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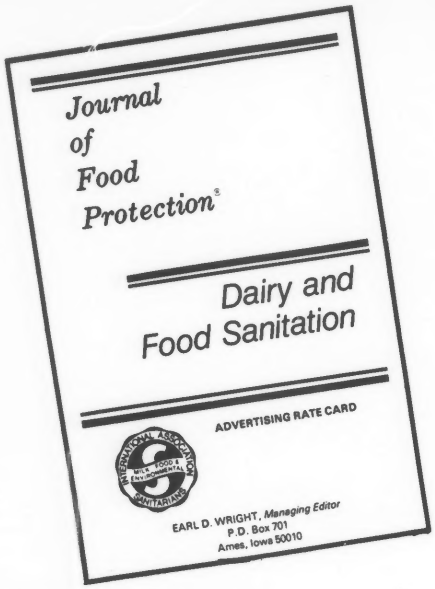
A Publication for Sanitarians and Fieldmen

- The Future of the National Dairy Herd Improvement Association (NDHIA)
- The Role of Continuing Professional Education For The Sanitarian
- Retail Dairy Foods Quality — An Assessment of the Incidence of Off-Flavors in California Milk

A Publication of the International Association of Milk, Food and Environmental Sanitarians, Inc.



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PRESIDENT'S PERSPECTIVE

Recalling a First Encounter

by Bob Marshall

I am keenly aware of the enormity of the challenges and opportunities of leading the "International". during this immportant year of planning for the future. In fact, thinking about this responsibility prompted me to ask "Why do people form Professional Associations?" This is a question we all would do well to ponder.

In search of an answer, my thoughts took me back to 1953 when I first indirectly encountered the "International". In that first encounter the Journal of Milk and Food Technology was the source of a scientific paper I needed for a senior course in dairy technology. Little did I realize I would eventually be given a golden opportunity to serve the publisher of that Journal--the "International".

It was in this thinking I discovered a special reason why people join associations, namely, to establish communications among persons with similar interests. This is the principal motive for publishing a scientific journal and for holding meetings of the Association and its affiliates.

The seed of inquiry planted in 1953 by one of my visioned teachers took root in the next few years, and I undertook research as part of my vocation. Then the Journal became a vital part of my profession. I became a contributor as well as a user.

Fortunately for me there was a State organization of sanitarians that invited me to become a member and involved me in their program. I found their annual educational meeting to be of high value, and I came to know most of the members well. As I did, they became sources of information, sounding boards of ideas, and assistants in interpretation of data, reports and observations. They became friends on whom I could call, and they became supporters.

A little further along the way in my process of learning about the International I came to appreciate the importance of the State organization as an affiliate of the International. Just as it was necessary to have a large number of active members in the State Association, so it was with the International.

Just as affiliates are important to IAMFES, so are the individual members of each affiliate--including those who are not members of IAMFES.

Individual sanitarians, laboratory technicians, managers, professors, field workers, and all the others our society represents have small spheres of influence. Collectively, we can have a tremendous impact in our Provinces or States, in our individual nations and in our world.

Yes, IAMFES is represented world-wide. We have members in 80 countries. Would it not be interesting to hear each member tell how he or she was first introduced to our Association? Does your relationship to the "International" mean enough to you to cause you to tell someone? If not, I welcome your suggestions as to how we can make this Association the kind of communicating society that fits your ideal.

As a student I first benefited by using an excellent journal. As a professional I've benefited even more through direct personal associations with IAMFES members at State and International meetings. For the welfare of us all, may our communications be even better in 1983.

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Retail Dairy Foods Quality - An Assessment of the Incidence of Off-Flavors in California Milk*

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Fluid dairy products (304 samples) were collected in retail California outlets, based on sales distribution by region and type of container. At the time of collection, the size and type of container, processor identity, code date, distance of light source from container and type of light, and case type were noted. Samples were collected arbitrarily from display cases, purchased and transported to a suitable location for judging without further light exposure. After collection, the milk was judged on a five point scoring system for flavor by experienced dairy judges following the ASDA scoring guide. The concentrations of riboflavin and vitamin C were also measured.

Samples packed in paper received a "no criticism" score more frequently than samples packaged in plastic. The predominant flavor defects in paper cartons were lacks of freshness, feed and fruity and in plastic, light-induced and feed. Samples in plastic were criticized for light-induced flavor over ten times as frequently as those packaged in paper. Intensity of light-induced flavor was not correlated with distance from light to sample. There was no relationship between brand of fluorescent light and incidence of light-induced flavor.

Flavor control can be one of the most difficult and perplexing problems of today's dairy industry. People drink milk because it's nutritious and it tastes good. If milk does not taste good, people will not drink it. Each year, we see milk consumption decreasing. Off-flavors can be a contributing factor in the decline of per capita consumption of milk.

Published studies from Senyk and Shipe (*9*), Barnard, Dimick and Hoskin (*3,5,7*), Bradley (*4*), and others have focused on the light-induced flavor problem. Results of research on the east coast suggest that the incidence of serious off-flavors in processed milk is increasing, and that the quality of milk available to the consumer is declining (*3*). Further, it has been stated that the increase in light-induced flavor has coincided with the increased use of plastic containers for fluid milk (*9*). Bandler et al. (*2*) rated light-induced flavor as one of three major off-flavors affecting consumer acceptance of fluid milk in New York State, along with the most serious problem in New York State retail milk, hydrolytic rancidity.

Plastic containers now account for over half of all milk sales. With this increase in containers that do not block harmful light energy, the potential for flavor problems and loss of milk nutrients increases.

In California, with the exception of bacteriological information, no published data are available on the flavor quality of dairy foods purchased by the consumer. Due to this lack of information on the quality of California milk at the retail level, the dairy industry asked for some answers. Thus, this survey was initiated.

MATERIALS AND METHODS

In this survey, 304 fluid milk product samples were collected in California retail outlets, based on approximate fluid milk sales by region and by type of container. Samples were collected following the general purchasing patterns of the California consumers. For example, 60 percent of the milk was purchased in captive-type markets, and about 70 percent (volume basis) was whole milk. It should be pointed out that this sampling protocol does not allow one to project the extent of defects to all milks marketed in California.

All samples were identified and evaluated for flavor, using a 5-point scoring system: 0, for no criticism; 1, for questionable; 2, for slight; 3, for definite; and 4, for a pronounced flavor defect, following the ADSA scoring guidelines for flavor defect and intensity. In addition, the following data were collected: size and type of container, processor identity, retail pull date, distance of light source from container, brand of light, and case type. The required samples were collected as a typical consumer would select from the dairy cases, purchased, kept cool and protected from light until judged. The milk was sampled for vitamin analysis and judged for flavor by a team of two or more experienced dairy judges, within 24 hours of collection.

Samples for riboflavin and vitamin C analysis were placed in one-half pint plastic containers, packed in a shipping carton with "blue ice" and transported to the University of California at Davis for analysis. Ribofla-

**Supported in part by a grant from the Dairy Council of California.*

TABLE 1. *Flvor defects of retail milks by container[a] type.*

Flavor Defect	Paper	Plastic	Total (%)
	No. of Samples (%)		
None	100(58)	52(39)	152(50)
Cooked	6(3.5)	--	6(2.0)
Feed	17(9.9)	16(12)	33(11)
Oxidized	3(1.7)	3(2.3)	6(2.0)
Light	7(4.1)	59(45)	66(22)
Rancid	0(0)	0(0)	0(0)
Fruity	14(8.1)	--	14(4.6)
Lacks Freshness	18(10.5)	1(<1)	19(6.2)
Other	7(4.1)	1(<1)	8(2.6)
Oil	0(0)	0(0)	0(0)
Total	172	132	304

[a]No glass containers were encountered in this survey.

vin was analyzed according to the fluorimetric procedure published by Hand (*6*), and the AOAC fluorimetric procedure (*1*) was used for determination of total ascorbic and dehydroascrobic acid. Statistical calculations were made according to methods published by Puri and Mullin (*8*).

RESULTS AND DISCUSSION

The summary of flavor characteristics by type of container is presented in Table 1. The percentage of each characteristic is shown in parentheses. Note that samples in paper received a "no flavor criticism" score more frequently than samples packaged in plastic 58 vs 39% of samples). All plastic containers found were single-service, blow-molded polyethylene. The predominant flavor defects found in paper were feed, fruity, and lacks freshness. No rancidity was found in any of the retail milks, reflecting the fact that flavor surveys during the past 10 years of California raw milk, done by us, showed less than 1% of the samples with a rancid flavor. This is unlike the experience of Bandler et al. (*2*) for New York State milk. The major flavor defects in plastic containers were feed and light-induced. Samples in plastic were criticized for light-induced flavor 10 times more frequently than those packaged in paper (45 vs 4.1% of samples). The higher percentage of fruity and lacks freshness off-flavors found in samples packed in paper was of interest. Perhaps plastic fillers are cleaner than paper fillers. Further study in this area would be helpful. There was no relationship between the lacks freshness and fruity flavors to sample age or days to code date on carton. The judges were experienced and would have recognized rancid or oily off-flavors if they had been encountered.

No correlation was found between the intensity of light-induced flavor in the milk and distance from sample to light source. This could be expected due to unknown variations in strength of light, time of exposure in display case, and previous history of milk handling.

Further, no relationship was found between brand of fluorescent lamp and the incidence of light-induced flavor. Most lamps encountered were the 40w cool-white types.

No relationships were found between the riboflavin content of the samples and the flavor defects and intensities in paper containers. Neither was there any difference in the riboflavin content in milks purchased in paper or plastic, or between milks with and without light-activated flavor. The mean riboflavin content for all milks was 1.56 mg/l, for milks with light-induced flavor, 1.55 mg/1. This was rather surprising considering controlled experiments found in the literature where the riboflavin is destroyed as photodegradation proceeds in plastic containers (*5,7,9*).

Table 2 shows the vitamin concentrations in plastic and paper containers. Overall there were no mean riboflavin concentration differences between milks in the two types of containers. However, the mean ascorbic acid concentration difference between milk packaged in paper and plastic was highly significant; indicating the protection provided by the paper-broad container. Also, these values fall within the ranges reported in the literature (*2*).

TABLE 2. *Summary of riboflavin and ascorbic acid in milk in paper and plastic containers.*

Vitamin	Containers	No. Samples	Vitamin Concentration			
			Min.	Max	Mean	SD
			mg/L			
Riboflavin	Paper	156	1.14	2.08	1.56	0.20
	Plastic	124	1.05	2.05	1.55	0.21
Ascorbic Acid	Paper	88	0.01	23.51	4.78	5.49
	Plastic	76	0.03	18.12	2.82	3.62

CONCLUSION

While 45 percent of the milk samples in plastic containers collected in this survey were criticized for light-induced flavor, there are many known ways of reducing this high incidence. The dairy processing community of California should take these steps to insure no losses of milk sales due to this defect.

The industry has always emphasized programs to improve quality from farm to consumer. It is hoped that these data, along with other published information, will help encourage corrective action, where appropriate.

REFERENCES

1. AOAC. 1975. Official methods of analysis. 12th ed. Association of Official Analytical Chemists, Washington, DC.
2. Bandler, D. K., R. B. Gravani, J. K. Kinsella, R. A. Ledford, G. F. Senyk, W. F. Shipe, E. T. Wolff, and R. R. Zall. 1981. The milk quality situation in New York State. J. Dairy Sci. 64:56.
3. Barnard, S. E. 1972. Importance of shelf life for consumers of milk. J. Dairy Sci. 55:134-136.
4. Bradley, R. L. 1979. Effect of light on alteration of nutritional value and flavor of milk: a review. J. Food Prot. 43:314-320.
5. Dimick, P. S. 1973. Effect of fluorescent light on the flavor and selected nutrients of homogenized milk held in conventional containers. J. Milk Food Technol. 36:383-387.
6. Hand, D. B. 1939. Determination of riboflavin in milk. Anal. Chem. 11 (6):306-309.
7. Hoskin, J. C., and P. S. Dimick. 1979. Evaluation of fluorescent light on flavor and riboflavin content of milk held in gallon returnable containers. J. Food Prot. 42:105-109.
8. Puri, S. C., and K. Mullen. 1980. Applied statistics for food and agricultural scientists. G. K. Hall Medical Publishers, Boston, Massachusetts.
9. Senyk, G. G., and W. F. Shipe. 1981. Protecting your milk from nutrient losses. Dairy Field. 64:81-85.

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THE ROLE OF CONTINUING PROFESSIONAL EDUCATION FOR THE SANITARIAN

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In order to cope with the decade of the 1980's and beyond the practicing sanitarian must be prepared for shifts in technology, regulation and enforcement strategy, and the overall economy. Those professionals concerned with environmental hazard control and public health should make every possible effort to ensure they are competent to adequately function within their respective work arena. The need for continued competence education among practicing sanitarians has never been greater. Yet it is very important that the sanitarian chooses eductional programs that are worthwhile and pertinent to his current activities practiced in the field. Factors such as the variety of training modes available, the high cost and inaccessability of training programs, as well as the general lack of information concerning available training programs make selecting worthwhile training programs a difficult and sometimes frustrating task.

We are living in a period of rapid change. The explosion of knowledge and spectacular advances in technology have given rise to rapid and far-reaching changes in practically all domains of human life. All these changes have created new educational challenges and have led some of us to question the relevancy and efficacy of most prevalent systems of education that grew in response to a more stable and less complex mode of personal, social, and professional life.

The complexity of our society, the complexities that we have in our individual lives, the pace change in life, the impermanence of all we thought would last forever: all of these mean it is no longer sufficient to plan a lifetime of working service on the knowledge a student is able to obtain in the few years spent in preservice education - whether one enters at age 18, 28, 38, or whatever.

Environmental health is a dynamic field because of changing technology, the changing expectations of the public as well as the changing economic, social, and political arenas. There are major transitions taking place which promise to reorient environmental health from communicable disease control, with a biological focus, to chronic disease control aimed at eliminating physical and chemical hazards in man's environment. New risks are being continuously introduced which must be examined and controlled. Additionally, new methods of detection and control are constantly being created. Environmental health is truly a rapidly changing and expanding field, and there is considerable public concern over environmental problems such as toxic wastes, air pollution, water pollution, and radiation safety.

Why Does a Sanitarian Need Continuing Education?

Since change is persistent and inevitable, it is easy, especially with the insurgence of new information and changes in public expectations, to fall behind, to rapidly become obsolete at any stage of our career. Obsolesence in this instance means less than optional job efficiency due to inadequate practitioner competency.

The Health Resources Administration has recognized the problems of continuing competency in environmental health, and through its financial support and leadership has helped our profession develop the basic components of a continuing competency system. Several years ago the Health Resources Administration in cooperation with the National Environmental Health Association (NEHA) embarked upon a series of projects for the purpose of defining the functions which environmental health personnel carry out, identifying the kinds of competencies which environmental health personnel need to carry out their job functions, and lastly developing a self-assessment instrument to determine where strengths and weaknesses in practitioner competencies exist.

The research staff of the National Environmental Health Association conducted a role delineation study of sanitarians employed throughout the United States. From the data generated by this study, the researchers were able to delineate four different categories of environmental health practitioner as noted on the next page:

TABLE 1. *Number and percentage of environmental health practitioners responding to highest level of education.*

Highest level of formal education	Technician		Technologist		Administrator		Scientist	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
High School	57	14	9	5	10	5	0	0
Associate degree	33	8	13	7	6	3	2	3
Bachelors degree	287	70	112	60	94	46	24	32
Masters degree	34	8	46	25	89	44	43	58
Doctorate degree	2	0	6	3	5	3	5	7

Position #1: That environmental health practitioner who is involved primarily in inspections, field sampling and testing; enforcement and public information activities.

Position #2: That environmental health practitioner who is involved primarily in educational, investigative, consultative, planning, and enforcement activities.

Position #3a: That environmental health practitioner who is involved primarily in supervisory, administrative and planning activities; directs enforcement and investigative programs.

Position #3b: That environmental health practitioner who is involved primarily in directing educational and investigative processes; acts as a consultant to industry and governmental agencies; and demonstrates administrative ability in environmental health. (4)

In many instances the terms technician, technologist, administrator and scientist have been substituted for positions number 1,2,3a and 3b respectively. These are certainly not the only appropriate descriptors which might be associated with each position, but they do indicate that certain responsibilities are carried out at each level. For instance, the technician collects data, but rarely analyzes it and interprets results. The technologist may very well make the determination as to what data are collected and when the results are available he is able to analyze them and prescribe an appropriate control strategy. The administrator would have all of the competencies possessed by the technician and technologist, but in addition to that has certain administrative and management competencies to be able to deal with budgetary, political, and organizational matters. The scientist on the other hand deals with the health risks created by biological, chemical, and physical hazards in the environment and works to resolve these problems.

The role delineation study also revealed that the sanitarians throughout the United States worked in one or more of 14 select program areas including:

Air Quality
Food Protection
Hazardous Substances and Product Safety
Housing
Institutional Environmental Health and Safety
Land Use
Noise Control
Occupational Health and Safety
Radiation Protection
Recreational Areas and Waters
Solid Waste Management
Vector Control
Water Quality
Water Supply (4)

Within each of the program areas, there are certain basic knowledges which a sanitarian must possess in order to competently perform his job function. These five knowledges which are said to comprise the foundation of environmental health professions are:

1. Knowledge of disease and injury causation and control techniques.
2. Knowledge of administrative law and process.
3. Knowledge of the utilization of resources in the collection, arrangement and interpretation of data.
4. Knowledge of environmental health administration.
5. Knowledge of behavioral sciences. (4)

Once NEHA's role delineation study was completed and the responsibilities and competencies identified for each practitioner level, a self-assessment instrument was developed. The self-assessment tool consisted of an entry level examination for the technician category and an advanced level exam for the technologist and higher level categories. The self-assessment test was devised to allow a sanitarian to evaluate how well he could function in a particular program area based upon his present level of knowledge and skill competencies. By using the self-assessment test the practitioner could identify areas of strength and weakness and could tailor an individualized continuing competency program.

