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NOVEMBER 1991

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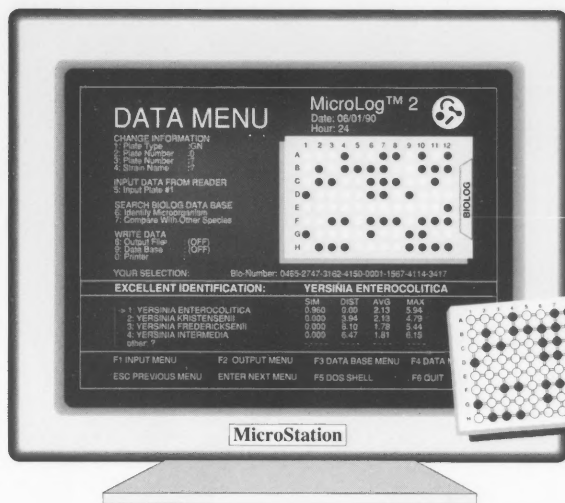
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Purpose

1. To encourage graduate students to present their original research at the IAMFES annual meeting.
2. To foster professionalism in graduate students through contact with peers and professional members of IAMFES.
3. To encourage participation by graduate students in IAMFES and the annual meeting.

Who Is Eligible

Graduate students enrolled in M.S. or Ph.D. programs at accredited universities or colleges whose research deals with problems related to environmental, food and/or dairy sanitation, protection and safety. Candidates cannot have graduated more than one (1) year prior to the deadline for submitting abstracts.

Criteria

1. A short abstract of the paper must be submitted to the IAMFES office by December 16, 1991. (Use the blue abstract forms from the September issue, if possible).
2. The author must indicate on the abstract form the desire to be considered for the competition.
3. The paper and the student must be recommended and approved for the competition by the major professor or department head.
4. The paper must represent original research done by the student and must be presented by the student.
5. An extended abstract form will be sent to all who enter the competition, and must be completed and returned by the deadline date on that form.
6. Each student may enter only one (1) paper in the competition.
7. Papers are to be presented as oral papers and should be approximately fifteen (15) minutes in length with an additional five (5) minutes allowed for questions, for a total of twenty (20) minutes.
8. The use of slides or other visual aids is encouraged.
9. **All students with accepted abstracts will receive a complimentary membership which includes their choice of *Dairy, Food and Environmental Sanitation* or the *Journal of Food Protection*.**
10. The papers will be judged by an independent panel of judges.
11. Winners are presented and honored at the annual Awards Banquet. All entrants will receive complimentary tickets and are expected to be present at the Banquet.

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Thoughts From The President . . .



By
Damien A. Gabis
IAMFES President

When Thanksgiving season comes around, our company can usually count on being involved in some Salmonellosis outbreak due to consumer mishandling of the traditional turkey dinner. When I think of the questions my non-food scientist relatives, friends, and neighbors have about safe thawing, cooking and handling of left overs, I come back to the thought: why don't these good folks know how to handle their food safely? They were never taught food safety for today's style of living!

It seems that most food protection professionals accept the idea that consumers need to learn about prevention of foodborne illness in the home. Surveys show that the public lacks the knowledge of food protection principles. We have a very far way to go in educating the consumer before the incidence rates of illnesses due to mishandling of foods in homes decrease. However, measurement of the success of consumer education efforts is difficult at best.

Almost without exception the reports of committees devoted to issues of foodborne illness urge that consumer education for prevention of illness have top priority. However, the scientists who make these recommendations are usually not charged with the responsibility to develop and implement action plans to integrate their recommendations into the educational systems.

Notwithstanding the low economic and societal dedication for education of consumers in prevention of food borne illness, there also seems to be a missing link in translating the available technical knowledge into action plans to educate the consumer. No effective avenues have been developed to actively incorporate the recommendations of food safety professionals into primary and secondary educational systems.

It seems to me that in order to have our professional recommendations on food safety issues integrated into the academic curricula of primary and secondary schools we, food protection professionals, will have to take the initiative to work directly and cooperatively with the educators who have the influence to implement the teaching of food safety.

I think it is the responsibility of food protection professionals to initiate such a beginning dialog with the educators. Perhaps establishment of task force with our sister associations to meet with educators' groups would be one way to begin an action plan.

On My Mind . . .

By
Steven K. Halstead
IAMFES
Executive Manager



. . . is evangelism - you may be asking yourself "What can evangelism possibly have to do with IAMFES? And in particular the annual meeting?" Well, read on.

Several years ago, the state headquarters of my church became concerned about its dropping membership. Research was done that showed the population had stabilized and that some churches were growing. What were they doing that we weren't?

They had an evangelism program. Obviously, we needed one also.

Experts were brought in from across the nation to teach classes throughout the state. Many theological and theological activities were developed - advertising materials, neighborhood and community fellowship, craft sales, etc. - all aimed at attracting potential members.

My local congregation really got into these activities and before long we had new people in church every Sunday.

Then we learned (the hard way) about incorporation. If the newcomers were given a role, i.e. choir, nursery, church school teacher, greeter, usher - anything - it didn't matter as long as they were involved - they stayed and became an active member of the congregation. If not, they didn't.

The lesson to be learned here is that getting new members is not enough. You have to keep them, and the easiest way is to get them involved.

Hosting an annual meeting of IAMFES provides a local affiliate with tremendous opportunity to involve its membership. In so doing, the affiliate is able to strengthen itself and grow.

There is such a wide variety of jobs to be done that it is difficult to know where to begin. Since the program content is why most people attend our annual meeting, let's begin there.

Of late, we have spotlighted the local affiliate with a full day of programming. In 1990, this took the form of a special,

added symposium for dairy field representatives. In 1991, we saw the dairy programs focus on the Kentucky Dairy Industry. In each case, members of the local affiliate served as planners, conveners and speakers.

If meeting people is your cup of tea, there are several ways of using these talents. The local affiliate members distribute the material to those who have pre-registered. They also serve as session helpers - people who run the slide projector, lights, distribute and receive evaluations, hand out the door prize tickets, and conduct the door prize raffle.

The local affiliate provides hosts (and hostesses) at all the social functions including the wine and cheese reception, the president's reception, the gala and the awards banquet. They also provide a

"concierge" in the spouses hospitality room who can direct people to local attractions and dining as well as to greet and welcome the spouses of attendees.

The local affiliate is in charge of all spouse tours and its members can take a very active role in the planning and execution of the tours.

Then there is the matter of donated dairy products - cheeses, milk, ice cream, etc. - an outstanding way to show off the local dairy industry. Some one has to solicit these and arrange for the delivery, storage and distribution of these products.

In short, hosting an annual meeting is an excellent way to get your members involved. Perhaps the 1989 meeting best demonstrated this. The Kansas Association of Sanitarians used nearly 80 members (and many, many spouses) in conducting the Kansas City Meeting. They would have used more, but they only have 80 members! 100% participation!

I'm sure that any affiliate that has hosted an annual meeting will agree that they are the better for having done so.

Evangelism/recruitment - use them or lose them.

More than anything else, hosting an IAMFES Annual Meeting requires an active-involved membership.

Product Tampering: Packaging and Prevention

Kathleen C. Deignan,

Presented at the International Dairy Show, Anaheim, CA, October 20, 1990

Tampering is the most senseless, most dreaded crisis category in the Food and Drug Industries. Just one tampering can cost a processor tens of millions of dollars in recall costs and product image rebuilding. Recent examples of companies involved in tampering threats include Gerber Baby Food, Hormel, Jell-O desserts, Girl Scout cookies as well as various regional dairies with their fluid milk products.

This very serious issue of preventing product tampering impacts all people in the dairy industry, from packaging suppliers to dairies to retailers to consumers. All have a role to play and are responsible for being fully informed on these issues.

A main concern is how Product Tampering relates to the dairy industry, both legally and from the perspective of consumers, dairies and packaging suppliers. In addition, the pros and cons of T.E. packages and the future of these packages are of interest to the dairy industry.

The word "tampering" can take many forms, including Tamperproof, Tamper-evident and Tamper Resistant. Each of these terms is used interchangeably, yet have their own meaning.

"Tamperproof" sounds wonderful but in reality cannot exist. A sophisticated tamperer can enter any glass, plastic, paper or metal package and reseal it - without detection. Most product tampering occurs in the privacy of tamperers home-under leisurely conditions with all the necessary tools. Although tamperproof is impossible, it is very achievable to produce high levels of Tamper Resistant and Tamper Evident packaging.

"Tamper Resistant (T.R.)" is the measure of the degree of difficulty a would be tamperer would have in manipulating and defeating the T.R. feature.

"Tamper Evident (T.E.)" refers to the degree any unauthorized opening of a container is apparent.

These two concepts (T.R. and T.E.) work together to form the package protection the U.S. Food and Drug Administration defines as "Having an indicator or barrier to entry which, if breached or missing, can reasonably be expected to provide visible evidence to consumers that tampering has occurred." The key terms are "barrier" and "visible evidence."

Some people call the product tampering threat a "sleeping volcano." It may lie dormant for months and months but its unpredictability of erupting at any moment is always

present. Product tamperings were reported to the FDA from 1984 to 1988 with an eruption from the "sleeping volcano" in 1986. In this one year \$1 billion worth of goods were destroyed because of tampering emergencies!

In 1983, Congress passed the Federal Anti-Tampering Act which provides for heavy monetary penalties and imprisonment for product tampering and for falsely reporting product tampering. The maximum punishment ranges from \$10,000 to \$100,000 in fines and from 1 year to life imprisonment, depending on the severity of the injury that occurs. Furthermore, this law gives the FDA, USDA and the FBI the authority to follow-up on tampering violations. This authority is being used aggressively.

In 1982, the FDA issued regulations requiring tamper-resistant packaging for certain cosmetics, medical devices and OTC drugs. Because of the diversity of food products and packages on the market, the FDA has been unable to design regulations that will ensure the integrity of all food containers. As a result the agency does not currently require tamper-resistant packaging for food products. In general, dairy packagers were slow to follow the drug packagers lead. This is probably best explained by the "tight margins" in the dairy industry. *Food and Drug Packaging Magazine* conducted a survey and found the unit cost dairy packagers are willing to spend on TR/TE devices is \$0.01-\$0.02/unit, whereas drug packagers are willing to spend \$0.03-\$0.05/unit and more. Because the dairy industry has "razor thin profit Margins," this will continue to be a challenge. However, although not required by law, more packagers have voluntarily added some form of T.R., especially packagers of cultured dairy products. This can be explained by the fact that cultured dairy products are more likely to be "freshness checked" by consumers in the store. Some shoppers can not resist sniffing a container of cottage cheese to check its appearance and freshness.

More products are being packaged in T.E. containers. A 1988 survey by the M.I.F. and *Dairy Foods* shows almost half (47%) of cottage cheese, 30% of Sour Cream, and 20% of Yogurt is packaged in T.E. containers. Because these statistics are three years old, the numbers are sure to have increased.

Not only is it important to provide T.E./T.R. packaging for consumers choice, but consumers must be educated as to what to look for to determine if tampering has taken place (T.E.). The Food Industry has made progress in this area.

In 1983 a University of Michigan study found consumers could not tell tampered from untampered packages in nine out of eleven examples! Only 18% of tampered packages were detected.

