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JULY 1994



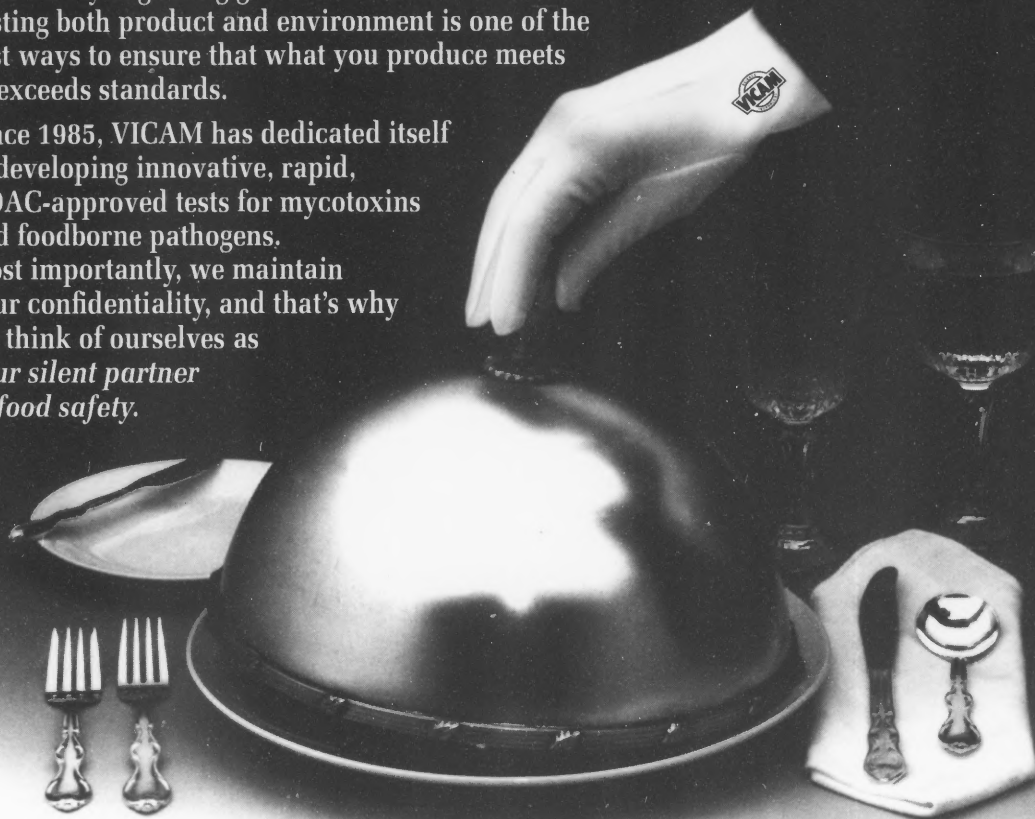
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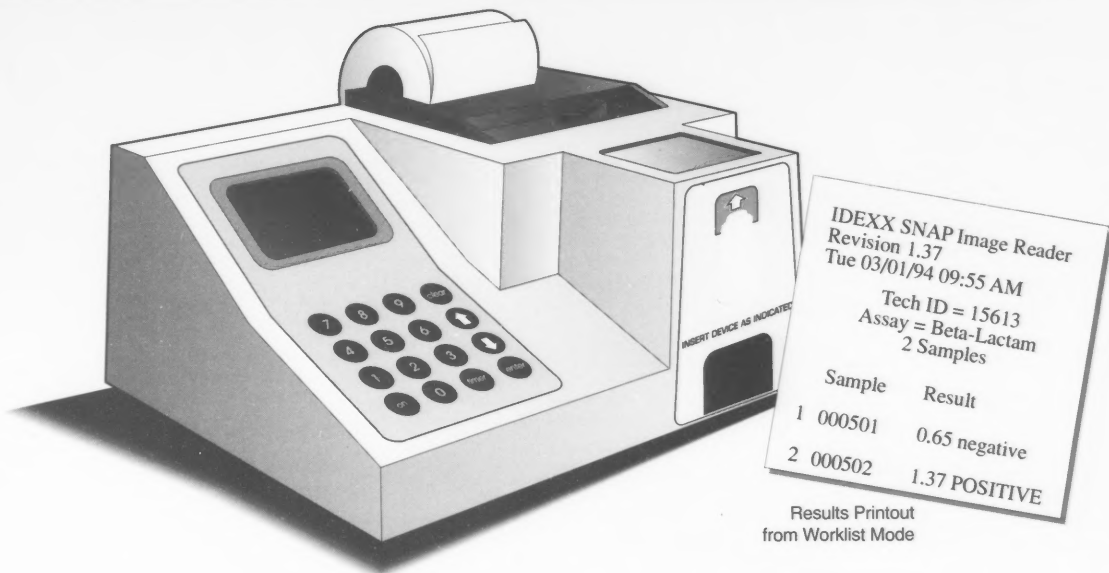
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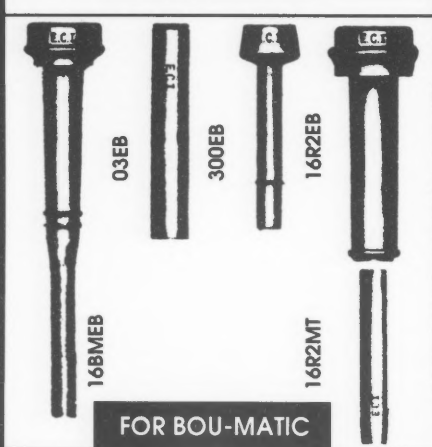
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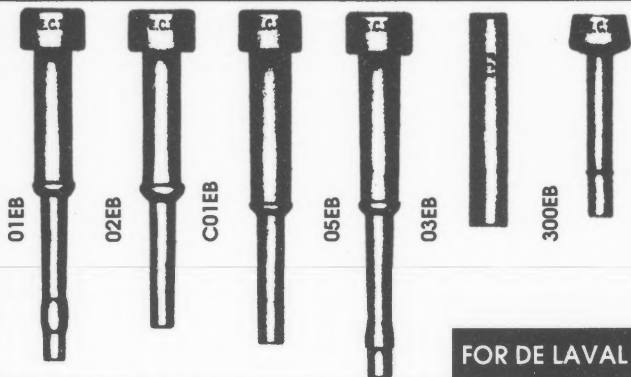


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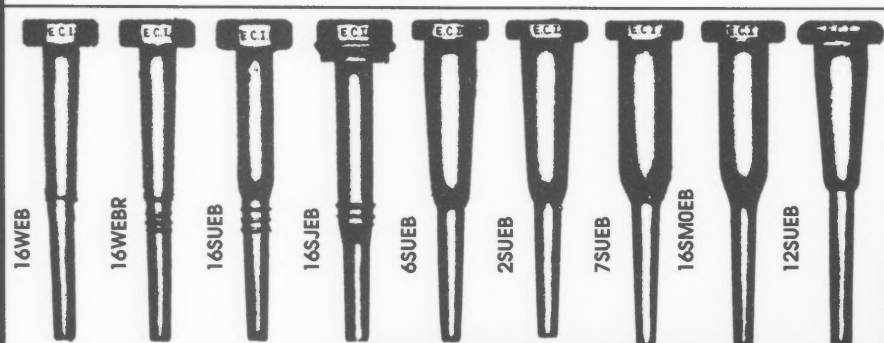
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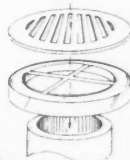
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Thoughts From the President . . .



By
Harold Bengsch
IAMFES President

It is indeed difficult for me to accept the fact that 12 months have already gone by since I wrote my first column as President of the IAMFES.

As I reflect back on those 12 months, one thing is for certain, I have learned a lot. I have learned that:

1. Although of great importance, IAMFES is much more than its excellent annual meeting.
2. Although of vital importance, IAMFES is much more than its two very respected journals.
3. Although of immeasurable importance, IAMFES is much more than the collective contributions made by its numerous committees, professional work groups and task forces.

The important key of the IAMFES is Y O U. You as a member; you as a working member of the many work groups; you as a valued member of academic; you as a valued member of industry; and, you as a valued member of government. Collectively, we the IAMFES, have become the gold standard in food protection and environmental sanitation. This has not happened overnight and will require diligence to maintain this standard.

Your Executive Board and the several work groups currently involved in carrying forward the strategic plan are pledged to upholding our mission statement:

"To provide food safety professionals worldwide with a forum to exchange information on protecting the food supply, and thus assure our leadership on an international scale."

Yes, I have learned a lot. That learning curve has given me an even greater appreciation for you as an individual member and you as an affiliate.

During July 31 through August 3 of this year, we once again have the great opportunity to showcase — who and what we are. This opportunity is the annual meeting in San Antonio, TX. The program for this meeting is not just outstanding, it is colossal. Thanks to Dr. Norm Stern and his Program Advisory Committee, this meeting will undoubtedly go down in the annals of program content as one of our greatest to date. Thanks to the Texas Affiliate and its President Kent Roach, along with the Local Arrangements Committee headed by Dr. Ron Richter, the meeting holds something for everyone.

To Steve and the IAMFES staff, a great big thank you for your support and diligent day-to-day work that goes on behind the scene at our headquarters. To each and every work group (committee, task force or professional development group) and chairperson, a great big thank you for your hard work through this year. To the Executive Board, thank you for your support and expert guidance.

I know that as the reigns of leadership move to Mr. Dee Clingman, your President-Elect, even greater accomplishments are in store.

Finally, to you as individual members, thank you for your support and the privilege you have given me in serving you as President of the International Association of Milk, Food and Environmental Sanitarians, Inc.



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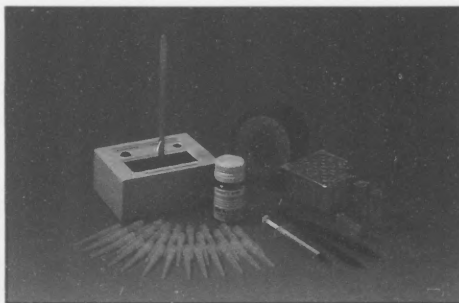
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On My Mind . . .



By
Steven K. Halstead, CAE
IAMFES
Executive Manager

is the Annual Meeting . . .

Success can be a wonderful thing. It can also be an ulcer looking for a stomach to happen. Such is this year's Annual Meeting.

We were approached by our Texas affiliate way back in 1990 about hosting the 1994 Annual Meeting. At the time, we were using just under 400 sleeping rooms a night on our three biggest nights — Sunday, Monday and Tuesday. Our program consisted of some 125 papers divided into three concurrent sessions.

We were not yet doing pre-meeting workshops, poster sessions, video theaters, or computer networking. We were having about 60 exhibitors — that hasn't changed much — but we had fewer committee meetings and virtually no related groups meeting in conjunction with our meeting (this year there are at least three groups meeting that I know of right now).

The Hyatt Regency, with its 630 rooms, two ballrooms and a whole floor of meeting rooms, seemed the perfect fit. And it was, until our meeting became so successful.

In the three years since we named the Hyatt as our headquarters hotel, our attendance has grown to over 1,000. We are now taking over 550 rooms on our peak nights. We will have over 200 presentations this year including two full days of posters. Our symposia and technical sessions will be divided between four concurrent sessions. Suddenly, a hotel that was large enough, with ample growing space three short years ago, has become frighteningly close to being too small.

**If you haven't already registered,
it's not too late. Call or FAX today.**

Originally, we had planned to use the Regency Ballroom for exhibits and the Rio Grande Ballroom for concurrent sessions. In order to add a fourth concurrent session, we had to take some of the exhibit space. To add insult to injury, the fire marshal made us redesign the exhibit hall layout which cost us at least five extra booths. The exhibit space is all sold out and there are nine companies on the waiting list.

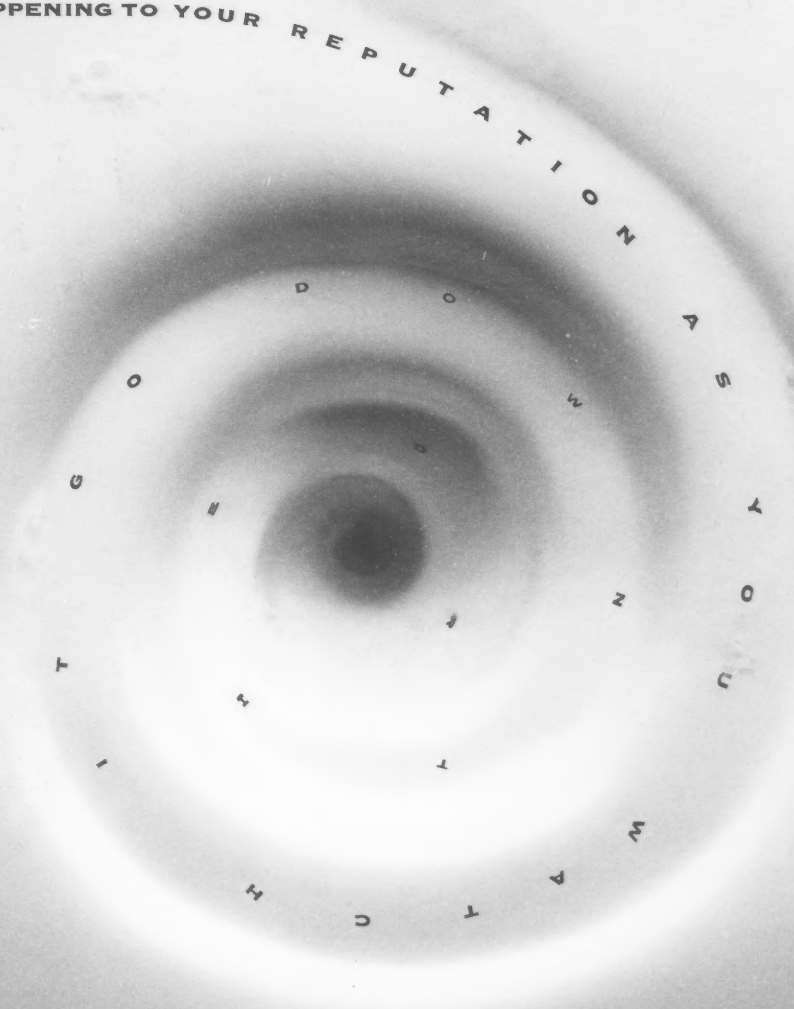
As I write this in early June, we have exceeded the number of rooms we had blocked for the Thursday, Friday and Saturday preceding the start of the meeting. We are rapidly closing in on the maximum number the hotel will allow us to have on all other nights. Our registrations are running about 20% higher than this time last year.

This is not to say that the Hyatt can't handle us. They can and have pledged themselves from the General Manager down to the bellpersons that they will make our San Antonio experience memorable starting with Nachos and Margaritas in the Exhibit Hall following the Ivan Parkin Lecture on Sunday night right on through the Awards Banquet on Wednesday night.

Combining the outstanding educational programming; superb social events; and regal amenities of the Hyatt with the marvelous attractions of San Antonio and its famous Riverwalk might leave you breathless. But you'll remember it!

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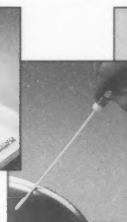
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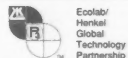
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ABSTRACT

Review of 1993 *Escherichia coli* O157:H7 Outbreak: Western United States

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Presented at the Symposium on Foodborne Microbial Pathogens, 80th Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians (IAMFES), Atlanta, Georgia, August 2-4, 1993

During the second week of January 1993, an unexpected number of patients with symptoms consistent with *Escherichia coli* O157:H7 infection became apparent to physicians at the Children's Hospital and Medical Center in Seattle, WA. Several patients were being treated by the Nephrology Service for Hemolytic Uremic Syndrome (HUS), a microangiopathic hemolytic anemia which is almost always precipitated by *E. coli* O157:H7, and which has a summer-autumn rather than a January peak (1). Additionally, multiple community physicians were telephoning the Gastroenterology Division regarding previously healthy children with acute painful bloody diarrhea. Also, the Children's Hospital and Medical Center Emergency Room had evaluated and treated at least three patients with painful bloody diarrhea in a 24-h period.

Immediately after these three observations were made, the Washington State Department of Health, Communicable Disease/Epidemiology Section was contacted and an outbreak investigation commenced with the assistance of public health authorities in the counties from which patients originated. The symptoms of the early cases closely resembled *E. coli* O157:H7 infection, which are very unusual in January in Washington State which established a surveillance program for this pathogen in 1987(2). For this reason, additional measures to increase ascertainment of infected patients were immediately undertaken by the State Epidemiologist's office, in advance of culture confirmation of cases. These measures included electronic mailings to all Washington county health departments, and telephone notification of emergency rooms and microbiology laboratories alerting these facilities of the possibility of a cluster of patients infected with *E. coli* O157:H7 in Washington State. Additionally, telephone consultations with public health officials of neighboring States and Provinces, and with investigators at the National Centers for Disease Control in Atlanta, GA, were undertaken by the State Epidemiologist's office.

Five days after notification of public health authorities, an epidemiological risk emerged among interviewed bona fide primary cases of infection with *E. coli* O157:H7, consumption of hamburger at multiple outlets of the same fast food restaurant chain. Cooking practices were reviewed and,

where necessary, altered to comply with the recently enacted State of Washington regulations (the internal temperature of ground beef must be at least 155°F, unless the consumer specifically requests a less well cooked patty; 3). Ground beef was obtained for microbiologic analysis, and incriminated lots were recalled. Approximately 1 week later, *E. coli* O157:H7, which was genetically indistinguishable from almost all patient isolates (4), was recovered from incriminated lots of ground beef.

Within several weeks, the magnitude of the outbreak in Washington and other western states became apparent. In Washington State alone, approximately 600 patients with hemorrhagic colitis and/or Hemolytic Uremic Syndrome (HUS) presented to medical attention in January 1993 (3). Over 75% of these patients were confirmed microbiologically to have been infected with *E. coli* O157:H7. Approximately 10% of the patients were secondary cases, without identifiable exposure to the incriminated vehicle. In Washington State, approximately 40 patients were hospitalized with HUS. Over half of these patients required dialysis or hemofiltration for acute kidney failure or electrolyte imbalance, and most patients required transfusions to overcome the hemolytic anemia and thrombocytopenia. Three Washington State patients died as a direct result of infection with *E. coli* O157:H7. The proportion of patients with HUS in this outbreak, as well as the case fatality rate and need for transfusions and dialysis, are consistent with previous series of infection with *E. coli* O157:H7 and of HUS.

In addition to infected patients in the State of Washington, approximately 200 additional patients developed clinical infection with *E. coli* O157:H7 in California, Nevada and Idaho after consuming the contaminated vehicle (3). However, these clusters were mostly recognized in retrospect.

The 1993 outbreak of *E. coli* O157:H7 infection in the western United States has confirmed the impression of many investigators that infection with *E. coli* O157:H7 is virulent and life-threatening. Moreover, when an organism which can cause human disease with a low inoculum is blended into large volumes of food, vast numbers of people can subsequently be affected in the absence of adequate cooking at the point of

preparation. Finally, the 1993 *E. coli* O157:H7 epidemic once again demonstrates the value of baseline epidemiological surveillance data, as accrued by the State of Washington on foodborne infections in general, and *E. coli* O157:H7 infections in particular, combined with a rapid and thorough investigative response to an outbreak.

The author thanks Drs. John Kobayashi, Beth Bell and Marsha Goldoft of the Washington State Department of Health, Communicable Disease/Epidemiology Section and Dr. Ellis Avner of the Children's Hospital and Medical Center, Seattle, for information used in this summary. This abstract was presented at the annual meeting of the International Life Sciences Institute, Atlanta, GA, August 2, 1993.

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E. coli O157:H7 Time Capsule: What Do We Know and When Did We Know It?

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Presented at the Symposium on Foodborne Microbial Pathogens, 80th Annual Meeting of the
International Association of Milk, Food and Environmental Sanitarians (IAMFES), Atlanta, Georgia, August 2-4, 1993

In the spring of 1982, a 56-year-old man awakened with severe abdominal cramps and the subsequent development of first watery, then bloody diarrhea. Hospitalization ensued and evaluation included a barium enema, which revealed significant submucosal edema in the colon. Stool cultures were negative for conventional bacterial pathogens. He remained hospitalized for 5 days as the bloody diarrhea resolved and he was discharged without a confirmed diagnosis (1).

This man was not the only individual afflicted with this illness. Public health authorities in Oregon noted a cluster of similar cases between February and March, and an almost identical scenario was repeated in Michigan in May and June. Illness was associated with hamburger consumption at a fast food chain. The serotyping of fecal *Escherichia coli* isolates was a humble and tedious task but it served to deliver our letter of introduction to *E. coli* serotype O157:H7.

In 1983, when the investigation of the Oregon-Michigan outbreaks was published, (1) *E. coli* O157:H7 was considered a rare *E. coli* serotype and the frequency with which it caused clinical illness was unknown. Both concepts were subject to early revision. Hard on the heels of the Michigan outbreak, this organism struck again in November, 1982 causing a diarrheal outbreak in a Canadian nursing home (2). A report from Canada in 1983 (3), showed that among over 2,000 strains of *E. coli* examined between 1978 and 1982, 6 were serotype O157:H7.

Laboratory studies showed that *E. coli* O157:H7 produced a cytotoxic activity demonstrable on Vero cells, two identical to that produced by Shiga toxin and neutralizable by polyclonal antisera to Shiga toxin (4,5). Different groups of researchers coined two terms, one descriptive and one immunologic, to describe this feature and hence was born the parallel nomenclature, Verotoxin and Shiga-like toxin, Verotoxin-producing *E. coli* (VTEC) versus Shiga-like toxin-producing *E. coli* (SLTEC). In that same year, a convergent line of evidence began to develop that VTEC infection was important in another illness, Hemolytic Uremic Syndrome (HUS). This common cause of acute renal failure in childhood frequently followed a bloody diarrheal prodrome, but a single microbial agent had not been consistently implicated by the early 1980s. In a study of 15 HUS patients from Toronto seen between 1980-1982, 11 had evidence of

VTEC infection (6). Two of the eight VTEC isolates were *E. coli* O157:H7.

The year 1984 saw the publication of two sporadic case series based on passive surveillance for hemorrhagic colitis. The series from the United States reported 28 cases ranging in age from 1 to 80 years (7). All had occurred as a sporadic illness with widespread geographic distribution. In the series from Canada, 20 cases had a similar age distribution (8). All but one had had bloody diarrhea and longer fecal excretion in children was noted.

The fall of that year saw simultaneous outbreaks at opposite ends of the age spectrum and on opposite sides of the United States. Three cases of HUS developed among the attendees of a day care center in North Carolina (9). An outbreak of diarrhea due to *E. coli* O157:H7 had occurred in which the majority of cases had non-bloody diarrhea, a feature notably different from earlier reports. But significantly, the pattern of transmission was highly indicative of person-to-person spread, carrying the ominous implication that this pathogen needed only a very small inoculum for the subsequent induction of illness. In Nebraska, 34 cases of diarrhea in a nursing home resulted in 4 deaths and 14 hospitalizations for severe illness (10). Thus, within 2 years of its discovery, *E. coli* O157:H7 had made a name for itself as a cause of severe and graphic enteric illness which could strike suddenly, affect all ages, required a low inoculum and could cause death.

The year 1985 saw the publication of a more systematic investigation of the role of VTEC infection in the HUS (11). Of the 40 patients investigated between 1980 and 1983, 60% had evidence of VTEC infection based on the isolation of a Verotoxin-producing *E. coli* from the stool or the demonstration of free fecal Verotoxin. Neither VTEC nor fecal Verotoxins were found in healthy controls, further strengthening the association.

In September, 1985, an explosive outbreak of *E. coli* O157:H7 infection occurred in a nursing home in Ontario (12). The severity of illness was far greater than that of earlier reports, with 19 deaths among the 55 affected residents. There was significant secondary spread to the staff, re-emphasizing the propensity of the organism to be transmitted person-to-person. Also noted was the possible role of antibiotic therapy in predisposing infected patients to a worse outcome.

Meanwhile, on the laboratory front methodical investigation of the diarrheagenic potential of *E. coli* O157:H7 had noted a discrepancy. In contrast to the 1983 paper, four *E. coli* O157:H7 strains were now reported in 1985, three to produce two distinct toxins for Vero cells, designated VT-1 and VT-2, the latter not neutralized by anti-Shiga toxin antibody. The further characterization of these toxins (14) showed that each was encoded on a separate bacteriophage. Because they were genetically related to Shiga toxin and had a similar biologic activity, the toxins were designated SLT-I and SLT-II, in keeping with the parallel nomenclature developed earlier.

During 1986, *E. coli* O157:H7 escalated its attacks in the ground war with public health authorities. In Minnesota, HUS developed in two patients who had consumed raw milk, and the organism was isolated from those patients and from milk and dairy cattle on the farms associated with them (15). Now a second food vehicle besides hamburger had been noted and the possibility that dairy cattle represented a natural reservoir of the organism had been raised. Reiteration of the raw milk connection occurred in Ontario during a kindergarten outbreak involving 30 cases, 3 of whom developed HUS (16). In a prospective study of patients with HUS from the Pacific Northwest, *E. coli* O157:H7 was detected in seven (17), implying that if cultures were obtained early enough, then a single etiologic agent could account for the majority of cases of HUS. In Washington state in the late fall, investigation of a fast food outbreak in a small town led to the recognition of a much larger statewide outbreak occurring simultaneously but dispersed over a far wider geographic area (18). The frustrating ability of outbreaks to go unrecognized despite their graphic nature had now been aptly illustrated.

In 1987 the first International Symposium on VTEC Infections was held in Toronto. This meeting brought together an international consortium of investigators from North and South America, western Europe and Asia who had been working on *E. coli* O157:H7 in its various aspects and guises. Clinicoepidemiologic studies worldwide indicated that the organism had a far wider geographic distribution than originally suspected. The mechanism of action of the toxins, the genetics of their production, their structure and function were being elucidated by several laboratories. Efforts to unravel the pathogenesis of infection had been undertaken in several animal models. Various diagnostic tests had been developed and there were reports of their sensitivity and specificity to detect *E. coli* O157:H7 in clinical specimens, food and the environment. In the 5 years since the discovery of this pathogen, advances had come quickly and anticipation that the accelerating pace of developments would continue had no counterbalance.

In the following year an analysis of the genetic relatedness of 100 strains of *E. coli* O157:H7 showed several intriguing points (19). These strains were quite distinct genetically from other VTEC serotypes, thus indicating that toxin production was not synonymous with a close degree of genetic relatedness. These strains did not exhibit the extensive genomic heterogeneity in their enzyme-encoding structural genes which would have implied a relatively remote origin with subsequent time for considerable genetic divergence. Rather, these strains appeared to represent a single clone which was widely disseminated geographically and which had recently descended from a common ancestor.

The year 1988 also saw the publication of a population-based prospective study of *E. coli* O157:H7 as an etiologic agent of diarrhea in Washington state (20). The highest age-specific incidence was observed in children ages 0 to 9 years. Comparison of incidence rates for this pathogen with those of the other common enteric bacteria, such as *Campylobacter*, *Salmonella* and *Shigella*, showed that the organism was by no means rare and probably had been underdiagnosed due to the lack of specific microbiologic testing. Similar results were found in a 2-year prospective study of sporadic diarrhea in Calgary (21). *Escherichia coli* O157:H7 was more common than *Campylobacter* and was more likely to be isolated from bloody than non-bloody stools. There was a striking summertime predominance and the highest age-specific incidence was in children less than 5 years of age.

In 1988, the Centers for Disease Control conducted a survey of state public health laboratory testing for this organism (22). Despite its rapid emergence in the previous 6 years as an important public health pathogen, barely three quarters of the state public health laboratories were testing for this pathogen at the time. The 489 *E. coli* O157 isolates identified that year at the Centers for Diagnostic Control were derived from most areas of the United States, indicating the widespread dispersion of this pathogen. Those states reporting the highest number of isolates were Washington, Oregon, Minnesota and Massachusetts suggesting the concentration of infection along the northern tier of states.

Late in 1989, a molecular analysis of 93 strains of *E. coli* O157:H7 from Washington stated considerable plasmid diversity among the isolates (23). While the strains of this serotype might be closely related genetically compared with other groups of *E. coli*, they were by no means genetically identical. Also observed was a disproportionately higher representation of SLT-II producing strains in HUS patients, suggesting that toxin genotype of the infecting strain might influence the risk of developing HUS (23). A subsequent publication showed that the isolation rate of *E. coli* O157:H7 declined sharply for cultures obtained more than 7 days after the onset of diarrhea (24), thus underscoring the point that the variable recovery of this pathogen in published series may have been due to the timing of testing rather than geographic variation. The data also suggested antimicrobial treatment after 7 days of diarrhea, the time at which patients typically develop HUS, was not likely to be effective given the absence of the organism. Arguments both for and against antimicrobial therapy were debated, but no clear consensus emerged, and clinicians were left to struggle with the decision for an individual patient.

In January, 1990, the small town of Cabool, MO became the setting for the largest outbreak to that date of *E. coli* O157:H7 (25). The pathogen deviated from its own self-written script of summertime outbreak, hamburger vehicle of and antibiotic-sensitive outbreak strain. Transmission apparently had occurred through the municipal water supply which had become contaminated following freeze-fracture of pipes in extremely cold weather. The agent had acquired drug resistance markers, a feature not previously seen and the outbreak had occurred well outside the summer months. The outbreak was large, took 2 months to control and was notable for its severity with two cases of HUS and four deaths. The pathogen

considered rare at the beginning of the 1980s had made a splashy debut into the 1990s.

Earlier outbreaks in nursing homes had suggested high rates of morbidity and mortality in the elderly population. In 1990 two outbreaks in institutions for the mentally retarded in Utah provided evidence that equally severe disease could be seen in much younger individuals (26). Eight cases of HUS with four subsequent deaths developed among 20 patients with diarrhea. Secondary transmission was seen, again underscoring the potential of this agent to amplify transmission via person-to-person spread. The disturbing possibility that antibiotics given earlier in illness posed a risk factor for the development of HUS was again noted but not conclusively answered. Although the rate of antibiotic therapy was higher for HUS cases, the patients had not received antibiotics for the same reasons or at the same point in their illness.

A retrospective study of HUS cases in Minnesota between 1979-1988 demonstrated a rising incidence of HUS over the decade studied (27). The implication was obvious — a rising incidence of HUS could well reflect a rising incidence of human infection with this *E. coli* O157:H7.

In 1991, several field investigations reported the isolation of this pathogen from dairy cattle (28). The organism was isolated from farms both with and without epidemiologic association with disease transmission. Culture-positive animals were well and excreted the organism intermittently. Curiously, *E. coli* O157:H7 was not more common in the adult animals usually slaughtered for meat but was more common in young heifers and calves. The link between fecal carriage of this organism in dairy cattle and its later presence in the food chain remained to be elucidated.

In the late fall of 1991, a cluster of four cases of HUS in southeastern Massachusetts was discovered to be part of a community outbreak of bloody diarrhea (29). Illness was associated with consumption of fresh apple cider. The waterborne outbreak in Missouri the previous year and the apple cider outbreak illustrated the capability of *E. coli* O157:H7 to be transmitted by a variety of vehicles, thus making it a moving target for public health authorities.

The remote Northwest Territories of Canada were the site of an extremely large outbreak in the summer and early fall of 1991 (30). Person-to-person spread led to protracted transmission over several months, presenting knotty problems in sanitation and infection control. In Oregon, swimming in a fecally polluted lake resulted in an outbreak of *E. coli* O157:H7 infections (31). An activity, rather than a food vehicle, was recognized as the risk factor for disease acquisition. The lessons learned here were that creativity and insight would be *de rigueur* for future outbreak investigations of this pathogen.

The year 1992 proved to be a relatively quiet year for *E. coli* O157:H7 in terms of outbreaks. Only a decade since its discovery, this pathogen finally achieved the status of being reviewed in a non-specialty journal (32), all previous reviews having been published in epidemiology, microbiology and infectious disease journals. Many of the papers published in 1992 reflected the laboratory-based effort that had been ongoing for several years. Advances in molecular biology yielded newer diagnostic techniques such as the use of polymerase chain reaction (33,34). Attempts to define the molecular basis for the attaching and effacing lesions characteristic of the histopathology in both

E. coli O157:H7 and EPEC infection led to the cloning of the *eae* gene of both EPEC and *E. coli* O157:H7 (35,36). Two years earlier the Committee on Food Microbiology of the International Life Sciences Institute had funded *E. coli* O157:H7 research and in 1992. Those seeds now began to bear fruit as the preliminary data accumulated from these investigations. The year 1992 can also be remembered as a rest period prior to the largest outbreak of *E. coli* O157:H7 on record, which occurred in Washington state during January-February, 1993 (37). It proved to be an eerie replay of the original outbreaks in Oregon and Michigan 11 years earlier with graphic and severe illness and transmission via undercooked hamburgers at a fast food chain. The scope of the outbreak only became apparent later as additional cases were recognized retrospectively in Idaho, California and Nevada (38). The outbreak was marked by intense and almost frenzied media coverage, widespread TV and newspaper publicity, and congressional and high level government attention.

The year 1993 has also seen the publication of a paper of less dramatic proportions but of no less interest to the scientific community. Genetic analysis of the degrees of relatedness of diarrhea-associated *E. coli* strains showed that the O157:H7 clone appears to have emerged recently from a progenitor related to an EPEC strain, which presumably acquired the SLT genes via horizontal transfer from other strains (39). Thus was born a new pathogen, *E. coli* O157:H7, causing a new illness, hemorrhagic colitis. Judicious reflection on the meaning of this finding suggests a larger significance — that *E. coli* O157:H7 is a messenger, bringing an unwelcome message that in mankind's battle to conquer infectious diseases, the opposing army is being replenished with fresh replacements. Looking back on the 11-year span since *E. coli* O157:H7 was discovered, what do we know about this pathogen? We know a great deal in exquisite molecular detail about the toxins it produces — their deoxyribonucleic acid and amino acid sequences, their structure and mechanism of action and their cellular receptors. We have a very good picture of the clinical disease caused by *E. coli* O157:H7 and we have a fair array of detection methods to find it. We have only a rudimentary idea of its ecological niche.

What don't we know about *E. coli* O157:H7? We have no cogent explanation for why this pathogen has appeared and we do not know whether we are fostering its dissemination. We have no detailed understanding of pathogenesis at the cellular level, leaving us without a scientific basis to design treatment strategies or prevent complications. We do not know what control measures work or where to apply them. We do not yet have a conceptual approach to *E. coli* O157:H7 which incorporates a comprehensive public health outlook with practical cost effective control measures.

It is sobering to note that all the features of the 1993 Washington State outbreak were already known by 1984. *Escherichia coli* O157:H7 is a high-grade pathogen which requires only a low inoculum, transmission is via a high-volume food item whose preparation contains a compositional and thermal Achilles heel, and it is served to a target audience most at risk for complications of illness.

It is quite disconcerting to compare the 1993 Washington state outbreak to the 1982 outbreaks in which *E. coli* O157:H7 was discovered. The main difference is that the 1993 outbreak was recognized faster — because clinicians correctly

recognized the disease, because area laboratories detected the organism and because the familiarity of the health department with the pathogen permitted a rapid focus for their investigation. But the patients were treated no differently in 1993 than they were in 1982, and no measures had been developed which would have either prevented the occurrence, or contained the scale, of the 1993 outbreak.

We have learned enough in the past decade to recognize that *E. coli* O157:H7 challenges us in many ways and on many levels. We can continue to do business, molecular biology and epidemiology as usual, or we can combine our efforts to meet these challenges. Then maybe the next outbreak will be smaller, perhaps specific treatments will prevent complications, and even deaths could be avoided. Or perhaps the next outbreak might not have to occur after all.

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Escherichia coli O157:H7 and Verotoxigenic *Escherichia coli* (VTEC)

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The most important development in the field of enteric infections has been the recognition in recent years of a new group of pathogenic *Escherichia coli* producing a toxin, Verotoxin or Shiga-like toxin.

Escherichia coli verotoxigenic were first described in 1977 in Canada by Konowalchuk et al. while investigating the use of Vero, African green monkey, kidney cell culture for the detection of *E. coli* toxins. In 1979 Wade et al. in England and Hardas et al. in India in 1982 reported the isolation of verotoxin-producing *E. coli* strains from stools of patients with diarrhea.

In 1982, two outbreaks of bloody diarrhea in Oregon and Michigan (27) and another outbreak in the fall of 1982 in Ottawa, Canada (30), led to the recognition of a new pathogenic serotype, *E. coli* O157:H7.

Escherichia coli O157:H7 has been previously isolated from one case of bloody diarrhea in California in 1975. In Canada the first isolation was made in 1978 and by the end of 1981, five strains of this serotype were identified. We were the first to report in 1983, that *E. coli* O157:H7 produce Verotoxins (14).

It was soon recognized that other *E. coli* serotypes produce verotoxins and since 1983, the association of verotoxigenic *E. coli* (VTEC) or Shiga-like toxin producing *E. coli* (SLTEC) with bloody diarrhea or hemorrhagic colitis has been further supported by reports from a number of countries, of increased isolation of these organisms from sporadic and outbreak cases.

Hemorrhagic colitis is a disease of all ages and is characterized by severe abdominal cramps and watery stools, which may progress to gross bloody diarrhea, vomiting and little or no fever. Karmali et al. in 1985, have shown the association of verotoxin producing *E. coli* with Hemolytic Uremic Syndrome (HUS) which is characterized by acute renal failure, microangiopathic hemolytic anemia and thrombocytopenic purpura (TTP), another manifestation of verotoxigenic *E. coli* infection affecting mostly adults, can be characterized as an aggravated form of HUS in which high fever and neurological

symptoms are present. The pathogenesis of HUS and TTP appears associated with verotoxin which damages endothelial cells, a process which leads to thrombocyte aggregation and capillary vessels damage in the kidney or other organs and which may lead, in a very small proportion of cases, to death. About 4 to 10% of bloody diarrhea cases may progress to HUS (10).

