

DAIRY, FOOD AND ENVIRONMENTAL

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MARCH 2000

- 2000 Annual Meeting Preliminary Program
- 2000 Secretary Candidates

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Sanitation



International Association for
Food Protection

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Other exhibits open for your enjoyment will be:

- A Walk Through Time in Georgia
- Cultures of the World
- First Georgians

See the Annual Meeting registration form on page 229 of this issue for further details.





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Items donated last year include Country Breakfast Kits, Framed Prints, Handmade Quilt, Pearl Necklace, Waterford Crystal Millennium Goblets, and Wine. Donations are accepted from individuals, companies, and groups.

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If you would like to donate an item, complete the accompanying form and return it to the Association office. A listing of auction items and donors will be included in the Annual Meeting Program and Abstract Book.

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QUOTATIONS

FROM JACK



By JACK GUZEWICH
President

“What draws more food safety professionals to our meeting is the outstanding program”

I have just returned from our winter Executive Board and Program Committee meetings. These were the first official meetings under our new name and they were held at the Hilton Atlanta, the site of our August 2000 Annual Meeting. The Hilton is a beautiful hotel located in the heart of Atlanta. There is plenty to see and do in the hotel as well as within walking distance.

What draws more and more food safety professionals to our Annual Meeting is the outstanding program and this year will be better than ever! David Golden, our program committee chairperson and his committee members (Stan Bailey, Don Breiner, John Bruhn, Alejandro Castillo, Donald Conner, Jeff Farrar, Donna Garren, Paul Hall, Maria Nazarowec-White, Thomas Schwarz, and Frank Yiannas) have done outstanding jobs, as have the many folks who have arranged symposia or submitted abstracts. Speaking of abstracts, 217 were submitted this year compared to 169 last year. Counting oral and posters, over 300 scientific papers will be presented this year. There will be technical oral sessions on foodborne pathogens, microbial methods, inactivation and control methods and risk assessment. Technical poster sessions will cover inactivation and control methods, general food microbiology and education and microbiological methods.

There are 21 specific symposia scheduled as well as an open slot for a session on late breakers; stay tuned for that. Abbreviated topics include: *Campylobacter* Performance Standards, Food Safety in

Latin America and the Caribbean; Biosensors; HACCP; Viruses, *Listeria*; Genetic Methods; Sprouts; Produce on Farm Food Safety; Mycotoxins; Large Dairy Farms; Transportation of Raw and Finished Dairy Products; and Cook-chill/Sous Vide Technology to name a few. Our general session on Tuesday afternoon is titled, “Bioterrorism and Food Protection.” It promises to be an eye opener.

Of course all work and no play is no way to enjoy a conference. An excellent set of tours has been arranged by the Georgia Local Arrangements Committee chaired by Ed Giera, Judy Harrison and Pam Metheny. The Sunday tour stops at CNN, the world of Coca-Cola Museum, and Underground Atlanta. Monday’s tour has a historical theme stopping at the Carter Presidential Center and the Martin Luther King Center among others. On Tuesday the tour heads for exclusive Buckhead to see Atlanta’s little Hollywood area and the homes of many past and present wealthy Atlantans.

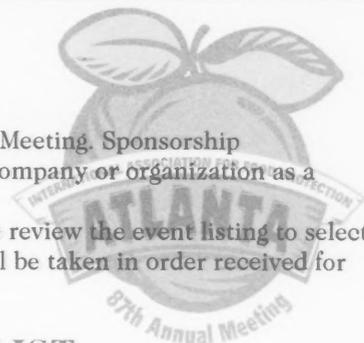
The Monday Social Event and dinner will be served at the famous Fernbank Museum of Natural History where you can see art galleries and exhibits including: Life and Death Under the Pharaohs, A Walk Through Time in Georgia, Cultures of the World, and First Georgians. Tuesday evening’s special event will feature dinner at Stately Oaks, a Greek Revival plantation home.

The 2000 Annual Meeting of the International Association for Food Protection will be one you won’t want to miss. I hope to see you there.

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We invite you to participate as a sponsor for the 2000 Annual Meeting. Sponsorship participation provides an excellent opportunity to position your company or organization as a supporter of the Association.

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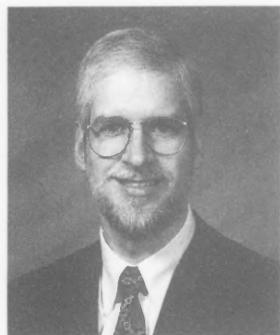
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COMMENTARY

FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP, CAE
Executive Director

“Let us cover
how the
Annual Meeting Program
comes
together”

On page 225 in this issue of *Dairy, Food and Environmental Sanitation*, you will find the Preliminary Program for our 87th Annual Meeting scheduled for August 6th to 9th in Atlanta, Georgia. This month I want to review how the Annual Meeting program comes together and explain the connection between our Annual Meeting and the Association Web site.

From the Preliminary Program, note that during most all session times we are offering five concurrent sessions this year in addition to a poster session. The large number of submissions of both symposia and technical sessions necessitated this action. For the first time ever, we will accommodate more than 300 presentations at this year's Annual Meeting. What a wonderful problem to have to deal with! Two factors led to this extensive program offering; one, of course, is the extreme interest in food science and safety that is sweeping the world today and the other was the ability to submit abstracts online.

This year was our first to offer online abstract submission and we can truly say it was an overwhelming success. Close to 95% of the submissions were received online or by E-mail! We only received 12 by mail and courier delivery.

Now, let us cover how the Annual Meeting Program comes together. Our Professional Development Groups (PDGs) and other

interested parties generate symposia topics and ideas. A symposium generally consists of six speakers with each giving a 30-minute presentation on a related topic. Normally, two convenors moderate the session to keep control of the time schedule. Symposia ideas are submitted to the Program Committee at the Annual Meeting one year in advance of presentation. The Committee reviews submitted symposia for appropriateness of topic as they relate to our attendees and recommends further development (if deemed appropriate). Fully developed symposia are then due before the January Program Committee meeting where final approval is granted.

Technical abstracts for individual presentations are submitted before the January Program Committee meeting. Committee members review each abstract and make the decision whether to accept or reject the presentation. Once accepted, the Committee painstakingly schedules each presentation to limit conflicting sessions or speaker schedules. The Program Committee, under the direction of Chairperson David Golden, completed their obligations and the program for Annual Meeting is now complete. Without the Committee's expertise, our program would not be possible. On behalf of all our Members, we extend a big "thank you" to each member of the Program Committee and to everyone on this year's Annual Meeting program!

We invite you to view the most complete program listing at the Association Web site (www.foodprotection.org) where you will also be able to register for the Annual Meeting online. Our E-commerce plans are progressing quickly. By the time you read this article, not only will you be able to register for the Annual Meeting; you will be able to renew your Membership, encourage new Members to complete their application for Membership online

and purchase booklets and other publications online. Also, look forward to seeing an online Membership Directory available to Members only by mid-March. You will need your name and Member number (on your Membership card) to gain access to the Members only section of the Web site.

I hope this short explanation gives you an insight about how many people are involved in bringing our Annual Meeting program to you. We covered the

process we go through to ensure only the highest quality presentations make it to the International Association for Food Protection Annual Meeting. We also discussed recent developments at the Association Web site. Please take time to view the Web site. While there, review the Annual Meeting program and plan your trip to Atlanta to attend the world's most comprehensive conference on food safety. We look forward to seeing you in August.



Visit our Web site
at www.foodprotection.org
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Annual Meeting information

Pre-Meeting Workshops

Saturday, August 5, 2000

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**Microbiological Sampling Plans
and Sample Collection
for Food Processors**

**Food Safety Impact
of Facility, Equipment
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A Survey of Virginia Apple Cider Producers' Practices

Jim R. Wright, Susan S. Sumner,* Cameron R. Hackney, Merle D. Pierson, and Bruce W. Zoecklein

SUMMARY

During the summer of 1998, questionnaires were mailed to 90 Virginia cider producers in an effort to gain a better understanding of current production practices. The questionnaire covered production levels and sales location, orchard management, facilities, processing, preservation measures, and additional safety measures. Most operations are seasonal, produce less than 5,000 gallons annually, and confine sales to Virginia. Although few producers fertilize orchards with manure, animals often graze nearby, and producers sometimes use drop and damaged apples. Most producers process in separate, enclosed areas and test water for bacteria. All indicated that equipment and facilities are cleaned and sanitized daily. The majority of producers sort apples before washing, use refrigerated storage, prevent contamination during storage, and wash and brush apples before pressing. However, most use only water for washing, and only 37% use a chemical sanitizer following the wash step. Few pasteurize cider or add preservatives; however, almost all store cider refrigerated or frozen. Although only 25% have an operating HACCP program, most have considered implementing HACCP. Few producers conduct microbiological tests on cider or include code numbers or expiration dates on labels. Finally, most producers expressed an interest in the use of alternative processing technologies to help assure the safety of their cider.

INTRODUCTION

In 1997, approximately 9,000 apple growers with orchards covering over 459,000 acres in the United States produced a crop valued at over 1.5 billion dollars (32). This indicates the importance of apples as an agricultural product in the United States; apples rank as the third most significant fruit crop in terms of annual production, and apple juice ranks second to orange juice among fruit juices consumed (10). Approximately 21% of the 1997 apple crop was processed into juices, including apple cider (32).

Prior to the 1940s, most apple juice was consumed fresh in the form of cider and was mainly a seasonal beverage (10). Since that time, cider production has decreased, in part because of the rapid growth of commercially canned juices (33). However, apple cider has its own distinctive appeal, is desired by many consumers, and provides an important source of income for apple growers (33).

Recently, outbreaks of hemolytic uremic syndrome (HUS) involving *Escherichia coli* O157:H7 in unpasteurized apple cider and juice have generated concern about its safety (1, 6, 7). Although, apple juice is often pasteurized, cider producers have relied upon the product's inherent acidity, as well as refrigeration and chemical preservatives, for preservation (10). However, research has shown that *E. coli* O157:H7 can survive in cider despite its low pH and regardless of

TABLE 1. Apple cider producers' responses about orchard management practices & facilities

Practices	Percentage answering "yes"
Purchase apples from outside sources	33
Fertilize orchards with manure	8
Permit animal grazing in orchards	5
Animals present in adjacent fields	54
Use drop apples for cider	32
Processing conducted in separate, enclosed area	79
Test water supply regularly for coliforms	72.5
Clean and sanitize equipment and facilities daily	100

whether refrigeration or preservatives are used (24, 37).

Therefore, alternative means of assuring the safety of unpasteurized cider are currently being sought. The purpose of this study was to gain information on practices currently used in apple cider production and what research the cider industry may need to help assure the production of a safe and high-quality product.

MATERIALS AND METHODS

During the summer of 1998, a questionnaire on cider producers' practices was developed and sent to 90 Virginia cider producers whose names and addresses had been obtained from Virginia Apple Growers Association (Richmond, VA).

The survey contained 30 questions pertaining to cider production and included a request for comments. Questions dealt with production levels, orchard management, facilities, fruit handling and processing, preservation measures, and additional safety measures. Of the 30 questions, 26 were of the "yes/no" type. The four multiple choice ques-

tions pertained to annual production levels, the source of apples, the frequency with which drop apples are gathered, and types of preservatives used. The survey was conducted on a basis of anonymity to assure the best possible response rate.

Forty-two questionnaires were returned, and the number of valid responses for specific questions ranged from 38 to 42. Some respondents did not provide answers for all questions. Three of the questions either did not apply to all producers or were dependent on prior questions and thus had fewer responses. For multiple choice questions with more than one choice marked, only the first response was included in calculations. For "yes/no" questions, the percentages reported are for "yes" answers; the percentage of respondents answering "no" can be obtained by subtracting the percentage of "yes" answers from 100. For all questions, percentages were obtained by dividing the total number of responses for a particular choice (yes/no or a, b, c, d, etc.) by the number of valid responses for a the question.

RESULTS AND DISCUSSION

Production levels and location of sales

It appears that a large portion of the Virginia cider industry consists of small, seasonal operations that market their product locally. The majority (59%) of respondents produce less than 5,000 gal of cider per year, and only 12% produce over 50,000 gal annually. A survey of Michigan cider producers obtained similar findings, with most operations producing under 5,000 gal and very few producing over 100,000 gal (35). Most processors (79%) sell cider only in Virginia. In addition, in the comments section, several respondents described their operations as small and seasonal. Seasonal production and in-state sales were also characteristic of Michigan producers (35). Virginia producers also expressed concerns about new regulations, and a few stated that they would likely cease production if faced with additional expenses.

Orchard management

Responses to questions on orchard management are given in Table 1. Most processors (67%) grow all their own apples. Only 8% of processors use manure to fertilize orchards, and only 5% indicate that domesticated animals are permitted to graze in orchards. These findings are in agreement with those of the Michigan survey (35). However, 54% of respondents noted that animals do graze in adjacent fields. In addition, 32% of producers reported using drop apples. The majority (66.6%) of those who use drops gather drop apples at least twice per week, although 25% gather drops only at the time of picking. In contrast, the Michigan survey reported that the use of drops was considerable and that drop apples were allowed to remain on the ground for some time prior to gathering (35). In a survey conducted by the CDC, of cider producers attending a meeting of the New England Fruit Growers, all 36 respondents reported that they use drop apples (1).

TABLE 2. Apple cider producers' responses about fruit handling and processing and preservation measures

Practices	Percentage answering "yes"
Sort apples to remove damaged, wormy, and unacceptable fruit	98
Sort apples before washing	82
Use damaged fruit for cider	37.5
Wash apples before crushing	93
Use detergent-based fruit wash	18
Use sanitizer after washing	37
Employ brushing in conjunction with washing	64
Refrigerate apples before use	63
Prevent contamination during storage	80
Pasteurize cider	22
Add preservatives	12
Chill cider immediately following production	93
Store cider refrigerated or frozen until sale	92.5

Because cattle, deer, and other wildlife are carriers for *E. coli* O157:H7, contamination is probably due to contact with or cross contamination from animal manure (19). Consequently, the use of drop apples for cider production is a risky practice. Fruit that has come into contact with the ground should be limited to use in products that receive a heat treatment to reduce the possibility of *E. coli* O157:H7 contamination (27). Fencing could be used to help restrict the entry of animals into orchards (22).

Facilities

Seventy-nine percent of respondents carry out all processing steps in a separate, enclosed room or building, and all reported that facilities and processing equipment are cleaned and sanitized at the end of

production each day (Table 1). Such practices are important to prevent outside sources of contamination, such as insects and rodents, from gaining entry to the processing plant and to prevent cross contamination from processing equipment (31). In an investigation of the prevalence of acid- and heat-resistant bacteria in apple cider and juice plants, it was found that bacterial counts increased gradually during daily production, an increase attributed to microbial growth in or on production equipment (30). Improperly cleaned and sanitized equipment results in residual fruit and juice and may lead to the survival of aciduric microorganisms (10).

The microbiological quality of cleaning water is very important, and coliform testing is required for most water supplies used for food processing (14). Most producers

(72.5%) noted that their water supplies are tested regularly for coliform bacteria. Wash and flume water should be tested regularly to ensure that it does not become a source of contamination (4, 15). *E. coli* O157:H7 can survive for long periods in water, especially cold water (34). In a study of cider and juice processing facilities, it was found that coliforms increased in wash and flume waters during the production day (16). This finding provides additional impetus for starting with clean water that is free of coliform bacteria.

Fruit handling and processing

Responses to questions related to fruit handling and processing are given in Table 2. Almost all processors (98%) sort apples to remove wormy, rotten, or otherwise unacceptable fruit, and 82% of those who sort apples do so before washing. However, 37.5% acknowledge that damaged fruit is used for cider production. These results are consistent with those of the Michigan survey (35). The removal of damaged fruit prior to washing is advised, because it may harbor bacteria that could be spread through wash water to sound apples (3). The waxy skin of apples provides a barrier to microbial entry; however, breaks in the skin weaken this natural defense (9).

Most producers (63%) refrigerate apples that are not used immediately and 80% indicate they take measures to prevent additional contamination during storage. Although refrigeration is not lethal to *E. coli* O157:H7, it can reduce microbial growth and reproduction and slow spoilage and rotting that could lead to increased levels of contamination (27). The prevention of contamination during storage is also critical, and measures taken for this purpose will help to maintain the microbiological quality of the fruit. Insects, birds, small animals, and other pests are potential sources of contamination and should be excluded from all parts of the processing facility (14).

Produce is cleaned to remove field soil, pesticide residues, insects, microorganisms, and other extraneous matter prior to processing (15). A typical wash procedure uses water or chlorinated water, may include scrubbing, and is intended to remove field soil prior to processing (10). Most processors (93%) use a wash procedure to clean fruit prior to pressing, and 64% also use brushing. However, most use only water to wash apples. Again, this is consistent with the findings of the Michigan survey (35), although only 33% of the New England respondents reported that they always wash apples before pressing (1). This disparity may be due to the timing of the New England survey, which was conducted in 1991, before most of the larger outbreaks had occurred.

Although a water wash may be adequate for removing field soil, it often has little effect on surface bacteria. Research has demonstrated the inability of water washes to remove bacteria from the surface of fruits and vegetables (26, 36). Only 18% of processors indicated that they use a detergent to facilitate soil removal. The addition of an approved detergent or a commercially available fruit wash to wash water may help to remove field soil and associated microorganisms from apple surfaces (23). A commercial phosphoric acid-based fruit wash significantly reduced *E. coli* O157:H7 on apple surfaces when applied as a dip treatment (36).

Although the importance of washing should not be underestimated a sanitizing treatment is also important for fruit used in production of unpasteurized juices (27). It is important to distinguish between cleaning and sanitizing: Cleaning can be defined as the physical removal of soil, while sanitizing consists of chemical or heat treatment designed to remove microorganisms (21).

The ineffectiveness of water washing is especially troubling given that only 37% of respondents use any type of sanitizing treatment for apples following the wash step. The use of detergents and sanitizers

is not common among Michigan cider producers, either (35). Water from municipal supplies is often chlorinated, and chlorine is widely added to wash water in fruit and vegetable processing plants (2). However, the antimicrobial activity of chlorine is reliant on environmental factors such as the pH, temperature, organic load, and ionic concentration of the solution (8). The microbial counts of fruits and vegetables, and thus the organic load, in wash and flume water is often rather high (26). In addition, wash solution is often recycled, which leads to a high organic load and a greater chance of contamination (4). Also, it has been shown that maintaining the desired level of free available chlorine in wash solutions is often made difficult by high levels of organic material in solution, especially if chlorine is added manually (13).

