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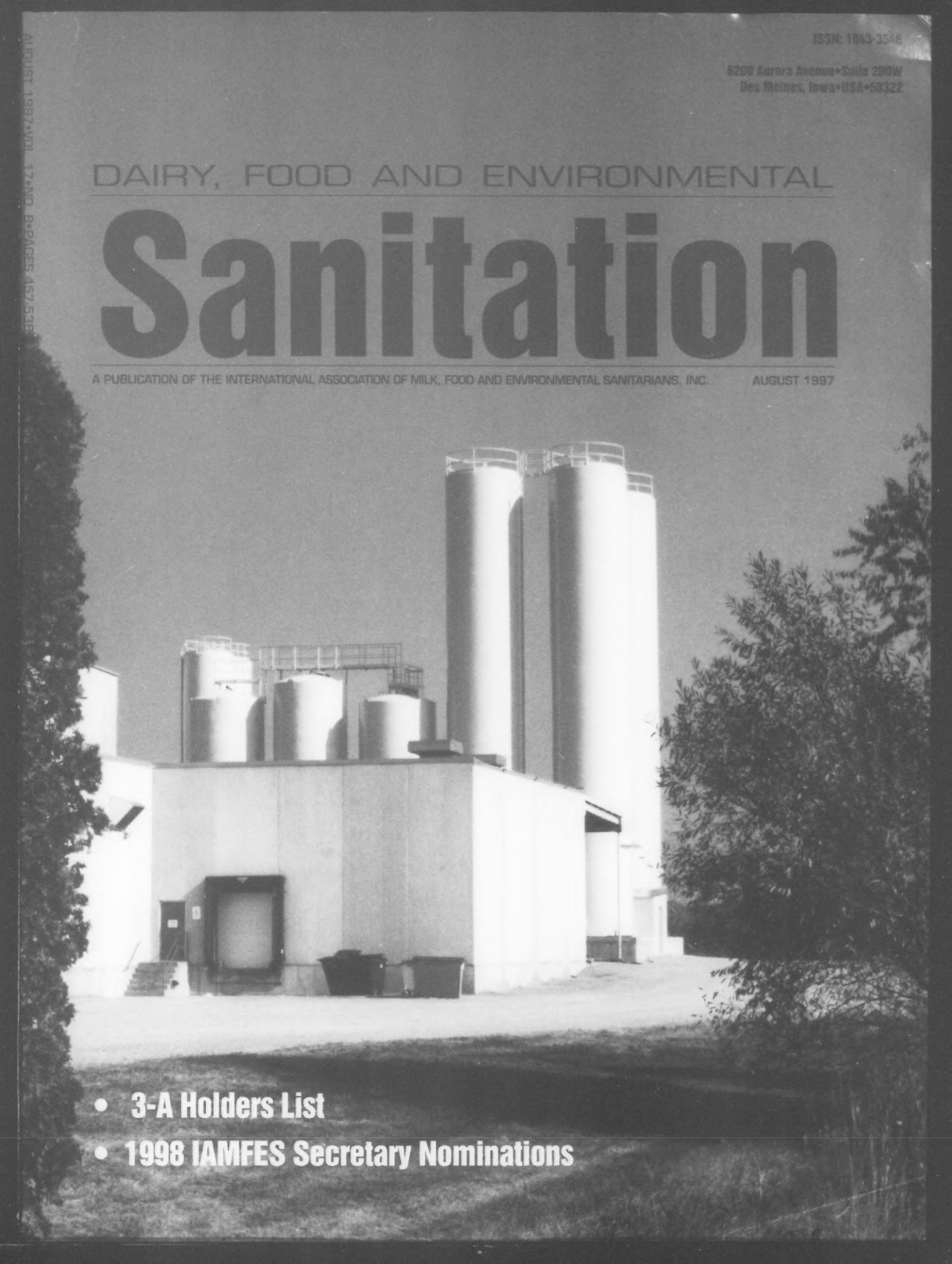
DAIRY, FOOD AND ENVIRONMENTAL

Sanitation

A PUBLICATION OF THE INTERNATIONAL ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SANITARIANS, INC. AUGUST 1997



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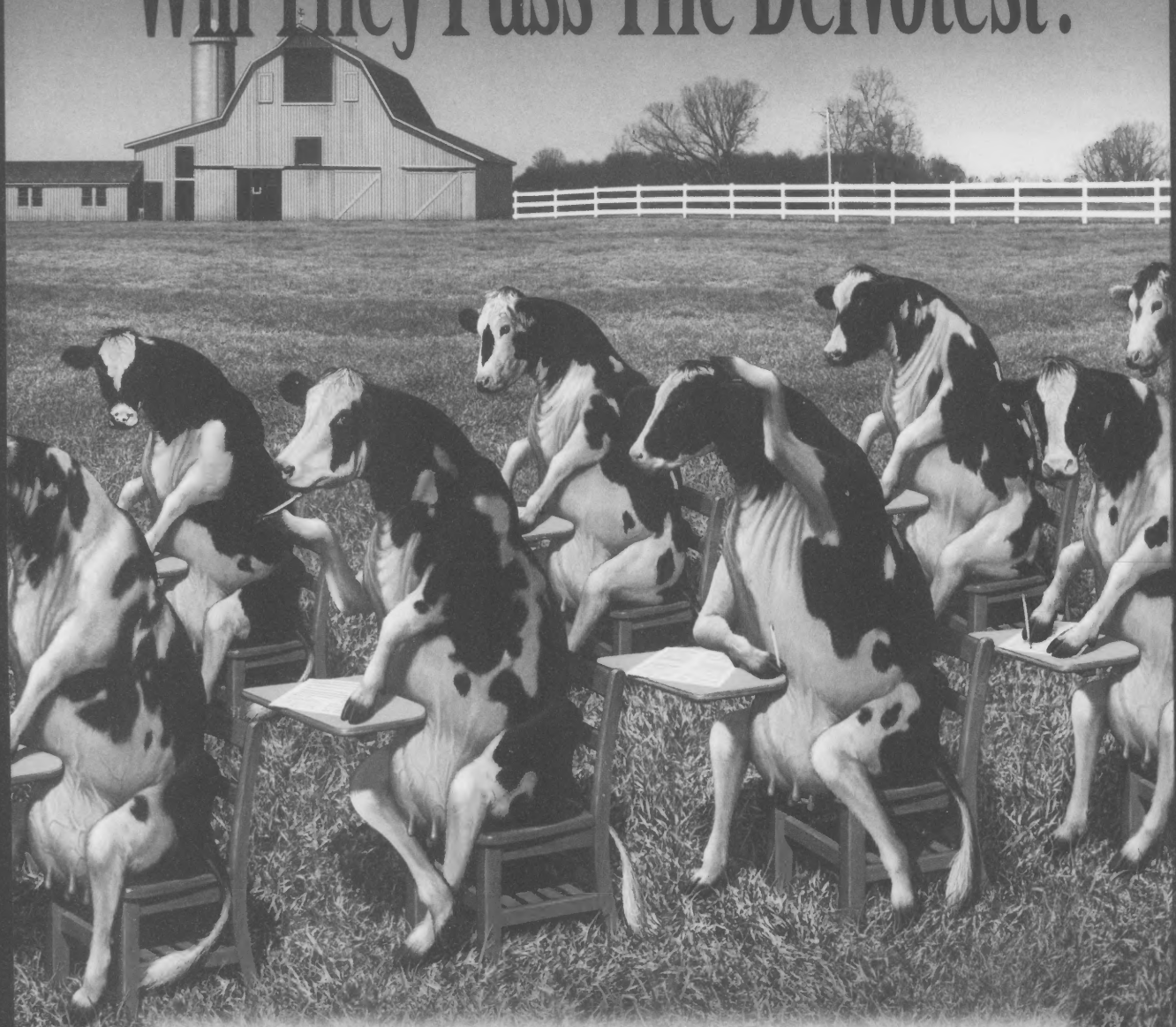

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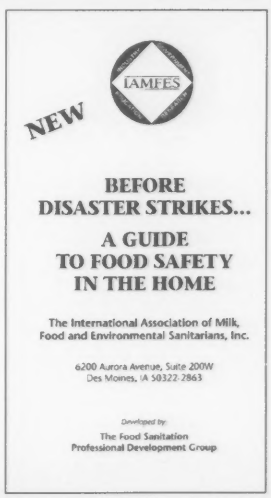

DAIRY, FOOD AND ENVIRONMENTAL

Sanitation

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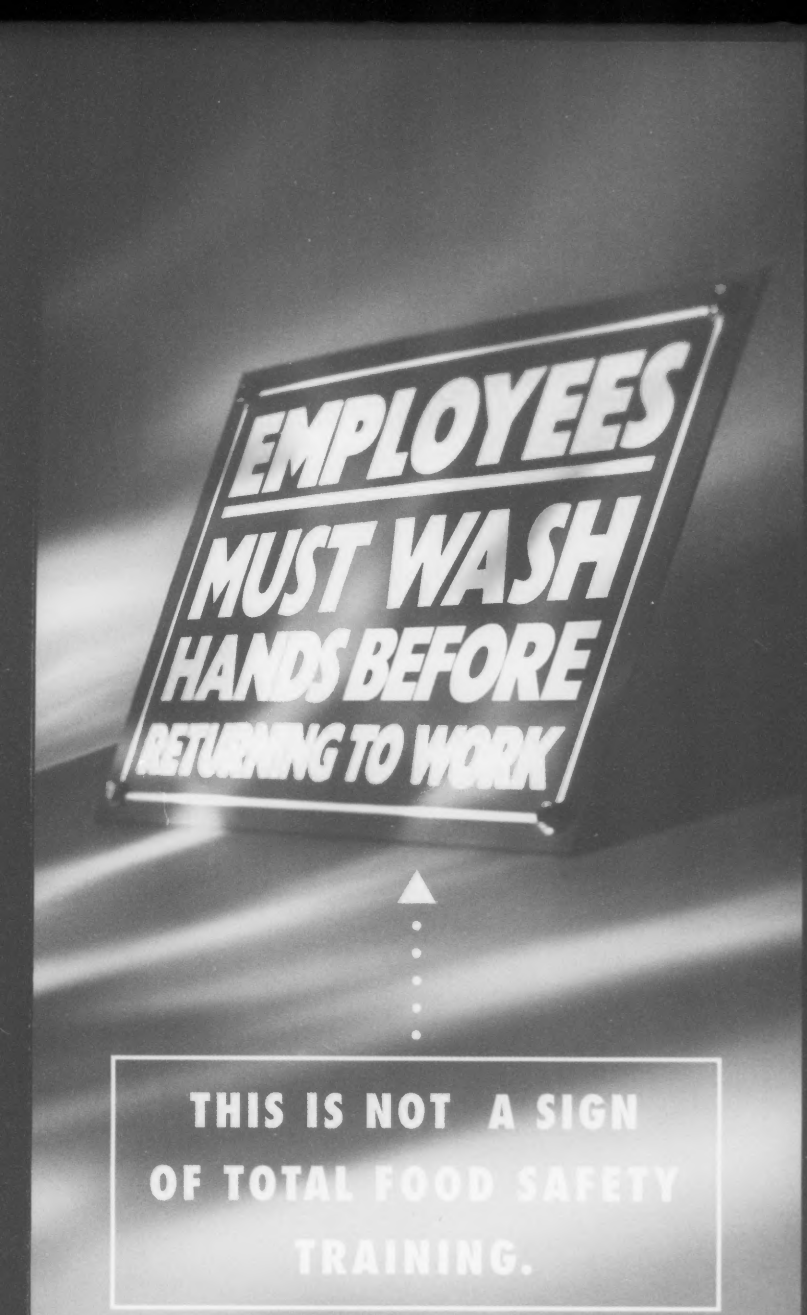

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Sanitation

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Part 2—Summary and Presentation of Descriptive Data and Epidemiologic Patterns; Their Value and Limitations

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Written by: Frank L. Bryan, John J. Guzewich, and Ewen C. D. Todd

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COMMENTS

FROM YOUR PRESIDENT

By GALE PRINCE
IAMFES President

"Orlando beckoned IAMFES members from around the world"

The steamy central Florida sun was out, lightning struck, and the rain rolled through; as did over 1,000 attendees! Orlando beckoned IAMFES members from around the world. You answered with spouses and children in tow.

Though the competition for your attention in Orlando was fierce, we duked it out (the Mighty Mouse packs a mean right hook) and managed to have continually well-attended sessions. The Florida Local Arrangements Committee served as an excellent host. For this I extend my thanks to all who attended and assisted with this year's meeting.

Over the past few years IAMFES has developed partnerships with many different organizations and companies. We owe a great deal to these valuable relationships. One that stands out in my mind as key to shaping the present-day IAMFES Annual Meeting is International Life Sciences Institute (ILSI). ILSI has been instrumental in increasing our international involvement. The IAMFES Executive Board is appreciative of the time, effort, voluntary contributions, and financial support that has stemmed from these recent cooperative ventures. Every bond we establish allows people to learn about and contribute to IAMFES and its mission.

With the passing of the 84th Annual Meeting, we witnessed two milestones for the Association. Our official attendance at the Annual Meeting surpassed the 1,000 mark, and we saw the presentation of IAMFES' first affiliate charter to a country outside North America. Korea was welcomed as an official IAMFES Affiliate on July 8, 1997. Several other countries have expressed an interest in forming a chapter of IAMFES' and will be working with the Executive Board and staff to explore these possibilities.

Surpassing the 1,000 attendee mark demonstrates the strength of IAMFES among food safety professionals and cannot be attributed to any one person or area of this Association. The foundation of the Annual Meeting is the program it offers participants. Thanks go to all of our committees, task forces, and professional development groups for their hard work in developing program ideas to assist the Program Advisory Committee. Each year the Program Advisory Committee works diligently to improve on last year's presentations. Before we left Orlando, the Program Advisory Committee had taken your ideas and outlined the subject matter for the 1998 Annual Meeting in Nashville. The committee will be coordinating regional workshops this year in addition to the program of the Annual Meeting.

Special thanks to our exhibitors at the Annual Meeting. They bring us an excellent opportunity to learn and expand our horizons with ideas and new tools to achieve our mission.

Dr. Martha Roberts, our 1997 Ivan Parkin Lecturer, opened the Annual Meeting by challenging food safety professionals to stand up for sound science. Her leadership in food safety sets an outstanding example for all of us.

The 1997 IAMFES Annual Meeting is history. If you have ideas to make the 1998 IAMFES Annual Meeting even better, please let me know. We will be discussing the Annual Meeting at our October Executive Board meeting. You can reach me at 513.762.4209; E-mail: gprince@kroger.com.

For those who attended, thanks! For those who couldn't attend, you were missed. Mark your calendars now to attend the 1998 meeting in Nashville, August 16-19, to be sure you don't miss out.

Reward Industry Excellence

Nominate Now!

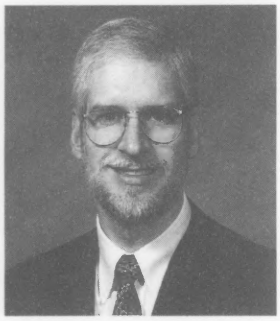
The 1998 IAMFES Black Pearl Award

Nominate a company superior in food quality and safety for the Black Pearl Award presented annually at the IAMFES Annual Meeting.

The Black Pearl Award, sponsored by Wilbur Feagan and F&H Food Equipment Company, was first presented in 1994. The Black Pearl Award was established to recognize a company for its outstanding commitment to and achievement in corporate excellence in food protection. For more information and to receive nomination criteria, contact the IAMFES office at 800.369.6337 or 515.276.3344; Fax: 515.276.8655.

COMMENTARY

FROM THE EXECUTIVE DIRECTOR



By DAVID W. THARP
IAMFES Executive Director

"The future for IAMFES is truly untapped"

My how time flies! The 84th IAMFES Annual Meeting is history. Completed. We had excellent attendance and surpassed 1,000. We had an excellent hotel in the Hyatt Regency Grand Cypress and an outstanding host in our Florida Affiliate! We could not ask for anything more!

I want to express my sincere thanks to the Florida Association of Milk, Food and Environmental Sanitarians and their Co-Chairs, Peter Hibbard and John Chrisman for the many hours of planning and for providing staffing for the Annual Meeting. Great job!

There are so many other IAMFES Members whose efforts enabled our Annual Meeting to flow smoothly and provide current science and information. The Program Advisory Committee was responsible for the excellent program; our exhibiting companies provided the latest in product and technology; and many individuals made a large commitment to IAMFES by delivering presentations. In addition, many associations and companies provide monetary support of speakers to enable their presence.

Thanks to everyone involved for your part in making this Annual Meeting the finest ever!

At the IAMFES Business Meeting, I reported on the operations of IAMFES and would like to summarize it for those of you not present. I pointed out that this was a year of change; I was appointed Director in January and we did some regrouping. We have made a great deal of progress since January. I would like to recognize the IAMFES staff for their teamwork and effort in planning the Annual Meeting. Each staff member is to be commended for their dedication and work ethic! I hope that you, as a Member, recognize the work the IAMFES staff performs. Take a minute of your time to show them your appreciation.

Both *Dairy, Food and Environmental Sanitation* and the *Journal of Food Protection* continue on schedule and in good shape. We are making progress in reducing processing time for manuscripts and are moving our mail dates ahead to help ensure you receive your journals in the issue month. For those who are international members, we are investigating alternative shipping methods so you receive your journals sooner.

We are installing new membership database software this fall and have established a rotation system to update our computer equipment. Our staff and Executive Board are looking at ways to reduce costs and increase efficiencies in our operations. One example is in advertising sales. In recent months (years), it has become increasingly difficult to staff our ad sales with part-time personnel. On June 1 we changed to outsourcing our advertising sales to a publisher's representative and are working with McCleary Communications. This has already proven to be a wise decision!

For the financial report, our budgeted revenues for FYE August '98 are $1.34 million which is an increase of more than $460,000 over FYE August '93! Much of this increase has come from communications and Annual Meeting revenue. I was happy to report that the Executive Board approved next year's budget without a dues increase. Overall, the Association is in good financial health. I am looking forward to the day I can report that IAMFES is in GREAT financial health!

IAMFES Officers have been speaking at Affiliate meetings through our support program; we welcomed a new International Affiliate – the Korean Association of Dairy, Food and Environmental Specialists; we debuted the *"Guide to Food Safety in the Home"* to be used by consumers before and after disasters; and we initiated a *"Food Protection Register"* to use as a resource for referring questions we receive about food safety issues to professionals who are willing to assist in providing answers. If you are interested in the *Food Protection Register*, call our office for more details.

Again, I feel that we have made great progress in a short time. We have our sights set high for the near future and the long term. The future for IAMFES is truly untapped. Our opportunities are wide open as we position our Association for growth and to continue to serve the needs of food safety professionals, worldwide!

THANK YOU!

IAMFES THANKS THE FOLLOWING INDIVIDUALS FOR THEIR SUPPORT OF THE IAMFES FOUNDATION

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Dairy, Food and Environmental Sanitation, Vol. 17, No. 8, Pages 470-481

Information Effects on Acceptance of Irradiated Foods in a Military Population

Howard G. Schutz[1] and Armand V. Cardello*

SUMMARY

A study was conducted to determine (1) the awareness and concerns of military personnel regarding irradiated foods and the willingness of military personnel to consume such foods, and (2) which of several alternative forms of product information can reduce concern and increase willingness to consume irradiated food. Four information treatments were developed, based on previous research and focus group interviews. These treatment conditions were (1) a statement of the benefits of irradiated foods printed on the package; (2) the benefits statement in conjunction with a USDA approval label; (3) presentation of a 20/20 television program segment discussing the pros and cons of food irradiation; and (4) presentation of a Purdue University Extension video describing the food irradiation process and its benefits. Pre- and post-treatment questionnaires were developed to assess consumer attitudes toward food irradiation and were pilot-tested to ensure validity and reliability. A study was conducted with 248 military consumers comparing the four treatment groups to a control group (no information).

Analyses of the data revealed that military personnel have a low level of awareness of food irradiation, but a high level of concern. The most effective information treatment was the Purdue University video, which significantly reduced respondents' concern and raised their judged likelihood to consume irradiated foods. It is concluded that positive, credible information about the safety/use of irradiated food can enhance acceptance of these foods by military (and other) consumers.

Note: The views, opinions, and/or findings contained in this report are those of the authors and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

INTRODUCTION

Irradiation is a 45-year-old process for the treatment of foods that provides for higher levels of food safety and greater shelf life by controlling microorganisms in the food. The U.S. military has been a major contributor to the research effort to develop food irradiation procedures that will result in products with high sensory quality *(1, 3, 14, 25)*. Although most of the technical problems in producing high quality foods in an economical manner by irradiation have been solved, this process has not been widely adopted by either the private or military sector. This is true in spite of the fact that the Food and Drug Administration and the World Health Organization have approved a variety of irradiated-food products for commercial marketing. One of the major reasons for this lack of adoption has been continuing evidence of consumer concerns about the use of irradiation, with regard both to the safety of irradiation facilities and the nature of the final irradiated food product. In spite of these concerns, there have been some limited processing and marketing efforts for fruits, vegetables and poultry in recent years *(4, 9, 15, 18, 19)*. These efforts have been very small in scope, with results that appear to be positive with the consumer populations surrounding the few markets that are handling the product.

Although the U.S. military has always considered irradiation an appropriate preservation technique to enable the production of safe foods that can be stored for long periods of time while maintaining their sensory quality, it has been considered inappropriate to utilize irradiated foods with military populations until there is a significant civilian acceptance and availability of the product. However, with the advent of some increase in the civilian availability of irradiated food, and with the recent indication that beef may be among the products that are approved for irradiation, the military is interested in determining what the potential acceptance would be for irradiated whole meat products. The reason for this interest is that, although smaller portions of meat can be treated by other processes to obtain appropriate safety and quality during long storage, larger pieces of meat, which might prove to be more acceptable to soldiers, cannot, at this time, be utilized in rations that are intended for field conditions. Irradiation may well overcome this limitation, if an effective strategy can be developed for insuring a positive attitude toward the use of irradiated food among military consumers.

Although there is considerable data on civilian awareness, concern, and purchase interest for a wide variety of irradiated foods *(3-7, 12, 22)*, far less information is available on effective strategies for improving consumer attitudes toward irradiated foods. This is true even though it has been demonstrated that providing consumers with information can have a direct and positive influence on public opinions toward irradiated food *(2, 11)*.

Information about food irradiation can vary widely in content and in form of presentation. Simple forms of information may include photographs of the food, package benefit statements, seals of approval, and simple descriptions of the process. More detailed forms of information may include longer descriptions of the process and its benefits or more sophisticated, audio-visual presentations of information related to food irradiation. In one recent study *(17)* a 10-min audio-visual slide-tape presentation provided information about food irradiation that was primarily positive. When shown to consumers in educational sessions, this audio-visual presentation resulted in a significant positive shift in consumer attitudes toward irradiated food. This effect was independent of whether or not actual samples of irradiated food were presented to consumers for tasting at the test session.

Almost all previous research on the effects of information in changing attitudes toward irradiated food have focused on conventional consumer populations. However, institutional foodservice consumers form an important segment of the overall consuming population, and one for which little information is available about relevant factors that may contribute to acceptance/rejection of irradiated foods. Military consumers serve as a general example of institutional foodservice consumers because (1) the cost of food is not typically an issue affecting food choice by these consumers, (2) consumption occurs in group dining situations, and (3) variety is limited to a small set of choices at each meal. On the other hand, military consumers form a special subgroup of institutional consumers because of the high percentage of males in this population and their lower mean age. The latter demographic characteristics of military populations are especially interesting and relevant to the study of attitude change toward food irradiation, because it has been shown that males and younger individuals are more susceptible to the effects of information on food irradiation than are females or older consumers *(17, 23)*.

The present study was designed to determine existing awareness and concerns of military consumers regarding irradiated food and their willingness to select and consume them, and to assess several strategies of information presentation to reduce consumer concerns and to increase willingness to eat irradiated foods.

MATERIALS AND METHODS

Subjects

Two hundred and fifty male military personnel from Fort Hood, Texas, participated as subjects. All but 1% were enlisted; the others were officers. Approximately 70% of subjects were between the ages

TABLE 1. Stimuli and experimental conditions

Stimuli:	
Slide 1	Definition of irradiation
Slide 2	Grilled steak with mandatory FDA label and Radura symbol
Slide 3	Grilled steak with mandatory label plus benefit statement
Slide 4	Grilled steak with mandatory label, benefit statement and USDA approval
Slide 5	Commercial status irradiation facility
20/20 video	Segment from 20/20 television program, 20 minutes, first aired 12/13/91
Purdue video	Cooperative Extension education video, 9 minutes (Pohlman, 1993)

Conditions:

Control:
Pre-questionnaire, slide 1 and 2, post-questionnaire

Benefit:
Pre-questionnaire, slide 1 and 3, post-questionnaire

Benefit & approval:
Pre-questionnaire, slide 1 and 4, post-questionnaire

20/20 video:
Pre-questionnaire, slide 1 and 2, 20/20 video, slide 5, post-questionnaire

Purdue video:
Pre-questionnaire, slide 1 and 2, Purdue University video, post-questionnaire

of 19 and 25. The remainder ranged from 26 to 40 years of age. Approximately 53% were single. Over 99% had completed high school and 43% had some college training (4% had completed college). Of the entire sample, 52% identified themselves as white, 26% as black, 13% Hispanic, 2% Asian, 2% Native American, and 5% "other." Fifty subjects from this panel population were randomly assigned to each of four treatment groups and 50 to a control group.

Selection/design of information treatments

Because previous research with civilian populations has indicated that various forms of product benefit information have been effective in decreasing concern and increasing willingness to purchase irradiated food, and because the technical information provided in an audio-visual presentation developed by Pohlman *(16)* produced positive effects among civilians, it was decided that it would be appropriate to examine these two basic types of information for their use with a military population. Also taken into consideration in choosing treatments were the practical aspects of implementation with large numbers of consumers. Because package labels are an easy and ubiquitous format for information presentation, this appeared to be a practical information vehicle to evaluate. Video information is also a practical alternative for the military, because the information can readily be made available during regularly scheduled training sessions.

To select/develop appropriate information for use in the treatments, a series of focus groups with military personnel were conducted on the general topic of food irradiation. Based on the information obtained from those focus groups, four information treatment conditions and a control condition were developed as follows:

Control condition

To develop an appropriate control condition in which subjects were exposed to an irradiated food item as it might be presented without added information, a slide was produced that showed the external package for a grilled beef steak field ration along with a photograph of an actual irradiated grilled beef product. The only written information on the package was the mandatory "treated by irradiation" statement and a Radura symbol, the international symbol for irradiated food (Fig. 2). In addition, to ensure that all groups, including the control group, understood the meaning and purpose of irradiation of food, a slide was presented that gave the following definition of irradiated food: "An irradiated food is one that has been treated with gamma rays from a radioactive source, such as Cobalt 60 or Cesium 137, or a machine generated electron beam, in order to destroy insects or microorganisms which may be present, making the food safer and preserving its quality." This slide was presented in all conditions. All slides used in the various treatments are shown in Fig. 1 to 5.

Benefit condition

The second information treatment consisted of a slide that showed the same control package for the grilled beef steak field ration along with the photograph of its contents, the mandatory "treated by irradiation" statement, and the

Figure 1. Contents of Slide 1: definition of food irradiation.

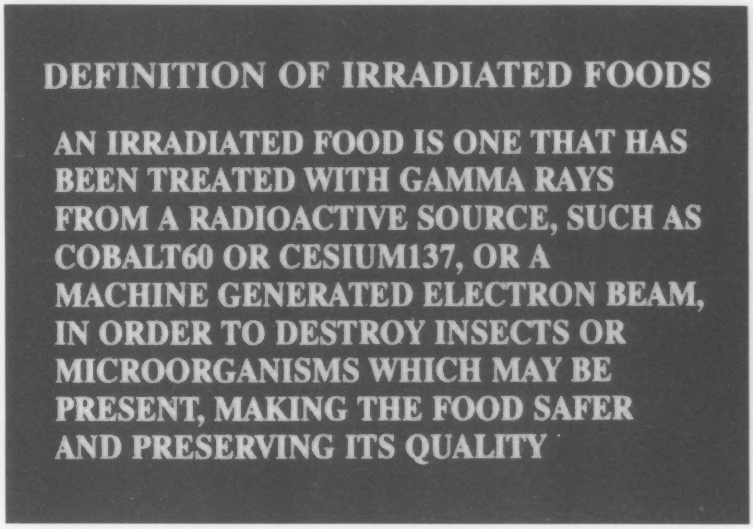
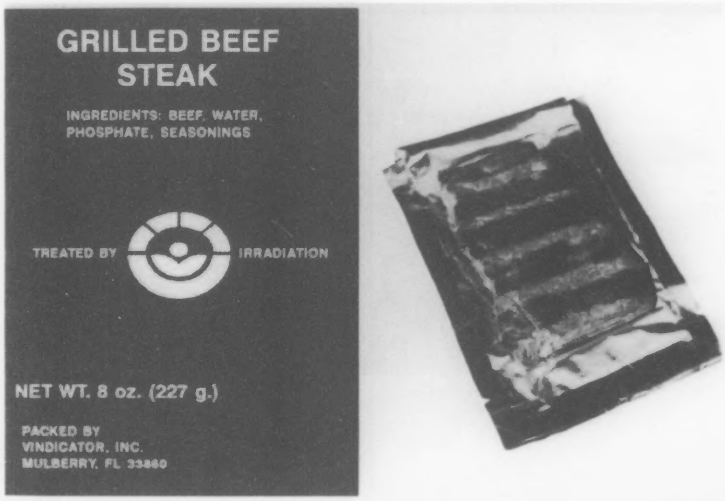


Figure 2. Contents of Slide 2: grilled steak package with mandatory FDA label and Radura symbol; photograph of grilled beef steak product.



Radura symbol. However, a benefit statement in large lettering that read "to eliminate bacteria to retain quality and improve storage stability" was added to the package label (Fig. 3).

Benefit plus approval condition

The third information condition was a slide of the same grilled beef steak package as used in the "benefit" condition, but with a U.S. Department of Agriculture inspection label displayed prominently in the lower right of the package. The label/seal read "U.S. inspected and passed by Department of Agriculture EST. 8990" (Fig. 4).

Purdue video condition

The fourth information condition consisted of the Purdue University Cooperative Extension information video (about 10 min) developed from slides and oral presentations used in a master's thesis conducted by Pohlman *(16)*. This video, although objective in nature, presented a clearly positive perspective on food irradiation, with no opposing views presented.

20/20 video condition

The last condition was a 20 min video presentation of the 20/20 television program on food irradiation, aired by the ABC television network, that contained interviews of a "pro" and "con" nature about food irradiation. The "pro" side consisted of an interview with the president of a U.S. irradiation processing corporation, whereas the "con" side consisted of interviews with people representing a food and water safety group. In spite of the balance in air time to the opposing views, the overall tone of the segment was positive to food irradiation and the concluding remarks of the interviewers were definitely supportive of food irradiation. As part of this information treatment, a slide was developed to describe and update the commercial status of the irradiation

Figure 3. Contents of Slide 3: grilled steak package with mandatory FDA label, Radura symbol, and benefit statement; photograph of grilled beef steak product.