Most VTEC infections are foodborne and in some special setting, such as institutions, day care centers and families the spread of infection has been shown to be person-to-person (3,29). The majority of outbreaks have been the result of contaminated ground beef, and insufficiently cooked hamburgers have been involved, most recently in Washington State and in Idaho, California and Nevada in one of the largest outbreaks of O157:H7 recorded on this Continent (5). In addition to ground beef (6), roast beef eaten rare and in one instance steak or new potatoes contaminated with manure and turkey roll, have been associated with hemorrhagic colitis cases and outbreaks. Raw milk has been implicated in several episodes affecting children visiting farms in the United States and Canada and a community contaminated water supply was implicated in an outbreak in Missouri (9). Verotoxigenic *E. coli* have been isolated from healthy cattle on farms (35) and these animals are considered to be the reservoir of human infections in North America. Recently, fresh-pressed apple cider made from apples probably contaminated with deer fecal material has been epidemiologically implicated in an outbreak in Massachusetts (1) and some years ago apple cider was implicated in an outbreak in Canada.

The incubation period is about 1 to 4 days and the duration of symptoms is about 5 to 10 days. Most cases of infection with *E. coli* O157:H7 are associated with watery diarrhea and may remain unnoticed and unreported. The infectious dose may be very low, given the apparent ease of person-to-person transmission. In some meat samples associated with outbreaks the number of bacteria was estimated to be as low as 1,000/g.

Escherichia coli O157:H7, unlike most *E. coli*, do not

ferment sorbitol after 24-h incubation (some strains may ferment this substrate after 48 h or longer; 14) and their identification was facilitated by the availability in 1985 of culture media, such as Sorbitol-MacConkey agar, which allowed the screening of sorbitol negative colonies at 24-h incubation (about 6% of other *E. coli* may be sorbitol negative colonies at 24-h incubation about 6% of other *E. coli* may be sorbitol negative and about 10 to 15% of human diarrheal stool specimens may contain non-sorbitol fermenting species). Stool cultures should be performed early in the disease, within 3 to 5 days after the onset of symptoms, as cultures taken later, often are negative for *E. coli* O157:H7 (24).

The identification of other VTEC is more difficult as there are no special markers which will allow easy identification and diagnostic antisera are not commercially available. Agglutination in O157 antiserum alone is not sufficient, as some other *E. coli* may be sorbitol negative (2) and other non-toxicogenic strains belonging to *E. coli* O157 serogroup possessing H antigens H1, H6, H 10, H12, H16, H19, H21, H25, H42, H43 and H45, may also be found in stools (Table 1). *Escherichia hermannii*, another sorbitol negative species may agglutinate in O157 associated with production of verotoxins, false positive reports can be avoided by routine determination of H7, flagellar antigen.

TABLE 1. *Escherichia coli* O157 Serotypes.

	Sorbito	Verotoxin
O157:NM	-	+
O157:NM	+	+
O157:H7	-	+
O157:NM	+	-
O157:H1	-	-
O157:H6	+	-
O157:H10*	+	-
O157:H12*	+	-
O157:H16	+	-
O157:H16	-	-
O157:H19	+	-
O157:H21	+	-
O157:H25	+	-
O157:H42	+	-
O157:H43	+	-
O157:H45	+	-

* Isolated from meat

Non-motile, verotoxigenic O157:H do occur and their identification may rely on another characteristic of these strains, lack of beta-glucuronidase production (MUG test negative; 31).

Confirmation of verotoxin production, however, must be made for all isolates.

Recently, strains of verotoxin-producing O157 isolated in Germany have been shown to ferment sorbitol in 24 h and are MUG positive, features which may complicate the identification of this serotype (11). Atypical strains of *E. coli* O157:H7 verotoxigenic which are urease positive, have been occasionally encountered.

Escherichia coli O157:H7 represent but one serotype among them, a variety of serotypes which have been identified

in Canada from human and nonhuman sources and include classical enteropathogenic serotypes such as O26:H11, O111:H8, O126:H8, O128:H2 and others, Table 2 and Table 3.

TABLE 2. *Escherichia coli* verotoxigenic serogroups isolated in Canada.

HUMAN SOURCE	
O1:H7	O91:H14,H21
O2:H29	O103:H2,H25
O5:H-	O104:H7
O7:H4	O111:H-,H8,H34*
O15:H27	O113:H21*
O16:H6	O118:H30
O26:H-,H11*	O121:H19
O38:H21	O126:H8*
O45:H2	O128:H2,H12*
O70:H11	O132:H-
O77:H18	O145:H-
O80:H-	O153:H1,H25
O82:H8	O157:H-,H7
O84:H2	O165:H-

* EPEC Serogroups
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TABLE 3. *Escherichia coli* verotoxigenic serogroups isolated in Canada.

CATTLE AND / OR MEAT	
O1:H20,H27	O103:H2*
O2:H29,H32	O110:H8
O5:H-	O111:H8,H11*
O6:H34	O113:H-,H7,H21*
O7:H7	O116:H-,H21
O8:H2,H19	O117:H4
O15:H-	O118:H16*
H21,H27*	O121:H7,H19*
O21:H21	O126:H8,H27*
O22:H8,H16	O128:H35*
O26:H11*	O132:H-
O38:H21*	O136:H16
O40:H8	O139:H-,H19
O43:H2	O142:H38
O46:H38	O145:H-,H16*
O69:H11	O153:H-,H21,H25*
O76:H21	O156:H-,H25
O77:H39*	O157:H-,H7*
O82:H8*	O159:H49
O84:H-	O163:H19
O88:H25,H49	O165:H*
O91:H-,H21*	

* Serogroups also identified among human strains.
June 1993

The production of verotoxins is mediated by lysogenic (temperate) phages which code for the production of verotoxin 1-VT1-(SLT-I and verotoxin 2-VT2-(SLT-II). These phages represent potentially mobile genetic elements which may explain the increasing number of toxin-producing strains. Conversely strains of *E. coli* O157:H7 have been encountered which lost the ability to produce verotoxins. VT1 (SLT-I) is nearly identical to the Shiga toxin produced by *Sh. dysenteriae* 1, whereas VT2 is antigenically distinct and unlike VT1 is not neutralized by antitoxin to Shiga toxin. Several verotoxins have been identified to date: VT1, VT2, VT2 variant-human, VT2ch-a and VT2vh-b (13), VTe (SLTIIv), a toxin associated with edema disease in pigs (21), and VTe-variant human-VTevh-isolated from a few cases of hemorrhagic colitis in humans (8; Table 4). In contrast to VT1 and VT2, the gene encoding for VTe, like the gene encoding for Shiga toxin, is

located on the bacterial chromosome.

Verotoxigenic *E. coli* strains have been shown to produce either one or both VT1, VT2 and also VTvh toxins in combination with other toxins or alone. In addition to verotoxin production, some VTEC possess other properties that may be required for virulence, such as ability to cause attaching and effacing -AE-lesions encoded by the *eae* gene found also among the classical enteropathogenic *E. coli* (EPEC; 34). *Escherichia coli* O157:H7 were shown to carry a 60 MDA plasmid encoding for fimbriae required for adhesion to the intestinal mucosa (16).

TABLE 4. Verotoxigenic *E. coli*.

TOXIN TYPES	
- VT1	(SLT-I)
- VT2	(SLT-II)
- VT2vh-a	(SLT-IIvha)
- VT2vh-b	(SLT-IIvhb)
- Vtevh	SLT-IIva)
- Vte	(SLT-IIv)

In view of the wide distribution of VTEC and their association with hemorrhagic colitis and especially with HUS, their identification by serological procedures is possible only in specialized laboratories such as reference centers. The serological typing of the numerous serogroups is labor intensive and other methodologies may be required for the detection of VTEC in clinical material and in foods (23).

Given the fact that the production of toxins is the main virulence factor of VTEC, the detection of VTEC colonies will be greatly improved and simplified by protocols such as the immuno-blot assay or colony-blot designed to detect toxin-producing colonies or detection of verotoxin genes using DNA probes for VT1 and VT2 (28), or the Polymerase Chain Reaction (PCR). The PCR technique allows the detection and identification of the five different toxin genes directly in the stool or from primary enrichment broths used in food microbiology with a high degree of specificity, sensitivity and speed. (15,25,32).

Recently proposed protocols for the isolation of *E. coli* O157:H7 from foods and feces are based on immunomagnetic separation technique, by attaching the bacterial cells to antibody-coated magnetic beads, has the ability to concentrate the cells in a sample containing few bacteria and also separate the O157 cells from other flora, thus allowing for efficient culture or screening for these organisms.

The presence of Verotoxins can also be demonstrated in tissue culture assays such as the Vero cell or HeLa cell assay. Vero cell assay is preferred because some Verotoxins such as VTe and VT2-variants show little or no activity on HeLa cells. Direct detection of free fecal verotoxin can be accomplished using tissue culture assays followed by neutralization of the toxins with specific antitoxins (28). Other methods for the detection of verotoxins include enzyme-linked immunosorbent assay (ELISA), counter-immunoelectrophoresis on fecal filtrates and indirect immunofluorescence on colony blots.

In addition to culture techniques, VTEC infections can be

detected by determining the antitoxin levels in patients' sera or antibody may be of limited value in many places due to the fact that VTEC other than O157 may be prevalent.

In addition to Canada and the United States, VTEC and *E. coli* O157:H7 have been reported in other countries such as: Argentina (where HUS is particularly frequent), Mexico, Australia, China, Japan, Korea, India, Thailand, Israel, Czechoslovakia, Germany, France, Belgium, Switzerland, Italy, Spain, Ireland, United Kingdom and South Africa (10).

In Canada, laboratory surveillance of isolations of *E. coli* O157:H7 and VTEC in all 10 provinces has been in place since 1982 and the number of isolations reported increased yearly from 25 reports in 1982 to 1643 isolations in 1992 (Table 5 and Fig. 1). This increase is due, in part, to the introduction in clinical laboratories of the Sorbitol-MacConkey agar in 1985, increased awareness of these pathogens and routine culture in practically all laboratories across Canada, and also probably to climatic changes resulting in warmer summers and increased contamination or mishandling of meats and other foods, etc. In Canada, VTEC have been isolated from 10 to 18% of ground beef and O157:H7 from 2% of the samples. Of the ground beef samples, 3.8% were positive for VTEC and no O157:H7 were isolated. Up to 20% of the healthy cattle were positive for VTEC and only 1.5% for O157:H7 (4,35). Similar values were reported from England, Germany, Thailand and the United States. No VTEC were isolated from chickens (26).

TABLE 5. Verotoxigenic *E. coli* isolations — Canada, (1978-1992).

YEAR	ISOLATIONS
1978	1
1979	1
1980	2
1981	1
1982	25
1983	59
1984	163
1985	294
1986	750
1987	1381
1988	1782
1989	2407
1990	1585
1991	1565
1992	1643

The incidence of VTEC infections increases beginning in May or June and peaks in August and September, a similar seasonal distribution observed with other enteric foodborne pathogens.

VTEC
CANADA 1978-1992

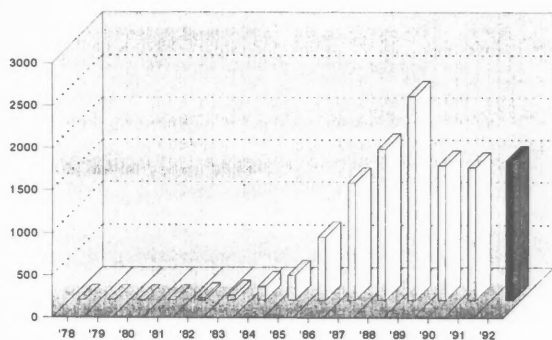


Figure 1. Verotoxigenic *E. coli* — Canada, (1978-1992).

In the last 2 years, over 130 cases of HUS in children under age 15 have been reported in Canada. Other complications of VTEC infections include gross anal dilation and intussusception. Death has been recorded in about 2 to 5% of the cases, mainly among the elderly, but also among children (10).

Outbreaks have occurred in schools, custodial and chronic-care institutions, day care centers, families and communities at large, usually associated with restaurants or fast food outlets and in most cases are associated with undercooked hamburgers.

The investigation of outbreaks requires epidemiological markers which will allow clustering of strains. Traditionally serotyping, biotyping, phagotyping have been successfully applied to the differentiation of enteric pathogens such as *Salmonella* and more recently *Campylobacter*s. Molecular techniques such as plasmid profile analysis, restriction endonuclease patterns, multilocus enzyme electrophoresis, pulse-field gel electrophoresis and the use of PCR with arbitrary primers (RAPD), have become tools of choice in the investigation of foodborne outbreaks. Attempts to biotype *E. coli* O157:H7 have failed because of lack of reproducibility, and plasmid profile analysis revealed, not unexpectedly, a variety of patterns, which did not allow accurate tracing of infections. A phatyping scheme has been developed for the differentiation of *E. coli* O157:H7 and has proven extremely valuable in epidemiological investigations (Table 6 and 7). At present, the scheme recognizes 80 different phagetypes and is being used in outbreak investigations in Canada, United Kingdom and Scotland.

In some cases, Pulse-field Gel Electrophoresis may be less informative than phagotyping and the use of PCR and arbitrary primers may prove to be an important tool in the provision of molecular epidemiological markers. Genotyping by PCR and restriction endonucleases patterns provide additional molecular markers for the tracing of infections of humans to foods, etc.

Educating the consumer remains a most important task in

the prevention of foodborne diarrheal disease.

Most, if not all, foodborne infections involving *E. coli* O157:H7 and other VTEC and for that matter all other foodborne pathogens such as *Salmonella*, *Campylobacter* and others, could be avoided by proper cooking (e.g., avoidance of pink centers in hamburgers, and proper handling and refrigeration of foods, particularly in the warm summer months, the picnic and barbecue season.)

Drinking of raw milk and of contaminated water are avoidable high risks and person-to-person transmission can be eliminated by good personal or institutional hygiene.

TABLE 6. Phage types of *E. coli* O157:H7 identified in outbreaks.*

Phage Type	No. of Outbreaks*	No. of Cases
1	38	102
2	24	72
4	40	113
8	18	66
14	48	116
21	3	7
23	4	13
26	1	2
31	21	55
32	3	136
34	3	13
39	3	8
40	2	38
43	1	4
45	1	3
48	1	3
53	1	4
1 and 2	5	25
1 and 4	3	50
1 and 8	1	11
1 and 23	1	7
31 and 32	1	2
1, 4, 14 and 31	1	13
1, 4, 21 and 31	1	16
8, 23 and 31	1	38
Total	237	917

* Settings of the outbreaks studied: nursing home outbreaks - 20; community outbreaks (day care, field trips, banquets, etc.) - 27; non-specified outbreaks - 5; hospital outbreaks - 3; and family outbreaks - 182.

TABLE 7. Phage types of *E. coli* O157:h7 associated with nonhuman sources.

Source	No.	Phagetype
Beef (Ground)*	28	1, 2, 4, 8, 14, 31, 32, 40
Veal (Ground)	1	23
Pork	2	4, 21
Milk (raw)	6	21
Bovine	8	68, 82, 83, 84
Cow Feces	18	1, 8, 14, 23, 31, 32, 34, 67
Dog Feces	1	4
Environment	3	4, 8

No. of Strains Examined: 67

* Two isolates from beef and all isolates from cow feces were from slaughter houses.

The contamination of meats, in particular, which occurs at the slaughter-house or meat-processing plants can and should be avoided by proper facilities and procedures, modern equipment and systematic cleaning and disinfection of working surfaces, especially meat grinders and packing areas. Supermarkets and other stores should use the same precautions. Time and temperature abuse must be avoided in all environments, including the home.

Microbiologists will have to fulfill their role in isolating and identifying correctly not only O157:H7, but also all VTEC organisms present in the food chain.

A better understanding of the ecology of VTEC on dairy and other farms will determine risk factors for the carriage of these organisms. Regulations are required for the proper cooking of hamburgers and other foods and consumer acceptance of irradiated foods will certainly contribute to the reduction if not the elimination of the risks of foodborne diarrheal disease.

Better surveillance for sporadic cases and outbreaks, tracking the geographic spread and the changes in food vehicles, characterization of the pathogenic traits and provision of epidemiological markers are not only important in investigations but can also allow for efficient measures in the prevention and control of diarrheal disease.

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Foodborne Illness (Part 9)

Viruses

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To date, human viral diseases identified as associated with foods have been relatively few. Viruses contaminate food similarly as bacteria. Viruses may be transmitted on foods, usually by fecal contamination by food workers or by fecally polluted waters. Human viruses are inert in food systems and are active only inside the human host. Therefore, they do not reproduce in food products.

Hepatitis A virus (HAV) and Norwalk-like agents have caused a number of foodborne outbreaks in recent years and will be discussed.

HEPATITIS A VIRUS

Hepatitis A virus is a small (27-nm) picornavirus transmitted via a fecal-oral cycle. Depending on the dose received, the incubation period can range from 15 to 50 days, averaging 28 to 30 days. The virus is shed in feces, beginning 10 to 14 days before symptoms appear, and then diminishes rapidly. Hence, an infected individual is most infectious before the apparent symptoms are observed. The infective dose is unknown, but is probably very low.

Onset of symptoms is usually abrupt with fever, nausea, abdominal pain, fatigue and possibly jaundice (yellowing of the skin or the whites of the eye). Most cases are mild and may last several weeks; a severe case may linger for several months. Many infections are asymptomatic (virus shed but no symptoms being manifest); many are mild without jaundice. The fatality rate is low <1%.

Common source outbreaks of HAV can occur when foods and water are fecally contaminated (evolve explosively), but the most usual mode of transmission is person-to-person by the fecal-oral route. Regarding foodborne HAV, most cases have been attributable to mishandling of food item(s) by infected persons. Vehicles have included many different types of foods (especially salads and sandwiches eaten cold or handled after cooking) that have been subject to direct (from a food worker) fecal contamination. Outbreaks from contaminated produce and from shellfish harvested from contaminated growing waters (eaten raw or minimally cooked) will continue to occur.

PREVENTION

- Practicing good personal hygiene and maintaining high standards of food protection and sanitation in the food preparation areas and among food workers.
- Good handwashing (done frequently/effectively) is very important in controlling this illness. Management must emphasize proper handwashing. Food workers have the **responsibility** to wash their hands often, especially after using a restroom. Handwashing is the most important aspect of personal hygiene.
- Handling food items with utensils (minimizing hand contact), especially those to be eaten cold/handled after cooking.
- Proper cooking/reheating of foods.
- Obtain shellfish from certified sources.
- Identifying food workers obviously ill with HAV and not permitting them to handle foods. Exposed food workers need immunoglobulin administered within 2 weeks of exposure to curtail the possible spread of the illness.

NORWALK AND NORWALK-LIKE AGENTS (SNOW, MOUNTAIN, HAWAII, etc.)

These agents are also small (27 to 32 nm) and have been implicated in about 1/3 of nonbacterial gastroenteritis outbreaks. Seen worldwide, more common in children; in the United States, illness typically occurs in older children and adults. The illness is generally self-limited and is mild to moderate in severity.

Symptoms include vomiting, nausea, diarrhea, abdominal pain, headache and low-grade fever lasting 2 to 3 days. The incubation period is from 24 to 48 h, with the

gastroenteritis lasting 12 to 60 h. Communicability is during acute stage and up to 48 h after diarrhea ceases. Attack rates of outbreaks are usually relatively high, often over 50%

Transmission is usually caused by a fecal-oral cycle, with respiratory transmission possible via aerosolized vomitus. Fomites may play a part in transmission. Recent studies suggest common source outbreaks can lead to secondary transmission to family members (person-to-person contact). Foods involved have included cole slaw and other salads, raw shellfish, eggs and icing on pastry; manufactured ice cubes and frozen food have also been vehicles.

PREVENTION

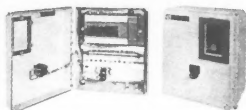
Most often, contamination from these agents result from

human carelessness. The risk of illness via foods is greatest for those items that are handled extensively and not heat treated before consumption, (e.g., eaten cold). Temperature abuse does not play a part in control measures because viruses cannot reproduce in food.

With the source of these agents being the fecal-oral route, emphasis should be on good personal hygiene, with special attention to **frequent** and **effective** handwashing by food workers. Purchasing certified shellfish, avoiding cross-contamination situations, and thoroughly cooking foods (agents are susceptible to heat of cooking temperatures), with minimal handling after cooking, are food protection and sanitation practices that need to be followed.

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Federal Register

Department of Health and Human Services

Food and Drug Administration

21 CFR Part 101

[Docket No. 91N-384H]

Food Labeling: Nutrient Content Claims, Definition of Term: Healthy

Agency: Food and Drug Administration, HHS.

Action: Final Rule.

Summary: The Food and Drug Administration (FDA) is amending its food labeling regulations to establish a definition for the term "healthy" under the Federal Food, Drug and Cosmetic Act (the act). This final rule will provide a definition for this implied nutrient content claim and provide for its use on the food label. This action is in response to the Nutrition Labeling and Education Act of 1990 (the 1990 amendments).

Dates: This regulation was effective May 8, 1994. Before January 1, 1998, the sodium content of individual foods, main dish and meal products shall be consistent with § 101.65(d)(2)(ii)(C)(1), (d)(2)(ii)(C)(2), (d)(3)(ii)(C)(1), (d)(3)(ii)(C)(2) or (d)(4)(ii)(B), as appropriate.

For Further Information Contact: Felicia B. Satchell, Center for Food Safety and Applied Nutrition (HFS-158), Food and Drug Administration, 200 C St., S.W., Washington, DC 20204, (202) 205-5099.

Supplementary Information:

I. Introduction

In the **Federal Register** of January 6, 1993 (58 FR 2302), FDA published a final rule entitled "Food Labeling: Nutrient Content Claims, General Principles, Petitions, Definitions of Terms; Definitions of Nutrient Content Claims for the Fat, Fatty Acid and Cholesterol Content of Food" (hereafter referred to as "the general principles final rule") that, among other things, provided for the use of implied nutrient content claims on the labels and in the labeling of individual foods and meal-type products. While the agency recognized that, as provided by section 403(r)(1)(A) of the act (21 U.S.C. 343(r)(1)(A)), a food is prohibited from bearing an implied nutrient content claim on its label or in its labeling unless the claim is designed by FDA by regulation, it was unable to adopt a comprehensive set of designations for implied nutrient content claims in the

general principles final rule because of resource constraints and the strict time frames under which that rulemaking was accomplished. Although the agency did not establish a comprehensive set of definitions, it did determine, among other things, that the term "healthy" is an implied nutrient content claim when it is used on the label or in labeling in a nutritional context, for example, when it appears in association with an explicit or implicit claim or statement about a nutrient (58 FR 2302 at 2375). The agency said that, for example, in the statement "healthy, contains less than 3 g of fat," "healthy" is an implied nutrient content claim.

Because of the complex nature of this term, the agency concluded that it was not possible to arrive at a final regulation for a definition of the term "healthy" as part of the general principles final rule (58 FR 2302, January 6, 1993). However, in that same issue of the **Federal Register**, FDA published a proposal entitled, "Food Labeling: Nutrient Content Claims, Definition of Term: Healthy" (hereafter referred to as "the healthy proposal"), to establish a definition for the implied nutrient content claim "healthy" for individual foods, main dishes and meal products (58 FR 2944, January 6, 1993). The agency tentatively concluded that foods labeled with the term "healthy" could be used with a variety of foods to assist consumers in maintaining healthy dietary practices, that is, to achieve a total diet that conforms to current dietary guidelines. In other words, FDA tentatively concluded that foods bearing a "healthy" claim should be those that, based on their nutrient profile, would assist consumers in achieving dietary recommendations. Consequently, the agency proposed to permit the use of the term "healthy" as an implied nutrient content claim on products that meet the definitions for "low fat" and that do not exceed the disclosure levels for sodium and cholesterol [proposed §101.65(d)(2)(21 CFR 101.13(h))]. The agency further stated that when "healthy" is not used as an implied nutrient claim, it would be subject to the general misbranding provisions of section 403(a) of the act (58 FR 2944 at 2945).

The agency advised that it intended to make any final rule that derived from the proposal effective on the date of applicability of the general principles final rule and the final rule on mandatory nutrition labeling (e.g., May 8, 1994) (58 FR 2944). However, FDA stated that if for some reason a final rule had not been issued by that date, "healthy" would be subject to the general nutrient content claim requirements for implied claims or the general misbranding clause (58 FR 2944).

In a companion document in the January 6, 1993, issue of the **Federal Register** (58 FR 688), the Food Safety and Inspection Service (FSIS) of the U.S. Department of Agriculture (USDA) proposed a definition for "healthy" or any other derivative of the term "health" on meat and poultry products that contain less than 10 g of fat, less than 4 g saturated fat, less than 95 mg of cholesterol, and less than 480 mg of sodium per 100 g and per reference amount

customarily consumed (RACC) for individual foods and per 100 g and per labeled serving for meal-type products. Food Safety and Inspection Service further proposed that any use of the term "healthy," whether in a brand name or in conjunction with a nutrient, must meet this definition.

The Food and Drug Administration received approximately 50 letters in response to the "healthy" proposal. Each letter contained one or more comments. The letters were from a wide range of sources, including consumers, consumer organizations, professional associations, State and local government agencies, industry and industry trade associations. Some of the comments supported various provisions of the proposal. Other comments suggested modifications, revisions or revocations of various provisions of the proposal.

AMENDMENT

Under the Federal Food Drug and Cosmetic Act and under authority delegated to the Commissioner of Food and Drug, 21CFR part 101 is amended as follows:

PART 101 -- FOOD LABELING

1. The authority citation for 21 CFR part 101 continues to read as follows:

Authority: Secs. 4, 5, 6 of the Fair Packaging and Labeling Act (15 U.S.C. 1453, 1454, 1455); secs. 201, 301, 402, 403, 409, 701 of the Federal Food, Drug and Cosmetic Act (21 U.S.C. 321, 331, 342, 343, 348, 371).

2. Section 101.65 is amended by adding new paragraphs (d)(2) through (d)(4) to read as follows:

§101.65 Implied nutrient content claims and related label statements.

* * * * *

(d) * * *

(2) The term "healthy" or any derivative of the term "healthy," such as "health," "healthful," "healthfully," "healthfulness," "healthier," "healthiest," "healthily" and "healthiness" may be used on the label or in the labeling of a food, other than raw, single ingredient seafood or game meat products, main dish products as defined in §101.13(1), as an implied nutrient content claim to denote foods that are useful in constructing a diet that is consistent with dietary recommendations provided that:

(i) The food meets the definition of "low" for fat and saturated fat;

(ii)(A) The food has a reference amount customarily consumed greater than 30 g or greater than 2 tablespoons and, before January 1, 1998, contains 480 mg sodium or less

reference amount customarily consumed, per labeled serving; or less per reference amount customarily consumed, per labeled serving; or

(B) The food has a reference amount customarily consumed if 30 g or less or 2 tablespoons or less and before January 1, 1998, contains 480 mg sodium or less per 50 g (for dehydrated foods that must be reconstituted before typical consumption with water or a diluent containing an insignificant amount as defined in §101.9(f)(1), of all nutrients per reference amount customarily consumed, the per 50 g criterion refers to the "as prepared" form);

(C)(1) The food has a reference amount customarily consumed greater than 30 g or greater than 2 tablespoons and, after January 1, 1998, contains 360 mg sodium or less per reference amount customarily consumed, per labeled serving; or

(2) The food has a reference amount customarily consumed of 30 g or less or 2 tablespoons or less and, after January 1, 1998, contains 360 mg sodium or less per 50 g (for dehydrated foods that must be reconstituted before typical consumption with water or a diluent containing an insignificant amount as defined in §101.9(f)(1), or all nutrients per reference amount customarily consumed, the per 50 g criterion refers to the "as prepared" form);

(iii) The food contains at least 10% of the RDI and DRV per reference amount customarily consumed, per labeled serving of vitamin A, vitamin C, calcium, iron, protein or fiber;

(iv) Where compliance with paragraph (d)(3)(iii) of this section is based on a nutrient that has been added to the food, that fortification is in accordance with the policy on fortification of foods in §104.20 of this chapter; and

(v) The food complies with definitions and declaration requirements established in this part for any specific nutrient content claim on the label or in labeling.

(4) The term "healthy" or its derivatives may be used on the label or in labeling of main dish products, as defined in §101.13(m), and meal products, as defined in §101.13(1) as an implied nutrient content claim provided that:

(i) The food meets the definition of "low" for fat and saturated fat;

(ii)(A) Before January 1, 1998, sodium is not present at a level exceeding 480 mg per labeled serving;

(iii) Cholesterol is not present at a level exceeding 90 mg per labeled serving;

(iv) The food contains at least 10% of the RDI and DRV per labeled serving of two (for main dish products) or three (for meal products) of the following nutrients — vitamin A, vitamin C, calcium, iron, protein or fiber;

(v) Where compliance with paragraph (d)(4)(iv) of this section is based on a nutrient that has been added to the food, that fortification is in accordance with the policy on fortification of foods in §104.20 of this chapter; and

(vi) The food complies with definitions and declaration requirements established in this part for any specific nutrient content claim on the label or in labeling.

Updates . . .

General Mills Restaurants Vice President to Become President of IAMFES

C. Dee Clingman, Vice President of Quality Assurance for General Mills Restaurants, will become President of the International Association of Milk, Food and Environmental Sanitarians, Inc. (IAMFES) at the 81st Annual Meeting in San Antonio, TX, August 1-4. Clingman will be the first elected officer to IAMFES from the foodservice industry.

Throughout his career Clingman has been recognized as an innovator, strategist and pioneer in new environmental health programs. He is the recipient of the IAMFES Harold Barnum Award (1983) for most outstanding industry Sanitation. He was also presented the Food Industry Sanitarian Award by the National Environmental Health Association in 1985 for his contributions to environmental sanitation in the food industry. Most recently, in 1993 he received the Davis Calvin Wagner Award from the American Academy of Sanitarians for his accomplishments in advancing the sanitarian profession and public health programs.

C. Dee Clingman is Vice President of Quality Assurance for General Mills Restaurants, which operates Red Lobster, The Olive Garden and China Coast restaurants. In this capacity, he directs a department providing quality direction and food protection to the 1,200 restaurants currently in operation in the United States and Canada.

FDA Holding Workshop on Anti-Salmonella Additive Guideline

The Food and Drug Administration (FDA) is holding a workshop to discuss a draft guideline entitled, "Utility Studies for Anti-Salmonella Chemical Food Additives in Animal Feeds." This draft guideline, which was announced in the June 23, 1994 **Federal Register**, provides direction on the testing of food additives that are intended to control *Salmonella* contamination of animal feeds. Single copies of the guidelines are available from the Communications and Education Branch, HFV-12, Center for Veterinary Medicine, Food and Drug Administration, 7500 Standish Place, Rockville, MD 20855. Send two self-addressed adhesive labels to assist in processing your request.

The workshop entitled, "Anti-Salmonella Chemical Food Additives in Animal Feeds: FDA's Guideline for Utility Studies" will be held in conjunction with the 1994 annual meeting of the Poultry Science Association. It will be held on Monday, August 8, 1994 at Mississippi State University in McCool Hall, Room 217.

The following is a tentative agenda for the workshop:

- 7:45 a.m. Continental Breakfast
- 8:15 a.m. Welcome and Introduction
Dr. H. Ekperigin, Chair
FDA/Center for Veterinary Medicine
- 8:20 a.m. Introduction of Speakers
Dr. J. S. Bailey
USDA/Agricultura Research Service
- 8:25 a.m. Opening Remarks
Dr. G. A. Mitchell
FDA/Center for Veterinary Medicine
The Dillon Beach Project
Dr. Richard McCapes
University of California, Davis
- 8:40 a.m. The Anti-Salmonella Guideline
Dr. H. Ekperigin
FDA/Center for Veterinary Medicine

Consent Decree Filed in Tissue Residue Case

Issued By:

Center for Veterinary Medicine, Office of Management, Communications and Education Branch, HFV-12

In the District Court for the Western District of New York, a Consent Decree of Permanent Injunction was filed on June 27, 1994, against Smith Family Farms, Clyde, NY.

Smith Family Farms is a large dairy operation with a history of illegal tissue residues. In addition to the illegal residues, they had failed to establish adequate management and husbandry practices to avoid or preclude residues, and they were routinely administered drugs in an extra-label manner. Specifically, Smith Family Farms was using a milk residue test to determine pre-slaughter withholding times rather than following label directions.

The Consent Decree requires Smith Family Farms to use new animal drugs in accordance with their label directions, establish systems to identify animals, establish and maintain medication/treatment records, establish a drug inventory and accountability program for animals sold by the defendant.

SUMMER WEATHER INCREASES RISK OF FOOD POISONING

UNIVERSITY PARK, PA — Summer is the season for swimming, baseball, barbecues and other fun. But it's also the season for foodborne disease. "Most foodborne bacterial illnesses occur between April and November, with a peak incidence in July," says Dr. Stephen Knabel, assistant professor of food science in Penn State's College of Agricultural Sciences. Warm temperatures and moist air create an ideal breeding ground for food-borne pathogens such as *Salmonella* and *Campylobacter*. The closer bacteria are to body temperature — 98.6°F — the faster they multiply. "Warm weather also makes it easier for foods to enter the temperature danger zone between 40 and 140°F, when bacteria can multiply to dangerous levels in a matter of hours," Knabel says. Does this mean a barbecue, picnic or family gathering is an invitation to disaster? Not at all, Knabel says. "Foodborne illness is easily prevented, but it's up to you," he says. "If you prepare, store and handle food properly during the summer, you'll avoid problems." Improper food storage is a common source of illness. "Use plenty of ice if you're going on a picnic this summer," Knabel says. "Keep meat and other foods in sealed containers and cover them with ice until you are ready to eat or cook them."

An Equal Opportunity University Cooling large containers of food also gives pathogens a chance to grow, since large amounts of food cool more slowly. "To cool warm food rapidly, divide it into smaller batches and place them in flat, shallow containers, which go immediately into the refrigerator," Knabel says. "Never cool foods on the counter top." Bacteria may reach dangerous levels if foods aren't thoroughly cooked. "Cook foods to the proper temperature to kill harmful microorganisms that might be present," Knabel says. "Treat raw meat, fish and poultry as though they are contaminated, even though they may not be." Cook raw poultry and meats until their centers are no longer pink and the juices run clear. "Always cut into the center of the meat to make sure it is done," Knabel says. "Use a thermometer to make sure the temperature inside large items, such as whole chickens or turkeys, reaches at least 165°F." Hamburger is particularly risky for carrying a strain of bacteria known as *Escherichia coli* O157:H7.

"In 1993, three children died and more than 400 people became ill after eating undercooked ground beef contaminated with this bacteria, so make sure your hamburgers are completely cooked," Knabel says. Finally, do not cross-contaminate foods. "When handling raw meat, keep juices from dripping on other foods and food containers," Knabel says. "It's smart to shape burgers ahead of time rather than handling raw ground beef at the picnic or barbecue site. Be sure to wash your hands thoroughly with soap and hot water after handling raw meat or after using the bathroom." To avoid spreading pathogens from one food to another, always use

clean utensils and plates. Never place cooked meat or any other foods on the same plate with raw meat. Wash containers or utensils used to prepare raw meat before using them again. Foodborne illness symptoms include stomach pain, nausea, vomiting, diarrhea, headaches and fever. In healthy adults, symptoms usually last only a day or two. But infants, young children, the elderly, pregnant women and people with impaired immune systems can develop life-threatening complications. For more information contact Steve Knabel at (814) 863-1372.

CHARLES DECKER, JR. NAMED EXECUTIVE DIRECTOR OF FLUID MILK EDUCATION PROGRAM

(Washington, D.C. — June 7, 1994) Charles E. (Charlie) Decker, Jr. has been appointed Executive Director of the National Milk Processor Education Program (Milk PEP), with specific responsibility for leading the recently approved consumer education campaign. The program is a new effort being launched by milk processors in the U.S. with the ultimate goal of reversing the continuing decline in the consumption of milk nationwide. It will be funded by a six month assessment on fluid milk processors, which is expected to generate an education fund of \$55 million for the first year of the program. A Processor Promotion Board, composed of senior executives from the industry, was appointed by Secretary of Agriculture Mike Espy on June 6. The Board will work with Decker and the Milk Industry Foundation (MIF) in the development and implementation of the plan. The MIF, which will administer the Program on a contractual basis, is the leading trade association for companies that process and distribute fluid milk. Part of the International Dairy Foods Association, the MIF is developing the comprehensive campaign to assist milk processors in educating the public about milk's many positive qualities, as well as to correct any negative misperceptions about the wholesomeness and healthfulness of milk.

The roots of the education program go back to the Farm Bill of 1990, which encouraged processors to join forces in this kind of effort. When the program was put up for a vote, 72% of processors in the U.S. (who process nearly 80% of fluid milk and fluid milk products consumed nationwide), elected to go forward with it. In announcing Decker's appointment, E. Linwood Tipton, President and CEO of the MIF, cited Decker's extensive experience in consumer advertising and marketing both on the agency and company sides. Most recently, Decker was President and Chief Executive Officer of The Benchmark Group, a strategic design and marketing communications company. His agency affiliations include executive positions with Ayer BBDO, and Benton & Bowles (now DMB&B). He also served as Vice President of

Advertising for The Quaker Oats Company, including during the period immediately following its acquisition of Gatorade in 1984. "There are few opportunities in the advertising business where one has a chance to use the powerful tools of advertising and marketing communications on behalf of a product as deserving as milk," stated Decker. "This is especially relevant now, given the rising number of consumer questions about the nutritional benefits of milk in its various forms." Decker received an MBA from The Wharton School at the University of Pennsylvania and a BA from Moravian College. He has one daughter and is relocating to Washington, DC from New York City.

COHEN GIVES THIRD FRAZIER MEMORIAL LECTURE

Dr. Mitchell L. Cohen spoke on "The Future of Foodborne Disease-Lessons from the Past" when he gave the third Frazier Memorial Lecture at the University of Wisconsin-Madison on May 26, 1994 in conjunction with the annual meeting of the Food Research Institute. Dr. Cohen received his undergraduate and medical degrees from Duke University. Currently he is Director of the Division of Bacterial and Mycotic Diseases in the National Center for Infectious Diseases of the Centers for Disease Control and Prevention in Atlanta, GA.

In his lecture, Dr. Cohen indicated that emergence of infectious diseases, including foodborne illnesses, is influenced by human demographics and behavior, technology and industry, economic development and land use, international travel, microbial characteristics and public health measures. He indicated that outbreaks of salmonellosis now exceed those of staphylococcal poisoning and perfringens illness and that seafood and poultry now are more important vehicles of foodborne illness than are beef and pork.