Because of the ineffectiveness of water and chlorine solutions, producers of unpasteurized juices may want to consider using other chemical sanitizer treatments. Organic acids such as acetic acid have GRAS status and have been used successfully to remove pathogens from produce (18, 28). In a comparison of several treatments, acetic acid at a concentration of 5% was the most effective treatment for removing *E. coli* O157:H7 from the surface of apples (36). Hydrogen peroxide, also known for its bactericidal effects and is rapidly decomposed leaving no residual toxicity (8). Hydrogen peroxide at a concentration of 3% proved to be effective for removing *E. coli* O157:H7 from the surface of tomatoes. Even greater effectiveness was seen when hydrogen peroxide was used in combination with acetic acid (28).

Preservation measures

Table 2 details preservation measures taken with the finished product. Most (78%) producers do not pasteurize their cider, which is not surprising given the small size and seasonal nature of most Virginia operations. Pasteurization may be cost prohibitive for such operations, because the associated costs in-

crease sharply as production capacity and number of processing days per year decrease (20). Also, a heat treatment may adversely affect the sensory characteristics responsible for the appeal of fresh cider (27). Michigan producers also do not frequently use unpasteurization (35).

Only 12% of producers add preservatives to cider. Of those who do, 60% use potassium sorbate and 40% sodium benzoate. In laboratory studies, potassium sorbate had little effect on *E. coli* O157:H7 populations in cider (24, 37). Likewise, *E. coli* O157:H7 survived in refrigerated cider containing 0.1% sodium benzoate for 21 days (24). Thus, although preservatives have merit for extending shelf life, they cannot be relied upon to eliminate *E. coli* O157:H7 from apple cider. According to the New England survey, the use of preservatives is also not common among producers in that region (1).

The most popular preservation measures are refrigeration and freezing. Almost all producers (93%) chill cider immediately after production, and 92.5% either refrigerate cider or freeze it until sale. Prompt cooling and subsequent refrigeration of unpasteurized cider is necessary to retain the best flavor and to prevent fermentation. Freezing can extend the shelf life of cider for even longer periods (10). However, neither refrigeration nor freezing is reliable for the elimination of pathogens. The survival of *E. coli* O157:H7 for up to 31 days in cider stored at 4 to 8°C has been documented (37). Survival in ground beef for 9 months (11) and in peptone water for 7 months (29) when stored at -20°C has also been shown.

Additional safety measures

The final area of investigation focused on additional measures that can help assure the safety of apple cider, and responses to these questions are shown in Table 3. Such measures include microbiological testing, labeling, HACCP, and alternative technologies. Although only 25% of cider producers indicated

TABLE 3. Apple cider producers' responses about additional measures to help ensure safety of cider

Practices	Percentage answering "yes"
Include expiration date on label	2
Include lot or code numbers on label	14
Conduct microbiological testing on finished cider	2
Have operating HACCP program	25
Considered implementing HACCP	67
Interested in alternative processing technologies	80

they have an operating HACCP program, 67% of those who have no HACCP program have considered implementing one. This interest in HACCP may be due in part to the recent proposal by the FDA for a regulation to require processors of unpasteurized juices to implement HACCP programs. The regulation also includes a requirement for processors to adapt their processes to achieve a five log reduction in the number of pathogens present in the final product (12). Use of an approved HACCP plan may help to assure the safety of unpasteurized cider by incorporating several key measures that focus on the prevention of contamination (25). In addition, HACCP could lead to the production of a higher quality product (27).

Very few producers (2%) conduct microbiological testing on cider, a finding consistent with the Michigan survey (35). Although not required, laboratory testing could be instituted as part of a HACCP program for verification purposes. Sampling and testing at various points throughout the process could be used to help identify problems and to provide confirmation of product quality (31).

Only 2% of cider producers label their product with an expiration date, and just 14% include an identi-

fying lot or code number. In contrast, approximately 50% of Michigan survey respondents include expiration dates, although most do not use lot codes (35). An expiration or freshness date might be included to encourage consumption of the product at its peak quality. Labeling can also be used to provide handling instructions (31). The use of lot/code numbers, along with good record keeping can facilitate product tracking and recall, if a contamination problem should arise (5).

Finally, 80% of Virginia cider producers said they would be interested in using alternative processing technologies to help assure the safety of their products. The FDA requirement for a five log reduction in the numbers of pathogens present in the finished product would allow producers to employ means other than pasteurization to achieve the reduction. These measures may include washing, scrubbing, antimicrobial solutions, alternative technologies, or a combination of techniques (12). Some alternative technologies currently being investigated are irradiation, flash pasteurization, pulsed light, microwave pasteurization, and ultraviolet light sterilization (17).

CONCLUSIONS

Although most Virginia cider operations are small, seasonal businesses, their importance to the economy and to Virginia agriculture should not be underestimated. As one respondent commented, "Cider making is a process to help apple producers to stay in the apple business." However, the serious nature of the recent outbreaks of *E. coli* O157:H7 linked to consumption of unpasteurized cider underscores the fact that the safety of the product as currently produced cannot be ignored.

Mandatory pasteurization would assure the safety of cider; however, it is an unpopular choice among producers, because of its costs and its possible effects on quality. Indeed, very few of those surveyed pasteurize their cider, and some said that a requirement for such a measure would be cost prohibitive and would likely cause them to cease production. The FDA regulations for HACCP may seem intimidating to some producers. However, our survey suggests that many of the methods the FDA mentions as means to achieve a five log reduction are already being used to some degree by many Virginia processors.

Most producers appear to be using sound orchard management practices, with the exception of the use of drop apples and damaged fruit. Likewise, most Virginia producers use good production practices and are committed to producing a safe and high-quality product. One recommendation for improvement is use of an approved sanitizer along with the wash step to provide additional assurance that pathogens are not carried over into subsequent processing steps. As one producer noted, "I strongly feel that quality fruit and cleanliness are the two most important factors in good cider."

In addition, most producers expressed an interest in the use of alternative processing technologies to help ensure a safe product. Thus, additional research in this area should be supported. As one producer commented, "We have

stopped producing cider until we can evaluate final FDA regulations and alternatives to pasteurizing and risks to producing the old-fashioned cider. We must weigh the risks, costs, and customer attitude once FDA regulations are in place. We want to utilize a cost-effective way to produce a clean product that tastes good, that customers will accept, is economical to produce, and will be competitive without high risk to us and our industry."

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REFERENCES

- Besser, R. E., S. M. Lett, J. T. Weber, M. P. Doyle, T. J. Barrett, J. G. Wells, and P. M. Griffin. 1993. An outbreak of diarrhea and hemolytic uremic syndrome from *Escherichia coli* O157:H7 in fresh-pressed apple cider. *JAMA*. 269:2217-2220.
- Beuchat, L. R. and J. Ryu. 1997. Produce handling and processing practices. *Emerging Infectious Diseases*. 3(4). www.cdc.gov/ncidod/EID/vol3no4/beuchat.htm.
- Binnig, R., and P. Possmann. 1993. Apple Juice, p. 271-317. In S. Nagy, C. S. Chen, and P. F. Shaw (ed.), *Fruit processing technology*. AgScience, Inc., Auburndale, FL.
- Brackett, R. E. 1992. Shelf stability and safety of fresh produce as influenced by sanitation and disinfection. *J. Food Prot.* 55:808-814.
- Canadian Food Inspection Agency. 1998. Code of practice for the production and distribution of unpasteurized apple and other fruit juice/cider in Canada. www.cfia-acia.agr.ca/english/plant/processed/code-eng.html.
- CDC. 1996. Outbreak of *Escherichia coli* O157:H7 infections associated with drinking unpasteurized commercial apple juice - British Columbia, California, Colorado, and Washington, October, 1996. *MMWR* 45: 975.
- CDC. 1997. Outbreaks of *Escherichia coli* O157:H7 infection and cryptosporidiosis associated with drinking unpasteurized apple cider - Connecticut and New York, October, 1996. *MMWR* 46:4-8.
- Davidson, P. M., and A. L. Branan (ed.), 1993. *Antimicrobials in foods*. Marcel Dekker, Inc., N.Y.
- Doores, S. 1983. The microbiology of apples and apple products. *CRC Critical Reviews in Food Science and Nutrition*. 19:133-149.
- Downing, D. L. 1989. Apple cider, p. 169-187. In D. L. Downing (ed.), *Processed apple products*. Van Nostrand Reinhold, NY.
- Doyle, M. P., and J. L. Schoeni. 1987. Isolation of *Escherichia coli* O157:H7 from retail fresh meats and poultry. *Appl. Environ. Microbiol.* 53: 2394-2396.
- FDA. 1997. Fruit and vegetable juice beverages: Notice of intent to develop a HACCP program, interim warning statement, and educational program. *Fed. Reg.* 62:45593-45596.
- Garg, N., J. J. Churey, and D. F. Splittstoesser. 1990. Effect of processing conditions on the microflora of fresh-cut vegetables. *J. Food Prot.* 53:701-703.
- Gould, W. A. 1994. *CGMP=S/Food Plant Sanitation*. CTI Publications, Inc., Baltimore, MD.
- Gould, W. A. 1996. *Unit operations for the food industries*. CTI Publications, Inc., Timonium, MD.
- Goverd, K. A., F. W. Beech, R. P. Hobbs, and R. Shannon. 1979. The occurrence and survival of coliforms and salmonellas in apple juice and cider. *J. Appl. Bacteriol.* 46:521-530.
- Great Lakes Fruit Growers News. 1997. FDA meeting message-juice making isn't business as usual. www.orchard.uvm.edu/glfgn/january1997/FDAmeeting.html.
- Karapinar, M., and S. Aktug Gonul. 1992. Removal of *Yersinia enterocolitica* from fresh parsley by washing with acetic acid or vinegar. *Int. J. Food Microbiol.* 16:261-264.
- Keene, W. E., E. Sazie, J. Kok, D. H. Rice, D. D. Hancock, V. K. Balan, T. Zhao, and M. P. Doyle. 1997. An outbreak of *Escherichia coli* O157:H7 infections traced to jerky made from deer meat. *JAMA*. 277:1229-1231.
- Kozempel, M., A. McAloon, and W. Yee. 1998. The cost of pasteurizing apple cider. *Food Technol.* 52:50-52.
- Marriott, N. G. 1994. *Principles of food sanitation*. Chapman & Hall, Inc., London.
- Mclellan, M. R., and D. F. Splittstoesser. 1996. Reducing risk of *E. coli* in apple cider. *Food Technol.* 50:174.
- Michigan Apple Cider Advisory Committee. 1998. Good manufacturing practices for Michigan apple cider. www.mda.state.mi.us/hot/cidergmps/gmps.html.
- Miller, L. G., and C. W. Kaspar. 1994. *Escherichia coli* O157:H7 acid tolerance and survival in apple cider. *J. Food Prot.* 57:460-464.
- Mortimore, S., and C. Wallace. 1994. *HACCP A practical approach*. Chapman & Hall, London.
- Nguyen, C., and F. Carlin. 1994. The microbiology of minimally processed fresh fruits and vegetables. *Crit. Rev. Food Sci. Nutr.* 34:371-401.
- Parish, M. E. 1997. Public health and nonpasteurized fruit juices. *Crit. Rev. Microbiol.* 23:109-119.
- Peters, D. L. 1995. Control of enteric pathogenic bacteria on fresh produce. M.S. thesis. University of Nebraska.
- Semanchek, J. J., and D. A. Golden. 1998. Influence of growth temperature on inactivation and injury of *Escherichia coli* O157:H7 by heat, acid, and freezing. *J. Food Prot.* 61:395-401.
- Swanson, K. M. J., S. B. Leasor, and D. L. Downing. 1985. Aciduric and heat resistant microorganisms in apple juice and cider processing operations. *J. Food Sci.* 50:336-339.
- The Pennsylvania State University. 1998. Pennsylvania tree fruit production guide, Part VII, Cider production. www.cas.psu/CASDEPT/hort/TFFPG/part7.htm.
- United States Apple Association. 1999. Consumer information - core facts. www.usapple.org/.
- USDA. 1977. Making and preserving apple cider. *Farmer's Bulletin Number* 2125.
- Wang, G., and M. P. Doyle. 1998. Survival of enterohemorrhagic *Escherichia coli* O157:H7 in water. *J. Food Prot.* 61:662-667.
- Wojtala, G. 1997. Michigan's response to *E. coli* O157:H7 in apple cider. Food Division, Michigan Department of Agriculture. Unpublished paper.
- Wright, J. R., S. S. Sumner, C. R. Hackney, M. D. Pierson, and B. W. Zoeklein. 2000. Reduction of *Escherichia coli* O157:H7 on apples using wash and chemical sanitizer treatments. *Dairy Food Environ. Sanit* 20(2): 20-26.
- Zhao, T., M. P. Doyle, and R. E. Besser. 1993. Fate of enterohemorrhagic *Escherichia coli* O157:H7 in apple cider with and without preservatives. *Appl. Environ. Microbiol.* 59:2526-2530.

Improving Content Writing Instruction in an Undergraduate Food Bacteriology Class

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SUMMARY

Written communication skills are vital for undergraduate students seeking careers in food production or marketing, yet writing instruction is often treated as secondary to training in technical skills. In a senior level food bacteriology class, students were required to write a scientific research paper and were guided through all stages of the content writing process, including development of subject material, organization of the central themes of the paper, and presentation of a logical argument. Students were told to write rough drafts and encouraged to revise their work rather than complete the assignment under deadline anxiety. A writing laboratory was included to familiarize students with electronic database searching and to reinforce literature critiquing and critical thinking. Students resisted efforts to curtail procrastination, with only half of the class submitting rough drafts. Suggestions for further improvement in writing instruction are given.

INTRODUCTION

The poultry industry and other food production industries are changing rapidly, as are the job skills required of its employees (27). To address these changes, industries and the university programs that

train their future employees must offer training that incorporates subject material on a variety of topics (14, 29). Such topics will include issues such as food hygiene and safety, organic production, welfare considerations, food quality, value

added products, pollution, and the effects on environment (14, 29). In addition to the conventional course areas of physiology, nutrition, immunology, and genetics, undergraduate programs should increase their emphasis on marketing, business, and international economics (5, 20, 27). To maintain competitiveness, industry employees will need workshops and on-the-job training (29), which will require critical thinking ability, interpersonal relations skills, and, most importantly, oral and written communication skills (25, 29). In a survey by Pardue (19), major poultry companies in the United States ranked written communication skills above technical knowledge of poultry as a requisite for desirable employee performance.

Methods of instructing undergraduate students to communicate effectively in writing have been debated for well over 100 years. In 1892, a "committee of 10" established by the National Education Association suggested that writing be incorporated into courses outside the English curriculum (10), although the committee was more concerned with "correctness of spelling and usage than with substance of thought" (30). O'Hagan (16) suggested that grading, which

became popular in the early 1900s, further complicated the problem, in that use of a grading system introduced subjective measures of writing rather than constructive criticism (16).

Academic writing instruction has historically been perceived as the duty of the English department, although instructors within this department have traditionally been trained to teach literature rather than writing skills (30). Aaron (1) suggests that the largest obstacle to content teaching is often a lack of instructor confidence, or the assumption that only English teachers are qualified to teach writing. Orr (17) confirmed this "impulse of fight or flight" among educators. Whaley and Wickler (32) reported that 62% of faculty expressed a need to improve their teaching, but believed that available formal assistance was lacking, so that they relied instead on advice from colleagues, student evaluations, or available literature. Haug (10) cited a tendency to delegate writing to junior staff or graduate students and cited at least one instance of student resistance to the integration of writing into a microbiology course, with lowered student evaluation scores as the result.

However, in the current job market, writing skills are crucial for success. Social priorities are changing towards the consumer-driven areas of environment, food safety, water purity, and land use planning (9), which require concise writing skills for expression of new ideas across disciplines and within the corporate hierarchy. Rhode (21) reported that further growth within educational systems will be due to interdisciplinary and international collaboration emphasizing language. Jaykus and Ward (11) have stated that consumer food safety relies partly on the rapidly changing food production, processing, and preparation systems on a global scale, and that consumer education should be included as a major area of food safety research. If students cannot write clearly, they will have difficulty in expressing technical ideas

to those outside their field of expertise, either domestically or internationally.

At Texas A&M University, Tebeaux and Chabot (31) detected problems in sentence structure, punctuation, and English grammar. Several respondents viewed student writing as "horrible" and "depressing." Other respondents stated that students falsely believe their writing is satisfactory and thus are not striving to improve their writing skills during their undergraduate careers. Texas employers surveyed by Zey et al. (35) noted that graduates often have insufficient word processing, composition, spelling, editing, grammar, and organizational skills upon hiring. Human resource representatives noted that students often misspelled words on their own resumes and even the name of the company to which they were applying for employment (35). The objective of this paper, therefore, is to describe several steps in the evolution of a writing laboratory designed to improve student writing in a senior level undergraduate food bacteriology course.

MATERIALS AND METHODS

Several changes were made in a senior level food bacteriology class at Texas A&M University with the objective of improving writing skills. The lecture material focused on foodborne pathogens, with an emphasis on etiology, identification, control, and prevention of contamination in commercial food production. The writing of a scientific review paper, 14 to 15 pages long, which accounted for 12.5% of the final grade was assigned. The students were required to incorporate into the paper at least 10 scientific sources (journal articles or books) related to an assigned topic in food microbiology. The list of topics was designed to expose students to current research in food microbiology, cater to a wide range of interests, and promote independent work.

The paper was required to contain an introduction in which the

scope of the assigned topic and its relevance to food microbiology were identified. Students were expected to emphasize the impact of their topic on food production as well as the contribution (or cost) of the topic to food production and the consumer economy. Students critiqued experimental evidence in a concise but thorough literature review to substantiate an overall argument within the paper. By this method, students were forced to create a logical discussion of the topic, rather than simply repeating facts and statistics. A summary reinforcing the topic's significance and stating the main points of the argument was included to reinforce conciseness and to require the student to organize the discussion into discreet arguments. To develop the students' critical thinking and analytical abilities, the instructor encouraged the students to form innovative ideas, indicate further opportunities for researching their topics, and suggest additional experiments that would expand the literature base.

To reduce student procrastination and encourage revision, the writing process was divided into three separate phases. Students were required to choose a topic within the first six weeks of the semester. A rough draft, containing at least 10 references, was due during the 11th week of the semester. The draft was reviewed by the instructor, graded for content, grammar and spelling, and returned to the student with suggestions for revision. The final paper was then due in the 14th week of the semester, leaving 2 weeks for final grading.

