufacturers/ processors, food service companies, primary producers, food safety professionals (auditors, trainers, consultants), food regulators

Instructors:

Richard Baines, Management Systems Food Safety and Environment, Royal Agricultural College, Cirencester, Gloucestershire, UK
Larry Hood, JohnsonDiversey Consulting, Bridgewater, NJ, USA
Alex von Holy, von Holy Consulting CC, Roosevelt Park, Gauteng, Republic of South Africa
Marjorie Jones, SGS Consumer Testing Services, Fairfield, NJ, USA
Paul Ryan, Food Marketing Institute, Arlington, VA, USA

Organizer:

Paul Ryan, Food Marketing Institute, Arlington, VA, USA

Workshop 3 – Predictive Microbiology as a HACCP Validation and Support Tool – Saturday, July 7

How severe is this cooling deviation? How long does it take for pathogens to grow at low temperatures such as 50°F? What can the HACCP team do to justify the rationale behind chosen critical limits? Does my heat treatment provide sufficient lethality? What are the boundaries for microbial growth that I can use for product formulation? Increasingly, both regulatory agencies and food industry scientists and managers are placing a renewed emphasis on HACCP validation for important pathogens such as *C. perfringens*, *B. cereus*, *S. aureus*, *Salmonella*, and *L. monocytogenes*, just to name a few. This workshop will serve as an introduction to the practical application of predictive microbiology as a tool to help answer such questions. Scientific and regulatory perspective on using predictive microbiology will be presented, along with an overview and demonstration of growth, survival and inactivation models in programs such as the Pathogen Modeling Program, ComBase Growth Predictor, and the Integrated Lethality Spreadsheet. Half a dozen case studies will be presented and discussed, including a hands-on working group exercise to illustrate the use (and how to avoid misuse) of various models to address real life problems.

Topics:

- Scientific Perspective on Predictive Microbiology and Its Relationship to HACCP Validation
- Fundamentals of Predictive Microbiology
- Overview and Demonstration of Software Tools
- Regulatory Perspective of FSIS and FDA on the Use of Predictive Microbiology
- Case Study and Working Group Exercises

Intended Audience

Food industry professionals responsible for HACCP validation; food safety and quality assurance professionals; and regulatory agency officials and academic food microbiologists with a special interest in predictive microbiology

Instructors:

Richard Whiting, Food and Drug Administration, College Park, MD, USA
Donald Schaffner, Rutgers University, New Brunswick, NJ, USA
Yuhuan Chen, GMA/FPA, Washington, D.C., USA
Jenny Scott, GMA/FPA, Washington, D.C., USA

Organizers:

Yuhuan Chen, GMA/FPA, Washington, D.C., USA
Donald Schaffner, Rutgers University, New Brunswick, NJ, USA

Workshop 4 – Controlling *Listeria monocytogenes* in Ready-to-Eat Meat and Poultry Products: A Train-the-Trainer Workshop – Saturday, July 7

While the number of recalls due to *Listeria monocytogenes* contamination on ready-to-eat meat and poultry products have decreased, the pathogen is still a challenge to control for meat and poultry processors, especially the small processors. There have been several efforts to control this pathogen for the past decade, but recent USDA-FSIS regulations have prompted the RTE meat and poultry industry to take a fresh look and institute controls to reduce the risk of this pathogen. There is an increasing volume of research being conducted on control strategies for this pathogen, especially in RTE meat and poultry products. These strategies include improved sanitation methods to eliminate the pathogen from the RTE meat and poultry processing environment, post-lethality treatments to reduce the populations as well as a myriad of antimicrobial agents to control growth during subsequent refrigerated storage. This workshop is intended to train the trainers such as extension personnel at land grant universities, food safety personnel at meat processing establishments and other food safety consultants who work with processors routinely.

This train-the-trainer workshop is partially funded by a grant from the National Integrated Food Safety Initiative (Special Emphasis Grant No. 2005-51110-03278) of the Cooperative State Research, Education, and Extension Service, US Department of Agriculture to Colorado State University, Cornell University, University of Nebraska-Lincoln, Kansas State University and The Ohio State University. The project focused on the development of methods and technologies to reduce the risk of *L. monocytogenes* in RTE meat and poultry products. The workshop is designed to provide state-of-the-art knowledge on control of *L. monocytogenes* and reducing its risk to the processors as well as the consumers.