The Frazier Memorial Lecture is supported by funds contributed by former colleagues, students and friends of the late Professor William C. Frazier, a pioneering food/dairy microbiologist at the University of Wisconsin-Madison. The lectureship annually brings a noted food microbiologist to the University campus for the lecture and for consultation with students and faculty. Representatives of the Departments of Food Science, Bacteriology and Food Microbiology and Toxicology administer the lectureship.

PROCESS AUTOMATION ENGINEERS JOIN A & B

Two new engineers at A & B Process Systems Corp bring expertise in process automation services.

Guy Falbo joins A & B as manager, process automation, while David M. Mains will serve as senior process automation engineer. Both come to A & B from Custom Control Products, Inc.

Falbo served as manager of project engineering, manufacturing and field installation. He previously was an assistant manager at Alfa Laval Corporation, responsible for product

design and development engineering, quoting and scheduling. Prior to that, he was a manager at APV Crepaco, Inc., heading a staff of 13 in the use of automation in heavy machinery, food, dairy and chemical industries. He holds a degree in business administration and electrical engineering technology from LaSalle University.

Mains holds degree in electrical engineering from the Milwaukee School of Engineering, and previously was a project engineer at CCPI. He has been involved in the design of control systems for the dairy industry, quoting, start-up of control systems, problem-solving and testing of electronic assemblies.

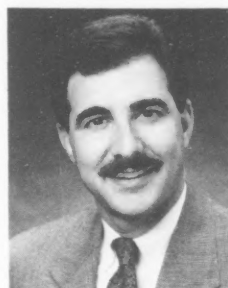
A & B Process Systems Corp. is a nationwide leader in the design, manufacture and installation of process flow systems for the dairy, food, beverage and pharmaceutical industries. The company is located at 528 North Street, P.O. Box 86, Stratford, WI 54484-0086, and can be reached at (715) 687-4332.

TAMWFP ANNOUNCES NEWLY ELECTED OFFICERS

The following were elected as officers for 1994-95 of the Tennessee Association at the June 2, 1994 meeting:

President: Ernest Yates, Cross Plains
President Elect: Dr. Genevieve Christen, Knoxville
Vice President: Gail Smith, Chattanooga
Sec/Treasurer: Dennis Lampley, Bon Aqua
Archivist: Ruth Fuqua, Mt. Juliet
Bd. Mbr. at Large: Dewain Patterson, Brentwood
Past President: Wayne Crabtree, Athens

BRENNEN JOINS SUPERIOR LABEL SYSTEMS AS VP/CFO



CINCINNATI — June 24, 1994 — Robert Brennan (pictured at left) has joined Superior Label Systems as Vice President and Chief Financial Officer.

Brennan was previously controller of corporate operations for Cintas, one of the country's largest uniform companies.

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Retail Food Operation Food Hazard Control Checklist

O. Peter Snyder, Jr., Ph.D.
 Hospitality Institute of Technology and Management,
 830 Transfer Road, Suite 35,
 St. Paul, MN 55114

The following is the ninth installment of the Retail Food Operation Food Hazard Control Checklist mentioned in the October 1993 column. This checklist will be continued over the next several months to cover its entirety.

RETAIL FOOD OPERATION FOOD HAZARD CONTROL CHECKLIST [40°F - 150°F (4.4°C - 65.6°C)]¹

FOOD SAFETY CONTROL REQUIREMENTS	PERFORMANCE EVALUATION	NEEDED TO ASSURE SAFETY
<p>Table condiments (Reg)</p> <ul style="list-style-type: none"> • All condiment containers are clean and uncontaminated, and are replaced if they appear to be below standard. • Individually portioned condiments are provided for table service or counter service. • Condiment bins are kept clean. • Commercially packed condiment containers are never refilled. <ul style="list-style-type: none"> - Partially filled condiment containers are sent to the kitchen for use in cooking. <p>Ice (Haz)</p> <ul style="list-style-type: none"> • Ice is produced from water meeting Environmental Protection Agency Standards in an approved ice dispensing machine, or is obtained from an approved commercial source. • All glass objects, including coffee pots and water glasses, are kept away from the ice bins or machine. • Ice that has been in contact with food packages or used for displays is never re-used. • Packaged food is not to be stored in undrained ice. • Food, beverages or food containers are not stored in ice intended for human consumption. <p>Ice (Reg)</p> <ul style="list-style-type: none"> • Drainage lines from beverage dispensers do not run through potable ice bins. <p>Ice scoops (Haz)</p> <ul style="list-style-type: none"> • Metal or plastic scoops with handles are used to dispense frozen food and ice. <ul style="list-style-type: none"> - Hands, glasses, paper cups, bowls or other non-approved items will not be used as a scoop. - Ice scoops are stored in the ice bin in an approved holder, with the handle up, or are inverted outside the ice bin in a clean place or in an approved container. - When filling an ice bucket, the bucket is kept at least 6 in. above the floor on a clean surface. <p>Food serving temperatures (Haz)</p> <ul style="list-style-type: none"> • Service employees are responsible for rejecting improperly cooked, warmed or held food or food that shows signs of deterioration. Any of these deficiencies will be reported to the supervisor/manager. • All foods served to customers are above 150°F or below 40°F when they leave the service area. 		

Abbreviations: (Haz) = Hazard; (Reg) = Regulatory; (Qual) = Quality; (OSHA) = Occupational Safety and Health Agency

¹ Temperatures, unless otherwise stated, are food temperatures. They are measured both 1/16-in. below the surface as well as at the center of food in order to determine the degree of control and stability of hot and cold systems.

CONSUMER	PERFORMANCE EVALUATION	NEEDED TO ASSURE SAFETY
<p>Consumer information (Haz)</p> <ul style="list-style-type: none"> • Consumers (customers) are given information about the food(s) they purchase whenever appropriate for foodborne illness prevention and whenever requested. <ul style="list-style-type: none"> - Customers are warned to consume hot, take-out foods in <2 h or they are given cold food [<40°F (4.4°C)] to take out and reheat later. - Customers are warned to keep cold food items at <40°F (4.4°C) and to consume these foods within a certain time period and to discard the unused portion at the end of that time. • To prevent possible allergic reactions in some people, customers are informed of the ingredients in food items, if they request this information. <p>Returned food (Haz)</p> <ul style="list-style-type: none"> • Any food returned by a customer is never to be reused, re-served or sold. • Return incident(s) are recorded on the manager's log before item(s) is/are thrown out. <p>Food sabotage (Haz)</p> <ul style="list-style-type: none"> • There is adequate surveillance to prevent sabotage of food products. • Employees inform management immediately if there is any unusual handling of food and of possible contamination of food by a customer. 		

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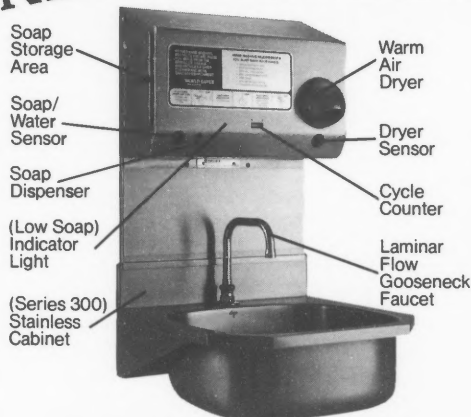
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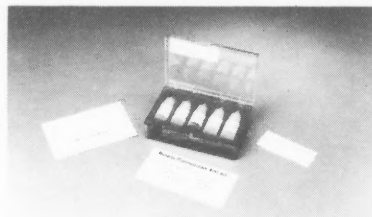


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- *The Department of Commerce and FDA* use of the *Managing a Food Safety System* course as the HACCP curriculum for the National Seafood Foodservice Pilot Program.
- *The Department of Commerce and the Chicago Health Department* use of SERVSAFE programs to train field personnel.
- *National and state environmental health association* sponsorship of SERVSAFE programs for their members.

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3-A Sanitary Standards for Uninsulated Tanks for Milk and Milk Products, Number 32-01

Formulated by
*International Association of Milk, Food and Environmental Sanitarians United States Public Health Service
The Dairy Industry Committee*

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius of new developments. Specifications for uninsulated tanks heretofore and hereafter developed which so differ in design, material, fabrication or otherwise as not to conform with the following standards, but which, in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS and DIC at any time.

A.1.5

As a product surge or feed tank within a milk or milk products processing system, and farm milk handling equipment.

This amendment shall be effective August 20, 1994

Amendments to Part One of the 3-A Sanitary Standards for Sensors and Sensor Fittings and Connections Used on Milk and Products Equipment, Number 09-09

Formulated by *International Association of Milk, Food and Environmental Sanitarians United States Public Health Service
The Dairy Industry Committee*

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Sensors and sensor fittings and connections specifications heretofore or hereafter developed which so differ in design, material, construction or otherwise, as not to conform with the following standards, but which in the manufacturer's or fabricator's opinion are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS and DIC at any time.

C.1.3

Where materials having certain inherent functional purposes are required for specific applications, such as ion-permeable materials on pH electrodes or reference junctions in pH or ORP sensors, ceramic materials may be used. Ceramic materials shall be inert, nontoxic, nonabsorbent, insoluble, resistant to scratching, scoring and distortion when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment or sterilization. The ceramic materials shall be nonpermeable to microorganisms and shall have an average pore size of less than 0.10 micrometer.

APPENDIX

J

DIAGRAMS

These diagrams are intended to demonstrate general principles only, and are not intended to limit individual ingenuity. The design used should conform with the sanitary requirements set forth in these 3-A Sanitary Standards. The following examples are included in this Appendix: Drawings of 3-A Sensors and Sensor Fittings and Connections Drawings of the following are included in this index.

These Amendments will become effective August 20, 1994.

Amendments to 3-A Sanitary Standards for Liquid Pressure and Level Sensing Devices, Number 37-01

AMENDMENT 1

*Formulated by International Association of Milk, Food and Environmental Sanitarians United States Public Health Service
The Dairy Industry Committee*

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. Liquid Pressure and Level Sensing Devices specifications heretofore or hereafter developed which so differ in design, materials and fabrication or otherwise as not to conform to the following standards but which, in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS and DIC at any time. Note: Use current revisions or editions of all referenced documents cited herein.

AMEND

D10.1.1

Where smaller radii are required for essential functional reasons, such as those in sensing devices for high pressure gauges and ultrasonic level sensing devices. In no case shall such radii be less than 1/32 in. (0.794 mm).

This amendment shall be effective August 20, 1994.

Amendments to 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-17

AMENDMENT 2

*Formulated by International Association of Milk, Food and Environmental Sanitarians United States Public Health Service
The Dairy Industry Committee*

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. Multiple-use plastic materials used as product contact surfaces for dairy equipment heretofore or after developed, which so differ in specifications or otherwise as not to conform with the following standards, but which, in the fabricator's opinion are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS and DIC at any time.

The "3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-17," are hereby further amended as indicated in the following:

H

Standards for Acceptability, sub-paragraph (H2): Make the following changes to the list of Generic Classes of Plastics:

TABLE 1

Generic Classes of Plastics	MAXIMUM PERCENT WEIGHT GAIN		
	Cleanability Response (Section E Regimen)	Product Treatment (Section F Regimen) Solution I	Solution J
Polyethylene Phtalate Polymers*	0.10	0.15	0.65

Covered by 21 CFR 177.1630

These amendements shall become effective August 20, 1994.

Amendments to 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-17

AMENDMENT 3

*Formulated by International Association of Milk, Food and Environmental Sanitarians United States Public Health Service
The Dairy Industry Committee*

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. Multiple-use plastic materials used as product contact surfaces for dairy equipment heretofore or after developed which so differ in specifications or otherwise as not to conform with the following standards, but which, in fabricator's opinion are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS and DIC at any time.

The "3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-17," are hereby further amended as indicated in the following:

H

Standards for Acceptability, sub-paragraph (H2): Make the following changes to the list of Generic Classes of Plastics:

TABLE 1

Generic Classes of Plastics	MAXIMUM PERCENT WEIGHT GAIN		
	Cleanability Response (Section E Regimen)	Product Treatment (Section F Regimen) Solution I	Solution J
Polyphylene Sulfide - PTFE (alloy)	0.06	0.08	0.30

Covered by 21 CFR 177.1630

This amendment shall become effective August 20, 1994.

Amendment to 3-A Sanitary Standards for Diaphragm-Type Valves for Milk and Milk Products, Number 54-00

AMENDMENT 1

*Formulated by International Association of Milk, Food and Environmental Sanitarians United States Public Health Service
The Dairy Industry Committee*

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. [Insert name of equipment] specifications heretofore or hereafter developed which so differ in design, materials and fabrication or otherwise as not to conform to the following standards but which, in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS and DIC at any time. NOTE: Use current revision or editions of documents cited herein.

- 1 D10 The chamber on the exterior side of the diaphragm (herein defined
- 2 as the bonnet) shall have one or more holes of at least 3/32 in.
- 3 (1.59 mm) in diameter just above the bonnet flange in a suitable
- 4 bossed area(s) located so that one hole will be at the lowest
- 5 point in the installed position for the detection of leakage.

These amendments to 3-A Diaphragm-Type Valves for Milk and Milk Products (formerly 08-20B) are effective August 20, 1994.

Editorial Amendment to the Amendments to 3-A Accepted Practices for Permanently Installed Product and Solution Pipelines and Cleaning Systems Used in Milk Product Processing Plants, Number 605-04

Formulated by International Association of Milk, Food and Environmental Sanitarians United States Public Health Service
The Dairy Industry Committee

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Practices for permanently installed product and solution pipelines and cleaning systems specifications heretofore or hereafter developed, which so differ in design, materials and construction, or otherwise as not to conform to the following practices but which in the manufacturer's or fabricator's opinion, are equivalent or better may be submitted for joint consideration of the IAMFES, USPHS and DIC at any time.

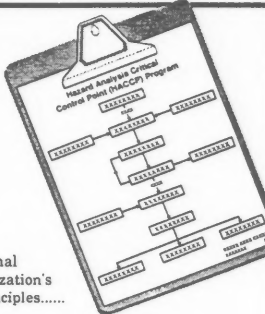
D.14

There shall be no threads on product contact surfaces or on solution contact surfaces.

This amendment is effective August 20, 1994.

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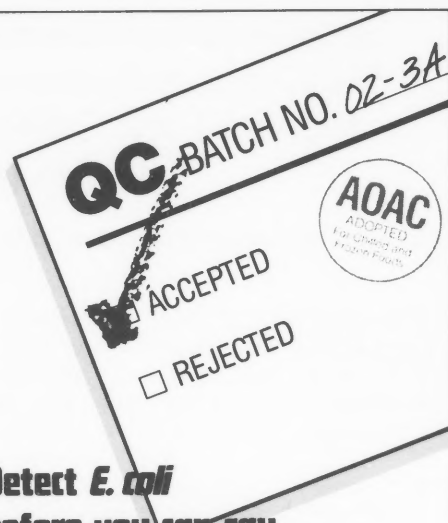
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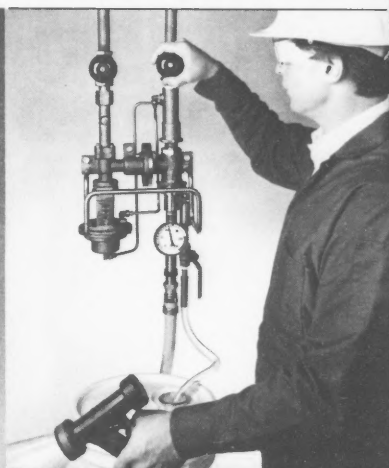
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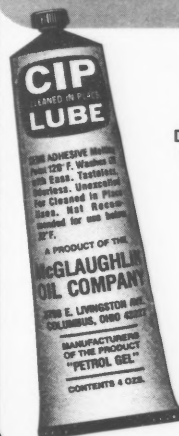
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For more information regarding the IAMFES Annual Meeting, contact IAMFES, 200 W. Merle Hay Center, 6200 Aurora Avenue, Des Moines, Iowa 50322, USA. Telephone: 800/369-6337 (U.S.), 800/284-6336 (Canada), or 515/276-3344 (international).
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For questions about the symposium programs, contact Ms. Catherine Nnoka, ILSI North America, 1126 Sixteenth Street, N.W., Washington, D.C. 20036, USA. Telephone: 202/659-0074. Telefax: 202/659-3859.

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Affiliate News



▶ Wayne Crabtree, President of TAMWFP

Tennessee Association's Annual Meeting HIGHLIGHTS...



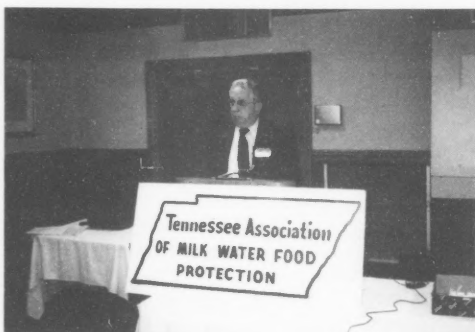
▶ Dr. Hugh McCampbell of the University of Tennessee speaks on Mastitis Control



▶ James "Sid" Matthews is presented a plaque for outstanding service to the dairy industry of Tennessee by Secretary/Treasurer, Dennis Lampley



▶ Dr. Wesley Sing of Vivalac Cultures Corporation speaks on New Technology in Cultured Dairy Products



▶ Hugh Wilson of the Tennessee Department of Agriculture speaks on Milk Hauler Regulations



▶ President Wayne Crabtree is presented a plaque for outstanding leadership as president by Secretary/Treasurer, Dennis Lampley.

Wisconsin Joint Conference 1994

The Wisconsin Association of Milk and Food Sanitarians (WAMFES), Wisconsin Environmental Health Association (WEHA), Wisconsin Association of Dairy Plant Field Representatives (WADPFR), joint conference is set for **Wednesday, September 21, and Thursday, September 22, 1994 at the Country Inn Resort in Waukesha, WI.**

Each group is planning separate programs at the conference that would be of interest of all groups. Some highlights include: Representative Spencer Coggs addressing the Wisconsin Lead Bill and a possible address by Secretary of the Department of Agriculture Alan Tracy. Other presentations planned are on Interstate Shippers Report, Future Dairy Trends, Component Pricing, Common Sense Approach to Mastitis, Wastewater Disposal of Milk House Waste, Milking Systems Analysis, Rodents and henta Virus, the Food and Drug Administration's new Model Food Code, Natural Occurring Arsenic, State, Local and Industry Views on a Foodborne Outbreak, Quality Assurance in Deli Foods, DNR and the LPHD, How to Pass a Federal Milk Survey, Current Issues in Food Protection, Implementing HACCP, Extended Production Run Times, NLEA-Food Labeling, the new ATCP 80 Rule, 50th Anniversary Celebration of WEHA and Many Exhibitors.


Something new this year is a Casino Night following the Awards Banquet.

The Country Inn offers a fitness center, swimming pools, tennis, volleyball, horseshoes and basketball. Next door to the inn is a challenging 18 hole par 71 golf course with a lot of water hazards.

Southeast Wisconsin area officers many sites to see, such as: Oktoberfest in Glendale, Old World Wisconsin in Eagle, East Troy Electric Railroad, Geneva Lakes Kennel Club, Milwaukee County Zoo, Mitchell Park Horticultural Conservatory, Holy Hill Cathedral in Hubertus. For those who desire an extended weekend vacation, the inn has extended the room price breaks for the weekend.

For more information, contact Neil Vassau, Department of Agriculture, Trade and Consumer Protection, Bureau of Laboratory Services, P.O. Box 7883, Madison, WI 53707, (608) 267-3504.

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Upcoming IAMFES Affiliate Meetings

1994

SEPTEMBER

•12-14, **Mississippi Environmental Health Association Annual Conference** will be held at the Ramada Inn Coliseum, Jackson, MS. For more information, please contact Susan Howell at (601)494-4514.

•19-21, **Indiana Environmental Health Association, Inc. Annual Meeting** will be held in Muncie, IN. For more information, contact Tami Barrett at (317) 633-8400.

•20-22, **New York State Association of Milk and Food Sanitarians Annual Conference** will be held at the Sheraton Inn-Buffalo Airport, Buffalo, NY. For more information contact Janene Gargiulo (607) 255-2892.

•21-22, **The Wisconsin Association of Milk and Food Sanitarians, Wisconsin Environmental Health Association and Wisconsin Association of Dairy Plant Field Representatives 15th Annual Wisconsin Joint Conference** will be held at the Country Inn Resort in Waukesha, WI. For more information, contact Neil Vassau, Department of Agriculture, Trade and Consumer Protection, Bureau of Laboratory Services, P.O. Box 7883, Madison, WI 53707, (608) 267-3504.

OCTOBER

•12-13, **Iowa Association of Milk, Food and Environmental Sanitarians Annual Meeting** will be held at the Best Western Starlite Village (formerly the Ramada Hotel), Waterloo, IA. For more information call Dale Cooper at (319) 927-3212.

NOVEMBER

•2-3, **North Dakota Environmental Health Assn. Annual Educational Conference** will be held at the International Inn, Williston, ND. For more information, contact Deb Larson at (701) 221-6147.

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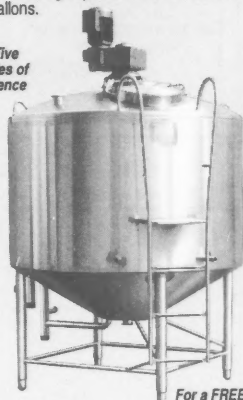
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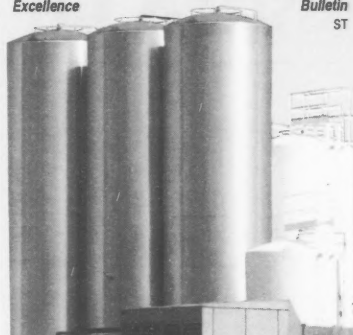
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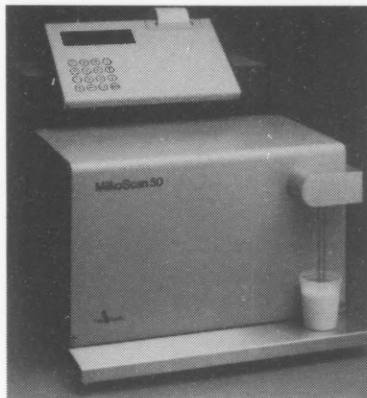
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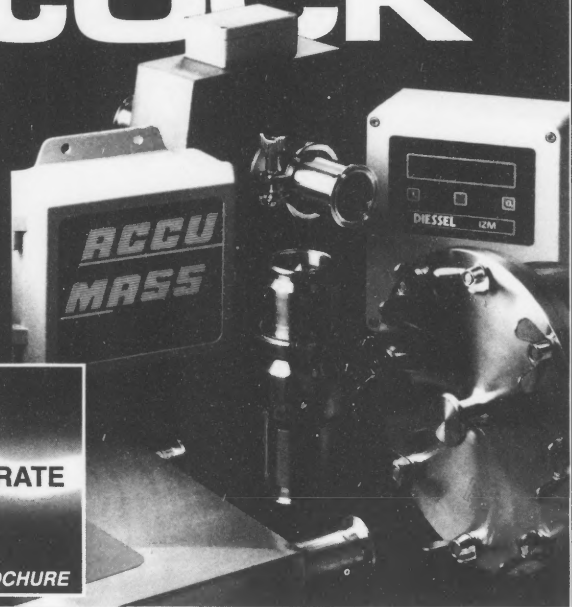
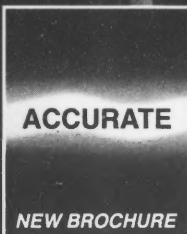
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Industry Products



TEMPERATURE COMPENSATED HAND REFRACTOMETER, RANGE 0-32%

Kernco Instruments Co., Inc. has introduced its Model ATC-M Automatic Temperature Compensated Hand Refractometer which measures Brix, sugar, and soluble solids in the range of 0 to 32%. This new model allows the user to obtain direct readings without having to refer to tables or thermometers. Another feature of the Model ATC-M is that it has a focus-able eyepiece which makes it easy for each user to use without eyestrain.

The Model ATC-M has a range of 0 to 32% with scale designations of .2 of 1%. This unit is useful to measure the sugar content of fruit, fruit juice, soft drinks, beverages and tomato juice, as well as measuring the concentration of aqueous solutions such as cutting oil, quenching oil and other concentrates.

This is a light-weight unit weighing approximately 11 oz. and is 6 3/4" long.

For additional information write to: KERNCO INSTRUMENTS CO., INC. 420 Kenazo Ave. El Paso, TX 79927; Telephone: (915) 852-3375; Contact: John P. Kelly, Advertising Director.

Kernco Instruments Co., Inc. - El Paso, TX

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USDA APPROVES NEOGEN TEST

LANSING, MI, JUNE 22, 1994 — Neogen Corporation (NASDAQ:NEOG) announced today that its newest quantitative test for aflatoxin has been approved by the U.S. Department of Agriculture, Federal Grain Inspection Service (FGIS) for certifying grain and grain products.

The new test, Veratox®-AST, detects the presence of aflatoxin, the most potent naturally-occurring carcinogen. The test was also approved by the Association of Analytical Chemists Research Institute in the spring.

"This approval allows over 100 government licensed laboratories to use the new Neogen test to certify levels of aflatoxin for millions of bushels of grain used in the U.S. or shipped to foreign customers," said Neogen President James Herbert. "In most cases, the new test will allow labs to

conduct tests more rapidly and less expensively than with current methods."

Aflatoxin is produced as a by-product of the mold *Aspergillus flavus* and has been linked to cancer in humans. When aflatoxin-contaminated grains are consumed by livestock, severe health and performance problems may occur. The U.S. Food and Drug Administration has established regulations concerning the presence of this toxin for both human and animal exposure.

Neogen introduced its first immunoassay test for the detection of aflatoxin in 1985. Since that time, the company has continued to expand and refine its product offering. The Agri-Screen test kits allows for screening for the presence of aflatoxin in a laboratory or field environment. The company's Veratox® kit is used for the quantitative testing of aflatoxin, and is particularly popular in laboratories that are testing multiple samples.

In 1993, the Company introduced its Automated Residue Monitor to be used in conjunction with the aflatoxin test kit. This robotic instrument allows laboratories to increase testing efficiency and decrease labor demands.

The newest Neogen test kit joins a group of approximately 100 different diagnostic tests manufactured and marketed by the company for the detection of natural toxins, pesticide residues, plant diseases, and naturally-occurring pharmacologic compounds.

Neogen is a Lansing, Michigan-based, publicly-held company that develops and markets products to control residues or improve quality for the food, agriculture and environmental industries.

Neogen Corporation - Lansing, MI

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mini VIDAS® Screens for Pathogens in 45 Minutes

The mini VIDAS® (Vitek ImmunoDiagnostic Assay System) is a multiparametric immunoanalysis system from bioMérieux Vitek, Inc. It allows food processors to rapidly screen for pathogens, such as *Salmonella* and *Listeria*, from enriched samples in as little as 45 min. Following extraction of a food sample, a Staphylococcal enterotoxin assay can be performed in approximately 80 min.

Designed for laboratories with small testing volumes, the mini VIDAS utilizes a testing format known as Enzyme-Linked Fluorescent Immunoassay (ELFA), a version of the well-known ELISA technology.

One section functions as a compartment for the printer, computer, display screen and keypad. Two other sections are used to process product samples, and can be run independently or together for a total of 12 tests at a time. Results are printed automatically.

For laboratories with larger testing volumes, VIDAS is available to process up to 30 samples at the same time.

PLEASE DIRECT ALL INQUIRIES TO:
Mr. Bob Bokerman, bioMérieux Vitek, Inc., 595 Anglum Drive, Hazelwood, MO 63042-2395. Phone 314-731-8504, bioMérieux Vitek, Inc., 595 Anglum Drive, Hazelwood, MO 63042-2395. U.S.A., Phone: (314) 731-8500, (800) 638-4835 FAX: (314) 731-8700

bioMérieux Vitek, Inc. - Hazelwood, MO

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New Series Of Intuitive Image Analysis Systems Kontron KS Series Sold Exclusively By Carl Zeiss

The Microscope Division of Carl Zeiss, Inc. announces that it is the exclusive representative for the new, innovative Kontron KS series of intuitive image analysis systems for research, quality control and other technical applications.

The KS series provide an unusual degree of user guidance which makes it possible to solve even complex image analysis problems quickly and easily. Using the comfortable MS Windows® user interface, the KS operator becomes an image analysis "specialist" with minimal training. A new contour-based measurement algorithm ensures extremely fast measurements and the proven Kontron macro interpreter and other functions allow complex image analysis problems to be divided into simple steps that are common to most applications.

The KS series are designed on a modular concept for future upgrading. Currently there are three models in the series: The KS 100 is designed for simple image analysis problems that are readily solved by interactive measurement.

The KS 200 offers digitizing and archiving of true color images in video and studio quality.

The KS 300 is a powerful automatic image analysis solution for almost all applications.

For automatic probe evaluation, a drive module for motorized scanning stages is available. Another option is the Prog Res digital camera for high-resolution true color images (3000 x 2300 pixels) for archiving and image analysis applications.

The KS series will be supplemented with modules for special applications such as 3-D reconstruction, 3-D image analysis and knowledge-based classification.

The **KS** series are available both as complete systems (microscope, PC, camera and software) and as software only. The **KS** concept ensures easy upgrading of hardware and software using standard PC's and framegrabbers.

For complete details and pricing, contact your Zeiss representative or Carl Zeiss, Inc., Microscope Division, Thornwood, NY 10594. Call (800) 233-2343; FAX (914) 681-7446.

Please send inquiries to: Zeiss Inquiry Service, c/o BMS, 325 North MacQuesten Pkwy., Mount Vernon, NY 10550

Carl Zeiss - Thornwood, NY

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1994 PRODUCT CATALOG AVAILABLE FROM DIFCO LABORATORIES

Difco Laboratories Inc., one of America's oldest and most highly regarded manufacturers of microbiology-related products, is making its 1994 Product Catalog for Microbiology available to customers.

In addition to the over 2,300 Difco products, the 170-page, full color 1994 Product Catalog highlights Difco's newest products made available in 1994. The catalog also features extensive indexes to help customers locate any Difco product at a glance.

New products including the ESP® Blood Culture System, EZ Streak® Urine Culture Device, Bacto® Prepared Sterility Bottles, and a Custom Media Development Program are highlighted in the catalog.

The catalog also informs customers how to obtain technical product information, and Certificates of Analysis for Difco products. In addition, the catalog explains how to order Difco products and contact Difco sales representatives.

The catalog also contains a convenient reference guide that explains product use in microbiological testing applications across a range of industries.

Difco Laboratories has been a technological leader in the development and manufacture of microbiology-related products for nearly 100 years. For more information, or a copy of Difco's 1994 Product Catalog, write to Difco Laboratories, P.O. Box 331058, Detroit, MI 48232-7058; call Difco toll-free in North America at (800) 521-0851; or FAX (313) 462-8517.

Difco Laboratories - Detroit, MI

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World Dryer Expands — Assigns New Rep Force to Touchless Hand Sanitation Line

"Safe food handling has become a critical concern of the foodservice industry. Because foodborne illness is costing this industry billions of dollars every year, we have focused our engineering efforts on touchless hand sanitation equipment. Initial marketing of this line has been very successful," said Randy M. Cordova, President of World Dryer.

The newly released FDA Food Code reinforces Cordova's commitment to hand sanitation equipment. The signature product of World Dryer's touchless line, the Wash Station, complies with the FDA Food Code regulations. This stainless steel unit dispenses soap, water and warm air without requiring the user to touch the unit. The Wash Station replaces traditional employee handwashing equipment, and features a cycle counter to monitor the number of handwashings that take place during a given time period.

The success of their new touchless product line has prompted World Dryer to assign a separate sales force for hand sanitation products. These representatives are separate and distinct from World Dryer's core product reorganization which markets the company's line of warm-air dryers for public washrooms. The addition of these hand sanitation representatives has, in effect, doubled the size of World Dryer's rep. force.

For additional information, contact World Dryer Corporation 5700 McDermott Drive, Berkeley, IL 60163 708-449-6950.

World Dryer Corp. - Berkeley, IL

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SLT Labinstruments Introduces Two Exciting New Breakthroughs in Microplate Technology

This new technology for microplate analysis enables the user to read plates at any wavelength without changing filters, and also provides the ability to perform a full spectrum scan.

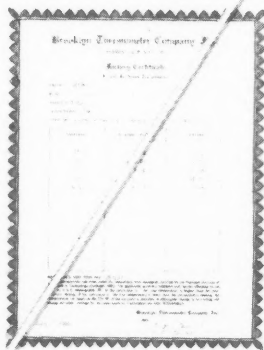
The NEW Rainbow reader spectrum filter with advanced optical and mechanical design. Flexible wavelength readings between 400 nm and 700 nm, selectable in 1nm increments, allow the user to quickly change to any other wavelength. In addition, the ability to perform a full-spectrum scan on a microplate is particularly

useful to researchers screening new or unknown compounds.

The rainbow can also operate with SLT's standard Spectra filters, allowing exceptional performance in the UV range. With a front loading plate carriage, built-in RS232 and remote software control, the Rainbow is designed to perform as a stand-alone instrument, or part of an integrated robotic system

SLT Labinstruments - Research Triangle Park, NC

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NIST TRACEABLE CERTIFICATION FOR ISO- 9000 COMPLIANCE

Brooklyn Thermometer Company, Inc. has announced the availability of a unique recertification program for liquid-in-glass thermometers. The program is suitable for companies that need to meet their ISO-9000 recalibration/recertification requirements and for those organizations that recognize the good practice of annual recertification of their Measurement Standards.

Measurement Standards originally certified by Brooklyn Thermometer or any other laboratory may be sent to Brooklyn Thermometer Company, Inc. for this economical service. To qualify, the Measurement Standard's original certificate must show an observed correction at 0°C (or 32°F) in addition to other temperature test points. Qualified Measurement Standards will be tested, a new certificate prepared and all returned within ten days of their receipt. A convenient recertification tag is applied to each thermometer to remind the user when the next recertification is due. The cost of this service is only \$75.00 per thermometer regardless of the number of test points shown on the original certificate.

For complete details by fax request Brooklyn's Recertification Data-Sheet from Brooklyn Thermometer Company, Inc. FAX (516) 694-6329, Phone (516) 694-7610; 90 Verdi Street, Farmingdale, NY 11735

Brooklyn Thermometer Co. - Farmingdale, NY

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Fristam Announces Achievement Award Winners

Fristam Pumps, Inc., Middleton, WI has announced the Fristam distributors which have achieved awards for outstanding performance for 1993. Top distributor honors for outstanding sales efforts go to:

Dairy Engineering - Colorado

Statco Engineering - California

W. A. Tompkins - Maine

Interstate Supply Company - Washington

Fristam Pumps extends its congratulations and special thanks to the above distributor partners for their outstanding achievements during 1993. Fristam Pumps would also like to thank all of our distributors for their continued efforts and success.

Fristam Pumps manufacturers in Middleton sanitary centrifugal and positive displacement pumps for the food, dairy and pharmaceutical and beverage industries.

Fristam Pumps, Inc. - Middleton, WI

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Shred Pax Equipment Shreds and Compacts Reject Packaging While Recovering the Liquid Contents

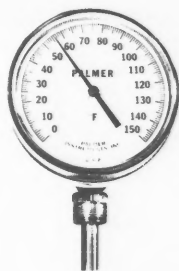
Shred Pax all-in-one shredder/compacter systems with liquid recovery are ideally suited to the dairy industry. Requiring as little as 7.5 to 15-horsepower motors, these compact electric-drive, slow-speed, high-torque shredders process 500 to 6,000 pounds per hour of filled plastic or cardboard containers - reducing waste volume by up to 80%. Shred Pax' larger 40-hp to 300-hp shredders process increasingly greater volumes.

With the electro-mechanical compacter attachment, the shredded packaging is continuously compacted and extruded through a discharge chute into an awaiting container for recycling or disposal. The liquid contents are drained through a pipe into a separate container. This is the only system on the market that delivers non-stop shredding and compaction action, along with liquid recovery.

For further information on Shred Pax shredders and compactors, contact Sandi Stevenson at Shred Pax Corporation, 136 W. Commercial Avenue, Wood Dale, IL 60191-1304; Phone (708) 595-8780; FAX (708) 595-9187.

Shred Pax Corporation - Wood Dale, IL

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Palmer Announces New Thermometers

Concerns over the use and disposal of a hazardous substance like mercury can now be eliminated by using Palmers' new Liquid Filled Dial Thermometers.

Since federal legislation has tightened environmental regulations as applied to Mercury Bearing Waste, the new requirements, added costs and associated safety precautions involving mercury disposal will make using traditional mercury-in-glass thermometers increasingly difficult.

Palmers' Liquid Filled Dial Thermometers contain an actuating medium which is mercury free, safe, non-toxic and non-flammable. Our Liquid Filled Dial Thermometers, with thermometers containing a liquid which has proven to be an excellent substitute for mercury. Its accuracy, response time and linearity are almost identical to mercury and much better than a bimetal or spirit filled thermometer.

Dual Sensing capabilities have now been added as an option. Thus an RTD or Thermocouple can be incorporated inside the dial providing independent mechanical and electronic output for "fail safe" monitoring with continuous accuracy of local and remote sensing from one installation.

Palmers' Dial Thermometers have various stems and connections which are interchangeable with existing industrial type thermowells. This enables users to convert to our liquid-filled thermometers without any mechanical changes in process plumbing, including Sanitary Fittings. Flexible stems are available for installations where wells are not being used or long stem lengths are needed, or if the fragility of Bimetal Thermometers is a problem. Super-short stem lengths are also available upon request.

New Stainless Steel Direct Drive Coils increase accuracy, withstand vibration and last longer than traditional sector and pinion thermometers. Palmers' Dial Thermometers are fully adjustable to the best reading angle with a case that can be rotated 350°. Light magnifying covers are used to enhance lighting in dark environments making reading the dial easier. An external calibration screw allows for easy accessibility and use.

All Palmer Dial Thermometers include a 3-year lifetime recalibration service.