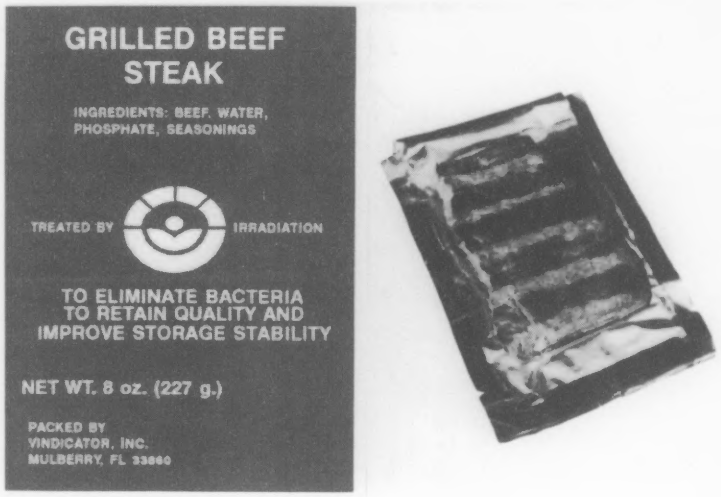


Figure 4. Contents of Slide 4: grilled steak package with mandatory FDA label, Radura symbol, benefit statement and USDA approval seal; photograph of grilled beef steak product.

facility described in the 20/20 program video (Fig. 5). Table 1 shows the experimental conditions for the four treatment groups and the control group.

Development of attitude assessment questionnaire

Pre- and post-treatment questionnaires were developed utilizing information from the focus groups and a review of previous questionnaires utilized with civilian populations, with consideration given to the unique aspects of military feeding situations. The pre-treatment questionnaire consisted of questions on: (1) the general quality of food in the military; (2) confidence in the safety of military foods, both in general and for specific food classes; (3) concerns about potential food hazards; (4) awareness of and concern about irradiated foods; and (5) willingness to consume irradiated foods in military dining halls and in field rations. Also included were questions on willingness to consume specific classes of irradiated foods, e.g., fruits, vegetables, meats, as well as questions on the perceived sensory characteristics of irradiated food. Demographic questions, including questions on gender, age, marital status, etc., were also included. The post-treatment questionnaire was limited to questions on concern about and willingness to consume both general and specific irradiated foods, and the questions previously described about the sensory characteristics for irradiated food and potential food hazards. Additional questions asked in the post-treatment questionnaire focused on the influence of U.S. Food and Drug Administration approval, and the appropriateness of irradiated food for a variety of eating situations.

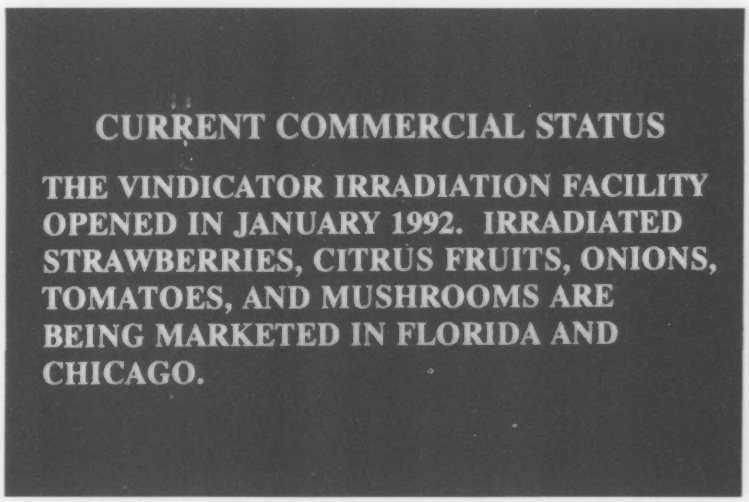
Procedures

All test sessions were held in a large classroom-like setting in a recreation and meeting building. Upon arrival at the session, subjects

TABLE 2. Percentage responses of subjects in the various treatment groups to the pre-treatment question, "Have you ever heard of irradiation as a method of preserving foods?"

	Overall	Treatment Condition				
		Benefit	20/20	Control	Benefit & approval	Purdue
	N=248	N=51	N=51	N=48	N=50	N=48
Yes	16.9%	25.5%	11.8%	16.7%	12.0%	18.8%
No	69.0%	54.9%	72.5%	72.9%	74.0%	70.8%
Do not know	14.1%	19.6%	15.7%	10.4%	14.0%	10.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figure 5. Statement of the commercial status of the food irradiation facility cited in the 20/20 video program.



were seated at individual chair-desks and asked to complete the pre-test questionnaire. After this questionnaire was collected, subjects were exposed in a group setting to one of the treatment/control conditions as shown in Table 1. After presentation of the treatment/control information, the post-test questionnaire was administered. The total time between administration of the pre-test and post-test questionnaires was no more than 30 min.

RESULTS AND DISCUSSION

Pre-test awareness of and attitudes toward irradiated food

At the outset, there were no statistically significant differences among groups in either their general attitude toward military food or its overall safety. With regard to their general attitudes, almost 50% of the population rated the quality of military food as "neutral," with the balance split between the "poor" and "good" categories. This is not a surprising result and corroborates other studies documenting the general attitudes toward food quality in the military *(8)*.

With regard to the attitude toward the safety of food served in the military, slightly over 50% of subjects were "moderately" or "completely" confident in the military food supply. However, approximately 41% were only "slightly" confident, which reveals some concern about general food safety. If one compares this result with the results of a recent study by the Gallup Organization *(10)* for the U.S. population as a whole, one finds that, overall, some 79% of the respondents in the Gallup study were "somewhat" or "very" concerned about the safety of foods.

Table 2 presents data on the question as to whether the respondents had heard of irradiation as a method of food preservation. The 69% responding "no" is higher than the values reported in the literature

TABLE 3. Pre- and post- treatment responses of subjects in the various treatment groups to the question, "If this process (irradiation) was used in the food you eat, what would be your reaction?"

Pre-Treatment

	Overall	Treatment Condition				
		Benefit	20/20	Control	Benefit & approval	Purdue
	N=248	N=51	N=51	N=48	N=50	N=48
No concern	7.7%	15.7%	2.0%	6.3%	8.0%	6.3%
Uncertain	39.9%	33.3%	37.3%	37.5%	48.0%	43.8%
Minor concern	19.4%	25.5%	19.6%	22.9%	14.0%	14.6%
Major concern	32.7%	25.5%	41.2%	33.3%	30.0%	33.3%
Missing	0.4%	0.0%	0.0%	0.0%	0.0%	2.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Post-Treatment

	Overall	Treatment Condition				
		Benefit	20/20	Control	Benefit & approval	Purdue
	N=248	N=51	N=51	N=48	N=50	N=48
No concern	25.4%	19.6%	25.5%	27.1%	18.0%	37.5%
Uncertain	8.1%	3.9%	3.9%	8.3%	14.0%	10.4%
Minor concern	35.9%	31.4%	39.2%	35.4%	38.0%	35.4%
Major concern	30.2%	43.1%	31.4%	29.2%	30.0%	16.7%
Missing	0.4%	2.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

(21, 22). Again, compared to the results from the Gallup Organization, 73% of the consumers in that study had heard of food irradiation, although 49% said they did not know much about it. In the present study the approximately 17% who indicated they had heard of food irradiation is, obviously, significantly less than the 73% figure. In part, this difference may be due to the manner in which the question on knowledge of irradiation was asked. For example, in some previous studies a definition was given first, and then the respondent was asked whether or not they had heard of it. However, it would appear that, beyond the difference in the way the question is asked, the military represents a population in which irradiation, as a food preservation method, is not as well known as it is in the general population. This could be viewed as either a negative or a positive factor with regard to the effect of information on attitude change. From the negative standpoint, there may be more necessity for education before introducing irradiated food in the military. On the other hand, if less negative information has been experienced by military personnel, then whatever positive information is presented may be more effective in eliciting a willingness to try irradiated foods.

The level of concern about irradiation being used in foods, as revealed in Table 3, indicates a high level of uncertainty. This is consistent with the large percentage of soldiers who indicated that they have not heard of irradiation. There were also over 50% with minor or major concerns, which is the result of a combination of those people who have knowledge and are concerned and those for whom the term "irradiation," without knowledge, results in some degree of concern. These levels of concern are consistent with what has been found in the civilian population *(6, 24)*.

From Table 4, we can see that approximately 20% of this population indicated they would be "likely" or "very likely" to consume irradiated food in a military dining facility. A slightly higher percentage (32%) were "likely" or "very likely" to consume irradiated food as a part of field rations (Table 5). These levels are lower than typically found in civilian populations *(5)*. These results could be due, in part, to lower levels of awareness of irradiation in the military than in a civilian population. The fact that subjects are more likely to consume irradiated food in a field situation than in a dining hall has some face validity, because there are fewer alternatives to consumption in the field than in military dining halls.

Considering these pre-questionnaire results as a whole, it would appear that the military represents a slightly different population than the civilian one, especially with

TABLE 4. Pre- and post- treatment responses of subjects in the various treatment groups to the question, "How likely would you be to consume irradiated foods if they were available in military dining halls?"

Pre-Treatment

	Overall	Treatment and Condition				
		Benefit	20/20	Control	Benefit & approval	Purdue
	N=248	N=51	N=51	N=48	N=50	N=48
Very unlikely	11.3%	11.8%	15.7%	6.3%	8.0%	14.6%
Unlikely	15.7%	19.6%	11.8%	6.3%	24.0%	16.7%
Neither likely nor unlikely	51.2%	49.0%	49.0%	66.7%	40.0%	52.1%
Likely	16.1%	13.7%	19.6%	16.7%	20.0%	10.4%
Very likely	4.4%	5.9%	3.9%	4.2%	6.0%	2.1%
Missing	1.2%	0.0%	0.0%	0.0%	2.0%	4.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Post-Treatment

	Overall	Treatment and Condition				
		Benefit	20/20	Control	Benefit & approval	Purdue
	N=248	N=51	N=51	N=48	N=50	N=48
Very unlikely	12.5%	25.5%	13.7%	6.3%	14.0%	2.1%
Unlikely	14.9%	11.8%	9.8%	18.8%	24.0%	10.4%
Neither likely nor unlikely	25.4%	21.6%	23.5%	25.0%	30.0%	27.1%
Likely	33.9%	31.4%	37.3%	39.6%	26.0%	35.4%
Very likely	12.9%	7.8%	15.7%	10.4%	6.0%	25.0%
Missing	0.4%	2.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

regard to lack of awareness, indicating that there is the opportunity through information and education to influence, in a positive way, military attitudes toward food irradiation. In addition, the comparability of the groups in terms of their pre-treatment attitudes indicates a low likelihood of interaction between these existing attitudes and the treatment conditions.

Effects of information treatments

Ten questions that the authors considered to be critical in evaluation of the effectiveness of the treatments were compared in the pre- and post-questionnaires, using analyses of variance. These questions addressed general concern about irradiated foods, the general likelihood of consumption of these foods, and the likelihood of consumption for specific classes of foods (red meat, fruits and vegetables, fish and seafood, poultry, pork, eggs, and dairy products). The results for five of these comparisions are shown in Fig. 6 to 10. The results for the other five are not presented because they show exactly the same pattern of results, as well as the same direction and levels of statistical significance.

Regarding the question about the level of concern about irradiated food, Fig. 6 shows the data for the five groups (% responses by category are shown in Table 3). Asterisks under a condition indicate a statistically significantly difference at the .05 level of probability. The two video presentations, 20/20 and Purdue, are associated with significant decreases in concern level, with the reduction in concern produced by the Purdue treatment being greater than that for the 20/20 treatment. In Fig. 6, the fact that the "benefit only" group shows the smallest drop in concern on the post-questionnaire may be due, in part, to the fact that this group had the highest level of awareness of irradiated foods before the treatments (Table 2). Their awareness

TABLE 5. Pre- and post-treatment responses of subjects in the various treatment groups to the question, "How likely would you be to consume irradiated foods if they were available in field rations?"

Pre-Treatment

	Overall	Treatment Condition				
		Benefit	20/20	Control	Benefit & approval	Purdue
	N=248	N=51	N=51	N=48	N=50	N=48
Very unlikely	11.3%	13.7%	15.7%	6.3%	10.0%	10.4%
Unlikely	13.7%	19.6%	9.8%	6.3%	18.0%	14.6%
Neither likely nor unlikely	41.1%	35.3%	41.2%	58.3%	30.0%	41.7%
Likely	21.0%	21.6%	17.6%	20.8%	24.0%	20.8%
Very likely	11.3%	9.8%	15.7%	8.3%	16.0%	6.3%
Missing	1.6%	0.0%	0.0%	0.0%	2.0%	6.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Post-Treatment

	Overall	Treatment Condition				
		Benefit	20/20	Control	Benefit & approval	Purdue
	N=248	N=51	N=51	N=48	N=50	N=48
Very unlikely	8.1%	15.7%	11.8%	4.2%	8.0%	0.0%
Unlikely	13.3%	11.8%	15.7%	16.7%	14.0%	8.4%
Neither likely nor unlikely	21.4%	25.5%	17.6%	27.1%	26.0%	10.4%
Likely	31.5%	25.5%	23.5%	29.2%	34.0%	45.8%
Very likely	25.0%	17.6%	31.4%	22.9%	18.0%	35.4%
Missing	0.8%	3.9%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

level was about 26%. Thus the additional presentation of benefit information may have had less effect on concern. The fact that there is a nonsignificant drop in concern for the control group could be due to the fact that, for the control group, we had to present some minimum level of information in order to justify administering a post-questionnaire. This information, as indicated in the test design protocol (Table 1), consisted of the definition of irradiation, a label of the grilled meat product, and a photograph of the product. This, in itself, could produce some drop in concern for the food irradiation process, since the photograph could well be described as a natural looking piece of meat (see Fig. 2 to 4).

Figure 7 shows the data for willingness to consume irradiated food in a military dining hall. Here the only significant difference is for the Purdue University video treatment, which resulted in an increase in subject's stated likelihood to consume these products.

Examining the data on "likelihood to consume" irradiated field rations in Fig. 8, the Purdue University treatment, again, is the only one that produces statistically significant increases between the pre- and post-questionnaire.

Figures 9 and 10 show the "likelihood to consume" ratings for the specific irradiated food categories "red meat" and "fruits and vegetables." Both show the same trend, with the Purdue University video treatment the only one resulting in significant improvements in willingness to consume these products.

Obviously, some of the consistency in the response to the various product classes could be ascribed to a halo effect, i.e., the psychological tendency to generalize a positive rating for one element in a category to all other elements within that category. However, without any additional information one would have to assume that none of these product classes represent a special problem with

Figure 6. Mean pre-treatment and post-treatment ratings of the level of concern about irradiated food for each of the five test groups. Scale: 1=no concern, 2=minor concern, 3=major concern.

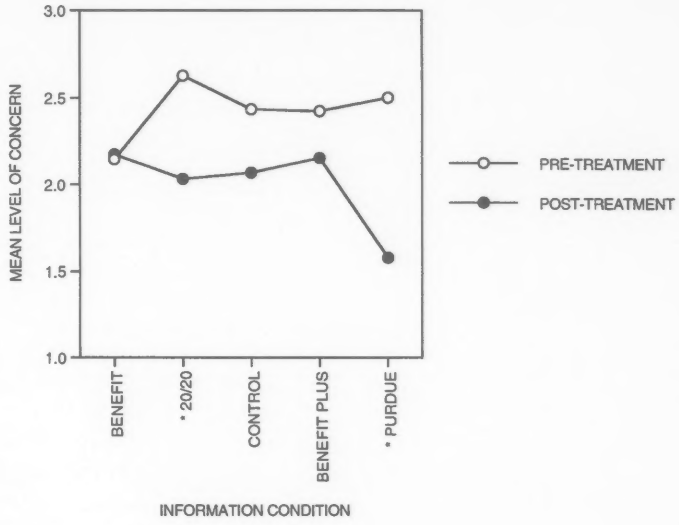
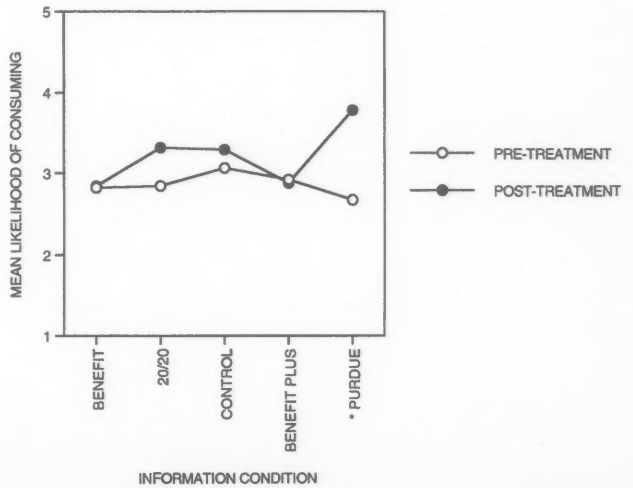


Figure 7. Mean pre-treatment and post-treatment rating of the likelihood of consuming irradiated foods in military dining halls for each of the five test groups. Scale: 1=very unlikely, 2=unlikely, 3=neither likely nor unlikely, 4=likely, 5=very likely.



regard to the willingness to accept irradiated foods in the military if soldiers are exposed to the "Purdue video tape" information. Also of interest is the fact that the data on willingness to consume irradiated food shifts from the "neutral" position to the "likely to consume" category after the "Purdue" treatment for all examined questions. Of significance, as well, is the fact that the concern level in the Purdue treatment group drops to somewhere between "no concern" and "minor concern" from a point between "minor" and "major" concern.

Considering the comparative information as a whole, it seems quite evident that one information treatment, the Purdue video treatment, has a statistically significant and practical effect on reducing concern and on increasing likelihood to consume irradiated foods. Although the 20/20 treatment did significantly reduce concern, it did not have a significant effect on willingness to consume products that were irradiated.

Because the Purdue treatment included the definition slide and a slide of the grilled steak mandatory label, one must consider these components as a part of the total treatment. However, it is clear from looking at the control group results, where this basic information was presented, that these points by themselves do not have a significant impact on concern about or willingness to purchase irradiated foods. Thus, one must assume that the major contribution, if not the entire positive contribution, is due to the information presented in the Purdue video. That there might be some positive synergism or interaction between the two is certainly reasonable, but we have no data from this study to support such a conclusion.

Based on the results of this study, we conclude the following: There is a relatively low level of awareness of irradiation as a preservation food process among military personnel. However, concern for this process, based on

Figure 8. Mean pre-treatment and post-treatment rating of the likelihood of consuming irradiated foods in field rations for each of the five test groups. Scale: 1=very unlikely, 2=unlikely, 3=neither likely nor unlikely, 4=likely, 5=very likely.

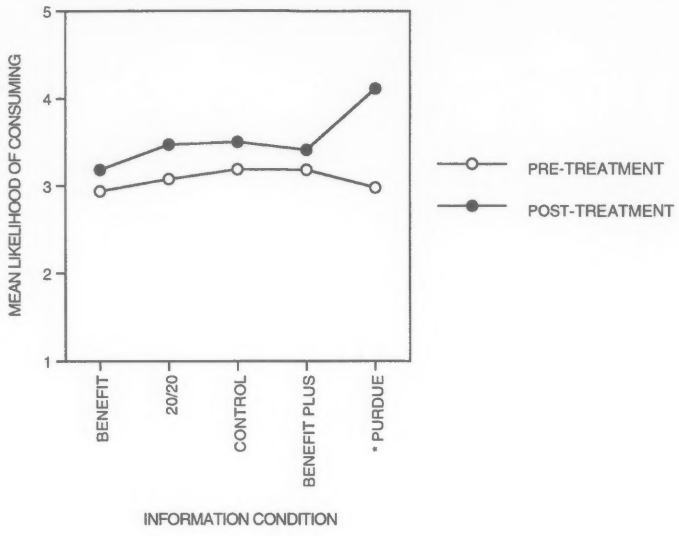
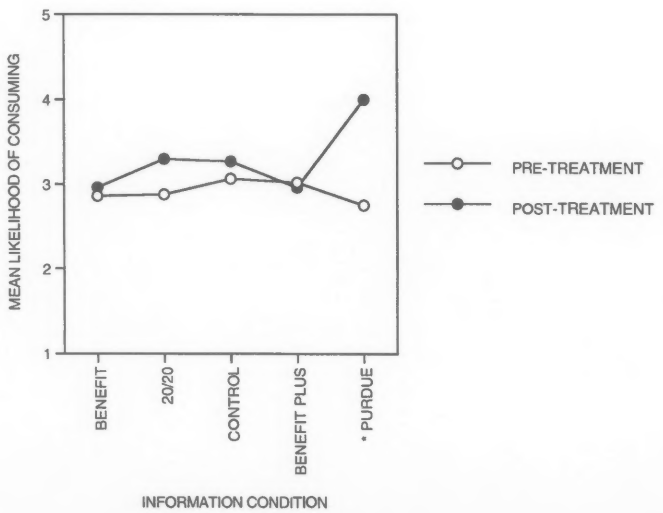


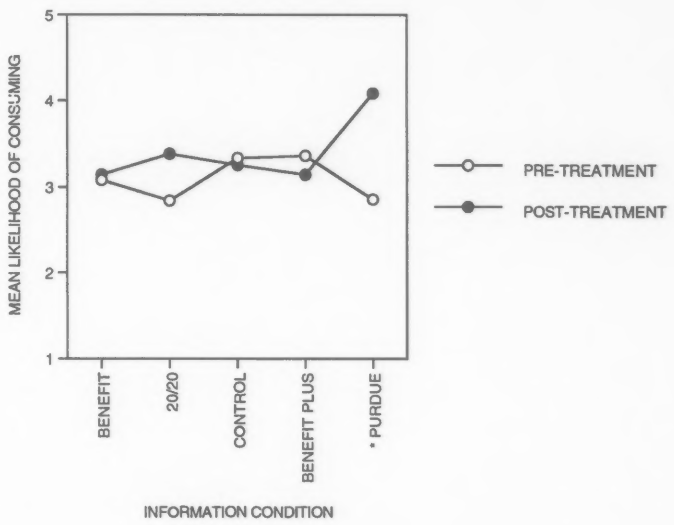
Figure 9. Mean pre-treatment and post-treatment rating of the likelihood of consuming irradiated red meat for each of the five test groups. Scale: 1=very unlikely, 2=unlikely, 3=neither likely nor unlikely, 4=likely, 5=very likely.



either knowledge or the perception of the name, is sufficiently high, that those responsible for military rations should be concerned about introducing irradiated foods into the military without any associated educational program. Supporting this conclusion is the finding that willingness to consume irradiated foods in both military dining facilities and field situations is low prior to information presentation, as is willingness to consume specific food classes that have been irradiated. However, the results on the effect of the various treatment conditions revealed a strong positive effect for one treatment, the Purdue University video, and a smaller effect for the 20/20 video. The effect for the Purdue video was significant not only in reducing concern to a much lower level, but also in increasing the likelihood of consumption of irradiated foods. Although these results are attitudinal in nature, one could reasonably assume that information of the sort presented in the Purdue video would be likely to improve the acceptance of irradiated foods if they were to be introduced into the military. It does appear that there is more willingness to consume irradiated food in the field than in the military dining facility, which may indicate that the introduction of irradiated foods in the military may occur more easily with field rations than with dining hall foods.

Because the Purdue video tape confounds the substantive information with the particular delivery source, i.e., a Purdue University Cooperative Extension specialist, we cannot be sure of the exact contribution of the source of the information versus the information itself. However, it does appear that the presentation of a balanced argument by a well known source, such as the 20/20 television program, did not have the positive effect of the more fact-oriented, positive approach of the Purdue video.

Figure 10. Mean pre-treatment and post-treatment rating of the likelihood of consuming irradiated fruits and vegetables for each of the five test groups. Scale: 1=very unlikely, 2=unlikely, 3=neither likely nor unlikely, 4=likely, 5=very likely.



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REFERENCES

1. Barnes, J. M., and D. M. Boyd. 1961. Radiation-processed foods as a component of the Armed Forces feeding systems. Report No. ORO-SP-174. Research Analysis Corp., McLean, VA.
2. Bord, R. J., and R. E. O'Connor. 1989. Who wants irradiated food? Untangling complex public opinion. Food Technol. 43:87–90.
3. Bruhn, C. M. 1995. Consumer attitudes and market response to irradiated food. J. Food Prot., 58:175–181.
4. Bruhn, C. M., and J. W. Noel. 1987. Consumer in-store response to irradiated papayas. Food Technol. 41:83.
5. Bruhn, C. M., H. G. Schutz, and R. Sommer. 1986a. Attitude change toward food irradiation among conventional and alternative consumers. Food Technol. 40:86.
6. Bruhn, C. M., H. G. Schutz, and R. Sommer. 1987. Food irradiation and consumer values. Ecol. Food Nutr. 21:219–235.
7. Bruhn, C. M., R. Sommer, and H. G. Schutz. 1986b. Effect of an educational pamphlet and posters on attitude toward food irradiation. J. Industrial Irradiation Technol. 4:1.
8. Cardello, A. V., R. Bell, and F. M. Kramer. 1996. Attitudes of consumers toward military and other institutional foods. Food Qual. & Pref. 7:7–20.
9. Cheney, K. 1993. Irradiation makes waves. Restaurants and Institutions, 103:34–53.
10. Gallup Organization, 1993. A survey of consumers' awareness, knowledge and attitudes toward the process of irradiation. Summary Report, Princeton, N.J.
11. Harris, L. 1985. Trends: Consumer attitudes and the supermarket. Food Marketing Institute, p. 29.
12. Hashim, I. B., A. V. A. Resurreccion, and K. H. McWatters. 1996. Consumer attitudes toward irradiated poultry. Food Technol. 50:77–80.
13. Josephson, E. S. 1965. Food irradiation. Recent progress in applying high doses of ionizing radiation to achieve shelf stable foods. Activities Report of the Research & Development Associates. 17:95–102.
14. Josephson, E. S., F. Heiligman, C. K. Wadsworth, J. J. Howker, and E. Weirbicki. 1977. Low dose food irradiation at Natick. Technical Report NATICK/TR-78/003, Army Natick Research and Development Command, Natick, MA.
15. Marcotte, M. 1992. Irradiated strawberries enter the U.S. market. Food Technol. 46:82, 84, 86.
16. Pohlman, A. 1993. Influence of education and food samples on consumer acceptance of food irradiation. M.S. Thesis, Purdue University.
17. Pohlman, A., O. Wood, and A. Mason. 1994. Influence of audiovisuals and food samples on consumer acceptance of food irradiation. Food Technol. 48: 46.
18. Pszczola, D. E. 1992. Irradiated produce reaches midwest market. Food Technol. 46:89–92.
19. Pszczola, D. E. 1993. Irradiated poultry makes U.S. debut in midwest and Florida markets. Food Technol. 47:89, 92, 94, 96.
20. Resurreccion, A. V. A., and F. C. P. Galvez. 1993. Consumer purchase behaviors toward irradiated beef. Final report for the American Meat Institute.
21. Ressureccion, A. V. A., F. C. F. Galvez, S. M. Fletcher, and S. K. Misra. 1995. Consumer attitudes toward irradiated food results of a new study. J. Food Prot. 58:193–196.
22. Schutz, H. G., C. M. Bruhn, and K. V. Diaz-Knauf. 1989. Consumer attitude toward irradiated foods: Effects of labeling and benefits information. Food Technol. 43:80–86.
23. Terry, D. E., and R. L. Tabor. 1988. Consumer acceptance of irradiated produce. Produce Marketing Association Yearbook. 42–47, Newark, DE.
24. Wiese Research Associates. 1984. Consumer reaction to irradiation concept. Omaha, NE.
25. Worfel, R. C. 1996. Natick update on irradiated foods program. Activities Report of the Research and Development Associates, 47:50–51.

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Nepal: Food Safety Profile and Health Education in Food Safety

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SUMMARY

A consultancy undertaken with the World Health Organization had the following terms of reference: "Food safety mission to Nepal to review the situation in the Kathmandu Valley and to assist the Ministry of Health in developing the necessary policies and strategies for the improvement of food safety." Data from the food safety profile indicate: (i) a high morbidity and mortality associated with diarrheal diseases; (ii) numerous sources of contamination of raw and industrially processed foods; (iii) a particularly weak food control infrastructure; (iv) a poor infrastructure for the safe preparation of food; (v) the importance of food preparation at home as a significant, and often the only, stage for defense, because most foods never enter commercial channels; and (vi) the need for integration of recommendations for food safety into environmental and personal hygiene education. In this context, education in proper food handling, especially through primary health care, is probably the single most important measure for preventing food-borne diseases. Main steps are proposed for the preparation of a culture-specific educational programme in food safety, which should include (i) the development of educational messages devised from a profile of habits and foods that pose recurrent health threats, (ii) the identification of distribution channels to reach the groups targeted for food safety education, and (iii) the diffusion of messages through the appropriate channels.

INTRODUCTION

The consultancy undertaken within the framework of the World Health Organization (WHO)'s Intensified Cooperation with countries in greatest need had the following terms of reference: "Food safety mission to Nepal to review the situation in the Kathmandu Valley and to assist the Government [Ministry of Health (MOH)] in developing the necessary policies and strategies for the improvement of food safety."

Nepal is a small Himalayan country with a population of about 19 million people. Although the population density is relatively low, only 20% of the country's area is arable land. Nepal started the modernization process within the past four decades, with an objective of improving the standard of living of the population. However, in spite of recent achievements *(16)* and the very considerable financial and technical investments by international organizations and by various bilateral aid agencies, an estimated 36% of the population in Nepal consume less than the minimum calorie requirement *(27)*. The Nepal Environmental Health Initiative, which followed the 1992 Conference on Environment and Development, and the National Plan of Action on Nutrition, which

followed the 1992 International Conference on Nutrition, recognize that malnutrition results from a convergence of many factors, including foodborne diseases. Both programs stress the importance of safe food.

FOOD SAFETY PROFILE[1]

Food production

New agricultural technology has contributed substantially to increasing food production; nevertheless, national agricultural production fails to meet consumption needs. For example, total grain production meets only 90% of the total requirement; thus the total average annual food deficit is about 300,000 tonnes.

Agriculture

Foodgrains dominate the country's crop sector, accounting for nearly 85% of the total cropped area. During the past two decades, foodgrain production has increased 2.3% per year. Much of this increase is due to expansion of the farmed area, while foodgrain yields have virtually stagnated *(27)*. Farmyard manure, which comprises any combination of livestock manure, animal bedding, agricultural crop residues, ash, and domestic refuse, is the main source of fertilizer in Nepal *(15)*. In areas where inorganic fertilizers are available, little attention has been paid to educating farmers regarding their use. As a result, there has been only a short-term increase in agricultural productivity through higher use of these fertilizers *(15)*. Pesticides are also often overused *(2)*, and food losses due to rodents, insects, and microbiological agents stress the need for an appropriate food safety policy. Estimates are that nearly 20% of food grains are lost annually to vermin and insects and to improper storage and handling practices *(9)*.

For several years, international organizations and bilateral donors have promoted kitchen gardening to enable communities to grow vegetables year-round and to generate cash income through sale of surplus vegetables *(2)*. Between 1984/1985 and 1989/1990, the total area under vegetable cultivation grew by 1.4% whereas production increased by 31% as the result of efforts to deliver improved seed, inputs and credit *(27)*. However, water contaminated with waste and nightsoil is used for irrigation, and highly contaminated water from ponds or rivers is used for washing fruit and vegetables; the consequence is a high risk of contamination with pathogens.