The first laboratory exercise of the course concentrated on writing techniques. It started with a short discussion on preventing procrastination, adopted from Keller and Heyman (12) and Yamauchi (33), who stressed that procrastination is an irrational tendency arising from fear of failure. Students were urged to schedule time to do a small portion of the assignment and to create a timeline for completion of the paper. To find relevant sources,

Figure 1. Writing survey distributed to students in an undergraduate food bocteriology class.
Part I: Student history¹

1. What was the most difficult writing assignment required on average in your courses?
 - a) Only essay questions on exams.
 - b) Short answer questions or short essays were sometimes required for homework.
 - c) Lab reports.
 - d) Short scientific research papers (under 10 pages).
 - e) Long scientific research papers (over 10 pages).
2. What was the typical reading assignment in your courses?
(Circle all that apply)
 - a) Textbooks.
 - b) Scientific papers which the professor copied & handed out in class.
 - c) Some assigned research papers which I had to photocopy from the library.
 - d) I have had to search for books from the library, but never research papers.
 - e) I have had to do a literature search for research papers for an assignment.
3. When do you usually start your writing assignments?
 - a) I do a little each day - it is completed before it is due.
 - b) The week before it is due and finish it over the weekend.
 - c) A few days before it is due and finish it the night before it is due.
 - d) The night before it is due and pull an all-nighter.
 - e) The day it is due and skip class to get it done.
4. Where do you usually get your information for papers?
(Circle all that apply)
 - a) Class notes, textbooks, T.A.s or professors.
 - b) The Internet (webcrawler, yahoo, etc. search).
 - c) A library search using NOTIS or WILS (Wilson).
 - d) A library search using OVID (Medline, Agricola, etc.).
 - e) Other sources or none (please describe).
5. Have you ever had any lectures on how to research and write papers other than POSC 429?
 - a) No - please go to the next page.
 - b) Yes - please answer question 6.
6. If you answered yes to question 5, where were your lectures?
(Circle all that apply)
 - a) High school English.
 - b) I've taken tutoring classes (off campus, grad students, etc.).
 - c) English courses/technical writing class at A&M.
 - d) Courses on another campus (Baylor etc.).
 - e) I've taken courses which had lectures & assignments on paper writing (Any courses in specific?)
7. What kind of career are you hoping to enter after college?
 - a) I don't know yet.
 - b) A family ranch or farm.
 - c) Line supervisor or plant manager of a production farm.
 - d) Quality control department.
 - e) Graduate or further schooling (another degree, vet/med school, etc.).
 - f) Sales or marketing.
 - g) Government/ extension (USDA, FDA, county extension, 4-H, etc.).
 - h) Other.

efficiently, a "skim test" was suggested; this involved reading references in the order of abstract, introduction, conclusions, and methods, to determine relevancy of a specific paper to the topic chosen by the student. The meaning of the terms hypothesis, controls, treatments, and effects, and of basic statistical terms such as statistical significance, standard error, and population inference, were reviewed to help students in critiquing research papers. Students were instructed to concentrate on refereed journal articles, government documents, and textbooks rather than non-refereed popular press articles, class notes, advertisements, or commercial Internet sites. Logical flow and summation were stressed, using an "hour glass" example: students were encouraged to start with a broad overview of the topic area, focus down to specific objectives, expand upon those objectives with experimental evidence, and conclude with their main points. Objective statements and conclusions were illustrated with examples from several articles from a journal, *Poultry Science*. Reference citation, formatting, grammatical errors, and spelling errors were covered in view of deficiencies noted by Zey et al. (35).

After the formal lecture, literature search engines were demonstrated in the department computer lab. The demonstration included two databases available in the spring of 1999: the Internet Database Service, IDS; (4) and OVID, version 7.8, (18), which are both licensed for use by Texas A&M University. Sample searches were conducted using the following databases from IDS: Agricola (National Agricultural Library, USDA, Beltsville, MD); Microbiology abstracts part A, Industrial & Applied Microbiology, and part B Bacteriology (Cambridge Scientific Abstracts, Bethesda, MD); Biotechnology and Bioengineering Abstracts (also Cambridge Scientific Abstracts), Medline (National Library of Medicine, MEDLARS Management Section, Bethesda, MD); and NTIS (National Technical Information Service, U.S. Department of

Figure 1, continued

8. How important do you think writing skills are to your career?
- A waste of my time.
 - The company/my secretary will do all my writing – all I need to know is dictation.
 - It might be important, but nobody has given me examples of how.
 - I need to learn to write effectively, but I won't need to research again (other than Internet).
 - It will be necessary for my career.
 - It will be important for success and advancement in my career.

¹Students were given twenty minutes to complete the survey after all writing exercises were complete and were instructed that the survey was anonymous and would not affect their course grade.

Figure 2. Part II: Writing survey distributed to students in an undergraduate food bacteriology class. Part II: Evaluation of laboratory exercise¹

9. Please rank the writing lab in order of 1 = most useful part to 5 = least useful part (or check "I missed the lecture")
- _____ Lecture topic: procrastination
_____ Lecture topic: paper structure
_____ Lecture topic: how to interpret paper statistics
_____ Handout: how to use Ovid/Combridge Scientific Abstracts
_____ Demonstration: literature searching
_____ I missed the lecture
10. This year we demonstrated OVID & gave a homework assignment – what should we do next year?
- Some format – no change.
 - OVID demonstration & assignment due in 1 week.
 - Have the class do lit searches on a common topic given in a handout in groups of 2.
 - Have the class choose their paper topic before the week of the lab and find sources in lab.
 - Remove the writing lab entirely.
 - Other _____.
11. Would scientific writing help sessions be useful?
- No.
 - I would rather just go to the professor's office hours with questions.
 - Yes, but I have no time in my schedule to attend them.
 - Yes: one help session to answer questions about revisions to the rough draft.
 - Yes: monthly help sessions.
 - Comments _____.
12. Have you started your research paper yet?
- No.
 - Other than what was necessary for the assignment, no.
 - I have my literature searches.
 - I have copied a few extra papers and am reading them.
 - I've started making an outline/writing a rough draft.

¹Students were given twenty minutes to complete the survey after all writing exercises were complete and were instructed that the survey was anonymous and would not affect their course grade.

Commerce, Springfield, VA). Searches using the databases Agricola and Medline, available through the OVID search engine (18), were also demonstrated for comparison. The search engines and databases were chosen because they included journals that emphasize agriculture, food and general microbiology, and government regulations.

Students were given a handout that included a take-home assignment to find three sources relevant to their topic. This assignment was due by the third week of class. After the assignments were graded and returned to the students, a questionnaire, reproduced in Figure 1 and 2, was completed by the students anonymously during the last 20 minutes of a laboratory session. After all laboratory sections had responded to the survey, answers were compiled using PROC FREQ of SAS (23). The responses to question 9 (the ranking of laboratory sections on a scale of 1 to 5) were averaged by PROC MEANS and analyzed by linear regression using PROC GLM of SAS. Means were separated by the LSMEANS function and were considered significantly different at $P < 0.05$.

RESULTS AND DISCUSSION

Twenty-three students participated in the survey. These students described a wide variety of career plans, from military service to real estate (Table 1). A majority were interested in sales, marketing, or graduate school. Five students had no plans for a career after graduation. Regional job trends in Texas, as reported by Dayberry and Dillingham (6), place the highest employment opportunities and deficit of graduates in the areas of marketing, merchandising, sales, and scientific research. The wide range of career choices is also not surprising; Dayberry and Dillingham (6) reported that almost one-fourth of Southwest Texas State University agriculture graduates enter non-agricultural professions. More specifically, food industries are increasingly requiring employees with multi-functional, business-orien-

TABLE 1. Characterization of survey respondents and prior writing experience

Item	n students responding	% students responding
Postgraduation career plans (question 7)		
Unsure	5	22
Family ranch or farm	1	4
Supervisor/manager in production	2	9
Quality control department	2	9
Graduate, professional or further schooling	6	26
Sales or marketing	8	35
Government/extension	2	9
Other ¹	7	30
Importance of writing skills (question 8)		
Waste of time	0	0
Company/secretary will do writing	0	0
May be important, but don't know how	2	9
Important, but research unimportant	6	26
Necessary for career	6	26
Important for success and advancement in career	10	43
Most difficult writing on average (question 1)		
Exam essay questions	2	9
Short answer questions/short essays	2	9
Lab reports	0	0
Short scientific research papers (<10 pgs.)	3	13
Long scientific research papers (>10 pgs.)	16	70
Prior lectures on writing (question 5)		
No	1	4
Yes	22	96
Prior writing lecture source (question 6)		
High school	19	83
Tutoring classes	0	0
English courses/technical writing at Texas A&M	16	70
Undergraduate courses other than Texas A&M	8	35
Other courses ²	6	26

¹ Other responses included "medical", military service, financial services, real-estate/self-business, corporate management and hotchery manager.

² Other responses included seminar, veterinary technology classes, marketing research and other poultry science classes.

tated skills (19, 35). Scanes and Iozzi (24) reported that students may use animal science degrees for other careers or "for life". Most students (91%) responded that writing was important to their careers, with 43% answering that it was important for success and advancement. Brumback (3) reported similar results in a survey of 92 agronomy students:

79% felt that writing was worthwhile, and 88% responded that writing skills were necessary in their careers.

When asked about past curriculum, most students (70%) responded that their most difficult writing assignments were long (over 10 pages) scientific research papers. This parallels results reported by Tebeaux

and Chabot (31), who found that 20 out of 39 responding instructors required "long" research papers in their classes. Most of the students (96%) had received some sort of formal lecture on how to research and write papers. When asked the source of those lectures, 83% cited high school, 70% cited an English class, and 35% cited lectures from

TABLE 2. Research and time management habits of students in an undergraduate food bacteriology class

Item	n students responding	% students responding
Time schedule of starting/finishing writing assignments (question 3)		
Little each day/finished before due	3	13
Week before due/weekend before due date ¹	11	48
Few days before due/night before due date	7	30
Night before due/morning of due date	1	4
Day due/past due date	0	0
Status of writing assignment, 10th week (question 12)		
Not started	5	22
Laboratory assignment (3 references on topic)	5	22
Completed literature search	1	4
Reading literature	9	39
Started outline/rough draft of paper	1	4
Typical reading assignments (question 2) ²		
Textbooks	11	48
Scientific papers prepared by the instructor	9	39
Assigned scientific papers requiring library visit	4	17
Library search for books	6	23
Library search for scientific papers	11	48
Source of information for writing (question 4) ²		
Class notes, textbooks, T.A.s or professors	16	70
Internet (webcrawler, yahoo, etc. search engines)	17	74
Library search using library search engines	14	61
Library search w/ Internet (OVID, Medline, Agricola)	8	35
Other sources ³	3	13

¹One student responded "the week of spring break."

²Respondents were allowed to choose more than one answer.

³Other sources included "journals," friends, or the encyclopedia.

another campus. Students may therefore be calling upon inadequate skills for the writing of a senior level research paper. One faculty respondent in a previous survey stated that "a good grade in [freshman English] is not an indication that a student has minimal acceptable writing skills" and that "many who pass [freshman English] cannot pass a simple composition test" (31).

Students stated that they usually started scientific research papers either the week before (48%) or a few days before (30%) the due date

(Table 2). When the survey questionnaires were distributed during the 10th week of class, only 1 student reported having progressed to the point of writing; a majority (51%) indicated that they had either conducted literature searches or had read background material on their topic. As of the 13th week of class, less than half of the students in the class had submitted rough drafts as assigned. Procrastination of this sort is common throughout the university system; Rothblum et al. (22) noted procrastination among 40% of

the students in an introductory psychology class, and Sommer (28) described the cycle of calculated procrastination, preparatory anxiety, and working under deadline pressure. However, when asked to rate sections of the writing laboratory on a five-point scale, where 1 = most useful and 5 = least useful, students consistently rated the talk on preventing procrastination as least useful, with a mean score of 4.3 ± 0.3 ($P < 0.05$). The lecture, which associated procrastination with self-doubt and fear of failure, may have

TABLE 3. Evaluation of writing laboratory

Item	Average ranking ¹	
Average score of writing laboratory (question 9)		
1 = most useful to 5 = least useful		
Lecture topic: procrastination	4.3 ± 0.3 ^A	
Lecture topic: paper structure / logical flow	2.3 ± 0.3 ^C	
Lecture topic: interpreting paper statistics	3.2 ± 0.2 ^B	
Handout: how to use Internet scientific search engines	2.4 ± 0.3 ^C	
Demonstration: literature searching	2.6 ± 0.3 ^{BC}	
	n students responding	% students responding
Format for future writing labs (question 10)		
OVID demonstration/assignment, due 2 weeks	7	30
OVID demonstration/assignment, due 1 week	1	4
Literature searches on common topics, groups of 2	2	9
Literature searches on individual topics	10	44
Eliminate writing lab entirely	3	13
Other	0	0
Scientific writing help sessions (question 11)		
Not useful	5	22
Instructor could help during office hours	4	17
Helpful, but schedule prevents attendance	2	9
Helpful: 1 per semester	9	39
Helpful: Monthly	4	17

¹Means with unlike superscripts are different, $P < 0.05$.

alienated the students. Milgram et al. (15) suggested that students rarely accepted reasons that threatened their self-esteem, such as fear of failure, and were more likely to list external factors, such as poor time management or an overabundance of assignments, as reasons for procrastination. Elefson (7) suggested that several students in agricultural writing courses would have received lower grades if they had submitted their draft as a final document, thereby omitting the supervised revision step, but lower grades may not be sufficient to break the cycle of procrastination. Rothblum et al. (22) suggested that reducing anxiety through giving multiple assignments instead of one, large project, and through setting clear external deadlines, may reduce procrastination, while Zimmerman (36) used

journal assignments to promote "long term dedication and commitment" from the students. Leeming (13) reported that asking students to make a formal, written commitment to study for an exam increased both the time that the students spent studying and the exam scores.

When asked to identify the typical university class reading assignment, 48% responded either "textbooks" or "literature searches for research papers". Thirty-nine percent stated that they were required to read scientific papers that the instructor had prepared for them, and 23% have had to conduct a search for books, but not research papers, from the library system. When asked what sources they cited for research assignments, most (70%) answered "class notes," while 61% used the library mainframe search engine.

Most students (74%) had claimed to seek information, yet significantly fewer students (35%) had claimed to use the OVID search engine, or the databases Medline or Agricola. This implies either an increased reliance on other electronic search engines, or, more likely, a shift toward use of nonrefereed sources available from commercial sites. York (34) suggested that acquiring sources from commercial sites is associated with a reluctance to examine sources critically and a tendency to take the printed word at face value. Citing references was also stated as a problem in writing (31), and numerous complaints of poor organization may instead reflect a lack of background literature to write about.

When asked for suggestions on modifying the writing laboratory,

most students favored either the demonstration method followed by a two-week assignment (30%) or a demonstration followed by supervised individual literature searches on chosen topics (44%). One student preferred to use examples of well-written papers from past semesters. Example papers may provide the students with organizational strategies, often adopted from each other through peer review (26) and may indicate a need for more explicit instruction on logical flow. Over half of the students (52%) requested either one help session or monthly help sessions in which students may voice concerns about revisions of the rough draft. However, 9 students either did not think help sessions would be useful, or would rather go directly to the instructor for help. Perhaps feedback opportunities could be incorporated into take-home examinations or assignments, to give students several chances to respond to instruction and guidance during the semester. These take-home exercises could be constructed to reflect the various stages of the writing process.

The key to improving writing skills of undergraduates may be increased practice. In the survey by Tebeaux and Chabot (31), consistent calls for more writing, and for writing in more classes, were noted. Zimmerman (36) applied a similar principle in his journal suggestions, encouraging lengthy expressive writing "to get thoughts and ideas on paper." Multiple authors (1, 3, 26) have recommended peer review of manuscripts, although this has the drawback of little flexibility on deadlines. Peer review may be useful in improving revision by allowing for a more thorough review of the drafts. Zimmerman (37) suggested that students could have a more active role in planning, setting up, conducting, and reporting on lab experiments, with limited instructor input. Though this approach may be suitable for training physics majors for careers in research or pilot plant design (37), it may place reticent or unassertive students at a disadvantage. Gallagher et al. (8) noted that some students have difficulty expressing themselves in group situa-

tions, and that lack of self-confidence was a prevalent concern among students. Voluntary discussion would decrease the stress of required public speaking.

As the poultry industry changes in response to altered global markets and new technologies, undergraduate programs need to incorporate more material on business practices and communication skills (19). Students need to learn how to communicate ideas concisely and effectively within the corporate atmosphere. If students are to receive instruction on written communication and critical thinking ability, writing assignments need to be increased and assigned uniformly across the student's entire college career. Grading of writing should be done in a stepwise process involving prewriting, writing and rewriting stages (3), rather than being done on finished products (2). Instructor or peer feedback should be present at each stage, to offer opportunity for improvement before the final grade is assigned. The problems of student procrastination and deadline anxiety need to be discouraged through a series of smaller, graded assignments rather than one deadline at semester's end. Finally, students in more courses should receive instruction on effective writing strategies and literature searches, rather than making the English department fully responsible.

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REFERENCES

1. Aaron, D. K. 1996. Writing across the curriculum: putting theory into practice in animal science courses. *J. An. Sci.* 74:2810-2827.
2. Bencich, C. B. 1997. Response: a promising beginning for learning to grade student writing, p. 47-62. *In* S. Tchudi. (ed.). *Alternatives to Grading Student Writing*. National Council of Teachers of English, Urbana, IL.
3. Brumback, Jr., T. B., M. Squires, and D. J. Parrish. 1985. Learning to write in agronomy. *J. Agron. Edu.* 14:31-34.
4. Cambridge Scientific Abstracts. 1999. Internet Database Service. www.csa.com/tbin/dbsel.cgi. Accessed January 25 and 28, 1999.
5. Cook, M. E. 1992. Current teaching programs in poultry science. *Poultry Sci.* 71:1313-1315.
6. Dayberry, D. T., and J. M. Dillingham. 1992. Career choices for agriculture graduates depend on regional job trends. *Nacta J.* 36:11-13.
7. Elefson, J. O.-B. 1992. Toward teaching at higher levels of cognition: teaching the process of agricultural writing. *Nacta J.* 36:11-14.
8. Gallagher, R. P., A. Golin, and K. Kelleher. 1992. The personal, career, and learning skills needs of college students. *J. College Student Devel.* 33:301-309.
9. Goecker, A. D. 1992. Undergraduate preparation for agricultural, food, and environmental science careers. *Nacta J.* 36: 9-12.
10. Haug, M. 1996. How to incorporate and evaluate writing skills in animal science and dairy science courses. *J. An. Sci.* 74:2835-2842.
11. Jaykus, L.-A. and D. R. Ward. 1999. An integrated approach: the future of graduate food safety education. *Dairy Food Environ. Sanit.* 19:14-17.
12. Keller, P. A., and S. R. Heyman. (eds.). 1987. *Innovations in Clinical Practice: A Source Book* (vol. 6). Professional Resource Exchange, Inc. Sarasota, FL.
13. Leeming, F. C. 1997. Commitment to study as a technique to improve exam performance. *J. College Student Devel.* 38:499-507.
14. Marks, H., and M. A. Ottinger. 1992. Symposium: Issues facing the Poultry Science Association, Inc. Education and research in poultry science. *Poultry Sci.* 71:1306-1307.
15. Milgram, N., S. Marshevsky, and C. Sadeh. 1995. Correlates of academic procrastination: discomfort, task aversiveness, and task capability. *J. Psychol.* 129:145-155.