Palmer Institutes, Inc. - Asheville, NC

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Unique Versatile Polyamide Hot Melt Developed for High Speed Castings, Potting and Encapsulation

Master Bond Polymer System MB544 is a new remarkably versatile polyamide hot melt composition offering an innovative approach for cost-effective high speed castings, potting and encapsulations. The Master Bond MB544 system does not require mixing of two components and subsequent curing as is the case with conventional epoxy, urethane or silicone materials. All that is required is heating the MB544 to a temperature in the 325°F-375°F range with stirring and then simply pouring the hot, low viscosity liquid into the desired cavity. The casting is ready for use upon cooling which depending on the quantity being poured can take anywhere from as little as 5 min. to a half-hour or so. Master Bond MB544 thus eliminates the labor and associated expenses incurred with conventional casting or potting operations. Also, encapsulated components can be recovered for repair, etc., if necessary by simply reheating.

The Master Bond MB544 polyamide castings are tough resilient solids with superior electrical insulation properties (>10¹² ohm-cm) and excellent water resistance (weight change <0.1% after 24-h immersion). Typical tensile strengths are in the order of 600 psi with elongations of more than 300%. This new product should be considered as a cost effective and technically desirable solution for castings, pottings and encapsulations which do not require exposures to high temperatures (e.g., above 150°F-175°F) during service.

Master Bond, Inc. - Hackensack, NJ

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Checkweigher Enhances Increase Versatility

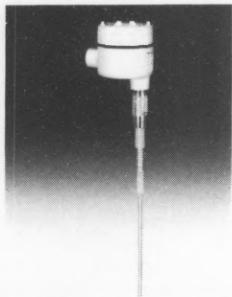
Rice Lake Weighing Systems announces recent enhancements to the popular stainless steel CW-40 Checkweigher, improving its versatility and efficiency. NTEP-certified, NEMA 4X rated and USDA approved, the CW-40 is ideally suited to meet the demands of industrial checkweighing environments.

Designed to assist in production-line automation, the improved CW-40 boasts bidirectional communication for two-way interfacing between the checkweigher and a host computer, while storage for 25 tare/tolerance combinations reduces operator set-up time.

Optional TTL relay outputs wired to Over, Under and Accept annunciator-light connections will automatically energize an output used to control an alarm, rejection ram or line shut-down when an out-of-tolerance weight is registered. The optional RS-485 communications package allows up to 32 individually-addressed CW-40s to be networked with a computer for command transferring and weight-data gathering. For more information, contact Rice Lake Weighing Systems at 715-234-9171.

Rice Lake Weighing Syst. - Rice Lake, WI
Please circle No. 259
on your reader service card.

New R. F. Impedance Level Control Combines Upscale Features with Low Cost and Unique 10-year Warranty



Pringo Instruments, Inc. announces its new economical full featured level controller. The L2000 represents a totally new concept in R. F. Impedance Level Control. Designed from the ground up to provide accurate, reliable service, the L2000 includes many features which are either extra cost options on other level controls or are simply not available. The L2000 and its L840 Series sensing probes assemble into one integral unit, thus eliminating the need for delicate, unwieldy connecting cable. Special Null-Kote™ circuitry cancels out the effect of conductive buildup on the sensing probe. The L2000 also has an explosion-proof/weather-proof enclosure, built-in 0-30 s time delay, heavy duty 10 amp DPDT relay, unique probe status indicator/power light, selectable high/low failsafe, standard sensing probes of type 316 stainless steel and Teflon, and Pringo's unique 10 year warranty.

For more information and technical specifications, contact Janet Turner, PRINCO Instruments, Inc., Telephone (215) 355-1500; FAX (215) 355-7766.

Carl Zeiss - Thornwood, NY

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Delco's IDC-2200 Pressure Washer Tackles Tough Cleaning Jobs Easily

Delco's IDC-2200 Cold Water Pressure Washer is an industrial duty, portable pressure washer designed and built for continuous duty applications. This rugged unit has the durability to tackle tough cleaning jobs and the portability to get there.

The heart of Delco's IDC-2200 unit, surrounded by an unbreakable hand carry polyethylene

case, is an industrial strength pump and motor with a beefed up bearing arrangement designed for long life and rugged dependability.

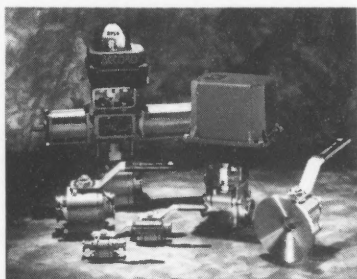
Delco's IDC-2200 is equipped with a 1 1/2 hp, high power factor, induction type, industrial motor featuring dual needle bearings to withstand extreme axial loads. The result is a motor with the highest torque characteristics of any induction type motor, greater efficiency, lower amp draw and a pressure washer that can be counted onto go the distance.

Additional features of Delco's IDC-2200 portable cold water unit include up to 1,000 psi, direct drive, 35' power cord with ground circuit interrupt for operator safety and accessories to hand any tough cleaning job.

Delco - St. Louis, MO

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Tri-Clover Introduces Expanded Ball Valve Line



An expanded line of 316L stainless steel ball valves for a variety of processing applications was introduced by Tri-Clover, Inc. The expanded line includes new sizes ranging from 1/2" to 4" tube OD. The valves are designed with manual, electric and pneumatic actuators. For added versatility, the stainless steel pneumatic actuators are available with a variety of switch control options.

Also added to the ball valve line are tank outlet valves available in 1, 1-1/2 and 2 in. sizes.

The Tri-Clover ball valve's full port reduces turbulence through the valve. An optional fully encapsulated seat is available to guard against product equipment.

Designed for processing applications requiring contaminant or corrosion-resistant service, the valves are easy to assemble and disconnect. Quick-couple mechanical joint Tri Camp® ends are self-aligning for fast, positive set-up and simple, steamlined take-down. Butt-Weld end connections also are available for dependable service on permanently installed pipelines.

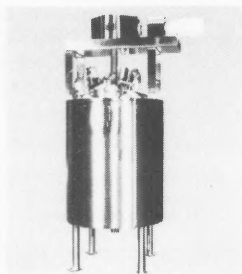
For easy maintenance, packing, stem, seat, body O-Rings and ball seats can be replaced in the field without special tools or potentially damaging benchwork.

Tri-Clover, Inc. is a leading manufacturer of sanitary stainless steel valves, pumps and fittings, as well as flow control, batch/weight and Clean-In-Place (CIP) systems. Founded in 1919, Tri-Clover, Inc. is an Alfa Laval Flow Company.

Tri-Clover, Inc. - Kenosha, WI

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Concentrating the "Cool" Way



For years concentrating of products has been accomplished with a vacuum vessel, pump and condenser. Normally, concentrating was done under 24-26" vacuum with 300-350°F steam in the vessels jacket and a product temperature of 135-150°F. But what about the temperature-sensitive products that require concentration and cannot withstand jacket temperatures of 300°F or more?

Lee has designed a system that uses warm water in the jacket in place of high temperature steam. Best of all, is the temperature at which the product is concentrated at a temperature of 45°F or less.

Lee Industries, Inc., working with Penn State University, has developed a vacuum concentrating system and process that is an alternative to either reverse osmosis or ultrafiltration. Concentration and the percent of solids can be varied to meet a customers particular needs. With the high level of concentration obtained by this system, some customers have found that IQF (individually quick frozen) pellets of their product are possible and the cost is quite attractive.

Lee industries can provide this system for use from a laboratory scale basis through full-size production units. Agitators can be provided from a propellar-type mixer to a single or double-motion, scraped-surface style agitator. Are you concerned about using this new technology? Don't be! Lee Industries offers a free test lab where full evaluation can be made and a process guarantee on scale-up is given.

For more information, contact Process Systems and Equipment, Division of Lee Industries, Inc., P.O. Box 687, Philipsburg, PA 16866.

Lee Productions, Inc. - Philipsburg, PA

Please circle No. 263
on your reader service card.

APV Brochure Features Pre-Mix Tanks for Mayonnaise

Described are stainless steel Crepac pre-Mix Tanks, designed for the production of mayonnaise and salad dressings. Features and benefits are discussed such as the horizontal high shear turbine type agitators for producing a uniform pre-emulsion; 316 s.s. product contact surfaces; 15° cone bottom with threaded bevel seat center outlet; and top construction available in full open, open with hinged covers or dome top design.

Brochure discusses application and specifications, options available, basic dimensions; shows flow diagram of typical continuous salad dressing

system with starch cooking capabilities; and also features other APV equipment important to the manufacture of mayonnaise and salad dressings.

Request brochure No. B-1-260. Contact APV - Tanks and Fabricated Products, 100 South CP Ave., Lake Mills, WI 53551; Phone (414) 648-1476.

APV Crepaco, Inc. - Lake Mills, WI

Please circle No. 264
on your reader service card.



Oxygen Absorber Delivers Longer, Fresher Shelf-Life for Fresh, Refrigerated Food Products

Fresh, refrigerated dairy filled pasta, fresh doughs, sliced meats and other prepared, refrigerated food products packaged with AGELESS® oxygen absorbers stay fresher, tastier and more appealing for longer periods by eliminating the spoilage and staling caused by ambient oxygen.

The convenient, economical AGELESS packet creates a unique, oxygen-free packaging environment which preserves the natural, wholesome goodness without altering product formation.

By creating a longer, more stable shelf-life, the AGELESS oxygen absorber extends the product freshness to permit both manufacturer and distributor to take advantage of more convenient production scheduling, flexibility in inventory management visible through longer shelf rotation patterns, more affordable transportation options, broader product line offerings, reduction of expired product losses through delayed distribution, expansion of geographic territories and more creative use of packaging materials and designs.

A variety of AGELESS oxygen absorbing formulations is available to meet the characteristics of specific food products. The AGELESS oxygen absorber packet is inserted during the packaging operation. A choice of manual or automatic insertion is available.

For more information, contact Mr. Masato; Mitsubishi Gas Chemical America, Inc., 9th Floor, 520 Madison Avenue, New York, NY 10022, (212) 752-4620.

**Mitsubishi Gas Chemical America, Inc. -
New York, NY**

Please circle No. 265
on your reader service card.



New Low-Cost, Feature Packed Temperature Logger Released Ideal for Storing, Transporting and Processing Dairy Products

Onset Instruments introduces the StowAway™, its latest entry in line of reusable, miniature temperature loggers, including the already popular Hobo™. From the farm to the plant to the store, the StowAway miniature microcomputer is an essential tool in dairy quality control. All for a fraction of the price of other loggers. Starting at a low \$121, the StowAway helps keep an eye on expenses as well as the temperature.

Still one ounce in weight and the size of a matchbox, the StowAway improves on an original, adding many new features to the Hobo design. Convenient field use with programmable delayed launch and external push-button start; alarms indicating out of range conditions; additional memory; increased logging intervals (1, 2, 5, 10, 15, 30 and 60 min); minimum maximum and averaged measurements; plotting software for easy analysis; and the logger's durability and reusability are just some of the features that make the StowAway the most powerful low-power complete logger available.

To operate, simply destroy the battery-powered Stow Away to sample and record up to 1,800 temperature measurements for user-selected durations of as brief as 15 min or as long as 360 days at intervals ranging from half-second to 4 h.

Using Onset's LogBook™ "point and click" software, temperature recordings are easily downloaded, plotted and analyzed using a Macintosh or a PC running Windows or DOS. LogBook also allows easy export into Lotus 1-2-3, Excel and other spreadsheet software packages. Full starter kits sell for \$59 and work with any type of Stow Away.

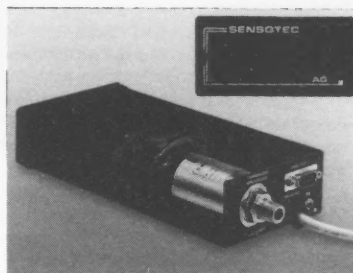
Once the data is downloaded, just re-launch the Stow Away for another sampling period. The Stow Away can be reused as often as is necessary as the logger's battery (2-year life, typical) is replaceable.

Available in internal or external sensor models with standard temperature ranges of -5°C to 37°C to 46°C; -39°C to 75°C; and -39°C to 122°C. Custom made temperature ranges are also available. The logger is accurate to ±0.2°C.

Onset makes as many different types of data loggers as there are applications for them. In addition to temperature, Onset also manufactures loggers to record humidity, pressure, light intensity and voltage.

For more information on the Stow Away and Onset's many other loggers, contact Rachel Furman at Onset Instruments, (508) 563-9000.
Onset Instruments - Pocasset, MA

Please circle No. 266
on your reader service card.



Digital Indicator Now Offers 0.035% Accuracy

Sensotec proudly offers our Accu-Gage line of precision digital pressure instruments, now with accuracy up to 0.035% F. S. Designed for industrial and laboratory applications, the Accu-Gage family requires no wiring or set-up because the integral pressure transducer and its readout system are housed and calibrated as a unit. The result is a portable, highly accurate replacement for precision dial gages, mercury columns and quartz tube barometers.

Housed in a rugged 3/8 DIN-standard black aluminum enclosure, the Accu-Gage provides a durable and low cost alternative to dial gages. Panel amount adaptors are provided with each instrument.

The Accu-Gage offers gage or absolute pressure ranges from 0-15 psi to 0-30,000 psi, 1-15 psiv and 16-32" HgA with accuracies from 0.25% to 0.035% F. S. Accu-Gage has an operating temperature range of 60°F to 130°F and full scale output of +/- 5V. Optional features include tare, auto-zero, dual limits, peak/hold, RS232 interface and hi/low quad limits. Available now from \$700.

Sensotec, Inc. - Columbus, OH

Please circle No. 267
on your reader service card.

MSA Announces New Infrared Detector for Ammonia

Low-level ammonia leaks may now be detected quickly by the Cillgard® IR Refrigerant Leak Detection System for the MSA Instrument Division, Pittsburg, PA. The Cillgard IR System was originally designed for rapid detection of hydrochlorofluorocarbons (HCFCs), chlorofluorocarbons (CFCs) or hydrofluorocarbons (HFCs) from industrial refrigeration units.

The Cillgard IR System used infrared (IR) photo-acoustic technology for detecting low-level

leaks of ammonia, as well as HCFC-123 and HFC-134a, the newer ozone-friendly refrigerant gases that replace CFC-11 and CFC-12, which can also be monitored continuously by the instrument.

The system provides audible and visible warnings of ammonia leaks or spills. Applications include any facility where ammonia may be used, including food and beverage processing facilities, refrigerated storage, display areas, manufacturing plants, research facilities, meat packing plants, loading docks and cryogenic plants.

The analyzer can monitor over a range of 0-1,000 parts per million (ppm). Sensitivity as low as 1 ppm helps to protect workers from low-level leaks, limit spoilage of inventories and reduce costs incurred by loss of ammonia.

Photo-acoustic infrared technology provides exceptional long-term stability and allows the instrument to operate for extended periods with minimal calibration adjustments.

Easy to install and maintain, the Chillgard IR System has a large four-digit liquid crystal display (LCD) and only six buttons for simple operation. Light-emitting diodes (LEDs) activate at each of three levels of alarm. When used with the optional Multipoint Sequencer Remote Sampling System, up to six points can be monitored simultaneously at locations up to 250 feet away.

For more complete and detailed information call 1-800-MSA-INST, or write MS, P.O. Box 427, Pittsburgh, PA 15230.

MSA Instrument Division - Pittsburgh, PA

Please circle No. 268
on your reader service card.

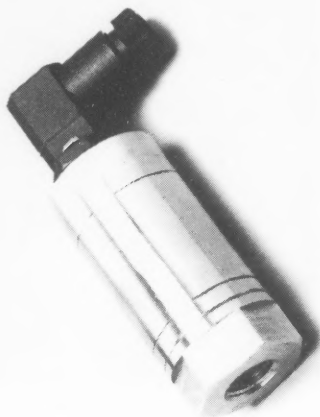
Dynalon Plasticware Package from Markson Science

Markson is proud to announce its partnership with Dynalon products in offering an exclusive plasticware package. This high quality plasticware package offers a general selection of beakers, funnels, cylinders, wash bottles, disposable HDPE containers and a heavy duty utility pan. Any customer ordering \$299 or more from Markson Science through September 15th can take advantage of this special offer. Simply place your \$299 (or more) order to receive your Dynalon gift certificate FREE of charge. The certificate is valid when you place your next regular order.

For a limited time, when you place your order for Dynalon plastic, Markson and Dynalon will also enter your name in a unique drawing for an all expense paid trip to the 1995 Pittsburgh Conference in New Orleans. This free trip includes your round-trip Domestic U.S. Airfare to New Orleans, five nights deluxe lodging in the French Quarter, gourmet dinner at K Pauls Restaurant, a \$500 gift certificate for \$500 in Dynalon Labware, and of course, admission to the Pittsburgh Conference exhibits and technical program. All orders for Dynalon plasticware placed between June 1 and December 15 qualify as entry into the unique drawing.

MSA Instrument Division - Pittsburgh, PA

Please circle No. 269
on your reader service card.



New Pressure Transducer Features 100 MV Output

SENSOTEC is proud to introduce the new P-100 MV series pressure transducer, which features 100 MV output and 0.1% F.S. accuracy.

The P-100 MV is available in gage pressure ranges from 1 psi to 1,000 psi and absolute ranges from 15 to 1,000 psi, with extremely high overpressure capacity. This transducer has high signal-to-noise ratio over a broad operating temperature of -20° to 190°F. Hastelloy and 316 L stainless steel wetted parts provide true all media compatibility and the compact size makes this unit ideal for numerous industrial and process applications.

The "platform" manufacturing process allows SENSOTEC to offer a variety of pressure port and electrical termination combinations as standard variables, yet provide excellent delivery. Prices start at \$370.00.

For more information, please contact SENSOTOTEC, INC., 1200 Chesapeake Avenue, Columbus, OH 43212; phone (800) 848-6564; FAX (614) 486-0506.

SENSOTEC, INC. - Columbus, OH

Please circle No. 270
on your reader service card.

EcoScience Acquires AMC, U.S. Produce Coatings Concern Launches New Unit to Market Products and Service Produce Industry

EcoScience Corporation (NASDAQ: ECSC) today announced the acquisition of AMC, an Orlando, Florida-based company providing postharvest coating products and services to the fresh fruit and vegetable markets throughout the U.S., Caribbean, Central and South America. The Company also announced the creation of a Produce

Systems Division that combines that AMC product lines and operating unit with its existing coatings business.

Natural postharvest coatings are increasingly used to extend the shelf-life of fruits and vegetables by creating a safe, protective barrier around the produce that retards the onset of decay. AMC markets the PacRite® and Sealrite® line of coatings and is an established provider of service, support and equipment to the produce packing industry. Earlier this year, EcoScience launched its innovative Nature Seal® coatings line of products and filed an EPA registration in January for the first product in its Bio-Save™ line of biological disease control agents.

"In today's produce market, both consumers and suppliers are increasingly concerned about the quality and freshness of their food supply," said Richard Andrews, the newly appointed president of the Produce Systems Division. "The addition of high quality, water-based products to our expanding line of natural produce coatings, as well as AMC's proven customer service capability, will allow us to directly address these consumer concerns."

EcoScience financed the acquisition through a combination of cash and common stock. AMC annual sales revenues totaled less than \$3 million last year. Other details were not disclosed. The company estimates the potential market for its postharvest coatings and biofungicides will exceed \$200 million annually on a worldwide basis.

"The formation of our Produce Systems Division provides EcoScience with a strong operating base from which to launch our innovative products for the postharvest treatment of fruits and vegetables," stated James A. Wylie, Jr., president and CEO of EcoScience. "This acquisition represents another critical step in building our direct sales and service organizations in high value, specialty markets."

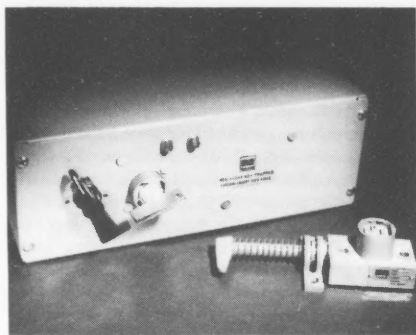
Founded in 1928, AMC is a subsidiary of North Carolina-based Aeroglide Corporation. "This transaction combines the strong product lines and well-established distribution channels of AMC with the innovative technology and products of EcoScience," said J. Frederick Kelly, Jr., president for Aeroglide. "With use of these new and existing products, the fresh produce industry will benefit through overall improved quality and prolonged shelf-life of their products."

The new Produce Systems Division will operate out of facilities in Orlando, FL. EcoScience introduced Nature Seal® in August 1993 and has an extended line of pre- and post-harvest disease inhibitors in development. The company filed an EPA registration for its Bio-Save-10™ biofungicides for disease control in January, 1994 and plans to file an additional registration with the EPA in mid-1994 for its second biofungicide, Bio-Save-11™.

EcoScience, a leading concern in the emerging environmental technology arena, is engaged in the discovery, development and commercialization of natural pest control products for the control of insects and diseases of plants, fruits and vegetables, and naturally-derived coatings to preserve food quality and extend the shelf-life of fruits and vegetables.

EcoScience Corporation - Florida

Please circle No. 270
on your reader service card.



Safety System for Industrial Mixers Protects Personnel

A safety system designed to ensure the correct operation of industrial mixers is now available from Castell Safety, Inc. Based on trapped key interlocking, the safety system protects operators and maintenance workers from injury caused by rotating mixer blades, charging and explosion.

Typically used in the food, paper, pharmaceutical, construction, plastics and rubber industries, industrial mixers can commonly scale two floors of a factory and represent several potential safety hazards. Primarily are the mixing blades which can continue to rotate for some time after the machine has been switched off.

Further hazards are presented by the mixer's hydraulically operated rams, pistons and arms. If these components are not purged of compressed air before personnel enter, they can still operate hydraulically. In addition, air accumulating in the vessel could result in charging and an explosion.

Castell's safety system uses trapped key interlocks to impose a set, safe sequence which must be followed before access can be gained to the mixer. The initial key is held trapped in the electrical isolator during normal operation. Turning and removing the key automatically switches the power off.

The isolator key is then inserted into a time delay unit which holds a second key trapped. It is impossible to remove the second key until the preset delay period has elapsed. The delay corresponds to the rundown time of the mixer blades. Once the second key is freed, it must be transferred to an exchange box.

Inserting and trapping the second key in the exchange box automatically operated the air valves of the mixer's hydraulic system. Once the mixer is purged of air and the air supply is isolated, the exchange box releases a final set of keys. These keys operate the interlocks governing the mixer's access hatches and allow personnel to gain entry.

While workers are inside the vessel, they carry a personnel key with them. Until the personnel keys are replaced, no one can reconnect the hydraulic and electrical power. This positively prevents anyone from inadvertently restarting the mixer while personnel are inside.

By using trapped key interlocks to impose a pre-determined, safe operating sequence, Castell's access control system ensures that the personnel risks associated with industrial mixers are eliminated.

For more information, contact Castell Safety, Inc., P.O. Box 18485, Erlanger, KY 41018; Telephone (606) 341-3075; FAX (606) 341-2302.

Castell Safety, Inc. - Erlanger, KY

Please circle No. 271
on your reader service card.



Kärcher First to Meet UL 1776 Standard for High-Pressure Cleaning Machines

Alfred Kärcher, Inc. is the first pressure washer manufacturer to meet UL (Underwriters Laboratory) 1776 standards for the safety and design of high pressure cleaning machines. UL 1776 officially went into effect April 11, 1994, and was created solely as a means to govern and improve the American pressure washer industry. These unprecedented requirements stipulate that a variety of standards be met to the letter for the safety, design and function of all pressure washers.

These requirements include but are not limited to stipulations concerning product design and manufacturing materials, electrical circuit specifications, proper wiring and insulation, burner efficiency and safety on hot water machines and external components such as wand lengths, power cords, handles and warning labels. All machines must be submitted to Underwriters Laboratories for extensive evaluation where a battery of detailed tests are conducted by UL engineers. Only after careful testing and analysis (whereby each pressure washer must either meet or exceed UL standards) will these machines be pronounced in compliance with UL requirements.

Kärcher manufacturers a complete line of quality, cold water high-pressure washers, cold-hot-steam high-pressure washers, waste water recycling systems, vacuum cleaners, carpet cleaners, fixed installation truck and bus washing systems, and a complete line of pressure washers for home use.

Copies of the UL 1776 standards are available. For more information contact: Alfred Kärcher, Inc., P.O. Box 1600 Cottontail Lane, Somerset, NJ 08875; Telephone (908) 356-1199, FAX (908) 356-0435.

Alfred Kärcher, Inc. - Fairfield, NJ

Please circle No. 273
on your reader service card.

Crepaco Tanks to Fit Your Process

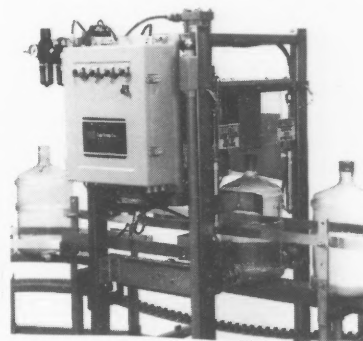
New 16-page brochure features the wide variety of Crepaco tanks, including process tanks, high speed mixers, blenders, storage tanks, horizontal food blenders, dual ribbon blenders, as well as specialty tanks, hoppers and fabricated assemblies; a total source for the process industries. Described are design, construction, features, benefits and typical applications for each of the Crepaco tank lines shown.

Also featured is the company's fully equipped pilot plant where confidential product testing and evaluation services are offered.

Request Brochure No. B-1-1. Contact APV - Tanks and Fabricated Products, 100 South CP Ave., Lake Mills, WI 53551; Telephone (414) 648-8311, FAX (414) 648-1476.

APV - Lake Mills, WI

Please circle No. 272
on your reader service card.



Cap Snap Co. Introduces Automatic De-Capper System

Cap Snap Co. Equipment Division has introduced its new De-Capper designed to automatically remove and discard Cap Snap Non-Spill® caps from plastic 5-gallon bottles at speeds up to 1,400 bottles per hour.

The new Cap Snap De-Capper increases bottling production rates and eliminates labor by automatically removing the Non-Spill® caps, according to Chip Barcus, Sales and Marketing Manager. The standard De-Capper configuration is designed for 5-gallon bottles. Other bottle sizes can be accommodated optionally.

The De-Capper can be installed over most existing conveyor lines. Special features include a sensor that allows bottles without caps to pass through. A built-in alarm will sound if the De-Capper fails to remove a cap during operation. The alarm signal can be used to activate an optional bottle ejector or stop the conveyor. Another optional sensor pauses operation if bottles back up on the discharge conveyor. Cap Snap's Non-Spill® tamper-evident, plastic closure was introduced by Cap Snap Co. in 1991. Since then, it has gained popularity with both consumers and bottlers.

When used in bottled water coolers, the Non-

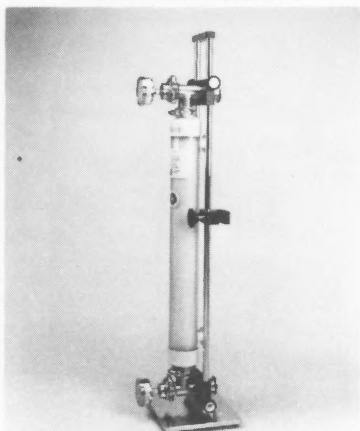
Spill® cap prevents water spillage commonly encountered when bottles are inverted and placed on coolers. A proprietary, patented device in the cap mates to a probe mounted in the cooler (available for most water cooler designs), allowing the bottle to be placed on the cooler, and water to dispense, without actually removing the cap.

As bottles fitted with the Non-Spill® cap come back to the plant, bottlers can now employ the Cap Snap De-Capper system. As long as the Non-Spill® cap remains intact, no foreign substances or objects can be placed in the bottle. Therefore, empty bottles returned can bypass the time-consuming, labor-intensive inspection process normally required for bottles with conventional caps which are returned open.

The new Cap Snap Co. De-Capper is priced under \$14,000, depending on options selected.

Cap Snap Co. - San Jose, CA

Please circle No. 274
on your reader service card.



Benchtop Pilot Hollow Fiber Ultra Filtration/Microfiltration System Processes 5 to 100+ Liter Volumes

A new hollow fiber ultrafiltration/microfiltration system from A/G Technology is designed for laboratory through pilot scale applications. As its name implies, the versatile FlexStand™ "Plus" Benchtop Pilot System is capable of concentration and/or diafiltration of process volumes ranging from 5 to 100 L or more.

Unlike the original FlexStand™ Benchtop System, FlexStand "Plus" system is equipped with 1.5-in. tri-clamp adaptors for feed inlet and retentate outlet connection. These adaptors allow for higher recirculation flow rates and provide more options for pump and piping connections to the system. This allows the FlexStand "Plus" system to accommodate larger A/G Technology hollow fiber cartridges containing up to 37 ft² of membrane area, thereby extending the process volume range.

The FlexStand "Plus" system has a modular design which allows users to purchase only those options which are required. The basic FlexStand "Plus" system consists of a heavy-duty stainless steel base, stand and supporters, backpressure pinch valve and inlet pressure gauge. System options include an outlet pressure gauge, butterfly valve

and permeate control system. Its sanitary design includes stainless steel fittings as well as USP XXII Class 6 polymers and elastomers.

With just an 8 in. x 10 in. footprint, the FlexStand "Plus" system takes up minimal benchtop space and can be easily transported from the lab to the cold room. Ease of cartridge change-out allows performance comparison of the wide range of A/G Technology membrane cartridge housing sizes, pore sizes and lumen diameters. Data from lab evaluations can be used to project scale-up processing requirements.

Suggested applications include protein concentration, bacteria and pyrogen removal, blood plasma purification, cell harvesting, cell washing, lysate clarification, virus concentration, colloidal suspension concentration and continuous buffer exchange.

The FlexStand "Plus" system utilizes A/G Technology cross-flow hollow fiber and tubule cartridges, whose consistent performance is based on a truly imperfection-free membrane morphology. This unique structure renders A/G Technology ultrafiltration membranes free of macrovoids and the "pinhole" defects characteristic of conventional flat-sheet and other hollow fibers. A/G Technology microfiltration membranes are true, bubble point testable membranes.

Complete performance and pricing information is available from A/G Technology Corporation, 101 Hampton Avenue, Needham, MA 02194; Telephone (800) 248-2535, FAX (617) 449-5786.

A/G Technology Corporation Needham, MA

Please circle No. 275
on your reader service card.



MPM-4100 Environmental Measurement System

Solomat-Neotronics introduces a major new indoor environment measurement instrument... the MPM-4100. The MPM-4100 can measure, display and log data for a broad range of parameters that are important for laboratory and industrial applications. This rugged, portable and easily operated instrument accepts a wide choice of probes for measuring relative humidity, air velocity, differential pressure, carbon dioxide, carbon monoxide, volumetric airflow, temperature, dew point, gage pressure, RPM and more. The monitor provides immediate readout of the measurements, or it

can be left unattended to collect data over time. you can also average readings, or display minimum or maximum values. Your own sensors can be added to give an even broader scope of use.

The MPM-4100 is housed in a heavy duty, shockproof case which is splash and dustproof. It fits comfortably in your hand and has an integral carrying handle. Wall mounting adaptors are available for permanent and semi-permanent applications. Up to 50,000 readings may be stored on timed intervals or the push of a button for a "snapshot" of instantaneous readings. The flexible datalogger may also be set up to log-on-alarm for tracking excursions beyond present limits and can log averaged data over time. Using Solomat-Neotronics' compact multiplexing accessories, the MPM-4100 can accept up to 32 channels of measurement data. Analog and alarm outputs are available for each channel. Solomat's advanced CS6 software streamlines instrument programming while also offering an in-depth report generation capability operating in a "Windows" style environment. The MPM-4100 is powered by either NiCd rechargeable or alkaline batteries with extraordinary battery life (up to 200 h continuous display of 3 months data logging with 3x C alkaline batteries).

A wide range of applications for the MPM-4100 include indoor air quality, ventilation and thermal comfort assessment, production area monitoring, HVAC system balancing and much more.

For more information, contact Rick Stonier, Solomat-Neotronics, The Waterside Building, 26 Pearl Street, Norwalk, CT 06850; 1-800-SOLOMAT (1-800-765-6628) or (203) 849-3111.

Solomat-Neotronics - Norwalk, CT

Please circle No. 276
on your reader service card.

Vitran Releases New Product Bulletin: Model 104 Low Output Gage and Absolute Pressure Transducer

Vitran Corporation of Grand Island, NY has recently released Product Bulletin No. 80 on Model 104 low output gage and absolute pressure transducer. This unit is a highly accurate millivolt pressure transducer designed for high performance industrial test applications.

The features and benefits are as follows:

Features:

- High accuracy
- 2.5 mV/V output standard
- 8 times overpressure protection
- Cleanable pressure cavity
- Numerous pressure ranges
- All stainless steel construction

Typical Applications:

- Test stands
 - engine
 - brake
 - aerospace/ground support
- Laboratory
- Research

The bulletin explains each feature, and emphasizes the customer benefits:

A standardized output signal (2.5 mV/V) allows for easy transducer changeovers without needing system calibration changes. Overpressure protection allows the 104 to withstand pressure

spikes common in extreme environments. Bonded foil strain gage technology delivers high accuracy and stability. Modular stainless steel construction makes the cavity easy to clean. An internal calibration circuit allows you to calibrate a transducer output signal without an external pressure source.

For a copy of Viatran's Product Bulletin No. 80 on the Model 104, call Viatran today at (800) 688-0030 or FAX (716) 773-2488.

Viatran Corporation - Grand Island, NY

Please circel No. 277
on your reader service card.

New High Surface Area Liquid Strainers from R-P Products Lower Costs by Extending Run Times

A new series of high surface area in-line liquid strainers from R-P Products provides longer runs between cleanings, thereby minimizing process interruptions and associated labor costs. Strainer baskets, with retentions from 700 mesh through 1/2 in., have been designed to increase surface area from 3 to as much as 21 times conventional strainer baskets, while holding pressure differential at a minimum.

Cleaning is simplified by the application of spun metal technology to fabricate the strainer housings. With only two major parts, the spun metal housings have fewer joints, nooks and crevices in which to accumulate process liquids and contaminants. This also contributes to fewer and shorter process interruptions as well as to minimum cleaning labor.

R-P Products new in-line strainers are well-suited for removing sand, rust and pipe scale from plant or process water; for filtering metal shavings and wear particles from recycled cutting, quenching, flushing and hydraulic oils and coolants, and for straining contaminants that can plug nozzles in spray systems. These strainers also remove plastic or rubber particles from mold heating or cooling waters; keep undispersed filter solids, scale and skin out of inks, paints and other coatings; and prevent large contaminants in lake and river water sources from being drawn into process systems.

For more information on the new high surface area in-line liquid strainers, contact Conning-Petter, P.O. Box 188, 9151 Shaver Road, Portage, MI 49081-0188; (616) 957-2000.

R-P Products - Portage, MI

Please circel No. 278
on your reader service card.

DFISA Releases International Industry Publications Guide

The Dairy and Food Industries Supply Association (DFISA) has released its *1994 Industry Publications Guide*. The guide is a compilation of more than 440 national and international books, magazines and newsletters which cater to the food, dairy, pharmaceutical and related sanitary processing industries.

The guide includes more than 150 domestic and 290 international titles that are categorized by topic and geography. Each listing contains the

publication, editor's name, address, phone and FAX numbers, and circulation figures.

The *1994 Industry Publications Guide* is available to DFISA members, as supplies last, at the minimal cost of \$50, and \$100 for non-members.

DFISA, the sponsor of the Food and Dairy EXPO, is an international trade association of more than 800 equipment, supply, service and ingredients companies serving the dairy, food, beverage, pharmaceutical and related processing industries. For more information on DFISA or the Food and Dairy EXPO contact: DFISA, 6245 Executive Boulevard, Rockville, MD 20852; (301) 984-1444.

DFISA - Rockville, MD

Please circel No. 279
on your reader service card.

Biocode, Inc. Completes \$4 Million Private Equity Financing

Biocode, Inc. has announced that it has completed a \$4 million, private equity financing to accelerate the development and commercialization of its antibody products and technologies for product identification and environmental diagnostics. The financing was provided by Apex Partners, a venture capital firm located in London, U.K.

The company's Biocode™ Marketing Systems products address growing market demand for strengthened product identification as well as for increased manufacturing and distribution control. The patented marking systems, which capitalize on the exquisite sensitivity of antibodies, provide a means to covertly and definitively identify virtually any bulk material or finished product, thereby preventing revenue loss due to counterfeiting, protecting manufacturers from liability claims, or allowing better distribution and manufacturing control.

The Company's Environmental Diagnostic Solutions (EDS) division provides immunoassay-based tests for the rapid detection of agricultural contaminants and environmental pollutants. Precise detection and monitoring of these materials is required by a large and increasing number of environmental laws and regulations worldwide.

"The financing will enable the company to expand our antibody detection technology and our commercial product lines," commented David J. Phillips, President and CEO of Biocode. "The funds will also allow us to increase our worldwide marketing and development efforts for Biocode™ Marketing Systems and EDS products."

The company's Biocode™ Marking Systems are currently in commercial use with a multinational polymer manufacturer. Development programs are also underway with strategic partners in the fuels, specialty chemicals and printing industries. In addition, Biocode markets three EDS kits in the European Community and Latin America, and plans to launch six additional kits over the next 2 years.

Biocode, Inc. is a biotechnology company that is developing systems to assure product quality based on authenticity and safety through its patented and proprietary monoclonal antibody technology. Biocode, Inc. is based in Cambridge, MA

and operates a marketing, research and production subsidiary in York, U.K.

Biocode, Inc. - Cambridge, MA

Please circel No. 280
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J&W Scientific Newsletter Separation Times Provides Analytical Methods for LUST and Chromatographic Efficiency

J&W Scientific's *Separation Times* newsletter, Volume 8, Number 1, provides valuable technical articles and trouble-shooting tips for high resolution chromatography, along with information on the latest chromatography products, literature and services.

The cover story, "Considerations for Leaking Underground Storage Tanks (LUST) Analytical Methods," details analytical methods specifically designed to meet state regulations and methodologies for monitoring contaminated LUST sites for gasoline range organics and diesel range organics associated with underground water contamination. J&W's DB™-VRX (with its unique selectivity and high diffusivity) and DB™-5ms (providing high thermal stability with low bleed) are the columns for this analysis. Valuable chromatograms and charts are presented in this article.

Also included is an article that discusses, "Chromatographic Efficiency: Pedagogy & Practice," the interrelationship between efficiencies and column dimension, balancing theoretical principles with practical necessities.