Poultry farming was a backyard venture in Nepal until the early 1960s, when the government introduced improved breeds into the Kathmandu Valley and established hatcheries to produce improved chicks. The continued increases in population, per capita income, and number of tourists, along with changes in food consumption habits, have ensured a rising demand for poultry meat and eggs in the Valley. The private sector has played a crucial role in the development of this industry. In 1990, the number of poultry farms was 6,000, meat and egg production was 4,388 tons and 107 million respectively, and there were 15 hatcheries producing 6.4 million chickens. However, the quality of chicks, poultry feed and veterinary medicines supplied to farmers is not monitored or checked by any agency, which results in sale of substandard inputs, adversely affecting poultry production. The lack of quality control and erratic market behavior has seriously affected the trust of many large scale buyers. Similarly, there is no organization to check the quality of eggs and meat sold in the market, and poor quality produce can be a health hazard *(27)*.

Total fish production increased from 2,800 tons in 1974/1975 to 14,500 tons in 1989/1990. Most of this increase was in the private sector. The objectives of the government fisheries development program include introducing new practices and modernizing older methods to integrate fish production with production of terrestrial animals, poultry and crops. One of the major constraints is that half of the farmers have no training. Farmers face a high incidence of fish disease and lack adequate supplies of water. Fish are either sold directly by farmers or are collected from them by local traders or wholesalers. There are major marketing problems such as the lack of all-weather roads, the absence of cold storage facilities for storing the harvest, and the lack of insulated vehicles to prevent spoilage during transportation *(27)*.

Food industry

Although Nepal has achieved substantial development increments in the food industry with increased urbanization, this industry is still embryonic. Main manufacturing industries include grain mills, bakeries, food product manufacturers, vegetable and animal oils and fats, dairy products, sugar factories and refineries, cocoa and confectionary products and canning/preserving of fruits and vegetables *(5)*. Regarding dairy products, the estimated annual production of processed milk is 25 million litres, of ice cream 13,000 kg, and of butter and ghee 800,000 kg. Cheese production has grown from 15 tons in 1969/1970 to 179 tons in 1992/1993 but faces a number of difficulties. Poor animal nutrition, along with the breeding and management practices used by farmers, contributes to low animal productivity; the incidence of diseases is high among yak and diagnosis, vaccination and other veterinary services are almost nonexistent in the area; and untrained manpower and inadequate technical knowledge of staff lead to poor quality products and large production losses *(27)*.

Food consumption

Breastfeeding and weaning

The practice of giving prelacteal feeds differs among to ethnic groups. Babies are given buffalo milk or honey with water, often using a cotton or bottle, a practice that presents more than one danger. However, attitudes towards this practice are changing because the influence of health workers. Exclusive breastfeeding during the first three to four months is practiced by 60 to 99% of mothers in rural areas and by 39% in urban areas *(12, 29)*. Breastfeeding is declining in urban areas for two main reasons: (i) Bottle-feeding and milk powder are symbols of prestige in many families; (ii) The duration of maternity leave for working mothers is only two months. However, prolonged breastfeeding is still common in rural areas. Traditionally, girls at 5 months and boys at 6 months are introduced to solid food, an event formalized by the rice feeding ceremony. In some Nepali societies pre-chewed food is given from the third month *(12)*. Hand-feeding is common in child feeding and usually starts at ages 4 to 8 months *(12)*. Special weaning food is rare, and rice is the most frequent solid food given to infants, mostly alone or with dal and vegetables. Commercially prepared weaning foods are gaining increased popularity, especially in urban areas.

Adult consumption

Homemade food. The major components of the Nepalese diet are cereals, legumes, and fat and oils. Vegetables, meat, milk, and dairy products are used as supplements. There is virtually no refrigeration and the traditional methods to preserve foods are drying, fermentation and pickling *(9)*. Few Nepalese purchase food according to quality; cost is the primary consideration. Industrially processed food is uncommon, and packaged processed food items are infrequently used and generally associated with western taste *(9)*. Pasteurized milk is not widely used; however, boiling milk before consumption seems to be a widespread custom *(9, 21)*. In urban areas, most people purchase foods from markets rather than shops. The hygiene in these markets is extremely poor (food is displayed on the ground, often close to garbage or to pond water, and commonly covered with flies) and these markets are a likely source of contamination. Most food is prepared and eaten at home, with the exception of street-vended foods in urban areas.

Street vended food. Two studies in Kathmandu indicate numerous hazardous practices and poor environmental conditions. For example, foods are prepared early in the morning in large quantities and are held for hours at ambiant temperature until they are sold; handwashing after handling raw foods and before handling cooked foods is very rare; drinking water, especially during the monsoon, is often served without prior treatment. Lack of basic facilities seriously aggravates the situation. Street vendors, who are frequently illiterate, do not receive any training in personal hygiene or safe handling and preparation of food, and they are not licensed *(13, 18)*.

Contamination of food

The use of chemicals such as food additives and pesticides is inadequately controlled. For example, foodgrains and vegetables are frequently contaminated with aflatoxin. High coliform counts have been regularly demonstrated in drinking water and various categories of foods. In addition, adulteration of food is rampant in Nepal, particularly in urban areas *(4, 9, 13, 18, 22)*.

Food control infrastructure

Food legislation

Nepal is a member of the Codex Alimentarius Commission. Food laws and regulations were updated in 1989 with the technical support of the FAO. The Food Act 2023, promulgated in 1966 with the aim of protecting people from health hazards and commercial frauds, is currently implemented in 36 districts *(20)*. Minimum mandatory standards were fixed for 52 commodities on the basis of Codex Alimentarius recommendations, mainly centered on processed foods available in the urban areas *(20)*. Safe tolerance limits for pesticide use for foodgrains were recently introduced. Under the Municipality Act, published in 1990, the municipalities have some food inspection responsibilities (in markets and restaurants) and have authority for licensing hotels, restaurants, catering establishments and butchers' shops. Codes of hygienic practice have not been developed *(20)*.

Food control implementation

Food inspectors. Bachelor of science graduates in chemistry and intermediate science graduates in food technology are qualified to be food inspectors. They receive training in food inspection, plant inspection, and finished product examination in FAO regional training courses. Twenty inspectorial posts cover 36 out of 75 districts. An inspector makes about six visits to different districts in a year for inspection. The lack of vehicles for sample collection and lack of necessary tools and manuals are among the various impediments to inspection. In addition, the turnover rate for these posts is around two per year, the better qualified people taking more attractive jobs elsewhere *(20)*.

Food laboratories. The Central Food Laboratory (Kathmandu) performs routine analytical services; trains food inspectors; and supervises and provides guidance to the five Regional Food Analytical Laboratories involved in analysis of food samples for regulatory purposes. In routine testing, 2,700 samples were analyzed in 1993/1994. Microbiological tests are limited to tests for coliforms, *Staphylococcus aureus, Salmonella*, yeasts, and molds *(4)*.

Factors influencing safety of food preparation

Safe water supply and sanitation. At the end of 1992, less than half of Nepal's population had access to a safe water supply *(15)*. The water supply in urban areas, already generally inadequate, is deteriorating because of rapid population growth and industrial expansion. In addition to quantitative shortages, infiltration of sewage into the water supply system because of poor construction results in contaminated drinking water. Sanitation provides for 3% and 25% of the rural and urban populations, respectively, so that 6% of the national population has sewage disposal facilities. There is no operating sewage collection and treatment facility in Nepal, and untreated water from individual latrines, factories, and municipal sewers is commonly discharged into natural water bodies *(15)*.

Fuel. Fuelwood from forest, shrublands, and land adjoining farms provides 75% of the total energy used. Reduced availability of fuelwood is due to deforestation, and one of the primary causes of forest degradation is a rapidly increasing human population's demand for fuelwood. Dung also serves as fuel for cooking and heating in many areas. The Kathmandu Valley is characterized by the development of sources of energy other than fuelwood, such as kerosene *(15)*. However, shortage of fuel was often raised as a major constraint in the implementation of basic food safety principles. Solar energy is not used for cooking in the Kathmandu Valley.

Women's status. Women are always associated with feeding and food and consequently with the responsibility for food safety. The constraints related to women's status therefore must be integrated into any program dealing with food safety. Literacy rates, an indicator of exposure to modern views and ideas, are notably higher in the Kathmandu Valley than elsewhere in Nepal. Because of a heavy workload (home production, agriculture, income earning), mothers are often unable to care for their children. Most are helped by older family members or by grown-up children in caring for young children. A consequence often mentioned is that food is prepared early in the morning, stored at ambient temperature for hours, and eaten without proper reheating.

Education in food safety. Education of food industry processors, farmers and foodhandlers responsible for mass food catering has been limited to a small number of initiatives and is far from being sufficient. Education of consumers has been suggested as a means to develop food safety awareness and prevention of foodborne diseases *(22)* but no specific program in this regard has ever been designed or implemented. Only a few food safety rules are presently included in training related to environmental and personal hygiene. They mostly involve handwashing, protection of food from flies and rodents, latrine use, and safe water storage. However, some fundamental principles such as "cooking food thoroughly," "reheating stored cooked foods thoroughly" and "eating cooked foods immediately" *(19)*, which dramatically reduce bacterial contamination at the final stage of food preparation before consumption, are rarely included.

Surveillance of foodborne disease

Diarrheal diseases. Despite considerable government efforts in the past three decades, diarrheal diseases in children under five remain a major cause of morbidity and mortality. A 1990 WHO survey in the Terai and Midhills reported annual incidence rates between 3.1 and 3.3 episodes per child *(17)*. No precise national data on childhood and adult mortality associated with diarrheal diseases is available, but it has been estimated that approximately 25% of childhood deaths are associated with diarrhea *(16)*. A sharp increase in the number of cases is observed during the monsoon *(24)*. This observation strongly supports the role of food as a major vehicle of diarrheal diseases, because, as it is well known, food contamination increases with environmental temperature. Serious cholera outbreaks were reported in 1991 (1,800 deaths) and in 1992 (1,049 deaths) *(16)*.

Surveillance system of foodborne diseases. Cases of diarrheal disease are clinically diagnosed in the sub-health posts, health posts and Primary Health Care Centres. Microbiological analysis of stools is not routinely undertaken because of the lack of laboratory facilities. These cases are reported monthly to the District Public Health Office, which reports to the Management Information System Section. This Section collects data on the total number of cases and treatment. In the case of an outbreak, investigations consist of microbiological analysis of human stool specimens and water samples; neither case-control studies nor microbiological investigations of food are performed (leftovers are considered no longer available).

CONCLUSION

The food safety profile data clearly indicate: (i) a high morbidity and mortality associated with diarrheal diseases; (ii) numerous sources of contamination of raw and industrially processed foods; (iii) a particularly weak food control infrastructure; (iv) a poor infrastructure for the safe preparation of food; (v) the importance of food preparation at home, often the only stage for defense because most foods never enter commercial channels; and (vi) the need for integration of food safety recommendations into environmental and personal hygiene education. At present, these recommendations are seriously incomplete and are not taught from a food safety point of view.

In this context, education in proper food handling, especially through primary health care, is probably the single most important

measure for preventing foodborne diseases *(1)*. Households should be the target group for education because the most effective control measures are those which can be applied in the final stages of food preparation.

HEALTH EDUCATION IN FOOD SAFETY

The main steps for the preparation of a culture-specific educational program in food safety are: (i) development of educational messages devised from a profile of habits and foods that pose recurrent health threats; (ii) identification of distribution channels to reach the groups targeted for food safety education; and (iii) diffusion processes through appropriate channels ("social marketing") *(14, 23)*.

Educational messages

Educational messages should be formulated on the basis of factors that lead to episodes of foodborne diseases. Appropriate systems for the epidemiological surveillance of foodborne diseases can be powerful tools for identifying the most hazardous foods and for understanding what contributes to their contamination. In Nepal, no such data have been collected because of the poor state of the surveillance system for foodborne disease. Thus, work should be undertaken to detect and characterize specific foods and food practices implicated in foodborne illness in the context of Nepalese food and eating habits.

As the availability of data resulting from this work is likely to take considerable time, experience from other countries might be helpful. Data gathered during various epidemiological investigations of foodborne disease indicate that deficiencies in food handling practices can be classified into three categories *(14)*: factors affecting contamination, factors affecting survival of pathogens, and factors affecting propagation of pathogens. Some of these factors are related to widespread, even universal, dangerous practices. WHO has edited a number of educational documents outlining basic food safety principles *(6, 8, 10, 19, 30)* that can be used as a starting point for the immediate implementation of an education program in food safety. They may also serve as a basis for locally designed education messages integrating the results of technical and socio-cultural research.

A technical and socio-cultural research study is planned that will identify the major sources of food contamination in the Kathmandu Valley by examining, *in situ*, home prepared foods (with emphasis on weaning foods) and street vended foods so that appropriate health behavior modification strategies can be devised.

The microbiological part of this project should be conducted in two steps: (i) detect the food most heavily and most frequently contamined by bacterial pathogens (especially during the annual peak of diarrheal diseases, in the summer); (ii) identify hazards during preparation and storage of these foods using the HACCP (Hazard Analysis Critical Control Point) approach, which is a fast, inexpensive scientific tool for obtaining information on contamination, survival and growth of microorganisms in food *(3)*.

In addition, study of traditions and beliefs related to food and food safety as well as analysis of economic and environmental factors are essential to ensure the success of the education program *(11, 14)*. Nepalese foods are classified into "hot/cold" categories, with inherent values for disease treatment and prevention *(21, 26)*. It is therefore important to understand these "hot" and "cold" properties and the ways in which they are altered by cooking *(14)*. People must also be convinced that change will provide a concrete, visible gain in their lives, and this implies that they must understand the relationship between unsafe food and their health [in 1989, one-third of the population expressed the belief that evil spirits, fright and gods can cause diarrhea *(25)*]. Fuel shortage and time constraints of mothers, which could lead to food underprocessing, should be carefully evaluated.

Distribution channels for information

The aim of any education program in food safety is to increase the entire population's level of awareness and knowledge. Given the data gathered in the food safety profile and acknowledging homes as important places where food is prepared, the first step of the program should focus on the persons in charge of preparation of the family food at home (i.e., those who are not affected by the regulatory system and cannot be influenced by means other than health education), especially in poor and socio-economically disadvantaged households. In Nepal, women play a predominant role in the preparation of family food. Educational efforts should therefore be concentrated on them. Education of school children is also of utmost importance, not only to educate and motivate them but because they in turn influence older members of the family and because older children often care for younger infants during the absence of mothers.

Such an educational program needs collaboration between various sectors and should combine mass media with education on a person-to-person basis. This not only allows wide dissemination of information but also provides opportunities for clarifying issues and eliminating doubts and fears *(14)*. A number of agencies and organizations that could be actively involved in the promotion and development of food safety education programs were visited: MOH (National Health Education Information and Communication Centre), WHO and UNICEF Nutrition and Control of Diarrheal Disease

Groups, WHO Collaborating Centre on Health Learning Material, Ministry of Education, Culture and Social Welfare (Non-Formal Education Section and the Curriculum Development Centre), Ministry of Local Development (Women's Development Division), Non-Governmental Organizations (NGOs) (United Mission to Nepal, Save the Children Fund UK, Save the Children US, CARE Nepal, Aide Médicale et Sanitaire, Nepal Red Cross Society, the Nepal Centre for Women's and Children's Affairs, the Nepal International Consumers Union) and scientific societies.

CONCLUDING REMARKS

Based on the consultancy report, the following recommendations were proposed:

1. **An Interdisciplinary Committee on Food Safety Education should be Established:**

- *including representatives of* MOH (National Health Education, Information and Communication Centre), Ministry of Education (Non-Formal Education Section and Curriculum Development Centre), Ministry of Agriculture (Food, Nutrition and Quality Control Directorate, and Nutrition Programme Section), Ministry of Local Development (Women's Development Division), WHO, Health Learning Material Centre, the working group on Operational Research on Food Contamination (see below), and NGOs,
- *with the following main objectives:* to design an educational strategy, to lay down a calendar, to adjust programs based on feedback, to stimulate the participation of NGOs and the private sectors in food safety, to assure communication and maintain cooperation between the various organizations involved, to promote the active participation of the community in food safety issues, and to reinforce the local authorities in charge of food safety activities, providing them with information and knowledge.

2. **The Following Plan of Action should be Implemented**

First phase

- *The first step of the educational campaign should be launched:* using WHO documents as starting messages in close collaboration with an anthropologist/sociologist and using mass media (mainly radio) as the main distribution channel.

The second phase should be prepared:

- To undertake operational research to identify factors that can endanger the safety of food and the hazardous steps during preparation procedure and storage; two kinds of data are expected: (i) technical information on the observed risks and hazards of the contamination of food; (ii) sociocultural evidence that covers information regarding food habits, rituals and beliefs of the population.
- To evaluate the progress of the research program; a Working Group (microbiologist, epidemiologist, food scientist, anthropologist/sociologist) should be set up to report regularly on the research to the previously mentioned committee on food safety education.
- To identify the most appropriate distribution channels.
- To involve experts in social marketing to determine the particular capacities of each form of communication.

Second phase

- *To organize a large meeting* including people of various origins to create awareness and knowledge on food safety, to draw attention to the need for and potential role of education to prevent diarrheal diseases and other foodborne diseases, and to review results of the operational research.
- *To plan and implement the various interventions of the second step of the educational campaign* with messages on practices and priorities selected from data of the operational research and using wide distribution channels, with the help of experienced specialists in social marketing and using various educational materials: chapter on food safety in textbooks (formal and non-formal education, literacy), manuals on CDD and nutrition, magazines for primary school children, booklets, calendars, posters, and other visual materials.
- *To evaluate the results of the first phase.*

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REFERENCES

1. Abdussalam, M. and F. K. Kaferstein. 1994. Food safety in primary health care. World Health Forum. 15:393–399.
2. Acharya, P., and Y. B. Thapa. 1994. A study on kitchen garden activities in CARE International in Nepal.
3. WHO. 1993. Application of the Hazard Analysis Critical Control Point (HACCP) system for the improvement of food safety – WHO-supported case studies on food prepared in homes, at street vending operations, and in the cottage industries. WHO/HPP/FNU/93.1. Food Safety Unit, Geneva (Switzerland).
4. Central Food Laboratory (Department of Agricultural Development). (1993/1994). Annual bulletin, 2050/2051.
5. Central Bureau of Statistics, HMG – National Planning Commission Secretariat. Statistical pocket book – Nepal, 1994. Sheela Printers, Kathmandu (Nepal).
6. WHO. 1992. Essential safety requirements for street-vended foods. WHO/HPP/FOS/92.3. Geneva (Switzerland).
7. WHO. 1989. Evaluation of programmes to ensure food safety – Guiding principles; Geneva (Switzerland).
8. WHO. 1993. Facts about infant feeding – Contaminated food: a major cause of diarrhea and associated malnutrition among infants and young children. 3. Geneva (Switzerland).
9. FAO. 1991. Strengthening facilities for food control and consumer protection, Nepal – Terminal statement prepared for the Government of Nepal by the Food and Agriculture Organization of the United Nations; Rome.
10. WHO. 1989. Food safety – Examples of health education materials. WHO/EHE/FOS/89.3, Geneva (Switzerland).
11. Forster, G. M., and F. K. Kaferstein. 1985. Food safety and the behavioral sciences. Soc. Sci. Med. 21:1273–1277.
12. Gongal, G. N., K. N. Pyakuryal, S. Upadhyaya, R. R. Khadka, and K. B. Neba. 1994. A study of socio-cultural influence on maternal and child feeding and weaning practices in Lumbini zone (draft report).
13. Gongal, G. N., B. L. Shrestha, S. J. Shah, S. Karmacharya, R. Joshi, Chitrakar. 1993. Street-vended and weaning foods in Kathmandu, Nepal. Study report.
14. WHO. 1998. Health education in food safety (provisional edition). WHO/EHE/FOS/88.7. Geneva (Switzerland).
15. HMG Environment Protection Council. 1993. Nepal environmental policy and action plan – Integrating environment and development.
16. HMG Ministry of Health, Planning and Foreign Aid Division, Department of Health Services/WHO. 1994. Implementation of strategies for Health for All by the Year 2000 – Third monitoring of progress.
17. HMG Ministry of Health, Public Health Division, Diarrheal Disease Control Program/WHO. June 1990 (Project ICP CDD 001). Diarrheal diseases household case management survey, Nepal.
18. Joshi, D. D., D. B. Thapa, and C. K. Gurung. 1988. Current food handling and street food preparation practices particularly of dairy products in Kathmandu (final report).
19. Kaferstein, F. K. 1988. The WHO golden rules for safe food preparation. World Health. 7–11.
20. Karki, T. 1994. Food safety in Nepal. Paper presented at multi-country study mission on food safety, Tokyo, Japan.
21. Krantz, M. 1991. Behaviors affecting nutritional status. Paper presented at the National Seminar on Nutrition on Preparation of International Conference of Nutrition, December 26–27. Kathmandu (Nepal).
22. Proceeding of the first national seminar on food safety in Nepal held in Kathmandu, 3–6 Sept. 1985 (D. D. Joshi, ed.).
23. WHO. 1990. Report of the task force on integrated approaches to health education in food safety. WHO/HPP/FOS/90.3. Geneva (Switzerland).
24. Shresta, K. D. 1994. Acute diarrhea cases in Nepal. 1993. An epidemiological review. J. Nepal. Med. Assoc. 32:68–85.
25. Stapleton, M. C. 1989. Diarrheal diseases: perceptions and practices in Nepal. Soc. Sci. Med. 28:593–604.
26. Stone, L. 1983. Hierarchy and food in Nepalese healing rituals. Soc. Sci. Med. 17:971–975.
27. Thapa, G. B. 1994. Public resource allocation and agricultural performance in Nepal. Research Report Series, n°24.
28. UNICEF. 1992. Children and women of Nepal – A situation analysis. Kathmandu (Nepal).
29. Upreti, P., and R. K. Adhikari. 1987. Report on impact study of feeding practices during and after diarrheal episodes. Tribhuvan University, Institute of Medicine.
30. Williams, T., A. Moon, and M. Williams. 1990. Food, environment and health. WHO. Geneva (Switzerland).

1998 IAMFES SECRETARY

CALL FOR NOMINATIONS

Nominations are now being accepted by the Nominating Committee for the office of IAMFES Secretary. A representative from the education sector will be elected in the spring of 1998 to begin serving at the conclusion of the 1998 IAMFES Annual Meeting for the year 1998-1999.

Letters of nomination, including a photograph and a biographical sketch, are to be submitted to the Committee Chairperson **no later than November 1, 1997**. After the close of nominations, the Committee will review the nominees and select two (or more) persons to be presented to the membership for voting.

The Secretary-Elect is determined by a majority of votes cast through a mail vote taken in the spring of 1998. Official Secretary duties begin at the conclusion of the 1998 IAMFES Annual Meeting. The elected Secretary serves as a member of the Executive Board of IAMFES for a total of five years succeeding to President, then serving as Past President. Board meetings are scheduled at least three times a year and other time commitments may be necessary.

For more information regarding duties and requirements of the position, please contact David Tharp, Executive Director at Phone: 800.369.6337 or 515.276.3344; Fax: 515.276.8655; E-mail: dtharp@iamfes.org.

Send a letter of nomination for Secretary of IAMFES, along with a photograph and biographical sketch of nominee, to the Nominations Chairperson:

Robert B. Gravani
Cornell University
Department of Food Science
11 Stocking Hall
Ithaca, NY 14853
Phone: 607.255.3262

Nomination deadline is November 1, 1997.

New Members

AUSTRALIA

Stefan U. Fabiansson
Meat Research Corporation
Sydney South, New South Wales

CANADA

Don J. Coady
Marine Institute
St. John's, Newfoundland

Alexandra I. Gabowicz
Kerry Ingredients
Mississauga, Ontario

Janice MacLeod
Wrigley Canada Inc.
Don Mills, Ontario

Joe Myatt
Natrel Ontario Inc.
Don Mills, Ontario

Frances Nattress
Agriculture & Agrifood Canada
Lacombe, Alberta

James Reffle
London Health Unit
London, Ontario

COSTA RICA

Florencia Antillon
Microtec, San José

Jose A. Gene
Laboratorio Microtec, San José

GREECE

Chris V. Papadopoulou
University of Ioannina
Ioannina

ITALY

Giampaola P.O. Quaquo
University Di Modena, Modena

NORWAY

Gro D. Oefjord
Colifast Systems, Lysaker

PORTUGAL

Madalena Vilela Pimentel
Faculdade De Farmacia
Forgas, Lisboa

SOUTH AFRICA

Ifigenia Geornaras
University of the Witwatersrand
Johannesburg

UNITED KINGDOM

Martin R. Adams
University of Surrey
Guildford, Surrey

UNITED STATES

ALABAMA

Scott R. Moss
Wayne Farms, Albertville

Nancy Reimer
Oxford

CALIFORNIA

William Huntley
DASI Linda LLC, West Covina

Karen A. Leininger
Riverside County Environmental
Health Dept., Riverside

Lucretia Mulvey
Vulcan Chemical Technologies, Inc.
West Sacramento

Michael Szekely
CSUN Associated Student Union
Burbank

Stan Wallen
Zacky Farms, Fresno

COLORADO

Ian Johnsson
Meat Research Corp., Englewood

DELAWARE

Harold Naylor
Qualicon, Inc., Wilmington

GEORGIA

Jamice Chisholm
Puritan Food Service, Marietta

Carl E. Davis
USDA-ARS-RRC, Athens

Mary F. Elmore
Puritan Food Service, Marietta

Robert W. McMahon
Bio-Tek Industries, Inc., Atlanta

FLORIDA

Rishi C. Gidwani
Key West

ILLINOIS

Robert Solomon
Silliker Labs, Homewood

IOWA

A. Marie Ramos
Iowa State University, Ames

Steven M. Sanders
Contract Services, Ltd., Burlington

KANSAS

Penni Peters
Kansas State University, Manhattan

KENTUCKY

Karen Sloat
Flav-o-Rich, London

Richard Westerdale
Winchester Farms Dairy
Winchester

Gard Whitney
Brown Forman, Louisville

MARYLAND

Cindy A. Roberts
USDA/FDA Foodborne Illness
Education Information Center
Beltsville

MICHIGAN

Susan Alles
DiverseyLever, Plymouth

Jim Bail
Domino's Pizza, Inc., Ann Arbor

Ronald Holben
Michigan Department
of Environmental Quality, Lansing

Jon Wannlund
Analytical Luminescence Lab
Saline

MINNESOTA

Chris Binsfeld
3M, St. Paul

Rebecca Illsley
University of Minnesota, St. Paul

MISSISSIPPI

Rachel A. Hurta
Wayne Farms, Laurel

MISSOURI

Azlin Mustapha
University of Missouri, Columbia

NEVADA

Carl R. Cahill
Washoe Co. District Health Dept.
Reno

NEW JERSEY

Michael S. Repko
Nabisco Inc., Parsippany

Myron Solberg
Rutgers University, New Brunswick

NORTH CAROLINA

Timothy A. Irwin
Gerber Products Co., Skyland

OHIO

Douglas S. Snedden
Foxtail Foods, Fairfield

OREGON

Philippe R. Neuville
CHZM Hill F.G., Portland

PENNSYLVANIA

Joel Simpson
Food Safety Solutions, Hollidaysburg

Jill A. Snowdon
SGA Associates, White Oak

Craig Weaver
Milk Marketing Inc., Windber

SOUTH CAROLINA

Rachel S. Montgomery
FermPro, Kingstree

SOUTH DAKOTA

Joe Hinricher
John Morrells & Co.
Sioux Falls

TENNESSEE

Steve L. Berry
City of Plano, Plano

Diane Butler
U.S. Army, Clarksville

Janay Griffin
Melaleuca, Knoxville

Patrick Jones
City of Plano, Plano

David Paulk
City of Lubbock, Lubbock

VIRGINIA

Peter F. Eberle
Foodservice & Packaging Institute
Arlington

WASHINGTON

Carol Larson
WSDA, Olympia

Sally L. Pytel
WSDA, Olympia

WISCONSIN

Glen Kurtz
Hudson

New IAMFES Sustaining Member

Karen L. Asher
U.S. Filter Corp.
Lowell, MA

UpDates

World Dryer Appoints Smith VP of Engineering

World Dryer Corporation announced the promotion of Dennis D. Smith to Vice President of Engineering, effective June 1, 1997. Dennis joined World Dryer in 1991 as Engineering Director, leading the company's efforts in the development of the touchless hand sanitation range of products and maintaining the high integrity of World Dryer's global leadership in hand drying. His accomplished background includes (5) U.S. patents and 30 years of high volume manufacturing and product design experience in consumer electronics and commercial equipment. In his new position, Dennis will be responsible for continued quality maintenance and R & D projects designed to further enhance World's growth.

Sparta Brush Company Promotes Roshelle M. Svoboda

Sparta Brush Company, Division of Carlisle Companies of Syracuse, NY has announced the promotion of Roshelle M. Svoboda to Director of Marketing.

Svoboda joined Sparta Brush Company in 1988 as a customer service representative. Through the years Svoboda has moved into the sales and marketing department holding various positions; most recently holding the title and responsibilities of Manager of Marketing Services.

Svoboda's primary responsibilities will continue to include advertising, promotional materials development, new product introductions, trade show management, and sales forecast management.

In addition to her marketing responsibilities, Svoboda has been and will continue to manage Sparta's customer satisfaction team as well as assist the sales department in some administrative duties.

Dennis Tenhoff Joins Walker Stainless Equipment

Walker Stainless Equipment Co., Inc., announced the appointment of Dennis (Denny) Tenhoff to the position of Vice President/General Manager of Transportation Products.

Denny comes to Walker with over 30 years experience in the transportation industry where he has served as V.P./General Manager of Brenner Tank in Wichita, Kansas, Director of Market Development and Operations for Polar Tank, and as V.P. of Manufacturing for Beall Transport.

Denny will be responsible for marketing, sales, engineering and manufacturing for Walker's Transportation Products Group.

Ecolab Announces Additions to Food and Beverage Team

Tom Arata has joined Ecolab as Vice President, Marketing in April. Prior to joining Ecolab, Arata was Business Director, Global Helium, for BOC Gases. He held positions in sales and marketing management at BOC before assuming that role. He had also worked as Regional Sales Manager for Baxter International and served as a pilot in the U.S. Air Force.

Arata holds a B.S. degree in biology from the U.S. Air Force Academy and an M.B.A. from the University of Colorado.

Carol Stauter has joined the division as Senior Market Manager, Dairy. She has extensive experience in sales and marketing management. Stauter comes to Ecolab from TetraLaval's headquarters in Sweden where, most recently, she was responsible for marketing support for the company's international viscous food division.

Stauter holds a B.A. degree in business/international communications from the University of Northern Iowa, and an M.A. degree in international management from Thunderbird International School.

Jim Zell joined the marketing group as Market Manager, Beverage & Brewing. Zell joined Ecolab as an Account Manager in 1992. Zell holds a B.A. degree in marketing from the University of Wisconsin – Eau Claire, and an M.B.A. from the University of Minnesota.