Topics:

- Communicating with an Adult Audience – Relevance to Extension Education Programs
- *Listeria monocytogenes*: Is It Still an Issue in RTE Meat and Poultry Products?
- *Listeria monocytogenes* – Ecology of an Elusive Foodborne Pathogen in RTE Processing Environment
- Regulations Pertaining to RTE Meat and Poultry Products – Current Perspective
- Post Lethality Treatments to Reduce *Listeria monocytogenes* on RTE Meat and Poultry Products – An Update
- Antimicrobial Agents to Control *Listeria monocytogenes* on RTE Meat and Poultry Products – An Update
- Strategies to Control *Listeria monocytogenes* on RTE Meat and Poultry Products – A Small Processor Perspective

Intended Audience

Extension specialists in the areas of food safety, microbiology and meat processing as well as food safety and QA personnel from the RTE meat and poultry industry

Instructors:

Dennis E. Burson, University of Nebraska, Lincoln, NE, USA
Pat Kendall, Colorado State University, Fort Collins, CO, USA
Randall Phebus, Kansas State University, Food Science Institute, Manhattan, KS, USA
John Sofos, Colorado State University, Fort Collins, CO, USA
Harshavardhan Thippareddi, University of Nebraska, Lincoln, USA
Martin Wiedmann, Cornell University, Ithaca, NY, USA

Organizer:

Harshavardhan Thippareddi, University of Nebraska, Lincoln, NE, USA

IAFP 2007 WORKSHOP REGISTRATION FORM

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Last Name _____

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Payment must be received by June 15, 2007 to avoid late registration rates.

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	Early Rate	Late Rate
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	Early Rate	Late Rate
Extension Specialist	$150.00	$225.00
Other	$350.00	$425.00

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

For student rates, call the Association office.

Refund/Cancellation Policy
Registration fees, less a $50 administrative charge, will be refunded for written cancellations received by June 22, 2007. 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 July 16, 2007. The workshop may be cancelled if sufficient enrollment is not received by June 15, 2007.

For further information, please contact the Association office at 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: jcattanach@foodprotection.org.

• 4 Easy Ways to Register •

Register online or complete the Workshop Registration Form and submit it to the International Association for Food Protection by:

Online: 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

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The Foundation of the International Association for Food Protection will hold its Annual Silent Auction during IAFP 2007, the Association's 94th Annual Meeting in Lake Buena Vista, FL, July 8–11, 2007. The Foundation supports:

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E-mail: dgronstal@foodprotection.org

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COMING EVENTS

MAY

- **2–4, AACC International C&E Spring Meeting,** Le Corum Conference Centre, Montpellier, France. For more information, go to www.cerealsandeurope.net.
- **5–8, United Fresh Marketplace,** McCormick Place Convention Center, Chicago, IL. For more information, call 202.303.3400 or go to www.unitedfresh.org.
- **5–10, The 31st National Conference on Interstate Milk Shipments,** Little America Hotel, Salt Lake City, UT. For more information, contact Leon Townsend at 502.695.0253; E-mail: ltownsend@ncims.org.
- **6–8, FMI Show Plus MARKETECHNICS®,** McCormick Place, Chicago, IL. For more information, go to www.fmi.org.
- **12–14, Interbake China 2007,** Guangzhou International Convention and Exhibition Center, Guangzhou, China. For more information, go to www.interbakechina.com.
- **15–16, Pennsylvania Association of Milk, Food and Environmental Sanitarians 68th Annual Conference,** University Park, PA. For more information, contact PSU at 814.865.8301; E-mail: shortcourse@psu.edu.
- **15–17, Fresh-cut Produce Hands-on HACCP Workshop,** University of Georgia Food Science Outreach Program, Athens, GA. For more information, contact Marian at 706.542.2574; E-mail: marianw@uga.edu.
- **16–17, Associated Illinois Milk, Food and Environmental Sanitarians Spring Meeting,** Bloomington, IL. For more information, contact Steve DiVincenzo at 217.785.2439; E-mail: sdivince@idph.state.il.us.
- **17–19, *Campylobacter* Isolation and Identification Workshop,** Auburn University, Auburn, AL. For more information, contact Omar A. Oyarzabal at 334.844.2608 or go to www.campylobacterworkshop.com.
- **21–24, 3-A Sanitary Standards, Inc. Annual Meeting,** Milwaukee, WI. For more information, call 800.633.5137 or go to www.3-a.org.