In addition, the issue includes a schedule for J&W's new 2-day GC course, which will be presented in 15 cities across the United States. The course features practical lectures enhanced with state-of-the-art computer animation, as well as hands-on training to solve and prevent problems while optimizing GC systems. The cost of the course is only \$379 and includes a reference manual, free lunch and refreshments and a certificate of completion.

For a free copy of J&W's *Separation Times*, Volume 8, No. 1, contact J&W Scientific at 91 Blue Ravine Road, Folsom, CA 95630; (916) 985-7888.

J&W Scientific - Folsom, CA

Please circel No. 281
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Separation of Anilines Without Tailing or Loss of Response

J&W Scientific's highly efficient DB™ 5ms and dual column (DB™-17/1701) capillary columns separate anilines with no tailing or loss of response.

Substituted anilines are considered by many to be the most important of all the industrially used amines. The GC analysis on anilines requires a column that is inert because anilines are basic and chromatographically active.

When using GC/MS, especially for trace analysis of anilines, the column of choice is DB™.

17/1701 dual column is an excellent choice, providing the added benefit of simultaneous confirmation and quantification.

DB™-5ms guarantees 10% more theoretical plates, ensuring the best resolution available; narrow retention indices, ensuring consistent relative retention of peaks and easy peak identification from one column to the next; and a reduction in stationary-phase bleed, reducing conditioning time and providing the best sensitivity possible for trace analysis.

For more information on J&W Scientific columns for anilines analysis, contact J&W Scientific at 91 Blue Ravid Road, Folsom, CA 95630, (916) 985-7888.

J&W Scientific - Folsom, CA

Please circle No. 282
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New Technology Designed by Kenyon Enterprises, Inc. Provides Way to Propagate Yeast from Sugar Feedstocks

Throughout the dairy, potato and confectioneries industries, there is a growing problem of maintaining effective, economical means of discarding waste sugar and starch streams. Within the dairy industry, just in Wisconsin, between 3 and 4 billion pounds of whey permeate is disposed of each year by land spreading.

Kenyon Enterprises, Inc. is an engineering and consulting firm with extensive experience in fermentation and systems design for fermentation. Kenyon has spent over 9 years converting waste food byproducts into usable resources and pioneering innovative systems for the production of yeast and ethanol from waste sugar and dairy byproducts.

New technology, designed by Kenyon Enterprises, Inc., an immobilized cell yeast reactor (ICYR) appears to provide an efficient, highly profitable means to propagate yeast from any liquid sugar feedstocks including whey permeate.

This design employs a continuous gas/liquid interchange in an environment of concentrated immobilized yeast cells.

Because of the nature of the design, there are several advantages of this system as compared with traditional yeast propagation systems: Capital equipment costs are substantially less, labor costs are minimal, operational and energy requirements are reduced and the propagation space requirements are reduced by over 80%. This reduction in space requirements and the ICYR's modular design will more readily allow yeast propagation systems to be located on site of sugar waste streams.

It also should be noted that this technology may be applicable for the production of several other products such as: ethanol, crude lactic acid, acetic acid, citric acid, penicillin or other pharmaceuticals.

For more information, contact Kenyon Enterprises, P.O. Box 66, Plainfield, WI 54966; (715) 335-6820.

Kenyon Enterprises, Inc. - Plainfield, WI

Please circle No. 283
on your reader service card.

Neogen Test Approved by AOAC-RI

Neogen Corporation has announced that its newest test for the detection of aflatoxin has been approved by the AOAC Research Institute. As a part of the testing protocol, AOAC-RI found the test to also comply with Federal Grain Inspection Service standards. AOAC-RI approval is also recognized by the American Association of Cereal Chemists.

The new test, Vertox®-AST detects the presence of aflatoxin, one of the most potent, naturally-occurring carcinogens. Veratox-AST is one of four different testing formats offered by Neogen for the detection of aflatoxin. This test allows for rapid and inexpensive quantitative testing of single samples.

Neogen introduced its first immunoassay test for the detection of aflatoxin in 1985. Since that time, the company has continued to expand and refine its product offering. The Agri-Screen® test kit allows for screening for the presence of aflatoxin in a laboratory or field environment. The company's Veratox kit is used for the quantitative testing of aflatoxin, and is particularly popular in laboratories that are testing multiple samples.

"Our earlier aflatoxin tests allowed for inexpensive and accurate screening as well as for higher volume, quantitative testing," said Don Uglow, a Neogen vice president. "The new Veratox-AST completes our product line with a test that is cost effective for a customer who desires quantitative results, but only runs one sample at a time," he said.

Aflatoxin is produced as a by-product of the mold *Aspergillus flavus* and has been linked to various types of cancer in humans. When aflatoxin-contaminated grains are consumed by livestock, several health and performance problems may occur. Because aflatoxin does not result in distinct disease symptoms, animal producers may not be aware of its presence. The U.S. Food and Drug Administration has established regulations concerning the presence of this toxin for both human and animal exposure.

The AOAC Research Institute is an international scientific organization whose activities are related to the development, improvement and understanding of analytical practices affecting public health and welfare. The well respected organization provides test kit manufacturers with a third party validation of product performance claims. AOAC-RI has official memorandums with FDA, USDA and other organizations to test the performance of test kits for specific regulatory agencies.

This newest Neogen test kit joins a group of approximately 100 different diagnostic tests manufactured and marketed by the company for the detection of natural toxins, pesticide residues, plant diseases and naturally-occurring pharmacologic compounds. Neogen is a Lansing, Michigan-based, publicly-held company that develops and markets products to control residues or improve quality for the food, agriculture and environmental industries.

Neogen Corporation - Lansing, MI

Please circle No. 284
on your reader service card.

New Milk Analyzer Offers Low Cost and High Performance

Foss Food Technology is proud to present the latest technology for compositional analysis in milk and cream. The MILOSCAN 50 is low cost, economical, user friendly and self-cleaning.

The unit is configurable for fat and protein or fat and solids, and measures up to 50 samples per hour.

Based on AOAC methodology, the MSC50 requires no sample preheating or zero adjustment. It is ideal for general purpose analysis in the smaller plant or as a second unit in larger plants. It comes with standard calibrations for skim, raw, pasteurized and homogenized milk, and 50% cream.

The MSC50 connects to a PC via standard RS232 protocol and software is available.

Foss Food Technology Corporation - Eden Prairie, MN

Please circle No. 285
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Sapphire™ Liquid Level Sensing System Receives United States Patent

The *Sapphire™* liquid level sensing system from Kay Ray/Sensall has been issued U.S. Patent No. 5,269,188 for its Time Gate™ technology. Time Gate™ performs continuous self-test of the sensor and electronics to ensure reliable level control and spill prevention across the broadest possible range of process liquids — even aerated and sound attenuating liquids. The continuous self-test performed automatically under both wet and dry conditions, verifying the physical integrity of the sensor including the crystal bond to the sensor body.

The inventors, Boris S. Rosselson and Alexander J. Esin spent years developing and perfecting the Time Gate™ method. Today, as an integral part of the *Sapphire* Liquid Level Sensing System, Time Gate™ has given *Sapphire* the technological edge over competitive systems.

Sapphire combines a dual compartment NEMA 4X enclosure with FM and CSA approvals for hazardous locations, permitting units to be safely and easily operated in hazardous and corrosive environments.

The *Sapphire* two-wire, 4-20 mA model can lower installed costs for users with two-wire instrumentation, and a 2-year product warranty ensures customer satisfaction.

Kay-Ray/Sensall, Inc., headquartered in Mr. Prospect, IL, provides high precision ultrasonic, gamma and neutron process measurement instrumentation. As a member of the Fisher-Rosemount group, Kay-Ray/Sensall is a part of the largest process instrumentation provider in the world, servicing the process industries with measurement, analytical and distributed control systems for better process management.

Kay-Ray/Sensall, Inc. - Mt. Prospect, IL

Please circle No. 286
on your reader service card.

Escherichia Coli O157:H7 — A Rapid and Accurate Single- Step Screening Test

There remains great concern about the presence of *Escherichia coli* O157:H7 in ground beef. Weber Scientific has a rapid immunoassay that provides presumptive results in just 15 min after a 6 to 8 h sample pre-enrichment.

The test consists of a single plastic dipstick. Due to the nature of this assay, washing steps are not necessary. The membrane on the dipstick has one horizontal "test zone" located near the bottom of the membrane which contains polyclonal antibody against *E. coli* O157. The antibody converts the binding reagent bound on the support from colorless to red/purple, resulting in a narrow red/purple line in the "test zone" rectangular window if *E. coli* O157:H7 is present. The sample continues to migrate through the support unit until it encounters binding reagent bound to the support in the "control zone" semi-oblong window, always resulting in the formation of a horizontal red/purple line, whether or not *E. coli* O157:H7 is present in the sample.

This test will react in the presence of 10^4 to 10^6 CFU/ml *E. coli* O157:H7 only, with no cross reactivity to similar organisms.

This single-step screening test has gained wide acceptance as rapid, cost-effective and reliable.

Weber Scientific - Hamilton, NJ

Please circle No. 287
on your reader service card.

Labconco's RapidStill II for Kjeldahl Distillation is Made in U.S.A.

Labconco Corporation, Kansas City, MO, offers the RapidStill II as an automatic steam distillation unit for labs performing rapid Kjeldahl nitrogen determinations. It serves as a companion to Labconco Rapid Digestors. The RapidStill II is made in America with domestically produced components.

The RapidStill II has a built-in dispenser switch which allows the operator to control the amount of sodium hydroxide being added to the sample. A manually set audible timer alerts the operator when distillation is complete. Each distillation takes 5 to 10 min.

The RapidStill II fits conveniently on a counter top or shelf and is ideal for labs requiring fast turnaround of KNA determinations. The RapidStill II produces ste 1, 100 watt heater element surrounding a 1,000 ml flask. The condenser is equipped with a ventilation valve which prevents any siphoning of distillate back into the condenser chamber.

For more information on Rapid and Classical Kjeldahl Systems, call Labconco Corporation at (800) 821-5525.

Labconco Corporation - Kansas City, MO

Please circle No. 288
on your reader service card.

High Quality Microbiological Testing and Chemical Analysis

Dairy and Food Labs, Inc. (DLF), established in 1925, is a client driven, service laboratory offering the highest quality microbiological testing, chemical analyses and nutrition labeling services. DFL can assist you in your HACCP, Quality Control and Regulatory needs. Specialty technical services provided: *Salmonella*, *Listeria*, *Escherichia coli* O157:H7, *Yersinia*, Vitamin A and D, sugars and fatty acid profiles, infra-red milk analysis, microscopy, shelf-life studies, consultation, environmental programs, quality control programs, pathogen screens, on-site training programs and rapid microbiology methods.

Dairy and Food Labs, Inc. - Modesto, CA

Please circle No. 289
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Shelf-Stable Standards for Infra Red Milk Analyzers and Somatic Cell Counters

Food Analytics, Inc. of Massena, NY, introduces its shelf-stable standards for use with Infra-Red Milk analyzers and Somatic Cell counters.

The standards for milk analyzers are available in powdered for enabling a shelf-life exceeding 1 year. These same standards can also be supplied in re-constituted form. The standards are available in a narrow butterfat range representing "raw milk" or in a more diverse range representing "pasteurized milk." There are six standards in each set.

Somatic cell standards are presented in a set of three values in the ranges 200,000, 400,000 and 600,000 cells/ml. A set will enable the checking of a single somatic cell counter once per day for a month. These standards have a 1 year shelf-life.

For more information on these products, please call Food Analytics, Inc., (800) 263-3677; or write to P.O. Box 43, Route 37, Massena, NY 13662.

Food Analytics, Inc. - Massena, CA

Please circle No. 290
on your reader service card.

Columbus Instruments Offers New Photosynthesis Meter

A new photosynthesis meter, developed by Columbus Instruments, allows measurement of gas production or consumption in plants, fruit and bacteria in either atmospheric or aquatic-based environment under any illumination level. Results are accomplished by periodically circulating a sample of the plant air through a pair of O_2 and CO_2 sensors before returning the sample to the test chamber. This design permits the extreme sensitivity of up to $0.2\mu L/h$ when determining gas volume exchanges without altering the sample conditions. The Photosynthesis meter determines both change in cumulative gas volumes and the rate of gas exchange. Results may be normalized to the sample volume, plant mass or total leaf area.

The breakthrough in technology involves the integration of multiple sensors, which enable the researcher to track the exchanges of both oxygen and carbon dioxide. This permits the measurement of carbon dioxide consumption, which is impossible for instruments using CO_2 scrubbing agents. The photosynthesis meter is also designed to measure res (e.g., air enriched with CO_2 or N_2).

Photosynthesis of multiple samples in up to 80 chambers is measured concurrently by a single instrument. The experimenter maintains a great degree of flexibility in determining an ideal chamber volume and optimum illumination techniques. Controlled by an IBM-AT compatible computer, this instrument is capable of displaying results and graphs in real time as well as outputting data to a diskette in a spreadsheet format.

For more information contact: Columbus Instruments, P.O. Box 44049, Columbus, OH 43204; Phone (800) 669-5011 (Domestic), (614) 276-0861 (International); FAX (614) 276-0529.

Columbus Instruments - Columbus, OH

Please circle No. 291
on your reader service card.

Neogen Introduces New Pesticide Detection Kit

Neogen Corporation recently introduced a new test for the detection of the three most widely used insecticides. The Agri-Screen® Ticket was designed for the U.S. Army to test for the presence of organophosphate, carbamate and thiophosphate chemical agents and insecticides.

In the not too distant past if you wanted to run a test for pesticides, you needed to send the sample to a laboratory, pay hundreds of dollars and wait. Now, in 5 min, with no technical training, you can determine the presence or absence of many commonly used insecticides in the field for as little as \$6.00.

The Agri-Screen® Ticket is easy to use, inexpensive and reliable. Suitable for field or laboratory use, the ticket can be used to detect pesticides in air, water, soil, produce, grains and on surfaces. The ticket detects the major organophosphate, thiophosphate and carbamate insecticide groups including: Malathion, Temik®, Sevin®, Furadan®, Systox®, Vapora®, Phosdrin®, Metasystox®, Guthion®, Actellic®, Dursban® and Diazinon.

The Agri-Screen Ticket is stable at room temperature with a 3 year shelf-life. The test works with a basic 1-2-3 procedure.

With easy to follow step-by-step directions and Neogen's 24-h technical support hotline, no technical training is necessary.

Neogen Corporation - Lansing, MI

Please circle No. 292
on your reader service card.

Unipath Announces New AnaeroGen™ Anaerobic Atmosphere Generation System

Unipath Limited is pleased to announce a new Anaerobic Atmosphere Generation System, the first product in the new Oxoid brand Atmosphere Generation System.

The unique Oxoid AnaeroGen System employs new technology that replaces oxygen with carbon dioxide in a sealed jar more easily, quickly and safely than with any other system. With no water, hydrogen or catalyst to add, the AnaeroGen sachet absorbs oxygen (to a final atmosphere of less than 1% oxygen) from 3.5 L jar in 30 to 40 min. No hydrogen is generated, heat does not exceed 65°F, and no hazardous pressure build-up occurs.

The fast action of the AnaeroGen System aids presumptive identification by improving colony growth during the first 24-48 h, especially with fastidious and obligate anaerobes.

The Oxoid AnaeroGen System includes everything needed for the transport, culture, selective isolation and susceptibility testing of anaerobic organisms: Oxoid AnaeroGen sachets in 2.5 L or 3.5 L format; 3.5 L anaerobic jar; wide range of special, high quality Oxoid dehydrated and prepared culture media and selective supplements.

Unipath provides the industrial food industry with a complete line of dehydrated culture media, an innovative range of selective culture media, and a wide range of diagnostic kits for the identification of organisms and/or their toxins.

For additional information contact Jeff Roberts at (800) 567-8387.

Unipath Limited - Ogdensburg, NY

Please circle No. 293
on your reader service card.

HACCP Quality Support

Lancaster Laboratories offers comprehensive microbiology analytical capabilities in support of HACCP quality programs. Services included finished product testing, environmental pathogen testing (*Listeria monocytogenes*, *Escherichia coli*, *Salmonella* Species), and equipment sanitation swabs analysis (Aerobic Plate Count and Coliforms). Transport swabs, sponges and instructions for environmental sampling are available. Lancaster Laboratories has over 20 years of experience in the food sciences and services many of the nation's largest food processors.

Lancaster Laboratories - Lancaster, PA

Please circle No. 294
on your reader service card.

EM Science Introduces the Reflectoquant® Analysis System

EM Science has announced the development of the Reflectoquant System for contamination monitoring and analysis. The technologically advanced system features the revolutionary new

RQflex Meter, a hand-held instrument for use with Reflectoquant Test Strips.

The Reflectoquant System enables the user to obtain test results on test parts-per-million level using a test strip read by a meter, with results available in 60 s. The RQflex Meter reads test strips for 30 different analytes, including chromium, nitrate and peroxide, the instrument features programming by the bar code method and result storage. Best of all, it fits in your pocket!

The Reflectoquant System analyzes a complete line of analytes and measures concentration based on reflected light from the test strip. A total of 30 test strip chemistries will be available with the system.

The Reflectoquant System features applications for a broad spectrum of industries and disciplines, including industrial and environmental laboratories, environmental field screening and waste water management, the food and beverage industry, electroplaters and other industries requiring process control and environmental monitoring.

For more information, contact Al Sutherland, Product Manager, at (800) 222-0342, or write: EM Science, 480 Democrat Road, Gibbstown, NJ 08027.

EM Science, an Associate of E. Merck, Darmstadt, Germany, offers more than 4,000 reagents, high-purity solvents, safety supplies and other laboratory products, including Merck's ISO 9001 Certified TLC Plates, Inorganic Reagent Salts, High-Purity Acids, Standards, Chromatography Sorbents and Quick Test Kits.

EM Science - Gibbstown, NJ

Please circle No. 295
on your reader service card.

Test Detects Staphylococci in About 80 Minutes

bioMérieux-Vitek's VIDAS® Staph Enterotoxin (SET) Assay allows owners of the VIDAS® instrument to quickly screen for the most common causes of food poisoning.

Although Staphylococci can be destroyed by heat treatment, the preformed toxins are heat stable and can survive heat processing and even retorting.

The VIDAS SET Assay, a qualitative enzyme-linked fluorescent immunoassay, is performed in the fully automated VIDAS® or mini VIDAS® instruments. Following a simple extraction protocol of the food sample, results are available in approximately 80 min.

VIDAS SET detects Staphylococci enterotoxins A, B, C1, C2, C3, D and E.

bioMérieux Vitek, Inc. - Hazelwood, MO

Please circle No. 296
on your reader service card.

Mercury-Free Cod Test Reagents Introduced by Bioscience, Inc.

A new line of mercury-free test reagents for determining Chemical Oxygen Demand (COD) in wastewaters has been introduced by the Analytical Products Division of Bioscience, Inc.

The new reagents, which supplement the

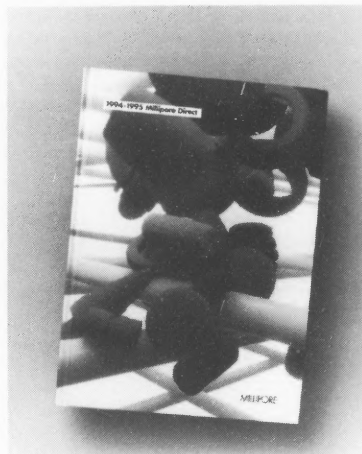
company's existing COD test products, reduce waste disposal costs and eliminate technician exposure to mercury. Mercury-free COD reagents are designed for non-reporting purposes and for waste streams with low-chloride content.

The mercury-free reagents are part of Bioscience's new accu-TEST® line which also include test kits for chloride and ammonia.

For technical information, contact the Analytical Products Division, Bioscience, Inc., 1550 Valley Center Parkway, Suite 140, Bethlehem, PA 18017; or FAX (610) 691-2170.

Bioscience, Inc. - Bethlehem, PA

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on your reader service card.



Millipore's 1994-95 Lab Products Catalog Now Available on the Internet

Millipore has just made available on the Internet, its 1994-95 Laboratory and Health Care Products Catalogue. The catalogue can be viewed by accessing the URL menu and typing:

<http://www.millipore.com>

and then selecting the items of interest. Users can get details on several thousand products encompassing Environmental Testing, Microbiology, Chemical/Industrial, Hospital/Pharmacy, Quality Assurance, Medical/Clinical/Diagnostic, OEM/Custom Products, Lab Water Purification and Molecular Biology. Subject headings and tables of contents guide the computer user to the product descriptions.

Millipore is a multinational, high technology company that applies its analytical and purification technologies to critical research and manufacturing problems in the pharmaceutical, environmental, medical, biotechnology, microelectronics and other industries.

Millipore Corporation - Bedford, MA

Please circle No. 298
on your reader service card.



Automatic Wash Station Improves Sanitation in Food Processing Plants

Recognizing the importance of proper hand sanitation in food safety, World Dryer has developed the first, fully-automatic Hand Wash Station that complies with handwashing procedures in the newly released FDA Food Code. Now, employees from all aspects of food processing can improve food safety every time they use the Wash Station.

Featuring a unique "logic system," the Wash Station has sensors that provide a complete soap and water wash, activating water only after soap has been applied, and preventing a "water only" wash. Once rinsed, hands are immediately dried under the touchless warm air nozzle. These hands-off features ensure sanitary cleansing with no risk of re-contamination. With handwashing requirements posted right on the machine, food handlers can't make a mistake.

The compact Wash Station easily fits into the same area required by hand sinks, and can be installed using existing water and electrical lines. Other features which make the Wash Station so easy to use include lighted low-soap indicator, on-off switch for cleaning the fixture without triggering the sensors and a water over-ride. The manufacturer also has a model that meets ADA requirements for the physically challenged.

To learn more about the automatic Wash Station, contact World Dryer Corporation, 5700 McDermott Drive, Berkeley, IL 60163; (708) 449-6950.

World Dryer Corporation - Berkeley, CA

Please circle No. 299
on your reader service card.

J&W's μ SIL[®]-WAX Guarantees Exceptional Electropherograms Without the Typical Peak Tailing

J&W Scientific's most recent Capillary Electrophoresis (CE) Application Note provides valuable information on the analysis of proteins with J&W's μ SIL[®]-WAX.

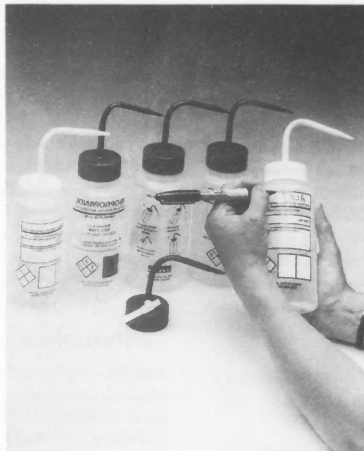
Tailing peaks and loss of resolution are things of the past. J&W Scientific's μ SIL[®]-WAX is a CE column coated with a new hydrophilic polymer that minimizes the solute-wall interactions that often occur in the analysis of proteins and peptides. The result is rapid, high resolution analysis of complex proteins and peptides.

Written by J&W technical support chemists, the application note is one in a continuing series of J&W Scientific CE notes being released. The note includes electropherograms of common proteins and peptides, as well as a profile of cow milk, exhibiting the exceptional performance of this new capillary.

To receive a free copy of J&W's application note on μ SIL[®]-WAX (No. CE3), contact J&W Scientific at 91 Blue Ravine Road, Folsom, CA 95630-4717; (916) 985-7888.

J&W Scientific - Folsom, CA

Please circle No. 300
on your reader service card.



Venting Washbottle

All washbottles aren't the same anymore. Markson Science, Inc. introduces a new washbottle design for safer identification, storage and handling of volatile solvents—the Venting Washbottle. It's innovative patent pending design solves the leaking, dripping and the "disappearing" label problems. A two-way valve mechanism below the nozzle prevents solvent vapor pressure build-up, yet doesn't interfere with normal dispensing.

Vented washbottles also feature a wide mouth for easy filling, color coded cadmium-free closures for easy identification, and are permanently labeled with the most current international hazard symbols.

Two sizes and styles, 250 ml and 500 ml, are

available either pre-labeled with solvent name or customize your own label. Customize your own label using any permanent label marker, regardless of solvent it doesn't disappear.

Solving the solvent problem is truly a safety feature every laboratory will appreciate.

For more information, call (800) 528-5114.

Markson - Hillsboro, OR

Please circle No. 302
on your reader service card.

Pall Corporation and New Logic International, Inc. Agreement for Membrane Separation System

Pall Corporation and New Logic International, Inc. have entered into an exclusive agreement under which Pall has acquired manufacturing and sales rights under New Logic's Vibratory Shear Enhanced Processing filtration system patents and know how. Pall will market the system under the name Pall-Sep VMF[™] filter. Pall has obtained exclusive rights to manufacture and sell the separations system worldwide.

The Pall-Sep VMF filter offers high flux rates, high concentration limits, low power requirements and mechanical simplicity in separations ranging from low molecular weights through 30 microns. These features, offered for the first time in a membrane system, provide a new standard in rapid separation. The Pall-Sep VMF filter can replace many conventional separation processes, such as evaporation, rotary drum vacuum filtration, centrifugal separation and crossflow membrane filtration.

The Pall-Sep VMF filter can be configured with reverse osmosis, ultrafiltration and microfiltration removal rated membranes and is designed to accommodate pilot and industrial scale filtration applications.

Markson - Hillsboro, OR

Please circle No. 303
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Continued from Page 389 . . .

New Faculty Member in Food Microbiology

MISSISSIPPI STATE, MI — Douglas L. Marshall has joined the faculty of the Department of Food Science and Technology to conduct research in food microbiology and teach courses in food microbiology and product development.



A native of Kearney, NE, Marshall earned the B.S. degree (microbiology) and M.S. degree (food science and technology) from the University of Nebraska at Lincoln. His Ph.D. in food science and human nutrition is from the University of Florida, Gainesville.

Prior to joining the MAFES and MSU faculty, Marshall spent 5 years as assistant professor of food science at Louisiana State University. His research focused on microbial quality in meats, poultry and seafood. Other research interests included development of rapid methods for detecting pathogens in foods, evaluation and application of novel antimicrobial agents as food preservatives or sanitizers. He also worked on development of a novel bread preservation method for developing countries.

His teaching experience includes food microbiology, food toxicology, food-borne diseases, food safety, food fermentations and food science. He has also served as consultant to a number of food industry firms.

He has authored or co-authored more than two dozen articles in scientific and trade journals and presented papers at a number of national and regional food science conferences.

Marshall is a member of professional and scientific organizations, including the International Association of Milk, Food and Environmental Sanitarians, Inc. (IAMFES), the Institute of Food Technologists (IFT), and the American Society for Microbiology. He is also a member of the Southern Regional Aquaculture Center Technical Committee.

An assistant professor, Marshall will conduct studies in food microbiology, developing methods to improve marketability and safety of all foods with special emphasis on seafoods and aquaculture. His teaching responsibilities will be at both undergraduate and graduate levels.

Technomic Announces Winners of the Second Annual Food Science Dissertation Award

LANCASTER, PA — Technomic Publishing Company has selected two winners of the 1994 Second Annual Food Science Dissertation Award. Maria Emilia C. Bruno, Ph.D., Rutgers, The State University of New Jersey, is the First Prize winner of \$1,000 for her doctoral dissertation, "Common Mechanism of Action of Bacteriocins from Lactic Acid Bacteria."

The Second Prize, \$500, will be awarded to Mark Campbell, Ph.D., Iowa State University, for his dissertation, "Application of Differential Scanning Calorimetry for Identifying Novel Starch Types in Maize."

Nominations for the 1995 Food Science Dissertation Award will be accepted until February 1, 1995. Nominations must include: The candidate's name, address and phone number; a dissertation abstract; a table of contents for the complete dissertation; a draft of a sample chapter; and a letter from the student chairperson or advisor indicating approval of the nomination.

Nominations for the 1995 award should be sent to: Joseph L. Eckenrode, Ph.D., Technomic Publishing Company, Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604.

American Farmland Trust Issues Proceedings of National Integrated Pest Management Forum

WASHINGTON, D.C. — American Farmland Trust, a national farmland conservation group based in Washington, formally released the proceedings of the National Integrated Pest Management Forum on June 15, 1994, that drew some 600 representatives of agriculture to Washington to chart the course of IPM into the 21st century.

Sponsored in part by the U.S. Department of Agriculture and the U.S. Environmental Protection Agency, the forum was designed to achieve a broad consensus on how to expedite the development and implementation of IPM in agriculture. IPM programs take a systems approach to pest control management, blending a variety of environmentally sensitive, yet economically sound techniques.

Forum participants specified scores of ways to address the 61 obstacles identified as precluding a wider acceptance of IPM. Among them were making a national commitment to IPM, increasing public and private funding for IPM research and extension and providing more funding to the Cooperative Extension Service to ensure long-term stability for IPM education.

In response to the forum and some ensuing workshops, the Clinton administration initially set a goal of having 75% of all U.S. farm acreage in IPM programs by the year 2000. Currently, IPM practices are used on only 15 to 25% of all farmland. "In setting the goal, the administration recognized IPM as a valuable component of sustainable agriculture systems, one that could help farmers address water quality and food safety concerns while maintaining profitability," said A. Ann Sorensen, author of the proceedings and director of AFT's Center for Agriculture in the Environment in DeKalb, IL.

Copies of the proceedings can be obtained for \$10 from AFT's National Office in Washington, D.C. Call or write AFT at 1920 N. Street, N.W., Suite 400, Washington, D.C. 20036; (202) 659-5170, ext. 3028.

A. Epstein and Sons International to Design Headquarters, R & D Facility for Quest International Flavors and Food Ingredients Co.

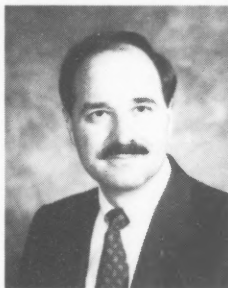
CHICAGO, IL — A. Epstein and Sons International, Inc., has been awarded a contract to provide architecture and engineering services to Quest International Flavors and Food Ingredients Co. for its new North American Business and Technology Center, expected to be located northwest of Chicago.

The 60,000-square-foot headquarters facility will include corporate and support offices and research and development laboratories, enabling Quest International to consolidate operations currently located in Sarasota, FL and Baltimore, MD. Construction cost is estimated at approximately \$7 million.

Based in the Netherlands, Quest International is a division of the Unilever Group. The company creates flavor, texture and food ingredients for an international roster of manufacturers.

A. Epstein and Sons International, Inc., which was founded in 1921, is an international architecture, engineering and construction organization with worldwide projects-in-progress valued in excess of \$1 billion. In addition to its Chicago headquarters, the firm maintains offices in New York, Los Angeles, Warsaw, Tokyo, Mexico City and three locations in Israel.

Sybron Chemicals Appoints Senior Research Scientist for Biochemical and Environmental Services



BIRMINGHAM, NJ — Sybron Chemicals, Inc. has named Dr. David J. Drahos to the position of Senior Research Scientist for the Biochemical Division.

Dr. Drahos, an expert in applied environmental microbiology, holds a B.S. in Physics from Manhattan College, NY, a Ph.D. in Molecular Biology from the University of Pittsburgh and currently serves as an adjunct associate professor for Clemson University. Dr. Drahos has authored or co-authored 22 published articles, holds one patent and has patents pending.

Prior to joining Sybron, Dr. Drahos served as Research Group Leader for the applied environmental microbiology program of Monsanto Company where he developed field-effective biological pesticides. As manager of an applied environmental microbiology research program for SBP Technologies, Dr. Drahos led a team demonstrating the bioremediation of petroleum hydrocarbons, polyaromatic hydrocarbons, trichlorethylene and halogenated pesticides.

Sybron Chemicals, a publicly traded international specialty chemical company based in Birmingham, NJ, develops, produces and markets specialty chemicals to two main markets: environmental (primarily related to water waste treatment) and textile dyeing and finishing. Products include Ionac[®] ion exchange resins and Purification Products Company reverse osmosis membranes for use in water treatment and special applications; BI-CHEM selectively adapted bacterial cultures for soil and groundwater remediation and industrial, municipal and sanitary waste treatment; and Tanatex[®] finishing chemicals for textile and carpet industries.

Penn State Researcher Revises Holstein Breed Standards

UNIVERSITY PARK, PA — A Researcher in Penn State's College of Agricultural Sciences has revised growth standards used to estimate the weight of Holstein calves and heifers from heart girth measurements.

Dr. Jud Heinrichs, associate professor of dairy science, has developed new, more accurate growth charts for height and weight of heifers at a given age from 2 to 24 months. "The new standards are helping dairy producers chart animal growth, provide balanced diets and determine when heifers should breed," he says.

Using data about Holstein weight and growth collected from across the United States, Heinrichs developed a new equation that makes girth measurement a more accurate estimate of weight and growth. Heinrichs already has revised growth charts for Ayrshire, Brown Swiss, Guernsey, Jersey and Milking Shorthorn cattle.

Farmers use these growth charts to compare their animals to a breed average for weight and height. Weight and growth usually are estimated by measuring an animal's heart girth. "Girth-measuring tapes are marked in inches on one side, with each inch correlated for the average weight of that breed on the other side," Heinrichs says.

Heinrichs recently evaluated heart girth tapes for Holsteins and found serious problems. "The Holstein standards were based on a 1936 U.S. Department of Agriculture study of a single herd," he says. "I analyzed more recent data that measured cows and calves using both tapes and scales. The tapes consistently made animals seem heavier than they really were."

Inaccuracy is a problem because body weights of animals are used to make various management decisions, such as ration balancing. "The average milk cow's cative life lasts only a few years, so a dairy farmer replaces about 30% of the herd each year," he says. "Replacing culled cows with superior heifers improves the herd, but getting good heifers takes good nutrition."

Genetic improvement in the Holstein breed over the decades may have altered the 1936 correlations between girth and weight, Heinrichs notes. "But

many tapes don't even match each other. If you pick a girth measurement and compare the weights given by two different tapes, they may differ by up to 40 pounds for a single inch measurement of heart girth."

Exclusive rights to the new standards developed by Heinrichs have been purchased by the Coburn Company, Inc., a leading national manufacturer of girth tapes. Heart girth tapes based on the revised standards should soon reach the market.

American Association of Cereal Chemists Appoints Davis Associate Director of Scientific Services

ST. PAUL, MN — Dr. Arthur Davis will join the staff of the American Association of Cereal Chemists (AACC) as associate director of scientific services. He will succeed Dr. Elwood Caldwell as director of scientific services in September. Caldwell will remain on staff working on special AACC projects.

Davis' principal responsibilities with the AACC will include the short course and check sample programs.

"AACC is most fortunate in obtaining the services of a cereal scientist who has both industry and academic experience," said Steven C. Nelson, AACC Executive Vice President. "We look forward to building on our reputation for quality services. We appreciate Dr. Caldwell's significant contributions including the expansion of the AACC Short Course program which now offers 30 courses a year, worldwide."

Davis has been director of technical services for Green Plant Fresh Vegetables. Prior to Green Giant, his previous positions have included manager technical quality services at General Foods Bakery Companies, a division of Kraft General Foods; assistant and associate professor at Kansas State University; group leader in cereal technology at the American Institute of Baking; and product development scientist at The Pillsbury Company. He also has been self-employed as a flight instructor and commuter and charter pilot. Davis has worked as a Peace Corps volunteer in Iran.

He has a Ph.D. in cereal chemistry and a M.S. in animal science from Kansas State University and a B.S. in animal science from Oregon State University. He is a member of the AACC, Institute of Food Technologists, Sigma Xi and Gamma Sigma Delta. Davis has published over 25 papers.

New Low-Fat Natural Cheddar Cheese

PHILADELPHIA, PA — A new formulation for a low-fat natural cheddar cheese has been developed by the Food Ingredients Division of FMC Corporation. Natural cheddar cheese usually contains 31 to 34% fat. Reducing the fat level and substituting with Novagel[™] NC-200 cellulose gel allows processors to formulate a low-fat natural cheddar cheese with only 6% fat — an 80% fat reduction.

The new formulation, containing a customized starter culture and Novagel[™] NC-200 cellulose gel, results in a significant yield improvement — up to 15% yield increase over low-fat cheddar prepared without Novagel[™] NC-200 cellulose gel.

More importantly, consumers can enjoy a low-fat cheddar cheese that has excellent mouthfeel, texture and flavor. Even after 11 months of aging, the natural cheese developed by FMC maintains its clean cheddar flavor with no bitter taste.

All this is accomplished in a traditional cheddaring, stirred curd or Colby process — no special equipment or handling is required. Fat levels are reduced by formulating with nonfat-milk solids and milk that has been skimmed to 0.5% butterfat content. The Novagel[™] NC-200 cellulose gel interrupts the casein structure in much the same way as the fat globules normally present in whole milk, resulting in a soft, low-fat cheddar cheese with textural properties which mimic that of full-fat cheddar.

FMC's efforts to further reduce fat in natural cheese continues at its Princeton, NJ Technical Facility and commercial processing plants. For recommended starting formulations and technical assistance, please contact the Food Ingredients Division hotline at (800) 346-5101.

Applications Available for First Annual International Capillary Electrophoresis Technical Paper Award

NORWALK, CT — Applications for the first annual Perkin-Elmer International Capillary Electrophoresis Technical Paper Award are now available. Papers are judged by an international panel of experts from academia and industry. The first-place winner will receive Perkin-Elmer equipment worth \$20,000 (at U.S. list price), and the second-place winner will receive a coupon worth \$5,000 (at U.S. list price) for items in any PE XPRESS catalog.

As described in the application, entries may be submitted until October 1, 1994. Winners will be announced at the High Performance Capillary Electrophoresis (HPCE) Symposium in January, 1995. Papers previously published within the last year are also eligible. The technical content of the papers is unrestricted as long as the analytical technique used is Capillary Electrophoresis (CE), and there is reference to a CE system from any manufacturer.

Judges include Dr. Max Safarpour, American Cyanamid, Princeton, NJ; Professor Milos Novotny, Indiana University, Bloomington, IN; Professor Shoji Motomizu, Okayama University, Okayama, Japan; Professor John Knox, University of Edinburgh, Edinburgh, Scotland; and Dr. John Wiktorowicz, Perkin-Elmer, Applied Biosystems Division, Foster City, CA.