Moshiri Joins Bohdan

Ben Moshiri has joined Bohdan Automation as Director of Marketing, heading a newly expanded marketing team. His group will focus on the combinatorial chemistry sector.

Dr. Moshiri's experience in laboratory automation includes employment with Questron Corporation (Mercerville, NJ) as Vice President, Sales and Marketing and prior to that, with Merck Limited (Poole, England), and Thermo-Unicam (Cambridge, England).

Quality Chekd Dairy Processors Recognized for Quality and Achievement

Quality Chekd Dairies, Inc., has named Hiland Dairy Company of Springfield, MO., the winner of the organization's Irving B. Weber Award for Quality Excellence. The announcement was made at the Quality Chekd Management & Leadership conference in St. Louis, where Quality Chekd dairy processor members from around the U.S., Canada, and Latin America gathered recently to review and discuss the latest industry trends.

Hiland received the Quality Chekd Weber Award for its emphasis on exceeding customer expectations in all aspects of its business. The award, similar to the Malcolm Baldrige National Quality Award, recognizes effective implementation of a quality focus throughout all areas of the member organization. Hiland is headquartered in Springfield, MO, and operates plants in Springfield as well as Ft. Smith and Fayetteville, AK; Wichita, KS; and Norman, OK.

Quality Chekd also recognized Umpqua Dairy Products Company, Roseburg, OR, with its Gingrich Award as the top single production plant within Quality Chekd; and Turner Dairies, Inc., Covington, TN, with its Zimmerman Award for marketing excellence. Turner dairy plants are also located in Memphis, TN, and Fulton, KY.

Having previously received the Malcolm Baldrige National Quality Award, Arthur D. Wainwright, CEO of Wainwright Industries, St. Louis, was a logical choice to address the Quality Chekd meeting. Wainwright said that perseverance and character is what the quest for quality is all about and that achieving world class quality is 90-percent dependent on how personnel are motivated and work together. He also noted that the dairy processors recognized by Quality Chekd, Hiland, Umpqua and Turner, all emphasized the skills and contributions of their people when accepting their awards.

USDA Announces International Standard-Setting Activities

In accordance with legislation implementing the Uruguay Round of the General Agreements on Tariffs and Trade, the U.S. Department of Agriculture is informing the public of international standard-setting activities of the Office International des Epizooties, (OIE) the Secretariat of the International Plant Protection Convention, (IPPC) and the North American Plant Protection Organization (NAPPO) during the coming year and asking for public comment on the standards to be considered by these entities.

In some cases, working groups and committees have not yet set meeting dates and locations or determined specific standards to be discussed. Also, because working groups and the issues they address are not static, this list may not present a complete picture of OIE, IPPC, and NAPPO standard-setting activities.

The following list represents OIE international standard-setting activities, their dates, and their current agendas:

- The OIE General Session will be held in May 1998 in Paris, France. The session will discuss animal health standards as they relate to trade, including risk assessment standards, regionalization, and specific disease issues.
- The OIE Regional Commission for the Americas meets each year in May and December or January. The Commission will discuss the location of regional offices for the Americas and animal health disease control issues, of regional concern.
- The Standards Commission of the OIE meets each year in February and September in Paris, France. The commission will, among other things, review and recommend revisions to international diagnostic test standards published in the OIE Manual of Standards of Diagnostic Tests and Vaccines; review OIE reference laboratories, reference sera, laboratory quality assurance, and make recommendations to the OIE Animal Health Code Commission; and discuss which diagnostic procedures would be most appropriately prescribed for specific animal and poultry diseases.
- The OIE International Animal Health Code Commission meets in September and January in Paris, France, and reviews and updates the Code after proposed changes are circulated to member countries for comments.
- The OIE Foot-and-Mouth Disease and Other Epizootics Commission meets when called upon by the director general and is currently looking at international standards for FMD serological testing, protocols for endorsement of FMD-free areas, and surveillance and monitoring standards for bovine spongiform encephalopathy.
- The OIE Fish Disease Commission meets annually in September in Paris, France, and is updating the OIE Fish Disease Manuals, preparing the annual OIE report

on the worldwide status of fish diseases, and planning and hosting international conferences on aquatic animal health.

• The OIE Ad Hoc Working Group on Biotechnology meets when called upon by the Director General in Paris, France, and is currently discussing ongoing reviews of diagnostic test kits, applications of genetic engineering to animal health, veterinary products developed using biotechnology, and possible uses of new biotechnological techniques in veterinary medicine.

• The OIE Working Group on Veterinary Drug Registration meets every two years in Paris, France, and at the next meeting will discuss planning for the upcoming session of the International Technical Consultations on Veterinary Drug Registration, developing training programs for veterinary drug registration officials of OIE member countries, and assisting an OIE ad hoc group in developing draft international guidelines for veterinary drug registration.

• The OIE Working Group on Informatics and Epidemiology meets when called upon by the director general in Paris, France, and is currently developing a Windows version of HandiStatus and designing and developing the OIE web page.

• The OIE Working Group on Wildlife Diseases typically meets annually in the summer or fall in Paris, France, and is planning on addressing the development of reporting methods for wildlife diseases, how to facilitate worldwide wildlife disease surveillance and the applicability of routine diagnostic tests to wildlife species, and problems related to propagation of wildlife species in captivity and the disease hazards associated with their release from zoos or game farms.

• The OIE Ad Hoc Working Group on Animal Disease Categorization meets when called upon by the Director General in Paris, France, and is currently looking at how to determine how frequently certain diseases should be reported to OIE. A range of IPPC standards are currently moving through different stages of development, review, and approval. Details on all the standards and their status are also available on the United Nation's Food and Agriculture Organization web page at: http://faowfsOa.fao.org/waicent/faoinfo/agricult/agp/agpp/PQ/Default.htm.

Current information on NAPPO policies, standard-setting activities, U.S. participants, and meeting agendas and dates is available on the NAPPO home page at: http://www.nappo.org.

Good Dairy Farm Employee Management Must be Learned

Hiring and managing employees is becoming an increasingly important aspect of successfully operating a dairy farm. "Good employee management is a skill that must be learned," says Dave Kjome, southeast Minnesota Dairy Educator with the University of Minnesota Extension Service.

"In most dairy operations, labor accounts for 10 to 15 percent of total costs," says Kjome. "Hiring a person not suited to your operation can be disastrous," he adds.

"Before hiring an employee, look objectively at your operation," he suggests. "Ask yourself these questions: Would I want to work on this dairy? Is it well cared for? Does pride in this operation show? Is the machinery clean and shedded? What about the farmstead and condition of the livestock buildings? The first impression to an outsider or a prospective employee is a lasting one."

"When hiring new employees, interview them thoroughly," says Kjome. "Find out what expectations they have for the position. Ask them about their past experiences to see how they fit into your operation. Spend time with them–it may be some of the best business time you spend."

Kjome emphasizes the importance of training the new employee. Spend time with the employee during the first days on the job and make sure the employee understands how you want the job to be done. Give the person an opportunity to ask questions.

"It's important to set aside time each week when all employees meet with management to talk over what has been happening and what needs to be done," says Kjome. "It's a good time to share current information on DHIA records, milk plant test results, veterinary and herd health reports, feed inventories and cropping updates. Set aside time for employees to brainstorm and offer ideas for improving the operation. If employees feel they are part of the management team, they will work better and are more likely to perform as outlined in expectations."

Joseph Frank Receives 1997 Gist-brocades Award

Joseph Frank, Professor of Food Science and Technology at the University of Georgia, has received the 1997 Gist-brocades Award from the American Dairy Science Association. The award for outstanding research on dairy products is one of the highest honors presented by the ADSA.

Frank's research has focused on the quality and shelf life of dairy products and the microbiology and enzymology of dairy products. His study of the microstructure of yogurt has helped lead to the development of improved fat-free products. His microbiological research has led to improved sanitation practices in dairy processing plants.

Frank also teaches food and dairy microbiology classes. He came to Athens in 1979 after receiving his Ph.D. from the University of Wisconsin and conducting post-doctoral research with the USDA's Eastern Regional Research Center. He is an active member of the International Association of Milk, Food, and Environmental Sanitarians, the Institute of Food Technologists, and the American Dairy Science Association. He has served as Chair on the *Journal of Food Protection* Management Committee.

He is also a member of the Sigma Xi, Phi Kappa Phi and Gamma Sigma Delta honorary societies. He served as the Malcomb Trout Visiting Scholar at Michigan State University in 1992, and he received the Outstanding Undergraduate Professor Award from the UGA Food Science Club in 1995.

The Gist-brocades Award was presented in June at the 92nd annual meeting of the American Dairy Science Association in Guelph, Ontario. The award is sponsored by Royal Gist-brocades N.V.

Request for Comments on Minor Species and Minor Uses Approval Options

In the June 23, 1997 *Federal Register*, FDA requested comments and suggestions relating to legislative and regulatory options to facilitate the approval of new animal drugs intended for use in minor species or intended for minor uses. Under the Animal Drug Availability Act of 1996 (the ADAA), FDA is required to announce proposals for legislative and regulatory changes to the approval process by April 9, 1998. Changes which facilitate approvals for minor uses and minor species will increase the availability of new animal drugs intended for these uses.

Minor use is defined in the *Code of Federal Regulations* (CFR) as "the use of: (a) New animal drugs in minor animal species, or (b) new animal drugs in animal species for the control of disease that (1) occurs infrequently or (2) occurs in limited geographic areas." Minor species are defined in the CFR as "animals other than cattle, horses, swine, chickens, turkeys, dogs, and cats. Sheep are a minor species with respect to effectiveness and animal safety data collection requirements; sheep are a major species with respect to human safety data collection requirements arising from the possible presence of drug residues in food."

FDA seeks comments on the scope of the definition of minor species or minor use, creating additional statutory authority, administrative and regulatory changes, creating incentives, and extending existing legal authority under the Animal Medicinal Drug Use Clarification Act for subjects such as medicated feeds and reproductive hormones. This list is not all-inclusive, and is not intended to limit the range of options available for public comment. The Agency asks that comments be as detailed as possible.

Written comments should be sent to the Dockets Management Branch (HFA-305), Food and Drug Administration, 12420 Parklawn Drive, Room 1-23, Rockville, MD 20857 by September 8,1997. Comments should be identified with the Docket Number 97N-0217.

Further information is included in the *Federal Register* which is available for review or downloading on CVM's Internet Website at http://www.cvm.fda.gov/. Paper copies are available from the Communications Staff, FDA/Center for Veterinary Medicine, HFV-12, 7500 Standish Place, Rockville, MD 20855; Phone 301.594.1755. Questions may be directed to Dr. George A. (Bert) Mitchell, Center for Veterinary Medicine (HFV-6), Food and Drug Administration, 7500 Standish Place, Rockville, MD 20855; Phone 301.827.5587.

Federal Trade Commission Executive Summary

Each year, over six billion gallons of fluid milk are sold in the United States. State and local reports of short-filling in packages of milk served in schools or sold in retail stores led to this joint federal/state study to examine the accuracy of net content labeling of milk, and to a lesser extent, other dairy products (such as yogurt and cottage cheese) and juice. This study was conducted by the staff of the Federal Trade Commission, Food and Consumer Service at the U.S. Department of Agriculture, the Office of Weights and Measures at the National Institute of Standards and Technology in the Department of Commerce, and the Office of Food Labeling at the U.S. Food and Drug Administration in coordination with state and local weights and measures offices.

For this study, twenty states, using an inspection procedure developed by the National Conference on Weights and Measures, conducted over 1600 inspections of milk, other dairy products and juice. Each inspection involved testing a group of packages referred to as the "inspection lot," which consists of packages of the same product in the same size, with the same label, from the same packer and with the same expiration date. These inspections took place at 512 locations. At many of the inspection sites, testing of multiple inspection

lots took place. For example, in a single retail store, inspection lots of whole milk, 2% milk, skim milk and cottage cheese may have been tested. For an inspection lot to be approved, the quantity of contents of packaged goods must meet two requirements under the testing protocol used. First, the average quantity of contents of packages in the lot must equal or exceed the quantity printed on the label. Second, individual packages may not be underfilled by an unreasonable amount, as defined in the testing protocol.

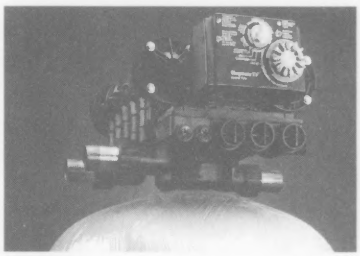
Overall, the inspections revealed widespread problems with short-filling of milk, other dairy products and juice. Just over 40% of the 1638 inspection lots failed. Of the 858 lots of milk and juice inspected at schools, universities and hospitals, almost one-half failed inspection. Of the 780 lots of milk and dairy products inspected in retail stores, packaging plants and dairies, almost one-third failed inspection. Results of inspections varied widely from state to state and from packager to packager. The results of this study cannot be statistically projected to the entire country, but do strongly indicate widespread problems with underfilling of milk, other dairy products, and juice.

This study shows that compliance with net content labeling requirements is in need of improvement. Although compliance levels were very high at many dairies and packagers included in this study, compliance levels at other facilities were poor or mixed. The study results suggest that inadequate quality control in the packaging plants and a lack of strict oversight by manufacturers and distributors is the cause of many short-filling problems. This study also indicates that active oversight by state and local weights and measures offices can help increase compliance with net content labeling requirements. State and local officials note, however, that resource constraints have limited their ability to maintain consistent oversight in this area.

A major goal of this joint federal/state project is to inform industry of the problems that exist and to provide information that will enable industry members to examine and, if necessary, reform their packaging practices. The government participants in this study are hopeful that increased public attention to the problem of short-filling will lead dairies, producers and packers to examine and reform their packaging processes voluntarily. Through business education efforts and warnings, government agencies will work with dairies and packagers to correct any problems found. Packagers that, in the future, fail to pay sufficient attention to their manufacturing processes run the risk of government enforcement actions with the possibility of fines, exclusions from government contracts, and government mandates to change their practices. Federal, state and local officials plan to continue to coordinate their efforts to monitor the accuracy of net content labeling of dairy products and juice, as well as other foods.

Request for Proposals

The American Water Works Association Research Foundation (AWWARF), a non-profit organization dedicated to advancing the science of water, announces the selection of new research projects approved for funding in 1997. AWWARF sponsors practical, applied research for the drinking water community and, since 1986, has managed research projects worth over $100 million. The new research projects cover topics including resources, treatment chemistry, customer issues, health effects, and epidemiology. Requests for Proposals (RFPs) for the new projects will be available on the AWWARF web site (www.awwarf.com) after July 15. For additional information, contact AWWARF at 303.347.6100.



OSMONICS

New Filter Control Valve Exceeds Standard Backwash Flow Rates

OSMONICS has recently introduced the new Autotrol Magnum Cv™ commercial and industrial (C&I) filter control valve. This unique top-mount valve package with two-inch flow rates offers backwash flow capabilities that allow for proper lift and cleaning of most filter media in tanks with diameters of 36 inches (914.4 mm) and beyond. No valve of its size comes close to matching its performance: 90 gallons per minute (20.4 m^3/h) at 25 psi (1.7 bar) pressure drop or 70 gallons per minute (15.9 m^3/h) at 15 psi (1.0 bar) pressure drop.

To ensure optimal application performance, the Magnum Cv control valve has been designed with a variety of controller options including Autotrol electronic controls that offer volume, time or remote backwash initiation capabilities; seven- or twelve-day mechanical time clocks; and impulse controls that initiate backwash from a remote signaling device. The filter control valve may be configured with an integral cartridge that prevents bypass of unfiltered water during backwash. The electronic control can also store valuable peak flow and daily water usage information. This product will not only meet all of your filter valve requirements but will serve your most demanding softener applications.

OSMONICS, Minnetonka, MN

Reader Service No. 301

Ecolab Introduces Matrixx™: Next Generation Dairy Sanitizer

Processors can count on high dairy product quality and excellent shelf life with Ecolab's new peracid-based sanitizer, Matrixx™. Advanced chemistry makes Matrixx significantly more effective in killing microorganisms that can cause spoilage than conventional sanitizers.

In addition to effecting a higher log reduction on microorganisms, Matrixx functions at a lower pH, so it is more effective at controlling mineral films. Its fast-breaking foam serves as a visible indicator that a sanitizer is present in manual or central sanitizing applications.

Matrixx works more effectively at low temperatures than other conventional sanitizers. At 5°C, Matrixx achieved a greater than five-log reduction in thirty seconds against *S. aureus* and *L. monocytogenes*.

Ecolab, St. Paul, MN

Reader Service No. 302

Plant Sanitation Guide

An essential tool for the dairy processing industry to assist in setting up a sanitation program under HACCP guidelines, is the Sparta Brush Spectrum™ Plant Sanitation Guide.

This eight-page, four-color guide includes: a generic three-dimensional plant layout showing specific brush types in recommended cleaning applications; a two-page working spreadsheet with an extensive listing of cleaning applications and suggested zones and colors; and referenced page number in Sparta's full-line catalog for all suggested sanitation products.

The Sparta Brush Spectrum™ Brush System has approximately 30 brush styles in up to eight bristle colors enabling process plants to segregate clean-up brushes by color and by work zone. Sparta strives to be a single source supplier with over 1,600 cleaning and related products.

Sparta Brush Company, Sparta, WI

Reader Service No. 303

Tri-Clover Brochure Introduces Tri-Blender®

A brochure featuring its Tri-Blender®, dry ingredient and liquid blending system has been made available through Tri-Clover.

The six-page full-color brochure details key benefits of Tri-Blender which thoroughly, efficiently blends dry ingredients and liquids. A unique tube-within-a-tube design keeps dry ingredients and

liquids separate until ready to be mixed, minimizing the air involved in the process.

Tri-Blender is designed to be integrated into an already existing process system. Compact size creates the possibility of installing it at any point in the process.

The brochure provides complete information on the selection of models available to meet blending application needs, including single-stage and double-stage models. Other options include valves, skid mounting, automatic custom control packages and automatic feeds. Ordering information and details on sales and service support also is featured.

Tri-Clover Inc., Kenosha, WI

Reader Service No. 304

Celsis-Lumac Rapid Microbial Screening Products for the Dairy Industry

With the Pasteurized Milk Screen Kit and UHT/ESL Screen Kit, dairies are able to reduce or even eliminate holding times with 24 to 48 h test results. For facilities not holding finished product these tests will deliver significant value by detecting contamination days earlier than today's methods. The Raw Milk Screening Kit avoids costly product and equipment contamination by providing microbial results in less than 5 minutes for incoming raw milk or milk in storage.

ATP-bioluminescence, used commonly by dairy plants for environmental testing, now has a wide variety of applications to test finished products and raw materials exclusively from Celsis-Lumac. To determine the financial value that rapid testing brings to a dairy, Celsis-Lumac utilizes comprehensive economic software modeling tools.

Celsis-Lumac, Evanston, IL

Reader Service No. 305

Allibert Contico Introduces the Dari-Pal, Versatile New Plastic Pallet

Allibert Contico is introducing 'Dari-Pal', a new plastic pallet to the dairy industry. The versatile design of the Dari-Pal allows the pallet to handle many dairy applications, and it provides the durability and sanitary characteristics demanded within the dairy community.

The unit is available in two sizes: 40" × 40" (9 16-quart crate foot pattern) and 48" × 40" (7 24-quart crate foot pattern). It is rackable on unsupported pallet racks given the unique design of its floating steel reinforced deck, and it will handle double-chain conveyors without the typical deflection.

The top deck is available with a full perimeter lip that locks crates in place, or with two side lips allowing for automated push-off of empty crates. The full perimeter lip also provides for positive interlock of pallets when stacked, providing shipping convenience as well as a built-in safety factor. The pallets come with an anti-skid rubber grommet system designed to minimize slippage and shifting of plastic crates.

Allibert's versatile new plastic pallet solves the on-going problems associated with wooden pallets. Its three-rail design eliminates 80 percent of the damage inflicted to the pallet by building it strong enough to forego the use of cross straps on the bottom.

Allibert Contico, Bridgeton, MO

Reader Service No. 306

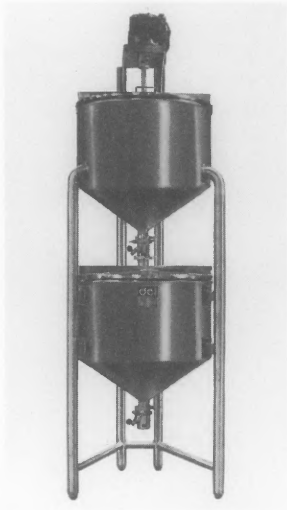
A & B Offers Automated CIP Systems

Custom and standard CIP (Clean In Place) systems are available in multiple or single tank units. A & B can equip an entire plant, or provide stand-alone or portable configurations. Fully-automated modular systems mounted on skids minimize disruption to plant production, are tested prior to shipment, and include complete system documentation. A & B has experience with Eductor and Return pump systems.

A & B's one-source service includes engineering, automation, fabrication and installation, helping to ensure custom solutions to customer needs without costly project delays and lost production time. All A & B equipment is fabricated in accordance with all regulatory requirements, including the ASME Boiler and Pressure Vessel Code.

A & B Process, Stratford, WI

Reader Service No. 307



DCI, Inc.

DCI, Inc. Announces the Availability of Batch – Mix – Blenders

DCI, Inc., manufacturers of stainless steel tanks for the worldwide dairy and food industries announces the availability of Batch-Mix-Blenders.

The Batch-Mix-Blenders are designed for adding ingredients to basic products – such as flavored cottage cheese, cheese spreads, sour creams, yogurts and puddings.

The bottom hopper acts as temporary storage prior to filling and packaging operations while new batches are being prepared in top hopper.

The Batch-Mix-Blenders are expertly crafted in sanitary design including the special sanitary agitator design. All construction is stainless steel with stainless steel support legs and sanitary-type ball feet.

DCI, Inc., St. Cloud, MN

Reader Service No. 308

Sloan Optima® Wash Stations Provide Hygiene Solutions

Sloan Valve Company has introduced a new electronic wash station designed to enhance hygiene in the dairy products industry, where controlling micro-organisms from the hands through manual hand washing is becoming increasingly vital in stopping the spread of bacteria. The new wash station, called the Optima® Wash Station, uses advanced infrared sensor technology, eliminating the need for users to touch the surface of the sink with their hands.

The Optima Wash Station, which measures 17" long and 17 1/4" deep, is a safe, low-voltage unit that gives users the option of hot/cold mixing and the convenience of controlling water temperature to their comfort. In addition, Sloan's raised outer rim on the sink prevents water from splashing or dripping onto floors and walkways. Also, angled corners and a recessed front protects users and passers-by from sharp comers.

The new Optima Wash Stations are pre-plumbed for fast, easy installation, and are water tested to ensure perfomance. Each Sloan faucet has a pressure regulator and a pressure gauge to minimize maintenance. The sink, which has sturdy wall-mounted brackets to fully support installation, requires no special wall or floor preparation.

Sloan Valve Company has made the components of the new wash station easily accessible for inspection and service through a front-mounted access door. Diagnostic lights give immediate indication of required maintenance. The unit's compact design makes cleaning quick and easy, saving money on housekeeping. There are no external pipes or waste traps exposed.

Sloan Valve Company, Franklin Park, IL

Reader Service No. 309

BusinessExchange

Services/Products

Thomas M. Gilmore, Ph.D. and J. Kirk Snyder
International Association of Food Industry Suppliers, Inc.
1451 Dolley Madison Boulevard
McLean, VA 22101-3850
Phone: 703.761.2600; Fax: 703.761.4334

20 Questions and Answers About the 3-A Sanitary Standards Program

This column provides answers to some of the most frequently asked questions about the 3-A Sanitary Standards Program. The first five questions and answers (Q&A) deal with the history of the program, the goals of the program, and the organizational structure of the 3-A Sanitary Standards Committees. Q&A 6 and 7 describe the standards development process. Q&A 8 lists the areas in which 3-A criteria can be applied. The domestic and international roles of 3-A Sanitary Standards and Accepted Practices are briefly discussed in Q&A 9 through 11. Q&A 12 through 15 introduce and explain the functions of the 3-A Symbol Administrative Council. Q&A 16 describes the procedures that must be followed to obtain authorization to use the 3-A symbol on equipment. Q&A 17 and 18 define mechanical cleaning, cleaning in place (CIP), and manual cleaning. Q&A 19 lists some of the many areas in which 3-A Sanitary Standards and 3-A Accepted Practices are used. The final Q&A directs the reader to other sources of information about the 3-A Sanitary Standards Program.

Q1. What does "3-A" mean?

A1. In the 1920s, two trade associations and one professional association (society) joined forces to formulate uniform standards for dairy equipment. These standards became popularly known as "3-A Standards." The name "3-A" was chosen to represent the three founding associations (their current names are the International Association of Food Industry Supplies [IAFIS], the Milk Industry Foundation [MIF], and the International Association of Milk, Food and Environmental Sanitarians [IAMFES]). Since 1944, the 3-A Program has included representation from suppliers and equipment fabricators, all national dairy processing associations (including one representing cooperatives), the United States Department of Agriculture (USDA), the United States Public Health Service (USPHS), and various state regulatory agencies. In its modern context, the name "3-A" represents the tripartite nature of the program's participants: equipment fabricators, equipment users, and regulatory officials.

Q2. What are 3-A Sanitary Standards?

A2. The 60 3-A Sanitary Standards provide material specifications, design criteria, and other information needed to satisfy public health concern regarding equipment. The Standards are available for many equipment types, from fittings to silo tanks. An index is available from either the 3-A Secretary's office or IAMFES.

Q3. What is meant by "3-A Accepted Practices?"

A3. A practice covers a system—a set of connected equipment and machinery that forms a whole or works together. In addition to specifying criteria for equipment, a practice may provide specifications for sanitary equipment installation and legal controls. Currently there are 9 - 3-A Accepted Practices.

Editor's Note: This is the first installment of a new regular feature in *DFES*. The 3-A Sanitary Standards Focus Column is scheduled to appear quarterly. Watch upcoming issues for the next installment.

Q4. What are the goals of 3-A Sanitary Standards and 3-A Accepted Practices?

A4. The ultimate objective is to safeguard public health. To meet this objective, 3-A Sanitary Standards and 3-A Accepted Practices ensure that dairy, food, and other microbially sensitive products are protected from contamination; that all product contact surfaces can be cleaned in place or easily dismantled for manual cleaning; and that all product contact surfaces can be easily inspected to confirm cleaning effectiveness.

Q5. Who develops 3-A Sanitary Standards and 3-A Accepted Practices?

A5. The 3-A Sanitary Standards and 3-A Accepted Practices are formulated by the three groups that make up the 3-A Sanitary Standards Committees:

1. **TCs**: The 50 Equipment Task Committees (TCs) represent fabricators and are open to qualified persons materially affected by the standards or practices;

2. **SSS-DIC/FIC**: The Sanitary Standards Subcommittee of the Dairy Industry Committee and the Farm Industry Committee, together referred to as the "User Group," represent dairy, food, and other materially affected processors, cooperatives, and the USDA;

3. **CSP-PHS**: The Committee on Sanitary Procedures (organized through IAMFES) and the USPHS work together to represent regulatory interests.

The 3-A Sanitary Standards Committees meet annually in May to discuss and review current and proposed standards and accepted practices. The 3-A Equipment Task Committees may hold additional meetings throughout the year as needed.

Q6. How are 3-A Sanitary Standards formulated?

A6. The primary suggestion for a 3-A Sanitary Standard may come from anyone. However, most suggestions originate with equipment manufacturers, processors, or public health officials. The request is generally communicated to the 3-A Secretary, who passes it on to the 3-A Steering Committee. If the 3-A Steering Committee deems the request applicable and timely, it gives the request to the IAFIS Technical Committee, which appoints or assigns the project to a 3-A Equipment Task Committee consisting of representatives from all known manufacturers of the equipment that is the subject of the request.

With the aid of processor and regulatory agency input, the Task Committee develops a tentative draft of the standard. This draft is then sequentially reviewed by the processor and regulatory committees. The three groups of the 3-A Sanitary Standards Committees suggest changes (often many changes!) and the tentative standard is redrafted one or more times. Much of this redrafting occurs via phone, fax, and letter ballot. IAFIS acts as the medium through which the views of the equipment fabricators are presented. The suggestions and recommendations are returned to the Task Committee, which either adopts them or seeks a common ground for further consideration.

When consensus is reached, formal approval takes place at the Annual Meeting. There are four signatories to the approved document: the Chair of the IAFIS Technical Committee; the Chair of the processor, or "user," committee; the Chair of IAMFES-CSP; and the USPHS representative. The document becomes effective 6 months after it is signed and is published in *Dairy, Food and Environmental Sanitation (DFES)*. Reprints are available from IAMFES, and copies are maintained by IAFIS.

Q7. Once a 3-A Sanitary Standard has been developed, does that mean that no further sanitary refinements in it are possible, probable, or expected?

A7. No. As stated in the preamble to all 3-A Sanitary Standards and 3-A Accepted Practices, "It is the purpose of the IAMFES, USPHS, DIC and FIC in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments." As sanitary science, equipment design, manufacturing efficiency, and dairy and food processing techniques advance, proposals to amend or modify 3-A Sanitary Standards or 3-A Accepted Practices may be submitted at any time. Naturally, in a vital and advancing field of industry, science, and technology, progress is a constant goal. Progress causes (or is caused by) change. 3-A Sanitary Standards are not limiters of progress.

Q8. Are 3-A Sanitary Standards limited to the dairy industry?

A8. No. Although the 3-A Program is rooted in the dairy industry, the criteria are applicable to all microbially sensitive products, to any process requiring zero microbiological defects, and to all processes that may require mechanical cleaning or cleaning in place. The USDA Food Safety and Inspection Service (USDA-FSIS) Egg Products Division and the United Egg Association (UEA) participate in the 3-A Committees and use 3-A

Sanitary Standards. Processors from the food and personal care products industries are also involved. The majority of requests about 3-A come from outside the dairy industry.

Q9. Are 3-A Sanitary Standards and Accepted Practices required by federal statute?

A9. No. 3-A Standards and Accepted Practices are developed by volunteers in an open forum using consensus-building procedures. They are voluntarily used by all interested parties. However, 3-A Sanitary Standards are referenced in the Grade A Pasteurized Milk Ordinance (PMO) and are fully utilized by the USDA.

Q10. Is 3-A criteria used in the United States exclusively?

A10. 3-A is recognized by nearly all developed countries as a leader in developing hygienic standards. Canada uses 3-A criteria, and Australia has adopted 3-A into its dairy regulations. Most Western European countries, New Zealand, Mexico, many South American countries, and Japan, have requested 3-A Sanitary Standards.

Q11. Do the 3-A Sanitary Standards Committees cooperate with other U.S. and non-U.S. hygienic standards developers?

A11. Yes. Internationally, 3-A represents U.S. interests to the International Organization for Standardization (ISO) Technical Committee 199 and the International Dairy Federation (IDF) Group of Experts B36. ISO-TC 199 is currently developing an international standard, the scope of which includes hygienic requirements for all sanitary machinery. IDF-B36 has published IDF Bulletin No. 310/1996, titled "IDF General Recommendations for the Hygienic Design of Dairy Equipment." 3-A also shares information and cooperates on projects with the European Hygienic Equipment Design Group (EHEDG) and monitors the activities of Committee on European Norms-Technical Committee CEN-TC 153.