Packaging Magazine conducted a consumer survey and found some improvements over a two year period. Surveying consumers who avoided food or drug packages because they "appeared" to have been tampered with, only 31% noticed in 1987 and in 1989 over 50% of the consumers avoided purchases. Heightened consumer awareness is a trend which will most likely continue.

After covering the penalties to the would-be tamperer, which most agree are severe enough to be a deterrent, another point of view of the legal aspect is of importance. T.E. packaging is not required by law and likely increases the total cost of the package. So, with "razor thin" profit margins, and with the dairy industry not exactly in the "high growth" category-why bother? This is a valid question.

From a food processor's point of view, if one's product is involved in a tampering incident, one will be expected to demonstrate to the court that he or she did the utmost on behalf of the consumers to provide a package with the highest level of TR/TE available. Using TR/TE packaging greatly reduces the risk of adverse judgement against a company in a product liability suit. A proactive attitude on T.E. is very important.

There is a second part to this scenario. If the dairy does use TR/TE packaging but fails to inform consumers, there may be a legal compromise on the liability position. The consumer must be educated to look for signs of tampering. They must be informed what a non-tampered package looks like. An analogy is nature's "perfect package" the egg. All consumers have learned early in life how to check for and recognize if the egg package has been compromised. It is a Go/No-Go decision. Similarly, the ultimate in TR/TE packaging would offer this same type of warning.

There are some theories that food processor's are opposed to blatantly warning consumers of anti-tampering protection because "danger doesn't sell." However, if the signal/warning is routine - i.e. all cottage cheese containers with a T.E. signal - it is not threatening to the consumer, it becomes expected. This argument for failing to inform would never hold up in court.

Considering the millions of dollars to react to a T.E. scare in terms of product recall and loss of brand confidence, it seems obvious that manufacturers must take a proactive stance, with or without regulations from the government and make TR/TE standard packaging.

A common defense in a product liability suit is if it was a criminal act which caused injury, should the product manufacturer be held responsible for the action of a criminal? The argument is unless the criminal act is foreseeable, the causation link between the product and the injured person is broken.

The soft side to this argument is "Foreseeability." If it is impossible to anticipate then it is not foreseeable. However, tampering is taking place and incidents are covered in the media, so tampering is foreseeable. A product must be

safe not only as it leaves your plant, but safe against any reasonable foreseeable danger.

The onus of tampering prevention rests primarily on the manufacturer. According to FDA commissioner Frank Young, the "First line of defense against tampering is packaging."

Starting with consumers, a look at the needs of people will help to objectively review packaging alternatives.

1989 *Packaging Magazine* conducted a consumer survey and found T.E. for food was considered the "most important feature" of a package by 84% of respondents. Also, nearly 50% said they would pay one to five cents more for a tamper-evident food package. There is inconsistent research on the subject of paying more - other surveys have found T.E. is expected now. Consumers want package security but they don't want to pay any more. Most have found the latter to be true more times than the former survey findings.

Consumers want packages that are lightweight, portable and offer effective T.E. packaging that is hard to open to prevent in-store sampling. Yet, they also want easy to open for elderly and teens hands, easy to reseal, direction on how to open so entire families can understand and freshness protection. There is basically a laundry list of wants and needs.

Changing demographics are impacting packaging. A significant group is the growing "Fifty-plus" club or "Gray Market" or "Mature Market."

Consumers fifty years and older have 42% of the buying power in the United States. They spent \$14.6 billion in 1989 on packaged foods. This is expected to increase to 17.9 billion in 1993 - a 22.6% increase! They need products that are more "User friendly." Since there are more than 63 million people in this category, there's a good reason to listen to their packaging needs.

There are two generalizations for this age category. First, that as people age, their fingers lose strength and dexterity and secondly that eyesight deteriorates. Both can be directly applied to T.E. packaging. Easy opening and ease of directions/identification of T.E. package are very important to winning over this group. (i.e. may not notice clear shrink bands, tiny copy, etc.)

Also, the changes in demographics show that working women will be an estimated 20% of the workforce by the year 2000 and more children and teens are food shopping and cooking. T.E. must be easy to open and close for this growing market, while also being convenient. Consumers also like T.E. packaging that is visible at point-of-purchase or "shelf detectable."

Dairies and manufacturers have quite a challenge when it comes to choosing a package for their product. Today "packaging" is expected to fulfill a wide variety of needs. A partial list of these needs include:

Stabilizing and dispensing the product, resisting product damage during transport, protecting the product from the environment, protecting the product against pilferage, attracting attention, creating imagery and memorability, providing brand identification, providing product information... and creating appetite appeal.

Unfortunately, calling direct attention to anti-tamper-

ing features conflicts with creating appetite appeal and desirable imagery. However, the seriousness of tampering incidents has made T.E. packaging a far higher priority. So T.E. must be added to this list of packaging expectations.

Some processors call their T.E. packaging "freshness sealed." However, these euphemisms should be used with caution as we already discussed from the liability standpoint.

Food and Drug Packaging surveyed 100 manufacturers on a T.E. package wish list. The overwhelming response was that manufacturers want devices that are cost effective, convenient for consumers and have shelf detectable T.E.

On a question survey, results found that areas of food packaging are likely to be of most importance to their firms over the next two years.

The Food Engineering's Executive Advisory Panel conducted their annual packaging buyers survey and found 53.5% stated T.E. packaging as a major importance. Most want it as an internal part of packaging systems that are both effective, inexpensive and capable of running at high speeds.

Low costs of some products make it difficult to justify cost of "high-tech" packaging. Some common requests for T.E. are consumer friendly, fool-proof, and no effects on line-speed during manufacturing.

Although external T.E. is preferred by consumers, dairy industries use more internal T.E. (induction heat seal liners) with a warning flag on the outer package. For small manufacturers, T.E. breakaway closures can be too expensive, making inner seal an economical means of providing T.E.

T.E. packaging must be strong enough to withstand rigors of packing, shipping and handling. Another important consideration is proving leak protection and oxygen resistance. Equipment is another important consideration, as well as cost and space required. Many dairies have limited space to process and package their product. Another factor is fast changeover to various size containers.

Packaging suppliers want to meet the needs of their customers, the food and dairy manufacturer, and in turn help them meet the needs of the consumer.

In addition to all of the various needs and wish lists already discussed, packaging suppliers have other needs of the TR/TE package. It must be simple to use, differentiated from other packagers - a competitive advantage, manufacturability to ensure a consistent, quality product, low cost material and or technology.

In addition, the package must appeal to small dairies and major food processors. Some suppliers change container size four times a day and need flexibility. Those with minimal to no change over have T.E. high speed-in-line for large dairies.

Many demands of packaging suppliers are in conflict. To best meet the needs of dairies and ultimately the consumers, packaging suppliers must be included early in the product development stage for new product and new packaging ideas.

After looking at T.E. issues and needs, a broad overview of the available products for dairy packaging is important.

First, some basic points of difference between internal and external T.E. For internal, consumers must take off the

lid or wait until they bring the package home to notice T.R., whereas external is "shelf detectable."

In fluid milks, paper milk cartons gable tops by their very nature are highly tamper-evident, but plastic milk containers pretty much have 100% T.E. closures.

In the dairy industry, cultured products are where the majority of activity is regarding T.E. packaging. As stated before, cultured products are prone to in-store sampling more than other type foods. There is great impetus for all cultured products to be packaged in some form of T.E.

One common type of T.E. packaging is banding. Various types of banding materials can be used such as polystyrene foam and vinyl film. Usually the banding material is in rollstock form, perforated horizontally, positively placed onto the container and then heat shrunk. Usually, banding is only cost-efficient in high volume. Advantages of banding include: any suppliers container package can be used, ease of changeover for various sizes and in-line fast production speeds. Films can be clear or foam, printed product specific or generic, such as "security sealed."

The disadvantages include initial cost of equipment (\$100,000-\$250,000) and the space requirement. Effectiveness of T.E. is questionable, if the generic seal is missing-will the consumer know? Generic bands are readily available for a would be tamperer to replace. Also, if the band is not on properly, it can pop off and/or crack during shipping. If this occurs, consumers probably wouldn't purchase the product even though it hasn't been tampered with.

The most popular internal method for T.E. packaging is on a foil or film innerseal usually sold in conjunction with an overcap lid. These are usually marked as "freshness sealed" and some claim they increase shelf life of products. They are easy to run for high-speed in-line filling equipment as well as for small dairies. No additional equipment is required, only attachments and a variety of suppliers offer this type of package. On the minus side, they are not T.E. at point of purchase. However, there are some single size clear overcaps on the market which overcome this point. Another alternative is a new foil in an overcap-lid from one supplier. However, the dairy can not always be sure they are getting an effective seal on the foil/film.

Some specific T.E. supplier products include: Guardian Ring II. After filling, the container passes through a heat tunnel which shrinks the lip of the lid under the rim of the container creating a single package from a separate cup and lid. The lid is scored around the circumference to make a tabbed band. Lifting the tab tears away the "Guardian Ring" leaving the lid resealable. A heat tunnel in the dairy is the only additional equipment required. The product is tamper evident on the shelf which is a plus for consumers.

A relatively new T.E. package is the Security Plus. The package features a lift-off lid with a "serrated ring" that separates from the package during initial opening. It is detectable on the shelf and is mechanically applied at the dairy with no additional equipment. However, a possible problem is damage during shipping and handling which may cause the serrated ring to become separated from the lid, giving the appearance that tampering has occurred when it actually has not.

Another option is the Tamper-Resistant lid (not T.E.),

which is a hard plastic tabbed ring that fits tight around the inside diameter of a standard lid. To open, consumers lift the tab and discard the ring. This is T.R., not T.E. because without the ring, it looks like a standard package. Consumers probably won't notice if the ring was missing until they bring the product home and are ready to open it.

There are other T.E. packaging choices for cultured dairy products, which will not be covered here.

In ice cream, shrink wrapping square half-gallons is the most common and there is also the traditional tear strip.

Various other packages, including pints and quarts, make use of banding. However, T.E. is not widely used in this industry. Partly because consumers don't "freshness check" or in-store sample frozen products. This is a great opportunity for packaging suppliers as T.E. for ice cream will certainly become more popular in the near future.

Now, some criteria as how to evaluate T.E. packaging. The following index was compiled from research at the user, marketing and production levels which was published in *Food and Drug Packaging* (October 1989).

- A. **Time** - How long does it take to successfully violate the package? (Remember, no package is Tamper-Proof)
- B. **Knowledge** - Can anyone do it?
- C. **Cost** - Can small firms afford to use T.E. device?
- D. **Equipment** - Will the violator have access to the equipment needed to effect entry and reclosure? (Remember, most tampering is not done in-store)
- E. **Feature Material** - Can T.E. device be reused without detection?
- F. **Feature Visibility** - Is the device/feature easily recognized as T.E.?

James R. Proffitt, Battelle Columbus Division, suggests the following criteria for Tamper-Resistance:

1. Be incorporated into the package
2. Be visually obvious
3. Give prompt warning
4. Offer redundant or parallel warnings
5. Offer protection at reasonable cost

Other criteria is the ease of open and reclosure (consumer), equipment requirements (dairy), cost of space, total package cost (material, package, and production efficiencies), flexibility on package sizes, and environmental considerations. Source reduction has been identified as one of the ways to successfully resolve the solid waste crisis. How does the T.E. package stand versus recyclability and excessive packaging? This last issue will become more important in all packaging decisions.