To obtain an official entry form and more information on the contest, contact: Laura Lauman, Perkin-Elmer International CE Award, The Perkin-Elmer Corporation, 761 Main Avenue, Norwalk, CT 06859-02050; phone (203) 761-2532; or FAX (203) 761-2887.

Perkin-Elmer is the leading worldwide manufacturer of analytical instrument and life science systems.

Perkin-Elmer's Applied Biosystems Division is the leading supplier of automated systems for life science research and applications.

Frozen Food Industry Finds Opportunity in New Food Label — Reinforces Frozen as a Healthy Option

MCCLEAN, VA — As of May 8, 1994, consumers will see a consistent nutrition label on every food product in their grocery store, including frozen foods, with the positive message of health and nutrition, frozen food companies have turned the advent of the new label into an opportunity to educate consumers on the many nutritional benefits of frozen products.

Industry efforts to create a special niche for frozen during Nutrition Labeling and Education Act (NLEA) implementation is well underway, according to the May/June issues of *Frozen Food Report*, the official magazine of the American Frozen Food Institute (AFFI). By effectively branding one's products using the Nutrition Labeling and Education Act to leverage healthful benefits on product packaging, and by identifying value-added opportunities for merchandising, frozen food companies see the NLEA as an opportunity to better serve consumers.

"Most of my time is devoted to implementing the new NLEA regulations. I believe the end result will create consumer confidence in the frozen food industry," one frozen food industry executive told *Frozen Food Report*.

In an attempt to reach core consumers and help retailers promote a product line, one company developed a 48-page full-color quarterly magazine focused solely on nutrition. Many frozen food companies have also developed specific consumer pieces to help answer consumer questions about the new label.

Another company is also taking advantage of the advent of the new food label to reposition its product line by redesigning the packaging. "The redesign would have happened anyway, but the costs and synergies associated with the NLEA made us wait about 6 months," said a company representative.

Another manufacturer of frozen Italian food took labeling one step further by graphically displaying ingredients on the front panel of the company's frozen food packaging. "We are giving our ingredients the first-class upgrade they deserve," said a company spokesperson. "Not only will our ingredients be listed on the front of our boxes, but they will also be graphically illustrated so the consumer can both see and read what they are eating."

"This is a great opportunity for frozen food companies to redesign their packages in creative ways that give customers more of the information they want," he continued.

And the prospects of frozen foods look good as many nutritionists report the category offers a plethora of options for today's busy consumer. Historically nutritionists have promoted frozen as an excellent choice for grocery shoppers. For example, the frozen fruit and vegetable category has seen much attention with the AFFI-supported *5 a day — for Better Health* campaign, a program sponsored by the National Cancer Institute and the Produce for Better Health Foundation.

Dietitians typically tell consumers who are watching calories to select a frozen entree or dinner with a modest fat and calorie content and use it as a base for a quick, nutritious meal. "The frozen food industry has led the rest of the grocery industry in producing products that are low in fat, cholesterol, sodium and calories. With the new food labels, we can sell our message to the American consumer, said AFFI President Steven C. Anderson.

In fact, the March 15 issue of *Woman's Day* offers 14 days of menus for on-the-go readers with no time to diet. The menus feature a variety of frozen food products that can be integrated into one's daily diet. The article was written by leading nutritionist Denise Webb, Ph.D., R.D.

"Round out the meal with a grain product, such as bread or a roll, and extra fruit or vegetables, such as some steamed frozen vegetables or a salad with low-fat dressing, and a piece of fruit," suggests another nutritionist.

"Well-chosen frozen meals, regular or diet, can be useful base from which to make quick and healthy meals," said one newspaper article. "But don't fall into the same trap as people who only know how to diet by following pre-planned menus. Frozen meals should be just one of the many ways that you create balanced, low-fat eating habits."

Comments like these from nutritionists, combined with the Nutrition Labeling and Education Act, prompted AFFI's Public and Trade Relations Council develop a national public relations campaign centered around a consumer education piece on the new label. The leaflet was designed to offer consumers guidelines on how to interpret the new food label, as well as incorporate frozen food into healthy, balanced diet.

It offers three menus for different types of eaters — the healthy appetite, the calorie counter and the executive on the go.

For more information on AFFI's NLEA brochure, *You Are What You Read*, call Traci Carneal, AFFI's vice president of communications, at (703) 831-0770.

AFFI is the national trade association that has represented the interests of the frozen food industry for over 50 years. Its over 530 member companies account for more than 90% of the total U.S. production of frozen food.

HFM Announces 1994 Conference Program

WASHINGTON, D.C. — The National Society for Healthcare Foodservice Management (HFM) has announced details for its 1994 National Training Conference Program. The National Conference is September 21-24, 1994 at the Breakers in Palm Beach, FL.

Sean Joyce of Omega Consultants to Management, will keynote the Conference with an interactive presentation titled, "Managing the Human Dimensions on the Changing Healthcare Environment."

Joe Pine II, author of the national bestseller, *Mass Customization: The New Frontier in Business Competition* and President of Strategic Horizons, will define how this paradigm shift is influencing companies today and establish a platform for a focused presentation on how this can be applied to healthcare foodservice.

Brad Hudson of the TQM Group will outline how to combine the "craft production and customized service" of fine dining with the "industrial production and mass service" of fast food with his presentation titled, "Industrial Cuisine."

The Mekan Company, national healthcare benchmarking experts, will present, "Identifying Your Strengths and Weaknesses Through Benchmarking." Operators who have been benchmarked will share their experiences and then attendees will go to break out sessions where they can compare their numbers with those of their peers. Speakers include Eileen O'Brien of Montefiore Medical Center in New York and Mary Anna Quinn from St. Jude's Children's Research Hospital in Memphis, TN.

The Covey Leadership Center will present a 3 h seminar developed by Stephen Covey, "The Seven Habits of Highly Effective People." This will be

followed by Ruby Puckett of Shands Hospital presenting the 1995 Joint Committee Standards.

The "Impact of Patient Focused Care," will be presented by John Beeler, assistant administrator, and Mary Smith, Director of Nursing at Bristol Hospital, along with Glen Schrig of Vanderbilt University Medical Center.

Other highlights include: "The Future of Healthcare"; presentations by the 1994 Operator of the Year Award Winner and 1994 HFM Spotlight Award winners; an awards luncheon; three receptions; the Annual Scholarship Golf and Tennis Tournament; and a presentation by The Breakers culinary staff.

ADA and DMA continuing education credits are available. Registration is \$295 for HFM members.

For more information, contact HFM at (202) 546-7236.

Second Asian Conference on Food Safety Scheduled for September 18-23, 1994

BANGKOK, THAILAND — Microbiological contamination of food is an issue of continuing concern around the world; the detection and understanding of emerging pathogens is becoming increasingly important. Adding to the food safety challenges facing the Asian region are the increasingly international character of food production and marketing, the impact of scientific and technological advances in food production, and the need to implement and oversee, with limited resources, a variety of functions related to food safety. Resolving these concerns will require the collaborative efforts of individuals and organizations from all sectors in the region and from around the world.

The Second Asian Conference on Food Safety will build on the momentum engendered at the successful first conference 4 years ago in Kuala Lumpur, Malaysia, to foster further collaboration to improve food safety in the region. Some 50 scientists from academic institutions, industrial laboratories and regulatory agencies in Asia, Europe, Latin America and the United States will update attendees on all aspects of food safety and on the progress toward international harmonization of food safety regulations.

The 5-day conference will feature sessions on food safety as a factor in international trade, the importance of safe water in food safety, mycotoxins, street foods, foods for better health, packaging issues, the role of the consumer in food safety, the safety of food ingredients and quality assurance issues. There will be ample opportunity for formal and informal information exchange throughout the meeting.

The conference is sponsored by the International Life Sciences Institute (ILSI) and ILSI Thailand in collaboration with the World Health Organization, Food and Agriculture Organization of the United Nations, Thai Nutrition Association, Institute of Food Research and Product Development at Kasetsart University, Faculty of Medicine at Ramathibodi Hospital (Mahidol University), ILSI Australasia, ILSI Japan and ILSI Southeast Asia.

A conference program, which includes registration and hotel information, is available from ILSI's Washington, D.C., offices (telephone 202-659-0074, FAX 202-659-3859) or from ILSI Southeast Asia (telephone 662-561-2308, 662-579-0572 or 662-561-1970; FAX 662-561-2308 or 662-561-1970).

Dairy Feeding Publication Available from University of Minnesota

ST. PAUL, MN — A newly-revised edition of *Feeding the Dairy Herd*, a basic reference manual on meeting the nutritional needs of dairy cattle, is now available from the University of Minnesota.

The 52-page publication is designed for dairy producers, feed industry personnel, veterinarians, dairy consultations, agricultural educators and others needing information on dairy nutrition.

The publication dates back to 1894 when the first edition originated at the University of Minnesota. The latest edition is the 34th published and the third multi-state edition. Its authors are dairy nutritionists at the University of Minnesota, the University of Wisconsin, Iowa State University and the University of Illinois.

The publication provides basic information on nutrition and feeding management for dairy animals from birth through their lactation cycles. It has sections on the anatomy and physiology of the cow, feed nutrients, feedstuffs,

feeding systems, ration formulation, purchasing feed and dairy cow diseases and disorders. It includes numerous tables that show how much of many different nutrients cows and heifers need, and the nutrient composition of many different feeds.

Copies of the 1994 edition of *Feeding the Dairy Herd*, North Central Regional Extension Publication 346, are available through county extension offices in Minnesota, Wisconsin, Iowa and Illinois.

The publication is also available from the University of Minnesota at item number BU-0469-NR1 at a cost of \$3 per copy (Minnesota residents add 6.5% sales tax; St. Paul residents, 7%). Send check or money order, payable to the University of Minnesota, to MES Distribution Center, University of Minnesota, 1420 Eckles Ave., St. Paul, MN 55108-6069. Include the title and item number in your order.

HFM Announces Results of Benchmark Survey Part I

WASHINGTON, D.C. — The National Society for Healthcare Foodservice Management has announced the results of Part I of the society's benchmark study. With 30% of the membership responding, the findings show that 82% of the society's members are from hospitals, 8% from extended care and 11% from combined facilities.

The survey found that member facilities varied from 42 to 3,200 beds, with an average of 427 beds. Those from hospitals average 438 beds; extended care, 372 beds; and combination facilities average 440 beds.

Member hospitals were found to be 56% from urban areas, 37% rural and 7% suburban. Extended care facilities are 58% urban, 21% rural and 21% suburban. Combination hospital/extended care facilities are 50% urban, 50% rural with no suburban facilities reporting.

For hospitals the average reported occupancy rate was 70%. Urban hospitals reported occupancy rate of 68%, rural facilities reported 60% and suburban reported 85%.

Extended care facilities in urban areas reported an average occupancy rate of 86%. For rural, the rate was 91%, 88% for suburban.

The study found the following operational characteristics:

- 24% responded that they were responsible for managing other departments.
- 14% operated a cook chill food prep system.
- 84% operate conventional food prep system.
- 5% operate cook/freeze food prep system.
- 68% use computers for food purchasing and inventory.

On average HFM members report that 51% of all meals are served to non-patients.

The majority of respondents used a pellet patient tray system and less than a quarter responding used rethermalization or other systems. A total of 98% of the hospitals reporting said they operate at least one cafeteria. All the Department of Veterans Affairs plus three others did not have cafeterias. In the VA hospitals, the Canteen Service runs the cafeteria.

All but one of the extended care facilities operate a cafeteria and 100% of the combination extended care facilities. HFM found that a quarter of its members operate coffee shops in their facility. Rural and suburban hospitals appear more likely to operate the coffee shop than those in urban areas. The same findings applied to extended care facilities and to combination hospitals and extended care facilities.

HFM is the only national society devoted exclusively to the independent healthcare foodservice operator. The society has over 850 members in 48 states including the District of Columbia and Canada.

Industry Spokesman Discusses Use of Antibiotics on Farm, Resistance Issues

ALEXANDRIA, VA — Discussing an issue that has sparked interest and confusion for more than three decades, an industry spokesperson said June 23, 1994, that reports about humans becoming increasingly resistant to traditional antibiotic therapies are of concern, but their relationship to the use of antibiotics in farming is minimal.

Speaking at a meeting of the AHI Food Safety Network, Martin Terry, a veterinarian with a doctorate in toxicology, said that animal health compa-

nies and independent researchers have exhaustively studied antibiotics issues since the early 1960s, with no evidence linking antibiotic resistance in people to antibiotics used in livestock. Terry is vice president of scientific and international affairs for the Animal Health Institute, in Alexandria, VA.

Terry explained the use of antibiotics used in meat, milk and egg production by providing 10 key points about antibiotics use in animals.

Terry said that as in human medicine, antibiotics are used in veterinary care to treat infections that might otherwise be untreatable. Examples he cited include respiratory infections, severe diarrhea and digestive, urinary and reproductive infections. Terry said that antibiotics are also used to prevent disease in animals, which can enhance an animal's growth.

Terry said that antibiotics are used therapeutically to treat a specific, active infection in a specific animal. Antibiotics are used at low, subtherapeutic levels to prevent infections and bacterial disease.

"Just like kids in daycare, animals like to trade and share their germs," Terry said. "What's different, though, is that animals end up in the food supply, so we must take precautions to prevent animals from getting sick."

Terry said that subtherapeutic use also improves the way an animal converts its feed to muscle and cited several studies suggesting that besides producing a healthier animal, this practice results in more abundant, affordable food.

Terry said specific antibiotics generally kill specific types of bacteria, but some bacteria are naturally unresponsive to certain antibiotics.

Resistance to antibiotics — in humans or animals — can occur in several ways. Terry said antibiotic resistance occurs primarily in one of three ways including: 1) Some bacteria are naturally resistant to certain antibiotics; 2) Some individual bacteria develop the genetic ability to survive antibiotic treatment and reproduce more of their kind; and 3) Once resistance to antibiotics develops in a single bacterium, it can be transferred from that bacterium to another through small bundles of genetic material.

Whether resistance to antibiotics can be transferred from animals to people and result in untreatable disease has been debated for decades. Terry said that whether an animal's antibiotic-resistant bacteria can cause untreatable illness in people has been studied by hundreds of scientific bodies, including the National Academy of Sciences, the Food and Drug Administration and the Office of Technology Assessment. He said there is no agreement on this issue because no one has proven whether a resistant animal pathogen can both produce disease in a human and retain its antibiotic resistance, which would render the disease untreatable with the antibiotic in question.

Human resistance to antibiotics is mostly caused by their use in people. According to Terry, *Science* magazine, the *Journal of the American Medical Association* and others have attributed bacterial resistance to antibiotics as largely the result of: 1) inappropriate use of antibiotics in human medicine; 2) failure of human patients to adhere to prescriptions for the full duration; and 3) increased clustering of sick people undergoing antibiotic treatment.

Antibiotic resistance in people has nothing to do with antibiotic residues in food. Terry said antibiotic resistance is totally unrelated to antibiotic residues, which are trace amounts of an antibiotic left in an animal's milk or tissue after slaughter. Terry said people don't acquire antibiotic resistance; bacteria do. And bacteria only acquire resistance when exposed to high levels of an antibiotic, not trace levels.

According to Terry, antibiotic use in animals is controlled by FDA, which reviews all products before approved and requires special tests for resistance. Food producers and veterinarians also keep records on antibiotics used, to avoid over-use of any one product. Terry added that several groups, including FDA, the Centers for Disease Control, the American Society for Microbiology, the Office of Technology Assessment and AHI are exploring surveillance programs to monitor antibiotic resistance in animals and people.

Terry said that the animal health industry continually investigates new products that may be effective in treating animal infections, as well as developing vaccines to prevent disease. In addition, Terry cited human pharmaceutical industry figures that show that more than 53 new antibiotics have been approved by FDA since 1960 — 10 since 1990.

Proper preparation of food reduces a consumer's chance of illness, according to Terry. He said that bacteria can largely be eliminated through proper cooking, refrigeration and handling of food — which is the best way to ensure food safety.

1996 Culinary Team USA Members Traveled to Brazil in a Culinary Exchange Between Chefs of America

LAKEBUENA VISTA, FL — The 1996 Culinary Team USA members recently returned from a cultural exchange trip to Brazil where they experienced the native cuisine of the regions including Rio de Janeiro and Bahia. They are invited guests of the Bahia Tourism Authority (Bahia Tursa), Varig Airlines, Le Maridien Hotels and a few key restaurateurs, like Massimo Ferrari of Massimo Restaurant, who have asked Team USA members to share knowledge about the trends and successes of various segments of the foodservice industry in the United States. A video crew followed the chefs on the trip to document the educational journey in a video to be titled, "Cooks Tour of Brazil." This tape will be distributed to chefs throughout the world via the World Association of Cooks Societies and in the United States through chapters of the American Culinary Federation.

The trip included visiting food markets, processing plants, a shrimp farm, cacao farm and, of course, some of the authentic restaurants in the South American Continent's largest country. Highlights included unique concepts in barbecuing and native one-pot cooking concepts originating from African roots. Joining the seven members of Culinary Team USA are the World President, Continental Director and Secretary General of the World Association of Cooks Societies (WACS) and the National President of the American Culinary Federation. The Team USA members will prepare a fund-raising dinner for charity and be involved in numerous press activities during the historic event.

Team USA members will be representing the United States at the 1996 "Culinary Olympics" and other world championship culinary competitions sanctioned each year by the World Association of Cooks Societies.

Twenty-five chefs from all over the nation successfully achieved spots on the 1996 Team USA at the 1993 American Culinary Federation's National Convention in Orlando, FL. The successful tryout process begun in 1989 by Team USA Manager Keith Keogh, also world president of WACS, has led to even better opportunities for chefs in the United States to tryout and become a member of the 1996 Culinary Team USA. "These members become ambassadors of American Cuisine and spend thousands of hours conducting research and development that is passed on to culinarians throughout the nation. The Cooks Tour of Brazil is a good example of what Culinary Team USA means to the education of chefs and cooks throughout the United States," stated Keogh.

Objectives for the trip to Brazil included the possibility of recruiting a chef organization from that country to represent their chefs and cooks as a member of the World Association of Cooks Societies. The American Culinary Federation, the United States representative of WACS, also played a key role by sharing the successes of programs like the certification of chefs, apprenticeship and other programs that have given the ACF a world-leading position in culinary associations. The entourage from the United States included the following members of the 1996 Culinary Team USA: Keith Coughenour, Executive Chef, Duquesne Club, Pittsburgh, PA; John Coletta, Executive Chef, Caesar's Palace, Las Vegas, NV; Daniel Dumont, Pastry Chef, Caesar's Tahoe, Lake Tahoe, NV; Kristin Jablonski, Pastry Chef/Instructor, William D. Ford Votech Center, Westland, MI; Duane Hendershot, Pastry Chef, Executive Pastry Chef, Marriott AT & T, Bedminster, NJ; Robert Mancuso, Executive Chef, Normandy Restaurant, Denver, CO; and Jeffrey Mora, Metropolitan Culinary Services, Burbank, CA.

Representing the World Association of Cooks Societies and American Culinary Federation were: Keith Keogh, WACS World President, Executive Chef, Walt Disney World's EPCOT Center, Lake Buena Vista, FL; Hans Bueschens, Cont. Dir. (Americas), Vice President of Culinary Relations, L.J. Minor Corporation, Solon, OH; L. Edwin Brown, WACS Sec. General, Executive Vice President, American Culinary Federation, St. Augustine, FL; Michael Ty, ACF National President, Executive Chef, Sheraton Dessert Inn, Las Vegas, NV; Joseph Amendola, WACS Ambassador, Senior Vice President and Principal, Fessel International, Orlando, FL.

The U.S. Culinary Team Foundation is a not-for-profit educational foundation comprised of numerous foodservice organizations in the United States. Funding for the Team USA effort comes primarily from American foodservice corporations. The funding is used for educational videos, cookbooks and travel surrounding the research and development of the six teams. The educational materials are given free of charge to culinary institutions throughout the United States.

Amendment to Nonfat Dry Milk Contract

New York, NY — The Coffee, Sugar and Cocoa Exchange, Inc. (CSCE) Board of Managers, at its May 18, 1994 meeting, approved an amendment to the nonfat dry milk (NDM) rules that would require all NDM delivered against the contract to be certified Kosher. The amendment is currently under review by the Commodity Futures Trading Commission. The Exchange notified the CFTC that, upon approval, it intends to make the amendment effective for deliveries against the November 1994 contract and for all months thereafter.

The Coffee, Sugar and Cocoa Exchange, Inc. is the world's leading marketplace for futures and options trading in these three international commodities.

Fluid Milk Processor Education Program Board Named by USDA

WASHINGTON, D.C. — United States Department of Agriculture (USDA) Secretary Mike Espy today announced the appointment of the Board of Directors for the national Fluid Milk Processor Education Program (Milk PEP). The 20-member Board consists of the following 15 fluid milk processors from each of 15 geographic regions and 5 at-large members.

Region 1: Arthur J. Pappathanasi, West Lynn Creamery, Inc., 1 year term; Region 2: Michael Marcus, Tuscan Industries, 2 year term; Region 3: Ronald W. Mong, Mong Dairy Co., 3 year term; Region 4: Ralph H. Gardner, Ingles/Milco, Inc., 1 year term; Region 5: H. Denny Gaultney, Skinnners' Dairy, Inc., 2 year term; Region 6: John Hitchell, The Kroger Co., 3 year term; Region 7: Jeffrey Lee Koehler, Associated Milk Producers, Inc./Morning Glory Farms Region, 1 year term; Region 8: Phillip A. Littel, Maplehurst Farms, Inc., 2 year term; Region 9: Mark V. Ezell, Purity Dairies, Inc., 3 year term; Region 10: Robert Fleming, Schepps-Foremost, Inc., 1 year term; Region 11: Miriam Erickson Brown, Anderson Erickson Dairy Company, 2 year term; Region 12: Richard L. Robinson, Robinson Dairy, Inc.; Region 13: James T. Wilcox, Wilcox Farms, Inc., 1 year term; Region 14: Richard Sturgeon, Super Store Industries, 2 year term; and Region 15: Gary San Filippo, Alta Dena Certified Dairy, 3 year term.

At-Large Members include: Robert W. Allen, Borden, Inc., 1 year term; Martin Margherio, Wassanen U.S. Dairies/Crowley Foods, Inc., 2 year term; Gary E. Hanman, Mid-America Dairyman, Inc., 3 year term; and Leonard J. Southwell, Prairie Farms Dairy, Inc., 3 year term.

The Public Member is Robert E. Baker, The Baker Group, Inc., 1 year term.

Program Designed to Stem Decline in Milk Sales.

Milk PEP will be a trial program conducted over a 15 to 18 month period, to provide accurate information to consumers and to correct existing misperceptions regarding fluid milk. The purpose of the Program will be to achieve a measurable improvement in consumer attitudes and perceptions about the full range of fluid products, and to stem the precipitous decline in per capita fluid milk consumption.

The Program is funded by a temporary 20 cents per hundred weight assessment per month on Class I sales over a period of 6 months. All milk companies processing 500,000 pounds or more of fluid milk per month are subject to the assessment. The assessment began in February, 1994 and is expected to generate an education fund of about \$55 million. Authority for the program was granted in the 1990 Farm Bill, and the nation's fluid milk processors approved the program in a referendum held last year.

The Milk PEP will be administered on a contractual basis by the Milk Industry Foundation (MIF), the trade association representing the nation's milk processors. USDA's Agricultural Marketing Service will monitor and provide oversight for the operations of the Board.

"We are pleased that after many months of waiting, we can get this important program up and running," stated E. Linwood Tipton, President and CEO of the Milk Industry Foundation. "The fluid milk consumer education program represents a unique opportunity for the industry to take the positive steps needed to help turn the fluid milk industry around."

Preliminary Action Taken, Next Steps Outlined.

While waiting for the Board to be named, MIF has taken some preliminary steps to insure that the Program remains on track. These steps

were necessary because of the USDA-imposed time frame for the Program (authority for the Program expires December 31, 1996) and the urgency to use the money already collected from fluid milk processors in a timely and purposeful way in order to benefit the industry. These actions, which require ratification by the Board, include the appointment of Charlie Decker as Executive Director of the Program and the start of pre-program research and benchmark analysis. In addition, some preliminary program elements have been developed in conjunction with Bozell, Inc., the advertising and public relations firm that has been working with MIF on this program for several years after an extensive agency selection process.

"With the Board now in place, we hope for quick ratification of the actions we have taken in order to avoid any additional delays. The fluid milk industry has waited a long time for this much-needed program, and results are now just around the corner," Tipton said.

The first meeting of the Board will be scheduled by USDA's Agriculture Marketing Service staff and is expected soon.

For more information, please contact Charlie Decker, Executive Director of Milk PEP, at (202) 737-4332.

National Television Series *Business Today* Features Special Two-Part Program

BOCA RATON, FL — *Business Today*, the national television series produced by WJMK, Inc., features a broad spectrum of issues for industry professionals in technology and manufacturing. Information and commentary for business is what *Business Today* is all about. WJMK producers select companies throughout the country for each half-hour program who contribute heavily to the technological growth in all realms of business. The first of this special two-part program entitled, "Food for Thought," will focus on the latest food processing technologies. The second half of the show, titled, "Innovative Loggin Technologies," will explore unique advancements in the world of logging. The show is scheduled to air via the Discovery Transponder in August of 1994.

The first half of the show, "Food for Thought" will take a close look at the challenges in the food industry. From labeling to freezing, "Food for Thought" will educate the viewer about innovative, cost-effective ways to improve the quality of operations by utilizing the following technologies.

Food Processing Additives

In recent years, Americans have recognized the need to be healthy. This in turn has forced food manufacturers to produce healthier foods. In their segment on *Business Today*, Hercules Food and Functional Products Company will feature a unique technology that helps reduce the fat content in foods. Vince Corbo, President of Hercules Food and Functional Products Company, states, "Hercules recognizes the need to serve food manufacturers with timely and detailed technical and applications assistance. Our successes have resulted from finding new applications for food gums in processed meats, convenience foods, baked goods, dairy products and beverages, and by introducing new products for healthful foods."

Blast Freezing System

Over the past 5 to 10 years, America's consumption of fast and frozen foods has grown dramatically. Food manufacturers are seeking ways to improve frozen food quality while reducing production line downtime and providing real-time and historical process data. I.J. White manufacturers blast freezing systems for the continuous production of frozen products. The systems are computer-controlled and can be tailored to each product's requirements. Their *Business Today* segment will give viewers a better understanding of blast freezing systems and the capacity to achieve higher quality food products using less energy in more sanitary environment.

Nutrition Analysis and Label

Recent regulations in the food industry have made the implementation of the latest in automation and information management technology a necessity. In their segment on *Business Today*, Express Analytic will introduce equipment that makes this possible. Dr. J. B. Weatherspoon, Vice President R & D and Quality Assurance at ConAgra Meat Products, states, "Those of us in the business of new products need fast turn around for quick decision making, a service uniquely provided by Express Analytic. Decisions based on the facts of analysis permit you to do it right the first time."

Business Today's "Food for Thought" can be seen via Discovery

Transponder on August 25, 1994, at 6:30 a.m. Eastern and Pacific time, 5:30 a.m. Central time and 7:30 a.m. Mountain time. Thomas Clynes, Senior Producer of the *Business Today* series, states, "Business Today serves as an important vehicle in communicating pertinent information to a wide range of communications professionals who share a common vision . . . the growth of our corporate economy. This special show 'Food for Thought', presents the critical components of the food processing industry."

WJMK, Inc., is a Boca Raton, Florida-based production company specializing in national, educational programming.

Powder and Bulk Solids Show Hosts 8,672 Visitors

STAMFORD, CT — The 19th annual presentation of the Powder and Bulk Solids Conference/Exhibition was deemed a success by exhibitors, attendees and show management. The event, held at the recently expanded Rosemont Convention Center (Rosemont/Chicago, IL) on May 10-12, 1994, hosted 8,672 industry professionals.

Taking up 150,000 square feet of space in the exhibit halls, 544 exhibiting companies displayed a wide variety of products and services in a bustling atmosphere of operating equipment. The show expanded again this year adding an upstairs hall to accommodate the space requirements of more than 100 new exhibitors. More than 1,500 new products were also exhibited at the show. Several exhibitors also offered special press briefings, including Dantec Systems, DEC, Inc., Beltservice Corp., Endress + Hauser, K-Tron North America, Hardy Instruments and Kaeser Compressors, Inc. JSJ Group's Basil Michel presented an overview and update on the ISO 9000 protocol in an informational session for the press.

The second annual Business-to-Business Breakfast featured presentations by Cahners Economics' vice president and director, Kermit Baker and attorney Edward T. Butt, Jr., of Wildman, Harrold, Allen and Dixon. Dr. Baker examined the international economic climate related to industries serviced by the Powder Show. Mr. Butt drew a broad overview of the complexities of avoiding product liability.

The concurrent technical conference offered workshops, technical sessions, management programs, industrial awareness seminars and short courses. The conference, which began a day before the exhibits opened, was directed by Abraham Goldberg of the Powder Advisory Center (London).

Taking over the direction of the Powder Show, Reed Exhibition Companies vice president Larry Kovarovic commented, "The enthusiasm of the new show management team matches that of both the veteran and the brand new exhibitors at our show; we are all focused on building an even more powerful presence in the multi-industry powder and bulk solids arena. This is the only show of its kind in North America, and we are looking at expanding its impact both here and outside the U.S."

Tom Porst, the show's new sales director, added, "In the burgeoning markets served at Powder, chemical, food, metals, plastics, stone/clay/glass, pharmaceuticals and more, attendees comprise a quality buying audience, as proven by independent research conducted each year. We are seeing an increasing number of buying teams among our overall attendance."

For more information on exhibiting in, speaking at or attending next year's event (May 9-11, 1995), please contact Tom Porst, Powder and Bulk Solids Sales Director, Reed Exhibition Companies, 999 Summer Street, Stamford, CT 06905; telephone (203) 352-8419.

Companies Show Support for 1994 International Dairy Show, Sponsor Special Events

WASHINGTON, D.C. — A number of companies, including both dairy foods and industry suppliers and processors, are co-sponsoring, along with the International Dairy Foods Association, specific special events at this year's International Dairy Show, being held October 5-8, 1994 in the Minneapolis, Minnesota Convention Center.

The International Dairy Show is the international trade exhibition serving the specific needs of the dairy foods industry, including processors,

manufacturers, marketers, distributors and their suppliers. Held biennially, the International Dairy Show is sponsored by the International Dairy Foods Association, including the Milk Industry Foundation, National Cheese Institute and International Ice Cream Association, and the affiliated American Butter Institute.

Co-sponsoring the following events are:

"Dairy Speaks" — Country Lake Foods, Kraft General Foods and Quality Chekd Dairy Products Association.

Country Lake Foods, Kraft General Foods and Quality Chekd Dairy Products Association are the co-sponsors of the exciting multi-media presentation, "Dairy Speaks." The program will highlight the forces that are shaping the dairy food industry, and will provide insight on important issues affecting demand and profitability: consumer trends, changing attitudes and demographics, shifting outlets, emerging international markets, technological challenges, streamlined operations.

"Dairy Speaks" is being presented on Friday, October 2, from 10:30-11:30 a.m., at the Convention Center, just prior to the ribbon-cutting ceremony to open the show exhibit floor.

Achieving Excellence Awards Ceremony — The NutraSweet Company

The Achieving Excellence Award Ceremony, which honors the best in dairy industry advertising and promotion programs, is being co-sponsored once again by The NutraSweet Company. This gala event is being held on Friday, October 7, 1994, 10:15-11:30 a.m. in the Minneapolis Convention Center.

From manufacturers and industry suppliers, to category and generic promotion programs, Achieving Excellence showcases each of the 1994 winners of best in print, radio and television advertising and highlights the best new products, packaging and promotion efforts for milk, cultured products, cheese, frozen desserts and butter.

For details on attending the Dairy Show, please call Sharon Niemczyk at (202) 737-4332.

Exhibit Space Sold Out for Environmental Management Associations 37th National Conference and Exposition

GLENVIEW, IL — Marcie Wangman, Executive Director of the Environmental Management Association (EMA) reported today that exhibit space for the EMA's annual conference is completely sold out. "We are excited about the conference, and the strong response from vendors indicates enthusiasm in the environmental management community as well." Wangman also said that advance registration for the conference is running strong.

The EMA's 37th National Conference and Exposition will be held at the Hyatt Cherry Hill, September 24-28, 1994, in Cherry Hill, NJ. The theme for the 1994 conference is, "Re-engineering Environmental Management While Renewing Ourselves."

The Environmental Management Association is a national professional association of facility managers, environmental services directors and industrial sanitarians. EMA is made up of environmental managers who represent an array of disciplines including food sanitation facilities, buildings and grounds and healthcare facilities.

For further information, contact EMA's national office, 4350 DiPaolo Center, Suite C, Glenview, IL 60025; (708) 699-6362, FAX (708) 699-6369.

“Foodborne Illness: An Update”

In January 1993, a major outbreak of foodborne illness unfolded in several Western States. More than 500 people became ill. Three children and one adult died. A major fast food chain found itself in the headlines. The cause? A pathogenic bacterium called *Escherichia coli* 0157:H7 found in hamburger patties.

Over the past year, smaller outbreaks of *E. coli* have been traced to foods served in a variety of sites: a supermarket, a home kitchen, a food bank and a recreational camp ground. As in the earlier outbreak, children were hit hardest by the illness. In addition, while *E. coli* was traced to foods other than meat, it has been most frequently isolated in ground beef.

According to the Centers for Disease Control and Prevention, *E. coli* outbreaks are increasing. From 1982 through 1990, there were 12 regional outbreaks. In 1993 alone, *E. coli* has surfaced in 16 outbreaks.

As a result of these outbreaks, the Federal Government is rethinking its role in food safety regulation and proposing major changes. We have asked ourselves:

- What can we do to further reduce the likelihood of foodborne disease?
- How should we change the inspection of raw meat and poultry?
- What improvements can be made in our food production systems?
- How can we do a better job of educating consumers and food service workers about food safety risks and safe guards?

We've been working to answer these and other questions over the past months. In the process, we are changing the face of Federal inspection.

Perhaps most significantly, the outbreak has sped the research and design of new inspection programs. These programs will be based on science and an understanding of where risks of contamination are greatest. This system, called Hazard Analysis Critical Control Points (HACCP), will serve as a model for all food safety regulatory programs administered by the U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA).

At the same time, USDA has moved on a number of initiatives specific to meat and poultry inspection. After years of chronic staffing shortages, USDA was given authority to hire an additional 160 Federal meat inspectors.

In addition, we're moving to improve how we conduct meat and poultry inspections. While inspectors now examine the carcass of every animal and all its internal organs looking for signs of disease or contaminated meat, they cannot detect microscopic bacteria. This has got to change. We've given a "fast-track" emphasis to the job of developing new techniques that will allow inspectors to quickly identify the presence of dangerous bacteria.

USDA has also developed labels with "safe handling instructions" that will be placed on all raw meat and poultry products.

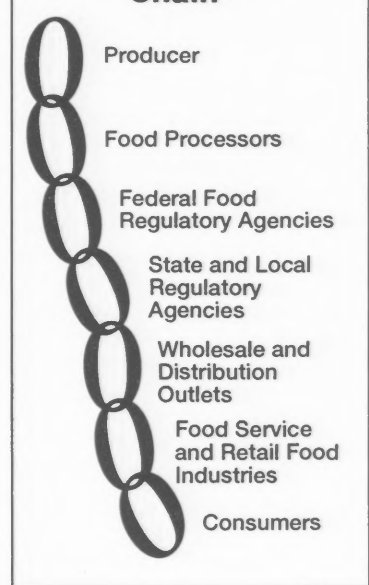
At the same time, the FDA is finalizing the new Federal model code for food service, food vending and food stores. Food regulatory authorities at all levels of gov-

ernment use these model food codes for developing and updating their own food laws and ordinances.

Finally, it's more important than ever that we do a good job of working with food service establishments to educate employees about safe food practices. Federal inspection is only one aspect of keeping food safe. The food service employee is a critical link in the food safety chain. Bacteria are an inherent part of raw food. Food must be properly prepared to protect public health and save food companies from the damage of an outbreak of foodborne illness.

The safety of the American food supply depends on all of us. The American public health is in our hands.

The Food Safety "Chain"



“Food Safety Facts for Food Service Managers”

If awards were given to people “wearing the most hats,” surely food service managers would be at the top of the list.

As managers of both the “back of the house” and the “front of the house” they need to be expert in everything from personnel and public relations to finance, food safety and sanitation.

Sometimes, unfortunately, problems with food safety and sanitation can undermine all of the other hard work that makes a restaurant a success.

This fact was underlined in January 1993, as serious outbreaks of foodborne illness hit several Western States. The outbreaks were traced to a pathogenic bacterium called *Escherichia coli* O157:H7 in hamburger patties served by a fast food chain.

As a result, the Federal government is moving to make changes in two areas: improving meat and poultry inspection and reinforcing food safety training for food handlers and consumers.

The U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA) are working together to update food service managers on keys to safe food handling. Their advice to managers:

- Make sure “food safety systems” are in place,
- Keep up to date on training and technology,
- Understand which foods and which customers are more “at risk,” and,
- Call on expert help when needed.

Food Safety Systems. What does it mean to have a “food safety system?” First, food service managers need to know WHERE and WHEN food is most likely to become contaminated with dangerous bacteria. One such system is called the Hazard Analysis Critical Control Process (HACCP) process. It helps the man-

ager identify food safety risks at critical points—receiving, cooking, hot holding and cooling. Once you know where the risks are, you can set up a system of controls at these critical points to reduce risks.

For instance, under the new FDA Food Code hamburger patties need to be cooked so that all parts reach 155° F for at least 15 seconds. Does that mean you need to check the temperature on every patty? No. You DO need to know how to set up a system to make sure employees are cooking hamburger patties in a way that ensures the right temperature is reached.

Training. It’s vital for food service managers to keep up to date on training programs. Food safety information and training programs are available from Federal agencies, professional organizations as well as some State and local health offices.

Several States and groups have pioneered applying HACCP concepts and training programs to food service. Maryland, for instance, requires food service to develop HACCP programs. The states of New York and Washington encourage food service establishments to voluntarily adopt HACCP programs. The airline industry has been using HACCP as a way of insuring food safety for flight kitchens for many years.