The self-assessment instrument was distributed to approximately 2,000 environmental health professionals working throughout the United States. Of this population, approximately 885 practitioners participated in the study.

Study participants were asked to identify their highest level of formal education. These data (Table 1) revealed that 92 percent of the technicians were trained at the baccalaureate level or less. Seventy-two percent of the technologists, 54 percent of the administrators, and 35 percent of the scientists had formal training at the baccalaureate level or less. William J. Holland, Deputy Chief of the Educational Development Branch, Health Resources Adminis-

tration made a startling revelation at a NEHA forum on continuing education when he noted that approximately 80 percent of the technicians and 60 percent of the technologists, who were trained at the baccalaureate level or less, had never received any formal training whatsoever in the health or environmental health sciences, except for where they were trained on the job. Holland went on to note that most of the practitioners in the administrator and scientist categories had been trained in either the health or environmental health sciences.

The point that should be apparent here is that there are a large number of people who are not formally prepared in the health or environmental health sciences. Those who have earned baccalaureate degrees may have majored in a number of areas ranging from English to Humanities. Many have had only a couple of courses in the basic sciences.

In addition to inadequate preservice preparation, there are other influences which may cause obsolescence in the environmental health professional. Van Dusen (6) identified the following:

1. *The person may never have acquired the necessary experience*. Many practitioners become established in one particular program and never have the opportunity to expand into other professional activities. For example, a sanitarian may have been a housing inspector for his entire career and hasn't had an opportunity to practice in one of the other program areas in environmental health. In addition, some areas of proficiency may not be maintained simply due to lack of practice.
2. *The practitioner may forget information previously learned*. We all have a tendency to forget certain knowledge and skill when they are not routinely used.
3. *The environmental health professional may experience occupational career shifts*. Going from one job to another or working within a dynamic organization may require one to expand into a variety of new program areas. Frequently the practitioner finds he doesn't have the competencies needed to perform the duties associated with his new position.
4. *Environmental health professionals vary in their efforts to increase their proficiency*. Some individuals are very excited about the prospects of getting more training and establishing new competencies while others are not. All too often the highly motivated individual is more likely to take the steps required to increase their proficiency rather than the individual who really needs it.

The need for continuous updating and other forms of self renewal has become a concern for individuals and employers of personnel at all levels of skills, whether public or privately engaged. Today, the professional, the skilled worker or the technician, must be sufficiently informed to participate directly in the solutions of broad social, economic, and technical problems of the day. This can be done primarily through continuing professional education and a dedication to life long learning.

Continuing Professional Education

Continuing professional education, sometimes called continuing competency education, is much different from preservice education. Continuing education consists of organized learning experiences which take up where academic and vocational training leave off. It does not include general education for academic credentials or preparation for job entry. The primary thrust of continuing professional education is aimed at refreshing, updating, or upgrading competencies of adults enabling them to better perform their occupational, economic, and social responsibilities.

Academians generally agree that the most likely area for expansion of educational programs for the part-time learner will be in professional and vocational education. This is partly based on consumer demand that professionals who serve them keep up to date on new developments and keep abreast of changes in their professions through continuing education activities. Another supporting factor is the increased interest on the part of state government in passing re-licensure laws which require the professionals to participate in continuing education courses to hold their licenses to practice.

Because of the need to keep abreast of technologial developments, as well as the increase in the amount and complexity of environmental legislation and regulations, many environmental health professionals find that continuing education has become a mandatory part of their lives.

Sources of Continuing Professional Education

In an effort to meet the professionals' educational needs there has been a remarkable increase in the variety and multiplicity of informal educational channels through which an individual might further his knowledge and skill competencies. Short courses, conferences, workshops, institutions, seminars, evening and weekend classes and correspondence study are some of the primary noncredit or institutional forms which have been created and used to satisfy the needs of the health practitioner.

Although the classroom is a prominent component of today's continuing education, the home will be the primary adult education center of the future. Video technology - the tapes, discs, cable television, and personal computers available but not widely used in people's homes today - will be firmly entrenched by 2001. Adults everywhere will be able to take all kinds of courses any time they want, using electronic media.

During the 1940's and through the 1960's governmental agencies, particularly the Center for Disease Control, the Food and Drug Administration and the Public Health Service; sponsored a major portion of the environmental health continuing education programs (5). However, since

the early 1970's most of these efforts have either ceased to exist or have considerably narrowed their focus and outreach. The virtual shutdown of federally sponsored training programs and centers such as the Taft Engineering Center in Cincinnati has contributed significantly to the decline of these kinds of activities.

Colleges and universities, professional associations, and private companies have been making a concerted effort to fill the void which has been created by the declining number of governmentally sponsored programs.

The number of students participating in seminars, workshops, evening and weekend classes, and home study courses is increasing annually. Specific examples of existing sources of individual environmental health educational materials include the Continuing Competency System for Environmental Health Professionals at the University of Washington and the Environmental Health External Degree Program at Ferris State College.

Several professional and industry-based organizations are beginning to take a proactive role in developing, delivering, funding and evaluating environmental health continuing professional education programs. Several industry-based groups, such as the American Sanitary Suppliers Association, the Soap and Detergent Association, and the Chemical Specialties Manufacturing Association, reported the existence of training materials including audio-visual support media. However, much of this material was characterized as proprietary, limited to members, and not directly applicable to environmental health professions. Educational programs available from the Retail Food Market Institute, the National Sanitation Foundation, the American Management Association, and National Educational Media, Inc. have been characterized as having direct application to the environmental health profession.

Obviously one would be remiss if he did not include the instructional services conducted as part of a professional society's annual meeting.

When looking for continuing education opportunity, the practitioner should review announcements in professional society journals and newsletters, academic, government, and industrial establishment publications, and the bimonthly Guide to Continuing Education published by Technological Advancement Centers, Inc. (East Brunswick, N.J.)

Mandatory versus Voluntary Continuing Education

One of the most controversial issues surrounding continuing professional education is whether or not it should be compulsory or voluntary.

Because of the public's concern about professional quality, many states are enacting mandatory continuing education laws for professionals whose work involves the public welfare. Almost half of the states have passed such legislation for physicians. Accountants, lawyers, engineers, and in some instances sanitarians, who traditionally have not been affected by public welfare legislation, are finding themselves subject to regulation. Few states, however, can match the zeal of Iowa, which in 1979 drafted relicensing requirements, calling for compulsory education, for all of its 23 professional licensing boards.

Proponents of mandatory continuing professional education see it as a necessary mechanism of social control to assure the public of continuing professional competence or conversely, to protect it from incompetences (3). They argue that compulsory continuing education is not of and by itself a harmful practice. Since the professions are not static but dynamic, individual members of the professions cannot retain their integrity if they themselves remain static. Thus, the question of mandated continuing education's violating individual freedom is not an issue. A profession and the public it serves have the right, and indeed the duty to improve standards on practitioners, as long as the standards are not arbitrarily and capriciously ordained.

Opposition to mandatory continuing education began to surface about four years ago when a number of educators expressed concern about the availability of programs offered to meet practitioners' educational needs. Professionals in remote areas are usually discriminated against because of the time, distance, and added expense of attending a continuing education program.

In addition, there are more and more critics who believe going to class does not make any difference in what the professional does in the work setting. Jerald W. Apps, a professor of continuing education at the University of Wisconsin is quoted as saying, "There is not research showing that participation in mandatory continuing education makes any difference" (7). Houle supported this contention when he said, "The ultimate evaluation of continuing education comes through necessary changes in performance. However, we have not yet clearly shown that continuing education makes professional performance better" (1).

Many educators agree that, whether or not mandatory continuing education is the way to guarantee professionals are competent, it is here to stay, because it is the most convenient method of satisfying the public interest in qualified professionals." (7).

It should be apparent by now that change is essential, that it is a vital part of our way of life, and that it is your role to be among the agents of change in public health. To be prepared for this role it is essential that you assess your knowledge and skills, identify your areas of weakness, and participate in a continuing professional education program which will meet your individual needs.

I close with a bit of Shakespear which I believe is appropriate when thinking about continuing education. It goes like this:

> The good Lord gave us two ends to use
> One to sit on, one to think with
> Success depends on which you choose
> Heads you win; tails you lose.

REFERENCES

1. Houle, C. O. 1980. Continuing learning in the professions. Jossey-Bass Publishers, San Francisco.
2. Krone, L. J. and T. G. Remigio. Profile of the field and self-paced

modules for environmental health practitioners. National Environmental Health Association, Denver.
3. Mattron, K. J. 1981. Mandatory education increases professional competence. pp. 46-51. In Burton W. Krietlow and Associates (Ed.) Examining controversies in adult education, Jossey-Bass Publishers, San Francisco.
4. National Environmental Health Association. 1980. The sanitarian in environmental health: responsibilities and competencies, Denver.
5. U.S. Department of Health and Human Services. 1982. Report of the proceedings of a workshop on preparation for practice in environmental health. Washington, DC.
6. Van Dusen, K. 1981. Continuing competency education system for environmental health personnel. University of Washington, Seattle.
7. Watkins, B. T. 1979. Continuing education for professionals. The Chronical of Higher Education. 19:9.

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The Future of the National Dairy Herd Improvement Association (NDHIA)

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I welcome the opportunity to discuss the National Dairy Records Program, having worked with the program in Kentucky for several years. Even though I have been in milk regulatory work for the last eight years I still have a certain amount of devotion to the dairy records program. I also assist a centralized laboratory located on the UK campus which tests raw milk both for the state DHIA and for our milk regulatory programs.

Our society is definitely in the "Information Age." Any business needs all the information available to make wise management decisions. Today, dairying is not only a business but it is big business by anyone's standards. On this basis it is difficult to understand how any dairyman operates without the aid of the Dairy Records Program.

The National Dairy Records Program, according to Dick Sechrist, their Executive Secretary, is growing by five or six percent each year in the number of dairy cows enrolled. As of January 1, 1981 there were 63,000 dairymen with almost five million dairy cows enrolled in some type of dairy records program. This represents forty-one percent of our nation's dairy cow population. Table 1 shows enrollment of dairy herds by different types of dairy records programs.

The fastest growing among the newer programs has been the AM-PM plan which now provides records for more than 700,000 cows. Currently, AM-PM is an "official" testing program when a monitoring device is installed at the farm to record the start and ending of milkings. Only one milking per month is supervised, and this alternates from morning to evening throughout the year. This means only one milk weight and one milk sample for component testing are taken each month as opposed to the two milkings weighed and sampled in the DHIA program. Research by Bob Everett, Cornell University, has shown that laction error for DHIA was 2.0 percent compared to 2.2 percent for AM-PM. However, the accuracy of AM-PM milk component data is not as good as for milk weights. The National Cooperative Dairy Herd Improvement Program Research Committee feels that bulk milk weight may provide about the same information as a monitoring device, so the AM-PM plan has much potential.

New services are apparently having some effect on increased enrollment in the dairy records program. Close to two - million cows are on a mastitis screening test, most of which are being analyzed by 60 electronic somatic cell testing instruments. Thirty-eight states have this service available at an average cost of 14 cents per sample. DHIA protein testing has jumped to 1.4 million cows per month. Several other optional services are being made available and are shown in Table 2.

The National DHIA's industry-wide, on-farm computer committee has set objectives which include minicomputers and computer terminals in the DHIA system. The DHIA system, conceivably, may be quite different ten years from now with the adoption of new electronic technology. Certainly on-the-farm electronic equipment will come gradually for many reasons, but it is happening and we can expect that dairymen will obtain the advantages of the new technology without losing any of the benefits of the present program.

DHIA's are becoming better organized and hiring their own management personnel. According to Dick Sechrist there are now 3,000 persons in laboratories, field operations, and computer management systems. Dick feels that those states which have acquired management in recent years will gradually move to more management and more centralization. I hope Dick is correct and this trend continues because it looks like one way to keep the cost to the dairymen in line with the type of dairy records program they want and need. The cost of testing has been kept to a minimum through the use of electronic equipment and volume. The cost of computing DHIA records in processing centers is another example of using electronic equipment and volume to keep costs down as much as possible, yet produce maximum information for dairymen. We are not saying that each state must have a central laboratory, or have its own processing center, or organize in exactly the same manner. States with a small dairy cow population may need to combine their efforts with another state or states. Actually, some combinations already exist as three states are sharing a laboratory and management system, and consideration is being given to a five-state operation in New England. The major objective should be for all states to give their dairymen the best dairy records program possible. If this means combining with some other state or

Table. 1. DHIA SYSTEM JANUARY 1, 1981

Program	Herds	Cows/ Herd	Cows (1,000's)	Cows % Change
DHI	32,207	78	2,516	-1.5
DHIR	4,284	80	342	7.5
DHI-AM-PM	3,033	112	339	260.5
Sub Total (Official Programs)	39,524	81	3,197	7.8
OS	16,596	45	745	-0.4
AM-PM	5,587	56	313	24.8
MOR	748	142	106	24.1
COM	262	370	97	-15.8
Other	258	86	22	-16.8
Sub Total (Non-Official Programs)	23,451	55	1,283	4.7
TOTAL	62,975	71	4,480	6.9

Table 2. DHIA OPTIONAL SERVICES

1. MASTITIS SCREENING	1,841,000 cows/month
Somatic Cell	1,612,000
CMT	224,000
Other	5,000
2. PROTEIN	1,361,000 cows/month
3. SNF	190,000 cows/month
4. FEED TESTING	30,000 samples/year
5. SOIL TESTING	23,000 farms/year
60,000 soil samples/year	
180,000 soil recommendations/year	
6. FARM ENTERPRISE ANALYSIS	1,000 farms/year
7. PROGESTERONE	4,000 kits/year
8. IDENTIFICATION SERVICES (VIP)	17,000/year

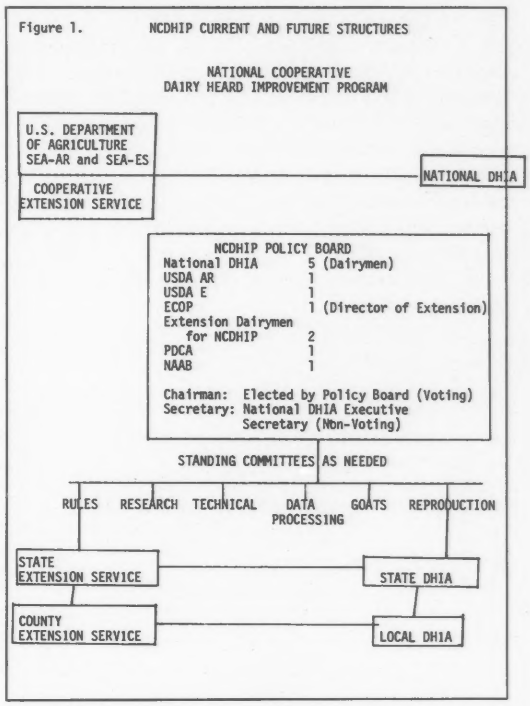
states in some way, then do it if your dairymen want it.

As DHIA's become better organized and hire their own management personnel county agents and extension specialists are less involved in the day to day operations. This is great because they need to be spending their time providing educational services, such as training supervisors and teaching dairymen how to properly interpret and use records for effective management. Extension will be needed to aid dairymen with the on-the-farm computer systems just getting under way. There will always be a need for extension and education in the dairy records program.

Today a National Cooperative DHIA "Policy Board" provides the *authority* for the DHIA rules and policies. It is made up of 1 PDCA; 1 NAAB; 2 Extension Dairymen, 1 Extension Director, 2 USDA and 5 National DHIA board members. National DHIA and its member DHIA's have the responsibility for enforcement. See Figure 1.

The DHIA supervisor's job has changed drastically and will probably change more in the future. No longer do many supervisors test their milk samples or compute their records, but they spend more time gathering data to be processed and obtaining milk weights and samples for testing.

Extension, state association, Dairy Records Processing Centers and other leaders in the Dairy Records program



must, and I am sure will, adapt to these changes in their roles to assure dairymen the most efficient record system possible.

National DHIA has recently hired a field service director, Dr. George E. Gramling, and they are going back to basics. I think it's great! They call it a "Quality Certification Program." It involves quality and accuracy of central testing laboratories, field operations and Dairy Records Processing Centers. Minimum standards have been developed for each area and states will be assisted to meet these standards by 1984.

Laboratory standards include instrument calibration, turn around time, approved procedures, daily control, and laboratory records. Field operation standards involve

supervisor training requirements, rules, equipment, check tests, and identification of cows. Dairy Records Processing Center standards involve various reports to the state DHIA, turn around time, types of reports, deadlines, and cooperation with breed associations.

This is a tremendous undertaking and will not come easily for those persons who resist change, but is most necessary for improvement of the total dairy records system. There isn't a single state that could not improve its image with this program, not to mention the accuracy of their information. I urge all states to cooperate fully with the National field service director, Dr. Gramling, to improve your state dairy records program by meeting the Quality of Certification standards as soon as possible in all three areas.