JUNE

- **4–6, Texas Association for Food Protection's 26th Annual Meeting,** Omni Southpark, Austin, TX. For more information, contact Howard Depoy at 936.756.6455; E-mail: hwdepoy@milkproductslp.com.
- **7–8, Food Mycology 2007: Emerging Mold Problems and Spoilage in Food and Beverages,** Westin Key West, Key West, FL. For more information, contact BCN Research Laboratories at 800.236.0505; E-mail: emilia.rico@bcnlabs.com.
- **15, Brazil Association for Food Protection Annual Meeting,** University of São Paulo, São Paulo, Brazil. For more information, contact Maria Teresa Destro at 55.11.3091.21.99; E-mail: abrappa@abrappa.org.br.
- **15–22, XXVII International Workshop/Symposium on Rapid Methods and Automation in Microbiology,** Kansas State University, Manhattan, KS. For more information, contact Daniel Y.C. Fung at 785.532.1208; E-mail: dfung@ksu.edu.
- **20, New Zealand Association for Food Protection Annual Meeting,** Town Hall, Wellington, NZ. For more information, contact Roger Cook at 64.4.463.2523; E-mail: roger.cook@nzfsa.govt.nz.
- **26–27, In-Plant Control of Microbial Contamination in Refrigerated and Processed Foods,** University of Georgia, Athens, GA. For more information, contact Marian at 706.542.2574; E-mail: marianw@uga.edu.

JULY

- **6–7, IAFP 2007 Workshops,**
  Workshop 1 – Environmental Sampling of Food and Water – Wet Lab
  Workshop 2 – Creating a Food Safety Management System (FSMS)
  Workshop 3 – Predictive Microbiology as a HACCP Validation and Support Tool
  Workshop 4 – Controlling *Listeria monocytogenes* in Ready-to-Eat Meat and Poultry Products: A Train-the-Trainer Workshop

  For more information, contact Julie Cattanach at 800.369.6337; E-mail: jcattanach@foodprotection.org. See our registration form on page 273.
- **8–11, IAFP 2007,** *Disney's Contemporary* Resort, Lake Buena Vista, FL. For more information, contact Julie Cattanach at 800.369.6337; E-mail: jcattanach@foodprotection.org. See our registration form on page 269.
- **10–12, Meat and Poultry Marination Short Course,** University of Georgia Food Science, Athens, GA. For more information, contact Marian at 706.542.2574; E-mail: marianw@uga.com.
- **28–Aug. 1, Institute of Food Technologists Annual Meeting and Food Expo,** Chicago, IL. For more information, call 312.782.8424; E-mail: info@ift.org.

AUGUST

- **7–9, Using SPC for HACCP Verification in Poultry and Food Industry,** University of Georgia Food Science, UGA Campus, Athens, GA. For more information, contact Marian at 706.542.2574; E-mail: marianw@uga.edu.

IAFP UPCOMING MEETINGS

JULY 8-11, 2007
Lake Buena Vista, Florida

AUGUST 3-6, 2008
Columbus, Ohio

JULY 12-15, 2009
Grapevine, Texas

COMING EVENTS

SEPTEMBER

- **11–12, Meat & Poultry HACCP Accredited Workshop,** University of Georgia Food Science, UGA Campus, Athens, GA. For more information, contact Marian at 706.542.2574; E-mail: marianw@uga.edu.
- **12–13, China International Food Safety and Quality Conference and Expo,** The Landmark Tower Hotel, Beijing, China. *Program assistance provided by IAFP.* For more information, go to www.chinafoodsafety.com.
- **18–20, New York State Association for Food Protection 84th Annual Conference,** E. Syracuse, NY. For more information, contact Janene Lucia at 607.255.2892; E-mail: jgg3@cornell.edu.
- **19–21, Washington Association for Food Protection Annual Meeting,** Campbell's Resort and Conference Center, Lake Chelan, WA. For more information, contact Stephanie Olmsted at 206.660.4594; E-mail: Stephanie.Olmsted@safeway.com.