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Overview of Egg Candling Lights Used by Inspectors

Edgar R. Smith
CW2, U.S. Army Veterinary Service

A task performed by local, state and Federal inspectors is verifying the quality grades of fresh shell eggs. Usually this means ensuring that the vendor's eggs meet the requirements for their grade as defined in the Code of Federal Regulations (7 CFR Part 56). These requirements include both external and internal characteristics which are further defined in the USDA's Agriculture Handbook 75. External characteristics are easily seen by the naked eye, however, internal characteristics are observed with the aid of an egg candling light. These egg candling lights are the subject of this article.

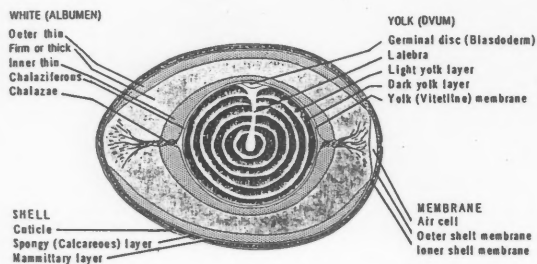


Figure 1. Parts of the Egg. Taken from U.S.D.A. Agriculture Handbook 75.

All candling lights operate under the same basic principle. A beam of light is directed through one side of the egg which will reveal internal characteristics when viewed from the other side of the egg. A high quality egg will not show a clear outline of the egg yolk because the thick egg white obscures it. (Fig 2). The air cell is small. As the egg gets older the thick egg white will break down into a thinner white which allows the yolk to be seen more clearly and the air cell will become larger as moisture evaporates through the shell membrane. These and other continuous changes will lower the quality of all eggs over a period time, although the rate of deterioration can be reduced by oiling the egg shell and controlling storage temperature and humidity. In addition, other defects such as cracks in the shell (called checks, fig. 2), blood spots, and rots can only be observed with the aid of a candling light. A good candling light will give a clear view of these characteristics.

While all candling lights operate under the same basic principle, there is a great deal of variety in how this principle

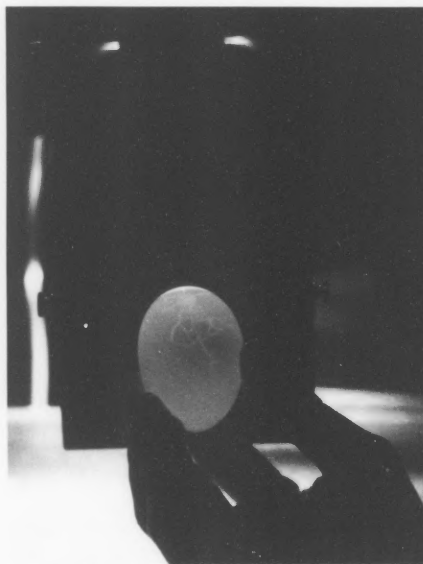


Figure 2. Checked egg. Courtesy U.S. Army Visual Information Center.

is applied. Employees on an egg packing line use a mass candler which enables them to see many eggs at the same time. These lights are not usually used to determine grade. Egg producers control quality grade by managing their flocks, feed and other factors. So, mass candlers are usually used to spot obvious defects. The other category of egg candler is used by inspectors to verify the grade claimed by the egg producer. These candling lights only candle one egg at a time. In this article, we will only discuss the candlers used by inspectors. Candlers used by inspectors employ a variety of designs and optical principles. Some lights employ a lens and a mirror to direct the beam of light (fig. 3). Some lights will use a green or blue light filter in order to make blood spots easier to detect (fig. 4). The type of light bulb used also varies. Usually an inspector candles eggs in a darkened room. However, there are some candlers on the market equipped with high intensity lights which are advertised as having the ability to be used in rooms that are not darkened. An inspection agency which is planning to purchase egg candling lights may want to buy or borrow different types of candlers (fig. 5) in order to compare and

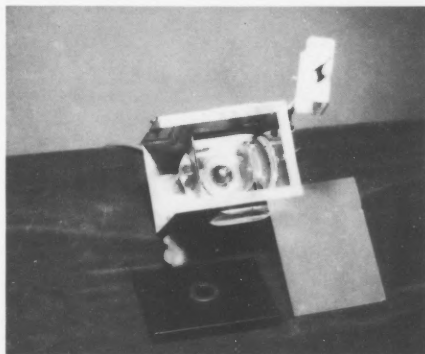


Figure 3. Breakdown of one type of candler showing components & interior. Courtesy U.S. Army Visual Information Center.



Figure 4. Egg with blood spots. Courtesy of U.S. Army Visual Information Center.

find the best value for their money in this era of shrinking budgets. I believe that such an agency will want to consider the following factors:

a. Visual Image - There is not a scientific optical standard for rating candling lights. I believe the best way to judge how well a candler can present a viewing of the interior of an egg is with side by side comparisons with other lights. If you assemble several different candelers in one location and candle the same group of eggs on each, you will get a basic idea of how each candler stacks up. The tester should make sure that the eggs used in the comparison test exhibit some of the more subtle characteristics and defects. That way, when the test is completed, the tester knows that the candler which is chosen will enable an inspector to see all the internal characteristics necessary to verify grade. If the candler is advertised as being suitable for use in rooms that are not darkened and this would be useful to the inspection agency, then tester should use the candling light under these conditions.



Figure 5. Examples of three candelers presently available. Courtesy U.S. Army Visual Information Center.

b. Initial Cost - There is a great deal of variety in the initial costs of these candelers. By comparing the different candelers on the market the tester will be sure that the candling light that is chosen is the best value for their money.

c. Cost of Replacement Parts - Light bulbs, lenses and mirrors, etc. have a tendency to break down under the wear and tear of normal use. The cost and difficulty of replacing these components should be a consideration. When comparing these candelers the tester should consider whether the fragile parts are installed loosely or securely. For example, a glass filter that can slip out easily has the potential of breaking every time the candler is moved. In addition, loosely attached parts that are not fragile may become lost and require replacement.

d. Ease of Use - By actually candling eggs on each light the inspector will be able to decide how "user friendly" each light is. Does the light aperture allow for easy rotation of the egg while it is in front of the light? An aperture that swivels will slow down the inspector. Does the light need to be adjusted frequently? If so, this too will slow down the inspector.

e. Mobility - For inspectors in the U.S. Army, mobility is an important consideration. Some candling lights must be transported frequently. For example, during Operation Desert Shield/Desert Storm it was necessary for candling lights to be sent to the Persian Gulf area, for inspectors who supported field units. A candling light that required assembly, mounting and adjustment by the inspector was not as desirable as one that was ready to use when it came out of the box. Even in this country, some civilian inspectors will carry their candler to retail stores and inspect eggs on the premises. For them as well, mobility may be an important consideration.

It is not the purpose of this article to say that one type of light is better than another. Instead, I wanted to point out the variety of these units in their design and price. By setting priorities and comparing these units, an inspection agency can help themselves to get the best value on the market and conserve their operating budget.

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Statement

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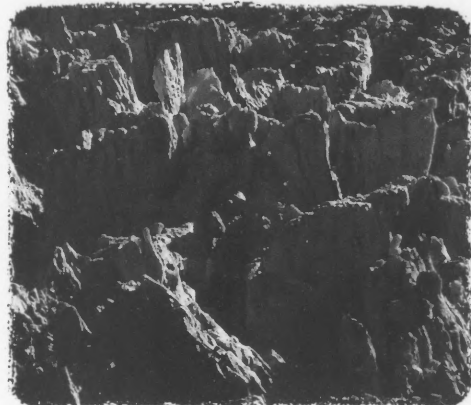
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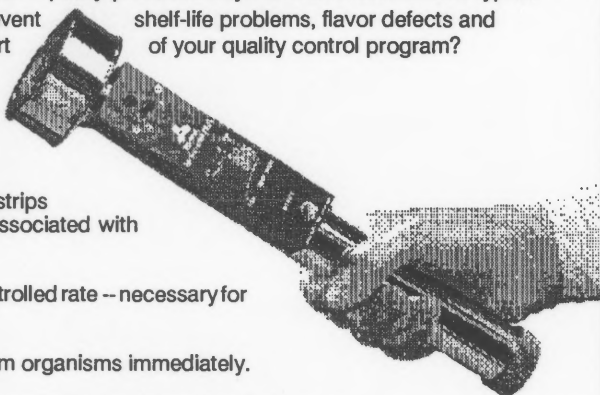
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Bacterial Species Isolated from Well Water in Southern Illinois

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A bacterial survey was conducted from January 1, 1990 through July 1, 1990 on well water samples submitted to the laboratory for potability testing. A total of 156 samples were submitted from fourteen Southern Illinois counties. Wells supplying private homes accounted for 119 samples. Of these 119 samples supplying private homes, 63 were from drilled wells and 56 were from dug wells. Testing revealed that 40% of the drilled wells and 66% of the dug wells were positive for bacterial growth. The term "bacterial growth" refers to any bacterial species present, including the indicator bacteria (total coliforms, fecal coliforms, fecal streptococcus) and non-indicator bacteria. Wells supplying meat processing establishments accounted for 37 samples. These wells had been treated and monitored routinely and were each negative for bacterial contamination. Most of the positive wells yielded a mixed population of indicator and non-indicator bacteria. Several of the non-indicator bacteria, as well as the indicator bacteria, are considered clinically significant opportunistic pathogens. Individuals using untreated, unmonitored, private groundwater supplies should be made aware of the potential health risks involved. Further investigation and communication between Public Health officials and environmental and clinical bacteriologists is imperative in determining the actual health significance of these bacteria.

Introduction

Since approximately 95% of the water used in rural areas is groundwater which is not treated or monitored on a regular basis for bacterial contamination and since 100 million people in the United States use ground water for drinking purposes, the quality of groundwater is a present and urgent matter of concern.⁴

The objective of this survey was to isolate and identify the bacterial species present in well water submitted to our laboratory for potability testing in order to better assess the actual quality of the drinking water sources of our rural population in Southern Illinois. The information may assist in evaluating the public health significance of non-indicator bacteria found in groundwater drinking sources, since many of the non-indicators commonly present in untreated groundwater are considered clinically significant opportunistic pathogens.

Materials and Methods

Sample collection

Water samples were collected from individual groundwater supplies located in 14 southern Illinois counties.

The clients were supplied with two sterile jars of 200 ml capacity. One bottle contained sodium thiosulfate as a dechlorinating agent. The clients were given written instructions detailing the procedure for aseptically obtaining, identifying, and shipping the sample.¹ The importance of obtaining aseptic samples by strictly adhering to the written instructions was thoroughly explained to the clients prior to collecting the sample.