At the 1981 National DHIA annual meeting, President Morris Van Gorden stated that this will be a "landmark" meeting since the delegate body will be asked to endorse plans for *total commitment to improve DHIA service, stability, accuracy, and integrity*. If all state DHIA's will adopt the *proper attitude* to accomplish these goals then there can be little doubt as to the future of the National Dairy Records Program. I am sure each state wants what it feels is best for their dairymen. Therefore, state and local boards and other state leaders must be open to suggestions and obtain assitance with their problems if needed. This assistance may come from other states and/or the national organization.

The Dairy Records Program is a program for dairymen and largely paid for by dairymen. Therefore, they certainly should have a voice in the policies and decisions that give the program direction. However, dairymen don't always have the time nor the expertise to *manage* the program on a local or state basis, in my opinion. So they need competent, trained personnel to carry out these duties for them. This type of personnel may not be possible for some states without joining other states in some way agreeable to all. Since public agencies will probably be forced to do less in the area of operational and policy duties in the future, this means these duties, if performed, will fall to the local and state DHIA's.

I am sure that many of the changes that we have discussed will continue to be argued within the national, state and local organizations and probably should be as long as it is constructive. However, I feel all directors (local, state and national) should heed past president Van Gorden's quote "total commitment to improved DHIA service, stability, accuracy and integrity" each time they find themselves in discord with each other. I believe that perhaps this quote should become the National Dairy Records motto.

Forty-one percent of all dairy cows are enrolled in the National Dairy Records Program in the United States today which is evidence of a successful program. If the changes that we have discussed today can be implemented without too much turmoil this program should enjoy even greater success as it offers improved services more efficiently.

St. Louis — in the heart of it all

You are invited to attend the 70th Annual Meeting of IAMFES, August 7-11, 1983 at the Marriott Pavillion in beautiful St. Louis, MO. Educational meetings, interminglings with fellow professionals and entertainment has been planned for this yearly event. You'll also enjoy the Ralston Purina Farm outing and dinner. Spouse's entertainment is once again an outstanding attraction. Don't miss it!

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1983 NATIONAL MASTITIS COUNCIL

February 21, 22, 23
Executive Inn, West
Louisville, Kentucky

"Tools for Prevention"

February 22, 1983
Tuesday

7:00 A.M.	NMC Board Breakfast
7:30 A.M.	NMC Board Meeting
11:00 A.M.	NMC Business Meeting: Presidential Address, Dr. Alan Bringe, University of Wisconsin, Madison
11:45 A.M.	Annual NMC Luncheon and program: Milking performance affected by liner design and slips, Dr. Jerry O'Shea, Agricultural Institute, Moorepark Research Center, Ireland
1:45 P.M.	Break
2:00 P.M.	Electrical Sensitivity of Dairy Cows, Dr. Robert Appleman, University of Minnesota, St. Paul
2:30 P.M.	Electrical Conductivity of Milk for Mastitis Detection, Dr. Sid Spahr, University of Illinois
3:00 P.M.	Milk Break
3:20 P.M.	Minnesota Dairy Farmers' attitudes toward and knowledge of bovine mastitis control, Dr. Norman Williamson, D.V.M., University of Minnesota, St. Paul
3:40 P.M.	Our approach to mastitis control in Virginia dairy herds, G. M. Jones, Department of Dairy Science, Virginia Tech.; Phil Parson, Maryland-Virginia Milk Producers Assoc., Arlington, Va.; Dr. Steven D. Vaughn, D.V.M., Orange Veterinary Clinic, Orange, Va.
4:20 P.M.	Question and Answer session, Dr. Alan Bringe, Moderator
5:00 P.M.	Milking Machine Manufacturers Council Reception
6:00 P.M.	NMC Dinner Special
7:00 P.M.	Technology transfer session, Dr. Jeffrey Reneau, University of Minnesota, Chairman
9:00 P.M.	Adjourn

UpDate on Post Milking Teat Dip Antisepsis

February 23, 1983
Wednesday

8:00 A.M.	Purpose of Teat Dip Position Paper - J. W. Pankey, Homer, Louisiana
8:05 A.M.	Historical Overview of Teat Dipping - R. J. Eberhart, State College, Pennsylvania
8:35 A.M.	Regulations - Today - C. R. McDuff, Minneapolis, MN
8:45 A.M.	Classes of Products - J. J. Jezeski, Gainesville, Florida
9:15 A.M.	Application, Storage, and Handling Teat Dips - R. P. Natzke, Gainesville, Florida
9:30 A.M.	Efficacy Studies - J. W. Pankey, Homer, Louisiana
10:00 A.M.	Economic Impact of Teat Dips - J. J. Jezeski, Gainesville, Florida
10:15 A.M.	Round Table Discussion
10:30 A.M.	Milk Break
10:50 A.M.	"Total Dairy Enterprise" - Don Berg of Land O'Lakes, Inc., Jim Rook, Dairy Production Specialist, and Steve Watrin, Dairy Production Specialist, Land O'Lakes, Inc.
11:30 A.M.	Research Challenges in Mastitis Control - From an Irishman's Point of View - Dr. Jerry O'Shea, Moorepark Research Center, Fermoy, Ireland
11:40 A.M.	How Do We Effectively Meet the Challenge to the Dairy Industry - Dr. Don Rollins, D.V.M., Mid-America Dairymen, Inc., Springfield, Missouri
12:00 noon	Adjourn

28 TOPICS READY TO GO FOR TECHNOLOGY TRANSFER SESSION AT ANNUAL MEETING

The new technology transfer session, chaired by the University of Minnesota's Jeff Reneau, will be held at 7:00 p.m. until 9:00 p.m. on Tuesday, February 22, 1983, at the Executive West, Louisville, Ky. Site of the NMC annual meeting, the evening session will stimulate lively exchange of ideas and research data. NMC members and guests are invited to browse among the various exhibits and to select among those topics of greatest interest to them. Each presentation will be repeated several times within the scheduled 2½ hours. A number of different medias and presentation types will be used by the 28 participants.

The following topics will be presented:

1. Steve Spencer, Penn State, Milking system design analysis, Computer demonstration on the use of the minicomputer in the analysis of milking system design
2. Tim Lesch, private practitioner from Illinois, Economics of mastitis control: TI 59 Computer program demonstration
3. Roger Morris, University of Minnesota Veterinary School, Mastitis Control prediction model, computer demonstration of economical analysis of mastitis control procedures
4. Woodie Pankey, LSU, Homer, La., Poster session on efficacy of teat dips
5. Rick Bennett, University of Calif., Davis, Poster session on control of environmental mastitis.
6. Stan Wollen, University of Nebraska, Poster session on a new teat dip list
7. Sid Spahr, University of Ill., Electric conductivity for the detection of mastitis, a demonstration of computerized electronic conductivity instrumentation.
8. Gary Richardson, Utah St. University, Electric conductivity instrumentation for early mastitis detection using a hand held unit
9. Bob Appleman, University of Minnesota, Poster session on cow behavior and stray voltage
10. Terrell Bodman, University of Nebraska, Extraneous voltage testing procedures
11. John McDonald, National Animal Disease Center, Ames, Iowa, Poster session on udder infection during the dry period
12. Larry Smith, Ohio State University, OARDC, Diagnosis of Coliform intramammary infection
13. Larry Smith, Ohio State University, OARDC, Environmental mastitis, effects of season, year, stage of lactation
14. Duane Rice, University of Nebraska, Demonstration of using video and teleconference telephone for informational meetings
15. Bill Sears, Mississippi State University, Poster session on prevalence of *Strep ag* for mastitis bulk tank sampling and an estimate of economic impact
16. Bill Crist, University of Kentucky, Kentucky dairy profits project
17. Darrell Johnson, private practitioner from Weyauwage, Wis., NMC education information for veterinarians and their clients
18. Bob Siebert, Madison, Wis., Update on teat end lesions and their implications in the field and in research
19. Lawrence Bauman and Ralph Farnsworth, University of Minnesota, Video tape presentation of teat canal dynamics during milking
20. Bob Peters, University of Maryland, Effect of intramammary devices on new infection rate, milk yield and somatic cell count in Maryland herds, a poster session
21. Jeff Watts, ISU, Homer, La., Identification of bovine *Staphylococcus*, a poster session
22. Robert Styles, Ontario Ministry of Agriculture, Ontario Milk Marketing Board's "C" for service udder health program
23. Don Barnum, Ontario Ministry of Agriculture, Reference samples and the calculation of true count on somatic cell count instruments
24. Jeff Reneau, University of Minnesota, Use of DHIA somatic cell count summaries in monitoring herd mastitis
25. Bob Eberhart, Penn State, Quality control standards for somatic cell counting
26. George Shook and Anne Seaman, University of Wisconsin, The new DHIA linear score for somatic cell counting
27. Bob Harmon, University of Kentucky, Identification of *Staphylococcus* isolated from bovine udder using API Staph-Ident system
28. Ken Olson, University of Kentucky, Use of DART system for cow and heifer health

News and Events

CYRIL K. (C. K.) JOHNS died December 13, 1982 at his home near Ottawa after a long illness. Born in England in 1899, he emigrated to Alberta in 1910. After service overseas in the army, he attended Olds School of Agriculture and then graduated from the University of Alberta in 1925 and McGill (M.Sc.) in 1926. After a brief stay with the Alberta Dairy Branch, he joined the Bacteriology Division of the Canada Department of Agriculture and commenced his life-time work in dairy bacteriology. On leave of absence, he earned his Ph.D. degree from the University of Wisconsin in 1937.

Dr. Johns was a pioneer in milk sanitation. He is probably best known for the development of the triple-reading resazurin test and, later, of preliminary incubation tests for assessing the sanitary quality of milk production. His work included studies on cleaning milking machines, comparative studies of chemical sanitizers and methods for their evaluation, and the role of bacteria in cheese ripening. A hard worker and a prolific writer, he published about 90 scientific papers and research bulletins, as well as scores of extension and popular articles. He spoke frequently on various aspects of milk quality throughout Canada and the United States, and around the world.

Dr. Johns was elected president of the International Association of Milk and Food Sanitarians in 1934-5. He served as a member of the editorial board of that journal and of the Journal of Dairy Science for many years. Indeed, he continued to assist in the editing of the Journal of Food Protection until a short time ago. He was called twice to Geneva to FAO-WHO Committees on Milk Hygiene as Secretary and as Chairman.

In recognition of his outstanding contribution, Dr. Johns was elected to Fellowships by the American Public Health Association in 1943 and by the Agricultural Institute of Canada in 1950. He received the Citation Award from the International Association of Milk and Food Sanitarians in 1954. Dr. Johns was made a member of the Hall of Fame of the Olds School of Agriculture in 1978.

In an administrative capacity, Dr. Johns became Head of the Food Microbiology Section of the Division of Bacteriology and Dairy Research in 1939, Officer-in-Charge of the Dairy Technology Unit in 1953 and Director of the Dairy Technology Research Institute from its formation in 1959 until its incorporation into the Food Research Institute in 1962. He retired in 1963 but continued to be active in the field of milk quality as a consultant.

J. Nix Dies

J. Nix, 65, Rochester, died on December 28, 1982 at his home.

J. was employed by the Dairy Division of the State Board of Health, where he had worked since 1968.

Prior to 1968, he was Chief Sanitarian for the Fulton County Health Department where he was instrumental in launching the careers of several sanitarians.

He was widely known by sanitarians throughout Indiana and was a long-time member of the Indiana Association of Sanitarians. He served on the IAS Board from 1964 through 1969 and was IAS president in 1968. He was active on the former IAS 3-A Sanitary Standards Committee and was a registered Professional Sanitarian.

Mr. Nix was born in Pauline, TX. Family members include a daughter Linda Perdue, Delphi, IN; a son David, Tomball, TX; a sister and three grandchildren. He was a World War II veteran and a member of the Elks and I.O.O.F. Lodges.

Memorial contributions may be made to the American Heart Association.

Klatte Retires

E Albert L. Klatte, Chief of the Bureau of Environmental Health, Marion County Health Department, Indiapolis, IN, announced his retirement which was effective December 31, 1982 after 26 years of service with that agency. He has spent a total of 41 years in public health, 12 of which were with the Indiana State Board of Health.

Tamper Proof Packaging

Although tamper-evident packaging on consumer products is an essential step in minimizing the risks of another Tylenol tragedy, manufacturers must reassess other areas of vulnerability that affect the integrity of their products.

"The dangers of tampering, as well as unintentional error, that can severely affect the health of the public and the reputation of the producer, exist throughout the flow of products--from raw materials to distribution," said Joel M. Kushnir, partner of Haines Lundberg Waehler Technical Regulatory Services, a New York-based consulting firm. "While there are no fool-proof measures that can be taken, a number of deterrents can be put in place to reduce these risks," he pointed out.

An important first step is to initiate and enforce rigid operating procedures in all plant operations, from receiving through product shipping, Mr. Kushnir said. "Any potentially hazardous materials that can contaminate products should be identified and put under strict controls." In addition, quality control checks should be made at every stage of the manufacturing process, rather than merely on the final product, he observed.

He advised companies to employ automation to reduce human contact with products wherever possible, and to select only the most capable and loyal employees for operations that present the greatest risk to product integrity. Examples of highly labor intensive operations that could lend themselves to cost effective automation include batching, blending, packaging, sealing or capping, materials handling and weighing, he said.

"Since employees are the critical factor in product quality, strong attention should be paid to adequate training and creating a satisfactory working environment, as well as careful screening in the hiring process," Mr. Kushnir said. Among other internal measures that can be taken, he cited periodic audits of compliance with manufacturing procedures, individual counseling on employee problems, and an efficient system for quick response to complaints from distributors, retailers and consumers.

"So far, internal incidents of product tampering have not been a major problem for most companies, but no management can afford to become complacent. Even the best systems and procedures to maintain product integrity must be objectively audited on a regular basis to make sure they are working effectively," Mr. Kushnir cautioned.

"Manufacturers lose most of their control over the integrity of their products after they leave the plant, but certain precautions to dealers can be recommended," he noted. These include spot checking of products on arrival, documented assignments of warehousing and sales personnel, and closer monitoring of retail shelves. "Goods returned by consumers and replaced on retail shelves may present the greatest single vulnerability for the product, and manufacturers should develop a policy on returns that precludes this occurrence," he emphasized.

Surplus Whey

Surplus whey has become the dairy industry's 9-billion pound headache, an unwanted stepchild of burgeoning cheese production.

But the problem may be just a symptom of the dairy industry's failure to implement new technology, says Clyde Amundson, University of Wisconsin-Madison food scientist.

Amundson and other researchers with the department feel that ultrafiltration is one of the most promising solutions to problems created by excess whey and escalating energy costs.

Ultrafiltration is a low-pressure system of pumps and membranes which separates the large molecules in whey and milk from water and smaller molecules.

It's already widely used in many other segments of the food industry and in the dairy industry in Europe. Many American cheese plants use it to concentrate whey solids, but Amundson says its real future may be with on-farm processing of milk.

On-farm ultrafiltration units would concentrate milk 2 to 3 times. Since removing water from milk or whey takes 60-80 percent of the energy used in cheese production, ultrafiltration offers substantial energy savings.

It would also help solve the whey disposal problem because cows could consume the by-product (retentate) from ultrafiltered milk.

A recent study indicates that on-farm ultrafiltration units would be more economical with large dairy herds than conventional milk handling equipment. It's likely to be economically feasible in small dairy herds once smaller equipment is mass-produced.

Although several firms are experimenting with on-farm ultrafiltration, none has yet approached regulatory agencies to gain approval.

A delay could prove costly, Amundson says. Europeans now ultrafilter milk in plants and on farms. Imported cheese made from ultrafiltered milk are not detectably different from conventionally produced cheese.

The UW researchers feel that there are no major

technical problems, since they now have semi-permeable membranes which are resistant to common cleaning agents. Although further research is needed, the next major obstacles appear to be regulatory ones.

Whey utilization simply hasn't been able to keep pace with the increased supply, Amundson says. Of the estimated 30 billion pounds of whey produed annually in the U.S., about 60-70 percent is processed for use in a wide range of products.

Whey production has increased in part due to the popularity of cheese used for pizzas. The dairy price-support system also offers economic incentives to make cheese instead of products such as butter and non-fat milk powder.

Disposal of excess whey, usually that from isolated plants, has become more difficult. Treatment to remove solids is expensive and land application has come under more stringent guidelines to limit any potential threat to groundwater quality.

Whey ultrafiltration doesn't solve the disposal problem because whey retentate contains about 72 percent of the original whey solids. Although the whey retentate can be processed to remove lactose, it's often not economical or there's limited demand for the resulting products.

Amundson says it makes much more sense to concentrate milk on farms and let cows put the retentate to productive use. UW-Madison dairy scientists have found that cows will consume any retentate produced.

Ultrafiltration of milk slightly alters its original composition, a factor that's likely to delay approval. But Amundson says that it shouldn't make any difference whether whey is removed after cheese is made or retentate is removed before cheese is made.

'Ultrafiltration won't really take off until cheesemakers feel more comfortable using pretreated milk," Amundson says.

Approval for on-farm use is likely to take longer, in part because regulating numerous smaller on-farm units would be more difficult than regulating fewer larger units in cheese plants.

Walker Stainless Brochure Available

A new four-page, full color bulletin, HST382, provides complete specifications for Walker stainless steel, horizontal type storage tanks designed for both producers and plant processors for storage of liquid products.