Domestically, the 3-A Secretary cooperates with the Dairy Practices Council on several projects and is exploring cooperation with NSF International and ASME Bioprocess Equipment Committee. Members of CSP-PHS also serve on the National Committee for Interstate Milk Shipments (NCIMS).

Q12. How can a prospective buyer or inspecting sanitarian determine whether a piece of equipment complies with existing 3-A Sanitary Standards?

A12. There are two possible ways: First the buyer or sanitarian can look for a 3-A symbol, which may be affixed by the manufacturer to equipment covered by existing standards, provided the manufacturer has received authorization from the 3-A Sanitary Standards Symbol Administrative Council. If the symbol is not readily found, the buyer or sanitarian can ask the equipment manufacturer whether the equipment does in fact comply with the existing pertinent 3-A standard, and can obtain copies of the relevant standard or standards against which to check the equipment carefully.

Q13. What is the 3-A Sanitary Standards Symbol Administrative Council?

A13. Commonly referred to as the "3-A Symbol Council," this body authorizes the use of the 3-A symbol on complying equipment. It also acts appropriately in any unlikely instance inappropriate use of the symbol. Of its eight members, four are representatives of IAMFES; two are representatives of processor associations, chosen by SSS-DIC/FIC; and two are representatives of equipment manufacturers, chosen by the IAFIS Technical Committee. In addition to these eight, a representative suggested by the UEA assists in authorizations for egg equipment.

Q14. How does the 3-A Symbol Council proceed?

A14. Under carefully developed bylaws, the 3-A Symbol Council:

1. Receives and processes applications from equipment manufacturers that wish to use the 3-A symbol;
2. Grants authority for use of the 3-A symbol on equipment that is certified by the manufacturer to comply with applicable 3-A Sanitary Standards;
3. Publishes (in *DFES*) the names of manufacturers and the types of equipment authorized to use the 3-A symbol;
4. Investigates and takes appropriate action in instances of alleged improper or unauthorized use of the 3-A symbol.

Q15. What does the 3-A symbol look like?

A15.

Q16. How does a manufacturer obtain permission to use the 3-A symbol?

A16. The procedure is as follows:

1. Manufacturers desiring to apply the 3-A symbol to their equipment must contact the 3-A Symbol Council Administrative Officer to request the proper application forms, which contain detailed instructions for the procedure.
2. Application can then be made for authorization to use the 3-A symbol. A separate application must be filed for each type of equipment. Sworn certification, full data, and an initial annual fee for the authorization must accompany each application.
3. Authorization for use of the 3-A symbol will be issued within thirty days of the receipt of the application, provided the equipment is in compliance and all required materials are included. This authorization will be valid for one year.
4. Names of manufacturers to which authorizations have been issued are published biennially in *DFES*. Reprints of this section are subsequently distributed to regulatory officials, educational institutions, industry purchasing agents, and all other interested parties.

Q17. Does the 3-A symbol mean the equipment is CIP cleanable?

A17. No. Most 3-A Standards provide criteria that would allow equipment to be mechanically cleaned or easily disassembled for manual cleaning. In either case, periodic visual inspection is necessary to confirm cleaning effectiveness.

Q18. What do the terms mechanical cleaning, CIP, and manual cleaning mean?

A18. *Mechanical Cleaning or Mechanically Cleaned:* Shall mean soil removal by impingement, circulation, or flowing chemical detergent solutions and water rinses onto and over the surfaces to be cleaned by mechanical means in equipment or systems specifically designed for this purpose.

Cleaned In Place (CIP): Shall mean mechanical cleaning of equipment, the cleanability of which has been sufficiently established such that all product or solution contact surfaces do not have to be readily accessible for inspection (for example, silo-type tanks or welded pipelines).

Manual Clean Out of Place (COP) Cleaning: Shall mean soil removal when the equipment is partially or totally disassembled. Soil removal is effected with chemical solutions and water rinses with the assistance of one or a combination of brushes, nonmetallic scouring pads and scrapers, high or low pressure hoses, and tank(s) which may be fitted with recirculating pump(s), and with all cleaning aids manipulated by hand.

Q19. Has the 3-A program proven its worth?

A19. Yes. 3-A Sanitary Standards are cited in the PMO and the Code of USPHS. In addition, adoption by state regulatory agencies and by USDA is noteworthy. The Standards universal adoption by the dairy and egg processing industries, countries other than the U.S., and the Department of Defense Logistics Agency are perhaps the greatest accolades for 3-A. 3-A is a win-win situation for all.

Q20. Where can I find more information about the 3-A Sanitary Standards Program?

A20. For information on the 3-A Standards Committees and Standards activities, contact: Thomas M. Gilmore, 3-A Secretary, International Association of Food Industry Suppliers, 1451 Dolley Madison Blvd., McLean, VA 22101-3850, USA; Phone: 703.761.2600; Fax: 703.761.4334.

For information on matters relating to the use and authorization of the 3-A symbol, contact: Joe Hall, Jr., Administrative Officer, 3-A Symbol Council, 3020 Bluff Road, Columbia, SC 29209-3502, USA; Phone: 803.783.9258; Fax: 803.783.9265.

For reprints and sets of 3-A Standards, contact: International Association of Milk, Food and Environmental Sanitarians, 6200 Aurora Ave., Suite 200W, Des Moines, IA 50322-2863, USA; Phone: 800.369.6337 or 515.276.3344; Fax: 515.276.8655.

ACKNOWLEDGMENT

The authors wish to thank Dr. John C. Bruhn, University of California-Davis, for his assistance in preparing this article.

3-A Sanitary Standards Actions

The 1997 Annual 3-A Sanitary Standards Committees Meeting has come and gone, and as usual, was a highly productive and widely attended event. More than 170 people gathered in Milwaukee, Wisconsin to represent equipment manufacturers, processors, and state and federal regulatory agencies during the four days of meetings. The agenda was ambitious, containing more than 20 review documents, but the 3-A Committees remained undaunted as they set their minds to the task.

The week began with a Monday evening meeting of the 3-A Steering Committee. After burning much of Monday's midnight oil, the Steering Committee reconvened on Tuesday, adjourning in record time (that is, before 10:00 p.m.). Also on Tuesday, seminars by Dr. Robert Bradley (University of Wisconsin) and Dale Seiberling (Seiberling & Associates, Inc.) were presented to a standing-room-only crowd. Dr. Bradley presented the results of his studies on surface finish cleanability and cleanability of wedge-wire strainers. Based on his research, the 3-A Committees were able to pass an amendment to the existing 3-A Standards for In-Line Strainers. Mr. Seiberling, a 40+ year veteran of the spray device industry, presented the group with a discussion of the history and various applications of these devices. The seminar ushered in Wednesday's review of the newly proposed tentative 3-A Sanitary Standards for Spray Cleaning Devices, which was passed by the manufacturers and processors. The document will now be reviewed by the sanitarian group.

Of the documents that were reviewed, three new standard proposals, three proposed amendments, and one revision were approved by the manufacturers and processors. These seven documents are ready for regulatory review, and if passed at the next meeting of the sanitarians, will become final. This year, the sanitarians passed three new standards and six new amendments. Following is a list of these nine documents. The effective date of the documents will be November 23, 1996 (documents become effective six months after final signature). This notice constitutes the public announcement of standards action and begins the public review period of these documents. The public review period of these documents ends September 23, 1997.

New 3-A Sanitary Standards:

1. 3-A Sanitary Standards for Italian-Type Pasta Filata Style Cheese Cookers, Number 70-00.
2. 3-A Sanitary Standards for Italian-Type Pasta Filata Style Cheese Moulders, Number 71-00.
3. 3-A Sanitary Standards for Italian-Type Pasta Filata Style Cheese Chillers, Number 72-00.

Amendments to 3-A Sanitary Standards:

1. Amendment 1 to 3-A Sanitary Standards for Formers, Fillers, and Sealers of Containers for Fluid Milk and Milk Products, Number 17-08.
2. Amendment 1 to 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-01.
3. Amendment 1 (Technical and Editorial) to 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-18.
4. Amendment 1 to 3-A Sanitary Standards for In-Line Strainers for Milk and Milk Products, Number 42-00.
5. Amendment 1 to 3-A Sanitary Standards for Refractometers and Energy Absorbing Optical Sensors for Milk and Milk Products, Number 46-00.
6. Amendment 1 to 3-A Sanitary Standards for Diaphragm-Type Valves for Milk and Milk Products, Number 54-01.

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Holders of 3-A Symbol Council Authorization as of August 1997

Questions or statements concerning any of the holders' authorizations listed below, model numbers or the equipment fabricated should be addressed to: Administrative Officer, 3-A Symbol Council, 3020 Bluff Rd., Columbia, SC 29209; Phone 803.783.9258; Fax 803.783.9265

01-07 Storage Tanks for Milk and Milk Products

2 APV Crepaco (5/1/56)
A Division of APV North America, Inc.
100 South CP Avenue
Lake Mills, Wisconsin 53551

28 Waukesha Cherry-Burrell (10/3/56)
(A United Dominion Company)
575 E. Mill Street
Little Falls, New York 13365

117 DCI, Inc. (10/28/59)
P.O. Box 1227, 600 No. 54th Avenue
St. Cloud, Minnesota 56301

76 Damrow Company (10/31/57)
196 Western Avenue, P.O. Box 750
Fond du Lac, Wisconsin 54936-0750

127 Paul Mueller Co. (6/29/60)
P.O. Box 828
Springfield, Missouri 65801

440 Scherping Systems (2/28/85)
801 Kingsley Street
Winsted, Minnesota 55395

571 Viatec Process Incorporated (8/15/89)
500 Reed Street
Belding, Michigan 48809

31 Walker Stainless Equipment Co., Inc. (10/4/56)
Elroy, Wisconsin 53929

02-09 Pumps for Milk and Milk Products

63R APV Fluid Handling-Americas (4/29/57)
100 South CP Avenue
Lake Mills, Wisconsin 53551

636 Abel Pumps Corporation (7/10/91)
79 North Industrial Park
511 North Avenue
Sewickley, Pennsylvania 15143-2339
(Mfg: Abel Pumps
Buchen, Germany)

568 Allweiler AG, Werk Bottrop (5/15/89)
Kirchhellener Ring 77-79
D-46244 Bottrop
Germany
(U.S. Rep.: Shanley Pump and Equipment, Inc.
2525 South Clearbrook Drive
Arlington Heights, IL 60005)

793 Ampco Pumps Co. (9/14/94)
4000 W. Burnham Street
Milwaukee, Wisconsin 53215

214R Ben H. Anderson Manufacturers (5/20/70)
Box A
Morrisonville, Wisconsin 53571

212R Babson Brothers Company (2/20/70)
Dairy Systems Division
20903 West Gale Avenue
Galesville, Wisconsin 54630-0659

923 Bombas Bornemann S.R.L. (5/16/97)
Armenia 2898 (1605)
Munro, Argentina
(U.S. Rep.: Bornemann Pumps, Inc.
P.O. Box 1769
Matthews, North Carolina 28105)

205R Boumatic (5/22/69)
1919 S. Stoughton Road
P.O. Box 8050
Madison, Wisconsin 53716

739 CSF Inox S.P.A. (6/25/93)
Strada per Bibbiano
7 - Montecchio E. (RE)
Italy
(U.S. Rep.: Sanchelima Intl.
1781-83 N.W. 93rd Avenue
Miami, Florida 33172)

709 Conexiones Inoxidables (1/18/93)
de Puebla S.A. de C.V.
Vicente Guerrero No. 211
Xicotepec de Juarez
Edo, Puebla, Mexico
(U.S. Rep.: Ben Dolphin Consulting
4735 Lansing Drive
North Olmsted, Ohio 44070)

820 Drum Industries, Inc. (3/17/95)
2501 Constant Comment Place
Louisville, Kentucky 40299
(Mfg. by: Alfa Laval Pumps, LTD
Easbourne East Sussex
England BN 23 6PQ)

671 Flowtech, Inc. (4/1/92)
1701 Spinks Drive
Marietta, Georgia 30067

466 Fluid Metering, Inc. (1/10/86)
29 Orchard Street
Oyster Bay, New York 11771

466 Fluid Metering, Inc. (1/10/86)
29 Orchard Street
Oyster Bay, New York 11771

828 Flux Pumps Corp. (4/13/95)
4430 Commerce Circle
Atlanta, Georgia 30336
(Mfg. by: Flux Geraete GmbH
Talweg 12
D75433 Maulbronn
Germany)

306 Fristam Pumps, Inc. (5/2/78)
2410 Parview Road
Middleton, Wisconsin 53562

65R G & H Products Corp. (5/22/57)
P.O. Box 909
Pleasant Prairie, WI 53158-0909

325 Johnson Pumps (U.K.) Ltd. (12/19/79)
Highfield Industrial Estate
Edison Road, Eastbourne
East Sussex, England BN23 6PT
(U.S. Rep.: Viking Pump, Inc.
406 State Street, P.O. Box 8
Cedar Falls, Iowa 50613)

145R ITT Jabsco Products (11/20/63)
1485 Dale Way
Costa Mesa, California 92626
(Mfg. by: ITT Jabsco, England)

502 Inoxpa, s.a. (4/28/87)
Carrer Dels Telers, 54
17820 Banyoles
Spain

314 Len E. Ivarson, Inc. (12/22/78)
3100 W. Green Tree Road
Milwaukee, Wisconsin 53209

603 Johnson Pumps (U.K.) Ltd. (8/16/90)
Highfield Industrial Estate
Edison Road, Eastbourne
East Sussex, England BN23 6PT
(U.S. Rep.: Viking Pump, Inc.
406 State Street, P.O. Box 8
Cedar Falls, Iowa 50613)

604 Johnson Pumps (U.K.), Ltd. (8/16/90)
Highfield Industrial Estate
Edison Road, Eastbourne
East Sussex, England BN23 6PT
(U.S. Rep.: Viking Pump, Inc.
406 State Street, P.O. Box 8
Cedar Falls, Iowa 50613)

841 Johnson Pumps (U.K.), Ltd. (8/18/95)
Highfield Industrial Estate
Edison Road, Eastbourne
East Sussex, England BN23 6PT
(U.S. Rep.: Viking Pump, Inc.
406 State Street, P.O. Box 8
Cedar Falls, Iowa 50613)

792 KSB, Inc. (9/14/94)
4415 Sarellen Road
Richmond, VA 23231
(Mfg. by: KSB AK Tiengesellschaft
Frankenthal, Germany)

673 Alfa Laval Pumps, Inc. (4/16/92)
9201 Wilmot Road
Kenosha, Wisconsin 53141-1426

654 Mono Pumps Ltd., Dresser Pump Div. (10/22/91)
Martin Street
Audenshaw, Manchester
England M34 5DQ
(U.S. Rep.: MonoFlo, Dresser Pump Division
Dresser Industries
821 Live Oak Drive
Chesapeake, Virginia 23320-2601)

400 Netzsch Incorporated (8/15/84)
119 Pickering Way
Exton, Pennsylvania 19341-1393

827 PACKO Diksmuide NV (4/14/95)
Cardijnlaan 10
B8600 Diksmuide, Belgium
(Not available in the U.S.A.)

701 Pierre Guerin SA (10/27/92)
BP. 12 - 79210
Mauze-Sur-Le-Mignon
France
(U.S. Rep.: Alfa Technical Group, Inc.
601 Thompson Road N.
Syracuse, New York)

241 Puriti, S.A. de C.V. (9/12/72)
Alfredo Nobel 39
Industrial Puente de Vigas
Tlalnepantla, Mexico
(U.S. Rep.: Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, WI 53115)

148R Moyno Industrial Products (4/22/64)
A Division of Robbins & Myers, Inc.
P.O. Box 960
Springfield, Ohio 45501-0960

684 PCM Pompes (7/9/92)
17, rue Ernest Laval
92170 Vanves
France
(U.S. Rep.: Alfa Laval Pump, Inc.
9201 Wilmot Road, P.O. Box 1426
Kenosha, WI 53141-1426)

364 Roper Pump Company (7/28/82)
P.O. Box 269
Commerce, Georgia 30529

888 Seeberger GmbH + Co. (8/30/96)
Scharnholzstrasse 344
D-46240
Bottop, Germany
(U.S. Rep.: seepex, Inc.
1834 Valley Street
Dayton, Ohio 45404)

595 seepex, Inc. (3/16/91)
511 Speedway Drive
Enon, Ohio 45323
(Mfg. by: Seeberger GmbH + Co.
Scharnholzstrasse 344
D-46240 Bottrop
Germany)

678 Shanley Pump & Equipment, Inc. (5/11/92)
2525 S. Clearbrook Drive
Arlington Heights, Illinois 60005
(Mfg. by: Allweiler, West Germany)

911 Sigma Equipment Corp. (3/20/97)
39 Westmoreland Avenue
White Plains, New York 10606

507 Sine Pump (7/21/87)
c/o Sundstrand Fluid Handling
14845 West 64th Street
Arvada, Colorado, 80004

567 Stainless Products, Inc. (4/4/89)
1649-72nd Avenue
P.O. Box 169
Somers, Wisconsin 53171

860 Sudmo North America, Inc. (11/28/95)
4786 Colt Road
Rockford, Illinois 61109
(Mfg. by: Sudmo Schleicher AG
Industiestr. 7
D-73469, Reisburg
Germany)

72R L.C. Thomsen Inc. (8/14/57)
1303-43rd Street
Kenosha, Wisconsin 53140

26R Tri-Clover, Inc. (9/29/56)
9201 Wilmot Road
Kenosha, Wisconsin 53141

609 Tuthill Corp. (12/12/90)
Tuthill Pump Division
12500 S. Pulaski Road
Alsip, Illinois 60658

899 Und Maschinenfabrik (12/31/96)
Lederle GmbH Pumpen
GewerbestraBe 53 D-79194
Gundelfingen, Germany
(U.S. Rep.: Alto Systems Inc.
P.O. Box 60667
Houston, Texas 77205)

52R Viking Pump, Inc. (12/31/56)
A Unit of IDEXX Corporation
406 State Street, P.O. Box 8
Cedar Falls, Iowa 50613
(Mfg. by: Johnson Pump
Highfield Ind. Estate, Edison Road
Eastbourne, E. Sussex
UK BN 23 6PT)

29R Waukesha Cherry-Burrell (10/3/56)
611 Sugar Creek Road
Delavan, Wisconsin 53115

04-04 Homogenizers and High Pressure Pumps of the Plunger Type

75 APV Homogenizer Group (9/26/57)
500 Research Drive
Wilmington, Massachusetts 01887

390 American Lewa, Inc. (6/9/83)
132 Hopping Brook Road
Holliston, Massachusetts 01760
(Mfg. by: Lewa, Germany)

247 Bran & Luebbe, Inc. (4/14/73)
1025 Busch Parkway
Buffalo Grove, Illinois 60015

657 Microfluidics Corp. (11/4/91)
P.O. Box 9101
30 Ossipee Road
Newton, Massachusetts 02164-9101

558 Niro Soavi S.p.A. (1/3/89)
43100 Parma (Italy)
VIA M. Da Erba Edoari, 29/A
(Distributed in the U.S. by:
Niro Hudson, Inc.
1600 Country Road F
Hudson, Wisconsin 54016)

847 Stork Food Machinery (8/25/95)
Airport Parkway
Box 1258
Gainesville, Georgia 30503
(Mfg. by: Stork Amsterdam B.V.
Ketelstraat 2
021 JX Amsterdam
The Netherlands)

770 Tetra Pak Engineering (6/13/94)
8400 Lakeview Parkway, Ste. 500
Pleasant Prairie, Wisconsin 53158
(Mfg. by: Tetra Pak-Stainless Equipment AB
Lund, Sweden)

87 Waukesha Cherry-Burrell (12/29/57)
(Fluid Handling Division)
611 Sugar Creek Road
Delavan, Wisconsin 53115

05-14 Stainless Steel Automotive Milk Transportation Tanks for Bulk Delivery and/or Farm Pick-up Service

379 Brenner Tank Mauston, Inc. (3/15/83)
N. 3760 Hwy. 12 & 16
Mauston, Wisconsin 53948

756 Beall Trailers of California (2/21/94)
1301 South Avenue
Turlock, California 95380-5108

70R Brenner Tank, Inc. (8/5/57)
450 Arlington Avenue, P.O. Box 670
Fond du Lac, Wisconsin 54936

40 Hills Stainless Steel & Equipment Co., Inc. (10/20/56)
505 W. Koehn Street
Luverne, Minnesota 56156

201 Paul Krohnert Mfg. Ltd. (4/1/68)
811 Steeles Avenue, P.O. Box 126
Milton, Ontario, Canada L9T 2Y3
(Not available in the U.S.A.)

513 Nova Fabricating, Inc. (8/24/87)
404 City Road
P.O. Box 231
Avon, Minnesota 56310

85 Polar Tank Trailer, Inc. (12/20/57)
Holdingford, Minnesota 56340

653 Tremcar (10/10/91)
1, Tougas Street
Iberville, Quebec, Canada J2X 2P7
(U.S. Rep.: Bay State Tr. & Tr.
527 Winthrop
Rehobeth, Massachusetts 02769)

25 Walker Stainless Equip. Co., Inc. (9/28/56)
625 State Street
New Lisbon, Wisconsin 53950

623 Walker Stainless Eq. Co., Inc. (3/28/91)
560 E. Burleigh Boulevard
P.O. Box 358
Tavares, Florida 32778

437 West-Mark (11/30/84)
2704 Railroad Avenue, P.O. Box 100
Ceres, California 95307

10-03 Milk and Milk Products Filters Using Disposable Filter Media, as Amended

593 Filtration Systems (3/2/90)
Div. of Mechanical Mfg. Corp.
10304 N.W. 50th Street
Sunrise, Florida 33351

720 R-P Products (3/19/93)
Box 388, 407 Jefferson Street
Three Rivers, Michigan 49093

435 Sermia International (11/27/84)
771 Boul. Industriel
Blainville, Quebec
Canada J7C 3V3
(U.S. Rep.: Edward W. Fox, Jr.
1201 W. Allen, No. 15
Bloomington, Iowa 47403)

296 L. C. Thomsen, Inc. (8/25/77)
1303 43rd Street
Kenosha, Wisconsin 53140

35 Tri-Clover, Inc. (10/15/56)
9201 Wilmot Road
Kenosha, Wisconsin 53141

11-05 Plate-type Heat Exchangers for Milk and Milk Products

880 AGC Engineering (6/7/96)
8509 Quarry Road
Manassas, Virginia 22110

365 APV Heat Exchanger AS (9/8/82)
Platinvej, 8
P.O. Box 329
DK-6000 Kolding
Denmark
(Not available in the U.S.A.)

20 APV Heat Transfer Technologies (9/4/56)
395 Fillmore Avenue
Tonawonda, New York 14150

120 Alfa-Laval, Agri, Inc. (12/3/59)
11100 No. Congress Avenue
Kansas City, Missouri 64153

17 Tetra Pak Engineering (8/30/56)
8400 Lake View Parkway
Pleasant Prairie, Wisconsin 53158
(Mfg. by: Alfa Laval Thermal
Lund, Sweden)

718 Babson Bros. Co. (3/8/93)
Dairy Systems Div.
1400 West Gale Avenue
Galesville, Wisconsin 54630

30 Waukesha Cherry-Burrell (10/2/56)
Process Equipment Division
P.O. Box 35600
Louisville, Kentucky 40232-5600

14 Chester-Jensen Co., Inc. (8/15/52)
5th & Tilghman Sts., P.O. Box 908
Chester, Pennsylvania 19016

791 The Coburn Co., Inc. (9/14/94)
834 E. Milwaukee Street, Box 147
Whitewater, Wisconsin 53190
(Mfg. by: Elmega S./L.
Apartado De Cerros, 1
Camino Vrejo De Mourelle, S/N
15840 [Santa Comba] La Coruna
Spain)

468 Tuchenagen NA, Inc. (2/2/86)
196 Western Avenue
Fond du Lac, Wisconsin 54936-1458
(Mfg. by: GEA Ahlborn GmbH Co.
P.O. Box 1180
Voss-Strasse 11/13
D-3203 Sarsted
Germany)

622 ITT Standard (2/25/91)
175 Standard Parkway
Cheektowaga, New York 14227

15 Kusel Equipment Co. (8/15/56)
820 West Street, P.O. Box 87
Watertown, Wisconsin 53094

360 Laffranchi Wholesale Co. (7/12/82)
P.O. Box 338
Ferndale, California 95536

414 Paul Mueller Co. (12/13/83)
P.O. Box 828
Springfield, Missouri 65801

912 Pladot Ein Harod (4/3/97)
Kibbutz Ein Harod Meuhad
18965 Israel
(Mfg. by: A.P.V. Company, Ltd.
P.O. Box 4
Crawley-West Sussex RH 102QB
England)
(U.S. Rep.: Norix-International L.T.D.
35 Monhegan Street
Clifton, New Jersey 07013)

279 The Schlueter Company (8/30/76)
3410 Bell Street, P.O. Box 548
Janesville, Wisconsin 53547-0548
(Mfg. by: Samuel Parker, New Zealand)

650 Schmidt-Bretten, Inc. (10/3/91)
380 E. Central Avenue
Bohemia, New York 11716

670 Flomax International, Ltd. (4/1/92)
2 Robert Street
P.O. Box 14537
Panmurie, Auckland
New Zealand
(U.S. Rep.: Masport, Inc.
6140 McCormick Drive
Lincoln, Nebraska 68507)

658 Thermaline (11/15/91)
180-37th Street
Auburn, Washington 98001

885 Tranter, Inc. Texas Division (7/11/96)
1900 Old Burk Highway
Wichita Falls, Texas 76304

610 Universal Dairy Equipment (12/13/90)
11100 N. Congress Avenue
Kansas City, Missouri 64153
(Mfg. by: Alfa Laval Agri, Inc.
Kansas City, Missouri 64153-1296)

12-05 Tubular Heat Exchangers for Milk and Milk Products

886 API Ketema Heat Transfer Technology (7/16/96)
2300 W. Marshall Drive
Grand Prairie, Texas 75051

438 APV Heat Transfer Tech. (12/10/84)
395 Fillmore Avenue
Tonawanda, New York 14150

248 Allegheny Bradford Corp. (4/16/73)
P.O. Box 200, Route 219 South
Bradford, Pennsylvania 16701

243 Babson Brothers Company (10/31/72)
Dairy Systems Division
20903 West Gale Avenue
Galesville, Wisconsin 54630-0659

734 The Diversified-Berdell Group, Inc. (5/19/93)
1710 Flushing Avenue
Ridgewood, New York 11385

605 Waukesha Cherry-Burrell (8/30/90)
Process Equipment Division
P.O. Box 35600
Louisville, Kentucky 40232-5600

103 Chester-Jensen Co., Inc. (6/6/58)
5th & Tilghman Sts., P.O. Box 908
Chester, Pennsylvania 19016

824 DASI Industries, Inc. (3/17/95)
214 Sherlake Lane
Knoxville, Tennessee 37922
(Mfg. by: Sacome Incapsa
30001 Murcia Spain)

613 Efrex Corp. (12/27/90)
11 Kitty Hawk Drive
Pittsford, New York 14534-1620

712 Enerquip, Inc. (2/24/93)
611 North Road
P.O. Box 467
Medford, Wisconsin 54451

889 FMC Corporation-FranRica Systems (9/5/96)
P.O. Box 30127
Stockton, California 95213-0127

298 Feldmeier Equipment, Inc. (1/28/85)
6800 Town Line Road
P.O. Box 474
Syracuse, New York 13211

307 G & H Products Corp. (5/2/78)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

217 Girton Manufacturing Co. (1/31/71)
P.O. Box 900
Millville, Pennsylvania 17846

616 ITT Standard (1/4/91)
175 Standard Parkway
Cheektowaga, New York 14227

711 Kusel Equipment Co. (2/24/93)
820 West Street
Watertown, Wisconsin 53094

238 Paul Mueller Co. (6/28/72)
P.O. Box 828
Springfield, Missouri 65801

96 C. E. Rogers Co. (3/31/64)
1895 Frontage Road, P.O. Box 118
Mora, Minnesota 55051

532 Scherping Systems (6/8/88)
801 Kingsley Street
Winsted, Minnesota 55395

392 Stork Food Machinery, Inc. (6/9/83)
(Mfg. by: Stork, Netherlands)
P.O. Box 1258/Airport Parkway
Gainesville, Georgia 30503

614 Tetra Pak Processing Systems (5/2/91)
P.O. Box 179
8400 Lake View Parkway, Suite 500
Pleasant Prairie, Wisconsin 53158
(Mfg. by: Tetra Pak Stainless Equipment AB
P.O. Box 64
Bruggaregatan 23, S-221 00
Lund, Sweden)

591 Thermotech/Div. of Fristam Pumps, Inc. (2/8/91)
2410 Parview Road
Middleton, Wisconsin 53562

632 Yula Corporation (6/4/91)
330 Bryant Avenue
Bronx, New York 10474

13-09 Farm Milk Cooling and Holding Tanks

802 Refinox S.A. DE C.V. (11/10/94)
Ind. Torreon, Coah, Mexico
(U.S. Rep.: James Read
M. E. Stainless
601 High Plain Drive
Bel Air, Maryland 21014)

49R Alfa Laval Agri, Inc. (12/5/56)
11100 North Congress Avenue
Kansas City, Missouri 64153

240 Babson Brothers Company (9/6/72)
Dairy Systems Division
P.O. Box 659
Galesville, Wisconsin 54630
(Mfg. by: Paul Mueller Co.
1600 West Phelps Street
Springfield, Missouri 65801)

4R Dairy Equipment Co. (6/15/56)
1919 S. Stoughton Road
Madison, Wisconsin 53708-8050

179R Heavy Duty Products (Preston) Ltd. (3/8/77)
1261 Industrial Road
Cambridge (Preston)
Ontario, Canada N3H 4W3
(Not available in the U.S.A.)