Technology. It’s also important to be aware of new technology, like thermocouples. Thermocouples are more sensitive than stem thermometers and can be used to get accurate readings even in thin hamburger patties.

Understand Foods and Customers “At Risk”.

Ground beef is more “at risk” for dangerous bacteria than other meat. Why? *E. coli* lives in the intestines of healthy cattle, along with other pathogenic bacteria. When cattle are slaughtered, the surface of the meat can become contaminated. Because of

the process of grinding beef, bacteria on the surface are transferred to the interior. If the interior of the patty isn’t cooked thoroughly, dangerous bacteria may remain alive.

Because of this, it’s important for the hamburger to be cooked until the interior is no longer pink and the juices are clear.

At the same time, this also means that beef roasts and steaks, generally, are not as “risky” as ground meat when the center is pink. The center of the roast or steak hasn’t been exposed to surface contamination. The exception? When roasts are fabricated or “tenderizing machines” break the surface of the steak. In those instances, bacteria on the surface could be transferred to the interior of the meat.

Some customers are more at risk than others from foodborne illness. Young children appear to be especially vulnerable to the *E. coli* bacteria. Approximately 500 people became ill as a result of the outbreak in Washington State. Many of those patients were children under 10 years old.

Other people who face special risks of becoming sick from foodborne bacteria include people over 60 as well as people with chronic illnesses and weakened immune systems.

Call on Experts. Finally, don’t hesitate to call on experts for help. Contact State food regulatory agencies, national or State chapters of trade and professional organizations. Both USDA and FDA offer hotline help. USDA’s Meat and Poultry Hotline can be reached at 1-800-535-4555, 10 a.m. to 4 p.m., ET, Monday through Friday. (Washington, D.C. call 1-202-720-3333.) FDA’s Seafood Hotline can be reached by calling 1-800-FDA-4010.

Federal Initiatives Strengthening The Food Safety Chain



Think of our food supply as a huge food safety chain. That chain begins with producers on the farm and at fisheries. It continues through plants that slaughter and process food under the guidance of Federal, State and local regulatory agencies — and moves on through wholesale and distribution outlets before reaching your food service industry and food markets.

Because the food safety chain is so long and so many things can go wrong anywhere, everyone has a responsibility to make sure that food remains safe and wholesome — from the first link to the last link in the chain.

Federal agencies are responsible for monitoring the food industry. To do this, Federal employees inspect food plants in this country as well as imports from other nations.

New Federal initiatives to improve food safety reach out in both directions on the food safety chain—back to the producer and forward to the consumer. These initiatives include:

- Determining why certain food products become contaminated with dangerous food poisoning bacteria and others don't.
- Establishing a mandatory "trace-back" system to trace any foodborne disease to the source — all the way to the farm if necessary.
- Developing new technologies, including rapid tests and other means, to detect disease-causing bacteria on food.
- Identifying critical areas where dangerous bacteria enter the food chain and designing a program to reduce contamination at critical control points.
- Updating model food code provisions governing the retail segment of the food industry — "The Food Code."
- Assessing the use of irradiation for red meat — just as it already has been approved for raw poultry, pork, flour and fruits and vegetables.
- Proposing safe handling instructions on labels of all raw meat and poultry products. New handling instructions for other foods are starting to appear as well.
- Developing national consumer education campaigns to improve the understanding of the risks of unsafe food practices.
- Determining why some people (elderly, children and those who are chronically ill) are more susceptible to foodborne disease than others.
- Encouraging consumers at higher risk for foodborne illness to take extra precautions.
- Educating food service workers on a stepped-up basis about the proper cooking and protection of food — including those who work in day care centers, nursing homes, hospitals, restaurants and fast food chains.

While the actions of the Federal Government are critical, they represent only one link in the food safety chain.

Public health depends on every link in the food safety chain.

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Employment Opportunities

ENVIRONMENTAL SANITARIAN

The Missouri Department of Health is seeking applicants for an Environmental Sanitarian V position in the Bureau of Community Environmental Health. The position is located in Jefferson City and responsibilities include coordinating the On-Site Sewage and Private Water Programs and overseeing the development and implementation of new statewide on-site legislation. Requires Bachelor's degree with 20 semester hours in biology, chemistry, bacteriology or sanitary science or closely related physical or natural science and five years of professional experience in environmental health, including one year involving significant diversification and two years in a supervisory, administrative or consultative capacity. Merit system position with liberal fringe benefits. Salary Range: \$27,744 to \$37,164. Starting salary commensurate with qualifications. For additional information, contact Roger Gibson at (314) 752-6090 or Pat Reagan, Office of Personnel Training, Department of Health, P.O. Box 570, Jefferson City, MO 65102 or (314) 751-6059. Fax (314) 526-5521.

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PRELIMINARY PROGRAM

81st Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians, Inc.

In Cooperation with the Texas Association of Milk, Food and Environmental Sanitarians

**Hyatt Regency Riverwalk, San Antonio, Texas
July 31 - August 3, 1994**

REGISTRATION TIMES

Saturday, July 30	12:00 - 5:00 p.m.
Sunday, July 31	8:30 a.m. - 7:00 p.m.
Monday, August 1	8:00 a.m. - 4:00 p.m.
Tuesday, August 2	8:00 a.m. - 4:00 p.m.
Wednesday, August 3	8:00 a.m. - 12:00 p.m.

EXHIBITOR HOURS

Sunday, July 31	7:45 - 10:00 p.m.
(Following the Opening Session)	
Monday, August 1	9:30 a.m. - 3:30 p.m.
Tuesday, August 2	9:30 a.m. - 3:30 p.m.

IAMFES BOARD MEETINGS

Saturday, July 30	8:00 a.m. - 5:00 p.m.
Tuesday, August 2	7:00 a.m. - 8:30 a.m.
Thursday, August 4	7:00 a.m. - 9:00 a.m.

COMMITTEE/PROFESSIONAL DEVELOPMENT GROUP MEETINGS

SUNDAY, JULY 31

7:00 - 10:00 a.m.	Affiliate Council
10:00 - 11:00 a.m.	Dairy Quality & Safety (Farm Section)
10:00 - 11:00 a.m.	Audio Visual Library
10:00 - 11:00 a.m.	Baking Industry Sanitary Standards
10:00 - 11:00 a.m.	Past Presidents Advisory
10:00 - 12:00 a.m.	Poultry Safety and Quality
10:00a.m - 5:00 p.m.	Communicable Diseases Affecting Man
11:00 - 12:00 a.m.	Dairy Quality and Safety (Plant Section)
11:00 - 12:00 a.m.	Foundation Fund
11:00 - 12:00 a.m.	Nominating
1:30 - 2:30 p.m.	Constitution and By-Laws
1:30 - 2:30 p.m.	Sanitary Procedures
1:30 - 3:00 p.m.	Meat Quality and Safety
1:30 - 3:00 p.m.	Dairy, Food & Environmental Sanitation
1:30 - 3:30 p.m.	Seafood Safety and Quality
1:30 - 3:30 p.m.	Applied Laboratory Methods
1:30 - 3:30 p.m.	Food Service Sanitation
3:00 - 4:00 p.m.	Environmental Issues in Food Safety
3:00 - 4:30 p.m.	Journal of Food Protection Management
3:00 - 5:00 p.m.	Food Safety Network
4:00 - 6:00 p.m.	Program Advisory

WEDNESDAY, AUGUST 3

12:00 - 4:00 p.m.	Program Advisory (members only)
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SUNDAY EVENING, JULY 31

Opening Session

- 7:00 **Welcome to the 81st Annual Meeting** - H. BENGSCHE, President of IAMFES and, R. RICHTER, Chairperson of the Local Arrangements Committee
- 7:15 **Introduction of the Ivan Parkin Lecture** - D. CLINGMAN, President-Elect of IAMFES
- 7:20 **Ivan Parkin Lecture**
- The Ivan Parkin Lecture is sponsored by the IAMFES Foundation Fund and is supported by the Sustaining Members**
- 8:00 **Nachos and Margaritas Reception** - Held in the Exhibit Hall. An opportunity to greet old friends, make new ones and view the excellent technical displays.

MONDAY MORNING, AUGUST 1

Quantitative Risk Assessment in Food Microbiology

Sponsored by the ILSI North America Technical Committee on Food Microbiology

Co-Conveners: E. TODD / P. SLADE
Regency Room

- 8:30 **Overview - the International Commission on Microbiological Specifications for Foods (ICMSF) Approach** - T. ROBERTS, Institute of Food Research, Reading, U.K.
- 9:00 **Risk Assessment Terms and Definitions** - M. POTTER, Centers for Disease Control and Prevention, Atlanta, GA
- 9:30 **Health Risk Analysis of Food in Canada** - E. TODD and J. Harwig, Health Canada, Ottawa, Ontario, Canada
- 10:20 **Process Reliability and Risk - A Food Industry Perspective** - M. COLE, Unilever Research, Bedford, U.K.
- 10:50 **Assessment of Risks Associated with Foodborne Pathogens - an Overview of a CAST (Council for Agricultural Science and Technology) Report** - P. FOEGEDING, North Carolina State Univ., Raleigh, NC
- 11:20 **Risk Analysis and Its Application in Food Regulation** - T. KINDRED, U.S. Dept. of Agriculture, Washington, DC

Technical Session — Dairy

Convener: J. AVERY
Rio E Room

- 8:30 **Vitamin Fortification of Milk** - R. BYRNE, International Dairy Foods Assn., Washington, DC

- 8:45 **Shelf-life of Commercial Conventionally Packaged Cottage Cheese** - S. MURPHY, R. Ledford, D. Bandler, S. Kozlowski, Cornell University, Ithaca, NY
- 9:00 **Computer Models for Thermal Inactivation of Native Milk Enzymes** - R. McKELLAR, Agriculture & Agri-Food Canada, Ottawa, Ontario, Canada

Technical Session — Risk Assessment

Convener: J. AVERY
Rio C Room

- 9:15 **Application of Sewage Sludge to Food Crops** - H. EMERY, San Antonio Water System Regulatory Programs Dept., San Antonio, TX
- 9:30 **Effect of Hydrostatic Pressure, in Combination with Heat and/or Irradiation, on the Survival of *Clostridium sporogenes* in Chicken** - Y. CRAWFORD and E. Murano, Iowa State University, Ames, IA
- 9:45 **Safety and Food Excellence (S.A.F.E.): A Program for Food Service Workers and Care Givers, who prepare Food for the Chronically Ill** - R. GRAVANI, D. Scott, P. Kendall and D. Schmidt, Cornell University, Ithaca, NY
- 10:20 **Environmental Testing for *Listeria*: the Quantitative Edge** - B. JACKSON, VICAM, Watertown, MA
- 10:35 **The Practical and Educational Role of Environmental Monitoring of Food Premises** - I. LINJACKI, University of Guelph, Guelph, Ontario, Canada
- 10:50 **Food Facility Plan Review** - J. SCHRADE, Food and Drug Administration, Brooklyn, NY
- 11:05 **Regulatory Inspection HACCP vs. Food Operation HACCP Self-Control** - O. SNYDER, Hospitality Institute of Technology, St. Paul, MN
- 11:20 **Growth of *Shigella flexneri* in Foods: Comparison of Observed and Calculated Growth Kinetics Parameters** - L. ZAIKA and O. Scullen, U.S. Department of Agriculture, ARS, Philadelphia, PA

Technical Session — Analytical

Convener: K. GLASS
Rio C Room

- 8:30 **Comparison of Enrichment Protocols for Use with VIDAS to Detect *Salmonellae*** - J. BAILEY and N. Cox, U. S. Department of Agriculture, ARS, Athens, GA
- 8:45 **Fluorometric Acid Phosphatase Method for Verifying End-Point Temperature in Cooked Poultry** - C. DAVIS, W. Townsend and C. Lyon, U. S. Department of Agriculture, ARS, Athens, GA
- 9:00 **Improved Medium and Method for Growing *E. coli*** - R. FIRSTENBERG-EDEN, S. Allen, M. Averill and N. Sullivan, Difco Laboratories, Inc., Ann Arbor, MI

- 9:15 **Comparison of a Micro Identification System to Conventional Biochemical Procedures for the Identification of *Salmonella*, *Escherichia coli* and other Gram Negative Enterobacteriaceae from Food Origin** - M. KNIGHT, M. Newman and J. Agin, Q Laboratories, Inc., Cincinnati, OH
- 9:30 **A New Rapid Coliform Detection Method. Petrifilm 2000 Coliform Count Plate** - G. KREJCAREK, K. Hesselroth, P. Mach, and Y. Yang, 3-M Company, St. Paul, MN
- 9:45 **A Murine Monoclonal Antibody Specific to D-serogroup *Salmonella*** - A. MASI and J. Zawistowski, University of Manitoba, Winnipeg, Manitoba, Canada
- 10:20 **ATP Luminescence as a Means to Rapidly Detect Microbial and Fecal Contamination on Carcass Tissue** - G. SIRAGUSA and C. Cutter, U. S. Department of Agriculture, ARS, Clay Center, NE
- 10:35 **Rapid Assessment of *Listeria* Control Using Bioluminescence** - A. WALKER, G. Stewart and J. Holah, Campden Food & Drink Research Assn., Chipping Campden, Glos., U.K.
- 10:50 **Effect of Monolaurin on *L. monocytogenes* Scott A at 37 and 8°C** - M. JOHNSON, D. Scott and A. Bhunia, University of Arkansas, Fayetteville, AR
- 11:05 **An isolation method for *Arcobacter butzleri* from Poultry** - A. LAMMERDING, Agriculture and Agri-Food Canada, Guelph, Ontario, Canada
- 11:20 **Improved Enrichment Recovery of *Campylobacter* spp. from Broiler Chicken Carcasses** - N. STERN, U. S. Department of Agriculture, ARS, Athens, GA
- 11:35 **DNA Probe-HGMF Methods to Detect Enterohemorrhagic *E. coli* and *Shigella* in Foods** - E. TODD, R. Szabo, J. Khattrra, L. Dube, D. Helmerson, D. Granville, A. Boville, H. Lior and J. MacKenzie, Health Protection Branch, Ottawa, Ontario, Canada
- 9:15 **Growth Inhibition of *Penicillium* species by Lactic Acid Bacteria** - H. GOURAMA, The Pennsylvania State University, Reading, PA
- 9:30 **Mechanism of Inhibition of Aflatoxin Biosynthesis by *Lactobacillus Casei Pseudoplatantarum*** - H. GOURAMA and L. Bullerman, The Pennsylvania State University, Reading, PA
- 9:45 **Optimization of Parameters for Production of Nisin and Inhibition of *Lactobacillus plantarum* in a Model Mixed-Culture Fermentation** - L. HARRIS and M. Vieira, University of Guelph, Guelph, Ontario, Canada
- 10:20 **Control of *Salmonella*, *Listeria monocytogenes*, *Campylobacter jejuni*, and Psychrotrophs on Chicken Skin with Lactic Acid and Sodium Benzoate** - C. HWANG and L. Beuchat, University of Georgia, Griffin, GA
- 10:35 **Influence of Sodium Chloride on Thermal Inactivation and Recovery of Non-proteolytic *Clostridium botulinum* Type B Spores** - V. JUNEJA, B. Mamer and B. Eblen, U. S. Department of Agriculture, ARS, Philadelphia, PA
- 10:50 **A Field Study Evaluating the Effectiveness of Different Hand Soaps and Sanitizers** - M. MILLER, L. James-Davis and L. Milanesi, General Mills Restaurants, Inc., Orlando, FL
- 11:05 **Development of Bacteriocin-Based Packaging to Reduce Pathogenic Organisms in Fresh Poultry** - N. NATRAJAN and B. Sheldon, North Carolina State University, Raleigh, NC

MONDAY AFTERNOON, AUGUST 1

**Microbiology vs. Epidemiology:
Complementary or Incompatible
Disciplines Symposium
Convener: E. TODD
Regency Room**

**Technical Session — Antimicrobials
Convener: N. STERN
Rio W Room**

- 8:30 **Decontamination of Beef Carcass Tissue with Bacteriocins Using a Model Carcass Washer** - C. CUTTER and G. Siragusa, U. S. Department of Agriculture, ARS, Clay Center, NE
- 8:45 **Evaluation of Methods to Deliver Bacteriocins during Wiener Manufacturing for Controlling *Listeria monocytogenes*** - A. DEGNAN and J. Luchansky, Food Research Institute, Madison, WI
- 9:00 **Chemical and Microbiological Qualities of Restructured Vacuum-Packaged Lamb Roasts Containing Sodium or Potassium Lactates** - D. FUNG, I. Sh-Sheddy and C. Kastner, Kansas State University, Manhattan, KS
- 1:30 **Worldwide Surveillance of Foodborne Disease Based on Epidemiological and Microbiological Findings** - E. TODD, Health Protection Branch, Ottawa, Ontario, Canada
- 2:00 **Microbiology Versus Epidemiology: Who Do You Trust?** - D. SIMPSON, State Epidemiologist, Austin, TX
- 2:30 **Human and Armadillo Leprosy in the Southern United States** - M. HUGH-JONES, Louisiana State University, Baton Rouge, LA
- 3:20 **A Microbiological Paradox: Viable but Non-Culturable Bacteria** - R. COLWELL, Maryland Biotechnology Institute, College Park, MD
- 3:50 **Hazard Analysis: The Link between Epidemiology and Microbiology** - F. BRYAN, Food Safety Consultation and Training, Lithonia, GA

- 4:20 **Microbiology, Chemistry and Epidemiology: the Setting of Food Safety Policy** - S. MILLER, Health Sciences Center, San Antonio, TX
- 4:50 **Panel of the Speakers: Questions and Conclusions**

Technical Session — General Food Microbiology
Convener: J. CERVENY
 Rio E Room

- 1:30 **Incidence of *Arcobacter* spp. in Ground Pork** - C. COLLINS, I. Wesley and E. Murano, Iowa State University, Ames, IA
- 1:45 **Commercial Field Trials Demonstrating Salmonellae Reduction in Broilers Using a Mucosal Competitive Exclusion Treatment** - N. COX, J. Bailey and N. Stern, U. S. Department of Agriculture, ARS, Athens, GA
- 2:00 **The Attachment of Viable and Nonviable *Salmonella typhimurium* to Poultry Skin** - K. KIM, H. Lillard, J. Frank and S. Craven, University of Georgia, Athens, GA
- 2:15 **Effect of Irradiation of Survival of *Salmonella enteritidis* in Whole Eggs and Liquid Eggs** - L. SERRANO and E. Murano, Iowa State University, Ames, IA
- 2:30 **Microbiological Evaluation of Reprocessed Broiler Carcasses** - C. POWELL, G. Blank and R. Gallop, University of Manitoba, Winnipeg, Manitoba, Canada
- 2:45 **Cider Composition versus Heat Resistance of *Escherichia coli* O157:H7** - D. SPLITSTOESSER, J. Churey and M. McLellan, Cornell University, Geneva, NY
- 3:20 ***Staphylococcus intermedius*: Etiologic Association with Foodborne Intoxication from Butter Blend and Margarine** - R. BENNET, F. Khambaty and D. Shah, Food and Drug Administration, Washington, DC
- 3:35 **Irradiation Inactivation of *Listeria monocytogenes* and *Staphylococcus aureus* in Ground Beef as Affected by Fat Content and Temperature** - J. MONK, M. Clavero, L. Beuchat, M. Doyle and R. Brackett, University of Georgia, Griffin, GA
- 3:50 **Trichinosis Outbreak Associated with Smoked Wild Boar Meat, Ontario, Canada** - B. MARSHALL and S. Isaacs, Wellington-Dufferin-Guelph Health Unit, Guelph, Ontario, Canada
- 4:05 **Enterobacteriaceae from the Chicken Intestine that use Phosphatidylserine for Growth and Inhibit *Salmonella typhimurium*** - S. CRAVEN, U. S. Department of Agriculture, ARS, Athens, GA
- 4:20 **Characterization of Pyocyanine Produced by *Pseudomonas Aeruginosa*** - N. NABBUT, American University of Beirut Medical Center, Beirut, Lebanon

- 4:35 **Effects of Ionizing Radiation and Anaerobic Refrigerated Storage on Indigenous Microflora, *Salmonella* and *Clostridium botulinum* types A and B in Mechanically-deboned Chicken** - D. THAYER, G. Boyd and C. Huhtanen, Eastern Regional Research Center, Philadelphia, PA
- 4:50 **Efficacy of Cultured Whey of Antagonistic Microorganisms to Inhibit Psychrotrophic Pathogens in Refrigerated, Cooked Beef and Poultry** - Y. HAO, R. Brackett and M. Doyle, University of Georgia, Griffin, GA

Stainless Steels for Dairy and Food Equipment Symposium
Co-Conveners: R. AVERY AND T. GILMORE
 Rio C Room

- 1:30 **Utilizing Stainless Steels in the Food and Dairy Industries** - P. ELLIOTT, P.E. Corrosion and Materials Consultancy, Inc., Colts Neck, NJ
- 2:00 **Fabrication and Application of Stainless Steel Equipment for Sanitary Applications** - V. MILLS, Evergreen Packaging Equipment, Cedar Rapids, IA
- 2:30 **Orbital Welding of Stainless Steel Tubing for Food and Dairy Applications** - B. HENON, ARC Machines, Inc., Pacioma, CA
- 3:20 **The Effect of Surface Finish on the Behavior of Stainless Steel in Food and Dairy Science** - A. TUTHILL, Tuthill Associates, Inc., Blacksburg, VA
- 3:50 **Hygiene and Other Health and Safety Aspects of Stainless Steel in Food-Handling and Processing Plants** - J. LILLY, Nickel Development Institute, Toronto, Ontario, Canada

Meat Quality and Safety: Effect of Production and Processing on the Microbial Quality of Meat Symposium
Sponsored by the Ontario Food Protection Assn.
Co-Conveners: R. TIFFIN AND A. LAMMERDING
 Rio W Room

- 1:30 **Innovations in Australian Meat Processing Practices and Slaughter Operations: Their Impact on Microbial Status** - B. SHAY, CSIRO Australia, Meat Safety Laboratory, Brisbane, Queensland, Australia
- 2:00 **Verocytotoxigenic *Escherichia coli*: The Dairy Farm as a Model for Animal - Human Transmission** - R. CLARKE, Agriculture and Agri-Food Canada, Guelph, Ontario, Canada
- 2:30 **FSIS Nationwide Beef Microbiological Baseline Data Collection Program: Survey of Steers and Heifers** - A.M. McNAMARA, U. S. Department of Agriculture, FSIS, Washington, DC

- 3:20 **Canadian Meat Industry Perspectives on How to Address Foodborne Illness** - G. SUNDEEN, Canadian Meat Council, Islington, Ontario, Canada
- 3:50 **HACCP from Pen to Plate** - R. USBORNE, Caravelle Foods, Mississauga, Canada

Monday Poster Session

- **Summary of Standard Plate Counts of Plant Obtained Chocolate Milk and Drinks After 14 Days at 7.2°C (45°F)** - S. BARNARD and R. Bicher, The Pennsylvania State University, University Park, PA
- **Rapid Colorimetric Method for Estimation of Rancidity in Dairy Products** - T. BAUER and P. Vasavada, University of Wisconsin, River Falls, WI
- **Survival of *Brucella abortus* in the Mexican White Soft Cheese** - M. DÍAZ, Centro De Investigacion En Alimentacion y Desarrolla, Sonora, Mexico
- **S-Value and Epifluorescence Determination of Bacterial Attachment on the Cleaning Brush of an Automatic Milking System*** - C. LIU and D. Westhoff, University of Maryland, College Park, MD
- **Effect of Temperature and Cell Concentration on Radiosensitivity of *Listeria monocytogenes*** - L. ANDREWS, D. Marshall and R. Grodner, Louisiana State University, Baton Rouge, LA
- **Rapid Detection of Enterotoxigenic *Clostridium perfringens* in Beef Using an Alkaline Phosphatase Microcolony Technique** - L. BAEZ and V. Juneja, U. S. Department of Agriculture, ARS, Philadelphia, PA
- **Development of Two Simple Methods for the Recovery of *Salmonella* from Food for Detection by PCR** - W. BARBOUR and H. Zanecosky, DuPont Co., Wilmington, DE
- **Comparative Study for Detection of *Listeria monocytogenes* in Foods by a Colorimetric DNA Method and Conventional Culture Methods** - G. DURBIN, K. Keough and G. Reynolds, GENE-TRAK Systems Corp., Framingham, MA
- **Rapid Assay System for the Detection of Beta-lactam Residues in Milk** - S. FAUST, S. Clark and L. Chaney, IDEXX Laboratories, Westbrook, ME
- **Reduction of Hydroxymethylfurfural of Honey Exposed to Different Sources of Radiation** - J. FARIA, Campinas State University, Campinas, Brazil
- **Estimation of Coliform Counts using the BacT/Alert Microbial Detection System** - S. JEFFREY, K. Read and B. Robison, Organon Teknika Corp., Durham, NC
- **Enrichment Procedures Affecting the Sensitivity of the EHEC-Tek™ ELISA System** - S. JEFFREY, R. Durham, B. Robison, Organon Teknika Corp., Durham, NC
- **Efficacy of the Microcolony Immunoblot Technique to Detect Heat-Injured *Listeria monocytogenes*** - J. PATEL and L. Beuchat, University of Georgia, Griffin, GA
- **Use of the BacT/Alert® Microbial Detection System to Monitor Sterility of Aseptically Processed Pudding** - B. ROBISON, Organon Teknika Corp., Durham, NC
- **The Development of a PCR Based Assay for the Detection of *Salmonella*** - G. TICE, M. Jensen, R. Jackson and J. Nozbek, DuPont Co., Wilmington, DE
- **Identifying and Typing *Listeria* Species with Patterns of Eco R1 Fragments Containing Ribosomal RNA Operon Sequences** - J. WEBSTER, E. Cole, J. Bruce, C. Iem and R. Hubner, DuPont Co., Wilmington, DE
- **A 43 hour Test for Detecting *Listeria* in Foods Using the Unipath *Listeria* Clearview Immunoassay** - R. HOLBROOK, T. Briggs, J. Anderson, J. Blades and P. Sheard, Unilever Research, Bedfordshire, U.K.
- **The Rapid Clearview™ *Listeria* Immunoassay for Detection of *Listeria* Species** - S. PARRY, T. Briggs, J. Blades, M. Gani and J. Piron, Unilever Research, Bedfordshire, U.K.
- **Optimization of Commercial Sterility Testing** - M. ROBERT, J. David, S. Alles, T. Weaver, S. Chang and T. VanArman, Gerber Products Co., Fremont, MI
- **Cold Temperature Stress Response of Psychrotrophic *Bacillus cereus*** - E. BERRY and P. Foegeding, North Carolina State University, Raleigh, NC
- **Model for the Non-Thermal Inactivation of *Listeria monocytogenes* in a Reduced Oxygen Environment** - R. BUCHANAN and M. Golden, U. S. Department of Agriculture, ARS, Philadelphia, PA
- **The Synergistic Effect of Sodium Acetate or Sodium Propionate Used in Combination with EDTA and Ascorbic Acid on the Inactivation of *Listeria monocytogenes*** - M. GOLDEN, R. Buchanan and R. Whiting, U. S. Department of Agriculture, ARS, Philadelphia, PA
- ***Aeromonas hydrophila* and Psychrotroph Population of Case- and Pond-Raised Channel Catfish** - Y. HUANG, C. Huang and G. Burtle, University of Georgia, Athens, GA
- **The Use of Response Surface Methodology to Model Non-Linear Survival Curves and to Predict the Effects of Temperature, pH and Sodium Chloride on the Heat Resistance of *Listeria monocytogenes* Scott A** - R. LINTON, W. Carter, C. Gennings and M. Pierson, Virginia Tech University, Blacksburg, VA
- **Validation of Predictive Mathematical Models to Demonstrate Applicability to Foods** - I. WALLS, V. Scott and D. Bernard, National Food Processors Assn., Washington, DC
- **The Economics of Federal HACCP Regulations** - D. ZORN, Food and Drug Administration, Washington, DC
- **An Expert System for HACCP Implementation** - F. BARRON and J. Acton, Clemson University, Clemson, SC
- **Influence of Temperature on Hemorrhagic *Escherichia coli*: Verotoxin Production and Minimum Temperature of Growth** - S. PALUMBO, F. Schultz and A. Williams, U. S. Department of Agriculture, Philadelphia, PA

TUESDAY MORNING, AUGUST 2

Applications For Predictive Microbiology Symposium

Sponsored by the ILSI North America Technical Committee on Food Microbiology

Co-Conveners: P. SLADE AND J. SCOTT
Regency Room

- 8:30 **Overview — Risk Assessment and Predictive Microbiology** - R. BUCHANAN, U. S. Department of Agriculture, Philadelphia, PA
- 9:00 **Modeling Applications** - T. McMEEKIN and T. Ross., University of Tasmania, Hobart, Tasmania, Australia
- 9:30 **Food Micromodel Update - UK and European Perspectives** - T. ROBERTS, Institute of Food Research, Reading, U.K.
- 10:20 **Model Validation (and Confidence in Models) — an Industry Perspective** - M. COLE, Unilever Research, Bedford, U.K.
- 10:50 **Cold Storage Temperature Fluctuations and Predicting Microbial Growth** - C. GILL, Agrifood and Agriculture Canada, Lacombe, Alberta, Canada
- 11:20 **Predictive Microbiology and HACCP** - P. ELLIOTT, Campbell Soup Company, Camden, NJ

Reduction of Foodborne Pathogens on Poultry Symposium

Co-Conveners: S. BAILEY AND M. ROBACH
Rio E Room

- 8:30 **Salmonellae Importance and Detection in Poultry Feeds** - A. WALDROUP, University of Arkansas, Fayetteville, AR
- 9:00 **Control of Salmonellae During Poultry Production** - J. BAILEY, U. S. Department of Agriculture, ARS, Athens, GA
- 9:30 **The Application of Process Modifications, Chemical Treatments, and Biopeptides to Inhibit Foodborne Pathogens Associated with Poultry Products** - B. SHELDON, North Carolina State University, Raleigh, NC
- 10:20 **Reduction of Foodborne Pathogens on Poultry by Treatment with Ionizing Radiation** - D. THAYER, U.S. Department of Agriculture, ARS, Philadelphia, PA
- 10:50 **Development of a Comprehensive Total Quality Assurance Program for use in Fully Integrated Poultry Companies** - M. ROBACH, Continental Grain, Duluth, GA
- 11:20 **Foodservice Industry Perspective on Pathogen Reduction in Poultry** - R. HARRINGTON, National Restaurant Assn., Washington, DC

Pesticides in the Food Industry Symposium

Co-Conveners: K. FUGIULE AND R. GRAVANI
Rio C Room

- 8:30 **The Impact of Sanitation on Pest Control in the Food Establishments** - R. GRAVANI, Cornell University, Ithaca, NY
- 9:00 **IPM — Trends in Pesticide Use and Indoor Environmental Quality** - A. FRISHMAN, AMF Pest Management Services, Inc., Farmingdale, NY
- 10:20 **Rodent Control for Food Processing** - E. MARSHALL, Lipha Tech, Milwaukee, WI
- 10:50 **Future of Pesticides for Use in Food Handling Establishments** - J. TUCKER, Urban Entomologist, Houston, TX

Meat Quality and Safety: Concerns and Solutions throughout Distribution Systems Symposium

Co-Conveners: L. SHELEF AND D. BERNARD
Rio W Room

- 8:30 **Update on Epidemiology of Food Poisoning Outbreaks Caused by Meat Products** - P. SPARLING, Centers for Disease Control and Prevention, Atlanta, GA
- 9:00 **Microbiological Controls for Safety and Quality of Meats During Manufacture** - J. MARSDEN, The American Meat Institute, Washington, DC
- 9:30 **Status of Consumer Education Programs Regarding the Safety of Meat Products** - S. CONLEY, U. S. Department of Agriculture, FSIS, Washington, DC
- 10:20 **The Challenge of HACCP Implementation in Fast Food Operations** - R. HARRINGTON, National Restaurant Assn., Washington, DC
- 10:50 **Safety and Quality of Meat Products at Retail and Deli Operations** - J. FARQUHAR, The Food Marketing Institute, Washington, DC

TUESDAY AFTERNOON, AUGUST 2

General Session — The New FDA Model Food Code: How Will We Implement It? Convener: J. GUZEWICH Regency Room

- 1:30 **The New FDA Food Code** - J. KVENBERG, Food and Drug Administration, Washington, DC
- 1:45 **The Restaurant Industry Perspective** - R. HARRINGTON, National Restaurant Assn., Washington, DC
- 2:00 **The Food Store Perspective** - J. FARQUHAR, Food Marketing Institute, Washington, DC
- 2:15 **The Vending Machine Industries Perspective** - L. EILS, National Automatic Merchandising Association, Chicago, IL

- 2:30 **The Agricultural Agencies Perspective** - E. HEFFRON, Michigan Department of Agriculture, Lansing, MI
- 2:45 **The Health Agencies Perspective** - D. SOWARDS, Texas Department of Health, Austin, TX

IAMFES Annual Business Meeting

- 3:15 **Welcome and Introduction** - D. CLINGMAN, President-Elect
- 3:30 **Report from the President** - H. BENGSCHE
- 3:45 **Business Meeting** - H. BENGSCHE, Presiding
- Moment of Silence in Remembrance of Departed Association Members
 - Minutes of Previous Business Meeting
 - Report of Executive Manager
 - Affiliate Council Report
 - Journal Management Committee Report
 - Old Business
 - New Business
 - Presentation of Resolutions - M. DOYLE, Past President

Tuesday Poster Session

- **Purification and Characterization of a Bacteriocin Produced by *Carnobacterium piscicola* LK5** - L. BAGI and R. Buchanan, U. S. Department of Agriculture, ARS, Philadelphia, PA
- **Biofilm formation by *Escherichia coli* O157:H7 on Stainless Steel Surface: Effect of Chemical Agents** - R. DEWANTI and A. Wong, Food Research Institute, Madison, WI
- **Cooling Rate and Outgrowth of *Clostridium perfringens* Spores in Cooked Ground Beef** - V. JUNEJA, O. Snyder and B. Eblen, U. S. Department of Agriculture, ARS, Philadelphia, PA
- **Isolation and Characterization of Enterocin EL1 A Bacteriocin Produced by a Strain of *Enterococcus faecium*** - W. LYON, E. Murano and D. Olson, Iowa State University, Ames, IA
- **Effect of Temperature, Salt and pH on Growth Inhibition of *Listeria monocytogenes* by Sodium Polyphosphate** - O. SCULLEN and L. Zaika, U. S. Department of Agriculture, ARS, Philadelphia, PA
- **Evaluation of Different Phosphates to Control Microbial Growth in Meat Products** - S. SUMNER, L. Flores, D. Peters and R. Mandigo, University of Nebraska-Lincoln, Lincoln, NE
- **Inhibitory Activity of Caffeic Acid Against *Clostridium botulinum* Spores** - A. WILLIAMS, B. Bowles, and A. Miller, U. S. Department of Agriculture, ARS, Philadelphia, PA
- **Antimicrobial Effect of Sodium Lactate, Trisodium Phosphate, and Sodium Glutamate Monohydrate Pre-Treatments in Combination with Organic Acids on *Escherichia coli* O157:H7** - P. WIXOM and J. Dickson, Iowa State University, Ames, IA
- **Microbiological Shelf-Life Stability of Textured Supro™ Granules** - V. COLLETT, Ralston Purina Co., St. Louis, MO
- **Shelf-life and Microbial Ecology of Precooked Poultry Stored Under Modified Atmosphere at 4°C** - R. BARAKAT and L. Harris, University of Guelph, Guelph, Ontario, Canada
- **Effect of Water Activity and Humectant Identity on the Growth Kinetics of *Escherichia coli* O157:H7** - R. BUCHANAN and L. Bagi, U. S. Department of Agriculture, ARS, Philadelphia, PA
- **Resistance of Acid Adapted Salmonellae to Organic Acid Rinses on Beef** - J. DICKSON and M. Kunduru, Iowa State University, Ames, IA
- **Survival of *E. coli* O157:H7 in Refrigerated and Frozen Low Fat Ground Beef and Thermal Inactivation by Microwave Energy** - L. FLORES, S. Sumner and L. Bullerman, University of Nebraska, Lincoln, NE
- **The Fate of *Listeria monocytogenes* and *Clostridium botulinum* in Minimally-Processed Packaged Vegetables** - J. FARBER, Y. Cai, C. Addison, B. Blanchfield, S. Wang and K. Dodds
- **Use of Time-Temperature Indicator to Monitor the Shelf-Life of Packaged Fresh Catfish** - L. HE and Y. Huang, University of Georgia, Athens, GA
- **Recovery of *Arcobacter* from Broiler Carcasses** - H. LILLARD and N. Stern, U. S. Department of Agriculture, ARS, Athens, GA
- **Monoclonal Antibody for Rapid Detection of *Clostridium botulinum* Toxin Type B** - R. CRAWFORD, J. Ferreira, S. McCay and H. Hamdy, Food and Drug Administration, Atlanta, GA
- **Susceptibility of *Listeria* sp. to Cell Bound Pediocin AcH in BHI Broth, Turkey Frank Slurries, and on Chicken Breast Meat** - J. FERGUSON, A. Bhunia and M. Johnson, University of Arkansas, Fayetteville, AR
- **The Fate of *Listeria monocytogenes* during the Manufacture of Manchego Cheese with Bacteriocin-producing Lactic Acid Bacteria and Commercial Lactic Starters** - E. GARCÍA, J. Rodríguez, P. Gaya, M. Medina and M. Nunez, Tecnología de Alimentos, Madrid, Spain
- **Microbial Changes of Osmotically Dehydrated Green Beans Coupled with Modified Atmosphere Packaging Stored at 10°C** - W. TAN, D. Grinstead, J. Mount and F. Draughon, University of Tennessee, Knoxville, TN
- **Mold Content of Stored Popcorn** - L. BULLERMAN and S. Katta, University of Nebraska, Lincoln, NE
- **Effect of Dry Milling on *Fusarium* Counts and Fumonisin in Corn** - A. CAGAMPANG and L. Bullerman, University of Nebraska, Lincoln, NE
- **Isolation of the Zearalenone-producing Strains from Agricultural Products in Southern Korea** - D. CHUNG, S. Kim and S. Kim, Gyeongsang National University, Gyeongnam, Korea
- **Inhibition of Phosphate on Mold Growth and Mycotoxin Production (T-2 Toxin, Zearalenone)** - D. CHUNG, I. Kim and S. Chung, Gyeongsang National University, Gyeongnam, Korea
- **Immunolocalization of Aflatoxin B1 in Liver of Chick Embryo Intoxicated with Aflatoxin B1** - Y. KO, S. Shu, J. Che and D. Chung, Hanyang University, Seoul, Korea

- The Mycoflora and Mycotoxin-Producing Potential of Fungi from Foods in Burundi - C. MUNIMBAZI and L. Bullerman, University of Nebraska, Lincoln, NE
- Application of Immunohistochemical Technique to Visualize Zearalenone Formation of *Fusarium graminearum* - J. KANG, S. Kang and D. Chung, Jinju Junior College, Gyeongnam, Korea
- Use of TECRA® Unique™ for the Detection of *Salmonella* in a Range of Food Products within 22 hours - D. KERR, M. Ash, D. Hughes and C. Fitzgerald, TECRA Diagnostics, Roseville, Australia
- A Predictive Model with Improved Statistical Analysis of the Interactive Effects of Factors Affecting the Growth of *Staphylococcus aureus* 196E - J. EIFERT, C. Gennings, W. Carter and C. Hackney, Virginia Tech, Blacksburg, VA
- Automated Detection of Foodborne Pathogens Using the TECRA® OPUS® System - M. ASH, D. Chee and U. Gasanov, TECRA Diagnostics, Roseville, Australia
- Agglutination Behavior of Lactic Starter Cultures - S. IBRAHIM and A. Nabulsi, University of Jordan, Jordan

WEDNESDAY MORNING, AUGUST 3

A Symposium on Risk Management
Sponsored by the Grocery Manufacturer's of America
Convener: M. CIRIGLIANO
Rio C Room

RISK ASSESSMENT The Risk Analysis Approach

- 8:30 Risk Analysis and Management Defined
- 9:00 Risk Analysis and Foodborne Illness
- Issues in the Assessment of Food Safety Risks
- 9:30 Infectious Dose and Susceptible Populations
- 10:20 The Role of Epidemiology in Estimating Risk and Risk Exposure
- 10:50 Acceptable Risk and the Risk/Benefit Equation
- 11:20 The "Cost" of Foodborne Disease

Safety and Quality-Related Research -
Dairy Foods and Research Centers Symposium
Convener: R. BISHOP
Rio E Room

- 8:30 Introduction - J. BISHOP, Wisconsin Center for Dairy Research, Madison, WI
- 8:40 A Comparison of Thermal Death Kinetics from Continuous Flow and Batch Leading Systems - P. FOEGEDING, Southeast Dairy Foods Research Center, Raleigh, NC

- 9:25 Shelf-Life Extension of Modified Atmosphere Packaged Cottage Cheese - J. HOTCHKISS and J. Chen, Cornell University, Ithaca, NY
- 10:20 Bacteria of Concern in Extended Shelf-Life Milk - B. WEIMER, M. Blake, D. McMahon and P. Savello, Western Dairy Foods Research Center, Utah State University, Logan, UT
- 11:05 Knowing and Controlling Cheese Pathogens - J. LUCHANSKY, Wisconsin Center For Dairy Research, Madison, WI
- 11:50 Dairy Product Safety System (HACCP) Designed Specifically for the Industry - J. BISHOP and R. Byrne, Wisconsin Center for Dairy Research, Madison, WI

Natural Antimicrobials and Inhibitors
for Food Applications
Sponsored by the ILSI North American Technical
Committee on Food Microbiology
Convener: P. HALL
Regency Room

- 8:30 Bacteriocins for *Listeria* Control - P. MURIANA, Purdue University, West Lafayette, IN
- 9:00 Potential for Use of Bacteriocin-producing Lactic Acid Bacteria in the Preservation of Meats - L. MCMULLEN and M. Stiles, University of Saskatchewan, Saskatoon, Saskatchewan, Canada
- 9:30 Efficacy of Naturally Occurring Food Flavors as Inhibitors of Foodborne Pathogens - B. BOWLES and A. Miller, U. S. Department of Agriculture, Philadelphia, PA
- 10:20 Regulatory Perspectives on the Use of Bacteriocins in Foods - F. FIELDS, U.S. Food and Drug Administration, Washington, DC
- 10:50 USDA's Regulatory Perspective on the Use of Bacteriocins in Foods - R. POST, U. S. Department of Agriculture, FSIS, Washington, DC
- 11:20 Industry Perspective on the Use of Natural Antimicrobials and Inhibitors for Food Applications - G. GOULD, formerly Unilever Research Laboratory, Bedford, U.K.