Standard tank capacities range from 1,000 to 12,000 gallons. Interiors are type 304 stainless steel polished to a #4 sanitary finish. All tanks meet or exceed 3A and U.S.D.A. standards. Other capacities, types of stainless steel and finishes are available upon request.

This Walker bulletin shows construction and insulation features by displaying a tank cutaway. Description of other features include manhole door, valving, controls, inspection components, refrigerated coldwall detail and agitation option.

For your free Walker stainless steel, horizontal type storage tank bulletin HST382, call or write Walker Stainless Equipment Co., Holding Tank Division, Elroy, WI. 608 462-8461.

Polyethylene Bags

For retail packagers, scientists, manufacturers, food processors, anyone who needs resealable, airtight containers, polyethylene bags from Albert Mojonnier, Inc., (AMI) are practical and versatile.

Transparent AMI bags are ideal for packaging consumer products from candies, dried fruits and nuts to small hardware items. Originally developed as sample bags for the dairy industry, their airtight seal and sturdy construction protects samples of liquid and dry materials including processed foods and drinks, farm products, chemicals, soils, petroleum products, medical/biological samples, and manufactured items.

The bags are sterilized, evacuated, and sealed at both ends during manufacture. Extruded from low density polyethylene into seamless tubes, the bags have only one seam (across the bottom) to make them strong and leak resistant. Closures of flat wire, applied to the outside of the bags with pressure-sensitive tape, are easier to handle and provide a tighter seal than standard round wire. The 3-mil thickness makes the bags puncture-resistant, so they are ideal for use with coarse, dry products.

AMI also manufactures bags for specialized applications.

For more information and a sample pouch of 25 bags, contact: Albert Mojonnier, Inc., 1110 North & North Hartford St., PO box 188 Eaton, IN 47338. 317 396-3351.

This page has been devoted to YOU, the IAMFES affiliates. Your input is needed on whether you feel this page should be a regular feature to serve as a communication source between the state and international office. Please respond.

RENEWALS...in a four way program were sent the past few months. On the majority, the renewals went well. We are receiving quite a few renewals since the first of 1983. When renewals are not received by December 31 those names are deleted from the computer listing. When the renewal is then received in January, it is added back to the list and the January issue is sent out with the February journal mailing. This means that your January journal/s will arrive 6 weeks later than normal. This is also time consuming and costly. When renewal time comes up again, please renew by the date specified. It makes it much easier, and most of all it saves YOUR association money.

AFFILIATES and affiliate officers are asked to send in any information for the Affiliate Newsletter that would be of interest to other affiliates. You need not just send information on your meetings, but on your members, their promotions and any other ideas your affiliate organization has.

ST. LOUIS in '83... Don't miss the 70th IAMFES Annual Meeting August 7-11, 1983 at the Marriott Pavilion in St. Louis, MO. This is a central location for all, so the attendance should be great. There is a registration form included in this month's issue of the journal. Register in advance and save. See you there!

DON'T FORGET...the membership contest is in full force and you have a chance as an individul or affiliate to win money just by telling others about your organization. Here are the guidelines...

Dear IAMFES Member:

Together we can keep IAMFES, your professional association growing even stronger.

Throughout the years through your promotion of IAMFES, the association membership/subscriptions continually increases.

NOW through July 1, 1983, you as a member will receive the following awards for your part in membership enrollment.

•$300.00 for affiliate groups who increase their membership by 25 members (affiliate and international membership) student membership would not be applicable.

•$100.00 for any IAMFES member who enrolls 10 new members (or 25 student members).

•$25.00 for any member who enrolls a new Sustaining Member.

•$ FREE registration including the banquet at the annual meeting August 7-11, 1983 in St. Louis, MO., for an IAMFES member who enrolls 5 new members.

REMEMBER, you have until July 1, 1983. Simply have the new members jot your name on their membership/subscription form so that you receive credit.

It's easy and best of all it's "rewarding."

INVEST IN FUTURES.

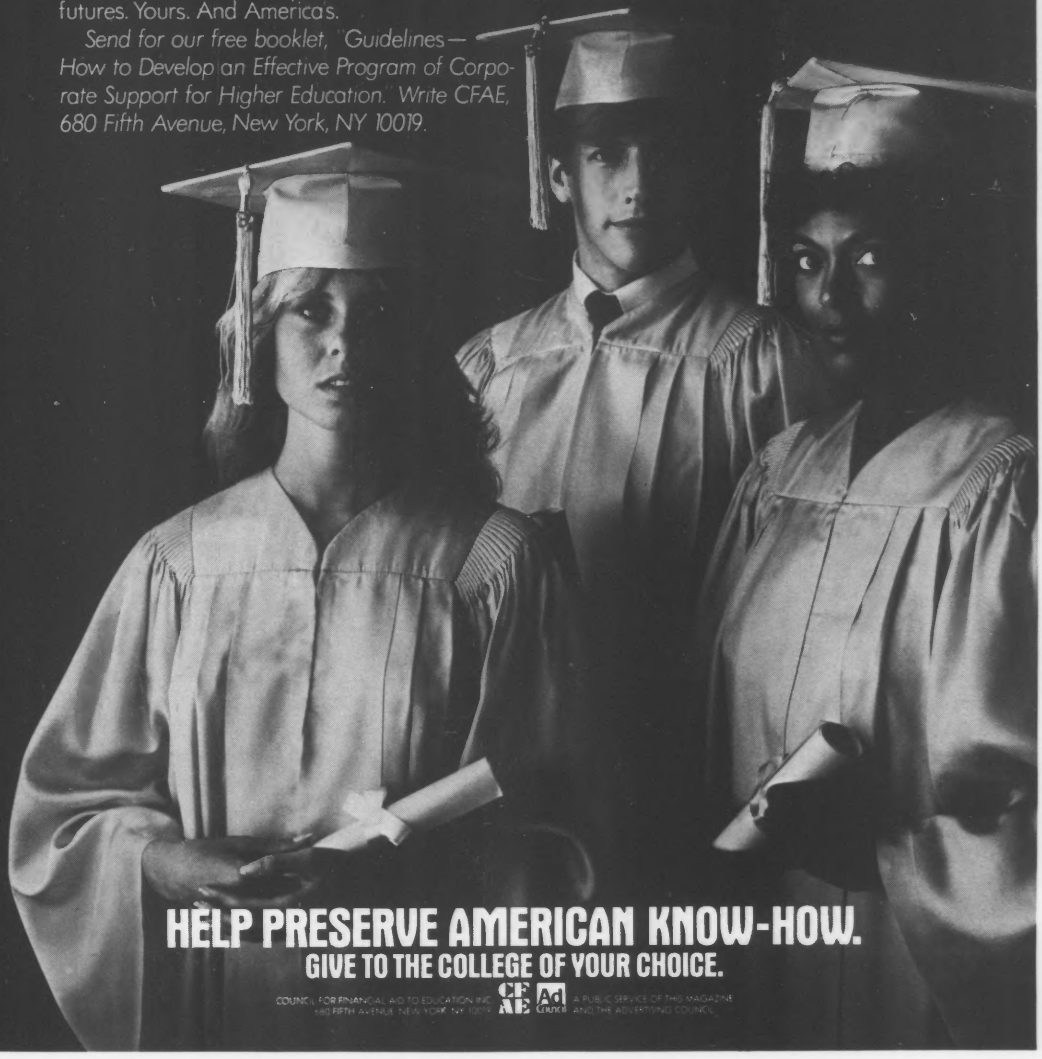
The future of American business is in college today. To compete with the rest of the world, we must have a steady supply of well-qualified college graduates. We need good engineers, managers, accountants, chemists, computer programmers—professionals of all kinds.

But colleges that educate these professionals are threatened by rising costs and less government funding. These colleges need money to pay professors' salaries—salaries that must compete with private industry. They need money to maintain and replace high-technology equipment. And they need money for additional student aid.

Without your help, the quality of higher education will decline. And so will the number of well-qualified graduates.

So, please, make sure your company gives all it can to higher education. It's an investment in futures. Yours. And America's.

Send for our free booklet, "Guidelines—How to Develop an Effective Program of Corporate Support for Higher Education." Write CFAE, 680 Fifth Avenue, New York, NY 10019.



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COUNCIL FOR FINANCIAL AID TO EDUCATION INC. 680 FIFTH AVENUE, NEW YORK, NY 10019 CFAE Ad Council A PUBLIC SERVICE OF THIS MAGAZINE AND THE ADVERTISING COUNCIL

Committee Reports

The Role of the Professional Sanitarian on the Baking Industry Sanitation Standards Committee

Martyn A. Ronge

Chairman, IAMFES BISSC Committee
Consultant, Harold Wainess & Associates, 464 Central Ave., Northfield, IL 60093

For generations, the Baking industry was beseiged by innumerable problems of public health significance due in many respects to the lack of basic sanitation and the frustration of the industry in general to establish effective and efficient sanitation regimens that would provide for the proper cleaning and sanitization of the highly specialized processing and packaging equipment as required by public health regulations.

In 1949, six of the national organizations serving the baking industry founded the Baking Industry Sanitation Standards Committee (BISSC) whose primary purpose was to develop, publish and promote the use of voluntary sanitation standards covering the design and construction of machinery and equipment used in the baking industry.

In addition to the six supporting organizations from the baking industry, BISSC sought the advice and counsel of various governmental associations including the International Association of Milk, Food and Environmental Sanitarians.

Since the inception of BISSC in 1949, IAMFES has been continuously and ably represented. Members of the IAMFES committee to BISCC have been very active and have substantially contributed to the formulation of all the present BISSC standards and have served in important capacities on the Office of Certification and innumerable task committees.

The BISSC Committee has been given a mandate by the Baking Industry, through its designated supportive groups, to not only develop new standards, but to update existing standards to keep abreast of new technologies and equipment as they appear in the everyday operations within the baking industry.

The first step in drafting a new standard or the revision of an existing standard is review by the BISSC Board of Directors. Whenever action is deemed appropriate, a Task Committee is authorized and appointed to consider all aspects of the subject.

Task Committees are composed of users (bakers), equipment manufacturers and at least one professional sanitarian. The industry members of the task committee, usually numbering approximately 8, are highly trained and have particular expertise in the areas presented in the proposed standard or revision. Task Committees are open to all interested parties.

The role and input of the professional sanitarian is vital to the function of the task committee in that the sanitarian is consulted as to the public health acceptability of all provisions in new standards as well as proposed revisions to existing standards.

Upon completion of the task committee's proposed text for a new standard or revision of an existing standard, a report and supportive information is presented to the General BISSC Committee which usually meets twice a year.

At this point the text and recommendations of the Task Committee are open to discussion by the General BISSC Committee.

During the open floor discussion of the Task Committee text, the professional sanitarian, if he was a member of the Task Committee presenting the text or not, plays an important role in stabilizing and putting into perspective the various recommendations and modifications presented as to their compliance with basic public health criteria and specific construction standards prescribed by regulations.

The amount of time consumed to develop a new standard varies widely, some require years while others are completed and accepted in a lesser period of time. It is common, especially in early drafts of a new standard, for it to be sent back to "Task" (Task Committee) for review and possible inclusion of recommendations made during the General Committee discussion.

Once a standard is approved by the Task Committee and the General BISSC Committee it is given a final review by the BISSC Board of Directors and with their approval is released for a sixty-day comment period.

Since editorial as well as other technical changes could have been made since the sanitarians reviewed the proposed standard, the professional sanitarian has a very responsible role in assuring that the changes made have no adverse effect on the intent of public health standards and regulations governing a specific standard or revision.

After all questions which may arise during the sixty day review period are resolved, the standard will go into effect.

In order to further enhance the use of the BISSC Standards and to permit easy identification of equipment which conforms to BISSC Standards, an Office of Certification is composed of five members: The BISSC General Chairman, a representative of the baking industry, the equipment manufacturing industry, a professional sanitarian and a member, (a professional sanitarian) from one of the consulting Public Health Associations.

The certification program is based on the honor system. An equipment manufacturer registers with BISSC, and can request certification of his equipment, by providing documentation that such equipment conforms to the applicable standard.

A request for certification of equipment from a manufacturer is presented to the Office of Certification for review as to whether or not the specific piece of equipment meets the applicable standard and does not conflict with the intent of public health criteria as viewed by the professional

sanitarian on the Office of Certification.

The ultimate aim of all BISSC Standards is to insure that all parts of bakery equipment are readily accessible and/or easily removable for thorough cleaning by ordinary methods, by regular employees.

The standards promulgated by an industry sponsored group, such as BISSC, whose principal commitment is to upgrading public health and sanitation in the baking industry is a significant factor in the day by day responsibilities of the professional sanitarian to provide the general public with a wholesome product manufactured under the best and most sanitary conditions possible.

All professional sanitarians are encouraged to obtain copies of the BISSC Standards and familiarize themselves with the operations of the BISSC Committee. Copies of the BISSC Standards are available, free of charge, to professional sanitarians from the Baking Industry Sanitation Standards Committee, 521 Fifth Ave., New York, NY 10017. All sanitarians, but especially those with special expertise in the baking industry and equipment evaluation, are urgently requested to contact the Chairman of the IAMFES BISSC Committee and offer their input and services by agreeding to serve on the IAMFES BISSC Committee.

Name Omitted from Award Winners List

Harold Heiskell was named an IAMFES Honorary Life Member in 1977. Mr. Heiskell's name was omitted from a previous listing of award winners.

Book Review

FOODS AND FOOD PRODUCTION ENCYCLOPEDIA

Edited by: Douglas M. Considine
Van Nostrand Reinhold Company 1982
2322 pages

By definition an encyclopedia is a book containing articles in alphabetical arrangement covering all branches of knowledge or all aspects of one subject. In this case, the subject is FOOD AND FOOD PRODUCTION and practically all, if not all, that is known or related to the subject has been included in this monumental compendium.

FOODS AND FOOD PRODUCTION ENCYCLOPEDIA, edited by Douglas Considine, covers over 7000 items using 1.9 million words in 2,322 pages. Included are more than 1000 illustrations and 580 tables. This text was not designed as a classroom textbook or written as a handbook for the fieldman. It is a comprehensive reference that represents a "broad and highly interdisciplinarian subject" ranging from abalone to zymase.

The user of FOODS AND FOOD PRODUCTION ENCYCLOPEDIA will find it a valuable research tool. With the exception of short definition entries, substantial reference listings are provided that include recent research activities as well as significant historical works. The encyclopedia is enhanced with numerous cross-references that lead the researcher through an exhausting review of pertinent information. For instance, in exploring the subject of water activity you will be lead to activity coefficient; humectants; intermediate moisture foods (IMF); Raoult's Law; and you may even find yourself researching the history and development of dog food.

FOODS AND FOOD PRODUCTION ENCYCLOPEDIA is a must for any library supporting any of the basic sciences. It is a necessity for the library supporting academic disciplines related to the subject of food and food production. Students and professionals involved in this interdisciplinary subject now have a new and valuable tool with which to work. The Van Nostrand Reinhold Company is to be congratulated for its publication.

Homer C. Emery, Ph.D.
Maj. MSC
665-B Infantry Post
Fort Sam Houston, TX 78234

New Product News

•Recumbent cows, unable to stand after milk fever, difficult calving or other ailments, can be raised easily and painlessly with a compact, British-made pneumatic system. The BOVIJAK 10 consists of a tough inflatable bag; its top is shaped to conform to a cow's underside, including the udder. The bag is supported on four slide-in legs, which give a firm x-formation tubular base; it is blown up with a rapid electric inflator; a 12-V model can run off a tractor or car battery.

After the base tubes have been fitted and the deflated bag laid out, two men roll the animal into it. As the bag inflates, it gradually lifts the cow. The operator can steady the cow or maneuver her with his shoulder. A quick-release harness set supports the animal once she is on her feet so that treatment can be given.

When blood circulation has been regained by manipulation, the cow is normally left in a supported raised position for 30 minutes. Subsequent lifts may be needed in severe cases. The bag can be partly deflated at any time to check the animal's ability to support herself.

The kit fits into a bag which can be carried by a veterinarian and kept in a car trunk.

Inquiries from prospective customers, agents or distributors are welcome by the company or may be sent to BIS. Snell-Wessex Ltd. (Contact: T. B. Snell, Managing Director), Penn Land, Hardington Mandeville, Yeovil, Somerset BA22 9PL England. Telephone: Yeovil 093-586-3151. Telex: 449752.

•Babson Bros. Co., builder of Surge dairy farm equipment, has made automatic milker removal smoother and simpler with the fully-automatic HTO Air/Electric milking system.
der for smoother unit take-off and retraction.

The new HTO Air/Electric system incorporates such features as the proven full-flow sensor, positive vacuum shut-off and an air cylinder for smoother unit take-off and retraction. The unit is adaptable to Surge group backflushing. With remote mounting of the electrical control, the system is also adaptable to flat barns.

The HTO Air/Electric is fully-automatic. You just set the switch, attach the unit and let the Surge electronic sensor and air cylinder do the rest. When milk flow drops below a pre-set level, the vacuum is shut off, the take-off mechanism activated and the milking unit smoothly returned to a hanging position. A built-in alarm system lets you know if the milking unit is prematurely retracted.

For durability and serviceability, the compact system is housed in stainless steel and has micro-integrated circuitry.

For more information, contact your local Surge dealer or write Babson Bros. Co., 2100 S. York Rd., Oak Brook, IL 60521.