ADVERTISING INDEX

Journal of Food Protection®

ISSN: 0362-028X
Official Publication

International Association for Food Protection

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Vol. 70 March 2007 No. 3

Research Notes

Reviews

* Asterisk indicates author for correspondence.

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

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

1 Planning Dairy Freestall Barns
2 Effective Installation, Cleaning, and Sanitizing of Milking Systems
3 Selected Personnel in Milk Sanitation
4 Installation, Cleaning, & Sanitizing of Large Parlor Milking Systems
5 Directory of Dairy Farm Building & Milking System Resource People
6 Natural Ventilation for Dairy Tie Stall Barns
7 Sampling Fluid Milk
8 Good Manufacturing Practices for Dairy Processing Plants
9 Fundamentals of Cleaning & Sanitizing Farm Milk Handling Equipment
10 Maintaining & Testing Fluid Milk Shelf-Life
11 Sediment Testing & Producing Clean Milk
12 Tunnel Ventilation for Dairy Tie Stall Barns
13 Environmental Air Control and Quality for Dairy Food Plants
14 Clean Room Technology
15 Milking Center Wastewater
16 Handling Dairy Products from Processing to Consumption
17 Prevention of & Testing for Added Water in Milk
18 Fieldperson's Guide to High Somatic Cell Counts
21 Raw Milk Quality Tests
22 Control of Antibacterial Drugs & Growth Inhibitors in Milk and Milk Products
23 Preventing Rancid Flavors in Milk
24 Troubleshooting High Bacteria Counts of Raw Milk
25 Cleaning & Sanitation Responsibilities for Bulk Pickup & Transport Tankers
27 Dairy Manure Management From Barn to Storage
28 Troubleshooting Residual Films on Dairy Farm Milk Handling Equipment
29 Cleaning & Sanitizing in Fluid Milk Processing Plants
30 Potable Water on Dairy Farms
31 Composition & Nutritive Value of Dairy Products
32 Fat Test Variations in Raw Milk
33 Brucellosis & Some Other Milkborne Diseases
34 Butterfat Determinations of Various Dairy Products
35 Dairy Plant Waste Management
36 Dairy Farm Inspection
37 Planning Dairy Stall Barns
38 Preventing Off-Flavors in Milk
39 Grade A Fluid Milk Plant Inspection
40 Controlling Fluid Milk Volume and Fat Losses
41 Milkrooms and Bulk Tank Installations
42 Stray Voltage on Dairy Farms
43 Farm Tank Calibrating and Checking
45 Gravity Flow Gutters for Manure Removal in Milking Barns
46 Dairy Odor Management
48 Cooling Milk on the Farm
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50 Farm Bulk Milk Collection Procedures
51 Controlling the Accuracy of Electronic Testing Instruments for Milk Components
53 Vitamin Fortification of Fluid Milk Products
54 Selection of Elevated Milking Parlors
54S Construction Materials for Milking Parlors
56 Dairy Product Safety (Pathogenic Bacteria) for Fluid Milk and Frozen Dessert Plants
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58 Sizing Dairy Farm Water Heater Systems
59 Production and Regulation of Quality Dairy Goat Milk
60 Trouble Shooting Microbial Defects: Product Line Sampling & Hygiene Monitoring
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70 Design, Installation & Cleaning of Small Ruminant Milking Systems
71 Farmers Guide To Somatic Cell Counts In Sheep
72 Farmers Guide To Somatic Cell Counts In Goats
73 Layout of Dairy Milk Houses for Small Ruminant Operations
75 Direct Microscopic Exam of Milk from Small Ruminants (training CD)
78 Biosecurity for Sheep and Goat Dairies
80 Food Allergen Awareness In Dairy Plant Operations
83 Bottling Water in Fluid Milk Plants
85 Six Steps to Success - Production of Low SCC Milk (training CD)
90 On-Farm & Small-Scale Dairy Products Processing
91 HACCP - SSOP's and Prerequisites
92 HACCP - Principle Number One: Hazard Analysis
93 HACCP - Principles 2 & 3 Critical Control Points & Critical Limits
97 Direct Loading of Milk from Parlor into Bulk Tankers
100 Food Safety in Farmstead Cheesemaking
101 Farmers Guide To Somatic Cell Counts In Cattle
102 Effective Installation, Cleaning & Sanitizing of Tie Barn Milking Systems
103 Approving Milk and Milk Product Plants for Extended Runs
105 Sealing Bulk Milk Truck Tanks