16. O'Hagan, L. K. 1997. It's broken – fix it! p. 3-14. In S. Tchudi. (ed.). Alternatives to Grading Student Writing. National Council of Teachers of English, Urbana, IL.
17. Orr, C. L. 1996. Communication across the curriculum in animal science. *J. An. Sci.* 74:2828-2834.
18. Ovid Technologies. 1998. OVID. New York, NY. www.ovid.tamu.edu/ovidweb/tamu/ovidweb.cgi. Accessed January 25 and 28, 1999.
19. Pardue, S. L. 1997. Educational opportunities and challenges in poultry science: impact of resource allocation and industry needs. *Poultry Sci.* 76:938-943.
20. Pescatore, A. J. 1988. Role of teaching programs. *Poultry Sci.* 67:879-882.
21. Rhode, G. E. 1992. Undergraduate education in the agricultural, food and environmental sciences. *Nacta J.* 36:13-14.
22. Rothblum, E. D., L. J. Solomon and J. Murakami. 1986. Affective, cognitive, and behavioral differences between high and low procrastinators. *J. Counseling Psychol.* 33:387-394.
23. SAS Institute Inc. 1985. SAS Language Guide for Personal Computers, Version 6 Edition. SAS Institute Inc., Cary, NC.
24. Scanes, C. G., and L. A. Iozzi. 1992. Strategies for departmental growth and development. *Poultry Sci.* 71:1332-1337.
25. Senauer, B. 1992. Preparing students for careers in food distribution and marketing: an opportunity for colleges of agriculture. *J. Food Dist. Res.* 23:1-7.
26. Sims, G. K. 1989. Student peer review in the classroom: a teaching and grading tool. *J. Agron. Edu.* 18:105-108.
27. Snetsinger, D. C. 1992. Poultry science training – what industry needs. *Poultry Sci.* 71:1308-1312.
28. Sommer, W. G. 1990. Procrastination and cramming: how adept students ace the system. *J. Amer. College Health* 39:5-10.
29. Summers, J. D. 1992. Will poultry science curricula meet projected needs of poultry and associated industries? *Poultry Sci.* 71:1316-1318.
30. Tchudi, S. 1986. Teaching writing in the content areas: college level. National Education Association, Washington, D.C.
31. Tebeaux, E., and B. Chabot. 1995. Report: Preliminary results of the Department of English Writing Instruction Questionnaire. Presented to L. Mitchell, Texas A&M University, College Station TX, April 20.
32. Whaley, D. C., and S. Wickler. 1992. Case study: faculty perceptions on teaching improvement. *Nacta J.* 36:4-6.
33. Yamauchi, K. T. 1998. Procrastination: Ten ways to "Do it now". University Counseling Center, Division of Student Affairs, Virginia Polytechnic Institute and State University. www.ucc.vt.edu/stdysk/procrast.html. Accessed January 18, 1998.
34. York, A. C. 1988. Teaching students objective skills to master science and science writings. *Nacta J.* 32:19-24.
35. Zey, M., A. Luedke, and S. Murdock. 1999. Changing employment demands and requirements for college graduates: focus group interviews with industry, agency, and school district representatives in Texas. Report to the Office of the Chancellor, the Texas A & M University System. Strategic Policies Research Group: The Texas A&M University System, College Station, TX 77843.
36. Zimmerman, A. P. 1991. Journal writing for technical courses in writing across the curriculum. *Nacta J.* 35:24-29.
37. Zimmerman, A. P. 1992. Laboratory assignments in writing across the curriculum. *Nacta J.* 36:7-10.

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Reflections from the Past

Presidential Address

Harold E. Thompson, Jr.

63rd Annual Meeting of the International Association
of Milk, Food and Environmental Sanitarians, Inc.
August 8-11, 1976
Arlington Heights, Illinois

This is the year of the Bicentennial, a year of nostalgia embracing the principles, thoughts, and hopes of those who helped create the United States. As has been noted many times and particularly emphasized this year, the principles set forth by a group of men in Philadelphia in 1776 still remain viable and the bases of our nation today. So it is with the International Association of Milk, Food and Environmental Sanitarians.

Thirty-five men met in 1911 and created the International Association of Milk Inspectors. From their deliberations came two basic objectives for the new association which were incorporated into our first constitution. They were service and leadership; service to the sanitarians and through the sanitarians to the public and industry; leadership by providing the sanitarians and others with knowledge and training to develop this service. These objectives are and should be the prime consideration of IAMFES. True, the scope of our service and leadership has expanded to include areas not even thought of or considered at that first meeting. This is as it should be as change is inevitable. Our Association has always been cognizant of change and yet has never lost sight of our basic objectives.

Our performance in these areas is the reason the Association is recognized as a leader in our field.

A YEAR OF CONSOLIDATION

The past year, while successful, probably can best be described as a year of consolidation. Past gains were strengthened and new ideas advanced for solving our problems. Progress was made, not perhaps as great as was desired, but it was significant and certainly strengthened the Association.

I should like to share with you some of the progress and success, the problems and the direction the Association is going.

MORE CONTACTS WITH AFFILIATES

One of the significant actions taken which certainly should strengthen the contacts between the Association and our Members and affiliates is the addition to the staff of Barbara Lee as Assistant Executive Secretary and Associate Editor of the *Journal*. It has been recognized for some time that better liaison and better communication with our affiliates, educational institutions, the sanitarians, and others is necessary if we are to maintain our leadership. We feel

that Mrs. Lee will help us fill this gap. Mrs. Lee's responsibilities will include liaison with state and national affiliate groups, coordination of workshops and short courses sponsored by IAMFES, supervision of production of the *Journal*, and organization of student affiliate groups. Mrs. Lee brings talent and enthusiasm to her new position and I wish to welcome her aboard.

FINANCES SOUND

Our financial position remains sound primarily due to our Executive Secretary and the newly formed budget committee. They have worked together long and hard to provide a sound basis for operation of the Association. I should note that the budget committee will report on their activities at the business meeting. While our present financial situation is sound, it does not provide for some activities which are necessary to strengthen the Association. It hardly seems necessary to remind you of the economic situation that exists today. Limitations on travel and other expenditures have hampered our efforts to institute many worthwhile projects. A great deal of thought has been given to ways to provide more consistency in our essential activities. A foundation has been established within the Association. This foundation will receive monies and will administer, separate from the finances of the Association, those funds according to the need.

COMMITTEES

I should like to spend just a few minutes in discussing the importance of our many committees. The significance of the work of these committees cannot be over emphasized. Despite a critical problem with travel which does not permit these committees to meet as they should, they have continued to maintain their important place in our Association. The work of these committees continue to exert a significant influence on food protection, both nationally and internationally. Work of the 3-A Sanitary Standards Committee, the Bakery Industry Committee, and the National Sanitarian Foundation has had far reaching effects on equipment used in the production and processing of food. Our Applied Laboratory Methods Committee is deeply involved with revision of *Standard Methods for the Examination of Dairy Products* and our Farm Methods Committee continues to make significant contributions to improvement of animal health and sanitary procedures of dairy farms.

The Committee on Communicable Diseases Affecting Man for the past several years has worked long and hard to complete a revision of the *Procedures to Investigate Foodborne Illness*. Previous editions of this booklet have received wide acceptance and have proved a valuable guide in epidemiological investigations. This new edition I'm sure will continue to contribute to furthering the improvement of epidemiological techniques. The new edition is now available.

MEMBERSHIP

While our Membership increased in the past 2 years, there has been significant increase this year. In fact, it appears, we have reached what I hope is a temporary plateau. This is of concern to your Executive Board and given a great deal of study. We are striving to continue our growth and our efforts to strengthen our relationship with our affiliates and provide more direct contact and services to our Membership. In our endeavors we need everyone's help and I most sincerely solicit your assistance. We need your help to reach the great number of unaffiliated sanitarians who most certainly will benefit materially as Members of this Association.

Again, we have not been able to work as closely with the affiliates as we had anticipated. However, with Mrs. Lee on our staff we should overcome many of the problems.

I am pleased to announce that we have a new affiliate, the National Association of Dairy Fieldmen. It was in recognition of the need to maintain a professional organization that the Board of Directors and advisors of the National Association of Dairy Fieldmen recommended that the organization become an affiliate of IAMFES. Both organizations should benefit as reports of the Fieldmen's Association will appear in the *Journal* as well as articles of interest to the professional fieldmen as well as sanitarians.

You will note that included in the Wednesday afternoon program is a special session devoted to the dairy fieldmen. We welcome these new affiliates and look forward to a long and beneficial association.

THE JOURNAL

The *Journal* continues to gain in stature as evidenced by its wide circulation throughout the world including 72 countries outside the United States. In the past year there have been a number of papers from foreign countries which in itself testifies to the recognition the *Journal* is receiving. Several changes have been made which hopefully will strengthen the *Journal* and make it more effective. As you have probably noted by now, the name *Journal of Milk and Food Technology* will be changed to *Journal of Food Protection*. This change was not made lightly but after careful deliberations and was considered to have these advantages: (a) the new name more accurately reflects the content of the *Journal*, (b) the new name reflects more accurately the major objective of IAMFES, (c) the word "technology" which is overused in titles of many journals has been eliminated; and (d) the change will in no way affect the wide recognition that the *Journal* now enjoys.

The change in the name will become effective January, 1977. As you will note the new title has appeared in subdued type and will become bolder as January, 1977 approaches with the simultaneous fading of the present name.

The price of the *Journal* to subscribers, that is libraries, institutions, and others, has been raised from \$16 to \$32 per year. You will be pleased to hear that this has had no negative effect on the number of subscribers.

We are still striving to balance the *Journal* with respect to technical and nontechnical articles. However, it seems we still must contend with the lack of desire or interest to prepare and submit nontechnical articles to the editor. I am sure many of you are engaged in projects and activities that would be of great interest and assistance to your fellow sanitarians. Why not take the time to tell us about these through the *Journal* and allow us all the benefit.

RELATIONSHIP WITH NEHA

As you know a little over a year ago our Executive Board and the Executive Board of the National Environmental Health Association (NEHA) met to discuss the feasibility of unification of the two organizations. During this discussion a timetable proposed by the IAMFES Executive Board was agreed to which would permit positive action in exploring the feasibility of unification. Last year, in his presidential address, Parnell Skulborstad made you aware of the background and purpose of this timetable. Unfortunately, this timetable has not been adhered to. Planned meetings between the two Executive Boards which are necessary to thoughtfully prepare for future joint action have not taken place. In order for the membership of each organization to become acquainted with the purposes and activities of the other, the timetable called for a joint annual meeting in 1979 at a mutually agreed on site. We have selected a site committee to work with NEHA but it is our understanding that NEHA has already made its selection for 1979. Whether this indicates a lack of interest or concern on NEHA's part I do not know. I do know that any efforts toward unification have been postponed as your Executive Board firmly believes that if unification is to be approached or considered it must be through the type of proposal or timetable that was agreed to by the respective Executive Boards.

CONSTITUTIONAL CHANGES

As you will recall last year we approved certain changes in the Constitution and Bylaws. Final approval was given changes by the Membership through a mail ballot. The most significant was the Constitutional change which made the Secretary-Treasurer a full-fledged member of the Executive Board. In recent years the role of the Secretary-Treasurer had diminished as the Executive Secretary had taken over practically all of the responsibilities. As was previously explained, some thought had been given to abolishing the office of Secretary-Treasurer. However, we were advised that such an office was necessary as in an emergency a

Secretary-Treasurer would be available to carry on the duties of the Executive Secretary. Therefore, as was true this year and will continue in the future, we will vote for a Secretary-Treasurer rather than a Second Vice President. The newly elected person will then advance through the Association's offices as is done presently. Perhaps I have discussed this in more detail than was necessary. However, inquiries concerning the recent election indicated there was some confusion as to the role of the Secretary-Treasurer. As you probably know, Dick March who has been our Secretary-Treasurer for the past several years was selected to continue in the new position.

THE FUTURE

Earlier I spoke of change and that change is inevitable. We either meet these changes independently or someone else will take over. While we can profit by our past experience, we must face the future and not back into it. To accomplish this we cannot afford to work in a vacuum, each of us working by ourselves. There must be close ties within our Association and within our committees and a two-way flow of ideas, information and problems among our Membership. Our greatest hurdle is to learn to work together, to recognize the interdependence of the Association and members and their contributions. Each of us needs to be concerned what each of us can contribute. The needs of the Association demand this and in the final analysis a viable, healthy, progressive Association must have this cooperation.

The future is bright for our Association but it will remain so only if we are prepared to meet it with vigor and ideas and positive action. These are challenging days for our Association. Our responsibilities are great, but the opportunities and rewards are even greater.

IN CONCLUSION

In closing I ask your indulgence to inject a personal note. I would like to express my appreciation to you for allowing me to serve as an officer of the Association. This service has afforded me a rich experience that has given me more than I have given. I would like to express my gratitude to the men with whom I have served on the Executive Board and to express to them my appreciation for their ever-present willingness to assume responsibility and to work at the many tasks which have been necessary during the past year. I would also like to thank the chairmen and members of committees for their support and continuing efforts. I am confident of and have, with the spirit of cooperation, leadership and service that prevails, a growing optimism for the future of the International Association of Milk, Food and Environmental Sanitarians.

Reprinted from *J. Milk Food Technol.*, Vol. 39, No. 10, Pages 702-704 (October, 1976).

Presidential Address

William Kempa

67th Annual Meeting of the International Association
of Milk, Food and Environmental Sanitarians, Inc.

July 27-31, 1980
Milwaukee, Wisconsin

I too want to welcome you to Milwaukee – the city with a very special meaning for Members of IAMFES. This is the birthplace of our Association, an event that took place in October 1911. Those of us who were privileged to attend the 59th Annual Meeting held here in 1972 are delighted to be back. At least one other annual meeting was held in Milwaukee – in 1935. We are highly honored to have with us this morning – Dr. C. K. Johns of Ottawa, Canada, who was president that year. Dr. Johns has been a Member of IAMFES for 50 years and has attended nearly all annual meetings.

The two hosts, Wisconsin Association of Milk and Food Sanitarians Inc. and Wisconsin Dairy Plant Fieldmen's Association, have again combined their resources to provide for us more than double the benefits and enjoyment. We do appreciate their generous efforts to look after us so capably. Likewise, we acknowledge the assistance rendered by the ladies, that always ensures the success of our annual meetings.

Within the next 15 minutes I will summarize for you the activities of IAMFES during the past year. I will confine my comments to four areas: (a) membership and finances, (b) committee activities, (c) the first concurrent meeting with NEHA and (d) new developments in 1980.

MEMBERSHIP AND FINANCES

There is some good and some not so good news to report about the first topic – membership and finances. Our Membership failed to make further gains from the previous year, and the membership Committee is still without a chairperson. Membership is one area in which our organization needs to resume its efforts by encouraging young and not so young men and women to join IAMFES.

In 1986 we will be celebrating our Diamond Anniversary (75th birthday). A substantial increase in membership would be one appropriate way to mark that occasion. Doubling or even tripling the numbers could be accomplished if every member succeeded

in bringing one or two members in over the next 6-year period. Let each one of us determine to be an active promoter and increase the numerical strength of IAMFES, so vital to our very existence.

Since three countries (Australia, Canada, USA) participated at the first meeting in 1911, it would be a splendid idea to have all three represented at the 1986 Annual Meeting, wherever it will be held. Furthermore, an invitation to form new affiliates in other countries should be extended, with Mexico being one of the most convenient possibilities.

All of us are becoming very sensitive to the effects of the current economic downturn. Escalating costs play havoc with every type of operation, be it a home, business, or an Association such as ours. To date we have managed to stay on top of our financial situation, thanks to the help received from our industry friends. However, each year it is becoming more difficult to maintain a balanced status. Our Budget Committee, chaired by Harry Haverland, who was assisted by Clarence Luchterhand and Leon Townsend, prepared a proposed budget for the new fiscal year July 1, 1980 to June 30, 1981. It's a perfectly "rounded" budget – still balanced but with no more corners left to cut. I assure you there never were many concerns to start with, and every conceivable avenue to keep us in the black has and is being explored.

COMMITTEE ACTIVITIES

Much helpful work is being conducted by more than a dozen Standing Committees and an equal number of other committees with specific tasks assigned to them. Some committees are quite large and cover many interests. For example, the Farm Methods Committee, chaired by Dale Termunde, who is assisted by James I. Kennedy, has 11 subcommittees, each with a chairman of its own.

Presently there are four or five committees without chairpersons. Any volunteers among those attending the 67th Annual Meeting will be greeted with open arms. In total, over 200 dedicated hard-working Mem-

bers serve on these committees. On behalf of the Executive Board and all Members, I express our sincere gratitude for their past and present contributions to IAMFES.

In recognition of their efforts, a revised list of Members serving on various committees will be published in the *Journal of Food Protection* sometime this fall. In the meantime, a preliminary list is posted at the registration desk, for your information. Any specific questions you may have can thus be directed to the right person or persons. Please do not hesitate to offer your services on any of the committees, even if this is the first meeting you ever attended. There are no limits on age, color, creed, or sex.

Much has been said in past years about sharpening our communications within and without the organization. The IAMFES committee members have done an excellent job of producing information flow via committee reports, preparation of manuals, such as *Procedures to Investigate Foodborne Illness*, *Procedures to Investigate Waterborne Disease Outbreaks*, publication of the *Journal of Food Protection*, etc. Would you believe then, that, according to Dr. Elmer H. Marth, Editor, *Journal of Food Protection*, there are people today in need of food safety information who have not heard of our journal's existence. This type of problem urgently requires immediate attention and correction.

CONCURRENT MEETING WITH NEHA

Regular contacts have continued between the executive members of IAMFES and NEHA before or since 1968. Ways and means for closer cooperation between the two associations have been studied during those years. Resulting from such discussions, the Annual Meetings of the two groups are being held concurrently for the first time. Unfortunately rapidly changing economic trends have disrupted some of the initial plans that were made. One of these changes necessitated a hotel substitution by our group, that increased the distance between the two meetings, making it less convenient for exchange attendance. This was regrettable but also unavoidable.

Those involved in planning this important event are to be congratulated. While their hopes were not realized to the extent first anticipated, they should not be too dismayed either. Any start is usually the most difficult aspect of any new venture. That phase was successfully launched.

1980 DEVELOPMENTS

In this first year of a new decade we are off to a good start in several directions.

1. One of these I have just mentioned – the first concurrent Annual Meetings of NEHA and IAMFES in a city that has more than beer.

Please learn more about Milwaukee by reading the August 1980 issue of *National Geographic*, if you have not done so already.