12R Paul Mueller Co. (7/31/56)
1600 W. Phelps, P.O. Box 828
Springfield, Missouri 65801

611 Universal Dairy Equipment (12/13/90)
11100 N. Congress Avenue
Kansas City, Missouri 64153
(Mfg. by: Alfa Laval Agri Inc.
Kansas City, Missouri 64153-1296)

16-05 Evaporators and Vacuum Pans for Milk and Milk Products

132 APV Anhydro (10/26/60)
182 Wales Avenue
Tonawanda, New York 14150

277 Contherm, Inc. (8/19/76)
P.O. Box 352, 111 Parker Street
Newburyport, Massachusetts 01950

500 Dedert Corporation (4/9/87)
20000 Governors Drive
Olympia Fields, Illinois 60461

186R Marriott Walker Corp. (9/6/66)
925 E. Maple Road
Birmingham, Michigan 48011

273 Niro, Inc. (5/20/76)
Food and Dairy Division
1600 O'Keefe Road
Hudson, Wisconsin 54016

639 Niro-Sterner, Inc. (7/10/91)
421-6th Street South
Winsted, Minnesota 55395

107R C.E. Rogers Co. (7/31/58)
P.O. Box 118
1895 Frontage Road
Mora, Minnesota 55051

299 Stork Food Machinery, Inc. (11/16/77)
P.O. Box 1258, Airport Parkway
Gainesville, Georgia 30503

17-08 Formers, Fillers and Sealers of Single Service Containers for Milk and Milk Products

366 Autoprod, Inc. (9/15/83)
5355 115th Avenue N.
Clearwater, Florida 34620

382 Combibloc, Inc. (4/15/83)
4800 Roberts Road
Columbus, Ohio 43228
(Mfg. by: PKL Verpackungsystems, Germany)

192 Evergreen Packaging (1/3/67)
2400-6th Street S.W., P.O. Box 3000
Cedar Rapids, Iowa 52406

488 BWI Fords Holmatic, Inc. (12/22/86)
1750 Corporate Drive, Suite 700
Norcross, Georgia 30093

619 Hassia Verpackungsmaschinen GmbH (2/22/91)
63689 Ranstadt, Hessen, Germany
(U.S. Rep.: Hassia USA, Inc.
1 Harvard Way, #4
Somerville, New Jersey 08876)

473 International Paper Company (6/12/86)
Liquid Pkg. Division
6238 Tri Ridge Boulevard
Loveland, Ohio 45140

735 Kvalitetsproduktion AB (6/11/93)
S-693 29 Degerfors, Sweden
(U.S. Rep.: Flowtech, Inc.
1900 Lake Park Drive, Suite 345
Smyrna, Georgia 30080)

731 LIEDER-Maschinenbau Gmbh & Co. KG (5/18/93)
Postfach 1252/Im Laab 3
3033 Schwarmstedt, Germany
(U.S. Rep.: Leider Machines N.A.
Woodcock Mountain Drive
Washingtonville, New York 10992)

330 Milliken Packaging (8/26/80)
White Stone, South Carolina 29353
(Mfg. by: Chubukkikai, Japan)

442 Milliken Packaging (3/21/85)
White Stone, South Carolina 29386

137 Elopak, Inc. (10/17/62)
30000 South Hill Road
New Hudson, Michigan 48165

281 Purity Packaging Corp. (11/8/77)
800 Kaderly Road
Columbus, Ohio 43228
(Mfg. by: Purity Packaging Corp.
25 Aylmer Street
Peterborough, Ontario, Canada K9J 6Y8)

924 Robert Bosch GmbH (6/4/97)
P.O. Box 1127
D-71301
Waiblingen, Germany
(U.S. Rep.: Robert Bosch Corporation
9890 Red Arrow Highway
Bridgman, Michigan 49106)

848 Septipack, Inc. (9/24/95)
2313 Benson Mill Road
Sparks, Maryland 21159
(Mfg. by: ARCII
4, Avenue de l'europe
ZAC des Hawks de Chatou
78402 Chatou Cedex, France)

482 Serac, Inc. (8/25/86)
300 Westgate Drive
Carol Stream, Illinois 60188

681 Shikoku Kakoki Co., Ltd. (6/8/92)
No. 10-01 Nishinokawa
Tarohachisu, Kitajima-Cho
Itanogun, Tokushima, Japan
(U.S. Rep.: Elopak, Inc.
30000 South Hill Road
New Hudson, Michigan 48165)

220 Tetra Rex Packaging Systems (4/24/71)
451 East Industrial Boulevard
Minneapolis, Minnesota 55413

694 IPFO International, Inc. (9/23/92)
100 Kings Point Drive
Century Towers, Suite 706
Miami, Florida 33160
(Mfg. by: Time Pack
GmbH, Weissensburg, Germany)

19-04 A1 Batch Continuous Freezers for Ice Cream, Ices, and Similarly Frozen Dairy Foods, as Amended

141 APV Crepaco, Inc. (4/15/63)
100 South CP Avenue
Lake Mills, Wisconsin 53551

146 Waukesha Cherry-Burrell Corp. (12/10/63)
P.O. Box 35600
Louisville, Kentucky 40232-5600

903 Coldelite Corp. of America (1/10/97)
Cattabriga
Division of Carpigiani
P.O. Box 4069, North Station
Winston-Salem, North Carolina 27115
(Mfg. by: Carpigiana
Via Emilia 45
Amzola Emilia
Bologna, Italy)

286 Tetra Laval Food Hoyer, Inc. (12/8/76)
7711 95th Street, P.O. Box 0902
Pleasant Prairie, Wisconsin 53158-0902
(Mfg. by: Tetra Laval Food Hoyer
Denmark)

355 Emery Thompson Machine & Supply Co. (3/9/82)
1349 Inwood Avenue
Bronx, New York 10452

22-07 Silo-type Storage Tanks for Milk and Milk Products

154 APV of North America, Inc. (2/10/65)
100 South CP Avenue
Lake Mills, Wisconsin 53551

168 Waukesha Cherry-Burrell (6/16/65)
575 E. Mill Street
Little Falls, New York 13365

160 DCI, Inc. (4/5/65)
P.O. Box 1227, 600 No. 54th Avenue
St. Cloud, Minnesota 56301

181 Damrow Co. (5/18/66)
(Div. of DEC Int'l., Inc.)
196 Western Avenue, P.O. Box 750
Fond du Lac, Wisconsin 54935-0750

312 Feldmeier Equipment, Inc. (9/15/78)
6800 Town Line Road
P.O. Box 474
Syracuse, New York 13211

439 JV Northwest, Inc. (1/22/85)
28120 S.W. Boberg Road
Wisonville, Oregon 97070

702 Paul Krohnert Manufacturing, Ltd. (11/6/92)
P.O. Box 126
811 Steeles Avenue
Milton, Ontario, Canada L9T 2Y3
(Not available in the U.S.A.)

155 Paul Mueller Co. (2/10/65)
1600 W. Phelps, P.O. Box 828
Springfield, Missouri 65801

503 Ripley Stainless, Ltd. (5/1/87)
RR #3, Site 41
Summerland, British Columbia V0H 1Z0
(Not available in the U.S.A.)

479 Scherping Systems (8/3/86)
801 Kingsley Street
Winsted, Minnesota 55395

675 Stainless Fabrication, Inc. (4/22/92)
4455 W. Kearney
Springfield, Missouri 65803

920 Technova, Inc. (4/24/97)
1450 Hebert Street
Drummondville, Quebec
Canada J2C 2A1
(U.S. Rep.: Bay State Truck & Trailer
527 Wintrop
Rehobeth, Massachusetts 02769)

165 Walker Stainless Equipment Co., Inc. (4/26/65)
902 Second Main Street
Elroy, Wisconsin 53929

23-02 Equipment for Packaging Viscous Dairy Products

174 APV Crepaco, Inc. (9/28/65)
100 South CP Avenue
Lake Mills, Wisconsin 53551

902 A.T.S. Engineering, Inc. (1/10/97)
7270 Torbram Road, Unit 23
Mississauga, Ontario
Canada L4T 3Y7
(U.S. Rep.: L and A Package Sales
356 Millstone Road
Clarksburg, New Jersey 08510
and Packaging Specialist
4500 Greenville Avenue
Dallas, Texas 75206)

868 Cryovac Division (3/5/97)
W.R. Grace & Co-Conn
P.O. Box 464
Duncan, South Carolina 29223-0464

853 Elmar Industries (10/11/95)
200 Gould Avenue, P.O. Box 245
Buffalo, New York 14043-0245

674 Hayssen Manufacturing (4/20/92)
225 Spartangreen Boulevard
Duncan, South Carolina 29334

447 Mateer-Burt Co., Inc. (7/22/85)
434 Devon Park Drive
Wayne, Pennsylvania 19087

870 Phoenix Engineering & Design Co. (3/22/96)
4634 Case Drive, P.O. Box 1467
Janesville, Wisconsin 53546

343 Tetra Laval Food Hoyer, Inc. (7/6/81)
201 Broad Street
Lake Geneva, Wisconsin 53147
(Mfg. by: Alfa Hoyer, Denmark)

679 Consolidated Biscuit Co. (6/1/92)
312 Rader Road
McComb, Ohio 45858

635 Interbake Dairy Ingredients Div. (7/10/91)
2821 Emerywood Parkway, Suite 210
Richmond, Virginia 23294

760 Jordan Manufacturing, Inc. (2/23/94)
1688 County Road 192
Crossville, Alabama 35962

537 Osgood Industries, Inc. (7/19/88)
601 Burbank Road
Oldszmar, Florida 34677

666 RapidPak (3/5/92)
2530 West Everett Street
Appleton, Wisconsin 54914-4958

740 Raque Food Systems, Inc. (6/25/93)
11002 Decimal Drive
Louisville, Kentucky 40299

222 Sweetheart Packaging (11/15/71)
10100 Reistertown Road
Owing Mills, Maryland 21117

891 World Cup Packaging Corporation (9/20/96)
777 Progressive Lane
South Beloit, Illinois 61080

24-02 Non-coil Type Batch Pasteurizers

158 APV Crepaco, Inc. (3/24/65)
100 South CP Avenue
Lake Mills, Wisconsin 53551

161 Waukesha Cherry-Burrell (4/5/65)
575 E. Mill Street
Little Falls, New York 13365

187 DCI, Inc. (9/26/66)
P.O. Box 1227, 600 No. 54th Avenue
St. Cloud, Minnesota 56302

166 Paul Mueller Co. (4/26/65)
P.O. Box 828
Springfield, Missouri 65801

878 Walker Stainless Equipment (5/14/96)
625 State Street
New Lisbon, Wisconsin 53950

25-02 Non-coil Type Batch Processors for Milk and Milk Products

159 APV Crepaco, Inc. (3/24/65)
100 South CP Avenue
Lake Mills, Wisconsin 53551

162 Waukesha Cherry-Burrell (4/5/65)
575 E. Mill Street
Little Falls, New York 13365

188 DCI, Inc. (9/26/66)
P.O. Box 1227, 600 No. 54th Avenue
St. Cloud, Minnesota 56301

725 Inox-Tech, Inc. (4/14/93)
6705 Route 132
Ville Ste-Catherine
Quebec, Canada J0L 1E0
(U.S. Rep.: Michael Ripka, Pres.
Bionex
12615 E. Meridian Avenue
Payallup, Washington 98373)

710 Lee Industries, Inc. (2/10/93)
P.O. Box 687
514 West Pine Street
Phillipsburg, Pennsylvania 16866

167 Paul Mueller Co. (4/26/65)
P.O. Box 828
Springfield, Missouri 65801

687 SANIFAB (8/3/92)
528 North Street
Stratford, Wisconsin 54484

448 Scherping Systems (8/1/85)
801 Kingsley Street
Winsted, Minnesota 55395

520 Stainless Fabrication, Inc. (12/8/87)
4455 W. Kearney
Springfield, Missouri 65803

837 Viatec Process Incorporated (7/10/95)
500 Reed Street
Belding Michigan 48809

202 Walker Stainless Equip. Co., Inc. (9/24/68)
625 State Street, P.O. Box 202
New Lisbon, Wisconsin 53950-0202

26-03 Sifters for Dry Milk and Dry Milk Products

752 Andritz Sprout-Bauer (1/28/94)
35 Sherman Street
Muncy, Pennsylvania 17756

363 Kason Corp. (7/28/82)
67-71 East Willow Street
Millburn, New Jersey 07041

430 Midwestern Industries, Inc. (10/11/84)
915 Oberlin Road, P.O. Box 810
Massillon, Ohio 44648-0810

185 Rotex, Inc. (8/10/66)
1230 Knowlton Street
Cincinnati, Ohio 45223

656 Separator Engineering, Ltd. (11/4/91)
810 Ellingham Street
Pointe Clair, Quebec, Canada H9R 3S4
(U.S. Rep.: Kason Corp.
1301 E. Linden Avenue
Linden, New Jersey 07036)

172 Sweco, Inc. (9/1/65)
(Division of Emerson Electric Company)
7120 Buffington Road
Florence, Kentucky 41042

27-03 Equipment for Packaging Dry Milk and Dry Milk Products

353 All-Fill, Inc. (3/2/82)
418 Creamery Way
Exton, Pennsylvania 19341

831 Custom Equipment Design (5/9/95)
1057 Highway 80 East, P.O. Box 4807
Monroe, Louisiana 71203

618 Hayssen Manufacturing Company (2/18/91)
225 Spartangreen Boulevard
Duncan, South Carolina 29334
(Mfg. by: Yamato Scale Co.
Akasi, 673, Japan)

625 Ishida Company, Ltd. (4/2/91)
44, Sanno-Cho, Shogoin
Sakyo-Ku, Kyoto, Japan
(U.S. Rep.: Heat & Control
225 Shaw Road
S. San Francisco, California 94080)

922 Ishida Co., Ltd. (5/9/97)
44 Sanno-Cho, Shogoin
Sakyo-Ku
Kyoto, Japan
(U.S. Rep.: Heat & Control, Inc.
21121 Cabot Boulevard
Hayward, California 94545-1132)

409 Mateer-Burt Co. (10/31/83)
434 Devon Park Drive
Wayne, Pennsylvania 19087

905 Pacmac, Inc. (2/13/97)
1161 Armstrong Avenue
P.O. Box 360
Fayetteville, Arkansas 72702-0360

895 Spiroflow-Orthos Systems, Inc. (11/27/96)
2806 Gray Fox Road
Monroe, North Carolina 28110

497 Triangle Package Machinery Co. (2/26/87)
6655 West Diversey Avenue
Chicago, Illinois 60635

28-03 Flow Meters for Milk and Milk Products

270 ABB Instrumentation, Inc. (2/9/76)
P.O. Box 20550
Rochester, New York 14602-0550

272 Accurate Metering Systems, Inc. (4/2/76)
1651 Wilkening Court
Schaumburg, Illinois 60173

253 Badger Meter, Inc. (1/2/74)
4545 W. Brown Deer Road
P.O. Box 23099
Milwaukee, Wisconsin 53223

884 Bailey-Fischer & Porter GmbH (7/12/96)
Dransfeld Strasse, Gottingen 37079
Germany
(U.S. Rep.: Bailey-Fischer & Porter
125 E. County Line Road
Warminster, Pennsylvania 18974)

359 Brooks Instruments (6/11/82)
Highway 301 North
Statesboro, Georgia 30458

660 Danfoss A/S (11/20/91)
DK-6430
Nordborg, Denmark
(U.S. Rep.: Danfoss Electronics
2995 Eastrock Drive
Rockford, Illinois 61109)

692 Endress & Hauser Flowtec AG (9/14/92)
Kägenstrasse 7
CH - 4153 Reinach, Switzerland
(U.S. Rep.: Endress & Hauser, Inc.
2350 Endress Place
Greenwood, Indiana 46143)

226 Bailey Fischer & Porter Co. (12/9/71)
125 E. County Line Road
Warminster, Pennsylvania 18974

477 Flowdata, Inc. (7/31/86)
1817 Firman Drive
Richardson, Texas 75081-1826

506 E G & G Flow Technology, Inc. (6/17/87)
4250 East Broadway Road
Phoenix, Arizona 85040

224 The Foxboro Company (11/16/71)
33 Commercial Street
Foxboro, Massachusetts 02035

717 Gemu Valves, Inc. (3/4/93)
3800 Camp Creek Parkway
Ste. 102, Bldg. 2400
Atlanta, Georgia 30331

649 Geo Technology Corporation (10/2/91)
12312 E. 60th Street
Tulsa, Oklahoma 74146

661 G/H Products Corp. (11/21/91)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

630 Halliburton Services (5/28/91)
Drawer 1431
Duncan, Oklahoma 73536-0346

574 Hersey Measurement Co., Inc. (10/12/89)
150 Venture Boulevard
P.O. Box 4585
Spartanburg, South Carolina 29305

512 Hoffer Flow Controls, Inc. (8/17/87)
107 Kitty Hawk Lane
Elizabeth City, North Carolina 27909

744 Honeywell IAC (11/16/93)
1100 Virgina Drive
Fort Washington, Pennsylvania 19034

918 Honeywell, Inc. (4/24/97)
1100 Virginia Drive
Fort Washington, Pennsylvania 19034
(Mfg. by: Endress & Hauser Flowtec AG
Kagenstrasse 7
CH-4153 Reinach
Switzerland)

733 Honeywell, Inc. (5/18/93)
16404 Black Canyon Highway
Phoenix, Arizona 85023-3095
(Mfg. by: Endress & Hauser Flowtec AG
CH-4153 Reinach
Switzerland)

265 Flow Automation (3/10/75)
9303 Sam Houston Parkway South
Houston, Texas 77099-5298

535 FMC Invalco, Inc. (7/12/88)
(An FMC Corporation Subsidiary)
P.O. Box 1183
Hutchinson, Kansas 67504

764 Johnson Yokogawa (4/22/94)
4 Dart Road
Newnan, Georgia 30265-1040
(Mfg. by: Yokogawa Electric Corp.
2-9-32 Nakacho
Musashino-shi, Tokyo, 180 Japan)

840 KOBOLD Instr. Inc. (7/17/95)
1801 Parkway View Drive
Pittsburgh, Pennsylvania 15205
(Mfg. by: KOBOLD Messring GmbH
Frankfort HRB 29376
Germany)

871 KOBOLD Instr. Inc. (3/28/96)
1801 Parkway View Drive
Pittsburgh, Pennsylvania 15205
(Mfg. by: Flowdata, Inc.
1817 Firman Drive
Richardson, Texas 75081-1826)

529 Krohne America, Inc (5/18/88)
7 Dearborn Road
Peabody, Massachusetts 01960
(Mfg. by: Altometer, Holland)

755 Liquid Controls LLC (2/21/94)
105 Albrecht Drive
Lake Bluff, Illinois 60044
(Mfg. by: Processautomatic
Box 117
61070 Vagnharad, Sweden)

778 Magnetrol Intl., Inc. (7/27/94)
5300 Belmont Road
Downers Grove, Illinois 60515

378 Micro Motion, Inc. (2/16/83)
7070 Winchester Circle
Boulder, Colorado 80301

729 Peek Measurement, Ltd. (4/14/93)
Kings Worthy, Winchester
Hampshire, England S023 7QA
(U.S. Rep.: Peek Measurement
10335 Landsbury, Ste. 300
Houston, Texas 77099-3407)

490 Rosemount, Inc. (1/8/87)
12001 Technology Drive
Eden Prairie, Minnesota 55344
(Mfg. by: Brooks Instrument
Highway 301 North
Slalesboro, Georgia 30459)

585 Solartron (12/7/89)
11321 Richmond Avenue
Houston, Texas 77082-2615
(Mfg. by: Solartron, England)

587 Schlumberger Ind., Measurement Div. (12/18/89)
1310 Emerald Road
Greenwood, South Carolina 29646
(Mfg. by: Schlumberger, France)

550 Sparling Instruments Co., Inc. (10/26/88)
4097 N. Temple City Boulevard
P.O. Box 5988
El Monte, California 91731

715 Thermal Instrument Co. (2/25/93)
217 Sterner Mill Road
Trevose, Pennsylvania 19053

386 Turbo Instruments, Inc. (5/11/83)
4 Vashell Way
Orinda, California 94563
(Mfg. by: Turowerk, West Germany)

803 Turck, Inc. (11/18/94)
3000 Campus Drive
Plymouth, Minnesota 55441-2656
(Mfg. by: EGE - Eletronik
Ravensberg 34
D-24214 Gehorf
Germany)

29-01 Air Eliminators for Milk and Fluid Milk Products

340 Accurate Metering Systems, Inc. (6/2/81)
1651 Wilkening Court
Schaumburg, Illinois 60173

662 G/H Products Corp. (11/21/91)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

436 Scherping Systems (11/27/84)
801 Kingsley Street
Winsted, Minnesota 55395

30-01 Farm Milk Storage Tanks

421 Paul Mueller Co. (4/17/84)
P.O. Box 828
Springfield, Missouri 65801

31-02 Scraped Surface Heat Exchangers

290 APV Crepaco, Inc. (6/15/77)
100 South CP Avenue
Lake Mills, Wisconsin 53551

323 Waukesha Cherry-Burrell (7/26/79)
Process Equipment Division
P.O. Box 35600
Louisville, Kentucky 40232-5600

274 Contherm, Inc. (6/25/76)
111 Parker Street
Newburyport, Massachusetts 01950

496 FMC Corp.
Fran Rica Systems (2/23/87)
P.O. Box 30127
Stockton, California 95213-0127

361 N.V. Terlet (7/12/82)
P.O. Box 62
7200 AB Zutphen
Netherlands
(U.S. Agent Manning & Lewis-NJ)

32-02 Uninsulated Tanks for Milk and Milk Products

397 APV Crepaco (6/21/83)
Division of APV North America, Inc.
100 South CP Avenue
Lake Mills, Wisconsin 53551

264 Waukesha Cherry-Burrell (1/27/75)
(A Unit of AMCA Int'l., Inc.)
575 E. Mill Street
Little Falls, New York 13365

268 DCI, Inc. (11/21/75)
600 No. 54th Avenue, P.O. Box 1227
St. Cloud, Minnesota 56301

708 Lee Industries, Inc. (1/12/93)
P.O. Box 688
Phillipsburg, Pennsylvania 16866

844 Paul Mueller Co. (8/24/95)
1600 West Phelps Street
Springfield, Missouri 65801

354 C.E. Rogers Co. (3/3/82)
1895 Frontage Road, P.O. Box 118
Mora, Minnesota 55051

683 SANIFAB (7/9/92)
A Division of A&B Process Systems Corp.
P.O. Box 86
Stratford, Wisconsin 54484

441 Scherping Systems (3/1/85)
801 Kingsley Street
Winsted, Minnesota 55395

852 Viatec, Inc. (10/18/95)
500 Reed Street
Belding, Michigan 48809

339 Walker Stainless Equip. Co., Inc. (6/2/81)
625 State Street
New Lisbon, Wisconsin 53950

33-01 Polished Metal Tubing for Dairy Products

310 Allegheny Bradford Corp. (7/19/78)
P.O. Box 200 Route 219 South
Bradford, Pennsylvania 16701

812 A.T.I. s.r.l. (1/26/95)
Viale Resegone 7
22036 Erba (Como)
Italy
(U.S. Rep.: Norca Corporation
185 Great Neck Road
Great Neck, New York 11022)

413 Azco, Inc. (12/8/83)
P.O. Box 567
Appleton, Wisconsin 54912

809 Damascus-Bishop Tube Co. (1/2/95)
795 Reynolds Industrial Park Road
Greenville, Pennsylvania 16125

736 Kvalitetsproduktion AB (6/11/93)
S-693 29 Degerfors, Sweden
(U.S. Rep.: Flowtech, Inc.
1900 Lake Park Drive, Ste. 345
Smyrna, Georgia 30080)

308 Rath Manufacturing Co., Inc. (6/20/78)
2505 Foster Avenue
Janesville, Wisconsin 53545

368 Rodger Industries Inc. (10/7/82)
P.O. Box 186, R.R. 1
Blenheim, Ontario
Canada N0P 1A0
(Not available in the U.S.A.)

776 Siam Stainless Pipe (7/18/94)
Fittings & Tubulars
Bangkok, Thailand
(U.S. Rep.: Kurt Orban Partners
Kurt Orban
450 Kings Road
Brisbane, California 94005)

775 Trent Tube (7/18/94)
P.O. Box 77
East Troy, Wisconsin 53120

289 Tri-Clover, Inc. (1/21/77)
9201 Wilmot Road
Kenosha, Wisconsin 53141

331 United Industries, Inc. (10/23/80)
1546 Henry Avenue
Beloit, Wisconsin 53511

34-02 Portable Bins

916 Custom Metalcraft, Inc. (4/17/97)
2332 East Division
P.O. Box 10587 GS
Springfield, Missouri 65808

647 Thomas Conveyor Company (9/18/91)
Tote System Division
P.O. Box 2916
Fort Worth, Texas 76113-2916

35-00 Continuous Blenders

869 ADMIX, Inc. (3/14/96)
23 Londonderry Road
Londonderry, New Hampshire 03053

527 Arde Barinco, Inc. (3/15/88)
500 Walnut Street
Norwood, New Jersey 07648

590 Chemineer, Inc. (1/23/90)
125 Flagship Drive
North Andover, Massachusetts 01845

417 Waukesha Cherry-Burrell (2/7/84)
Process Equipment Division
P.O. Box 35600
Louisville, Kentucky 40232-5600

825 GEI North America, Inc. (3/30/95)
GEI Collette
One Indian Lane East
Towaco, New Jersey 07082
(Mfg. by: Machines Collette N.V.
Keerbaan 70
B-2160 Wommelgem
Belgium)

526 Hosokawa Bepex Corporation (3/16/88)
333 Taft Street NE
Minneapolis, Minnesota 55413

914 International Mixing Tech. s.a.r.l. (4/9/97)
469 Avenue Louis Herbeaux
F-59240 Dunkerque
France
(U.S. Rep.: Peregine Consumer Tech.
2004 E. 67 Street
Los Angeles, California 90001)

642 Mondomix Howden B.V. (8/7/91)
Reeweg 13
P.O. Box 98
1394 ZH Nederhorst den Berg
The Netherlands
(U.S. Rep.: Mondomix Howden
1 West Illinois Street, Suite 300
St. Charles, Illinois 60174)

680 Quadro Engineering, Inc. (6/3/92)
613 Colby Drive
Waterloo, Ontario
Canada N2V 1A1
(U.S. Rep.: Quadro, Inc.
55 Bleeker Street
Milburn, New Jersey 07041-1414)

766 Semi-Bulk Systems (4/28/94)
159 Cassens Court
Fenton, Missouri 63026-2543

724 Silverson Machines, Inc. (4/14/93)
P.O. Box 589
355 Chestnut Street
East Longmeadow, Massachusetts 01028
(Mfg. by: Silverson Machines
Chesham, England)

36-00 Colloid Mills

808 Boston Shearpump, Inc. (12/16/94)
P.O. Box 812143
Wellesley, Massachusetts 02181

846 IKA Works, Inc. (9/7/95)
2635 North Chase Parkway, S.E.
Wilmington, North Carolina 28405-7499

915 IKA Works, Inc. (4/17/97)
2635 North Chase Parkway, S.E.
Wilmington, North Carolina 28405-7499

608 Kinematica, Inc. (10/17/90)
19 Normandy Road
Newton, Massachusetts 02166
(Mfg. by: Kinematica AG
CH-6014 Littau/Lucerne, Switzerland)

293 Waukesha Cherry-Burrell (8/25/77)
611 Sugar Creek Road
Delavan, Wisconsin 53115

38-00 Cottage Cheese Vats

541 Kusel Equipment Company (9/16/88)
820 West Street
Watertown, Wisconsin 53094

385 Stoelting, Inc. (5/5/83)
502 Highway 67
Kiel, Wisconsin 53042-0127

40-01 Bag Collectors for Dry Milk and Dry Milk Products

453 Hosokawa MikroPul E. Systems (9/4/85)
20 Chatham Road
Summit, New Jersey 07901

381 Marriott Walker Corp. (4/12/83)
925 E. Maple Road
Birmingham, Michigan 48809

456 C. E. Rogers Company (9/25/85)
P.O. Box 118
Mora, Minnesota 55051

41-01 Mechanical Conveyors

631 Flexicon Corporation (5/28/91)
1375 Stryker's Road
Phillipsburg, New Jersey 08865

894 Spiroflow-Orthos Systems, Inc. (11/5/96)
2806 Gray Fox Road
Monroe, North Carolina 28110

42-00 In-Line Strainers

855 Flowtech Inc. (10/30/95)
1900 Lake Park Drive, No. 345
Smyrna, Georgia 30080

655 Tri-Clover, Inc. (10/23/91)
9201 Wilmot Road
Kenosha, Wisconsin 53141

606 Waukesha Cherry-Burrell (9/18/90)
611 Sugar Creek Road
Delavan, Wisconsin 53115

44-02 Air Driven Diaphragm Pumps

713 Warren Rupp, Inc., A Unit of IDEXX Corp. (2/5/93)
800 North Main Street
P.O. Box 1568
Mansfield, Ohio 44905

833 Wilden Pump & Engr. Co. (6/22/95)
22069 Van Buren Street
Grand Terrace, California 92313-5651

805 Tri-Clover (11/18/94)
9201 Wilmont Road
Kenosha, Wisconsin 53141
(Mfg. by: KWW
Dusseldorf, Germany)

927 Yamada America, Inc. (6/18/97)
1575 High Point Drive
Elgin, Illinois 60123

45-00 Cross Flow Membrane Modules

807 CeraMem Separations (11/30/94)
12 Clematis Avenue
Waltham, Massachusetts 02154

813 Golden Technologies Co., Inc. (2/2/95)
1697 Cole Boulevard, Suite 300
P.O. Box 4040
Golden, Colorado 80402

786 North Carolina SRT, Inc. (9/24/94)
221 James Jackson Avenue
Cary, North Carolina 27513
(Mfg. by: Tohshin Seiko Co., Ltd.
42-2 Aza Shinmei Tazawa Ohkuma
Watari-Cho, Watari-Gun
Miyagi 889-23 Japan)

46-00 (Refractometers and Optical Sensors)

904 AW Company (2/7/97)
8809 Industrial Drive
Franksville, Wisconsin 53126
(Mfg. by: TTS Technologies
Tampereen Teollisuussahko Oy
Nokianite 2
33270 Tampere
Finland)

785 Bran & Lubbe, Inc. (9/2/94)
1025 Busch Parkway
Buffalo Grove, Illinois 60089
(Mfg. by: Bran & Lubbe
Norderstdt
GMbH [Germany])

859 The Electron Machine Corp. (11/4/95)
15820 CR 450 West
P.O. Box 2345
Umatilla, Florida 32784

800 Epsilon Industrial Inc. (10/24/94)
2215 Grand Avenue Parkway
Austin, Texas 78728

783 James C. Camp (9/2/94)
dba Advantec Process Systems
95 Wyngate Drive
Newnan, Georgia 30265
(Mfg. by: BTG Inc.
2364 Park Central Boulevard
Decatur, Georgia 30035-3987)

737 MSC Moisture Systems (6/17/93)
117 South Street
Hopkinton, Massachusetts 01748-2273

697 Liquid Solids Control, Inc. (10/21/92)
P.O. Box 259
Farm Street
Upton, Massachusetts 01568

751 Maselli Misure S.p.A. (1/20/94)
Via Baganza, 4/3
43100 Parma, Italy
(U.S. Rep.: Maselli Measurements, Inc.
P.O. Box 7571
7746 Lorraine Avenue
Stockton, California 95267)

882 optek-Danulat Inc. (6/25/96)
279 S. 17th Avenue, Suite 10
West Bend, Wisconsin 53095
(Mfg. by: optek-Danulat GmbH
HaedenkampstraBe 18
D-45143 Essen
Germany)

921 optek-Danulat Inc. (4/30/97)
279 South 17th Avenue, Suite 10
West Bend, Wisconsin 53095
(Mfg. by: optek-Danulat, Inc.
HaedenkampstraBe 18
D-45143 Essen
Germany)

767 Foss NIR Systems, Inc. (6/6/94)
12101 Tech Road
Silver Spring, Maryland 20904

750 PT Papertech, Inc. (1/20/94)
#204 - 2609 Westview Drive
North Vancouver
B. C. Canada V7N 4M2
(U.S. Rep.: BD Services Corporation
300 North Commercial Street
Bellingham, Washington 98227)