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

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

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

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

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

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

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

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

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- ❒ D1060 Frozen Dairy Products
- ❒ D1070 The Gerber Butterfat Test
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ENVIRONMENTAL

- ❒ E2012 Better TEDs for Better Fisheries
- ❒ E3010 The ABC's of Clean – A Handwashing and Cleanliness Program for Early Childhood Programs
- ❒ E3020 Acceptable Risks?
- ❒ E3030 Air Pollution: Indoor
- ❒ E3031 Allergy Beware
- ❒ E3040 Asbestos Awareness
- ❒ E3055 Effective Handwashing – Preventing Cross-Contamination in the Food Service Industry
- ❒ E3060 EPA Test Methods for Freshwater Effluent Toxicity Tests (Using Ceriodaphnia)
- ❒ E3070 EPA Test Methods for Freshwater Toxicity Tests (Using Fathead Minnow Larva)
- ❒ E3075 EPA: This is Super Fund
- ❒ E3080 Fit to Drink
- ❒ E3110 Garbage: The Movie
- ❒ E3120 Global Warming: Hot Times Ahead
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- ❒ E3130 Kentucky Public Swimming Pool and Bathing Facilities
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- ❒ E3170 Tape 1 – Changes in the Remedial Process: Clean-up Standards and State Involvement Requirements
- ❒ E3180 Tape 2 – Changes in the Removal Process: Removal and Additional Program Requirements
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- ❒ F2013 Control of *Listeria monocytogenes* in Small Meat and Poultry Establishments
- ❒ F2014 Controlling Food Allergens in the Plant
- ❒ F2015 Controlling *Listeria*: A Team Approach
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- ❒ F2101 Tape 2 – Food Safety for Food Service: HACCP
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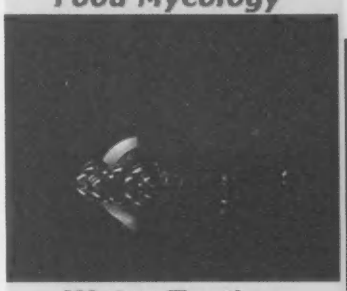

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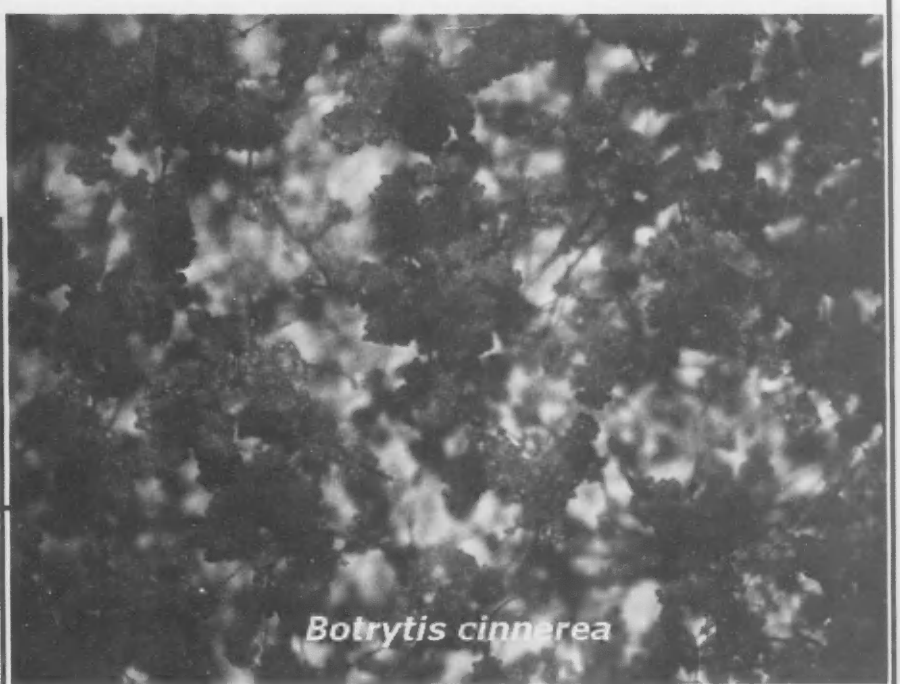

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