•Versatemp model VT. . . A rugged, hand held portable digital thermometer. The case is brushed anodized aluminum with stylish plastic end caps. The metal case protects this instrument from radio frequency noise and physical abuse. The liquid crystal display has 1/2'' tall numbers and is readable in dim interiors or direct sunlight. One 9 volt battery is housed in a separate battery compartment and supplies over 600 hours of continuous use. Storage temperature is from -67°F to +190°F and the operating temperature is from 32°F to +125°F. This instrument has +/-1°F or 1°C accuracy and resolution over the range of -330°F to +155°F or -200°C to +815°C. Versatemp also has 1° repeatability.

There are two switches on this instrument. The on/off switch has three positions; momentary on, continuous on and off. The second switch is for selecting either degrees F or C. In addtion, Versatemp has open sensor indication and automatic low battery indication.

For more information contact: Electronic Development Labs Inc., 385 Oser Avenue, Hauppauge, L.I., N.Y. 11788, 516-435-2808.

•The Mark II automatic palletizer/unitizer is now justifiable with as little labor savings as one person, one shift, with a 50% return on investment. The machine palletizes cases, bags, pails and bundles.

This palletizing robot is specially priced and designed for the low volume production up to 23 cases per minute. A programmable control allows the machine to palletize different case sizes and stacking patterns. A selector switch allows a person to change from one case size or pattern in just seconds. An automatic slip or tie sheet dispenser and pallet dispenser is also available. The machine offers a flexible layout with minimum floor space. There are *NO* hydraulics involved. Maximum layer load is 750 pounds.

Also available is a semi-automatic Model Mark I to eliminate the drudgery of lifting heavy loads. Other models are also available for faster case rates.

For more information contact: Phil Winiski, Kinetic Systems, Inc., 1216 W. Wisconsin Ave., Appleton, WI 54911, 414-739-7436.

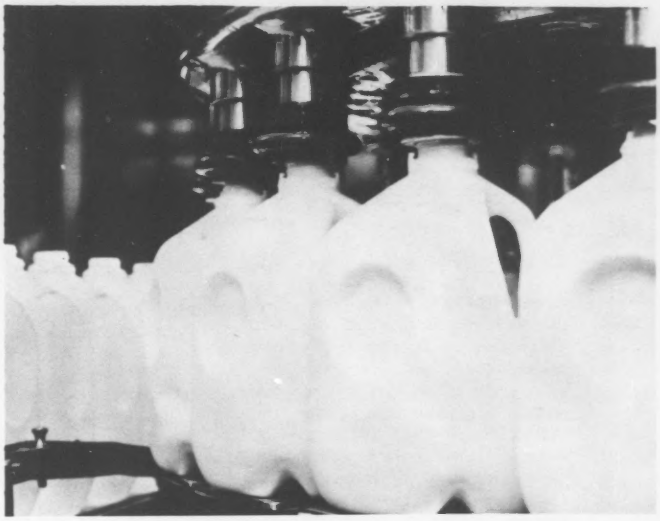
•*A new, improved blow molding resin for lightweight milk bottles* that has cut the reject-per-hour rate for one customer by 75% is now available from ARCO Chemical Company, a division at Atlantic Richfield Company.

Super Dylan™ G*97008 high density polyethylene (HDPE) has been dramatically improved through process modifications to make it ideally suited for gallon containers in the 55-60 gram range. For dairies still using bottles in the 65-70 gram range, the resin offers exceptional cost savings, ARCO Chemical said.

Because of the purity of manufacture, the resin results in a pin hole free container even in the thin walls found in lightweight bottles. In addition, it offers extremely fast cycle times and ease of processing.

Super Dylan G*97008 is sold in a density of 0.962 with a melt index of 0.8. Sample quantities are available for testing.

For additional information, contact: John A. Hausmann, ARCO Chemical Company, 1500 Market Street, Philadelphia, Pa. 19101, 215-557-3652.



•*Corning Glass Works has added a 24-well plate to its line of 96-well Cell Wells™* plates for tissue culture applications.

The rigid polystyrene plate features 24 coded wells, each 16mm in diameter. Like its 96-well predecessors, the new 24-well plate features a nontreated lid that reduces condensation and special lid rings and raised well rims to reduce cross-contamination of tissue cultures. Recessed areas between each well also help to reduce cross-contamination during filling procedures.

Each of the 24 wells are coded separately and in ranks and files for easy reference. In addition, all well bottoms are on the same lane for quick, accurate microscope scanning and the distortion-free polystyrene provides excellent optical clarity for observation.

Easy-to-use 24-well Cell Wells™ plates are individually packaged to preserve sterility. Tissue-culture treated 24-well plates are available in flat-bottomed well style with lid.

Corning Cell Wells™ plates are specifically designed for applications in hybridoma/monoclonal-antibody, titration and toxicity-testing procedures, but are useful in many other general applications.

Cell Wells™ tissue-culture plates are produced by Science Products, MS-21-5-8, Corning Glass Works, Corning, NY 14831.

•*Cleanup of liquids and slurry from food processing sites is easy with the Mobile SumpVac®* from Spencer Turbine Company.

Designed for easy one-person operation, the narrow, center-wheeled unit is only 28.5 inches wide and capable of 360° turning for easy maneuverability amongst procesing equipment.

Difficult to handle liquids and slurry are picked up in one operation at a rate of up to 15 gallons per minute. A fine mesh filter separates sludge and liquid for later disposal and/or reclamation. A wide range of cleaning tool attachments are available or can be fabricated to meet any specific application.

Additional features include a continuous duty ODP, TEFC or explosion proof motor, spark resistant aluminum fans and fabricated steel weldment construction. Standard tank sizes are 55 to 125 gallons, with larger capacities available. All units incorporate an automatic shut-off when tank is full.

For more information on the Mobile SumpVac®, contact John Sousa, The Spencer Turbine Company, 600 Day Hill Road, Windsor, CT 06095, 800-243-8160.

•*The patented ALPHASONIC® System* is an economical way to stop noise and satisfy sanitation requirements while providing a clear view of the process.

ALPHASONIC Panels are contoured from a smooth, rigid plastic sheet with no cracks or crevices for product accumulation. A sealed support frame is furnished in optional baked enamel or stainless steel. Lightweight, individual panels are instantly removable for cleaning or complete access to process. Impervious to most chemicals, the ALHASONIC System or its individual components may be washed or steam cleaned to sterilize. Visual inspection may be accomplished from outside the unit.

Costly ventilation and cooling systems are usually not required due to the panel's heat dissipating qualities. The low thermal gradient prevents internal condensation and possible contamination. Modular design permits an infinite variety of configurations to meet the explicit dimensional requirements of all production or process equipment.

For more information or engineering assistance contact: Larry Hansen, ALPHADYNE, INCORPORATED, 727 Harding Street N.E., Minneapolis, MN 55413-2858, 612-378-1080.

•*Sonitron™ Super "C"* is the latest, most advanced model for the effective control of rats, mice, bats, chipmunks, squirrels and other annoying rodents. This industrially-designed unit is a product of 12 years of advanced technological experience in ultrasonics to rid pests permanently without unpleasant after effects.

The Sonitron™ Super "C" will cover up to 4,000 sq. ft. and is also available with a monitoring system for a multi-faceted, centrally-controlled application. The proper use of ultrasonics transmits extremely high decibel levels which cause rodents to leave the immediate area, but yet are above the audible range of humans.

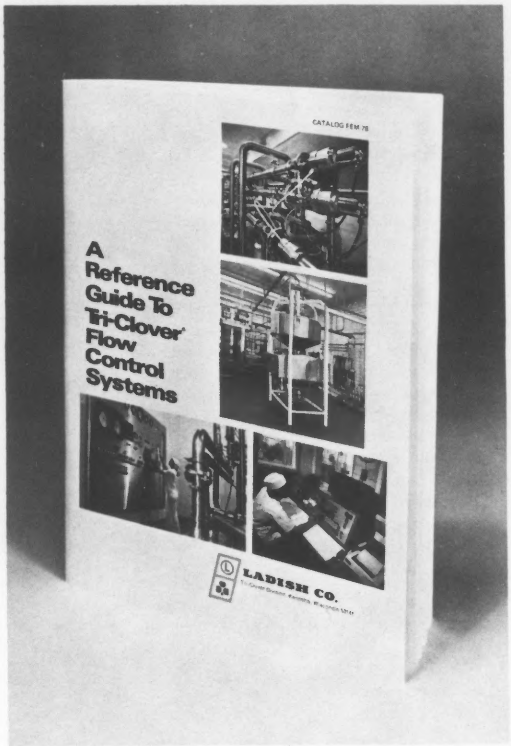
The Sonitron™ Super "C" is housed in a walnut grain cabinet, 6-1/2" long, 5-7/8" wide and 4-3/8" high. It comes with a mounting bracket and a UL approved transformer, and can be easily plugged into any 110V or 220V outlet. For further information contact: Impex Industries, Inc., 239 Rangeway Road, N. Billerica, MA 01862, 617-667-3801.

•*A new product guide issued by Crest Ultrasonics*, Trenton, New Jersey, is designed to assist in the selection of the appropriate ultrasonic cleaning system in hospitals and laboratories. Entitled ' "Sterile" is not "Clean" ', the guide covers a range of systems for cleaning surgical instruments and lab glassware.

For large medical centers, the bulletin describes console models that combine a variety of functions such as ultrasonic cleaning, spray rinsing and instrument lubrication. Single station consoles, roll-around models, consolettes and countertop drop-in sonic sinks round out the Crest line for smaller or more specialized cleaning requirements.

Cleaning accessories and chemicals are also shown and the bulletin includes a list of hospitals and laboratories where Crest equipment is in use.

For a copy of the Crest product guide, contact: Crest Ultrasonics Corporation, P.O. Box 7266, Trenton, NJ 08628, 609-883-4000.



•*A Reference Guide to Flow Control Systems*, published by LADISH CO., Tri-Clover Division, Kenosha, Wisconsin, combines condensed specification detail, sizing information and product descriptions on the full line of Tri-Clover stainless steel sanitary products for the dairy and food processing industries.

The guide is cited by Tri-Clover as a frequently requested reference to their 5000-plus item product line which includes stainless steel pumps, valves, fittings and a wide variety of flow control components.

Intended to serve customers and distributors alike, the 20-page book includes four sections:

•Processing Pumps: Positive & Centrifugal

•S/S Fittings: Clamp type, Butt-Weld & Bevel Seat

•System Valves: Automatic Air Actuated, Ball, Diaphragm and Butterfly

•Systems & Components: Tri-Blender®, CIP Systems, Batch/Weigh Systems and flow system components

Cross references are included for readers to request comprehensive literature on any product line.

For your copy write: LADISH CO., Tri-Clover Division, Kenosha, Wisconsin 53141. Ask for Catalop FEM.

Holders of 3-A Symbol Council Authorizations on February 15, 1983

Questions or statements concerning any of the holders of authorizations listed below, or the equipment fabricated, should be addressed to Earl O. Wright, Sec'y.-Treas., P.O. Box 701, Ames, Iowa 50010-0701.

01-06 Storage Tanks for Milk and Milk Products

28 Cherry-Burrell Corporation (10/ 3/56)
(unit AMCA Int'l)
575 E. Mill St.
Little Falls, New York 13365

102 Chester-Jensen Company, Inc. (6/ 6/58)
5th & Tilgham Streets
Chester, Pennsylvania 19013

2 CREPACO, Inc. (5/ 1/56)
100 C.P. Avenue
Lake Mills, Wisconsin 53551

117 DCI, Inc. (10/28/59)
St. Cloud Industrial Park
St. Cloud, Minnesota 56301

76 Damrow Company (10/31/57)
Div. of Dec. International, Inc.
196 Western Avenue
Fond du Lac, Wisconsin 54935

115 Alfa-Laval, Ltd. (9/28/59)
113 Park Street South
Peterborough, Ontario, Canada
(not available in USA)

109 Girton Manufacturing Company (9/30/58)
State Street
Millville, Pennsylvania 17846

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

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

02-08 Pumps for Milk and Milk Products

325 Albin Pump Inc. (12/19/79)
(Mfg. by Albin Motor Aktiebolag)
1260 Winchester Parkway
Smyrna, Georgia 30080

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

212R Babson Bros. Co. (2/20/70)
2100 S. York Rd.
Oak Brook, Illinois 60621

29R Cherry-Burrell Corporation (10/ 3/56)
(unit AMCA Int'l)
2400 Sixth St., Southwest
Cedar Rapids, Iowa 52406

63R CREPACO, Inc. (4/29/57)
100 CP Avenue
Lake Mills, Wisconsin 53551

205R Dairy Equipment Company (5/22/69)
1919 South Stoughton Road
Madison, Wisconsin 53716

370 Texas Process Equipment Co. (11/ 9/82)
(Mfg. by Evro Johnston Pumps Ltd., England)
5880 Bingle Road
Houston, TX 77092

65R G & H Products, Inc. (5/22/57)
5718 52nd Street
Kenosha, Wisconsin 53140

364 E. C. Smith and Assoc., Inc. (7/28/82)
(Mfg. by The Howard Pump Co. Ltd.)
60 East 42nd St.
New York, NY 10165

145R ITT Jabsco Incorporated (11/20/63)
145 Dale Way
Costa Mesa, California 92626

348 ITT MARC Division, England (12/ 3/81)
ITT Jabsco Limited
3200 Bristol-Suite 710
Costa Mesa, CA 92626

314 Len E. Ivarson, Inc. (12/22/78)
3100 W. Green Tree Road
Milwaukee, Wisconsin 53223

372 The Kontro Company, Inc. (12/20/82)
450 River Street
P.O. Box 30
Orange, MA 01364

26R Ladish Co., Tri-Clover Division (9/29/56)
9201 Wilmot Road
Kenosha, Wisconsin 53140

373 Luwa Corporation (12/27/82)
4404 Chesapeake Drive
Charlotte, NC

319 Mono Group, Inc. (3/21/79)
(Mfg. by SSP Pumps Ltd.)
847 Industrial Drive
Bensonville, IL 60106

148 Robbins & Myers, Inc. (4/22/64)
1895 W. Jefferson St.
Springfield, OH 45506

306 Stamp Corp. (5/ 2/78)
2410 Parview Road
Middleton, WI 53562

332 Superior Stainless, Inc. (12/10/80)
611 Sugar Creek Rd.
Delavan, WI 53115

357 Tanaco Products (4/13/82)
3860 Trail Road
Blaine, Washington 98230

72R L. C. Thomsen & Sons, Inc. (8/15/57)
1303 43rd Street
Kenosha, Wisconsin 53140

219 Tri-Canada Inc. (2/15/71)
P.O. Box 4589
Buffalo, NY 14240

175R Universal Milking Machine Div. (10/26/56)
Universal Cooperatives, Inc.
408 South First Ave.
Albert Lea, MN 56007

329 Valex Products Corp. (6/10/80)
20447 Nordhoff St.
Chatsworth, Calif. 91311

52R Viking Pump Div. (12/31/56)
Houdaille Industries, Inc.
406 State Street
Cedar Falls, Iowa 50613

5R Waukesha Foundry Company (7/ 6/56)
1300 Lincoln Ave.
Waukesha, Wisconsin 53186

04-03 Homogenizers and High Pressure Pumps of the Plunger Type

344 ALFA-LAVAL, Inc. (8/24/81)
2115 Linwood Avenue
Ft. Lee, New Jersey 07024

247 Bran and Lubbe, Inc. (4/14/73)
512 Northgate Parkway
Wheeling, IL 60090

87 Cherry-Burrell Company (12/20/57)
(unit AMCA Int'l)
2400 Sixth Street, Southwest
Cedar Rapids, Iowa 52404

37 CREPACO, Inc. (10/19/56)
100 CP Avenue
Lake Mills, Wisconsin 53538

75 Gaulin, Inc. (9/26/57)
44 Garden Street
Everett, Massachusetts 02149

309 Rannie Tech. Inc. (7/19/78)
(Mfg. by Rannie A/S, Denmark)
1050-29th Ave. S.E.
Minneapolis, Minnesota 55414

256 Liquipak International, Inc. (1/23/74)
2285 University Avenue
St. Paul, Minnesota 55114

05-13 Stainless Steel Automotive Milk Transportation Tanks for Bulk Delivery and/or Farm Pick-up Service

70R Brenner Tank, Inc. (8/ 5/57)
450 Arlington
P.O. Box 670
Fond du Lac, Wisconsin 54935

40 Penske Tank Co. (10/20/56)
900 Sixth Ave., Southeast
Minneapolis, Minnesota 55114

66 Dairy Equipment Company (5/29/57)
1919 South Stoughton Road
Madison, Wisconsin 53716

45 The Heil Company (10/26/56)
3000 W. Montana Street
Milwaukee, Wisconsin 53235

297 Indiana Tank Co., Inc. (8/29/77)
P.O. Box 366
Summitville, Indiana 46070

305 Light Industrial Design Co. (3/23/78)
8631-A Depot Road
Lynden, WA 98264

338 Murphy's Inc. (4/20/81)
P.O. Box 18
Avon, MN 56310

201 Paul Krohnert Mfg., Ltd. (4/ 1/68)
811 Steeles Avenue
Milton, Ontario, Canada L9T 2Y3
(not available in USA)

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

47 Pullman Trailmobile (11/ 2/56)
701 East 16th Avenue
North Kansas City, Missouri 64116

121 Technova Inc. Gosselin Division (12/ 9/59)
1450 Hebert c.p. 758
Drummondville, Quebec, Canada J2C 2A1
(not available in USA)