919 Perstorp Analytical, Inc. (4/24/97)
12101 Tech Road
Silver Spring, Maryland 20904

742 Reflectronics, Inc. (9/15/93)
3009 Montavesta Road
Lexington, Kentucky 40502

817 Technitron Labs Inc. (2/24/95)
555 Briarwood Court
Troy, Ohio 45373

47-00 Pumps for Cleaning & Sanitizing Solutions

897 Ampco Pumps Company (12/10/96)
4000 West Burnham Street
Milwaukee, Wisconsin 53215

50-00 Level Sensing Devices

705 Bindicator Company (12/29/92)
1915 Dove Street
Port Huron, Michigan 48060

51-00 (Formerly 08-17R) Plug-Type Valves

787 Cipriani, Inc. (8/27/91)
Tassalini S.P.A.
23195 LaCadena Drive, Suite 103
Laguna Hills, California 92653

772 G & H Products (6/10/57)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

780 L. C. Thomsen, Inc. (8/31/57)
1303 - 43rd Street
Kenosha, Wisconsin 53140

239 LUMACO (6/3/72)
9-11 East Broadway
Hackensack, New Jersey 07601

788 Puriti, S.A. De C. V. (9/12/72)
Alfredo Nobel No. 39
Fracc. Ind. Pte. de Vigas
Tlalnepantha, Mexico
(U.S. Rep.: Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, Wisconsin 53115)

781 Robert James Sales, Inc. (8/31/94)
699 Hertel Avenue, Suite 260
Buffalo, New York 14207

357 Tanaco Products (4/15/82)
3860 Loomis Trail Road
Blaine, Washington 98230

777 Tech Control Ent. (8/2/85)
3725 N. Murray Road
Otis Orchard, Washington 99027
(Mfg. by: Tech Control, Taipei, Taiwan)

271 The Foxboro Company (3/8/76)
33 Commercial Street, No. 05-4A
Foxboro, Massachusetts 02035

790 Tri-Clover, Inc. (10/15/56)
9201 Wilmont Road
Kenosha, Wisconsin 53141-1413

759 VNE Corporation (3/16/78)
1149 Barberry Drive
Janesville, Wisconsin 53545

761 Waukesha Cherry-Burrell (12/17/57)
611 Sugar Creek Road
Delavan, Wisconsin 53115

52-01 (Formerly 08-17H) Thermoplastic Plug Type Valves

907 L"A"UFER International AG (2/25/97)
Finkenweg 2
D-88709
Meersburg, Germany
(U.S. Rep.: M. G. Newell Corporation
115 N. 20th Street
Tampa, Florida 33605)

577 Ralet-Defay (11/2/89)
66, Boulevard Poincare
1070 Brussels, Belgium
(U.S. Agent GENICANAM, Chazy, New York)

53-00 (Formerly 08-17A) Compression Type Valves

484 APV Fluid Handling-Americas (10/22/86)
100 South CP Avenue
Lake Mills, Wisconsin 53551-1799

730 APV Crepaco (4/21/93)
100 South C P Avenue
Lake Mills, Wisconsin 53551-1799

552 Alloy Products Corp. (11/23/57)
P.O. Box 529
1045 Perkins Avenue
Waukesha, Wisconsin 53187

245 Babson Brothers Company (2/12/73)
Dairy System Division
P.O. Box 659
20903 West Gale Avenue
Galesville, Wisconsin 54630
(Mfg. by: Superior Stainless, Inc.
611 Sugar Creek Road
Delavan, Wisconsin 53115)

443 Badger Meter, Inc. (4/30/85)
6116 East 15th Street
Tulsa, Oklahoma 74112

686 Bardiani Valvole S.R.L. (8/3/92)
Via G. Vittorio, 30/B
43045 Fornovo (PR) Italy
(U.S. Rep.: Sanchelima Int.
1763 Northwest 93rd Avenue
Miami, Florida 33172)

538 Cipriani, Inc.-Tassalina S.P.A. (7/31/88)
23195 La Cadena Drive, Suite 103
Laguna Hills, California 92653
(Mfg. by: Fratelli Tassalini, Italy)

716 Conexiones Inoxidables (3/4/93)
de Puebla S.A. de C.V.
Vicente Guerrero No. 211
Xicotepec de Juarez
Edo, Puebla Mexico
(U.S. Rep: Ben Dolphin Consulting
4735 Lansing Drive
North Olmsted, Ohio 44070)

376 Defontaine of America, Inc. (1/25/83)
16720 W. Victor Road
New Berlin, Wisconsin 53151

530 G & H Products Corp. (5/31/88)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

480 GEA ECOFLEX (8/8/86)
Division of Niro, Inc.
9165 Rumsey Road
Columbia, Maryland 21045-1991

883 Keystone Hygienic Valve Division (7/12/96)
12-14 Kaimiro Street
Pukete Industrial Estate
Hamilton, New Zealand
(U.S. Rep.: Keystone Valve Division
P.O. Box 40010
Houston, Texas)

607 Kammer Valve, Inc. (9/25/90)
510 Parkway View Drive
Pittsburgh, Pennsylvania 15205-1410
(Mfg. by: Kammer Ventile GmbH
Manderscheidtstr. 19
45141 Essen 1, Germany)

570 LUMACO (8/9/89)
9-11 East Broadway
Hackensack, New Jersey 07601

881 MTS Milchtechnik AG (6/14/96)
Saint Galler Strasse 19
CH-9042
Speicher AR
Switzerland
(U.S. Rep.: Mr. James Lucas
Lucas & Associates
965 Mission Street
San Francisco, California 94103)

594 Oden Corp. (3/6/90)
255 Great Arrow Avenue
Buffalo, New York 14207

483 On-Line Instrumentation, Inc. (10/15/86)
Rt. 376, P.O. Box 541
Hopewell Junction, New York 12533

652 Pierre Guerin SA (10/4/91)
BP.12 - 79210
Mauze-Sur-Le-Mignon
France
(U.S. Rep.: Alfa Technical Group, Inc.
4905 West Brook Hill Drive
Syracuse, New York 13215)

551 Puriti, S.A. de C.V. (9/12/72)
Alfredo Nobel 39
Fracc. Ind. Puente de Vigas
Tlalnepantla, Mexico
(U.S. Rep.: Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, Wisconsin 53115)

149R Q-Controls (5/18/64)
Subsidiary of Cesco Magnetics
93 Utility Court
Rohnert Park, California 94928

748 Richards Industries Valve Group (1/11/94)
3170 Wasson Road
Cincinnati, Ohio 45209-2381

762 Stainless Products, Inc. (12/18/80)
1649 - 72nd Avenue
Somers, Wisconsin 53171-0169

806 Steri Technologies, Inc. (11/23/94)
857 Lincoln Avenue
Bohemia, New York 11716
(Mfg. by: Aseptomag AG
Bachweg 3, Postfach 415
CH-3401 Burgdorf
Switzerland)

804 Sudmo North America, Inc. (11/18/94)
4786 Colt Road
Rockford, Illinois 61109
(Mfg. by: Sudmo Schleicher AG
Industriester 7 D-73469
Reisburg, Germany)

823 Sudmo North America, Inc. (3/17/95)
4786 Colt Road
Rockford, Illinois 61109
(Mfg. by: Sudmo Schleicher AG
Industiester 7 D-73469
Riesburg, Germany)

542 L.C. Thomsen, Inc. (8/31/88)
1303-43rd Street
Kenosha, Wisconsin 53140

34A Tri-Clover, Inc. (10/15/56)
9201 Wilmot Road
Kenosha, Wisconsin 53141

467 Tuchenhagen North America, Inc. (1/13/86)
(Mfg. by: Otto Tuchenhagen, West Germany)
196 Western Avenue
Fond du Lac, Wisconsin 54936-1458

561 VACU-PURG, Inc. (1/26/89)
214 West Main Street
P.O. Box 272
Fredericksburg, Iowa 50630

584 Valvinox, Inc.-SGRM Division (11/27/89)
650 1ere Rue.
Iberville-QUE-Canada J2X 3B8
Not Available in the USA

796 VNE Corp. (10/11/94)
1149 Barberry Drive
Janesville, Wisconsin 53547
(Mfg. by: EGMO LTD.
1 Hayotsrim, P.O. 266
Nahariya, Israel)

555 Waukesha Cherry-Burrell (12/11/57)
611 Sugar Creek Road
Delavan, Wisconsin 53115

86R Waukesha Specialty Co., Inc. (12/20/57)
P.O. Box 160, Hwy. 14
Darien, Wisconsin 53114

54-01 (Formerly 08-17B) Diaphragm-Type Valves

565 APV Fluid Handling-Americas (10/22/86)
100 South CP Avenue
Lake Mills, Wisconsin 53551-1799
(Mfg. by: APV Rosista, Inc., W. Germany & Denmark)

877 APV Fluid Handling (5/14/96)
Division of APV North America, Inc.
100 South CP Avenue
Lake Mills, Wisconsin 53551-1799

615 AsepCo (1/4/91)
1101 San Antonio Road, #301
Mountain View, California 94043

814 Burkert Contromatic Corp. (2/2/95)
2602 McGaw Avenue
Irvine, California 92714
(Mfg. by: Buerkert Steuer-Und Regeltechnik
Christian-Buerkert-Str 13-17
D-74653 Ingelfinger
Germany)

745 Cashco, Inc. (12/9/93)
P.O. Box 6, Hwy. 140 West
Ellsworth, Kansas 67439-0006

617 Defontaine of America, Inc. (2/1/91)
16720 W. Victor Road
New Berlin, Wisconsin 53151

856 Flowtech, Inc. (10/30/95)
1900 Lake Park Drive, No. 345
Smyrna, Georgia 30080

637 Gemu Valves, Inc. (7/10/91)
3800 Camp Creek Parkway
Bldg. 2400, Suite 102
Atlanta, Georgia 30331

514 H. D. Bauman Inc. (8/24/87)
35 Mirona Road
Portsmouth, New Hampshire 03801

203R ITT Engineered Valves (11/27/68)
33 Centerville Road
Lancaster, Pennsylvania 17603-2064

494 Saunders Valve, Inc. (2/10/87)
16516 Air Center Boulevard
Houston, Texas 77032-5103

55-01 Boot Seal Valves for Milk & Milk Products

839 G & H Products Corp. (7/11/95)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909
(Mfg. by: Keofitt A/S
Snaremosvej 27
DK-7000 Fredericia
Denmark)

821 Keofitt, Inc. (3/17/95)
1001 W. Glen Oaks, Suite 221
Mequon, Wisconsin 53092
(Mfg. by: Keofitt A/S
Snaremosvej 27
DK-7000 Fredericia
Denmark)

56-00 (Formerly 08-17E) Inlet and Outlet Leak-Protector Plug Valve

34E Tri-Clover, Inc. (10/15/56)
9201 Wilmot Road
Kenosha, Wisconsin 53141

57-01 (Formerly 08-17F) Tank Outlet Valve

531 G & H Products Corp. (5/31/88)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

534 Lumaco (6/30/72)
9-11 East Broadway
Hackensack, New Jersey 07601

643 Paul Mueller Company (8/22/91)
1600 West Phelps
Springfield, Missouri 65801

58-00 (Formerly 08-17M) Vacuum Breakers and Check Valves

843 APV Crepaco, Inc. (8/24/95)
100 South CP Avenue
Lake Mills, Wisconsin 53551

691 Defontaine of America, Inc. (9/19/92)
16720 W. Victor Road
New Berlin, Wisconsin 53151

835 G & H Products Corp. (6/22/95)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

834 Stanfos, Inc. (6/22/95)
3908 - 69th Avenue
Edmonton, Alberta
Canada T6B 2V2
(U.S. Rep.: Andron Stainless Corporation
8901 Farrow Road, Suite 101
Columbia, South Carolina 29203)

857 Steel & O'Brien, Mfg. Co. (10/30/95)
12850 Route 39
Sardinia, New York 14134

689 VNE Corporation (8/17/92)
1149 Barberry Drive
Janesville, Wisconsin 53547

908 Waukesha Cherry-Burell (4/25/97)
611 Sugar Creek Road
Delavan, Wisconsin 53115

59-00 (Formerly 08-17D) Automatic Positive Displacement Sampler

291 Accurate Metering Systems Inc. (6/22/77)
(Mfg. by: Diessel, Germany)
1650 Wilkening Court
Schaumburg, Illinois 60173

284 Bristol Equipment Co. (11/18/76)
210 Beaver Street
P.O. Box 696
Yorkville, Illinois 60560-0696

60-00 (Formerly 08-17G) Rupture Discs

422 BS & B Safety Systems, Inc. (6/12/84)
7455 E. 46th Street
Tulsa, Oklahoma 74145-6379

407 Continental Disc Corp. (10/14/83)
3160 W. Heartland Drive
Liberty, Missouri 64068

854 Fikex Metal Prod. (10/17/95)
Div. Fike Corp.
704 South 10th Street
Blue Springs, Missouri 64015

892 Oklahoma Safety Equipment Company (10/11/96)
(OSECO)
1701 West Tacoma
Broken Arrow, Oklahoma 74012

61-00 (Formerly 08-17I) Steam Injected Heaters

728 APV Unit Systems Inc. (4/14/93)
395 Fillmore Avenue
Tonawanda, New York 14150

811 Hydro-Thermal Corporation (1/1/95)
400 Pilot Court
Waukesha, Wisconsin 53188

560 Pick Heaters, Inc. (1/19/89)
P.O. Box 516
West Bend, Wisconsin 53095

874 Q-Jet Systems, Inc. (4/2/96)
704 Powell Lane, P.O. Box 350
Lewiston, New York 14092-0350

62-01 (Formerly 08-17L) Hose Assemblies

795 Able Hose & Rubber, Inc. (9/14/94)
2307 E. Hennepin Avenue
Minneapolis, Minnesota 55413

774 The Briggs Co. (7/18/94)
3 Bellecor Drive
New Castle, Delaware 19720

758 Crouch Supply Co. (2/22/94)
P.O. Box 163829
902 S. Jennings
Ft. Worth, Texas 76161

721 Dixon Valve & Coupling Co. (3/23/93)
800 High Street
Chestertown, Maryland 21620-1196

913 JGB Enterprises, Inc. (4/9/97)
115 Metropolitan Drive
Liverpool, New York 13088

757 Nelson-Jameson, Inc. (2/21/94)
P.O. Box 647
2400 East 5th Street
Marshfield, Wisconsin 54449

727 Pure Fit, Inc. (4/14/93)
924 Marcon Boulevard
Allentown, Pennsylvania 18103

799 Rubber World (10/21/94)
936 Links Avenue
Landisville, Pennsylvania 17538

698 Sanitary Couplers, Inc. (10/23/92)
696-698 Pleasant Valley Drive
Springsboro, Ohio 45066

700 Titan Industries, Inc. (10/23/92)
P.O. Box 1007
11121 Garfield Avenue
South Gate, California 90280-7590

63-01 (Formerly 08-17R) Sanitary Fittings

470 Advance Fittings Corp. (3/30/86)
218 West Centralia Street
Elkhorn, Wisconsin 53121

380 Allegheny Bradford Corp. (3/21/83)
P.O. Box 200 Route 219 South
Bradford, Pennsylvania 16701

79R Alloy Products Corp. (11/23/57)
1045 Perkins Avenue, P.O. Box 529
Waukesha, Wisconsin 53187

682 Andron Stainless, Ltd. (6/30/92)
6170 Tomken Road
Mississauga, Ontario
Canada L5T 1X7
(U.S. Rep.: Andron Stainless Corp.
8901 Farrow Road, #101
Columbia, South Carolina 29223)

349 APN, Inc. (12/15/81)
921 Industry Road
Caledonia, Minnesota 55921

900 APV Fluid Handling America (12/31/96)
100 South CP Avenue
Lake Mills, Wisconsin 53551-1799

621 Bradford Castmetals (2/25/91)
P.O. Box 33
Elm Grove, Wisconsin 53122

688 Swagelok (8/4/92)
9760 Shepard Road
Macedonia, Ohio 44056

645 Cipriani, Inc. - Tassalini S.P.A. (8/27/91)
23195 LaCadena Drive, Suite #103
Laguna Hills, California 92653

696 Conexiones Inoxidables (10/1/92)
de Puebla S. A. de C. V.
Vicente Guerrero No. 112
Xicotepec de Juarez
Edo. Puebla, Mexico
(U.S. Rep.: Ben Dolphin Consulting
4735 Lansing Drive
North Olmsted, Ohio 44070)

528 Mark IV Industrial
Dayco Industrial Division (3/16/88)
1 Prestige Place
Miamiburg, Ohio 45342

677 EXCEL-A-TEC, Inc. (5/8/92)
N93 W14635 Whittaker Way
Menomonee Falls, Wisconsin 53051

838 Food & Dairy Quality Mgmt. Inc. (QMI) (7/10/95)
245 E. 6th Street, Suite 416
St. Paul, Minnesota 55101

67R G & H Products Corp. (6/10/57)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

925 Hassia Verpackungsmachinen (6/5/97)
GmbH
P.O. Box 1120
D-63689
Ranstadt, Germany
(U.S. Rep.: Hassia USA, Inc.
One Harvard Way #4
Somerville, New Jersey 08876)

773 Herrli AG (7/15/94)
3210 Kerzers
Switzerland
(U.S. Rep.: VNE Corp.
P.O. Box 1698
Janesville, Wisconsin 53547)

917 Irving Polishing & Mfg., Co., Inc. (4/17/97)
5704 46th Street
Kenosha, Wisconsin 53144-1899

454 Jensen Fittings Corp. (9/11/85)
107-111 Goundry Street
North Tonawanda, New York 14120-5998

389 Lee Industries, Inc. (5/31/83)
P.O. Box 688
Philipsburg, Pennsylvania 16866

703 Parker Hannifin Corp. (11/6/92)
Instrument Connectors Div.
9400 South Memorial Parkway
Huntsville, Alabama 35803

200R Paul Mueller Co. (3/5/68)
1600 W. Phelps Street, Box 828
Springfield, Missouri 65801

726 Pure Fit, Inc. (4/14/93)
924 Marcon Boulevard
Allentown, Pennsylvania 18103

242 Puriti, S.A. de C.V. (9/12/72)
Alfredo Nobel 39
Industrial Puente de Vigas
Tlalnepantla, Mexico
(U.S. Rep.: Waukesha Cherry-Burrell
611 Sugar Creek Road
Delavan, Wisconsin 53115)

424 Robert-James Sales, Inc. (8/31/84)
699 Hertel Avenue, Suite 260
Buffalo, New York 14207

699 Rodger Industries, Inc. (10/23/92)
P.O. Box 186
Blenheim, Ontario
Canada N0P 1A0
(Not available in the U.S.A)

334 Stainless Products, Inc. (12/18/80)
1649-72nd Avenue, Box 169
Somers, Wisconsin 53171

741 Steel & O'Brien Mfg., Inc. (8/26/93)
12850 Route 39
Sardinia, New York 14134

391 Stork Food Machinery, Inc. (6/9/83)
P.O. Box 1258/Airport Parkway
Gainesville, Georgia 30503
(Mfg. by: Stork Amsterdam, Netherlands)

449 Tech Controls Enterprise Co., Ltd. (8/2/85)
3725 N. Murray Road
Otis Orchard, Washington 99027
(Mfg. by: Tech. Control, Taipei, Taiwan)

73R L.C. Thomsen, Inc. (8/31/57)
1303-43Road Street
Kenosha, Wisconsin 53140

34R Tri-Clover, Inc. (10/15/56)
9201 Wilmot Road
Kenosha, Wisconsin 53141

707 Valvinox, Inc., SG RM Div. (1/5/93)
650-1st Street
Iberville, Quebec, Canada J2X 3B8
(Mfg. by: SG RM, France
Not available in the U.S.A.)

304 VNE Corporation (3/16/78)
1149 Barberry Drive
Janesville, Wisconsin 53547

82R Waukesha Cherry-Burrell (12/17/57)
611 Sugar Creek Road
Delavan, Wisconsin 53115

64-00 (Formerly 08-17N) Pressure Reducing and Back Pressure Regulating Valve

782 CASHCO, Inc. (8/31/94)
P.O. Box 6
Ellsworth, Kansas 67439-0006

753 G & H Products (2/1/94)
P.O. Box 909
Pleasant Prairie, Wisconsin 53158-0909

769 Richards Industries Valve Group (6/6/94)
3170 Wasson Road
Cincinnati, Ohio 45209-2381

65-00 Sight &/or Light Windows & Sight Indications & Contact with Milk & Milk Products

849 Jacoby TarBox Division of (9/25/95)
Clark Reliance Corp.
16633 Foltz Industrial Parkway
Strongsville, Ohio 44136

867 J.M. Canty, Inc. (2/19/96)
590 Young Street
Tonawanda, New York 14150
Strongsville, Ohio 44136

845 L. J. Star Inc. (9/7/95)
P.O. Box 1116
2201 Pinnacle Parkway
Twinsburg, Ohio 44807
(Mfg. by: Herberts Industrieglas
GmbH & Co.
KG, Wuppertal
Germany)

890 Moisture Systems (9/14/96)
117 South Street
Hopkinton, Massachusetts 01748

818 Tri-Clover, Inc. (3/10/95)
9201 Wilmot Road
Kenosha, Wisconsin 53141-1413

68-00 Ball Types Valves

898 Fluid Transfer (12/12/96)
Division of Lee Ind., Inc.
514 W. Pine Street
Philipsburg, Pennsylvania 16866

73-00 Shear Mixers, Mixers and Agitators

901 Admix, Inc. (1/2/97)
23 Londonderry Road
Londonderry, New Hampshire 03053

74-00 Sensors and Sensor Fittings and Connections

32 ABB Instrumentation, Inc. (10/4/56)
P.O. Box 20550
Rochester, New York 14602-0550

738 ABB Instrumentation, Inc. (6/25/93)
1175 John Street
Rochester, New York 14602-0550

747 Alloy Engineering Co., Inc. (1/11/94)
304 Seaview Avenue
Bridgeport, Connecticut 06607

576 Ametek/Mansfield & Green Division (10/13/89)
8600 Somerset Drive
Largo, Florida 34643

822 Ametek U.S. Gauge Division (3/17/95)
PMT Products
820 Pennsylvania Boulevard
Feasterville, Pennsylvania 19053

318 Anderson Instrument Co., Inc. (4/9/79)
156 Auriesville Road
Fultonville, New York 12072

865 APV Heat Transfer Tec (1/25/96)
395 Fillmore Avenue
Tonawanda, New York 14150
(Mfg. by: Pasilac Electronics
Silkelorg, Denmark)

428 ARI Industries, Inc. (9/12/84)
381 ARI Court
Addison, Illinois 60101

659 Bindicator Company (11/20/91)
1915 Dove Street
Port Huron, Michigan 48060

706 Bindicator Company (12/29/92)
1915 Dove Street
Port Huron, Michigan 48060

926 BOURDON - SEDEME S.A. (6/18/97)
125, rue de la Marre
B.P. 214 41103
Vendome Cedex
France
(U.S. Rep.: Rawson & Co., Inc.
P.O. Box 924288
Houston, Texas 77292-4288)

872 Brookfield Eng. Lab, Inc. (3/28/96)
240 Cushing Street
Stoughton, Massachusetts 02072-2398

315 Burns Engineering, Inc. (2/5/79)
10201 Bren Road, East
Minnetonka, Minnesota 55343

525 Caldwell Systems Corporation (3/4/88)
1200 Diamond Circle, Unit K
Lafayette, Colorado 80026

910 CEMCO Mfg., Inc. (3/7/97)
1120 North Peoria
Tulsa, Oklahoma 74106-4904

850 Chicago Stainless Equip. (9/28/95)
511 Weston Ridge Drive
Naperville, Illinois 60563

851 Chicago Stainless Equipment (9/28/95)
511 Weston Ridge Drive
Naperville, Illinois 60563

672 Computer Instruments Corp. (4/3/92)
1000 Shames Drive
Westbury, New York 11590

829 DCT Instruments (4/13/95)
1165 Chambers Road
Columbus, Ohio 43212
(Mfg. by: Sensotec Inc.
1200 Chesapeake Avenue
Columbus, Ohio 43212)

862 Delta Controls Corporation (11/30/95)
585 Fortson Street
Shreveport, Louisiana 71107

586 Diversey Lever Equipment (12/14/89)
151 Harvey West Boulevard
Santa Cruz, California 95060

866 Dovex S.S., Inc. (1/29/96)
2400 N.E. 2nd Street
Minneapolis, Minnesota 55418

640 Dresser Industries (7/16/91)
Instrument Division
250 East Main Street
Stratford, Connecticut 06497

663 Dresser Industries (12/4/91)
Instrument Division
210 Old Gate Lane
Milford, Connecticut 06460

405 Drexelbrook Engineering Co. (9/27/83)
205 Keith Valley Road
Horsham, Pennsylvania 19044

861 Dwyer Instruments, Inc. (11/28/95)
P.O. Box 373
Michigan City, Indiana 46360
(Mfg. by: Ametek, U.S. Gauge Div.
PMT Products
820 Pennsylvania Boulevard
Feasterville, Pennsylvania 19053)

763 EG & G Berthold Laboritorium Prof. (4/21/94)
Berthold GmbH & Co. KGCalmbacher Str. 22
D-7547 Bad Wildbad 1, Germany
(U.S. Rep.: Berthold Systems, Inc.
101 Corporation Drive
Aliquippa, Pennsylvania 15001-4863)

524 E G & G Flow Technology (1/14/88)
4250 E. Broadway Road
Phoenix, Arizona 85040

459 Endress + Hauser, Inc. (10/17/85)
2350 Endress Place
Greenwood, Indiana 46142
(Mfg. by: Endress + Hauser GmbH
Hauptstrasse 1
D-79689 Maulburg, Germany)

876 Fisher-Rosemount Singapore (5/14/96)
Private Limited
1 Pandan Cresent
Singapore 0512
Republic of Singapore
(U.S. Rep.: Rosemount, Inc.
12001 Technology Drive
Eden Prairie, Minnesota 55344)

598 FMC Invalco, Inc., (3/22/90)
A FMC Corp. Subsidiary
P.O. Box 1183
Hutchinson, Kansas 67504-1183

206 The Foxboro Company (8/11/69)
33 Commercial Street
Foxboro, Massachusetts 02035

463 The Foxboro Company (12/6/85)
33 Commercial Street
Foxboro, Massachusetts 02035

592 Claud S. Gordon Co. (2/27/90)
5710 Kenosha Street
P.O. Box 500
Richmond, Illinois 60071

668 GP: 50 New York, Ltd. (3/30/92)
2770 Long Road
P.O. Box 1150
Grand Island, New York 14072

651 Granzow, Inc. (10/3/91)
2300 CrownPoint Executive Drive
Charlotte, North Carolina 28227
(Mfr: Kubler AG
Baar, Switzerland)

633 Griffith Industrial Products Company (6/21/91)
P.O. Box 111
Putnam, Connecticut 06260

749 Haenni Cie & AG (1/17/94)
CH-3303
Jegenstorf, Switzerland
(U.S. Rep.: Haenni Instruments, inc.
1107 Wright Avenue
Gretna, Louisiana 70056)

771 Hawk America (6/13/94)
1741 W. Rose Garden Lane
Phoenix, Arizona 85027

794 Honeywell, Inc. (9/14/94)
1100 Virginia Drive
Fort Washington, Pennsylvania 19034

557 Honeywell, Inc. (12/21/88)
Industrial Controls Div.
1100 Virginia Drive
Fort Washington, Pennsylvania 19034

832 H.O. Trerice Co. (5/12/95)
12950 W. Eight Mile Road
Oak Park, Michigan 48237-3288
(Mfg. by: Bourdon-Sedene
125 Rue De La Marre
41 100 Vendome
France)

629 ISE-Magtech (5/20/91)
907 Bay Star
Webster, Texas 77598-1531

572 ITT Conoflow (9/25/89)
P.O. Box 768, Rt. 78
St. George, South Carolina 29477

798 Kay-Ray/Sensall, Inc. (10/14/94)
1400 Business Center Drive
Mount Prospect, Illinois 60056

842 Klay Instruments B.V. (8/18/95)
Nijverheidsweg 5
NL 7991 CZ Dwingeloo
The Netherlands
(Not available in the U.S.A.)

396 King Engineering Corp. (6/13/83)
P.O. Box 1228
Ann Arbor, Michigan 48106

893 Kistler-Morse Corporation (10/31/96)
19021-120th Avenue N.E.
Bothell, Washington 98011-9511

285 K Systems Corp. (Tank Mate Division) (12/7/76)
4919 Butterfield Road
Hillside, Illinois 60162

620 Larad Equipment (2/25/91)
213 Airport Drive Extension
Hopedale, Massachusetts 01747

501 Lumenite Control Technology Inc. (4/27/87)
2331 N. 17th Avenue
Franklin Park, Illinois 60131

596 Magnetrol International (3/20/90)
5300 Belmont Road
Downers Grove, Illinois 60515

768 MTS Systems Corporation (6/6/94)
Sensors Division
3001 Sheldon Drive
Cary, North Carolina 27513

906 Mettler-Toledo Process (2/14/97)
Analytical, Inc.
261 Ballardvale Street
Wilmington, Massachusetts 01887
(Mfg. by: Mettler-Toledo Process AG
ImHackacker 15
8902 Urdorf Switzerland)

627 Milltronics, Inc. (4/12/91)
P.O. Box 4225
Peterborough, Ontario
Canada K9J 7B1
(U.S. Rep.: Milltronics, Inc.
709 E. Stadium Drive
Arlington, Texas 76011)

588 Minco Products, Inc. (12/20/89)
7300 Commerce Lane
Minneapolis, Minnesota 55432

863 Nelson-Jameson (1/11/96)
2400 East 5th Street, P.O. Box 647
Marshfield, Wisconsin 54449
(Mfg. by: Chicago Stainless Equipment
511 Weston Ridge Drive
Naperville, Illinois 60563)

597 NUOVA FIMA S.p.A. (3/20/90)
Via C. Battisti 59
28045 - INVORIO (N0) Italy
(Not available in the U.S.A.)

909 Ohmart/VEGA (3/4/97)
4241 Allendorf Drive
Cincinnati, Ohio 45209-9961
(Mfg. by: VEGA Grieshaber KG
AM Honenstein 113
D-77761 Schiltach
Germany)

523 Paper Machine Components, Inc. (1/3/88)
Miry Brook Road
Danbury, Connecticut 06810

554 Par Sonics, Inc. (11/30/88)
R.D. #1 - Box 505
Centre Hall, Pennsylvania 16828

563 PI Components Corp. (2/13/89)
1951 Highway 290W
Brenham, Texas 77833

644 Princo Instruments, Inc. (8/22/91)
1020 Industrial Highway
Southampton, Pennsylvania 18966-4095

815 ProMag PM LTD (2/24/95)
11552 Merchant Drive
Baton Rouge, Louisiana 70809

487 Pyromation, Incorporated (12/16/86)
5211 Industrial Road
Fort Wayne, Indiana 46825

367 RDF Corporation (10/2/82)
23 Elm Avenue
Hudson, New Hampshire 03051

495 Rosemount Analytical, Inc. (2/13/87)
Uniloc Division
2400 Barranca Parkway
Irvine, California 92606

328 Rosemount, Inc. (5/22/80)
12001 Technology Drive
Eden Prairie, Minnesota 55344

732 SensorTec, Inc. (5/18/93)
16335-7 Lima Road
Huntertown, Indiana 46748

784 Sensotec, Inc. (9/2/94)
2080 Arlington Lane
Columbus, Ohio 43228

515 Setra Systems, Inc. (9/14/87)
45 Nagag Park
Acton, Massachusetts 01720

583 S. J. Controls, Inc. (11/11/89)
2248 Obispo Avenue #203
Long Beach, California 90806

873 Smar Equipamentos (4/2/96)
Industriasis Ltda.
7240 Brittmoore, Suite 118
Houston, Texas 77041
(Mfg. by: Smar Equipamentos Industriasis Ltda.
Av. Dr. Antonio Furian Jr.
Serlhozlnko - SP - 14160.000
Brazil)

875 SOR (4/15/96)
14685 W. 105th Street
Lenexa, Kansas 66215-5964

638 Span Instruments (7/10/91)
P.O. Box 860709
Plano, Texas 75086-0709

420 Stork Food Machinery, Inc. (4/17/84)
P.O. Box 1258/Airport Parkway
Gainesville, Georgia 30503

896 TBI-Bailey Controls Company (12/3/96)
2175 Lockheed Way
Carson City, Nevada 89706

641 Tempress A/S (7/16/91)
P.O. Box 2090, DK-8240
Russkov, Denmark
(Not available in the U.S.A.)

690 Texas Thermowell, Inc. (8/25/92)
P.O. Box 1535
Hwy. 96 North
Silsbee, Texas 77656

765 Tri-Clover, Inc. (4/27/94)
9201 Wilmot Road
Kenosha, Wisconsin 53141

444 Tuchenhagen North America, Inc. (6/17/85)
P.O. Box 1458
196 Western Avenue
Fond du Lac, Wisconsin 54936-1458

836 Valmet Automation (7/2/95)
30 Thomas Drive
Westbrook, Maine 04092
(Mfg. by: Valmet-Finland
P.O. Box 237 SF-33101
Tampere, Finland)

754 Valmet Measurements (2/15/94)
30 Thomas Drive
Westbrook, Maine 04092
(Mfg. by: Valmet-Finland
P.O. Box 237 SF-33101
Tampere, Finland)

410 Viatran Corporation (11/1/83)
300 Industrial Drive
Grand Island, New York 14072

779 Wahl Instruments, Inc. (8/10/94)
5750 Hannum Avenue
Culver City, California 90231

522 Weed Instrument Company, Inc. (12/28/87)
707 Jeffrey Way
Round Rock, Texas 78664

569 WEISS Instruments, Inc. (5/24/89)
85 Bell Street
West Babylon, New York 11704
(Mfg. by: Nuova-Fima, Italy)

600 Weksler Instruments Corporation (4/27/90)
250 E. Main Street
Stratford, Connecticut 06497

646 WIKA Instrument Corp. (9/10/91)
1000 Wiegand Boulevard
Lawrenceville, Georgia 30243
(Mfg. by: WIKA Ind. Corp.
63911 Klingenberg
Germany)

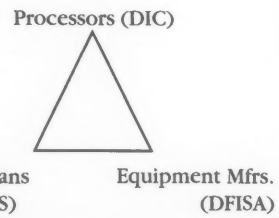
685 Winter's Thermogauges, Ltd. (8/3/92)
2220-3 Midland Avenue
Scarborough, Ontario
Canada M1P 3E6
(U.S. Rep.: Winter's Thermogauges, Inc.
6020/3 N. Bailey Avenue
Buffalo, New York 14226)

879 Zurich Industria E (6/3/96)
Comercio LTDA
R. Serra da Piedade, 183
Sao Paulo - SP - Brazil 03131-080
(Not available in the U.S.A.)