2. A two-color Membership pamphlet "IAMFES. INC. – IT'S FOR YOU", mentioned in Howard Hutchings' Presidential Address last year, has been completed. The goals, history, structure and operation of the IAMFES are clearly described and should be regularly reread by every Member. Pass on the extra copies to prospective Members.
3. A presentation "packet" has been prepared by the IAMFES office to guide Executive Board Members when speaking at Affiliate Meetings.
4. An important amendment to the IAMFES Constitution and Bylaws was passed early this year, enabling the Affiliate Council Chairman to be a voting Member on the Executive Board. This will greatly improve liaison among the existing 28 Affiliates and IAMFES. Currently Leon Townsend is serving in that capacity. We value his concerns and judgment. Welcome to the Board.
5. Another outstanding innovation is the introduction of a sample copy of *Food and Fieldmen* in June 1980, containing a variety of topics to fill the needs of dairy plant fieldmen and practicing sanitarians. Regular publication will commence in January 1981 but with a different title, *Dairy and Food Sanitation*. Congratulations are extended to the Journal Management Committee, chaired by Dr. Ralston B. Read, Jr., to Jan Richards, Earl Wright, to the contributing authors and others who converted many ideas into such a pleasing magazine.
6. At this time I want to acknowledge a wealth of information that is being presented by highly qualified experts at this 67th Annual Meeting. To every contributor and to Bill Arledge, Program Chairman, we say sincere thanks from all the Members.

I also take pleasure in welcoming to the Executive Board our newest Member, Archie Holliday, as Secretary-Treasurer.

In closing, I wish to express my personal gratefulness to all Members for giving me the opportunity to serve as your president during the past year. It has been the briefest and the most exciting year I've ever experienced. Thank you all for your marvelous cooperation, support and friendship.

Reprinted from *JFP*, Vol. 43, No. 11, Pages 892-893 (November 1980).

Book reviewed by: William LaGrange, Ph.D., Extension Food Scientist, Iowa State University, Ames, IA 50011

Book Review



Listeria, Listeriosis, and Food Safety

Second Edition

Edited by: Elliot T. Ryser and Elmer H. Marth



Listeria, Listeriosis, and Food Safety is written by professional experts in this important food safety area and would be a useful text for all involved in the study and practice of food safety. *Listeria monocytogenes* has been recognized as a human pathogen since 1929, but not until recent years have detection methods been refined to establish the importance that this pathogen plays in our food safety concerns and foodborne illness outbreaks. Because a great deal of new knowledge concerning *Listeria* and the listeriosis problem has been developed since the 1991 first edition, this second edition was published in 1999.

The seventeen chapters included in this second edition are written by recognized experts. The following topics as well as hundreds of appropriate references are included within this book; the genus *Listeria*, *L. monocytogenes* in the environment, listeriosis in animals and humans, pathogenesis of *L. monocytogenes*, characteristics of this microorganism that relate to food processing, conventional and rapid methods for detecting *Listeria*, typing *L. monocytogenes*, reviews of foodborne listeriosis caused by food type including dairy foods, meat, poultry, seafood, and plant foods, and controlling *Listeria* in food processing plants. Also included is a section listing the media used to isolate and cultivate *Listeria* and *L. monocytogenes*.

For copies of *Listeria, Listeriosis, and Food Safety*—

Mail requests to: Marcel Dekker, Inc., 270 Madison Ave., New York, NY 10016-0602; Phone: 212.696.9000; Fax: 212.685.4540.

Highlights of the Executive Board Meeting

January 23-24, 2000

Atlanta, Georgia

Following is an unofficial summary of actions from the Executive Board Meeting held January 23 and 24, 2000 in Atlanta, Georgia:

Approved the following:

- Minutes of November 12-14, 1999 Executive Board Meeting
- Minutes of November 13, 1999 Executive Session Board Meeting
- Issuance of Certificate of Merits to Christine Bruhn and Barbara Cassens
- Fees for tours and events at the 87th Annual Meeting
- Exhibiting and co-sponsorship of the NSF Food Safety Conference

Discussed the following:

- Communication Update: Journal production remains on schedule, reports on *DFES* and *JFP* were accepted, monitor cost of providing journals online
- Membership Update: Membership growing, increased interest due to new name, new Member materials were reviewed
- Advertising Update: Ad sales growing, Exhibit Hall sales strong, sponsorship for Annual Meeting continues on pace
- Financial Update: Presented November 1999 financial statements, first quarter net results ended just over budget
- 401(k) plan to replace current 403(B) plan for employees
- Affiliate Operating Guidelines to be reviewed and revised
- The winter 2000 Affiliate Newsletter
- Prospective new Affiliate organizations in United Kingdom, Mexico, Quebec, and Manitoba
- Association slide show update for Executive Board use with Affiliate presentations
- Affiliate Educational Session scheduled for Saturday, August 5 in Atlanta, 2:00 to 4:00 p.m.

- Affiliate Delegates participation in New Member Reception on Saturday, August 5 in Atlanta, 4:30 to 5:30 p.m.
- Update received from 3-A Task Force
- Correspondence from the Committee on Communicable Diseases Affecting Man
- Committee Member appointments for 2000
- Secretary Candidates, nomination process and voting deadline
- Award nomination process
- President's Recognition Award
- An occasional column in Food Quality Magazine
- Report from the Local Arrangements Committee - 2000 Annual Meeting
- Tours and events for the 2000 Annual Meeting
- Use of LCD data projectors during the Annual Meeting
- Planning for 2001 and 2002 Annual Meetings; future Annual Meeting sites
- Annual Meeting Workshops
- Future Workshop ideas and Workshop sub-committee of Program Committee
- Co-sponsorship of Japan PC2000, and ASAE 2000
- Goals for the Association
- Internationalization of the Association
- Revised Policy Manual
- Student PDG activities and luncheon on Sunday, August 6 in Atlanta, 12:00 to 1:30 p.m.
- Establish an Army Food Inspectors PDG
- Update on written Association history project
- Exhibiting at the International Fresh-cut Produce Association Conference

Next Executive Board meeting: March 31 - April 2, 2000, Des Moines, Iowa



International Association for Food Protection

2000 – 2001

SECRETARY ELECTION

Biographical information on the Secretary candidates for 2000-2001 is presented on the following page. Please review the information carefully as you make your decision on which candidate to vote for.

Ballots were mailed to all International Association for Food Protection Members during the first week of February. Completed ballots are due back to the Association office by March 24, 2000. Sealed ballots will be forwarded to the Tellers Committee for opening and counting. Results of the election will be announced in the May issue of *Dairy, Food and Environmental Sanitation*.

If you have any questions about the voting process, please contact David W. Tharp, CAE, Executive Director at 800.369.6337, or 515.276.3344, or E-mail: dtharp@foodprotection.org.

THE CANDIDATES

PAUL A. HALL



FRANK YIANNIS



BIOGRAPHICAL INFORMATION

Paul A. Hall

Paul A. Hall is Director of Microbiology and Food Safety for Kraft Foods where he is responsible for developing and directing strategic microbiological safety and research programs including microbiological risk management, control of pathogens and spoilage organisms, HACCP implementation and regulatory compliance. Prior to joining Kraft in 1989, Mr. Hall previously held corporate microbiology positions for Anheuser Busch Companies and Ralston Purina Company.

During his 25-year career, Mr. Hall has published and lectured extensively in the area of microbiological food safety and has served on a number of microbiological trade and professional association technical committees. He is an active member and past-chair of the International Life Sciences Institute's (ILSI) Technical Committee on Food Microbiology and was instrumental in forging the highly successful Annual Meeting collaboration between IAAP and ILSI. Mr. Hall has been an active Member of IAAP since 1987. He is currently vice-chair of the Annual Meeting Program Committee and is also a member of the *Journal of Food Protection* Management Committee, past editorial board member of the *Journal of Food Protection* and past Black Pearl Award Jury Committee member. Mr. Hall has organized and chaired numerous Annual Meeting symposia and programs over the past twelve years.

Other professional affiliations for Mr. Hall include, Chair – Industry Board of Advisors for the University of Georgia, Center for Food Safety and Quality Enhancement, National Center for Food Safety and Technology, Past President – Food Microbiology Division – American Society for Microbiology, and Executive Committee – Food Microbiology Research Conference. Additionally, Mr. Hall has served on the Food and Drug Administration's CFSAN Research Review Committee and as an industry representative on the Food Laboratory Accreditation Working Group. Mr. Hall received his bachelor's degree in microbiology from the University of Missouri – St. Louis and his M.S. in management of technology from Washington University in St. Louis. He is currently completing a Ph.D. in quality management.

Frank Yiannas

Frank Yiannas is Manager of Walt Disney World's Environmental Health Department. He oversees all food safety programs, as well as other public health functions, for one of the world's largest entertainment companies. Mr. Yiannas joined Disney in 1989 to establish their first food safety laboratory. During his tenure, Mr. Yiannas has expanded the program beyond testing by establishing cutting-edge risk management strategies.

Mr. Yiannas is a nationally recognized speaker on the topic of innovative and creative approaches to food safety. Under his direction, Disney has been recognized for playing a leadership role in implementing HACCP at the food service level, developing hand-held computer technology to conduct food safety audits, and utilizing progressive microbial detection methods. Mr. Yiannas plans to extend the hand-held technology to computerize HACCP measurements. Also, he presently co-chairs a committee to develop international food safety icons that visually and universally communicate important food safety processes.

Mr. Yiannas has been an active Member of IAAP since 1993. His involvement at the Annual Meetings includes organizing symposia, functioning as convener, and presenting on relevant food safety issues. Mr. Yiannas is presently serving a three-year term on the Annual Meeting Program Committee. He also chairs the Food Sanitation Professional Development Group (PDG), and is a member of the Microbial Risk Assessment and Retail Food Safety & Quality PDGs.

Locally, Mr. Yiannas is very involved with the Florida Association of Milk, Food and Environmental Sanitarians (FAMFES). He is the current president of FAMFES and plays an active role in organizing the annual education conferences, assisting with the FAMFES newsletter, and recruiting new members.

At the national level, Mr. Yiannas holds a seat on Council I, Laws and Regulations, of the Conference for Food Protection (CFP). This council recommends changes to the Food and Drug Administration Model Food Code. He recently co-chaired a committee for the CFP to develop standards for permanent, outdoor cooking sites.

Mr. Yiannas is a Registered Microbiologist with the American Academy of Microbiology in the area of Consumer Products and Quality Assurance. He received his BS in microbiology with honors from the University of Central Florida and is pursuing a master of public health from the University of South Florida. In addition, he is a member of several professional associations, including the Institute of Food Technologists and the American Society for Microbiology.

NewMembers

AUSTRALIA

Murray S. Cambrill
Sanitarium Health Food Co.
Berkeley Vale, NSW

CANADA

Susan J. Buchko
University of Manitoba
Lethbridge, Alberta

Nichole Halliday
CanAmera Foods
Oakville, Ontario

Myron Harasym
Chil-Con Products, Ltd.
Brantford, Ontario

Suzarra Khan-Ramnarine
Kingsway Chocolate Co. Ltd.
Mississauga, Ontario

Chris Smith
Saskatchewan Ag & Food
Saskatoon, Saskatchewan

Shirley A. Toms
Calgary, Alberta

SINGAPORE

Christopher B. Finch
Singapore Br., Wespac DVC
FPO, AP

UNITED KINGDOM

Christopher J. Griffith
University of Wales Institute,
Cardiff
Cardiff, South Wales

Barbara M. Lund
Institute of Food Research
Norwich, Norfolk

UNITED STATES

Alabama

Patricia A. Pushcar
Mobile County Health Dept.
Theodore

California

Gordon M. Brock
Silliker Laboratories
Modesto

Keith Hashiguchi
San Mateo County Environmental
Health, Redwood City

Colin M. O'Sullivan
ITT-JABSCO
Costa Mesa

Edgar R. Smith
Southern California District
Vista

Delaware

M. C. DeLacy
Proctor and Gamble Dover Wipes
Co., Dover

District of Columbia

Tim Weigner
Food Marketing Institute
Washington

Florida

Indauê Ieda G. Mello
University of Florida
Gainesville

Georgia

Ynes R. Ortega
University of Georgia, CFSQE
Griffin

Illinois

Nayana Brahmhatt
Tone Products, Melrose Park

Iowa

Elizabeth A. Lautner
National Pork Producers Council
Des Moines

Kansas

Cassandra M. Gordon
Kansas State University
Manhattan

Louisiana

Tammy Bradley
Dutch Quality House
Bossier City

Wanda J. Lyon
Louisiana State University
Baton Rouge

Massachusetts

Jeff Johnson
Land O'Lakes Inc., Alexandria

Minnesota

Deborah Drake
Ecolab, Inc., St. Paul

Nebraska

Jitka Stiles
University of Nebraska-Lincoln
Lincoln

New Jersey

Theodore J. Passon, Jr.
Pure Earth Environmental Labs Inc.
Pennsauken

New York

Cary Locatelli
Knight Marketing Corp.
Johnstown

Ynte H. Schukken
Quality Milk Promotion Services
Ithaca

North Carolina

Gary D. Cartwright
North Carolina State University
Raleigh

Oregon

Steve L. Loehndorf
Reser's Fine Foods, Beaverton

Pennsylvania

Todd S. Martens
Hershey Foods Corporation
Hershey

South Carolina

Donna Boozer
Capsugel, Greenwood

Tennessee

Paul D. Ebner
University of Tennessee
Knoxville

Valene W. Ling
University of Tennessee-Knoxville
Knoxville

Texas

Richard E. Horton
7-Eleven, Inc.
Dallas

Wisconsin

Garrett J. Heintz
Agrilink Foods, Inc.
Green Bay

Louise Hemstead
CROPP/OrganicValley
LaFarge

Anne M. Hodge
Oscar Mayer/Kraft
Madison

Greg Josefchuk
Copesan, Brookfield

Cynthia B. Michalski
Oscar Mayer Foods, Madison



UpDates

United Fresh Fruit and Vegetable Association Announces New 2000 Board Nominees

United Fresh Fruit and Vegetable Association has announced the produce industry leaders nominated to serve on its 2000 Board of Directors. Ascending to chairman is Stephen F. Griffin, president, Misionero Vegetables, Salinas, CA, who served the past year as chairman-elect; Fred B. Heptinstall, executive vice president of Chiquita Banana, N.A., Cincinnati, OH is nominated as 2000 chairman-elect to assume the chairmanship of United in 2001.

Current chairman E. Bruce McEvoy, chief executive officer, Seald-Sweet Growers, Inc., Vero Beach, FL will remain on the Executive Committee for one year as past chairman; Bob Wilkins, general manager, GPOD of Idaho, Shelley, ID will continue to serve as secretary/treasurer.

In addition, the following industry leaders are nominated to serve on United's Board for a 2-year term beginning February 2000: Lawrence A. Kern, president and CEO, Apio, Inc., Guadalupe, CA; Ronald G. McCormick, director of produce, Wal-Mart Stores, Inc., Bentonville, AR; Gale Prince, director corporate regulatory affairs, The Kroger Co., Cincinnati, OH; Will Rousseau, partner, Rousseau Farming Co., Tolleson, AZ; John C. Sorenson, Ph.D., president, Novartis Seeds, Inc., Boise, ID; Robert Stumpo, director of purchasing and distribution, Wendy's International,

Dublin, OH; and William F. Williams, chairman and president, Glory Foods, Inc., Columbus, OH.

Alfa Laval Flow Inc. Appoints New President

Sammy Hulpiau has been named president of Alfa Laval Flow Inc.

Hulpiau joined the Alfa Laval organization in 1988. Most recently, he was president of Alfa Laval Flow in Holland. Much of Hulpiau's experience comes from the food, dairy and brewery industries.

Hulpiau brings a master's degree in business administration and computer science from the University of Brussels. He had several years of experience in information technology before accepting positions in corporate management.

Quality Chekd Dairies Inc. Elects Board Officers for the New Millennium

Quality Chekd Dairies, Inc. has elected its new board officers for the year 2000. They are: president, Paul Arbuthnot, general manager, Sunshine Dairy Inc., Portland, OR; vice president, L. G. (Lynn) Oller, president, Hiland Dairy Company, Springfield, MO; treasurer, Dennis Winter, president and CEO, Super Store Industries, Stockton, CA; and secretary, Doug Parr, vice president sales and marketing, Dean Foods Company, Franklin Park, IL.

Officers of Quality Chekd Dairies, Inc. are elected for a one-year term by members of the board of directors for Quality Chekd

Dairies. Board members, now nine in total, are elected by the membership to serve three-year terms.

Carl Zeiss, Inc. Makes New Appointments

Carl Zeiss announced the appointment of James J. Kelly as the company's new president and CEO for its US holding company, Carl Zeiss, Inc., and James Sharp as president of the microscope division of Carl Zeiss, Inc.

Kelly, an 11-year industry veteran has served as general counsel, vice president of marketing and manager of the microscopy group at Carl Zeiss Inc. since 1997.

James Sharp returns to manage the microscopy business in North America after serving for the past three years in Jena, Germany, as senior vice president for the Zeiss microscopy group.

Ashland Distribution and Specialty Chemical Companies Name Armstrong Vice President Planning and Development

Ashland Distribution and Specialty Companies have named David H. Armstrong vice president of planning and development.

Armstrong is now responsible for managing the merger and acquisitions (M&A) activity and strategic planning process, including major capital project analysis, special studies and new business development, for both Ashland Distribution Company and Ashland Specialty Chemical Company.

Armstrong holds a bachelor's degree in chemical engineering from The Ohio State University and a master's degree in business administration from Rutgers University.

Walker Stainless Equipment Announces the Addition of Perry Dwars and Joseph Miller

Walker Stainless Equipment, Inc. announces the addition of Perry Dwars to the position of director of sales. Perry's experience in the food and dairy industries will allow him and his team to quickly respond to customers' changing needs in the stationary equipment marketplace.

Joe Miller has been named central regional manager for Walker Equipment, reporting to Perry. Joe has extensive experience in the perishable transportation market.

Elgin Dairy Foods Inc. Appoints New Food Technologist

Elgin Dairy Foods, Inc. announces the appointment of Daniel Shafiabady as food technologist. Daniel graduated with a bachelor's degree in food science from the University of Illinois, Champaign-Urbana, and will be a part of the R&D team.

Duane Ehlke Promoted at Fristam Pumps

Fristam Pumps, Inc. announces the promotion of Duane Ehlke to the position of senior project engineer.

A member of Fristam's engineering department for six years, Duane holds a bachelor's of science degree in mechanical engineering from the University of Wisconsin-Platteville.

He is responsible for the design, development and improve-

ment of Fristam's product lines, as well as providing technical support for the company and its customers.

Otto Joins Duralam – Will Oversee Meat, Seafood and Poultry Markets

Duralam, Inc. announced that Gregory Otto has been named marketing/technical sales manager. Otto will focus primarily on the meat, seafood and poultry markets. His initial responsibilities will include overseeing Duralam's new chub-style packaging business.