189 A. & L. Tougas, Ltee (10/ 3/66)
1 Tougas St.
Iberville, Quebec, Canada
(not available in USA)

25 Walker Stainless Equipment Co. (9/28/56)
New Lisbon, Wisconsin 53950

08-17 Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products

291 Accurate Metering Systems, Inc. (6/22/77)
1731 Carmen Drive
Elk Grove Village, IL 60007

79R Alloy Products Corporation (11/23/57)
1045 Perkins Avenue
P.O. Box 529
Waukesha, Wisconsin 53186

349 A.P.N., Inc. (12/15/81)
400 West Lincoln
Caledonia, MN 55921

245 Babson Brothers Company (2/12/73)
2100 South York Road
Oak Brook, Illinois 60521

284 Bristol Engineering Company (11/18/76)
210 Beaver Street
Yorkville, Illinois 60560

301 Brown Equip. Co., Inc. (12/ 6/77)
9955-9¼ Ave.
Hanford, California 93230

82R Cherry-Burrell Company (12/11/57)
(unit AMCA Int'l)
2400 Sixth Street, Southwest
Cedar Rapids, Iowa 52406

260 CREPACO, Inc. (5/22/74)
100 CP Avenue
Lake Mills, Wisconsin 53551

322 ALFA-LAVAL LIMITED (7/16/79)
(not available in USA)
113 Park St. So.
Peterborough, Ontario
Canada K9J 3R8

304 VNE Corp. (3/16/78)
(Mfg. by Egmo Ltd.-Israel)
1415 Johnson St., P.O. Box 187
Janesville, WI 53545

271 The Foxboro Company (3/ 8/76)
Neponset Street
Foxboro, Massachusetts 02035

67R G & H Division of Alfa-Laval, Inc. (6/10/57)
(Some Models Mfg. by Alfa-Laval AB-Sweden)
5718 52nd Street
Kenosha, Wisconsin 53140

203R ITT-Grinnell Company, Inc. (11/ 7/68)
DIA-FLO Div
33 Centerville Rd.
Lancaster, Pennsylvania 17603

369 IMEX, Inc. (11/ 3/82)
6733 S. Sepulredo Blvd., Suite E
Los Angeles, CA 90045

34R Ladish Co., Tri-Clover Division (10/15/56)
9201 Wilmot Road
Kenosha, Wisconsin 53140

350 Rosista, Inc. (1/ 7/82)
808 North Central Road
P.O. Box 685
Wood Dale, IL 60191

287 Sanitary Processing Equipt. Corp. (1/14/77)
(Mfg. by Koltek OY-Finland)
2611 Lodi Street
Syracuse, New York 13208

239 LUMACO (6/30/72)
Box 688,
Teaneck, New Jersey 07666

200R Paul Mueller Co. (3/ 5/68)
P.O. Box 828
Springfield, Missouri 65801

295 Precision Stainless Products (8/11/77)
(Mfg. by Toyo Stainless Co. Ltd.)
5636 Shull St.
Bell Gardens, CA 90201

149R Q Controls (5/18/64)
Occidental, California 95465

334 Stainless Products Inc. (12/18/80)
1649 72nd Ave., Box 169
Somers, WI 53171

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

300 Superior Stainless, Inc. (11/22/77)
211 Sugar Creek Rd.
Delavan, Wisconsin 53115

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

191R Tri-Canada, Inc. (11/23/66)
P.O. Box 4589
Buffalo, NY 14240

250 Universal Milking Machine (6/11/73)
Div. of Universal Cooperatives
407 First Ave, So.
Albert Lea, Minnesota 56007

278 Valex Products (8/30/76)
20447 Nordhoff St.
Chatsworth, California 91311

86R Waukesha Specialty Company, Inc. (12/20/57)
Darien, Wisconsin 53114

09-07 Instrument Fittings and Connections Used on Milk and Milk Products Equipment

321 Anderson Instrument Co., Inc. (6/14/79)
R.D. #1, Fultonville, New York 12072

315 Burns Engineering, Inc. (2/ 5/79)
10201 Bren Road, East
Minnetonka, MN 55343

206 The Foxboro Company (8/11/69)
Neponset Avenue
Foxboro, Massachusetts 02035

367 R D F Corporation (10/ 2/82)
23 Elm Ave.
Hudson, NH 03051

285 Tank Mate Division/Monitor Mfg. (12/ 7/76)
P.O. Box AL
Elburn, Illinois 60119

32 Taylor Instrument Process Control (10/ 4/56)
Div. Sybron Corporation
95 Ames Street
Rochester, New York 14601

10-00 Milk and Milk Products Filters Using Disposable Filter Media, As Amended

371 Alloy Products Corp. (12/10/82)
1045 Perkins Ave.
Waukesha, WI 53186

35 Ladish Co., Tri-Clover Division (10/15/56)
9201 Wilmot Road
Kenosha, Wisconsin 53140

296 L. C. Thomsen & Sons, Inc. (8/15/77)
1303 43rd St.
Kenosha, Wisconsin 53140

11-03 Plate-type Heat Exchangers for Milk and Milk Products

316 Agric Machinery Corp. (2/ 7/79)
P.O. Box 6
Madison, NJ 07940

326 American Vicarb Corporation (2/ 4/80)
(Mfg by Vicarb S. A. France)
1522 Main Street
Niagra Falls, N.Y. 14301

20 A.P.V. Equipment, Inc. (9/ 4/56)
395 Fillmore Avenue
Tonawanda, New York 14150

30 Cherry-Burrell Corporation (10/ 1/56)
(unit AMCA Int'l)
2400 Sixth Street, Southwest
Cedar Rapids, Iowa 52404

14 Chester-Jensen Co., Inc. (8/15/56)
5th & Tilgham Streets
Chester, Pennsylvania 19013

38 CREPACO, Inc. (10/19/56)
100 CP Avenue
Lake Mills, Wisconsin 53551

365 Pasilac Therm Inc. (9/ 8/82)
(Mfg. by DK-600 Kolding, Denmark)
1050 29th Ave. S.E.
Minneapolis, Minnesota 55414

279 The Schluter Co. (8/29/76)
(Mfg. by Samuel Parker Ltd.)
112 E. Centerway
Janesville, WI 53545

17 ALFA-LAVAL, Inc. (8/30/56)
(Mfg. in Sweden)
2115 Linwood Ave.
Ft. Lee, New Jersey 07024

362 Kraeze Dairy Equipment, Inc. (7/20/82)
14393 Euclid Avenue
Chino, CA 91710

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

360 Laffranchi Manufacturing Co. (7/12/82)
P.O. Box 455
Ferndale, CA 95536

12-04 Tubular Heat Exchangers, for Milk and Milk Products

248 Allegheny Bradford Corporation (4/16/73)
P.O. Box 264
Bradford, Pennsylvania 16701

243 Babson Brothers Company (10/31/72)
2100 S. York Road
Oak Brook, Illinois 60521

103 Chester-Jensen Company, Inc. (6/ 6/58)
5th & Tilgham Street
Chester, Pennsylvania 19013

307 G&H Products, Inc. (5/ 2/78)
5718-52nd St.
Kenosha, WI 53141

217 Girton Manufacturing Co. (1/23/71)
Millville, Pennsylvania 17846

252 Ernest Laffranchi (12/27/73)
P.O. Box 455
Ferndale, California 95536

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

96 C. E. Rogers Company (3/31/64)
South Highway #65
P.O. Box 188
Mora, Minnesota 55051

13-06 Farm Milk Cooling and Holding Tanks

240 Babson Brothers Company (9/ 5/72)
2100 S. York Road
Oak Brook, Illinois 60521

11R CREPACO, Inc. (7/25/56)
100 CP Ave.
Lake Mills, Wisconsin 53551

119R DCI, Inc. (10/28/59)
St. Cloud Industrial Park
St. Cloud, Minnesota 56301

4R Dairy Equipment Company (6/15/56)
1919 South Stoughton Road
Madison, Wisconsin 53716

49R (DeLaval Agricultural Division) (12/ 5/56)
Alfa-Laval, Inc.
11100 N. Congress Ave.
Kansas City, Missouri 64153

10R Girton Manufacturing Company (7/25/56)
Millville, Pennsylvania 17846

356 Meyer D. Haberer (2/3/81)
P. O. Box 220
Bowdle, S.D. 57428

179R Heavy Duty Products (Preston), Ltd. (3/ 8/66)
1261 Industrial Road
Preston, Ontario, Canada
(not available in USA)

12R Paul Mueller Company (7/31/56)
P.O. Box 828
Springfield, Missouri 65801

16R Zero Manufacturing Company (8/27/56)
Washington, Missouri 63090

16-04 Evaporators and Vacuum Pans for Milk and Milk Products

254 Anhydro, Inc. (1/ 7/74)
165 John Dietsch Square
Attleboro Falls, Massachusetts 02763

132 A.P.V. Equipment, Inc. (10/26/60)
Tonawanda Industrial Park
395 Fillmore Ave.
Tonawanda, New York 14150

107R C. E. Rogers Company (8/ 1/58)
South Highway #65
P.O. Box 118
Mora, Minnesota 55051

277 Alfa Laval Contherm Division (8/19/76)
Route 1 Rotary, PO Box 352
Newburyport, MA 01950

356 Damrow Co., Div. of DEC Int. (3/18/82)
196 Western Ave.
Fond du Lac, Wis. 54935

186R Marriott Walker Corporation (9/ 6/66)
925 East Maple Road
Birmingham, Michigan 48010

273 Niro Atomizer Inc. (5/20/76)
1600 County Rd F.
Hudson, WI 54016

299 Stork Food Machinery, Inc. (11/16/77)
(Mfg. by Stork-Friesland B.V.)
P.O. Box 816
Somerville, New Jersey 08876

311 Wiegand Evaporators, Inc. (8/28/78)
8940 Rt. 108
Columbia, Maryland 21045

17-06 Fillers and Sealers of Single Service Containers For Milk and Milk Products

366 Autoprod, Inc. (9/15/82)
12 S. Denton Ave.
New Hyde Park, New York 11040

346 B-Bar-B, Inc. (10/20/81)
E. 10th & McBeth Streets
P.O. Box 909
New Albany, IN 47150

351 BRIK PAK INC. (1/ 7/82)
2775 Villa Creek
Suite 165-D
Dallas, TX 75234

192 Cherry-Burrell Corporation (1/ 3/67)
(unit AMCA Int'l)
2400 Sixth St., Southwest
Cedar Rapids, IA 52404

324 Continental Can Co., USA (4/15/82)
(Mfg. by ERCA, France)
711 Jorie Blvd.
Oak Brook, Ill. 60521

137 Ex-Cell-O Corporation (10/17/62)
2855 Coolidge,
Troy, Michigan 48084

352 GMS Engineering (1/12/82)
(Sweetheart Plastics)
1936 Sherwood St.
Clearwater, FL 33515

220 Liquipak International, Inc. (4/24/71)
2285 University Ave.
St. Paul, Minnesota 55114

330 Milliken Packaging (8/26/80)
(Mfg. by Chubukikai Co. Ltd.)
White Stone, South Carolina 29353

281 Purity Packaging Corporation (11/ 8/76)
800 Kederly Drive
Columbus, Ohio 43228

211 Twin-Pak Inc. (Canada) (2/ 4/70)
(Mfg. by Thimonnier & Cie, France)
Steel & Cohen, 745 Fifth Ave.
New York, New York 10022

19-03 Batch and Continuous Freezers, For Ice Cream, Ices and Similarly Frozen Dairy Foods, As Amended

286 O.G. Hoyer, Inc. (12/ 8/76)
201 Broad St.
Lake Geneva, WI 53147
(Mfg. by O.G. Hoyer A/S of Denmark)

146 Cherry-Burrell Company (12/10/63)
(unit AMCA Int'l)
2400 Sixth Street, Southwest
Cedar Rapids, Iowa 52404

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

355 Emery Thompson Machine and Supply Co. (3/ 9/82)
1349 Inwood Avenue
Bronx, NY 10452

22-04 Silo-Type Storage Tanks for Milk and Milk Products

168 Cherry-Burrell Corporation (6/16/65)
(unit AMCA Int'l)
575 E. Mill St.
Little Falls, New York 13365

154 CREPACO, Inc. (2/10/65)
100 CP Avenue
Lake Mills, Wisconsin 53551

160 DCI, Inc. (4/ 5/65)
St. Cloud Industrial Park
St. Cloud, Minnesota 56301

181 Damrow Company, Division of DEC (5/18/66)
International, Inc., 196 Western Ave.
Fond du Lac, Wisconsin 54935

262 DeLaval Company Ltd., Canada (11/11/74)
113 Park Street South
Peterborough, Ontario Canada

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

312 Sanitary Processing Equip. Corp. (9/15/78)
P.O. Box 26
Dewitt, New York 13208

165 Walker Stainless Equipment Co. (4/26/65)
Elroy, Wisconsin 53929

23-01 Equipment for Packaging Frozen Desserts, Cottage Cheese and Milk Products Similar to Cottage Cheese in Single Service Containers

174 Anderson Bros. Mfg. Co. (9/28/65)
1303 Samuelson Road
Rockford, Illinois 61109

209 Doboy Packaging Machinery Division (7/23/69)
of Nordson Corporation, 215 N. Knowles Ave.
New Richmond, Wisconsin 54017

302 Eskimo Pie Corp. (1/27/78)
530 E. Main St.
Richmond, Virginia 23219

343 O. G. Hoyer, Inc. (7/ 6/81)
(Mfg. by O. G. Hoyer, Denmark)
201 Broad Street
Lake Geneva, Wis. 53147

222 Maryland Cup Corp. (11/15/71)
Owings Mills, MD 21117

24-00 Non-Coil Type Batch Pasteurizers

161 Cherry-Burrell Corporation (4/ 5/65)
(unit AMCA Int'l)
575 E. Mill St.
Little Falls, New York 13365

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

187 DCI, Inc. (9/26/66)
St. Cloud Industrial Park
St. Cloud, Minnesota 56301

166 Paul Mueller Co. (4/26/65)
P.O. Box 828
Springfield, Missouri 65601

25-00 Non-Coil Type Batch Processors for Milk and Milk Products

162 Cherry-Burrell Corporation (4/ 5/65)
(unit AMCA Int'l)
575 E. Mill St.
Little Falls, New York 13365

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

188 DCI, Inc. (9/26/66)
St. Cloud Industrial Park
St. Cloud, Minnesota 56301

177 Girton Manufacturing Co. (2/18/66)
Millville, PA 17846

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

202 Walker Stainless Equipment Co. (9/24/68)
New Lisbon, Wisconsin 53950

26-02 Sifters for Dry Milk and Dry Milk Products

229 Russell Finex Inc. (3/15/72)
156 W. Sandford Boulevard
Mt. Vernon, New York 10550

173 B. F. Gump Division (9/20/65)
Blaw-Knox Food & Chem. Equip. Inc.
750 E. Ferry St., P.O. Box 1041
Buffalo, NY 14211

185 Rotex, Inc. (8/10/66)
(Mfg. by Orville Simpson Co.)
1230 Knowlton St.
Cincinnati, Ohio 45223

363 Kason Corporation (7/28/82)
231 Johnson Avenue
Newark, NJ 07108

176 Koppers Company, Inc. (1/ 4/66)
Metal Products Division
Sprout-Waldron Operation
Munsy, Pennsylvania 17756

172 SWECO, Inc. (9/ 1/65)
P.O. Box 4151
6033 E. Bandini Blvd.
Los Angeles, California 90051

27-01 Equipment for Packaging Dry Milk and Dry Milk Products

353 All-Fill Inc., Great Valley Corp. Center (3/ 2/82)
40 Forest Valley Pkwy. C.B10
Malvern, PA 19355

313 WPM Systems, Inc. (10/10/78)
Div. of St. Regis Paper Company
4990 Acoma St.
Denver, Colorado 80216

347 Hubbard Consultants, Inc. (10/28/81)
1531 B West Irving Park Rd.
Suite 211
Itasca, IL 60143

28-00 Flow Meters for Milk and Liquid Milk Products

272 Accurate Metering Systems, Inc. (4/ 2/76)
(RZ2A Mgf. by Diessel GmbH-Germany)
1731 Carmen Drive
Elk Grove Village, Illinois 60007

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

223 C-E IN-VAL-CO, Division of Combustion (11/15/71)
Engineering, Inc.
P.O. Box 556, 3102 Charles Page Blvd.
Tulsa, Oklahoma 74101