Demographic data requested included the client's name, address, county, location of the well on the premises, type of well, use of well water, date and time of collection, and the collector's name and address. Specimen arriving 30 hours after sampling were rejected and resampling was requested. All samples were tested within two hours of arrival at the laboratory.¹

The samples were submitted to the laboratory for a variety of reasons, including the necessity to comply with the Illinois Department of Public Health's requirements for testing well water for the sale of rural property, after the installation of new wells, and after repairs on existing wells. Clients also submitted samples due to concern over the change in turbidity, odor or taste of the water, and the possibility of drainage entering the well. Clients or physicians submitted water samples due to the arrival of an infant, senior citizen, or immuno-compromised person at the household, or due to a history of gastro-intestinal problems in the household. Veterinarians recommended water evaluation due to herd health problems. Samples were also submitted by clients prior to and after purchasing chlorination, filtration, or water softening devices. Clients submitted samples in response to their new awareness of the potential danger of drinking untreated groundwater through educational programs sponsored by government agencies. Samples were also submitted by operators of meat processing establishments in order to comply with the regulations of the Illinois Department of Agriculture for water used in processing procedures.

The sample submissions do not constitute a random survey. Since the submissions include samples which reflect

a physician's, veterinarian's, or homeowner's doubts about the quality of the homeowner's water, the sample population may not reflect the actual distribution of bacteriologically contaminated well water supplies, but may be biased toward a higher number of contaminated wells.

Total coliform, fecal coliform, and fecal streptococcus enumeration was performed on each sample as requested upon submission. Additional enrichment, isolation, and identification procedures were performed as necessary to identify each bacterial species present. Difco media was used exclusively for each enumeration, isolation, and confirmation procedure.

Enumeration of Indicator Bacteria. Total coliforms, fecal coliforms, and fecal streptococci enumerations were performed by standard method filtration techniques.^{1,2} Sample aliquots of 100 mls and 50 mls were filtered. Endo broth, FC agar, and KF Streptococcus agar were used for the detection of total coliforms, fecal coliforms, and fecal streptococci, respectively. Total coliforms were verified by selecting up to ten sheen or borderline sheen typical colonies from each Endo broth plate. These colonies were inoculated onto corresponding lauryl tryptose broth and brilliant green lactose bile broth. Fecal coliforms were verified by selecting up to ten typical blue colonies from each FC agar plate and inoculating these colonies onto lauryl sulfate broth. Positive cultures were then transferred to EC broth to complete the fecal coliform confirmation. Fecal streptococci were verified by selecting up to ten typical pink to red colonies from the KF agar plates and examining each for catalase production. Catalase negative colonies were confirmed as fecal streptococcus by growth in Brain Heart Infusion (BHI) broth at 44.5°C and growth in BHI broth with bile at 35°C after 72 hours of incubation. The results were reported as colony forming units/100ml.^{1,2}

Isolation. Three different methods were used to obtain isolated colonies: 1) When the sample yielded isolated colonies on the Endo broth plates, FC agar plates, and KF streptococcus plates used for enumeration of indicator bacteria, these colonies were selected for species identification, as well as verification of the indicator group; 2) When the sample yielded a confluent growth on the Endo broth plate or the FC plate, this growth was restreaked onto duplicate MacConkey's agar plates, brilliant green agar plates, and tryptose blood agar plates. One set of plates was incubated at 35°C for 24-48 hours and the other set was incubated at 44.5°C for 24-48 hours.¹ Use of the higher incubation temperature enhanced the isolation of fecal coliforms by reducing the number of interfering organisms. Non-indicator bacteria were isolated at the lower temperature. When the sample yielded a confluent growth of fecal streptococcus on the KF agar plate, the growth was restreaked onto tryptose blood agar plates and incubated at 35°C for 48 hours. Since the selective media used to enumerate and isolate total coliforms, fecal coliforms and fecal streptococcus inhibit the growth of bacteria, such as *Pasteurella*, *Actinobacillus*, non-fecal *Streptococcus*, *Staphylococcus*, and *Corynebacteria*, this third isolation method was utilized.

The remaining 100 ml portion of the samples was filtered using Millipore HAWG filters (diameter 47 mm and pore size 45 µm). After filtration the filter membranes were

placed on a tryptose blood agar plate and incubated at 37°C for 48 hours. Isolated colonies were selected for identification. If a confluent growth resulted, the growth was restreaked onto tryptose blood agar plates, MacConkey's agar plates, brilliant green agar plates, and mannitol salt agar plates. After 24 and 48 hours incubation at 35°C, the isolated colonies were selected for identification.^{10,11,12}

Identification. Isolated colonies were selected for gram staining. The gram positive cocci were tested for catalase production, and the gram negative rods were examined for oxidase production.

The gram negative, oxidase positive rods were inoculated onto the Pasco Gram Negative 10 Tri-Panel System (Difco). The gram negative oxidase negative rods were inoculated onto Analytical Profile Index (API) 20E System (Sherwood Medical). The small gram positive catalase negative cocci were inoculated onto API Rapid-Strep System (Sherwood Medical). The identification systems were inoculated, incubated and evaluated according to the manufacturer's recommendations.

The API method proved to be convenient and has a proven accuracy against conventional methods of 97% when identifying Enterobacteriaceae.⁹ Pasco was chosen for the gram negative non-fermenters because it did not require extensive auxiliary testing and had an accuracy rate of 95% when identifying commonly encountered bacteria.¹⁵

The API Rapid Strep system was selected because its data base includes *Streptococcus* species of human and animal origins, and our isolates included both sources. This system compares favorably with conventional methods for species and group identification.¹⁸

Results and Discussion

A total of 156 well water samples were tested from January 1 through July 1, 1990. Of these 156 wells, 119 were privately owned wells supplying one-family units. The other 37 wells supply meat packing plants.

Those 37 wells consisted of 32 drilled wells and 5 dug wells. Bacterial growth, a term referring to indicator and/or non-indicator bacteria, were not isolated from any of these wells. They were monitored by the Illinois Department of Agriculture.

Table 1. A total of 156 wells were tested January 1 through July 1, 1990.

	Drilled Wells	95		Dug Wells	61
<u>Drilled Wells</u>			<u>Dug Wells</u>		
Private	63		Private	56	
MPLI	32		MPLI	5	

Drilled wells

Private - Positive for bacterial growth - 26 (40%)
 Private - Negative for bacterial growth - 37
 MPLI - Negative for bacterial growth - 32

Dug Wells

Private - Positive for bacterial growth - 37 (66%)
 Private - Negative for bacterial growth - 19
 MPLI - Negative for bacterial growth - 5

TOTAL WELLS POSITIVE:

63 of 156 - 40%
 63 of 119 - 52%

Monitoring consisted of bi-annually sampling the wells in accordance with Illinois Public Health Association (IPHA) specifications and submitting the sample to an IPHA licensed laboratory for total coliform and fecal streptococcus enumeration and nitrate level determination. Treatment, if necessary, consisted of procedures recommended by the IPHA.

Of the 119 privately owned wells, 62 (52%) were positive for bacterial growth. The privately owned wells were not routinely monitored. The private wells consisted of 63 drilled wells and 56 dug wells. Of the 63 drilled wells, 26 (40%) were positive for bacterial growth. Of the 56 dug wells, 37 (66%) were positive for bacterial growth.

The dug wells did produce a noticeably higher proportion of contaminated samples. However, since random sampling was not attained, statistical comparisons were not attempted. Most of the dug wells were constructed before well construction codes were in effect. Factors contributing to the noticeably higher proportion of bacterial isolations in dug wells are poor choice of location, damaged lining due to advanced age, shallow depth, and poor initial construction.

Results of enumeration of indicator bacteria. Of the 63 drilled wells, 23 were positive for total coliforms, 21 were positive for fecal coliforms, and 16 were positive for fecal streptococcus.

Of the 56 dug wells, 37 were positive for total coliforms, 27 were positive for fecal coliforms, and 35 were positive for fecal streptococci. When the results of the drilled wells and dug wells were combined, 50% of the wells were positive for total coliforms, 48% were positive for fecal coliforms, and 43% were positive for fecal streptococcus. When the sample produced total coliforms, fecal coliforms and fecal streptococcus were usually present as well.

Table 2. Results of Bacterial Enumeration - Drilled Wells. Total Wells: 63

Bacterial Count/100ml	Wells with No Growth	Wells with 1-30	Wells with 31-100	Wells with 101-300	Wells with Conf. Growth	Total Wells With Growth
Total Coliforms	40	8	3	0	12	23
Fecal Coliforms	42	17	1	2	1	21
Fecal Streptoc.	47	9	5	0	2	16
Non-Coliform	38	11	8	0	6	25

These results corroborate the findings of Bifulco et al., Sworobuk et al., Sandhu et al., and Exner and Spalding. Bifulco et al. found that 58% of the ground water supplies in Preston County, West Virginia were positive for total coliforms, 30% were positive for fecal coliforms, and 36% were positive for fecal streptococci.⁴ In an earlier survey of that area, Sworobuk et al. found that 68% of the ground water supplies were positive for total coliforms, 48% were positive for fecal coliforms.¹⁷

Table 3. Results of Bacterial Enumeration - Dug Wells. Total Wells: 56

Bacterial Count/100ml	Wells with No Growth	Wells with 1-30	Wells with 31-100	Wells with 101-300	Wells with Conf. Growth	Total Wells With Growth
Total Coliforms	19	10	13	8	6	37
Fecal Coliforms	29	9	9	2	7	27
Fecal Streptoc.	22	13	18	2	2	35
Non-Coliform	20	8	12	13	5	36

In comparison, Sandhu et al. found 90% of the ground water supplies in South Carolina were positive for total coliforms, 48% were positive for fecal coliforms, and 36% were positive for fecal streptococci.¹⁶ Exner et al. reported that 62% of the ground water supplies examined in Nebraska were positive for total coliforms.

Enumeration of non-indicator bacteria. The term non-indicator bacteria refers to bacteria which were isolated and enumerated on the Endo broth plates, FC agar plates and KF agar plates, but which did not produce colonial characteristics or biochemical reactions compatible with total coliforms, fecal coliforms or fecal streptococcus. This group consisted of *Pseudomonas*, *Aeromonas*, *Acinetobacter*, and *Alcaligenes* species.

Attempts were made to isolate additional non-indicator bacterial species, such as *Pasteurella*, *Actinobacillus*, non-fecal *Streptococcus* and *Staphylococcus* using method 3 as described earlier. This method produced only the bacterial species previously isolated using methods 1 and 2.

Of the 63 drilled wells, 25 were positive for non-indicator bacteria. Of the 56 dug wells, 36 were positive for non-indicator bacteria. When results of the drilled and dug wells were combined, 51% of the wells were positive for non-indicator bacteria.

Table 4. Percent Results of Bacterial Enumeration of Drilled and Dug Wells Combined.

Bacterial group:	Positive Wells
Total Coliforms	50%
Fecal Coliforms	48%
Fecal Streptococcus	43%
Non-Coliforms	51%

The bacteria identified and the number of wells harboring each species are shown in Table 5.

Table 5.