The Quality and Safety of
Aquacultured Fishery Products Symposium
Convener: Y. HUANG
Rio W Room

- 8:30 Introduction of Aquaculture - R. MARTIN, National Fisheries Institute, Fairfax, VA
- 8:50 Chemical/Physiological Perspectives - G. FINNE, Silliker Laboratories of Texas, College Station, TX
- 9:10 Microbiological Perspective - Fin-Fish - D. WESTHOFF, University of Maryland, College Park, MD

- 9:30 **Microbiological Perspective - Crustaceans** - R. NICKELSON, Silliker Laboratories, Homewood, IL
- 9:50 **Microbiological Perspective - Molluscan** - G. RODRICK, University of Florida, Gainesville, FL
- 10:30 **Residues in Aquacultured Products** - I. HIGUERA, Consultores En Alimentos, Sonora, Mexico
- 10:50 **Value-Added Aquaculture Products** - Y. HUANG, University of Georgia, Athens, GA
- 11:10 **HACCP in Aquaculture** - E. GARRETT, National Marine Fisheries Service, Pascagula, MS

WEDNESDAY AFTERNOON, AUGUST 3

A Symposium on Risk Management (cont.)
Sponsored by the Grocery Manufacturer's of America
Convener: M. CIRIGLIANO
Rio C Room

RISK MANAGEMENT Control Practices and Their Impact

- 1:30 **Managing Risks from the Industry Perspective**
- 2:00 **Economic Impact of Control Practices**

Education and Communication of Risks

- 2:30 **Education and the Public's Understanding of Risk - the Role of Industry, Government and Academia**
- 3:00 **Communicating Food Safety Risks to the Public**

Current Regulatory Approaches

- 3:50 **Short Presentation and Roundtable**

Dairy Symposium
Convener: D. HENNING
Rio E Room

Topics to be announced

**European Food Processing Equipment
Hygiene Standards Symposium**
Convener: H. LELIEVELD
Regency Room

- 1:30 **Food Industry Perspective** - M. MOSTERT, Unilever Research Laboratorium, Vlaardingen, The Netherlands
- 2:00 **Equipment Manufacturers Perspective** - P. SKUDDER, APV Baker Ltd., Crawley, U.K.
- 2:30 **CEN and EHEDG Perspective** - D. TIMPERLY, Campden Food and Drink Research Association, Chipping Campden, U.K.
- 3:20 **The Government Perspective** - B. MITCHELL, Ministry of Agriculture, Fisheries & Food, London, U.K.
- 3:50 **Test Methods and Their Development** - J. HOLAH, Campden Food and Drink Research Association, Chipping Campden, U.K.
- 4:20 **The 3-A Viewpoint on European Standards** - T. GILMORE, Dairy and Food Industries Supply Association, Rockville, MD
- 4:50 **The Challenge - Harmonization of Hygienic Design Criteria** - R. MALLER, Thomas J. Lipton Co., Englewood Cliffs, NJ

**Current Food Safety and Related
Health Issues Symposium**
Convener: J. MARCELLO
Rio W Room

- 1:30 **The Impact of International Free Trade on Food Safety Standards** - K. TING, U. S. Department of Agriculture, Washington, DC
- 2:00 **International Food Safety and Quality Standards** - C. CARNEVALE, Food and Drug Administration, Washington, DC
- 2:30 **Does International Fair Trade Mean Compromised Food Safety Standards? - Impact on Seafood Safety** - C. HACKNEY, Virginia Polytechnic Institute and State University, Blacksburg, VA
- 3:20 **Poultry Safety After NAFTA** - J. MARCY, University of Arkansas, Fayetteville, AR
- 3:50 **Hantavirus Pulmonary Syndrome (HPS) - An Emerging Public Health Threat** - R. GRINNEL, United States Public Health Service, Albuquerque, NM
- 4:20 **Use of Foodborne Disease Data for HACCP Risk Assessment: A New Approach in the State of New York** - J. GUZEWICH, New York State Department of Health, Albany, NY

81st IAMFES Annual Meeting

Spouse/Companion Tours and Special Events

BIENVENIDOS

Sunday, July 31 — 9:00 a.m. - It's up to you

Cost: \$25 (\$30 on-site) Lunch on your own

Welcome to San Antonio . . . one of America's four unique cities . . . where the east meets the west, where the romance and tradition of old Spain meet the sound and energy of a high tech society, where the river dances through the heart of the city and the fiesta never ends. A chartered transit bus will be your magic carpet and Convention Coordinators guide will be your key as you are met at the Hyatt Regency Riverwalk at 9:00 o'clock in the morning for this introductory tour.

First, we'll drive through Hemisfair Plaza to the Institute of Texan Cultures. This "hands-on" museum is for the interpretation and assimilation of Texas history and folk culture and tells about the 26 ethnic groups who were the pioneers of this great state.

We'll drive through the King William Historic District, which was one of San Antonio's early residential neighborhoods. Built at the turn of the century by German "merchant princes," the area has been "re-awakened" and is once again a gracious and friendly old-fashioned neighborhood.

On to the new IMAX Theater, featuring "Alamo - The Price of Freedom," located in Rivercenter Mall. The movie is a stunning experience, shown on a six-story screen with a six-track sound system that lets you "feel" the action. "Alamo - The Price of Freedom" is the most historically accurate depiction of the famous battle in existence. The 45-minute movie "puts you in the middle of the battle of the Alamo."

Walk next door to the "Cradle of Texas Liberty," the Alamo, tucked in among downtown hotels, office buildings and crowded streets. The Alamo's roughly pitted, sandstone facade belies its quiet, churchlike limestone interior where even the most casual visitor experiences an awe while viewing the names of the Alamo heroes inscribed in bronze on the walls.

Continue to San Jose, Queen of the Texas Missions, for a tour of the Indian compound in this extensively restored mission. You will see Indian living quarters, Spanish officer's quarters, the convent, the beautiful church with its elaborately carved entrance, and the famous Rosa's Window.

There will be time for lunch on your own, shopping and browsing in El Mercado where the shops are loaded with curios from the Southwest. Items include: Dresses, shirts, pinatas, dolls, jewelry, straw hats, leather goods, and many other "goodies." Our guide will tell us how to ride the trolley back to the hotel for ten cents. Return to the Hyatt at your leisure.

LBJ RANCH & FREDERICKSBURG

Monday, August 1 — 8:45 a.m. - 4:30 p.m.

Cost: \$25 (\$30 on-site) Lunch on your own

The beautiful Texas Hill Country has never been so well known as when Lyndon B. Johnson was President of the United States. His barbecues under the oak and pecan trees of his ranch were seen by all in those days. So that you can taste a little of "Pedernales country" for yourselves, we have arranged a day in this legendary part of Texas. A chartered motor coach with a Convention Coordinators guide on board will meet you at the Hyatt Regency Riverwalk at 8:45 in the morning for the drive to the LBJ Ranch. There will be a 90 minute educational tour of this National Historic Park including the Junction School, the Johnson birthplace and cemetery, the LBJ ranchlands with its registered Hereford cattle, the Show Barn, and the exterior of the Texas White House where Mrs. Johnson still resides.

On to the historic Fredericksburg for lunch on your own, shopping and browsing on Main Street in this quaint German town, or visiting the Admiral Chester Nimitz Museum of the War of the South Pacific (a Recorded Texas Historic Landmark) with the Japanese Peace Garden.

See the historic "Sunday Houses", where farmers and ranchers stayed on weekends. Return to the hotel at 4:30 in the afternoon.

MIL COLORES

Tuesday, August 2 — 9:00 a.m. - 3:00 p.m.

Cost: \$25 (\$30 on-site) Lunch on your own

Capture the spirit and the many colors of San Antonio as you depart the Hyatt Regency Riverwalk at 9:00 in the morning. We'll follow the Mission Trail, pausing at Mission Concepcion, and San Jose, Queen of the Texas Missions. We'll proceed to historic Fort Sam Houston, established in 1876, and now Headquarters for the Fifth Army. We'll see the enormous parade field, the Quadrangle where Chief Geronimo was once held captive, and General's Row where many famous military personalities have resided.

On to the San Antonio Botanical Center, 38-acres representing, in miniature, the diverse Texas landscape - from the wild flowers of the Texas Hill Country to the formal rose gardens of East Texas. A Biblical Garden, Children's Garden, and a Fragrance Garden are also featured. A highlight of the center is the new underground conservatory, with rare and exotic plants and flowers.

There will be time for lunch on your own and shopping at Los Patios, an oasis on the banks of Salado Creek. Shop in the boutiques located on the park-like grounds, including: The Flower Forest, Marisol Boutique, Tejas Gifts, Tienda, Big Sky Clothing Company, The Gallery, Vega's Jewelry and Lo Singular. Enjoy lunch at the Gazebo, the Hacienda or the Brazier Restaurants.

The McNay Art Museum is a "treasure house of art," religiously dedicated to discriminating taste. Housed in a magnificent Mediterranean mansion built around a lush courtyard and reflecting pool, you'll view works by Van Gogh, Gauguin, Matisse, Picasso, Renoir - to name a few. The McNay is rated one of the best small museums in the country.

We'll pause on Alpine Drive which affords a beautiful view of the city skyline and the Japanese Sunken Garden below. Arrive back at the Hyatt Regency Riverwalk at 3:00 in the afternoon.

SHOPPER'S PARADISE

Wednesday, August 3 — 9:00 a.m. - 4:00 p.m.

Cost: \$20 (\$25 on-site) Lunch on your own

"Shop till you drop!" Today you will see some of the most interesting shops in the area as you depart the Hyatt Regency Riverwalk at 9:00 a.m. in a chartered motorcoach to search for bargains galore! First, we'll journey to San Marcos, Texas, to a new and exciting outlet mall, one of the nation's largest. Clothing, accessories, housewares - in such shops as Adolpho, Perry Ellis, Coach, Mikasa, Eddie Bauer, Etienne Aigner, Nike, Sara Coventry, Fitz & Floyd - and much, much more. On to the Tanger Factory Outlet Center where you'll find items for the entire family. Buy directly from 31 upscale designers and manufacturers outlet stores and save 30 to 70% off retail prices.

Then to the quaint German town of New Braunfels, Texas where "Life is Beautiful." The Langston House, a symmetrical Greek Revival style house, was built in 1854 by Franz Moreau. The log and "fachwerk" construction was common in those days. The house was later occupied by the Gross family, the Frieze Family and then the Langston Family.

We'll continue to the nearby town of Gruene, founded in 1872 by Henry D. Gruene from Germany, who built a home and cotton gin and the town grew. It was known for its dance hall and saloon built in the 1880's which is the oldest dance hall in Texas still in existence. Death came to Henry Gruene in 1920 and this also marked the end of the development of the town. In 1925 the boll weevil and the depression struck and it became a ghost town. The untouched town was purchased in 1974 and businesses were once again established in the old buildings. We'll enjoy stepping back in time as we visit the many shops in town including: Texas Homegrown, The Bush Whacker, Nature's Alliance, The Gruene Antique Company, The Back Porch, Buck Pottery and others. Guests can eat on their own at one of the three restaurants located in Gruene. Arrive back at the Hyatt Regency Hotel at 4:00 o'clock in the afternoon.

Monday Night Social Event

"A LITTLE BIT TEXAN"

August 1 — 6:00 - 10:00 p.m.

Cost: Adults \$35 (\$40 on-site)

Children \$20 (\$25 on-site)

Git your boots, jeans, western shirts and cowboy hats (no six-shooters, please) and head on out for a "little bit of Texas — The Rio Cibolo Ranch."

We'll board our Grey Line buses at 6:00 p.m. and head for the wild, wild east. A short ride later, we'll cross the Rio Cibolo River and pull into the ranch. A Texas style Barbeque dinner - beef brisket and chicken quarters, cole slaw, beans, relish tray, bread and butter and fruit cobbler — will await us.

Work up an appetite by learning or dancing the Texas National past-time — line dancing. A band and dance instructor will be there to show you how its done — the real way. Or there's the Rol-A-Roper, horse shoes, volleyball, basketball, cow-chip toss or wagon rides. Or just chat with your friends under a beautiful Texas sky — (it isn't really any bigger, it just seems like it!)

We'll mosey on back to the Hyatt Regency between 9:30-10:00 p.m.

Traditional IAMFES Gatherings

IVAN PARKIN LECTURESHIP

Sunday, July 31 — 7:00 p.m.

Followed by the **Nachos and Margaritas Reception** for the Opening of the Education Exhibits.
An opportunity to greet old friends, make new ones and view the excellent technical displays.

IAMFES ANNUAL AWARDS RECEPTION AND BANQUET

Wednesday, August 3

Reception: 6:00 p.m.

Banquet: 7:00 p.m.

Cost: \$30 (\$35 on-site)



This is Your Personal Invitation to Join

The International Association of Milk, Food and Environmental Sanitarians, founded in 1911, is a non-profit educational association of food protection professionals. The IAMFES is dedicated to the education and service of its members, specifically, as well as industry personnel in general. Through membership in the Association, IAMFES members are able to keep informed of the latest scientific, technical and practical developments in food protection. IAMFES provides its members with an information network and forum for professional improvement through its two scientific journals, educational annual meeting and interaction with other food safety professionals.

Who are IAMFES Members?

The Association is comprised of a diverse membership of over 3,500 from 38 nations. IAMFES members belong to all facets of the food protection arena. The main groups of Association members fall into three categories: Industry Personnel, Government Officials and Academia.

Why are They IAMFES Members?

The diversity of its membership indicates that IAMFES has something to offer everyone involved in food protection and public health. INFORMATION is that offering.

Your Benefits as an IAMFES Member

Dairy, Food and Environmental Sanitation — Published monthly, this is the official journal of IAMFES. Its purpose is the disseminating of current information of interest to the general IAMFES membership. Each issue contains three to five informational applied research or general interest articles, industry news and events, association news, columns on food safety and environmental hazards to health, a food and dairy industry related products section, and a calendar of upcoming meetings, seminars and workshops. All regular IAMFES members receive this publication as part of their membership.

Journal of Food Protection — A refereed monthly publication of scientific research and authoritative review articles. Each issue contains 12 to 15 technical research manuscripts and one to five articles reporting a wide variety of microbiological research pertaining to food safety and quality. The *Journal of Food Protection* is internationally recognized as one of the leading publications in the food and dairy microbiology fields. This journal is available to all individuals with the Member *Plus* option.

The IAMFES Annual Meeting — Held in a different city each year, the IAMFES Annual Meeting is a unique educational event. Three days of technical sessions, scientific symposia and commercial exhibits provide members and other industry personnel with over 100 presentations on the most current topics in food protection. It offers the opportunity to discuss new technologies and innovations with leading authorities in various fields concerned with food safety. IAMFES members receive a substantially reduced registration fee.

To Find Out More...

To learn more about IAMFES and the many other benefits and opportunities available to you as a member, please call (515) 276-3344, or stop by the IAMFES Annual Meeting Registration Desk.

1994 IAMFES Annual Meeting Exhibitors (as of 7/6/94)

Exhibiting Company	City	State	Booth #
3M Microbiology Products	St. Paul	MN	27
3-A Sanitary Standards Symbol Admin. Council	Columbia	SC	30
A & B Process Systems Corp.	Stratford	WI	31
ABC Research Corporation	Gainesville	FL	37
Advanced Instruments, Inc.	Norwood	MA	38
Aquionics, Inc.	Erlanger	KY	2
Atkins Technical, Inc.	Gainseville	FL	22
Becton Dickinson Microbiology Systems	Cockeysville	MD	53
Bentley Instruments, Inc.	Chaska	MN	42
Biocontrol Systems, Inc.	Bothell	WA	1
bioMérieux Vittek, Inc.	Hazelwood	MO	14 & 15
Biotrace, Inc.	Plainsboro	NJ	43
Capitol Vial, Inc.	Tuscon	AZ	21
Cargill Analytical Services	Cedar Rapids	IA	40
Charles Felix Associates	Leesburg	VA	59
Charm Sciences, Inc.	Malden	MA	41
Crouch Supply Co., Inc.	Ft. Worth	TX	55
Custom Control Products, Inc.	Racine	WI	33
Dairy & Food Labs, Inc.	San Ramon	CA	35
Decagon Devices, Inc.	Pullman	WA	46
Difco Laboratories	Detroit	MI	6
Diversey Corp.	Livonia	MI	39
DQCI Services, Inc.	St. Paul	MN	26
Dresser Industries Instruments Division	Stratford	CT	48
Dynal, Inc.	Lake Success	NY	49
The Educational Foundation of the National Restaurant Association	Chicago	IL	25
Electro-Steam Generator Corporation	Alexandria	VA	60
EM Science	Gibbstown	NJ	17
Foss Food Technology	Eden Prairie	MN	12 & 13
G & H Products Corp.	Kenosha	WI	5
Gardex Chemicals, Ltd.	Etobicoke	Ontario	10
Gist-Brocades	Menomonee Falls	WI	3
Idetek, Inc.	Sunnyvale	CA	29
IDEXX Laboratories, Inc.	Westbrook	ME	58
Integrated BioSolutions, Inc.	Monmouth Junction	NJ	32
International BioProducts, Inc.	Redmond	WA	20
Klenzade, Ecolab, Inc.	St. Paul	MN	24
Meritech, Inc.	Englewood	CO	51
Michelson Laboratories, Inc.	Commerce	CA	52
NASCO	Fort Atkinson	WI	57
Nelson-Jameson, Inc.	Marshfield	WI	9
Nickel Development Institute	Toronto	Ontario	7
Organon Teknika	Durham	NC	23
PRISM	Miami	FL	4
Q Laboratories, Inc.	Cincinnati	OH	61
Ralston Analytical Laboratories	St. Louis	MO	18
REMEL	Lenexa	KS	47
R-Tech	Minneapolis	MN	28
Silliker Laboratories Group	Homewood	IL	54
Smithkline Beecham Animal Health	Exton	PA	56
Sparta Brush Company	Sparta	WI	36
The Sterilex Corporation	Owings Mills	MD	8
Troy Biologicals, Inc.	Troy	MI	50
Unipath (a Division of UL Canada Inc.)	Nepean	Ontario	44 & 45
Vicam	Watertown	MA	16
Weber Scientific	Hamilton	NJ	11
West Agro, Inc.	Kansas City	MO	19
ZEP Manufacturing Company	Atlanta	GA	34



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Coming Events

1994

July

•8-15, Rapid Methods and Automation in Microbiology International Workshop XIV, to be held at Kansas State University, Manhattan, KS. For more information contact Dr. Daniel Y. C. Fung at (913) 532-5654, FAX (913) 532-5681. A mini-symposium will occur on July 8th and 9th.

•12-13-Animal Housing Expo, to be held at the Lebanon Fairgrounds in Lebanon County, University Park, PA. For reservations or for information about exhibiting at the expo, contact general chair Dan McFarland, Penn State Cooperative Extension, 112 Pleasant Acres Road, York, PA 17402-9041, or call (717) 757-9657.

•27-August 3, 1994 Dairy Study Tour to Michigan, sponsored by the University of Minnesota, St. Paul, MN. Tour visits dairy farms and scenic sites in Michigan. For more information, contact Gerry Wagner at (612) 625-1978.

•27-28, American Frozen Food Institute (AFFI) Workplace Safety Conference, to be held at the Westin Hotel in Denver, CO. For more information, call Bob Garfield, AFFI's vice president of regulatory and technical affairs, at (703) 821-0770.

•31-August 3, 81st Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians will be held at the Hyatt Regency Hotel, San Antonio, TX. For more information, contact: Julie Heim — Registration; David Tharp — Exhibits; at (800) 369-6337 (US or Canada) or (515) 276-3344.

August

•9-10, Producing Safe Dairy Foods, a two-day course sponsored by the Center for Dairy Research in Madison, WI. For further information, contact the CDS Conference Office at (608) 263-1672.

•9-12, Fermentation Microbiology, a continuing education workshop sponsored by the American Type Culture Collection, will be held in Rockville, MD. For more information, contact the ATCC Workshop Manager at (301) 231-5566.

•15-17, Downstream Processing, Recovery and Purification of Proteins, a continuing education workshop sponsored by the American Type Culture Collection, will be held in Rockville, MD. For more information, contact the ATCC Workshop Manager at (301) 231-5566.

•16-18, 11th Biennial Cheese Conference, sponsored by the Department of Nutrition and Food Sciences, Western Center for Dairy Protein Research and Technology, Cooperative Extension Service, Utah State University. For more information, contact Gayla Johnson (801) 797-2379.

•20-25, 41st International Congress of Meat Science and Technology, hosted by the American Meat Science Association, to be held in San Antonio, TX. For more information

contact Ken Johnson, ICoMST Secretariat at (312)467-5520.

•23-24, Microbiological Concerns in Food Plant Sanitation & Hygiene, a two — day interactive lecture course, sponsored by Silliker Laboratories Group, Inc., will be held in Chicago, IL. For further information, contact Silliker Laboratories, Education Services Department at (800) 829-7879.

•25, Dairy and Food Industries Supply Association (DFISA) Seminar, a full-day seminar entitled "Road to Exporting" sponsored by the International Trade Committee of DFISA, will be held at the Hyatt Regency O'Hare in Chicago, IL. For further information, contact Jennifer Brown, Director of Marketing Information, at (301) 984-1444.

September

•8-9, Anaerobic Bacteriology, a continuing education workshop sponsored by the American Type Culture Collection, will be held in Rockville, MD. For more information, contact the Workshop Manager at (301) 231-5566.

•14-16, International Dairy Federation Annual Sessions to be held in Adelaide, Australia. **18-22 International Dairy Congress** to be held in Melbourne, Australia. For more information please contact IDF, 1601 Malvern Road, Glen Iris 3146, Victoria, Australia, Telephone (03) 885-9781, FAX (03) 885-0017.

•14-16, Growth and Preservation of Animal Viruses, a continuing education workshop sponsored by the American Type Culture Collection, will be held in Rockville, MD. For more information, contact the ATCC Workshop Manager at (301) 231-5566.

•18-21, 1995 National Educational Conference, sponsored by the Canadian Institute of Public Health Inspectors, "Approaching the 21st Century — Challenges in Health Protection," to be held in Victoria, British Columbia, Canada. For more information please contact Mr. R. W. Bradbury (604) 478-0523, FAX (604) 478-9363.

•18-23, Second Asian Conference on Food Safety, sponsored by the International Life Sciences Institute, will be held in Bangkok, Thailand. For more information, contact Lili Merritt (202) 659-0074.

•19-21, Indiana Environmental Health Association Fall Annual Educational Conference will be held in Muncie, IN. For additional information, contact Tami Barrett at (317) 633-8400.

•19-23, Second International Activated Carbon Conference hosted by the Professional Analytical and Consulting Services, Inc., will be held at Plaza Hotel in Pittsburgh, PA. For more information contact Henry Nowicki (412) 457-6576.

•20-22, New York State Association of Milk and Food Sanitarians Annual Conference, Sheraton Inn-Buffalo Airport, Buffalo, NY. For more information contact Janene Gargiulo (607) 255-2892.

•21-23, Microscopy/Photomicrography, sponsored by the American Type Culture Collection, will be held in Rockville, MD. For more information, contact the ATCC Workshop Manager at (301) 231-5566.

•21-24, National Society for Healthcare Foodservice Management (HFM) 1994 National Training Conference will be held at the Breakers in Palm Beach, FL. For more information contact HFM at (202) 546-7236.

•26-28, Conventional and Molecular Cytogenetic Techniques, a continuing education workshop sponsored by the American Type Culture Collection, will be held in Rockville, MD. For more information, contact the ATCC Workshop Manager at (301) 231-5566.

October

•5-7, New York State Registry of Sanitarians 1994 Educational Conference will be held at the Villa Roma Resort Hotel, Callicoon, NY. For more information please contact Susan Jones (516) 727-8947 or Michele Hecht (516) 349-5816.

•5-8, 1994 International Dairy Show, sponsored by the International Dairy Foods Association, Milk Industry Foundation, National Cheese Institute and International Ice Cream Association, co-sponsored by the American Butter Institute, will be held at the Minneapolis Convention Center, Minneapolis, MN. For more information, contact International Dairy Show Convention Management at (703) 876-0900.

•12-13, Iowa Association of Milk, Food and Environmental Sanitarians Annual Meeting will be held at the Best Western Starlite Village (formerly the Ramada Hotel), Waterloo, IA. For more information, call Dale Cooper at (319) 927-3212.

•12-13, Seafood Quality Evaluation Workshop for Analytical Laboratories and the Seafood Industry, co-sponsored by the University of California Cooperative Extension, Sea Grant Extension Program; U.S. Food and Drug Administration; U.S. Department of Commerce; and National Food Processors Association, will be held at the Doubletree Hotel and Marina in San Pedro, CA. For further information contact Bob Price (916) 752-2194 or Pamela Tom (916) 752-3837.

•19-20, North Central Cheese Industries Association Annual Conference to be held at the Holiday Inn, Brookings, South Dakota. For further information contact E. A. Zottola, Executive Secretary, NCCIA, Box 8113, St. Paul, MN 55113.

•21-22, Breakfast Cereal Technology, sponsored by the American Association of Cereal Chemists, will be held in Minneapolis, MN. For more information, please contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121. Phone (612) 454-7250, FAX (612) 454-0766.

•25-26, HACCP for Meat and Poultry Processors, a two-day interactive workshop designed for those responsible for implementing a HACCP plan in a processing plant, will be held in Dallas, TX. Sponsored by Silliker Laboratories Group, Inc., more information is available by calling Silliker's Education Services Dept. at (800) 829-7879.

•25-26, Illinois Environmental Health Association's Annual Education Conference will be held at the Hotel Pere Marquette in Peoria, IL. For more information (708) 682-7979, ext. 7196.

November

•2-3, North Dakota Environmental Health Assn. Annual Educational Conference will be held at the International Inn, Williston, ND. For more information, contact Deb Larson at (701) 221-6147.

•2-7, Fifth Panamerican Dairy Congress, the International Fair of the Dairy Industry and Dairy Cattle Exhibition, co-sponsored by the Panamerican Dairy Federation, FEPALE and the COLANTA Dairy Cooperative, will be held in Medellin, Colombia, South America.

•7-10, Second Saudi Symposium and Exhibition on Food and Nutrition will be held at King Saud University campus in Riyadh, Saudi Arabia. For more information, contact the Food Science Department at 1-966-467-8407 or FAX 966-1-467-8394.

•9-10, Separations Technologies: Markets and Applications. Location: Royal Sonesta Hotel, Cambridge, MA. For more information, please contact Program Division, Technomic Publishing Company, Inc., 851 New Holland, Ave., Box 3535, Lancaster, PA 17604; phone: (717) 291-5609; FAX (717) 295-4538. Toll free U.S. and Canada: (800) 223-9936

1995

January

•3-5, Milling for Cereal Chemists, sponsored by the American Association of Cereal Chemists, will be held in Kansas State University, Manhattan, KS. For more information, please contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121. Phone (612) 454-7250, FAX (612) 454-0766.

•16-17, Wheat Gluten: Chemistry and Technology, sponsored by the American Association of Cereal Chemists, will be held in Kansas City, MO. For more information, please contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121. Phone (612) 454-7250, FAX (612) 454-0766.

•18, Dough Modifiers, sponsored by the American Association of Cereal Chemists, will be held in Kansas City, MO. For more information, please contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121. Phone (612) 454-7250, FAX (612) 454-0766.

•18-21, U.S. Dairy Forum, sponsored by the International Dairy Foods Association, will be held at La Quinta Resort and Club in Palm Springs, CA. For more information call (202) 737-IDFA.

•19, Food Surfactants, sponsored by the American Association of Cereal Chemists, will be held in Kansas City, MO. For more information, please contact Marie McHenry, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121. Phone (612) 454-7250, FAX (612) 454-0766.

To insure that your meeting time is published, send announcements at least 90 days in advance to:
IAMFES, 6200 Aurora Avenue, Suite 200W, Des Moines, IA 50322-2838.

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IAMFES Offers the Northeast Dairy Practices Council (NDPC) "Guidelines for the Dairy Industry"

At the urging of our Dairy Quality and Safety Professional Development Group, IAMFES has entered into an agreement with the Northeast Dairy Practices Council (NDPC) to distribute their "Guidelines for the Dairy Industry."

NDPC is a non-profit organization of education, industry and regulatory personnel concerned with milk quality and sanitation throughout 15 northeastern/mid-Atlantic states. Interestingly, its membership and subscriber rosters list individuals and organizations throughout the United States, Canada and Japan.

For the past 25 years, NDPC's primary mission has been the development of and the distribution of educational guidelines directed to proper and improved sanitation practices in the production, processing, and distribution of high quality fluid milk and manufactured dairy products.

The NDPC Guidelines are written by professionals who comprise five permanent Task Forces. Prior to distribution, every Guideline is submitted for approval to the key milk control sanitarian in each of the 15 states which are now active participants in the NDPC process. Should any official have an exception to a section of a proposed guideline, that exception is noted in the final document.

Although the Guidelines are developed east of the Mississippi River, clearly they have a high degree of applicability wherever cows are milked and milk is transported, processed and distributed.

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

The entire set consists of 48 guidelines including:

- | | |
|---|---|
| 1 Dairy Cow Free Stall Housing | 32 Fat Test Variations in Raw Milk |
| 2 Effective Installation, Cleaning and Sanitizing of Milking Systems | 33 Brucellosis and Some Other Milkborne Diseases |
| 3 Selected Personnel in Milk Sanitation | 34 Butterfat Determinations of Various Dairy Products |
| 7 Sampling Fluid Milk | 35 Dairy Plant Waste Management |
| 8 NE Ext. Publ., Conferences, Short Courses, Correspondence Courses and Visual Aids in Dairying | 36 Dairy Farm Inspection |
| 9 Fundamentals of Cleaning and Sanitizing Farm Milk Handling Equipment | 37 Planning Dairy Stall Barns |
| 10 Fluid Milk Shelf Life | 38 Preventing Off-flavors in Milk |
| 11 Sediment Testing and Producing Clean Milk | 39 Grade A Fluid Milk Plant Inspection |
| 13 Environmental Air Control & Quality for Dairy Food Plants | 40 Controlling Fluid Milk Volume and Fat Losses |
| 14 Clean Room Technology | 41 Milkrooms and Bulk Tank Installation |
| 16 Handling Dairy Products From Processing to Consumption | 42 Stray Voltage on Dairy Farms |
| 17 Causes of Added Water in Milk | 43 Farm Tank Calibrating and Checking |
| 18 Abnormal Milk--Fieldman's Approach | 44 Troubleshooting Dairy Barn Ventilation Systems |
| 21 Raw Milk Quality Tests | 45 Gravity Flow Gutters for Manure Removal in Milking Barns |
| 22 Control of Antibacterial Drugs and Growth Inhibitors in Milk and Milk Products | 46 Dairy Odor Control |
| 23 Preventing Rancid Flavors in Milk | 47 Naturally Ventilated Dairy Cattle Housing |
| 24 Troubleshooting High Bacteria Counts of Raw Milk | 48 Cooling Milk on the Farm |
| 25 Cleaning and Sanitizing Bulk Pickup and Transport Tankers | 49 Postmilking Teat Dips |
| 28 Troubleshooting Residual Films on Dairy Farm Milk Handling Equipment | 50 Farm Bulk Milk Collection Procedures |
| 29 Cleaning and Sanitizing in Fluid Milk Processing Plants | 51 Controlling the Accuracy of Electronic Testing Instruments for Milk Components |
| 30 Potable Water on Dairy Farms | 52 Emergency Action Plan for Outbreak of Milkborne Illness in the Northeast |
| 31 Composition and Nutritive Value of Dairy Products | 53 Vitamin Fortification of Fluid Milk Products |
| | 54 Selection and Construction of Herringbone Milking Parlors |
| | 56 Dairy Product Safety (Relating to Pathogenic Bacteria) |
| | 57 Dairy Plant Sanitation |
| | 58 Sizing Dairy Farm Water Heater Systems |
-

If purchased individually, the entire set would cost \$174. We are offering the set, packaged in three loose leaf binders for \$125 plus \$9 shipping and handling (outside the US, \$21 for shipping and handling).

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

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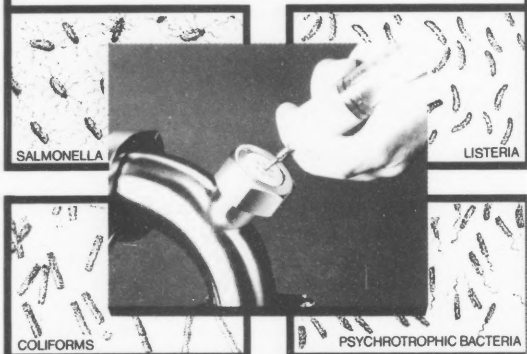
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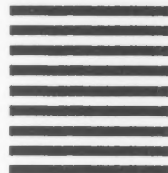


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Dairy, Food and Environmental Sanitation Readers:

Through a series of errors and omissions, the June issue you originally received was not of the quality you have come to expect from us, nor was it of the quality we expect from ourselves. The only course of action for us was to reprint the issue. This is the issue you should have received in June!

We have taken a number of steps internally and externally aimed at preventing a re-occurrence of this situation.

We have placed the "revised" issue in this removable wrapper for your convenience. If you still have the original issue around, we ask that you destroy it and replace it with this "revised" issue.

We thank you for your patience and understanding.

Sincerely,

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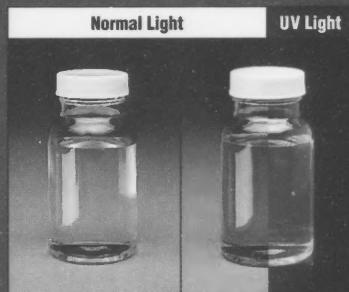
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