359 Emerson Electric Company (6/10/82)
Brooks Instrument Div.
P.O. Box 450 North 301
Statesboro, GA 30458

265 Electronic Flo-Meters, Inc. (3/10/75)
P.O. Box 38269
Dallas, TX 75239

226 Fischer & Porter Co. (12/9/71)
Magnetic Flowmeters
Dept. 372 County Line Road
Warminster, Pa. 18974

224 The Foxboro Company (11/16/71)
Neponset Avenue
Foxboro, Massachusetts 02035

320 Max Machinery, Inc. (3/28/79)
1420 Healdsburg Ave.
Healdsburg, CA 95448

270 Taylor Instrument Company Division (2/ 9/76)
Sybron Corporation, 95 Ames Street
Rochester, New York 14601

29-00 Air Eliminators for Milk and Fluid Milk Products

340 Accurate Metering Systems (6/2/81)
(Mfg. by Diessel GmbH-Germany)
1731-33 Carmen Drive
Elk Grove Village, IL 60007

30-00 Farm Milk Storage Tanks

257 Babson Bros. Co. (2/ 7/74)
(Mfg. by CREPACO, Inc.)
2100 S. York Road
Oak Brook, Illinois 60521

31-00 Scraped Surface Heat Exchangers

274 Contherm Corporation (6/25/76)
P.O. Box 352
Newburyport, Massachusetts 01950

322 Cherry Burrell (7/26/79)
2400 6th St. SW
Cedar Rapids, IA 52406

290 CREPACO, Inc. (6/15/77)
100 So. CP Ave.
Lake Mills, WI 53551

361 Damrow Company (7/12/82)
A Division of DEC International, Inc.
196 Western Ave.
Fond du Lac, Wisconsin 54935

32-00 Uninsulated Tanks for Milk and Milk Products

264 Cherry-Burrell Company, (1/27/75)
(unit AMCA Int'l)
575 E. Mill St.
Little Falls, NY 13365

268 DCI, Inc. (11/21/75)
P.O. Box 1227
St. Cloud, Minnesota 56301

354 C. E. Rogers Co. (3/ 3/82)
South Highway #65
Mora, MN 55051

339 Walker Stainless Equipment Co., Inc. (6/2/81)
601 State Street
New Lisbon, WI 53950

33-00 Polished Metal Tubing for Dairy Products

310 Allegheny Bradford Corporation (7/19/78)
P.O. Box 264
Bradford, PA 16701

289 Ladish Co., Tri-Clover Division (1/21/77)
9201 Wilmot Road
Kenosha, Wisconsin 53140

308 Rath Mfg. Co. Inc. (6/15/77)
2505 Foster Ave.
Janesville, WI 53545

368 Gordon J. Rodger & Sons Ltd. (10/ 7/82)
(not available in USA)
P.O. Box 186
Blenheim, Ontario N0P 1A0

335 Stainless Products Inc. (1/4/81)
1649-72nd Ave., P.O. Box 169
Sumers, WI 53171

345 Trent Tube Division Crucible, Inc. (9/16/81)
2188 S. Church St.
East Troy, WI 53120

331 United Industries Incorporated (10/23/80)
1546 Henry Ave.
Beloit, WI 53511

35-00 Continuous Blenders

292 Waukesha Division, Abex Corp. (8/24/77)
1300 Lincoln Ave.
Waukesha, WI 53186

36-00 Colloid Mills

293 Waukesha Division, Abex Corp. (8/24/77)
1300 Lincoln Ave.
Waukesha, WI 53186

37-00 Pressure and Level Sensing Devices

318 Anderson Instrument Co., Inc. (4/ 9/79)
R.D. #1 Fultonville, N.Y. 12072

317 C-E Invalco Division of Combustion Engineering, Inc.
P.O. Box 556
Tulsa, OK 74101
(2/26/79)

328 Rosemount, Inc.
12001 West 78th St.
P.O. Box 35129
Eden Prairie, MN 55344
(5/22/80)

Calendar

1983

March 14-16, 1983---SECOND NATIONAL DAIRY HOUSING CONFERENCE, Madison, WI. For more information contact: Cathy Ziegert, Meetings Secretary, ASAE, 2950 Niles Road, St. Joseph, MI 49085, 616 429-0300.

March 20-23, 1983---AMERICAN CULTURED DAIRY PRODUCTS INSTITUTE ANNUAL MEETING AND CONFERENCE/KULTURES AND KURDS KLINIC/NATIONAL JUDGING CONTEST, International Drive Holiday Inn, Orlando, Florida. For further information: C. Bronson Lane, ACDPI, P.O. Box 7813, Orlando, Florida 32854.

March 21-25---MID-WEST WORKSHOP IN MILK AND FOOD SANITATION, The Ohio State University. For information contact: John Lindamood, Department of food Science and Nutrition, 2121 Fyffe Road, The Ohio State University, Columbus, OH 43210.

March 24, 1983---IOWA ASSOCIATION MILK, FOOD & ENVIRONMENTAL SANITARIANS. Little Amana, Iowa. Contact Bill LaGrange, ISU, Department of Food Technology, Ames, IA 50011.

April 11-13---DAIRY AND FOOD INDUSTRIES SUPPLY ASSOCIATION, 64th ANNUAL MEETING, Boca Raton Hotel and Club, Baco Raton, FL. For more information: Dairy and Food Industries Supply Association, 6245 Executive Blvd., Rockville, MD 20852, 301-984-1444.

April 13-14, 1983---FOOD MICROBIOLOGY UPDATE. Orange County Cooperative Extension Office, Anaheim, CA. Topics covered include sampling, new trends and methods for detection, enumeration, and identification of microorganisms, microbial aspects of food processing methods, pathogens, and the significance of microorganisms in food. Contact Paulette De Jong, Food Science and Technology, University of California, Davis, CA 95616, 916 752-1478.

April 20-22---SOUTH DAKOTA ENVIRONMENTAL HEALTH ASSOC. ANNUAL MEETING. Howard Johnsons, Sioux Falls, SD. For more information contact: Morris V. Forstine, SD State Dept. Health, 1320 S. Minnesota Ave., Room 101, Sioux Falls, SD 57105.

April 20-22, 1983---FOOD MICROSTRUCTURE ANNUAL MEETING in conjunction with Scanning Electron Microscopy 1983. For more information contact: Dr. Om Johari, SEM Inc., P.O. Box 66507, AMF O'Hare (Chicago), IL 60666, 312-529-6677.

April 26---ILLINOIS ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SANITARIANS SPRING MEETING. For more information contact: Clem J. Honer, 1 S 760 Kenilworth Ave., Glen Ellyn, IL 60137.

April 27, 1983---SOUTHERN CALIFORNIA FOOD PROCESSORS SANITATION WORKSHOP FOR THE FOOD PROCESSING AND FOOD SERVICE INDUSTRIES. Presented by the University of California Cooperative Extension with assistance from industry trade associations and food industry personnel. Inn at the Park, Anaheim, California. For more information contact: Paulette De Jong, Food Science and Technology, University of California, Davis, CA 95616, 916 752-1478.

May 16-20, 1983---INTERNATIONAL DAIRY FEDERATION SYMPOSIUM, Denmark. For more information contact: Canadian National Committee International Dairy Federation, 549 Sir John Carling Building, Ottawa K1A 0C5 Canada, 613-994-9537.

May 23-25, 1983---TRACE ANALYSIS OF FOODS: Flavor Problems and Contaminants. Univ. of MN, St. Paul, MN. For more information contact: Gary Reineccius, Department of Food Science and Nutrition, University of MN, St. Paul, MN 55108.

June 1-3, 1983 "Roles of Cereals and Legumes in the Food Supply" three day symposium sponsored by the Nutritional Sciences Council of Iowa State University. For more information contact: Dr. J. Dupont, Dept. of Food and Nutrition, Iowa State University, Ames, IA 50011.

June 8, 1983 Nebraska Dairy Industries Association Annual Spring Dairy Outing, Beemer, NE. For more information contact: T.A. Evans, Executive Secretary, 134 Filley Hall, East Campus, UN-L, Lincoln, NE 68583.

June 13-14, 1983 Conferences on the Human-Animal Bond, University of Minnesota, Contact: Center to Study Human-Animal Relationships and Environment 1-117 Health Sciences Unit A 515 Delaware St. S.E., Minneapolis, MN 55455.

June 17-18, 1983 Conferences on the Human-Animal Bond, University of California, Irvine. Contact: California College of Medicine A121 Medical Sciences I, Irvine, CA 92717.

July 3-8, 1983---67TH ANNUAL SESSION OF THE INTERNATIONAL DAIRY FEDERATION, Oslo, Norway. For further information, contact Harold Wainess, Secretary U.S. National Committee of the IDF (USNAC), 464 Central Avenue, Northfield, IL 60093, 312-446-2402.

July 9-14, 1983 Annual Education Conference, National Environmental Health Association, Holiday Inn Scope, Norfolk, VA. Contact: Leon F. Vinci, Director of Health, City of Middletown, Middletown, CT 06457-1300.

August 1-5, 1983 "Biotechnology: Microbial Principles and Processes for Fuels, Checmials and Ingredients" Massachusetts Institute of Technology Cambridge, MA 02139. Contact: Director of Summer Session , MIT, Room E19-356, Cambridge, MA 02139.

August 7-11, 1983---IAMFES ANNUAL MEETING, St. Louis, MO.

Aug. 7-11, 1983---23rd ANNUAL MEETING, THE HOSPITAL, INSTITUTION, AND EDUCATIONAL FOOD SERVICE SOCIETY. Fairmont Hotel, New Orleans, LA. HIEFSS Expo '83 will be open on August 9 and 10. For more information contact: Carolyn Isch, Assistant Executive Director, HIEFSS, 4410 West Roosevelt Road, Hillside, IL 60162, 312 449-2770.

Aug. 14-19, 1983---5th WORLD CONFERENCE ON ANIMAL PRODUCTION, Nihon Toshi Center, Tokyo, Japan. For more information contact: The 5th WCAP Conference Secretarial, c/o National Institute of Animal Industry, Tsukuba Norindanchi, PO Box 5, Ibaraki 305, Japan.

Sept. 7-9---SYMPOSIUM ON LACTIC ACID BACTERIA IN FOODS: GENETICS, METABOLISM AND APPLICATIONS. Wageningen, The Netherlands. Organized by The Netherlands Society for Microbiology. For more information contact: Dr. P. M. Klapwijk, Unilever Research Laboratory, P. O. Box 114 3130 AC Vlaardingen, The Netherlands.

September 14-15, 1983 Nebraska Dairy Industries Association 29th Annual Convention, Bellevue, NE. For more information contact: T.A. Evans, Executive Secretary, 134 Filley Hall, East Campus, UN-L, Lincoln, NE 68583.

Sept. 18-23---SIXTH WORLD CONGRESS OF FOOD SCIENCE & TECHNOLOGY, Dublin, Ireland. For more information contact: Sixth World Congress of Food Science and Technology, Congresses & Exhibition Ltd. 44, Northumberland Rd., Dublin, 4, Ireland.

Sept. 20-22---NEW YORK STATE ASSOCIATION OF MILK AND FOOD SANITATION ANNUAL MEETING. Hotel Syracuse, Syracuse, NY. For more information contact: David Bandler, Stocking Hall, Cornell University, Ithaca, NY 14853.

Oct. 22-26---FOOD AND DAIRY EXPO -83, McCormick Place, Chicago, IL. For more information contact: Dairy and Food Industries Supply Association, 6245 Executive Blvd., Rockville, MD 20852, 301-984-1444.

November 2-4, 1983 9th Annual Food Microbiology Research Conference, Chicago, IL. For more information contact: Dr. J.M. Goepfert, Canada Packers, Ltd., 2211 St. Clair Avenue West, Toronto, Ontario, CN M6N 1K4.

1984

August 3-9, 1984---IAMFES ANNUAL MEETING, Edmonton, Alberta, Canada.

Nov. 22-24, 1984---14th ANNUAL SYMPOSIUM ON THE ANALYTICAL CHEMISTRY OF POLLUTANTS, 3rd International Congress on Analytical Techniques on Environmental Chemistry-Expoquimia, Barcelona Spain. For more information write: Av. Reina Ma. Christina Palacio No. 1, Barcelona-4 Spain.

JFP Abstracts

Abstracts of papers in the February Journal of Food Protection

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Detectability and Precision of the AOAC *Bacillus stearothermophilus* Disc Assay Demonstrated in the 1981 FDA Split Milk Samples Testing Program, J. T. Peeler, J. E. Leslie, J. E. Barnett, G. A. Houghtby and J. W. Messer, Division of Microbiology, Food and Drug Administration, 1090 Tusculum Avenue, Cincinnati, Ohio 45226

J. Food Prot. 46:84-86

Four blind duplicate milk samples containing β-lactam residues were analyzed by 149 analysts at 47 laboratories. Four official variations were used: (*a*) antibiotic 4 (A4) agar and 55°C incubation, (*b*) A4 agar and 64°C incubation, (*c*) PM indicator (PMI) agar and 55°C incubation, and (*d*) PM1 agar and 64°C incubation. A β-lactam concentration of 0.008 1U/ml was detectable 100% of the time by variations a, b, and c and 98% of the time by variation d, with average zone diameters of 18.7, 17.7, 16.4 and 17.6 mm, respectively. The 0.005 1U/ml concentration was detected 92% of the time by variation a, 99% by b, 57% by c and 89% by d, with average zone diameters of positive units of 16.3 15.5, 14.9 and 15.2 mm, rspectively.

Microbiological Survey of Frozen Ground Meat and a Proposed Standard, A. Mates, Public Health Laboratory, Ministry of Health, P.O. Box 9526, Haifa, Israel

J. Food Prot. 46:87-89

A microbiological survey of frozen ground meat was conducted during a period of five years, 1975-1980. Five hundred and nineteen samples of frozen ground beef and 172 samples of frozen ground fowl were examined. Bacteriological tests performed included aerobic plate count (APC), *Staphylococcus aureus, Streptococcus faecalis* and *Salmonella*. A proposed standard limiting distribution of the various bacteria found in frozen ground meat was proposed. The data indicated that frozen ground fowl was heavily contaminated (33%) with *Salmonella*, therefore according to our findings, this product should not be processed.

Extracellular Heat-Resistant Proteases of Psychrotrophic Pseudomonads, Thakor R. Patel, Francis M. Bartlett and Jawed Hamid, Department of Biochemistry, Memorial University of Newfoundland, St. John's, Newfoundland, Canada A1B 3X9

J. Food Prot. 46:90-94

Several bacterial isolates from raw milk produced proteases. Most of such 28 isolates were gram-negative rods which were oxidase- and catalase-positive. All the isolates grew at temperatures in the range of 0-35°C, but failed to grow at 37°C. Nineteen of these isolates were tentatively assigned to genus *Pseudomonas*, and were used in the present investigation. Extracellular proteases from these psychrotrophic pseudomonads were heat-resistant, being able to retain partial activity even after heat-treatment at 120°C for 10 min. Milk proteins were preferred substrates by these proteases although some also hydrolysed bovine serum albumin, hemoglobin and ovalbumin. The optimum pH for the maximum activity was between pH 7.2 and 7.4. Divalent metal ions like Cu^{2+}, Co^{2+}, Hg^{2+}, and Zn^{2+} were inhibitory to protease activity while Ca^{2+}, Mg^{2+}, and Mn^{2+} had little or no inhibitory effect on the proteases. Induced levels of protease production were observed when cultures were grown in minimal media containing either casein or nonfat dried milk powder. Glucose, citrate and lactose repressed enzyme synthesis in a minmal salts medium containing either casein or nonfat dried milk powder. Protease activity was also detected in cultures grown in minimal medium containing glutamine. Proteases from different isolates varied in their molecular weights.

Prevalence of Enterotoxigenic Staphylococci in Bakery Products, R. Sankaran and R. K. Leela, Defense Food Research Laboratory, Mysore-57001, India

J. Food Prot. 46:95-97

A variety of bakery products, including cakes, sweet puffs, vegetable puffs and cream buns, from five local bakeries were screened for their microbiological quality. The aerobic plate count varied between 10^2 to 10^4 CFU/g. The highest numbers were found in puffs containing vegetable fillings and least in bread and buns. Genera identified included *Bacillus, Micrococcus, Staphylococcus, Enterobacter, Escherichia* and *Klebsiella*. Staphylococci were not present in bread or buns; however, these organisms were isolated from cream-filled cakes and puffs containing coconut scrapings. These isolates were capable of producing enterotoxins of which enterotoxin B was most common.

Survival of *Salmonella* spp., *Staphylococcus aureus* and *Bacillus cereus* in "Advocaat", H. J. Beckers and E. H. W. Van Erne, Laboratory for Zoonoses and Food Microbiology, National Institute of Public Health, P.O. Box 1, 3720 BA Biltohoven, The Netherlands

J. Food Prot. 46:98-99

Egg yolk and advocaat (a liquor consisting of egg yolk, saccharose and spirit; final ethanol concentration 17.2 vol%) were artificially contaminated with *Salmonella* (5 serotypes), *Staphylococcus aureus* (3 phage types) and *Bacillus cereus* (1 strain). Inoculated egg yolk was used to produce advocaat. Within 24 h after inoculation, the number of *Salmonella* and *S. aureus* in the laboratory-prepared advocaat and in the commercially-made advocaat decreased 5 log units or more. It was concluded that the killing effect of ethanol on *Salmonella* and *S. aureus* in advocaat was equal to pasteurization. Results also suggest that recontamination of advocaat with *Salmonella* or *S. aureus* would cause no public health risk. Spores of *B. cereus* survived in the product for up to 6 months. *B. cereus* could be isolated from all 20 samples of advocaat of 6 different manufacturers. Serotyping suggested factory-related *B. cereus* strains.