Predominant Bacterial Species Identified	Total Number of Wells POSITIVE (Drilled & Dug)
<i>Streptococcus faecium</i>	29
<i>Streptococcus faecalis</i>	22
<i>Escherichia coli</i>	18
<i>Aeromonas hydrophila</i>	17
<i>Streptococcus avium</i>	15
<i>Streptococcus bovis</i>	14
<i>Pseudomonas maltophilia</i>	11
<i>Citrobacter freundii</i>	9
<i>Klebsiella pneumoniae</i>	8
<i>Pseudomonas diminuta</i>	7
<i>Pseudomonas aeruginosa</i>	6
<i>Klebsiella oxytoca</i>	6
<i>Enterobacter agglomerans</i>	6
<i>Enterobacter cloacae</i>	5
<i>Enterobacter aerogenes</i>	5
<i>Pseudomonas cepacia</i>	3
<i>Alcaligenes</i>	3
<i>Acinetobacter calcoaceticus var anitratus</i>	1
<i>Acinetobacter calcoaceticus var lwoffii</i>	1
Other non-coliform species	12

Significance of Bacterial Isolations. All of the positive dug wells produced mixed populations of indicator and non-indicator bacteria. However, a single non-indicator bacterial species was recovered from five of the drilled wells. These

species were present in each well as a confluent growth and were identified as *Pseudomonas aeruginosa*, *Pseudomonas dimutiva*, *Aeromonas hydrophilia*, *Acinetobacter calcoaceticus*, and *Alcaligenes faecalis*. *Pseudomonas* species are a common cause of otitis, sinusitis, pneumoniae, urinary tract infections, conjunctivitis, bronchitis, wound infections, meningitis, and arthritis. *Aeromonas hydrophilia* causes an acute diarrheal disease, wound infections, and septicemia. *Acinetobacter* species cause pneumoniae and tracheobronchitis.^{5,8,10,11,12,13}

Table 6. Examples of Bacterial Populations in Selected Drilled Wells.

1. *Pseudomonas aeruginosa*
2. *Pseudomonas diminuta*
3. *Pseudomonas diminuta*, *Pseudomonas cepacia*, *Aeromonas hydrophilia*
4. *Aeromonas hydrophilia*
5. *Acinetobacter calcoaceticus* var *lwoffii*
6. *Alcaligenes* species
7. *Pseudomonas maltophilia*, *Aeromonas hydrophilia*, *Streptococcus faecium*, *Escherichia coli*, *Streptococcus faecalis*
8. *Citrobacter freundii*, *Aeromonas hydrophilia*
9. *Enterobacter agglomerans*, *Enterobacter aerogenes*, *Streptococcus faecalis*
10. *Citrobacter freundii*, *Pseudomonas maltophilia*, *Streptococcus faecium*
11. *Pseudomonas maltophilia*, *Aeromonas hydrophilia*
12. *E. coli*, *Pseudomonas aeruginosa*, *Citrobacter freundii*, *Klebsiella pneumoniae*, *Streptococcus faecium*, *Streptococcus faecalis*

Table 7. Examples of Bacterial Populations in Selected Dug Wells.

1. *Escherichia coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Streptococcus bovis*, *Streptococcus faecium*
2. *Enterobacter cloacae*, *Klebsiella pneumoniae*, *E. coli*, *Streptococcus avium*, *Streptococcus faecalis*, *Streptococcus faecium*
3. *E. coli*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, *Streptococcus faecalis*
4. *E. coli*, *Klebsiella oxytoca*, *Streptococcus faecium*, *Streptococcus faecalis*
5. *Enterobacter agglomerans*, *Pseudomonas cepacia*
6. *Klebsiella oxytoca*, *Streptococcus avium*, *Pseudomonas maltophilia*

Streptococcus faecium, *Streptococcus faecalis*, and *Streptococcus bovis* (Group D. *Streptococcus*) were among the most frequently isolated bacterial species. Their presence was of special concern, not only because they indicate pollution, but also because these three bacterial species cause 10% of all urinary tract infections and 20% of all cases of endocarditis. They also cause meningitis and wound infections.¹⁰

Escherichia coli, *Citrobacter freundii*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, and *Enterobacter* species cause enteropathogenic, enterotoxigenic, enteroinvasive, and hemorrhagic intestinal infections, urinary tract infections, wound infections, central nervous system infections, and septicemia. These coliform bacteria were isolated in 50.4% of the privately owned wells. Although their presence indicates fecal contamination and the possibility of the

presence of *Salmonella* and *Shigella*, they are themselves potential pathogens.^{1,12}

Although the presence of these opportunistic pathogens in well water is well documented, and their potential for pathogenicity is addressed, their actual role in causing illness has not been extensively investigated. However, in their study of point-of-use domestic reverse-osmosis filtration units, Payment et al. found a correlation between high numbers of heterotrophic bacteria produced by these units and episodes of gastrointestinal illness in the families. These waterborne bacteria included mostly the genera *Pseudomonas*, *Acinetobacter*, *Flavobacterium*, *Chromobacterium*, *Alcaligenes*, and *Moraxella*.¹⁴ Recent studies have suggested the presence of *Acinetobacter* species with virulent characteristics in groundwater supplies.⁴

Factors contributing to Contamination of the Wells.

The wells which produced confluent growths and mixed cultures of bacteria were often dug wells less than 7.3 meters deep, brick-lined, clay bottom, and covered by boards at ground level. Most of these wells were reported to be over 50 years old. Some were still located in barnyards or pastures or in areas that were once barnyards. One 3.7 meters deep by 1.5 meters wide bricked-lined well was stocked with two catfish to keep the well free of insects and slugs. Slugs were a common problem in the stone and brick-lined older wells. All of these wells were still being used for a drinking water source by the submitting family.

Attempts were made to seal the tops of other dug or drilled wells with concrete covers at the surface. However, over a period of years and constant use, depressions had developed around the wells which allowed surface water to accumulate and seep into the well below the concrete seal.

On three occasions *Klebsiella pneumoniae* was isolated in high numbers. Questioning the owners revealed that wooden supports, ladders, or planks had been left in the well after cleaning or repairing the wells.

Two wells which exhibited a large population of *Streptococcus avium* had a pipe from the roof guttering which was connected to the well. Rain water washed bird feces into the well.

One concrete-lined, concrete covered 9.1 meters deep dug well persistently produced high numbers of *E. coli* and fecal streptococcus regardless of the attempts of the new owner to sanitize the well. As he investigated the well's history, he discovered it had once been used as a "septic tank" by a previous owner for their new indoor plumbing. Those previous owners then relied on a cistern located beneath a back porch for their water.

Some of the drilled well samples were apparently contaminated by dirty filters in water softening devices and systems. Since deep drilled wells often produce "hard water", water softening and filtration devices are often sources of contamination. Changing the filters or bypassing the system often solved the bacterial contamination. The bacteria most commonly isolated from water passing through these systems were *Pseudomonas maltophilia*, *Pseudomonas cepacia*, and *Klebsiella pneumoniae*.

Since previous studies have indicated that waterborne opportunistic pathogens have the ability to produce illness, further investigation and communication between physi-

cians, public health officials, and environmental and clinical microbiologists are imperative to understanding the actual health significance of these organisms in rural drinking water supplies.^{4,14}

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Design of Dairy Cow Housing Systems in the United Kingdom

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Summary

During the last 30 years the United Kingdom has seen a swing from housing dairy cows in cowsheds (tied-stalls) to straw yards and particularly cubicles (free-stalls). In the late 1950s over 90% of herds were cowshed housed; today 65% of herds representing about three quarters of all cows are housed in cubicles. The widespread adoption of the cubicle is evidence of its success but problems remain. Soiling and injury to cows can still occur and increases in mastitis caused by environmental pathogens have been attributed to modern housing systems.

The Agricultural Development and Advisory Service (ADAS) of the Ministry of Agriculture, Fisheries & Food has undertaken a research and development programme with the objective of providing sound guidance to dairy farmers, veterinarians and agricultural consultants on methods of housing cows.

This paper reviews the main factors influencing the success of straw yard and cubicle housing of dairy cows under UK conditions and summarizes the approach taken to consultancy work.

Introduction

Most herds in the UK are housed for between five and seven months of the year. Some enter winter quarters as early as September and most return to pasture in the April to May period when grass growth begins. A combination of cubicles, parlour milking (mainly herringbones), grass silage plus concentrates in winter with grazed grass in summer is the most common system for the UK's 46,000 dairy herds and herd average of just over 70 cows.

Economic forces were responsible for the swing away from cowsheds which began in the 1960s. A reduction in the labour force associated with dairy farming coincided with increasing herd size, and the introduction of parlour milking provided the opportunity for considerable improvements in productivity. Looking back over the last 30 years the prophet's predictions of dire consequences associated with such developments were never realized. Progressive improvements to machine milking technology, to milking installations, to cow housing and feeding strategies have resulted in improved herd performances. The evidence suggests that almost all economic indices improve as herd

size increases. The same can be said of mastitis where udder infection has been seen to decline as herd size increases (1). Yet, problems associated with parlour milking and particularly loosehousing remain.

Environmental mastitis occurs more frequently when cattle are housed because levels of exposure to pathogenic bacteria are high due to the confinement of the housing system. Additionally, teat lesions may be produced or exacerbated if housing is inadequate with a consequent increase in exposure to the more common udder pathogens (2). Teat cleanliness is essential for clean milk production and also in reducing to a minimum the transfer of mastitis bacteria during teat preparation. As modern milking routines allow little time for teat preparation, the housing system must maintain clean cows in the intervals between milking.

Trends in cow housing

Straw yards were the first alternative to cowsheds but from the early 1960's the numbers of dairy farms with cubicle or kennel housing gradually increased. Table 1 shows the current position where the majority of herds are housed in cubicles.

Table 1. Methods of Housing Cows (% of herds, England & Wales)

	Cowsheds	Straw yards	Cubicles
Total	20	16	64

Source: ADAS 1989

Straw Yards

The Basic requirements can be summarized as:

- Rectangular building
- Adequate space per cow
- Concrete feed/loafing area
- Wide access to bedded area
- Eaves height suitable for machinery
- Good ventilation
- Ample supply of bedding

A rectangular yard is most suitable. It allows a long concrete strip for feeding, watering and loafing. A wide

access to the bed should be provided and a bedded area that avoids unnecessary walking and disturbance to other cows. Collectively these benefits reduce poaching and help maintain a clean dry bed.

Space requirement is influenced by dairy cow size. See Table 2.

Table 2. Straw Yard Space Allowances

Body weight	Total space	Bedded area	Feed/loafing area
kg	m	m	m
600	7.5	5.5	2.0
650	8.0	6.0	2.0
700	8.5	6.25	2.25
750	9.0	6.5	2.5

The space provided is important to enable cows to behave in a relatively natural way. Cows prefer to have a space of at least 1m from other cows if not protected by some physical barrier. Arguably, space is of greater importance in a looseyard than in a cubicle house where individual cubicles provide a measure of protection.

Walls should preferably be solid to a minimum of 1.8m above maximum bed height. Floors can be flat or sloped, constructed of porous material or concrete. If concrete is not used, seepage into the surrounding ground may occur with the risk of pollution to underground water sources. Feed areas obviously require concreting and should be as flat as possible.

Good ventilation of the building is vital for maintenance of a dry yard because of the moisture and heat produced by cows and bedding. Yards require large amounts of bedding. For a 180 day winter, at least 1.5 tons of straw per cow must be provided.