MARK OF COMPLIANCE

The 3-A Symbol Story

The 3-A Sanitary Standards Symbol Administrative Council, known throughout the industry as the "**3-A Symbol Council**," was organized in 1956. Its purpose is to grant authorization to use the **3-A Symbol** on equipment that meets 3-A Sanitary Standards for design and fabrication.



A Modern Concept

The modern concept of the 3-A program was established in 1944 when the Dairy Industry Committee (DIC) was formed. DIC is one of the three industry segments involved in the preparation of 3-A Sanitary Standards. These industry segments are:

- **Processors,** represented by DIC
- **Equipment Manufacturers,** represented by DFISA
- **Sanitarians,** represented by IAMFES

Use of the Symbol

Voluntary use of the **3-A Symbol** on dairy equipment:

- assures processors that equipment meets sanitary standards
- provides accepted criteria to equipment manufacturers for sanitary design & fabrication
- establishes guidelines for uniform evaluation and compliance by sanitarians.

3-A Sanitary Standards Symbol Administrative Council

3020 Bluff Road

Columbia, SC 29209-3502

803-783-9258 phone **803-783-9265 fax**

Reader Service No. 228

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Amendment 1 to 3-A Sanitary Standards for Formers, Fillers, and Sealers of Containers for Fluid Milk and Fluid Milk Products, Number 17-08

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. Specifications for formers, fillers, and sealers of containers for fluid milk and fluid milk products 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.

D1.12 **Fill Valves Entering the Package (Bottom-Up Fill)**

D1.12.1 The following shall be employed for fill valves that enter the package and that accumulate product splash:

D1.12.1.1 Provisions shall be made to sanitize nozzles as needed, or:

D1.12.1.2 A controlled environment, as described in D1.11.1.1 of these standards, shall be provided.

D1.12.1.3 Any fill valves on packages over 2 liters in volume shall be periodically sanitized as needed and be located in a controlled environment as provided for in D1.11.1.1 of these standards.

K1 In the case of bottom-up fill type machines which are not provided with a controlled environment, an information plate should be provided which will specify the frequency that the exterior surfaces of the filler valves must be sanitized.

This amendment to 3-A Sanitary Standards for Formers, Fillers, and Sealers of Containers for Fluid Milk and Milk Products, Number 17-08 is effective November 23, 1997.

Dairy, Food and Environmental Sanitation, Vol. 17, No. 8, Pages 526-527

Amendment 1 to 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment Number 18-01

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

It is the purpose of the IAMFES, USPHS, DIC and FIC 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 rubber and rubber-like materials 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, DIC and FIC at any time. The 3-A Sanitary Standards and 3-A Accepted Practices provide hygienic criteria applicable to equipment and systems used to produce, process, and package milk, milk products, and other perishable foods or comestible products.

A **SCOPE**

A1 These sanitary standards cover the material and serviceability requirements[1] of rubber and rubber-like materials intended for multiple-use as product contact surfaces or solution contact surfaces in the production, processing and handling of milk or milk products. Test procedures and criteria are also provided for rubber and rubber-like materials as a means of determining their acceptance as to their ability to be cleaned and to receive effective bactericidal treatment or steam sterilization and to maintain their essential properties in these accelerated use-simulating conditions[2]. These standards are not meant to cover design and fabrication criteria for individual rubber or rubber-like components because such criteria are provided for in other 3-A Sanitary Standards and 3-A Accepted Practices, nor are these standards intended to cover RTV silicone adhesives or sealants.

A2 In order to conform with these 3-A Standards, multiple-use rubber and rubber-like materials shall comply with the following material, original physical properties and serviceability requirements[3].

B **DEFINITIONS**

B1.1 Rubber: See ASTM D1566 – Terminology Relating to RUBBER[5]. (Except for hard rubber as defined in B1.3.)

B1.2 Rubber-Like: See ASTM D1566 - Terminology Relating to RUBBER. (Except for hard rubber as defined in B1.3.)

[1]Procedures in Section C are serviceability requirements performed to evaluate the original physical properties of rubber or rubber-like materials.

[2]Procedures in Section D are not normal cleaning and bactericidal treatment tests but are accelerated use tests.

[3]Use current revisions or editions of all referenced documents cited herein.

[5]Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; Phone 610.832.9500.

This amendment to 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-01 is effective November 23, 1997.

L EXAMPLE OF A RUBBER CERTIFICATION FORM

EXAMPLE OF A RUBBER CERTIFICATION FORM

Please type all information except signature:

Company Name: _____

Address: _____

_____

_____

_____

Rubber Compound: _____

Compound # or Grade: _____

Part Name: _____

Rubber Class: _____

The rubber or rubber-like materials listed above have been evaluated according to the test procedures contained in the 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-. These materials are (this material is) covered by the Scope and applicable definitions in these Standards. These materials comply (this material complies) with The Code of Federal Regulations, Title 21, Part 177.2600, and complies with the applicable material and compatibility criteria found in Sections C and D. (See attached Test Results Form.)

Company Representative:

Name: _____

Signature: _____

Dairy, Food and Environmental Sanitation, Vol. 17, No. 8, Pages 528-529

Amendment 1 (Technical and Editorial) to 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment Number 20-18

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

It is the purpose of the IAMFES, USPHS, DIC and FIC 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 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, DIC and FIC at any time. The 3-A Sanitary Standards and 3-A Accepted Practices provide hygienic criteria applicable to equipment and systems used to produce, process, and package milk, milk products, and other perishable foods or comestible products.

A **SCOPE**

A1 These sanitary standards cover the material requirements of plastics for multiple-use as product contact and/or cleaning solution contact surfaces in equipment for production, processing, and handling of milk and milk product(s). Test criteria are provided for plastics as a means of determining their acceptance as to their ability to be cleaned and to receive effective bactericidal treatment and to maintain their essential functional properties and surface finish in accelerated use-simulating tests[1]. These standards do not apply to plastics for single service application nor plastics which are of rubber or rubber-like origin resulting from chemical or thermal vulcanization or curing. These standards are also not meant to cover design and fabrication criteria for individual plastic components, because such criteria are provided for in other 3-A Sanitary Standards and 3-A Accepted Practices. In order to conform with these 3-A Sanitary Standards, multiple-use plastics shall comply with the following material, fabrication of test specimens as described in Section D3 herein, and cleanability standards[2].

B **DEFINITIONS**

B5 **Terms Related to Plastics**

B5.1 Terms defined in ASTM D883, Standard Definitions of Terms Relating to PLASTICS[4] shall be the following except those materials included in the 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces on Dairy Equipment, Number 18-.

B5.1.1 *Plastic(s), n.*

B5.1.2 *Polymer, n.*

B5.1.3 *Thermoplastic, n.*

B5.1.4 *Thermoplastic, adj.*

B5.1.5 *Thermoset, n.*

B5.1.6 *Thermoset, adj.*

B5.1.7 *Thermosetting, adj.*

B5.1.8 *Plasticizer, n.*

B5.1.9 *Elastomer, n.*

B5.2 Other terms defined by 3-A Committees:

B5.2.1 *Plastic Additive, n:* Any material that is added to a plastic or polymer to enhance or modify the original physical and/or chemical properties.

B5.2.2 *Plastic, adj.:* The adjective "plastic" indicates that the noun is made of, consists of or pertains to plastic.

Current B8 & B8.1-B8.5 are renumbered as B6 & B6.1-B6.5.

TABLE 1 - Plastics Included in These Standards

Generic Classes (Code of Federal Regulations Citation[5])	Maximum % Weight Gain		
	Section E - Cleanability Response	Section F - Product Treatment (Solution I)	Section F - Product Treatment (Solution J)
Nylon 66-Nylon 6-aramid fiber blend (21 CFR 177.1500, 177.1632)	2.00	3.00	8.00
Nylon 66-Nylon 6-aramid fiber-PTFE blend (21 CFR 177.1500, 177.1380, 177.1632)	2.00	3.00	8.00
Polytetramethylene terephalate-PTFE blend (21 CFR 177.1660, 177.1380)	0.10	0.15	0.65

This amendment to 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-18 is effective November 23, 1997.

[1]Procedures in Sections F and G are not normal cleaning and bactericidal treatment tests but are accelerated use-simulating tests.

[2]Use current revisions or editions of all referenced documents cited herein.

[4]Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; Phone: 610.832.9500.

[5]Citations are by title, part, and section number, thus 21 CFR 177.1010 refers to Title 21, Part 177, Section 1010. CFR references include the basic polymers, optional adjuvants, specifications, and limitations and conditions of use.

Dairy, Food and Environmental Sanitation, Vol. 17, No. 8, Page 530

Amendment 1 to 3-A Sanitary Standards for In-Line Strainers for Milk and Milk Products Number 42-00

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. In-line strainers for milk and milk products specifications heretofore or hereafter developed which so differ in design, material, construction or otherwise, as not to conform to 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. **NOTE:** Use current revisions or editions of all referenced documents cited herein.

B2 *Strainers:* Shall mean equipment having one or more barrier elements with defined openings to separate and retain particulate material from liquid product streams.

B3 *Barrier:* Shall mean element or elements with defined openings to allow flow of liquid products while preventing the passage of particulate materials. Openings may be, but are not limited to, round holes, or slots or openings created by weldments of solid V-shaped profile wire. Woven wire is not permitted.

B6 *Manual (COP) Cleaning:* Shall mean soil removal when the equipment is partially or totally disassembled. Soil removal is effected with chemical solutions and water rinses with the assistance of one or a combination of brushes, nonmetallic scouring pads and scrapers, high or low pressure hoses and tank(s) which may be fitted with recirculating pump(s), and with all cleaning aids manipulated by hand.

B7 *Easily or Readily Removable:* Shall mean quickly separated from the equipment with the use of simple hand tools if necessary.

B8 *Easily or Readily Accessible:* Shall mean a location which can be safely reached by an employee from the floor, platform, or other permanent work area.

B9 *Inspectable:* Shall mean all product contact surfaces can be made available for close visual observation.

B10 *Simple Hand Tools:* Shall mean implements normally used by operating and cleaning personnel such as a screwdriver, wrench, or mallet.

Renumber current B3 and B4 definitions as B4 and B5, respectively.

D8 Internal angles of less than 135° on product contact surfaces shall have radii of not less than 1/16 in. (1.59 mm), except those internal angles of weldments on solid V-shaped profile wire, and those provided for in Section D5.

D11 Round holes in the barrier or barrier elements shall not be less than 1/32 in. (0.794 mm) in diameter, except that if square or rectangular, the least dimension shall be no less than 0.020 in. (0.51 mm) with corner radii of no less than 0.0050 in. (0.13 mm). In the case of solid V-shaped profile wire, the space between the wires shall be at least 0.0050 in. (0.13 mm) and the space between the wire supports shall be no more than 1/2 in. (12.7 mm). All openings shall be accessible for cleaning and free of burrs.

D12 Strainers which use solid V-shaped profile wire shall be easily removable and inspectable and shall be COP cleaned.

Renumber current D12 as D13.

APPENDIX

G SPECIAL CLEANING CONSIDERATIONS

G1 Solid V-shaped profile wire strainers should only be COP cleaned and should be provided with an appropriate protective cage or basket to protect it during cleaning in a COP wash vat.

These amendments to 3-A Sanitary Standards for In-Line Strainers for Milk and Milk Products, Number 42-00 are effective November 23, 1997.

ComingEvents

SEPTEMBER

·**3-5, Producing Safe Dairy Foods Workshop,** held in Madison, WI. The information presented will deal with foodborne illnesses associated with dairy foods and the means to control the problems. For more information, contact Mary Thompson, Outreach Specialist, Wisconsin Center for Dairy Research, University of Wisconsin, Madison, WI; Phone (608) 262-2217 or E-mail: thompson @cdr.wisc.edu.

·**7-9, Quality Through Diversity Conference,** Renaissance Airport Hotel in Orlando, FL. The American Hotel and Motel Association and Conrad N. Hilton College at the University of Houston are joining together in announcing the 1997 Hospitality Industry Quality Through Diversity Conference. For more information, contact Laura Sutherland at (713) 743-2446.

·**8-10, Cell Culture and Hybridomas: Quality Control and Cyopreservation Techniques Workshop,** sponsored by the American Type Culture Collection (ATCC). For more information, contact ATCC, Workshop Coordinator, 12301 Parklawn Dr., Rockville, MD 20852; Phone: (800) 359-7370; Fax: (301) 816-4364; E-mail: workshops@atcc.org.

·**10-11, The Wisconsin Laboratory Association's 21st Annual Education Conference,** Holiday Inn, Fond du Lac, WI. For more information, please contact Wisconsin Laboratory Association, P.O. Box 28045, Green Bay, WI 54304.

·**11-12, HACCP Workshop,** in Chicago, IL. This workshop provides for an intensive day and a half evaluation of HACCP principles and elements for developing a successful program for your facility. Participants evaluate their HACCP plan against those designed by the experts. For additional information or to enroll, contact: AIB, 1213 Bakers Way, Manhattan, KS 66502; or Phone: (913) 537-4750; Fax (913) 537-1493.

·**13-17, Healthcare Food Service Management Announces 1997 Conference Program,** at Loews Ventana Canyon Resort in Tucson, AZ. Participants will learn how to become an effective leader, build high-performance teams, run effective meetings, allocate scarce resources, maximize revenue and much more. All conference participants must be HFM members to attend. Program brochures are available from HFM at (202) 546-7236.

·**17-18, Washington Milk and Food Sanitarians Association's 1997 Annual Meeting,** in Wenachee, WA at the Double Tree Inn. Inquiries can be sent to Dr. Lloyd Luedecke, Dept. of Food Science & Tech., Washington State University, Pullman, WA 99164-6376.

·**23-25, New York State Association of Milk and Food Sanitarians Annual Conference,** Sheraton Saratoga Hotel, Saratoga Springs, NY. For more information, contact Janene S. Lucia, 172 Stocking Hall, Ithaca, NY 14853; Phone (607) 255-2892; Fax (607) 255-7619; E-mail: jgg3@cornell.edu.

·**25-26, Practical Net Content Control Seminar,** Washington, D.C. Sponsored by The Food Processors Institute. This program is designed to provide training in statistical process control and net content compliance. For more information, call Customer Service at (202) 639-5954.

·**25-26, 18th Annual Dairy, Food and Environmental Health Symposium,** at the Chula Vista, Wisconsin Dells, WI. Sponsored by the Wisconsin Association of Milk and Food Sanitarians (WAMFS), Wisconsin Environmental Health Association (WEHA), and the Wisconsin Association of Dairy Plant Field Representatives (WADPFR). For more information, please contact Neil Vassau, Dept. of Agriculture, Trade, & Consumer Protection, Bureau of Laboratory Services, P.O. Box 7883, Madison, WI 53707; Phone 608-267-3504.

·**27-30, ACIL 60th Annual Meeting,** The Ritz-Carlton, Kapalua, Maui, Hawaii. The meeting is designed for scientific and engineering laboratory, testing and R & D businesses. Sessions will focus on changes in the laboratory marketplace and workforce, facilities management and risk management. For further information, contact Sheila Way, Operations Director, ACIL, 1629 K Street, N.W., Washington, D.C. 20006 at (202) 887-5872; Fax (202) 887-0021.

OCTOBER

·**5-9, Saudi Agriculture 97, 16th Agriculture, Water and Agri-Industry Show,** at the Riyadh Exhibition Centre. Further information can be obtained from Virginia Jensen, Kallman Associates, 20 Harrison Ave., Waldwick, NJ 07463.

·**8-10, Quality Management in the Food Industry,** Statler Hotel, Cornell University, Ithaca, NY. This 3-day introductory course is co-sponsored by the IFT Continuing Education Committee, IFT Food Quality Assurance Division, and Cornell University. For further information, contact Institute of Food Technologist's Professional Development Department at (312) 782-8424.

·**12-16, American Association of Cereal Chemists 82nd Annual Meeting,** at the San Diego Convention Center, San Diego, CA. The Annual Meeting includes a technical program, technical and poster sessions, table-top exhibits, new product/ser-

vices sessions, educational short courses and social events. For additional information, contact AACC Headquarters, 3340 Pilot Knob Road, St. Paul, MN 55121-2097, or Phone: (612) 454-7250; Fax: (612) 454-0766.

· **13-16, ASI Fall Workshop, HACCP Workshop for Food Processors,** in Atlanta, GA. For information, contact Vicki Bodrow, ASI Food Safety Consultants, Inc. 7625 Page Blvd., St. Louis, MO 63133; Phone (800) 477-0778.

· **13-16, Environmental Seminar Series for Asian Processors,** in Las Vegas, NV. For more information, contact Sacha Helfand at (703) 684-1080; E-mail: fpmsa@clark.net.

· **20-22, AIB Sanitation and QA Managers' Update Seminar,** Manhattan, KS. This seminar has been tailored to meet the needs of plant sanitarians, quality managers, plant managers, and production supervisors who need to stay informed to make the right choices in today's challenging work environment. For additional information, contact AIB Food Safety, 1213 Bakers Way, Manhattan, KS 66502; Phone (785) 537-4750; Fax (785) 537-1493.

· **20-23, Packaging Basics for the Food Industry, School of Packaging,** Michigan State University, E. Lansing, MI. This 3-day introductory course is co-sponsored by the IFT Continuing Education Committee, IFT Food Quality Assurance Division, and Cornell University. For further information, contact Institute of Food Technologists Professional Development Department at (312) 782-8424.

· **21-22, Food Safety Conference,** in Saratoga, NY. Co-Sponsored by IAMFES. The two-day conference will feature nationally-recognized food science experts and will provide quality assurance, plant, and line managers, regulators, and others involved in food processing with invaluable information on food safety. For further information, contact Carol Miklos at (802) 656-5808.

· **22-24, Food Microbiology Symposium and Workshop,** The University of Wisconsin – River Falls, River Falls, WI. The symposium title is "Current Concepts in Foodborne Pathogens and Rapid and Automated Methods in Food Microbiology." A Rapid Methods in Food Microbiology workshop designed to provide practical demonstrations and discussion of various tests and instruments available for rapid detection, isolation and characterization of foodborne pathogens and toxins as well as prediction of shelf life and checking hygiene and sanitation in food processing facilities is also scheduled. For additional information, contact Dr. Purnendu C. Vasavada, Animal and Food Science Dept., University of Wisconsin – River Falls, River Falls, WI 54022 or Phone: (715) 425-3150; Fax: (715) 425-3785; E-mail: purnenduc.vasavada@uwrf.edu.

· **27-29, International Whey Conference,** sponsored jointly by the American Dairy Products Institute (ADPI), the U.S. National Committee of IDF (USNAC), and the International Dairy Federation (IDF), at the Westin Hotel O'Hare, Rosemont, IL. For additional information, contact American Dairy Products Institute, 130 N. Franklin St., Chicago, IL 60606; Phone (312) 782-4888/5455; Fax (312) 782-5299.

· **27-30, Freezing and Freeze-Drying of Microorganisms Workshop,** sponsored by the American Type Culture Collection (ATCC). For more information, contact ATCC, Workshop Coordinator, 12301 Parklawn Dr., Rockville, MD 20852; Phone: (800) 359-7370; Fax: (301) 816-4364; E-mail: workshops@atcc.org.

· **28-29, 46th Annual Meat Industry Research Conference,** at the Chicago Hyatt Regency, Chicago, IL. This year's conference will feature sessions on microbial testing and nationwide microbial baselines; meat grading in the 21st century; meat quality; standards of identity; and new technologies, such as advanced meat recovery, packaging and case ready meats. For more information, contact AMI's Manager of Education Services, Lora Williams in the Convention and Education Services Dept. at (703) 841-2400.

· **29-2, Nov., Worldwide Food Expo 97,** Chicago, IL. The Dairy and Food Industries Supply Association (DFISA), the International Dairy Foods Association (IDFA), and the National Food Processors Association (NFPA) will cosponsor Worldwide Food Expo 97 in Chicago's McCormick Place. To have Worldwide Food Expo 97 information faxed to you, call (503) 402-1352.

· **30-2 Nov., American Meat Institute's (AMI) 1997 International Meat Industry Convention and Exposition,** held in Chicago, IL at McCormick Place. For more information, contact AMI's Convention Management Group at (703) 876-0900.

NOVEMBER

· **3-4, International Dairy Federation Symposium on Standards and Trade,** at the Palmer House Hilton Hotel in Chicago, IL. The symposium will examine the role of Codex Alimentarius, its relationship with the World Trade Organization (WTO) and its impact on dairy product standards – both national and international. For further information, contact Anne Divjak at the International Dairy Foods Association, 1250 H Street N.W., Suite 900, Washington, D.C. 20005; Phone (202) 737-4332; Fax: (202) 331-7820; E-mail: adivjak@idfa. org.

· **5-7, The Dairy Practices Council 1997 Annual Conference,** at the Harrisburg East Holiday Inn, Harrisburg, PA. For further information, contact The Dairy Practices Council, P.O. Box 866, Barre, VT 05641-0866; Phone/Fax (802) 476-3092; E-mail: Dairypc@aol.com.

·**10-12, Drug Product Stability and Shelf Life,** New Brunswick, NJ. The intent of this course is to explore fundamentals of current principles and practices concerning the stability of pharmaceutical and cosmetic products, degradation of such products by chemical, physical and microbiological factors, and the development, validation and application of a stability indicating assay. For further information, contact Registrar, The Center for Professional Advancement, P.O. Box 1052, East Brunswick, NJ 08816; Phone (908) 613-4500; Fax (908) 238-9113.

·**12-13, Food and Drug Administration's Veterinary Medicine Advisory Committee Meeting.** The topic will be veterinary medical issues related to the quality standards for the manufacture of animal drugs, such as current good manufacturing practices (CGMPs). For further information, contact Ms. Jacquelyn Pace, FDA/Center for Veterinary Medicine (HFV-200), 7500 Standish Place, Rockville, MD 20855; Phone (301) 594-5920; Fax (301) 594-4512.

·**17-20, ASI Fall Workshop, Food Safety and Sanitation,** in Chicago, Il. For information, contact Vicki Bodrow, ASI Food Safety Consultants, 7625 Page Blvd., St. Louis, MO 63133; Phone (800) 477-0778.

DECEMBER

·**3-5, 3rd Annual SERDP Symposium,** at the Washington Hilton Hotel, Washington, D.C. For the first time, it will sponsored in cooperation with the Environmental Security Technology Certification Program (ESTCP). For further information, contact SERDP Program Office, 901 N. Stuart St., Suite 303, Arlington, VA 22203; Phone (703) 696-2117; fax (703) 696-2114.

·**3-5, Good Clinical Practices,** San Francisco Bay Area, CA. This course will emphasize the specific responsibilities of those involved in clinical research along with the requirements by the federal agency to approve research developed for an NDA submission. For further information, contact Registrar, The Center for Professional Advancement, P.O. Box 1052, East Brunswick, NJ 08816; Phone (908) 613-4500; Fax (908) 238-9113.

·**8-10, Current Good Manufacturing Practice (cGMP) for the Pharmaceutical and Allied Industries,** Boca Raton, FL. For further information, contact Registrar, The Center for Professional Advancement, P.O. Box 1052, East Brunswick, NJ 08816; Phone (908) 613-4500; Fax (908) 238-9113.

JANUARY 1988

·**29, Feb. 2, INDPACK '98 International,** International Exhibition & Conference for the Packaging Industry, in Mumbai (Bombay), India. For further information, contact Dusseldorf Trade Shows, New York, 70 West 36th St., Suite 605, New York, NY 10018; Phone (212) 356-0400; Fax (212) 356-0404; Web Site: http://www.dtsusa.com/dts/.

ADVERTISING INDEX

International Association of Milk, Food and Environmental Sanitarians

The publishers of the *Journal of Food Protection* would like to announce the offering of the abstracts of the International Association of Milk, Food and Environmental Sanitarians' 84th Annual Meeting held in Orlando, Florida the 6th of July through the 9th of July, 1997, as a supplement to the 1997 volume of the *Journal of Food Protection.*

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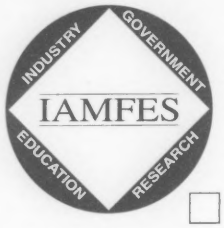

International Association of Milk, Food and Environmental Sanitarians

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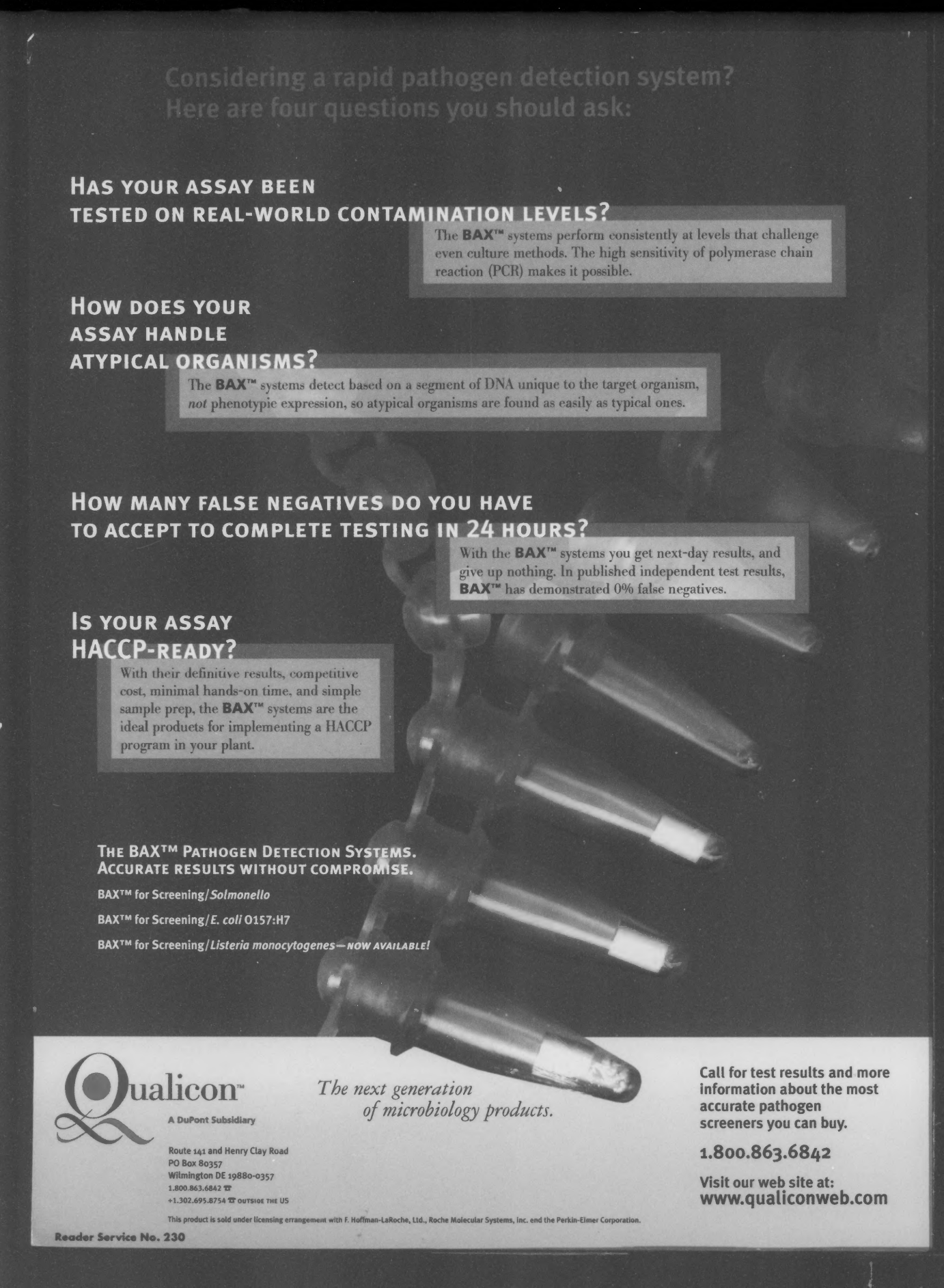
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