Otto's experience in the meat, seafood and poultry markets includes all areas of horizontal form-fill-seal operations. He began his flexible packaging career in 1986, and has since held positions in sales, marketing, graphics, quality assurance, production and customer service.

**Visit our Web site
www.foodprotection.org**

Mills to Retire as 3-A Symbol Council Administrative Officer

Vince Mills has submitted his resignation as administrative officer of the 3-A Sanitary Standards Symbol Administrative Council. His request has been accepted, with deep regret, by the 3-A Symbol Council Board of Trustees. The resignation will become effective upon the selection of his successor, in order to ensure that a smooth transition of the Symbol Council office can be made.

The position of Symbol Council Administrative Officer typically requires 1/2 - 2/3 time. In addition, a secretarial/administrative assistant of approximately 1/2 - 2/3 time also is required. Salary scale for the positions is dependent upon qualifications and experience.

Persons who may have an interest in serving as Administrative Officer of the 3-A Symbol Council should contact either Dr. Warren S. Clark, Jr., Chairman of the Symbol Council Board of Trustees, c/o The American Dairy Products Institute, 300 W. Washington St., Suite 400, Chicago, IL 60606-1704; Phone: 312.782.4888; Fax: 312.782.5299; E-mail: adpi@flash.net or Mr. Earl O. Wright, Secretary-Treasurer of the Council at 501.855.9408; E-mail: bwt@ipa.net.

Is the Proposed European Food Authority a Recipe for Change?

The business of food safety is suddenly topical and the European Commission's recent White Paper on Food Safety promises a radical new approach in order to guarantee high standards for food safety. The document proposes the establishment of a European Food Authority that will embrace most aspects of food



NEWS

safety from "table to table" and put the interests of consumers first. The authority will be responsible for risk assessment and communication on food safety issues, but not for risk management, which will remain a responsibility of the European Commission.

The guiding principles of the European Food Authority will be to be guided by the best science, be independent of industrial and political interests, be open to rigorous public scrutiny, be scientifically authoritative, and work closely with national scientific bodies.

The principles are laudable, but the white paper presents little detail on how the authority will be funded, despite setting tight deadlines for its establishment. Secure funding is essential if the authority is to achieve its aims. Its relationship with national authorities responsible for food safety will also be critical to its success. When dispassionate scientific evidence and national political interests meet, which will prevail?

Putting cynicism aside for a moment, however, there are tremendous challenges and opportunities for scientists already working in the field.

For example, there has never been a more pressing need to

ensure the harmonization and integration of existing surveillance data on organisms in food-producing animals, foodstuffs (both animal and human), and humans.

This could and should be addressed before the authority starts work (predicted to be 2002). The big question remains; will the establishment of a European Food Authority really prove to be a recipe for change? The proof of the pudding, as they say, will be in the eating!

Reported by Sarah O'Brien (PHLS Communicable Disease Surveillance Centre, London, England).

Checking Water to Avoid Contamination

Each year, communities throughout the United States face short-term water quality problems when microorganisms make their way into public and private water supplies at levels that can cause disease. Often this occurs in the Pacific Northwest in late winter when flooding inundates wells and septic systems, mixing drinking water with contaminated water.

Carol Wyatt, a microbiologist and assistant professor in the Department of Veterinary Microbiology and Pathology at Washington State University's College of Veterinary Medicine studies water-borne disease causing organisms and offers advice on testing, pathogens, and water quality assurance.

The most common method used to determine if water supplies are contaminated is a coliform test. Coliforms are bacteria that live in the intestines of humans and animals. These beneficial bacteria aid digestion by helping break down food and are excreted in feces.

Specially stained and under a microscope, coliforms are easy to identify in water samples. High concentrations in a water sample mean the water is contaminated with feces.

Coliforms themselves aren't necessarily hazardous, but the presence of coliforms indicates that other hazardous microorganisms might be in the water. These microorganisms can cause what physicians call enteric diseases.

Enteric disease microorganisms infect the cells of the intestinal lining, either growing on them or in them. The resulting diseases can be serious and occasionally fatal. Symptoms can include cramping, diarrhea, vomiting, nausea, and sometimes fever.

Enteric disease microorganisms can be in the form of bacteria, viruses, or protozoa. Two types of protozoa, *Giardia lamblia* known for causing "backpacker's diarrhea," and *Cryptosporidium parvum*, a common cause of "traveler's diarrhea," are of particular concern. In the last several years these agents have contaminated city water supplies in several locations around the country. In 1993, *Cryptosporidium* contamination of the Milwaukee municipal water supply sickened more than 400,000 and killed some 70 people.

People killed by microorganisms in water are usually the very young, the very old, and those individuals with insufficient immune systems.

Disease-causing protozoa can sometimes be found in water in rural or developing areas. Generally, wild animal feces containing the protozoa contaminate the water supply. Proper well development and sanitary water storage and transport systems in those regions are the key to safety.

Protozoa can be difficult to eliminate from water supplies. They resist commonly prescribed antibiotics, as well as chlorination.

Filtration is one way to remove some contaminants from water and several water filtration systems are available for home-use. But no filter system is completely effective.

Physical filters are made of fibers, ceramics, or fabric. Activated carbon filters often include silver, a toxic element to some microorganisms.

Reverse osmosis filters pass water through membranes and collect it in storage tanks.

Ultraviolet disinfection units pass water through a beam of ultraviolet light. Ozone, a naturally occurring form of combined oxygen molecules that destroys certain microorganisms has been used to treat water but is also expensive. Sometimes different systems are combined to treat water in small quantities.

Cities don't use filtration because it's usually too expensive and can't decontaminate large quantities of water fast enough.

Municipal water is regularly tested for a variety of pathogens and chemicals and must meet EPA standards under the Safe Drinking Water Act. Homeowners are notified if drinking water becomes unsafe and contamination sources are then located and eliminated.

Even today, with many advances in technology, the best way of killing microorganisms in water is to boil it hard for 20 minutes. Boiling is the most common advice water managers give when they are faced with major water quality problems.

FSIS to Increase Permissible Levels of Food Ingredients Used as Antimicrobials and Flavoring Agents

The US Department of Agriculture's Food Safety and Inspection Service is increasing the permissible levels of several food ingredients that are used to inhibit the growth of certain pathogens or as flavor enhancers.

Under the rule, use of sodium diacetate and sodium acetate as flavoring agents in meat and

poultry products is approved at a level up to 0.25 percent by weight of total formulation. Use of sodium diacetate to inhibit the growth of *Listeria monocytogenes* is also approved to 0.25 percent.

FSIS will permit the use of sodium lactate and potassium lactate as flavoring agents and as a means of inhibiting certain pathogens in fully cooked meat and poultry products at a level up to 4.8 percent of total formulation.

However, an increase in the amount of sodium acetate as an antimicrobial agent in meat and poultry was not approved because sufficient data were not submitted to support the requested increase. FSIS also cannot permit the use of potassium acetate or potassium diacetate as a means of inhibiting the growth of certain pathogens or as a flavoring agent at this time since the Food and Drug Administration has not yet established a level for that use and data were not submitted to support the requested increase.

Since use of the approved food ingredients changes a product's formulation, FSIS expects establishments using the substances to reassess their Hazard Analysis and Critical Control Point plans for those products.

Also, establishments using the substances to inhibit the growth of pathogens should consider modifying their HACCP plans to designate their use as a critical control point, or should consider incorporating their use into an existing critical control point.

This rule, announced in the Federal Register, will become effective March 20, 2000, unless FSIS receives written adverse comments. An electronic copy can be obtained at www.fsis.usda.gov or requested from the Docket Clerk at the address below.

Comments can be submitted to the FSIS Docket Clerk, Docket #99-028DF, U.S. Department of Agriculture, Food Safety and Inspection Service, Cotton Annex, Room 102, 300 12th Street, SW, Washington, D.C. 20250-3700.

Salmonella Uses Chemical to Communicate

Chemical communication between animals, particularly insects, has been well documented through scientific study. Now, add microorganisms to the list of creatures that communicate this way. An Agricultural Research Service scientist has found that *Salmonella* bacteria release a chemical that directly affects the growth of these organisms.

Veterinarian Jean Guard-Petter, who is in ARS' Southeast Poultry Research Unit at Athens, GA, found that the food pathogen *Salmonella* enteritidis uses the chemical acylhomoserine lactone, or AHL, as a communication tool.

Each *Salmonella* bacteria puts out a low level of AHL, but when the population grows, so does the amount of AHL. At high levels, AHL prompts *Salmonella* to grow beyond its original genetic programming and signals cells to produce molecules that increase virulence. The abundance of these organisms in a confined space, such as the spleen of the chicken, forces them to move to another area, sometimes a hen's eggs. Even though *Salmonella* contaminates a small fraction of the 45 billion eggs produced each year in the United States, this still translates into a significant amount of illness. Occurrences of *S. enteritidis* food poisoning have increased fourfold in the US and 40-fold in Europe in the past 15 years.

Petter was the first to see that AHL is a factor in *S. enteritidis*' rapid growth and spread. She made her discovery by using a special plasmid reporter system that inserts genes in *S. enteritidis* bacteria. These genes cause the bacteria to emit light if they are producing AHL. As the light grows brighter, it indicates growth to a

high cell density. Dr. Petter's discovery may provide another tool for improving food safety.

Very Small Meat and Poultry Plants Implement HACCP

The US Department of Agriculture's Food Safety and Inspection Service (FSIS) announced that as of January 25 all the nation's meat and poultry supply is now required to be produced under the Pathogen Reduction/Hazard Analysis and Critical Control Point systems. This marks the final phase of HACCP implementation, in which very small plants, those with fewer than 10 employees and less than \$2.5 million in annual sales are to be operating under this science-based inspection system.

Under HACCP, plants identify critical control points during their processes where hazards such as microbial contamination can occur, establish controls to prevent or reduce those hazards, and maintain records documenting that the controls are working as intended. Slaughter plants must test for generic *E. coli* to determine the efficacy of their controls and all slaughter plants and plants producing raw ground product must meet a standard for the prevalence of *Salmonella* on products.

Approximately 300 of the nation's largest plants, those with 500 or more employees, came under HACCP in January 1998; 2,300 small plants, with between 10 and 499 employees, implemented HACCP in January 1999. HACCP has reduced the prevalence of potentially dangerous *Salmonella* in raw meat and poultry by as much as 50 percent in small and large plants.

"FSIS and state inspection programs have worked hard to ensure a successful transition to

HACCP in approximately 3,400 very small federally inspected plants and 2,300 state-inspected plants," said FSIS Administrator Thomas J. Billy. "We applied what we learned from the large and small plant implementation to assist very small plants in making the transition with minimal disruption."

Very small plant implementation has gone smoothly in part due to FSIS and state educational outreach efforts with plant owners and management staff.

Very small plants were provided a timeline of suggested dates for completing key milestones and supplied with technical assistance and workshops during the past year. Industry associations and large companies also provided valuable assistance to very small plants making the transition to HACCP.

Outbreak of Trichinellosis in South East England

An outbreak of eight cases of trichinellosis has arisen among Yugoslavian immigrants in west London and in the county of Hertfordshire. The outbreak has been traced to the town of Sombor in northern Serbia (former Yugoslavia) where between 40 and 80 cases are believed to have resulted from eating infected salami made from pork. This salami is a regional delicacy that is often eaten at this time of year. Nine salamis were brought into the United Kingdom from Sombor on 22 November 1999, distributed as gifts between four households, and eaten by at least eight people towards the end of November. At least five of the eight developed classical features of trichinellosis towards the end of December, including fever, myalgia, peripheral and periorbital oedema, rash, and myocardial infiltration (at least two cases had

retrosternal pain, palpitations, and orthopnoea, and three patients had non-specific ST changes on electrocardiography). Five cases were treated with either albendazole or thiabendazole. Symptoms of systemic trichinellosis typically occur three weeks after eating infected meat, which coincides with the phase of larval migration. The diagnosis has been made on clinical grounds. Serological tests are being conducted by the parasitology laboratory at University College London (UCL), which (along with UCL's histology department) is also examining leftover pork for trichinella larvae. Cases may arise elsewhere, and should prompt enquiries about exposure to smoked meat, especially pork, imported from countries of the former Yugoslavia. Two outbreaks of trichinellosis occurred in the German state of Northrhine-Westfalia between November 1998 and January 1999, one associated with ground meat (including pork) and the other with a commercially prepared raw smoked sausage. The original source of the meat could not be traced: the retailer was part of a chain supplied by abattoirs in several European countries, in turn supplied by about 40 producers. The problem of tracing contaminated meat to its source has also arisen in association with recent outbreaks of trichinellosis linked to consumption of horse meat.

Reported by Sanjay Bhagani (sanjay@bhagani.nellineuk.net), Matthew Burn, Barbara Bannister, Coppetts Wood Hospital, London, and Lorna Milne, West Hertfordshire Health Authority, England.

Salmonella's Molecular Mimics May Spark Arthritis

Scientists at Johns Hopkins have uncovered an important link between getting

specific bacterial infections and developing autoimmune diseases such as arthritis.

In a study reported in Feb. edition of the journal *Nature Medicine*, the researchers show clearly that immune system cells which fight bacteria can also attack normal cells carrying a specific mimic molecule, one that closely resembles a bacterial protein.

Further, they show that as long as there's been a previous bacterial infection, immune cells can attack "innocent bystander" cells, body cells that bacteria have never infected. This occurs when the cells are stressed by exposure to irradiation, environmental toxins or the body's stress chemicals.

"We've found this evidence that the immune system can be fooled," says Mark Soloski, Ph.D., who led the research team, "and it suggests subtle changes that could underlie many autoimmune diseases." The study also offers a starting place for scientists to investigate environmental or genetic triggers to autoimmune diseases.

The team focused on infections by *Salmonella*, bacteria well known for food poisoning but also long thought to trigger arthritis in some people. "As many as 10 percent of those who get *Salmonella* develop a 'reactive' kind of arthritis which lasts a few weeks," says Soloski. "But a smaller, significant number of those patients get a severe, debilitating type of arthritis that's long-lasting."

To investigate bacteria/arthritis connections, the scientists observed behavior of a typical bacteria-fighting immune cell, the cytotoxic lymphocyte (CTL), as it approached infected body cells. Cells invaded by bacteria normally give clear signals that they're infected. "They display small pieces of bacterial proteins on

their surface that say, in effect, 'Hey, here's a sick cell,' says Soloski. Attracted by this protein "flag," CTLs dock with the infected cells and trigger their rapid self-destruction.

The Hopkins scientists first identified the protein "flag" in mouse cells infected with *Salmonella* as one common to certain bacteria associated with human arthritis, including *Borrelia*, the cause of Lyme disease.

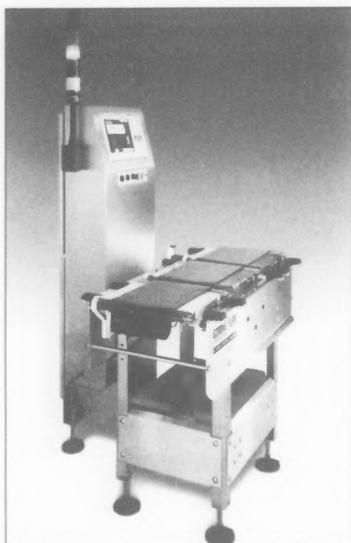
But they also found the bacterial "flag" was almost identical to parts of a "universal housekeeping molecule" found in humans, mice and all living organisms. This "housekeeping molecule" helps proteins keep their shape.

When researchers artificially coaxed mouse body cells to display the *Salmonella* "flag," the mouse CTLs would readily attack them. But CTLs also went into attack mode if the cells displayed a piece of the mouse's own housekeeping molecule or the identical human version. "This shows us the immune cells readily respond to a molecular mimic," says Soloski.

"In a normal *Salmonella* infection in mice," Soloski says "at least half of the CTLs are stirred up to recognize the mouse's own protein as well as the bacterial one. That's a huge immune response. Based on the similarity of the set-up in humans," he adds, "the response is likely the same. Now the scientists are trying to find why and how this immune response translates into arthritis in some mice and humans."

In a small side study, the team also found that normal, uninfected body cells could be attacked by CTLs if the cells were stressed in some way, such as being exposed to higher temperature or radiation or general infection. "We don't know what's going on here," says Soloski, "but it's a good place to study other triggers of autoimmune diseases."

IndustryProducts



Goring Kerr

Goring Kerr Introduces Its New D900 Checkweigher

Goring Kerr—A Thermo Sentron Company has introduced its new D900 Checkweigher. The new D900 is offered as a high rate, accurate control for a range of checkweighing applications. The D900 incorporates a 32-bit processor system and an integral PC micro-controller to handle all weighing, control and reject function at line speeds up to 700 packages per minute. The D900 also has a full-color graphic display; a user-friendly, interactive menu structure; and is packed watertight NEMA 4X rated stainless steel enclosure.

The system is capable of providing basic and advanced production statistics, loading set-up data for up to 100 products and

communicating with external data collecting systems. With the D900, it is possible to keep track of trend changes in the weight of hydroscopic product and adjust limits accordingly. It has the capacity to run random products on the same production line with an automatic product switchover. It has the capacity to run random products on the same production line with an automatic product switchover. In addition, the D900 has the capability to control filler adjustment and record external events.

Goring Kerr - A Thermo Sentron Co., Westmont, IL

Reader Service No. 243

New AcroWell™ Filter Plates from Pall Gelman Laboratory

Pall Gelman Laboratory's new AcroWell filter plates with BioTrace™ NT and BioTrace PVDF membranes strongly bind biomolecules such as DNA and protein. The upstream binding membrane layer is supported by hydrophobic PTFE that protects the upstream membrane. The lower membrane acts as a barrier to passive flow, allowing long incubations with the wells filled with hybridization and immunodetection solutions.

A central hole in the hydrophobic PTFE layer of each well allows fluid to pass under applied vacuum or centrifugation. The small hole size prevents solution loss during extended or high temperature incubations. The double-layer membranes are sealed

to the bottom of the plate using a proprietary sealing technology that eliminates crosstalk between wells, allowing adjacent wells to contain different probe mixtures without cross contamination.

The new AcroWell plate can be used to bind biomolecules for applications including ELISA, ELISPOT, kinase assays, nucleic acid hybridization, molecular diagnostics, cell-based immunodiagnostics, and protein:protein and protein:nucleic acid interactions.

AcroWell filter plates are designed with robotic handling systems in mind, although they can be used for manual filtration. The rigid single-piece construction meets the design recommendations of the Society of Biomolecular Screening, and plates fit most standard vacuum manifolds. Polypropylene plate construction is chemically resistant and low in biomolecule binding. Plates are stackable with or without the lid in place.