Stocking density

The flexibility of a yard is often exploited in that too many cows can be introduced. Overcrowding leads to stressful conditions including aggression and disturbance, trodden teats and teat lesions occur and the bedding becomes wet and dirty. Dirty conditions are associated with outbreaks of mastitis caused by environmental organisms. A recent survey (5) implied a slightly higher incidence of mastitis in looseyards than in cubicles. Inadequate ventilation is often a major failing and in addition to the effect on cow health, it contributes substantially to wetness of the bedding.

The quantity of bedding required and the labour requirement for spreading the bedding and cleaning out the yard is costly. However, yards can in some circumstances produce a solution to increasingly important environmental issues such as straw burning, pollution and smells associated with agitating slurry tanks and spreading slurry. A straw yard lessens the straw disposal problem at harvest time and it is a convenient and relatively inoffensive means of storing manure.

Well designed and managed yards are capable of producing good clean conditions for dairy cows and it is likely that the system will continue to be used in some parts of the UK.

Cubicles

In spite of the widespread use of the cubicle, which in itself is evidence of the advantages of the system, no single design has emerged as totally successful. The aim is a simple one; to allow cows to lie undisturbed with minimal risk of injury and in clean conditions.

The basic requirements are:

- Sufficient space
- Wide passages and gateways
- Alternative routes
- Non-slip floors
- Efficient ventilation
- Loose box facilities.
- A dry bed

Cows are sociable animals but their performance is adversely affected by overcrowding. They need enough space to lie down comfortably and walk around without conflict with other cows. It is essential that there are as many cubicles as cows. Layouts should include alternative routes between lying and feeding/watering areas so that dominant cows cannot cause obstructions. Passages and doorways must be wide enough and floors not slippery to avoid injury.

Cubicle base

Ideally the base should be firm, durable, free draining and easy to clean. Concrete is the most economic and durable material.

Healthy cows have surplus body heat and in well ventilated buildings where some form of bedding material is used, the amount of heat lost to the floor is not critical. Insulation of bases is therefore of no benefit. Concrete is best laid 100mm thick on consolidated hardcore and the surface finished with a wooden float. Deep tamping ruts or projections should be avoided.

Natural materials, eg chalk or soil are used but often break up and form uncomfortable and sometimes, wet beds.

ADAS studies (3) have shown that except where the bedding to be used is sand, the base should not be provided with a raised lip or kerb at the end to retain the litter. Raised lips increase bedding wetness. A front to rear slope of 100mm has been shown to reduce the soiling of beds by preventing the recumbent cow moving too far into the cubicle and is to be recommended (4).

Size

Inadequate length is the main reason why some cows refuse to use cubicles. Some only partially lie in the cubicle and have difficulty rising. Length should be suitable for the majority of cows in the herd. In practice this means it should suit the larger cows not the average. Photographic studies of cow movement (1) have shown that the forward space demand of an 800 kg cow when rising ranges from 0.7m to 1.0m.

Table 3 gives recommended dimensions for a range of cow sizes. The trend to heavier cows calls for a clear width (not centre to centre) of 1.2m in most cases. With space sharing divisions clear width can be reduced to 1.1m or 1.0m for small cows.

Table 3. Cubicle Size

Body Weight kg	Cubicle length m	Cubicle width (clear) m
425	2.04	1.1
525	2.12	1.1
625	2.20	1.2
725	2.28	1.2
825	2.33	1.2

Divisions

Provided the length and width are suitable for the cow size, a number of designs of division are satisfactory. However, where space is limited, many designs can be restrictive to pelvis and head and do not allow space sharing. The continued increase in cow size has resulted in this situation occurring on many farms and in response a number of alternative division designs have been introduced and attempts made to modify existing divisions.

The so called Dutch comfort division allows space sharing between adjacent cubicles and greater freedom of movement for cows when lying down or rising. Cantilever divisions can be made adjustable for width and can provide flexibility in the use of the building. Critical dimensions common to all include top rail height of at least 1050mm (prevents cows from turning around) and a lower rail height of 400mm from the base (prevents cow getting trapped or bruising their rib cages).

ADAS studies (7) have shown how cubicle divisions can be successfully modified by replacing the lower rail with nylon rope. Where cubicles are too short, removing solid fronts or adjusting front rails gives cows a 'launching space'.

Headrails and brisket boards

Headrails are necessary in most installations. They must however be easily adjustable and not interfere with cows when rising or lying down. Brisket boards have been successfully used in conjunction with headrails in controlling cow position when standing or lying down and can reduce soiling of the beds.

Layout

Cubicles and passageways are best in straight runs to allow easy movement of cows and cleaning of passageways. Clearways, at least two cubicles wide and preferably three, should be provided for every run of 20 cubicles. Clearways are suitable locations for water troughs. A badly positioned trough is a common cause of dirty beds. Ventilation of buildings is frequently incorrect. Many buildings imitate wind-tunnels whilst others have insufficient air openings. Protection from driving rain or severe draughts should be provided to ensure there is no reduction in the numbers of useable cubicles. Lack of outlet ventilation is particularly common in the UK.

Cow Behavior

Under good conditions particularly during grazing cows lie down for up to 14 hours per day. Higher yielding cows in early lactation were seen to lie down for longer periods than low yielding cows (2) especially when ambient tem-

peratures fell during the cold part of the winter. The extended lying times had the effect of raising the temperature of the bedding beneath the cow to incubation temperatures on a number of occasions. The effect on bacterial teat challenge needs to be considered.

Other trials showed that cows laid for twice as long on concrete beds fitted with cow-matting or concrete generously bedded with straw than they did on bare concrete. Prolonged standing requires energy and exposes hooves to slurry for longer periods.

Discussion

The last three decades have witnessed rapid changes to the systems of housing dairy cows in the UK. On reflection the transformation from cowsheds to straw yards and cubicles may have been too rapid, particularly in the early days, for the necessary design principles and husbandry techniques to have been learned.

Most cows in the UK are now housed in cubicles. Many cubicles were installed 10 or more years ago during which time cow size has increased due to breed changes and improved diet. As a result, it is not uncommon to find cubicles too small for the cows they house.

Considerable information is now available on the needs of the dairy cow and how best those needs can be met by cubicle design, by modifications, and by improved management.

This paper has concentrated only on the design of housing systems. It can be argued that the success of any housing system depends upon its management, and good management frequently overcomes housing inadequacies. It must also be argued that the main effect of housing cows is to increase teat contamination and the risk of mastitis infection by environmental pathogens through high exposure from bedding.

In addition housing generally results in higher bacterial counts of the milk produced. It is therefore necessary to understand the important interaction between housing and milking. Clean teats are necessary for clean milk production. Modern milking parlour routines allow minimal time for teat washing and drying. Experience in the UK suggests that where housing is poor, farmers and herdsmen are reluctant to extend teat preparation times during milking. The result can be reduced teat hygiene standards. Teats when presented for milking must require the minimum of preparation; the housing system has therefore the main responsibility for the maintenance of high standards of teat cleanliness.

There are also important welfare considerations. The dairy farming industries of the world must recognize not only the welfare needs of dairy cows, but also be aware that consumers expect that dairy cows which produce the products they purchase, are housed and cared for in good circumstances.

Systems of housing designed and managed to a high standard will meet that requirement.

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Mastitis Therapy: Rationale for New Routes and Regimens of Treatment for *Staphylococcus aureus* Mastitis

W.E. Owens

Hill Farm Research Station, Louisiana Agricultural Experiment Station
Louisiana State University Agricultural Center, Rt. 1, Box 10, Homer, LA 71040

The poor response of *Staphylococcus aureus* mastitis to antibiotic therapy is a major area of concern for veterinarians, dairy farmers, and mastitis researchers. Reported therapy success ranges from 15 to 70%, with less than 50% efficacy commonly expected. Reasons for this poor success include poor penetration of antibiotics into areas of scarring and inflammation (1,9), inactivation of antibiotics by milk and serum components (4), intracellular or metabolically inactive organisms (2), bacterial L-forms (3), resistance to antibiotics, and improper treatment procedures.

The poor response of chronic *S. aureus* mastitis to therapy often requires the dairy farmer to resort to culling as his only effective treatment. When antibiotic therapy is attempted during lactation, it is generally via intramammary infusion of two or three doses of a lactating cow product at 12 or 24 h intervals. The question is, are these therapy recommendations adequate in the face of such poor results?

Current treatment recommendations for lactating cows vary somewhat depending on the source of information.

Generally they include:

1. Infuse an approved product at 12 or 24 h intervals for up to 3 treatments.
2. Milk cow out completely prior to treatment.
3. Consider repeated massage and milk out of infected quarters possibly in conjunction with oxytocin. (Primarily done when coliform mastitis is suspected).
4. Systemic administration of a compatible antibiotic in conjunction with intramammary infusion (again usually reserved for coliform mastitis).
5. Culture when possible, prior to initiation of therapy, to determine ID and susceptibility of organism.

Two primary concerns when treating during lactation are protection of the milk supply from adulteration and return of the cow to profitable production as soon as possible. Unfortunately, both of these legitimate concerns argue for lower dosage and fewer treatments, and may contribute to the poor success of therapy.

Recent pharmacokinetic and tissue antibiotic concentration studies (6,7,8) suggest that further evaluation of sys-

temic therapy either alone or in combination with more traditional intramammary infusion of antibiotic is warranted. Infused antibiotic often does not penetrate the mammary gland completely, and deep-seated intramammary infections such as those typified by *Staphylococcus aureus* may often be exposed to an inadequate concentration of antibiotic for an insufficient length of time to be effective.

At the Hill Farm Research Station we are studying the combination of intramammary infusion with intramuscular injection. This, of course, is not a novel idea as many veterinary practitioners have traditionally used various antibiotic combinations. Our objective was to conduct controlled studies to investigate the efficacy of combination therapy and to determine how much antibiotic was actually reaching the deeper mammary tissue.

Efficacy of combination therapy

We have previously reported that in a study involving 49 lactating cows with 78 quarters subclinically infected with *S. aureus*, combination of intramammary infusion of 62.5 mg amoxicillin with intramuscular injection of 9,000,000 U procaine penicillin G proved to be more efficacious than infusion of amoxicillin alone (5) (Table 1). Infusions were administered at each milking for 6 milkings while intramuscular injections were given once daily.

Table 1. Comparison of intramammary infusion plus intramuscular injection with intramammary infusion alone.

	Group1 ¹			Group2 ²		
	Treated	Cured	(%)	Treated	Cured	(%)
Quarters	40	10	25.0	35	18	51.4*
Cows	23	7	30.4	25	12	48.0*

*Percent cured for group 2 was greater than for group 1 ($P < .01$).

¹Infused with 62.5 mg amoxicillin at each milking for 3 d.

²Infused at each milking for 3 d with 62.5 mg amoxicillin and injected once daily intramuscularly with 9,000,000 U procaine penicillin G for 3 d.

Combination therapy resulted in bacteriologic cure of 51% of quarters and 48% of cows compared with 25% of quarters and 30% of cows for intramammary infusion alone. All of the quarters in this study were chronically infected, having failed therapy at least once prior to the study. Often, quarters destined for cure continued to shed viable bacteria for 48 h after initiation of therapy and uncured quarters often yielded bacteria throughout therapy. If therapy had been discontinued at 48 h as is often recommended, it is likely that the number of cures would have been even lower.