Temperature Histories of Menu Items During Meal Assembly, Distribution and Service in a Hospital Foodservice, S. J. Ridley and M. E. Matthews, Department of Food Science, University of Wisconsin-Madison, Madison, Wisconsin 53706

J. Food Prot. 46:100-104

Temperatures from the same menu items were obtained during the processes of meal assembly, distribution, and service under actual operating conditions in a hospital using the cook/chill/reheat/serve method of foodservice. Internal temperatures of all portioned menu items on one supper tray were recorded for a total of 18 meals, over a 6-week period. At meal assembly, internal temperatures of 20 chilled menu items, from a total of 93, were ≤45°F (≤7°C). After distribution of meals in unrefrigerated food carts from the central kitchen to galleys in patient units, internal temperatures of 11, from a total of 93 chilled menu items, were ≤45°F (≤7°C). After cold-holding in galley refrigerators or freezers, internal temperatures of 26, from a total of 99 menu items, were ≤45°F (≤7°C). During meal service, menu items that were to be served hot were heated in microwave ovens. Of the 40 menu items which were microwave-heated, internal temperatures of 25 items were ≤165°F (≤74°C). Findings emphasize the need for managers to become aware of temperature quality as meals are transported through subsystems in the foodservice on route to patients. Improvements in procedures and equipment used and increased supervision of time-temperature relationships were recommended, especially when microwave-heating menu items. Temperature surveys should be part of the Food Quality Assurance Program in every hospital foodservice.

Effects of Harvesting Waters and Storage Conditions on Yeast Populations in Shellfish, Mary A. Hood, Department of Biology, University of West Florida, Pensacola, Florida 32504

J. Food Prot. 46:105-108

The yeast population in freshly harvested oysters, *Crassostrea virginica,* and clams, *Mercenaria campechiensis,* was limited to a small number of species. The yeast most commonly occurring was *Rhodotorula rubra* and the second was a *Trichosporon* sp. Concentrations of *R. rubra* increased in oysters stored as both shellstock and shucked at 7, 14 and 21 d at 2, 8 and 20°C. Oysters processed using a method similar to that used by most Florida processing houses and stored were found to contain higher levels of *R. rubra* than shellstock or shucked unprocessed oysters. Levels of *R. rubra* also increased in clams stored as shellstock. Correlation analysis of concentrations of *R. rubra* and selected physical/chemical parameters of the waters from which the shellfish were harvested showed a significant interaction between *R. rubra* and salinity. Fresh oysters harvested from high saline waters contained significantly higher levels of *R. rubra* than oysters harvested from low saline waters. Oysters collected from waters whose salinities were above 20‰ and stored as shellstock developed significantly higher levels of *R. rubra* than oysters from lower salinity waters. Processed oysters showed a similar response. The results suggest that *R. rubra* is part of the "normal biota" of Florida oysters and that the major factors influencing the development of this yeast in oysters are time and temperature of storage and the salinity of the waters which the oysters are harvested.

Effect of Mammalian Tissues on Mutagenicity of Several N-Nitroso Compounds, R. P. Sinha and M. R. Parulekar, Food Research Institute, Research Branch, Canada Agriculture, Ottawa, Ontario, Canada K1A 0C5

J. Food Prot. 46:109-114

Supernatant fractions from different organs of rat and beef origin were tested for their effect on the mutagenic activity of N-methyl-N'-nitro-N-Nitrosoguanidine (MNNG), using *Salmonella typhimurium* tester strain (TA 1535). At equal protein concentrations their effects were quite different. Both beef and rat liver supernatant fluids (1.7 - 3.4 mg of protein per plate) completely inhibited the mutagenic action of MNNG (5 μg per 0.1 ml of cell culture) while that of the heart showed partial inactivation. Under similar conditions, beef kidney and rat seminal vesicle fractions had no effect on MNNG-induced mutagenesis. The antimutagenic property of the liver supernatant fluid was unaffected by mild heat treatment (70°C for 30 min) but completely destroyed by boiling for 10 min. Liver supernatant fluids also had a lethal effect on the tester strain. The antibacterial agent was separated from the antimutagenic property by dialysis. The dialyzate fraction had no lethal effect, but still remained active in inhibiting mutagenesis. To test whether the action of liver supernatatnt fluid was specific for MNNG alone, several other carcinogens belonging to the N-nitroso groups, methyl methane sulfonate (MMS), ethyl methane sulfonate (EMS) and 1-nitrosopyrrolidine (NO-Pyr), were tested. Among various tissue fractions tested only the liver supernatant fluids drastically reduced the mutagenic activity of MMS (500 μg/plate), EMS (10^4 μg/plate) and NO-Pyr (10^4 μ*M*/plate).

Behavior of Aflatoxin M_1 in Yogurt, Buttermilk and Kefir, Dana W. Wiseman and Elmer H. Marth, Department of Food Science and The Food Research Institute, University of Wisconsin-Madison, Madison, Wisconsin 53706

J. Food Prot. 46:115-118

Yogurt, buttermilk and kefir were made from milk that was naturally contaminated with aflatoxin M_1 (AFM_1). Yogurt was made from skim milk alone or skim milk supplemented with 4% nonfat dry milk. The AFM_1 content of yogurt, regardless of formulation, appeared to vary during storage, but after 6 weeks at 7°C it was essentially at the same levels as in the initial milk. Buttermilk was made from skim milk and stored up to 2 weeks at 7°C. In the first 3 trials, the AFM_1 content appeared to increase after fermentation. This apparent increase remained through 4 d when these studies were stopped. In the second 3 trials, the apparent increase in AFM_1 did not occur after fermentation. In these trials, AFM_1 in buttermilk behaved as in yogurt; the apparent content was variable during holding, but AFM_1 remained stable through 2 weeks of refrigerated storage. Kefir was made from skim milk subjected to low-heat (64°C for 30 min) or high-heat pasteurization (84°C for 30 min). After fermentation, the apparent AFM_1 content of kefir decreased. During storage the AFM_1 content of kefir in 3 of 4 trials appeared to increase slightly, but in no instance did it return to original levels during or at the end of storage at 7°C.

Effect of Growth-Location and Length of Storage on Glycoalkaloid Content of Roadside-Stand Potatoes as Stored by Consumers, Ann M. Wilson, Deborah F. McGann and Rodney J. Bushway, Department of Food Science, 102 B Holmes Hall, University of Maine, Orono, Maine 04469

J. Food Prot. 46:119-121

Potato tubers were purchased from roadside stands at 25 locations in the State of Maine and were stored from 1 to 3 months under home storage conditions at 12.2°C. Initially and after 1 and 3 months of storage, tubers were analyzed for their α-chaconine, α-solanine and total glycoalkaloid (TGA) contents. Mean α-chaconine, α-solanine and total glycoalkaloid contents of the tubers ranged from 0.41 to 3.45, 0.35 to 1.51 and 0.75 to 6.16 mg/100 g of tuber (wet weight), respectively. Statistical analysis of the results indicated that the interaction of location and storage time had a significant ($P<0.05$) effect on concentration of the individual and total glycoalkaloids in the tubers. The results also demonstrated that storage under these suboptimum conditions did not cause an increase of glycoalkaloids to a toxic level.

Cadmium Determination of Frozen Cod: An Interlaboratory Comparison, Bohdan M. Slabyj, Robert D. Koons, Harry E. Bradbury and Roy E. Martin, Department of Food Scinece and Department of Plant and Soil Sciences, University of Maine, Orono, Maine 04469 and National Fisheries Institute, Inc., 1101 Connecticut Avenue, Washington, DC 20036

J. Food Prot. 46:122-125

Results of analyses of cod portions by eight laboratories indicate that a substantial lack of agreement exists among laboratories and methods for cadmium analysis. Consistent results for cod samples of low Cd content (biologically bound) were reported by only three of eight participating laboratories. These laboratories reported a mean Cd content of 0.323 ppm with a coefficient of variation of 38%. Results were better when cod samples were spiked with Cd acetate at the 78 ppm level. Six of the eight laboratories correctly reported that Cd content at the 78 ppm level (mean 71.2 ppm with a coefficient of variation of 13%). Lack of consistency in determining biologically bound cadmium in cod tissue is attributed in part to loss of Cd during dry ashing of tissue. Laboratories utilizing atomic absorption spectrophotometry or neutron activation analysis generally reported more accurate results than the laboratory utilizing argon plasma atomic emmission spectrometry.

Incidence of *Bacillus cereus* in Milk and Some Milk Products, Ahmed A-H. Ahmed, Moustafa K. Moustafa and Elmer H. Marth, Department of Food Science and the Food Research Institute, University of Wisconsin-Madison, Madison, Wisconsin 53706

J. Food Prot. 46:126-128

Four hundred samples of milk and milk products were obtained over a 5-month period from different retail outlets in Madison, Wisconsin, and were examined for presence and number of *Bacillus cereus*. *B. cereus* was isolated from 9, 35, 14 and 48% of raw milk, pasteurized milk, Cheddar cheese and ice cream samples, respectively. No. *B. cereus* was recovered from yogurt. The level of contamination with *B. cereus* did not exceed 100/ml in raw milk, 1000/ml in pasteurized milk, 200/g in Cheddar cheese and 3800/g in ice cream.

Methods to Measure Water Activity, John Troller, Procter & Gamble Co., Winton Hill Technical Center, 6071 Center Hill Road, Cincinnati, Ohio 45224

J. Food Prot. 46:129-134

Various methods and principles for measurement of water activity are reviewed. Where data are available on performance of the methods they, too, are included along with disadvantages and advantages of the various procedures.

Influence of Water Activity on Growth, Metabolic Activities and Survival of Yeasts and Molds, Larry R. Beuchat, Department of Food Science, University of Georgia Agricultural Experiment Station, Experiment, Georgia 30212

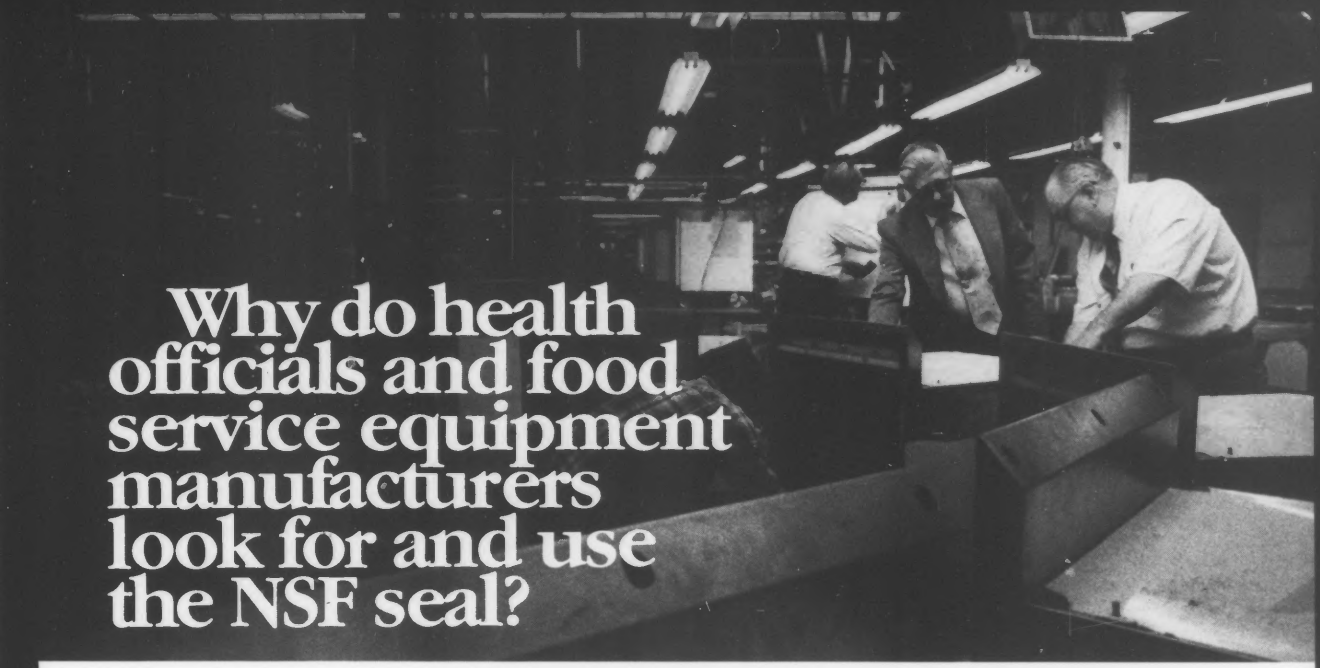
J. Food Prot. 46:135-141

The behavior of yeasts and molds as influenced by water activity (a_w) is reviewed. Fungal spoilage of foods occurs more often than bacterial spoilage at a_w 0.61-0.85 not because fungi grow faster at reduced a_w but rather because the competitive effects of the vast majority of bacteria are absent. Higher a_w is generally required for spore formation than for spore germination. The range of a_w permitting germination of spores is greatest at an optimum temperature, but optimum availability of nutrients tends to broaden the range of a_w and temperature at which germination and growth will occur. The minimum a_w levels for growth of fungi are lower than those required for mycotoxin production. It is imperative that diluents and enumeration media with reduced a_w be used to detect xerotolerant fungi in foods. Otherwise, vegetative cells and spores may be killed by osmotic shock or remain dormant when exposed to high a_w associated with diluents and media routinely used for mycological analyses.

Influence of Water Activity on Foodborne Bacteria-A Review, William H. Sperber, The Pillsbury Company, 311 Second St. S.E., Minneapolis, Minnesota 55414

J. Food Prot. 46:142-150

The influence of water activity on some characteristics of bacterial growth is presented. Bacteria are able to overcome the plasmolytic effect of reduced water activity by intracellularly accumulating compatible solutes such as glutamic acid or proline. In food systems, water activity is one of several preservative factors which interact to form a preservative system. Other preservative factors considered in this review are temperature, pH, O/R potential and chemical preservatives. Control of water activity in foods is receiving more attention as new food products and new technologies are developed.



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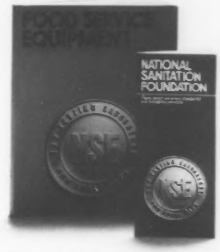

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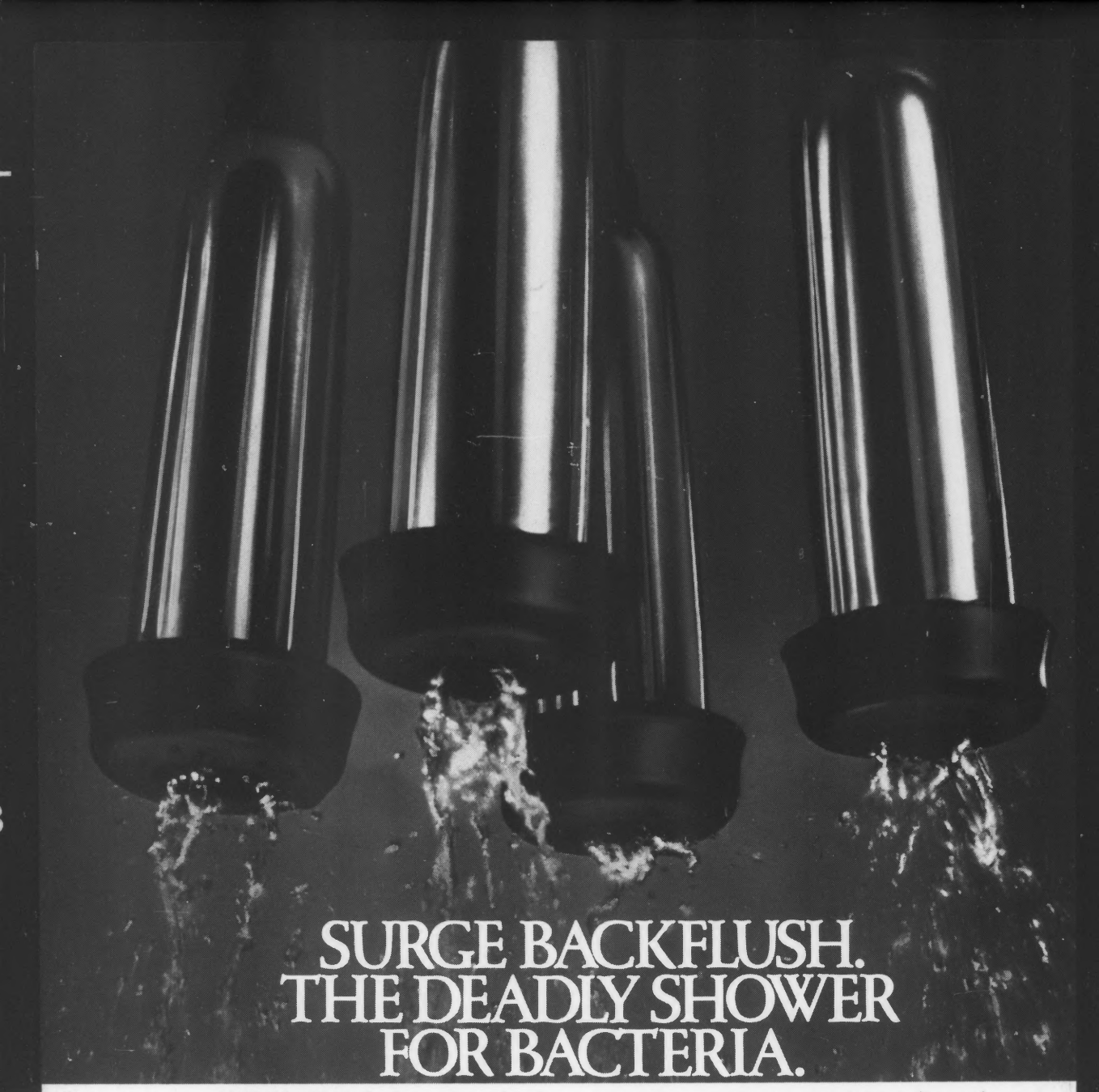

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