Pall Corporation, Ann Arbor, MI

Reader Service No. 244

Neogen Unveils Microwell Salmonella Test

Neogen Corporation had added a test for a pathogen identified as one of the most prevalent causes of domestic foodborne illness — *Salmonella*.

Neogen's new test kit, Alert for *Salmonella*, utilizes superior antibodies to provide the quickest testing times available of any microwell enzyme-linked

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immunosorbent assay (ELISA). Alert for *Salmonella* provides results in only 50 minutes after enrichment.

Salmonella infection is most often associated with poultry, raw meats, eggs, milk and dairy products, and sprouts. According to the Food and Drug Administration (FDA), the pathogen causes as many as 4 million cases of salmonellosis a year in the United States alone. The effects of salmonellosis can range from mild nausea and diarrhea to severe, and potentially fatal, complications in the very young and old, and among those with weakened immune systems.

Neogen Corporation, Lansing, MI

Reader Service No. 245

Anaerobe Identification Capability

Biolog, Inc. has released the MicroLog™ AN Database and MicroPlate™ for identification of anaerobic bacteria. With this product, laboratories now have the capability to identify a wide variety of anaerobic bacteria.

The Biolog AN Database provides capability to identify over 350 species of bacteria, far beyond any other kit-based anaerobic identification product. Additionally the MicroLog AN Database provides anaerobic identification and characterization capabilities that previously were not readily available to most microbiologists.

As with other Biolog MicroPlates™, the AN MicroPlate performs 95 discrete tests simultaneously. The chemistry used in the AN MicroPlate is the same patented redox chemistry used in other Biolog MicroPlates. The patterns created are metabolic fingerprints of the organism being identified. The vast number of reaction patterns from a single

MicroPlate allows the System software to provide a very accurate identification. Other kit-based identification methods rely on much less information for identification.

Biolog, Inc., Hayward, CA

Reader Service No. 246



ThermoWorks, Inc.

Waterproof Thermometer Survives Wet Conditions in the Plant, Lab or Field

ThermoWorks announces a new handheld thermometer designed for rough duty in wet and messy applications such as food service, processing plants, environmental testing and laboratories. The heavy duty meter housing is sealed with gaskets and o-rings to meet IP-65 standards. The handheld probe features a type K thermocouple sensor for very fast response times and a wide temperature range. The stainless steel shaft is 5" long with a rigid 1/8" diameter that is reduced and ground to a point for easy insertion and a 10 second response time. Each thermometer is individually factory calibrated with the probe attached for a total system accuracy within $\pm 1\%$ of the reading. The thermometer is powered by a 9-volt battery fitted in a gasket-sealed battery compartment. The Fahrenheit model measures over a range of -58 to 572°F while the Celsius version covers -50 to 300°C.

ThermoWorks, Inc., Alpine, UT

Reader Service No. 247

Introducing: NIST Traceable Water Resistant Temperature Recorder

Dickson is pleased to introduce the SK401 NIST Traceable Water Resistant Temperature Recorder to their current line of instrumentation.

Dickson's SK401 chart recorder is housed in a water resistant Velox PBT NEMA 4X case. This compact and affordable SK401 can record temperatures from -20 to 120°F in a 7-day recording time range.

The SK401 is suitable for outdoor use, not in direct sunlight, and is ideal for industrial and food applications, including HACCP. The SK401 is small enough that it can also monitor the inside of freezers and coolers.

Dickson Company, Addison, IL

Reader Service No. 248

Ultra-Thin, Ultra-Hard, Surface Enhancement Applied on International Space Station's Quick Disconnect Couplings Eliminates Wear, Leaks, and Contamination

In the harsh vacuum and low temperatures of outer space, the valves on quick disconnect couplings (QDCs) on the International Space Station (ISS) must operate with total reliability. Even UPS or FEDEX haven't found a way to make an overnight delivery of a replacement part to outer space. That's why the QDCs must be extraordinarily smooth, hard, and durable to alleviate the possibility of damage to the sealing surface during transportation or simply when opening or closing valves at temperatures as low as -160°F (-107°C).

During the extremely long period of exposure to the harsh condition in space, any damage to the coupling's valves, even minute surface scratches can result in unacceptable levels of system fluid leakage. Such gradual leakage of system fluids would contaminate the ISS external facilities and/or its internal habitat. It would also result in depletion of valuable resources which could be replenished only at great expense by additional space shuttle flights. Extreme system cleanliness, therefore, is vital, and contamination represents a constant, serious danger. Surface hardness, durability, and extended reliability are of utmost importance for the QDCs installed both inside and outside the ISS.

The design engineers at the Parker Stratoflex Unit of Parker Hannifin Corporation achieved that hardness, durability, and smoothness by specifying that the surface of the ISS QDCs be treated with NEDOX®, a proprietary surface enhancement coating technology applied by its developer, General Magnaplate Corporation of Linden, NJ. NEDOX provided an extremely thin film coating that permanently dry-lubricates the surface to a coefficient of friction (COF) as low as 0.06 while providing a hardness of up to Rc68.

Stratoflex's valve components for ISS QD couplings are manufactured from high strength Inconel or stainless steel. These components are polished, scrupulously cleaned, carefully packed, and sent to General Magnaplate's Ventura, California facility where the NEDOX coating is applied. Magnaplate's stringent QA inspection methods assure that the customer's

exacting specification requirements are met.

NEDOX is just one of many coatings in the family of Magnaplate "synergistic" surface enhancement products. They earned the term "synergistic" because the characteristics of the final coating exceed those of any of the separate components. NEDOX coatings create non-stick surfaces that exhibit superior resistance to corrosion as well as to static buildup. Because of their extremely low coefficient of friction, NEDOX-treated surfaces also exhibit excellent release properties which eliminate the need to use silicones or other sprays or additives on all types of molds and dies. Many of the coatings in the NEDOX series are compliant with FDA, USDA, and AgriCanada codes for food and drug use, and clean up easily without caustics, bleaches or other potentially environmentally-harmful cleaners.

General Magnaplate Corporation, Linden, NJ

Reader Service No. 249



CEM Corporation

Rapid, Accurate Moisture/Solids Analysis

The compact new SMART System⁵ from CEM provides automated microwave moisture/solids analysis in seconds. The sample is continuously weighed

during the drying process to ensure complete dryness and prevent burning. Utilizing temperature feedback and built-in power control, the SMART System⁵ adjusts microwave power to provide reproducible results and ensure repeatable conditions for every test. The user-friendly software provides pre-programmed methods and help screens the guide the operator through a test.

CEM Corporation, Matthews, NC

Reader Service No. 250

Promega's M-MLV Reverse Transcriptase, RNase H Minus

Promega Corporation is pleased to announce the availability of M-MLV Reverse Transcriptase, RNase H Minus, Point Mutant. This enzyme can be used in cDNA synthesis with long messenger RNA templates. Our history of manufacturing reverse transcriptases ensures a reliable supply, providing consistent performance for use in the laboratory. M-MLV RT (H-) is available in catalog package sizes as well as in bulk quantities.

Promega manufactures a wide range of molecular biology reagents for use in DNA analysis as well as for use in other food and agricultural testing applications. The company achieved ISO 9001 registration in 1998. This registration validates Promega's conformance with the standards set by the International Organization for Standardization.

Promega Corporation, Madison, WI

Reader Service No. 251



International Association for
Food Protection
Annual Meeting

August 6-9

Preliminary Program

Monday, August 7, 2000

Morning

Symposia Topics

- *Listeria monocytogenes*: Current Issues and Concerns, Section I Pathology, Virulence, and Risk Assessment of *L. monocytogenes*
- Safer Production of Sprouts from Seeds
- Cook-chill/Sous Vide Technology
- The Role of Molecular Techniques for Vibrios and Viruses in Making Risk Management Decisions

Technical Session

- Foodborne Pathogens

Poster Session

- Inactivation and Control Methods I

Afternoon

Symposia Topics

- *Listeria monocytogenes*: Current Issues and Concerns, Section 2 Detection, Enumeration, and Intervention Strategies for *L. monocytogenes*
- International Farm Level Produce Food Safety: Good Agricultural Practices
- Relevance of Testing to Reduce Risk
- HACCP-based Strategies for Cooked Ready-to-Eat Seafoods Based on Quantitative Risk Assessment

Technical Session

- Microbiological Methods

Poster Session

- Inactivation and Control Methods II

All Day Poster Symposium

- Approaches to Control Pathogens in the Next Millennium

Tuesday, August 8, 2000

Morning

Symposia Topics

- *Campylobacter* Performance Standards: Implementation and Control

- Genetic Methods to Track Microorganisms in Food Production and Processing
- Issues Facing Today's Large Dairy Producers
- Approaches to Food Safety in Latin America and the Caribbean

Technical Session

- Inactivation and Control Methods I

Poster Session

- General Food Microbiology and Education

Afternoon

General Session — Bioterrorism and Food Protection

Wednesday, August 9, 2000

Morning

Symposia Topics

- Food Biotechnology: Perspectives, Challenges and Opportunities
- Biosensors and Real Time Detection Systems
- Transportation of Raw Milk and Finished Dairy Products
- Significance of Mycotoxins in the Global Food Supply

Technical Session

- Inactivation and Control Methods II

Poster Session

- Microbiological Methods

Afternoon

Symposia Topics

- The Role of Norwalk-like Viruses (NLVs) in Foodborne Disease
- Canadian On-Farm Food Safety Program
- The Earth is Curved (And so are Kinetic Data)

Technical Session

- Risk Assessment and Miscellaneous



International Association for
Food Protection

ATLANTA

EVENT INFORMATION

Evening Events

Cheese and Wine Reception

Sunday, August 6, 2000 (8:00 p.m. – 10:00 p.m.)

A tradition continues for attendees and guests. The reception begins immediately following the Ivan Parkin Lecture on Sunday evening in the exhibit hall.

Exhibit Hall Reception

Monday, August 7, 2000 (5:00 p.m. – 6:30 p.m.)

Relax with colleagues and friends in the exhibit hall at the end of the day. Exhibitors showcase the latest developments in the industry during this informal reception.

Monday Night Social – Fernbank Museum of Natural History

Monday, August 7, 2000 (6:00 p.m. – 9:30 p.m.)

A world of exciting adventure awaits you at Fernbank Museum of Natural History. At your leisure you will have the opportunity to dine with colleagues and explore unique state-of-the-art galleries and exhibitions. Fernbank uses innovative design and programming to draw natural history out of display cases and bring it to life. For a limited time only, Fernbank is featuring the world renowned collection of Egyptian art from the National Museum of Antiquities in Leiden, the Netherlands. Mummies, sculptures, jewelry and papyrus pages from the Book of the Dead are among the antiquities featured. This is the only time that these pieces will be on view in the United States before they return to the Netherlands for permanent reinstallation. Don't miss this rare opportunity!

Dinner at Stately Oaks

Tuesday, August 8, 2000 (6:30 p.m. – 10:00 p.m.)

Stately Oaks, a Greek Revival plantation home, was built in 1839 and housed Yankee officers during the Battle of Jonesboro. The home is furnished with period pieces and offers a glimpse of life in the Antebellum



August 6-9

Atlanta, Georgia

period. A guide will take you on an informative tour throughout the house, painting a picture of the rural South during the mid 1800s. Guests will then enjoy a delicious Southern cooked meal. You will not go away hungry!

Awards Banquet

Wednesday, August 9, 2000 (7:00 p.m. – 9:30 p.m.)

A special occasion to formally recognize the accomplishments of deserving food safety professionals. An elegant reception and dinner are followed by the awards ceremony. Business attire requested.

Daytime Tours

(Lunch included in all daytime tours)

Pop Topics

Sunday, August 6, 2000 (9:30 a.m. – 2:30 p.m.)

Today's tour will not only quench your thirst for knowledge but will also quench your thirst. Enjoy a tour of CNN and the world of Coca-Cola Museum. Watch as writers, editors, producers and technicians bring round-the-clock news coverage to over 200 countries worldwide. Take your taste buds on a trip around the globe when you sample Coke's most popular products from other countries at the first museum dedicated to the world famous soft drink, Coca-Cola. Your tour will continue to The Varsity, an Atlanta legacy, where you can order the best chili dogs and hamburgers in town. A stop at Underground Atlanta, the most popular visitor attraction in Georgia, will complete your tour.

Daytime Tours *(continued)*

Peach Buzz

Monday, August 7, 2000 (9:30 a.m. – 2:30 p.m.)

Enjoy a driving tour of Atlanta sites and take a glimpse into the lives of Atlanta's historical hometown heroes. Be a part of history at the Carter Presidential Center where you will find exhibits that focus on important twentieth century events. Continue your historical journey to the Martin Luther King, Jr. Historic District on "Sweet Auburn Avenue" and see the MLK Center, Dr. King's birth home and tomb. You will then experience a revival of genuine Southern hospitality and the finest selection of Southern homestyle food in the city at Mary Mac's Tea Room.

Diaries of the South

Tuesday, August 8, 2000 (9:30 a.m. – 2:30 p.m.)

Be swept away to one of the most exclusive areas of Georgia with a driving tour of Buckhead. Today, Buckhead is considered Atlanta's "Little Hollywood". Step back in time at the Atlanta History Center and see how locals lived over 100 years ago. Continue your journey to the elegant Swan House to witness the glitz and glamour of yesteryear. This beautiful home was built around 1920 for Mr. Inman, one of Atlanta's wealthiest citizens. Walk through the Tullie Smith Plantation, an original farmhouse circa 1800s. Personnel dressed in period costume enhance the multi-sensory experience and offer a charming look at turn-of-the-century fashions. The highlight of the day will be the final stop at the Swan Coach House for lunch. The Swan Coach House presents gourmet cuisine, accented with Southern flavors. Encircled by colorful gardens and natural woodlands, this early 20th century carriage house was once part of the Inman estate.

Affiliate Educational Session

Affiliate Educational Session

Saturday, August 5, 2000 (2:00 p.m. – 4:00 p.m.)

Attention Affiliate delegates, gain insights on Affiliate organizational issues. Be a leader for your Affiliate and participate in this educational experience.

New Member Reception and Orientation

New Member Reception

Saturday, August 5, 2000 (4:30 p.m. – 5:30 p.m.)

Is this your first time attending the Annual Meeting? If so, you are invited to attend this orientation session.

Learn how to get involved in Committees and get the most out of attending the Meeting. We look forward to your participation.

Committee Meetings

Committee Meetings

Sunday, August 6, 2000 (7:00 a.m. – 5:00 p.m.)

Share a wealth of knowledge and expertise. Committees and Professional Development Groups (PDGs) plan, develop and institute many of the Association's projects. Technical challenges facing the food safety industry are discussed, examined and debated. Volunteer to serve on any number of committees or PDGs that plan and implement activities to meet the Association's mission.

Student Luncheon

Student Luncheon

Sunday, August 6, 2000 (12:00 p.m. – 1:30 p.m.)

Take charge of your career today! A Student Professional Development Group (PDG) has formed to provide students the opportunity to network with peers and serve as a point for food safety employers to seek qualified applicants. Sign up for the lunch today to get involved. The purpose of the lunch is to establish objectives and responsibilities as a PDG and discuss plans for the future. Dr. Anna Lammerding, Chief of Microbial Food Safety Risk Assessment from Health Canada and Mr. Gale Prince, Director of Regulatory Compliance at The Kroger Company will speak about challenges and opportunities in the field of food safety.

Golf Tournament

The Golf Club at Bradshaw Farm

Sunday, August 6, 2000 (6:00 a.m. – 2:00 p.m.)

Enjoy spectacular views of the northern Georgia mountains as you join your friends and colleagues in a round of golf at The Golf Club at Bradshaw Farm. Everyone is invited to participate in this best-ball tournament. Built on historic farm property, the unique barn-style club house is reminiscent of the great history attached to the course. With elevated tees, tree-lined bermuda fairways and meticulously groomed bentgrass greens, Bradshaw Farm remains one of the most highly regarded layouts in the Atlanta metro area and is perfect for golfers of all skill levels. What an ideal way to kick off the 87th Annual Meeting!



International Association for Food Protection

87th Annual Meeting

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

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

Meeting Information

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

Registration includes:

- Technical Sessions
- Symposia
- Poster Presentations
- Ivan Parkin Lecture
- Exhibit Hall Admittance
- Cheese and Wine Reception
- Exhibit Hall Reception
- Awards Banquet
- Program and Abstract Book

4 Easy Ways to Register

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



Phone: 800.369.6337; 515.276.3344

Fax: 515.276.8655

Mail: 6200 Aurora Avenue, Suite 200W,
Des Moines, IA 50322-2863



Web site: www.foodprotection.org

The early registration deadline is **June 30, 2000**. After June 30, late registration fees are in effect. Registration materials may be picked up on site at the Hilton Atlanta.

Refund/Cancellation Policy

Registration fees, less a \$50 administration fee and any applicable bank charges, will be refunded for written cancellations received by July 14, 2000. No refunds will be made after July 14; however, the registration may be transferred to a colleague with written notification. Refunds will be processed after August 14, 2000. Additional tickets purchased are nonrefundable.

Exhibit Hours

Sunday, August 6, 2000 — 8:00 p.m. – 10:00 p.m.
Monday, August 7, 2000 — 9:30 a.m. – 1:30 p.m.
3:00 p.m. – 6:30 p.m.
Tuesday, August 8, 2000 — 9:30 a.m. – 1:30 p.m.

August 6-9, 2000, Atlanta, Georgia

Hotel Information

For reservations, contact the hotel directly and identify yourself as an International Association for Food Protection Annual Meeting attendee to receive a special rate of \$119 per night, single or double. Make your reservations as soon as possible; this special rate is available only until July 7, 2000.

Hilton Atlanta
255 Courtland Street, NE
Atlanta, Georgia 30303
404.659.2000

Evening Events

Sunday, August 6, 2000

Cheese and Wine Reception (8:00 p.m. – 10:00 p.m.)

Monday, August 7, 2000

Exhibit Hall Reception (5:00 p.m. – 6:30 p.m.)

Monday Night Social **Fernbank Museum of Natural History**
(6:00 p.m. – 9:30 p.m.)

Tuesday, August 8, 2000

Dinner at Stately Oaks (6:30 p.m. – 10:00 p.m.)

Wednesday, August 9, 2000

Awards Banquet (7:00 p.m. – 9:30 p.m.)

Daytime Tours

(Lunch included in all daytime tours)

Sunday, August 6, 2000

Pop Topics (9:30 a.m. – 2:30 p.m.)

Monday, August 7, 2000

Peach Buzz (9:30 a.m. – 2:30 p.m.)

Tuesday, August 8, 2000

Diaries of the South (9:30 a.m. – 2:30 p.m.)

Golf Tournament

Sunday, August 6, 2000

Golf Tournament (6:00 a.m. – 2:00 p.m.)