A disturbing observation from these and other such experiments was the continued presence of viable bacteria in milk samples despite the presence of inhibitory antibiotic levels. This phenomenon has been observed with all the combinations studies to date. It appears that a certain population of the infecting *S. aureus* is not easily killed by the antibiotics even when concentrations above the *in vitro* minimum inhibitory concentration (MIC) are present. These strains are not resistant in the classic sense, for when they are allowed to grow on blood agar and tested *in vitro*, they are susceptible to the antibiotics in question. Apparently, such organisms are protected in some manner in the mammary gland and survive what should be lethal antibiotic concentrations.

Bacteria growing within the mammary gland differ considerably from the same organism grown *in vitro* on laboratory media. Characteristics altered by changes in growth conditions include:

- A. rate of growth
- B. cell wall thickness and composition
- C. expression of capsule
- D. hydrophobicity
- E. toxin production
- F. antigenicity

Changes in such parameters may significantly impact the susceptibility of mastitis pathogens to antibiotics. Current *in vitro* susceptibility tests do not account for changes in susceptibility due to *in vivo* conditions. We must begin to consider more carefully what occurs *in vivo* when planning new treatment strategies.

We must also remember that antibiotic therapy is just one aspect of a good mastitis control program. It cannot control mastitis alone, particularly if the other aspects of mastitis control such as teat dipping, properly functioning machines, and good management are ignored.

Summary

Staphylococcus aureus mastitis continues to be a major problem to the dairy industry, and is the most difficult of the common mastitis pathogens to treat successfully. Recent research indicates that routes and regimens of mastitis therapy be reevaluated with particular emphasis on determining which antibiotics achieve sufficient concentrations in tissue, and which doses and routes are best. There is also a need for *in vitro* tests that better simulate and predict *in vivo* activity of antibiotics against mastitis pathogens.

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Got a testing problem? Ask Ginn

Roy Ginn has served the industry locally by heading a top-notch laboratory. However, his real contribution has come from his participation and leadership on national boards and committees.

Few people deal with all facets of the dairy industry, but Roy E. Ginn, general manager of the Dairy Quality Control Institute (DQCI), successfully works with producers, processors, researchers, manufacturers and government officials.

The institute, located in Minneapolis, MN, is unique because it services all parts of the industry. Its credibility and accuracy are known nationwide, due, in part, to Roy Ginn's leadership.

Ginn received his bachelor of science degree from Penn State College in dairy manufacturing in 1951. After graduating, he worked with the federal milk marketing order administrator, Sealtest Foods and operated his own lab, Pittsburgh Control Laboratory before joining DQCI.

After 26 years at DQCI's helm, Ginn is retiring with the lab expanding into new areas with a broader clientele. The institute, often referred to as "Ginn's lab," and Ginn's work in servicing all members of the dairy industry has been highly successful.

In 1965, Ginn was hired to manage the Quality Control Committee by Dr. J.C. Olson, a bacteriologist at the University of Minnesota. The committee was formed by Dr. Harold "Jo" Macy, in 1936 as a solution to the concerns of Minneapolis-area processors and producers about milk quality.

Previous testing methods were varied and inaccurate. The results from area plants were published in the paper weekly, causing consumers to doubt the consistency of milk quality. With the cooperation of the university, processors and dairy farmers wanted to improve milk quality and ease consumer concerns. Headed by University of Minnesota staff, the committee obtained a

contract with the federal order administrator to check test processors in the Minneapolis-St. Paul area. This standardized the testing procedures for the area.

Under Ginn's leadership, the committee incorporated into the Dairy Quality Control Institute, a nonprofit organization, in 1970. The board of directors is made up of university staff and representatives from cooperatives and processing plants. In 1970, DQCI represented 5,000 dairy farmers and 19 processing plants.

Testing milk quality . . .

Various forms of testing go on currently at the lab. DQCI still holds its contract with the federal order administrator to test producer and processing plant samples in the Twin Cities market. It is one of the few regions where a federal lab does not do the milk marketing testing. This form of testing is done by random checks on cooperatives and plants.

The lab also tests milk samples for regional cooperatives and processing plants. Mergers have decreased the number of cooperatives serviced. Cooperatives had been doing their own testing of farm samples, but, recently, the increase in costs for labs, equipment and personnel has caused them to return to an outside lab. The institute now works with five processing plants, and dairy farmers now number 5,000.

When the number of processors and dairy farmers needing services began to decline, Ginn led his lab team into different areas. The institute began preparing samples that serve as standards for other laboratories. Samples are prepared at milkfat levels between 2.5 and 5.8 percent. They are then shipped to labs and serve as standards so lab personnel in the labs can check the equipment and technique for accuracy.

The increase in demand for component samples caused DQCI to form a profit subsidiary called DQCI Services, Inc., in the early 1980's. They are not the only lab which provides this service, but they control a large portion of the market, according to Ginn. The standard samples are shipped to laboratories across the country and, soon, around the world.

Continual research at DQCI . . .

DQCI's work has never ended with testing. Continual research and the developments of new methodologies continues at the lab, orchestrated by Ginn. He has authored or co-authored over 40 papers in an effort to increase the accuracy and efficiency of milk testing.

In 1968, Ginn's lab was the first in Minnesota to install a Milko-Tester, a machine that revolutionized the testing of milkfat, replacing the Babcock method. The Babcock method has an accuracy of 0.1 percent, and the improved Milko-tester has an accuracy of .06 percent. Ginn worked with Dr. Vernal S. Packard, a researcher in Food Science and Nutrition at the University of Minnesota, to test the accuracy of the machine.

"People told us it would never work. But it did, and it gave the farmer a more accurate account of his milkfat reading," Ginn said.

Ginn also worked with the Coulter Counter, the first machine used to test somatic cells counts in milk. By working to improve its accuracy, Ginn helped the machine be approved as a standard method of testing.

In the 1980's, Packard and Ginn began to find more accurate ways to test the milkfat percentage. They developed control standards for the infrared tester which tests samples for fat, protein, lactose, solids and somatic cells at the rate of 300 per hour. This machine can be expected to be accurate up to .03 percent.

"Of all the work Roy and I have done together, the development of infrared control samples has been the most helpful to developing accurate testing for the dairy industry," Packard said.

Ginn also has worked on testing for antibiotics. Together with industry colleagues, a national testing system for antibiotics was developed and approved by FDA.

Ginn said, "Everyone is aware that we want to keep antibiotics out of milk. This year, the National Conference on Interstate Milk Shipments added regulations to control antibiotics in milk. Although we always have done a good job on milk quality, this added testing increases consumer confidence."

Ginn's dedication to the dairy industry does not stop in the lab. He has served on various national councils, committees and boards in an effort to keep high milk quality standards.

Ginn has served on the executive board and is currently the head of the lab committee for the National Conference of Interstate Milk Shipments. This committee brings together members from industry, government and laboratories to set the standards for Grade milk.

Ginn also has been president and on the executive board of the International Association of Milk, Food and Environmental Sanitarians (IAMFES). This organization serves as an educational body to bring together university and other industry people to share new methodologies.

Ginn also has been involved with the National Mastitis Council, the Minnesota Technology Society and the Minnesota Sanitarians Association.

Ginn shows dedication in his family life. He has been married for 42 years to his wife, Marty. They have four children and six grandchildren.

Runs a good shop . . .

To Ginn, the work outside the lab is worth it. "It is my life. I want to improve the technique and methods; I want to get the best test possible. I just try to keep DQCI credible and run a good shop," Ginn said. Others agree that "credibility" has led to his success.

Ginn has kept the lab current with technology, and he always is looking to the future. He has moved the lab twice, in an effort to keep it up to scientific standards. He also is environmentally conscious. All clients who receive standardized samples from Dairy Quality

Services, Inc., are given discounts if they return vials and shipping boxes. The boxes are reused, and the containers are sent to recyclers.

"Dairy Quality Control is absolute first class, and that is because Roy Ginn doesn't accept less than quality," says Paul Nierman, formerly in charge of fluid operations at Mid America Dairymen. After serving on the institute's board of directors, Nierman has been selected as Ginn's successor as CEO. Nierman believes the tradition of quality will remain at the institute.

Ginn is the first to tell you that his lab's achievements were accomplished by his "team" of employees and colleagues. But the "team" will tell you that the captain's leadership has made a niche for quality testing in the dairy industry.

Rhonda Franck, Reprinted from Hoard's Dairyman, September 10, 1991.

Milk Industry Foundation Presents Teaching Award to Dr. Ronald L. Richter

Dr. Ronald L. Richter of Texas A&M University has been presented with the Dairy Manufacturing Teaching Award by the Milk Industry Foundation (MIF), Washington, DC, in recognition of his demonstrated ability as a teacher of undergraduate students.

The award, which consists of a \$1000 stipend and a plaque, was presented Aug. 14 at the 86th Annual Meeting of the American Dairy Science Association at Utah State University in Logan, Utah.

The biannual award has been presented by MIF since the mid-1950s, and is designed to foster and encourage excellence in undergraduate teaching in dairy processing programs. Recipients are chosen by a selection committee appointed by the American Dairy Science Association, Champaign, Illinois.

Richter is responsible for teaching dairy technology courses that include a course on dairying, two courses on dairy and food technology, and a course in sensory evaluation of food. Richter was instrumental in developing a pilot-plant laboratory for teaching dairy manufacturing courses. He has developed systems for students to review lectures using visual, auditory, and electronic aids.

Richter also regularly serves as advisor to the Dairy Science Club. As one student noted, "Dr. Richter had a very unique teaching style which encouraged the students to learn. As a result of Dr. Richter's involvement with industry personnel, he was able to bring to the classroom many examples of problems and situations that arose in dairy plants."

Richter received his B.S. in dairy science from South Dakota State University in 1966; his M.S. in 1967 from the University of Kentucky; and his Ph.D. in 1970 from Texas A&M University.

For more information contact Scott Ramminger at (202)296-4250.

Pasteurizer Operator Workshop Set for December

A three-day Pasteurizer Operator's Workshop has been set for December 17-19, 1991 at Penn State's University Park Campus. The workshop, developed by faculty in Penn State's Food Science Department in cooperation with the Pennsylvania Department of Agriculture, includes speakers from six equipment and supply companies. One day will be spent in the University Creamery using their latest short time pasteurizer system.

Enrollment is limited to 45, so please register early. The cost is just \$295. Checks should be made payable to Penn State and sent to the Pasteurizer Operator's Workshop, The Pennsylvania State University, 306 Ag. Administration Building, University Park, PA 16802.

To receive a program or for more information call (814)865-8301, FAX (814)865-7050. For specific information on program contact you may contact Sidney E. Barnard (Sid), program chair, at (814)863-3915.

Foodservice Systems Beyond the Year 2000

The Israel Dietetic Association is sponsoring the International Conference on *Foodservice Systems Beyond the Year 2000*. This conference will be held at the Hilton Hotel in Jerusalem March 29-31, 1992 as a satellite of the XIth International Congress of Dietetics. An exhibition is also planned.

On the third day of the conference the program committee has planned study tours to various parts of the country to see foodservice industries that may be of particular interest to you, such as kibbutz catering, hospitals, hotel chains, defence oriented establishments, radiation and food packaging industries, etc.