International Association for Food Protection

87th Annual Meeting

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E-mail: info@foodprotection.org
Web site: www.foodprotection.org

Attendee Registration Form

August 6-9, 2000, Atlanta, Georgia



Name (Print or type your name as you wish it to appear on name badge) _____

Title _____ Employer _____

Mailing Address (Please specify: Home Work) _____

City _____ State/Province _____ Country _____ Postal/Zip Code _____

Telephone _____ Fax _____ E-mail _____

First time attending meeting Member since: _____

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

Member Number: _____

REGISTER BY JUNE 30, 2000 TO AVOID LATE REGISTRATION FEES

REGISTRATION FEES:

Registration (Awards Banquet included) _____
 Association Student Member* _____
 Retired Association Member* _____
 One Day Registration: Mon. Tues. Wed. _____
 Spouse/Companion (Name): _____
 Children 15 & Over (Names): _____
 Children 14 & Under (Names): _____
 *Awards Banquet not included

MEMBERS	NONMEMBERS	TOTAL
\$ 260 (\$310 late)	\$395 (\$445 late)	_____
\$ 45 (\$ 55 late)	Not Available	_____
\$ 45 (\$ 55 late)	Not Available	_____
\$ 145 (\$170 late)	\$200 (\$225 late)	_____
\$ 40 (\$ 40 late)	\$ 40 (\$ 40 late)	_____
\$ 25 (\$ 25 late)	\$ 25 (\$ 25 late)	_____
FREE	FREE	_____

EVENTS:

Golf Tournament (Sunday, 8/6) _____
 Student Luncheon (Sunday, 8/6) _____
 Monday Night Social, Fernbank Museum (Monday, 8/7)
 Children 14 and under _____
 Dinner at Stately Oaks (Tuesday, 8/8)
 (Limited tickets available) _____
 Awards Banquet (Wednesday, 8/9) _____

	# OF TICKETS	
\$ 90 (\$105 late)	_____	_____
\$ 5 (\$ 10 late)	_____	_____
\$ 39 (\$ 44 late)	_____	_____
\$ 34 (\$ 39 late)	_____	_____
\$ 60 (\$ 65 late)	_____	_____
\$ 40 (\$ 45 late)	_____	_____

DAYTIME TOURS:

(Lunch included in all daytime tours)
 Pop Topics (Sunday, 8/6) _____
 Peach Buzz (Monday, 8/7) _____
 Diaries of the South (Tuesday, 8/8) _____

\$ 56 (\$ 61 late)	_____	_____
\$ 53 (\$ 58 late)	_____	_____
\$ 65 (\$ 70 late)	_____	_____

TOTAL AMOUNT ENCLOSED \$ _____
 US FUNDS on US BANK

Payment Options:

Check Enclosed

JOIN TODAY AND SAVE!!!
 (Attach a completed Membership application)
 (See page 236 of this issue
 for a membership application)

Name on Card _____

Signature _____

Exp. Date _____

EXHIBITORS DO NOT USE THIS FORM

Microbiologist/Plant Pathologist/ Food Technologist

The Eastern Regional Research Center (ERRC), ARS, USDA, has a permanent full-time position in the area of microbial food safety. The individual will conduct microbiological studies relating to the safety and quality of fresh and minimally processed fruits and vegetables in support of industry needs and regulatory requirements. Chemical, physical and biological interventions will be developed to ensure that produce is free of human pathogens.

ERRC is located on an attractive 27-acre campus just outside of Philadelphia in Wyndmoor, Montgomery County, Pennsylvania. Employees enjoy a flexible work schedule, excellent library facilities, and computer center. Candidates must be a U.S. citizen, have a degree in Microbiology, Plant Pathology, Food Science, or a related discipline. In addition, the ability to plan, conduct and report research and publish in professional journals is essential. Salary commensurate with experience — \$42,919 to \$79,518 per year.

For information on the position call Dr. William Fett at 215-233-6418 or E-mail wfett@arserrc.gov. Visit the ARS Vacancy Web site: www.ars.usda.gov/afm/hrd/resjobs. For application package call Mary Ann Byrne at 215-233-6571. Applications must be marked ARS-XOE 0145 and must be complete and postmarked by April 24, 2000.

USDA/ARS is an Equal Opportunity Employer

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WORKSHOP

Introduction to Microbial Risk Analysis

May 4-5, 2000

Washington, D.C.

More details will be available in the April issue of *DFES*, or visit our Web site at www.foodprotection.org for the latest information.



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Make Your Reservations Today for the 87th Annual Meeting

Hilton Atlanta
255 Courtland Street, NE
Atlanta, Georgia 30303

Identify yourself as an International Association for Food Protection Annual Meeting attendee to receive a special rate of \$119 per night. Make your reservations as soon as possible; this special rate is only available until July 7, 2000.

Phone: 404.659.2000

Coming Events

APRIL

• **1, On-Farm Milk Processing: Alternative Income Opportunities for Milk Producers**, Frederick, MD. Subject areas will include processing of cheeses and other specialty milk products from cow, sheep and goat milk. For further information, contact Dr. Scott A. Rankin at 301.405.4568.

• **3-4, Advanced HACCP Workshop**, Manhattan, KS. Participants will learn how to: confirm prerequisite programs; review the HACCP manual; verify implemented HACCP systems; and validate the HACCP plan. For additional information, contact AIB, 1213 Bakers Way, PO Box 3399, Manhattan, KS 66505-3999 or Phone: 785.537.4750; Fax: 785.537.1493.

• **3-5, Food Irradiation 2000**, Sheraton National Hotel, Arlington, VA. For more information, contact Melanie Searle, Intertech Conferences, 19 Northbrook Dr., Portland, ME 04105; Phone: 207.781.9800; Fax: 207.781.2150; E-mail: info@intertechusa.com.

• **4-6, Missouri Milk, Food & Environmental Health Association Annual Meeting**, Ramada Inn, Columbia, MO. For additional information, contact Stephen St. Clair at 573.221.1166.

• **6-9 IAFIS Annual Conference**, The Westin LaPaloma, Tucson, AZ. For further information, contact Dorothy Brady at 703.761.2600.

• **7-12, 2000 Conference for Food Protection**, Hyatt Regency Hotel, Milwaukee, WI. For additional information, contact Trevor Hayes, CFP Executive Secretary, 1085 Denio Ave., Gilroy, CA 95020-9206; Phone/Fax: 408.848.2255; E-mail: TWHgilroy@aol.com.

• **10-13 Discovery 2000, Emerging Strategies for Drug Discovery**, Hyatt Regency La Jolla, San

Diego, CA. Presented by Institute for International Research, Biotechnology Division. For further information, Phone: 888.670.8200 (US); 941.951.7885 (International); Fax: 941.365.2507; E-mail: register@iirny.com.

• **12, Metropolitan Association of Dairy, Food and Environmental Specialists Annual Spring Conference**, Victorian Manor, Edison, NJ. For further information, contact Fred Weber at 609.584.7677.

• **12-14, Michigan Environmental Health Association 55th Annual Conference**, Kewadin Conference Center, Sault Ste. Marie, MI. For further information, contact Leslie Askwith at 906.635.3624.

• **13, Kansas Association of Sanitarians Spring Meeting**, at Mount Conference Center, Atchinson, KS. For additional information, contact Chris McVey at 316.342.4864.

• **16-19, Foodborne Pathogens 2000: Perspectives and Interventions**, Crowne Plaza, Arlington/Crystal City, VA. Sponsored by the Society for Industrial Microbiology. For more information, contact 3929 Old Lee Highway, Suite 92A, Fairfax, VA 22030-2421; Phone: 703.691.3357; Fax: 703.691.7991; E-mail: info@simhq.org.

• **17-19, A Food Industry Approach**, Manhattan, KS. Special features include integrating ISO 9000 requirements with a comprehensive quality program; evaluating and improving your quality program; grasping HACCP and how it fits into your quality and food safety system; building a HACCP plan from the ground up; and networking with others. For additional information, contact AIB, 1213 Bakers Way, P.O. Box 3999, Manhattan, KS 66505-3999; Phone: 785.537.4750; 800.633.5137; Fax: 785.537.1493.

• **18, Upper Midwest Dairy Industry Association Spring Meeting**, Ramada Inn, Owatonna, MN. For additional information, contact Paul Nierman at 612.785.0484.

• **19, Upper Midwest Dairy Industry Association Spring Meeting**, Holiday Inn, Alexandria, MN. For additional information, contact Paul Nierman at 612.785.0484.

• **24-27, CIP/COP/SIP Workshop**, sponsored by IAFIS. Michigan State University, East Lansing, MI. For additional information, contact Dorothy Brady at 703.761.2600 or E-mail: dbrady@iafis.org.

• **27, Indiana Environmental Health Association, Inc., Spring Educational Conference** at Valle Vista in Greenwood. For additional information, contact Helene Uhlmann at 219.853.6358 or Bob Schmidt at 812.349.2542.

• **28, Fourth Annual Symposium on Industrial and Fermentation Microbiology**, Radisson Center, La Crosse, WI. For additional information, contact Dr. S. N. Rajagopal, Dept. of Microbiology, University of Wisconsin-La Crosse, La Crosse, WI 54601; Phone: 608.785.6976; Fax: 608.785.6959; E-mail: rajagopa.s@uwax.edu.

• **30-May 3, American Dairy Products Institute (ADPI) and American Butter Institute (ABI) 2000 Joint Annual Meeting**, Chicago Hilton & Towers Hotel, Chicago, IL. For more information, contact Dr. Warren Clark, Jr., ADPI at 312.782.4888; 312.782.5455; Fax: 312.782.5299.

MAY

• **2, Northern California Institute of Food Technologists Suppliers' Expo 2000**, Oakland Convention Center, Oakland, CA. For more information, call 650.802.0888.

• **4-5, Introduction to Microbial Risk Analysis Workshop**, Marriott Inn and Conference Center, at the University of Maryland University College, College Park, MD. Sponsored by the International Association for Food Protection. For additional information visit our Web site at www.foodprotection.org or Phone: 800.369.6337; 515.276.3344; Fax: 515.276.8655.

• **7-11, 8th World Salt Symposium Salt 2000**, in The Hague. Participants will be informed of the developments that are important for their respective activities in relation to salt. For further information, contact Dr. Justus M. de Jong, Phone: 31.74.2443908; Fax: 31.74.2443272; E-mail: Salt.2000@inter.NL.net.

• **7-12, 3-A Sanitary Standards Annual Committee Meetings**, Four Point Sheraton Hotel, Milwaukee, WI. For additional information, contact Philomena Short at 703.761.2600.

• **16-17, Pennsylvania Assn. of Milk, Food & Environmental Sanitarians Meeting** at the Nittany Lion Inn, State College, PA. For further information, contact Eugene Frey at 717.397.0719.

• **31, Massachusetts Milk, Food & Environmental Inspectors Association**, Parwick Center, Cickopee, MA. For additional information, contact Fred Kowal at 413.592.5914.

JUNE

• **5-7, Texas Assn. of Milk, Food & Environmental Sanitarians**, Holiday Inn South, Austin, TX. For further information, contact Ron Richter at 409.845.4409.

• **7-8, Associated Illinois Milk, Food & Environmental Sanitarians Field Representative Meeting**. For further information, contact Tom Gruetzmacher at 815.395.8797.

JULY

• **3rd Annual Florida Food-borne Pathogen Analysis Conference**, Tradewinds Resort, St. Pete, Beach, FL. For further information, contact Dr. Joanne Brown, Chief, Bureau of Food & Residue Laboratories, Florida Dept. of Agriculture and Consumer Services,

3125 Conner Blvd., Bldg. 4, Tallahassee, FL 32399-1650; Phone: 850.488.0670; Fax: 850.488.4226.

AUGUST

• **5, International Association for Food Protection Annual Meeting Workshops**, Atlanta, GA. Workshop I "Microbiological Sampling Plans and Sample Collection for Food Processors." Workshop II "Food Safety Impact of Facility, Equipment Construction and Maintenance." For additional information, Phone: 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: info@foodprotection.org. or Visit our Web site at www.foodprotection.org for the most current annual meeting information.

• **6-9, International Association for Food Protection Annual Meeting**, Atlanta, GA. Registration information available in this issue of *DFES* on pages 229 or contact Julie Cattanach at 800.369.6337; 515.276.3344; Fax: 515.276.8655; E-mail: jcattanach@foodprotection.org. Visit our Web site at www.foodprotection.org for the most current annual meeting information.



International Association for Food Protection
Formerly IAMFES

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For information on membership with the International Association for Food Protection, Circle #100 on this card.

100	115	130	145	161	175	190	205	220	235	250	265	280	295	310	325	340
101	116	131	146	162	176	191	206	221	236	251	266	281	296	311	326	341
102	117	132	147	163	177	192	207	222	237	252	267	282	297	312	327	342
103	118	133	148	164	178	193	208	223	238	253	268	283	298	313	328	343
104	119	134	149	165	179	194	209	224	239	254	269	284	299	314	329	344
105	120	135	150	166	180	195	210	225	240	255	270	285	300	315	330	345
106	121	136	151	167	181	196	211	226	241	256	271	286	301	316	331	346
107	122	137	152	168	182	197	212	227	242	257	272	287	302	317	332	347
108	123	138	153	169	183	198	213	228	243	258	273	288	303	318	333	348
109	124	139	154	170	184	199	214	229	244	259	274	289	304	319	334	349
110	125	140	155	171	185	200	215	230	245	260	275	290	305	320	335	350
111	126	141	156	172	186	201	216	231	246	261	276	291	306	321	336	
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BOOKLETS

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

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

Multiple copies available
at reduced prices.
Phone our office for pricing information
on quantities of 25 or more.

Shipping/Handling
Booklets Total

OTHER PUBLICATIONS

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

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

Shipping/Handling
Other Publications Total

3-A SANITARY STANDARDS

Quantity	Description	Member or Gov't. Price	Non-Member Price	TOTAL
	Complete Set 3-A Dairy & Egg Standards	\$125.00	\$250.00	
	Five-year Update Service on 3-A Dairy & Egg Standards (new and revised standards only)	165.00	330.00	

SHIPPING AND HANDLING – Each set \$6.25 (US) \$10.25 (Outside US)

Payment Must be Enclosed for Order to be Processed
★ US Funds on US Bank ★

Shipping/Handling
3-A Sanitary Standards Total
TOTAL ORDER AMOUNT

CHECK OR MONEY ORDER ENCLOSED

Exp. Date _____

SIGNATURE _____

3 EASY WAYS TO ORDER:

Phone: 515.276.3344; 800.369.6337
Fax: 515.276.8655

or Mail your order to the Association address listed above.

Prices effective through August 31, 2000

Invite A Colleague to Join

The International Association for Food Protection, founded in 1911, is a non-profit educational association of food safety professionals with a mission "to provide food safety professionals worldwide with a forum to exchange information on protecting the food supply."

* Who Should Join?

The Association is comprised of a diverse membership of 3,000 people from 50 nations. The International Association for Food Protection Members belong to all facets of the food protection arena including: Industry, Government and Academia.

* Why Should They Become Association Members?

Dairy, Food and Environmental Sanitation — A reviewed monthly publication that provides practical and applied research articles and association news, updates, and other related information for food safety professionals. All Members receive this publication as part of their Membership.

Journal of Food Protection — An international, refereed scientific journal of research and review papers on topics in food science and food aspects of animal and plant sciences. This journal is available to all individuals who request it with their Membership.

The Audiovisual Library — Provides quality training videos dealing with various food safety issues. Members are allowed free use of these videos.

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* Help Others Find Out About the Association...

To learn more about the Association and the many other benefits and opportunities available to a Member, visit our Web site: www.foodprotection.org or please call 515.276.3344 or 800.369.6337; Fax: 515.276.8655; E-mail: info@foodprotection.org. We will be happy to send new Member information if you provide us the necessary mailing information.



International Association for
Food Protection

Formerly IAMFES

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ADVANCE NOTICE OF AVAILABILITY OF RESEARCH FUNDS

**DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration**

***Research Studies on Microbiological Hazards Associated with the Food
Animal Production Environment; Availability of Cooperative
Agreements; Advance Notice of Request for Applications***

AGENCY: Food and Drug Administration, HHS.

ACTION: Advance Notice.

SUMMARY: The Food and Drug Administration (FDA), Center for Veterinary Medicine (CVM) is planning to publish a request for applications (RFA) in the Federal Register announcing the availability of research funds for fiscal year (FY) 2000. These funds will support cooperative agreements to study the microbiological hazards associated with the food animal production environment. Approximately \$600,000 will be available in FY 2000. FDA anticipates making three to six Cooperative Agreement awards at \$100,000 to \$200,000 per award per year (direct and indirect costs). Support for these agreements may be for up to three years. The number of agreements funded will depend on the quality of the applications received and the availability of Federal funds to support the projects.

DATES: We anticipate that the RFA will publish in the Federal Register in March 2000. FDA will not accept any materials prior to the actual published due date for submission. This is only an advance notice and no activity should be taken by any organization prior to the submission and award of an application.

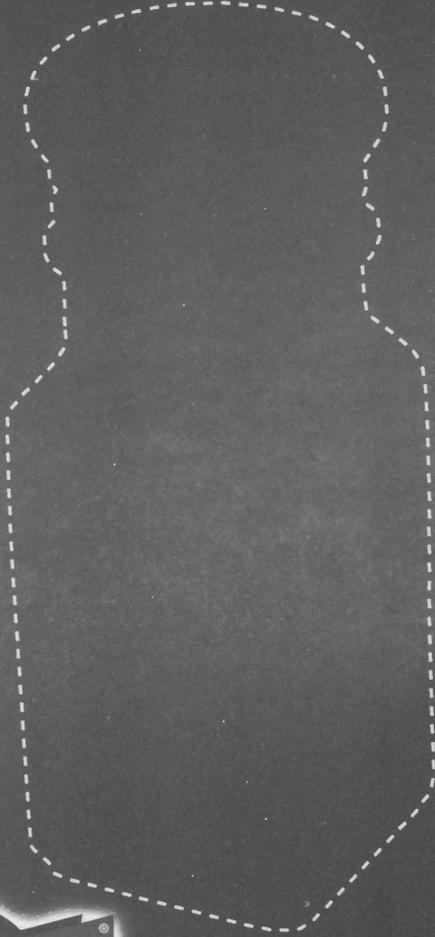
FOR FURTHER INFORMATION CONTACT:

David B. Batson, Ph.D., Office of Research, Center for Veterinary Medicine (HFV-502), Food and Drug Administration, 8401 Muirkirk Road, Laurel, MD 20708, Tel. (301) 827-8021, FAX (301) 827-8250.

If you wish to receive a copy of the RFA after publication in the Federal Register please contact: Cynthia M. Polit, Grants Management Specialist, (HFA-520), Food and Drug Administration, Rm. 2129, 5630 Fishers Lane., Rockville, MD 20857, Tel. 301-827-7180.

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