We expect experts from tens of countries to participate and contribute to the success of this conference. We hope that you will join us in Jerusalem.

For more information contact Aryeh Lewis, Conference Secretariat, POB 574, Jerusalem 91004, Israel. Tel: 972-2-864870, FAX: 972-2-868165.

A & B Launches Sani-Fab

A & B Process Systems Corp. has established Sani-Fab Process Equipment, a division that will focus strictly on stainless and high alloy steel fabrication and machining.

Sani-Fab custom-manufactures Clean-In-Place (CIP) units, skid-mounted process systems, process vessels, transfer panels, high temperature-short time equipment, electrical enclosures and consoles, platforms, ductwork, and related process components.

Fabrication has been one of many services offered by A & B, a Stratford, Wisconsin company established in 1973. A & B will continue to concentrate on process flow systems engineering, process mechanical installation, and control systems engineering and implementation. The company provides services nationwide to major corporations in the dairy, beverage, foods and pharmaceutical industries.

"Initially, fabrication was provided as a part of our total services, with an emphasis on our design and installation services," said A. Jay Hilgemann, president of A & B. "By focusing on customized process equipment, Sani-Fab will broaden the scope of our production capabilities, process application expertise and overall produce and service offering. This will allow us to better serve our customers, and to compete in a vastly changing marketplace."

For more information contact Brian Gehrke at (715)687-4332.

Silliker Offers New Food Microbiology Short Course

Silliker Laboratories Group, Inc. offers a second presentation of its well-received short course, "*Principles of FOOD Microbiology*," in San Antonio, TX, on January 7-9, 1992 at the Sheraton Gunther Hotel, 205 E. Houston Street.

This two and one-half day lecture is designed for practicing food technologists responsible for the microbiological safety and quality of food and for those individuals whose job function requires a knowledge of these areas. The registration fee is \$755 and participants who register by November 7, 1991 can take advantage of the \$675 *early bird* registration fee.

Designed and coordinated by Dr. John H. Silliker, the course combines lectures, discussions, and informal evening meetings to provide a basic understanding of the factors that affect microbial growth in the safety and survival of food products. Special emphasis is placed upon the microbial ecology of foods, the influence of processing techniques on microflora, and the influence of these factors on the safety and quality of various foods.

A number of highly respected food industry professionals will serve as lecturers for various presentations. They include: Dr. Damien A. Gabis, Dr. Russell S. Flowers, Dr. Richard B. Smittle and Dr. Ranzell Nickelson II, of Silliker Laboratories; and Dr. Carl Vanderzant, professor emeritus, Texas A&M University.

Founded in 1961, Silliker Laboratories provides chemical and microbiological analyses, technical and consulting services, research and informational services related to the safety, stability and nutritional value of food. Silliker Laboratories are located in Chicago Heights, IL, Columbus, OH, Garwood, NJ, Stone Mountain, GA, Sinking Spring, PA, Carson, CA, Hayward, CA, San Antonio, TX, College Station, TX, Grand Prairie, TX, and Mississauga, Canada.

For additional information and to register for "Principles of FOOD Microbiology," contact Silliker's short course registration at (708)756-3210 or write, Attn: Short Course Registrations, Silliker Laboratories Group, Inc., 1304 Halsted Street, Chicago Heights, IL, 60411.

New Book Cuts Through The Rhetoric Surrounding Food Safety Issues

Rising above the controversies and debates, *Food Safety* proves a clear, accurate, and unbiased presentation of current food safety data. From naturally occurring food toxicants to commonly used additives and preservatives, this book covers the whole spectrum of food safety issues.

Food Safety enables the reader to access in one readily available volume, the vast range of information on contemporary food safety issues. *Food Safety* presents a balanced analysis of the data, detailing both the benefits and risks associated with food production practices. This reasoned, scientific approach to food safety will be appreciated by food industry professionals, technicians, and researchers and will be of particular interest to dietitians, food technologists, microbiologists, toxicologists, nutritionists, home economists/human ecologists, food writers and editors, sanitation specialists, and food industry professionals in legal, marketing, and management positions.

Food Safety is written by Julie Miller Jones, Ph.D., professor of Foods and Nutrition at the College of St. Catherine, St. Paul, Minnesota.

Content Overview

- Regulating Food Safety
- Establishing The Safety of Food Components
 - What is Risk?
 - Naturally-Occurring Food Toxicants
- Bacteriological Problems Occurring in Food
 - Molds and Mycotoxins
 - Parasites, Viruses, and Toxins
- Food Processing Effects on Nutritional Quality and Food Safety
 - Food Additives
 - Food Colors and Flavors
 - Food Irradiation
 - Pesticides
- Incidental Contaminants in Food
 - Radionuclides in Food
 - Food Safety

Food Safety is available at a special prepublication discount price of \$42 until November 30, 1991. List price after that date is \$48. 6" x 9" hardbound format; ISBN 0-9624407-3-6.

To order this new book simply make checks payable to Eagan Press, and mail to 3340 Pilot Knob Road, St. Paul, MN 55121-2097. Or call toll-free 1-800-328-7560 in the U.S. from 8:00 a.m. to 4:00 p.m. (CST). In Minnesota call (612)454-7250. Telex (MCI/UW) 6502439657; Facsimile (612)454-0766.

Food Safety is published by Eagan Press, which specializes in Food Science publications. A photograph of the book is available upon request.

Food Labeling Reform: A Progress Report

Today's food shopper, influenced by more nutrition information than ever before, faces confusing choices. In competition for the nutrition-conscious shoppers' food dollars, the industry tries to give consumers what they perceive to be healthier choices. For example, frozen yogurt is labeled "97 percent fat free" and salad oil, "no cholesterol." Most of these labels are accurate, but misleading. Vegetable oil never did contain cholesterol, and frozen yogurt may be 97 percent fat-free by weight, but many of its calories come from fat.

Even more basic information, such as the ingredients in mayonnaise, macaroni and bread, is also important to today's consumer. These and other foods, based on recipes set by the Food and Drug Administration as long ago as 1930, had been considered "standard" and by law were exempt from the requirement to list ingredients. But most of today's cooks don't make their own bread and other basics, and can't pull up ingredients from memory like their parents could.

Responding to the need for more useful information on food labels, FDA in 1989 called for changes that would more accurately reflect advances in nutrition science. The agency held nationwide hearings to find out what consumers and industry wanted to see on food labels, and early in 1990 began publishing proposals for new regulations.

In announcing the reform initiative, Health and Human Services Secretary Louis W. Sullivan, M.D., said, "The time is ripe for a change in the food label, and the FDA has proposed some good, sound regulations that should help ease much of the confusion—and, best of all, help us get the information we need to eat healthier diets."

Almost concurrently with the FDA proposals, the Nutrition Labeling and Education Act of 1990 became law. FDA views the new law as supporting its effort to reform food labeling. The legislation gives FDA's labeling initiative a solid legal base and an accelerated timetable.

The timetable is important because the new law specifies that if the rules are not finalized by Nov. 8, 1992, the pending FDA proposals will become the final regulations. Except for the addition of sodium content in the late 1980s and voluntary revisions by certain processors, FDA's food labeling regulations have remained basically unchanged for almost 18 years. Therefore, because of the number of changes necessary to bring food labels in line with the new law, FDA is proposing the changes in three phases.

Phase One: Ingredients, Juices, Produce, and Fish

Phase One was accomplished earlier this summer with the publication of three proposed regulations. The first, published on June 26, addresses ingredient labeling. In accordance with the new law, FDA is proposing to require the listing of all ingredients in all standardized

foods, and of all certified color additives by name. Other provisions of the ingredient labeling proposal would:

- Require food labels to explain that the list of ingredients is in descending order of predominance by weight.
- Require the listing of all sweeteners together in the ingredient list under the collective term "sweeteners," when more than one sweetener is used in a product. Following the collective term, each sweetener would be listed in parentheses in descending order of predominance by weight of the sweetener in the food.
- Require the declaration of protein hydrolysates, used in many foods as flavors and flavor enhancers. Most importantly for consumers with religious or cultural dietary requirements, the declaration must identify the food source of the additive. For example, if hydrolyzed milk protein is added to canned tuna, the ingredient statement should declare it in that manner and not by the general designation "hydrolyzed protein."
- Require the label to identify caseinate as a milk derivative when used in foods that claim to be nondairy, such as coffee whiteners, because some people with milk allergies use nondairy products.
- Provide a uniform format if a processor chooses to declare ingredients by percent of content. The percentages would be based on weight rather than volume, to avoid inconsistent calculations. Firms could use percentage declarations for as many or as few ingredients as they choose, as long as the information is not misleading.
- Require label declaration of sulfiting agents present in standardized foods. Some people are allergic to these preservatives.

The proposal also calls for comments from all interested parties to improve the readability of ingredient information on the labels, particularly concerning such questions as type size and placement of major and minor ingredients.

The other two proposals, published July 2, 1991, relate to the labels on fruit and vegetable juices, and to nutrition information for the most popular raw fruits, raw vegetables, and raw fish. The first would require the percentage of actual fruit or vegetable juice to appear on the label of all juices, whether full strength or diluted. Multiple juice beverages that name or otherwise identify individual juices on the labels would have to declare the percentage of each of the identified juices.

In the second July proposal, FDA identifies the 20 most frequently consumed raw fruits, vegetables, and fish. For these 60 foods, the regulation would provide guidelines for retail outlets to make available to consumers nutrition information close to where the foods are displayed for sale. Initially, this information would be displayed voluntarily; then by May 1993, FDA would determine if enough retail outlets had displayed the nutrition information. If so, the guidelines would continue to be voluntary; if not, mandatory regulations would be written.

Final rulemaking on these three Phase One proposals is due by November 8, 1991.

Phase Two: Nutrition Content

Phase Two of FDA's food labeling reform involves the mandatory listing of information about a food's nutrition content on labels. While many processed foods have included nutrition labeling for many years, it has never been required across the board. Under FDA's reform plan, it now would be required on most foods that are meaningful sources of nutrients (not on most spices, for example). (And because they would be covered by in-store nutrition labeling, raw produce and fish are not a part of this Phase Two mandatory nutrition labeling plan.)

The Phase Two plan also would allow for a simplified nutrition labeling format when more than half of the required nutrients are present in insignificant amounts.

The list of required nutrients would be changed to include sugars and complex carbohydrates, and would simplify the language of some of the nutrients. For example, "saturated fat" would be used rather than "saturated fatty acids." The regulation would also require slightly modified nutrition labeling on vitamin and mineral supplements.

Nutrition information would be presented as quantitative amounts—for example, 4 grams of fat—or as percentages of certain dietary reference values. These values—Reference Daily Intakes (RDIs) and Daily Reference Values (DRVs)—would replace the U.S. Recommended Daily Allowances (USRDA) that have been used for many years. RDIs would provide consumers a basis to compare the protein, vitamin and mineral content of foods. DRVs would provide a similar basis to compare certain other food components (fat, fatty acids, cholesterol, carbohydrates, fiber, sodium, and potassium) that have been identified as especially important for the maintenance of good health. FDA continues to study how these values can best be presented on food labels.

FDA also is inviting the food industry to participate in a pilot program to test alternative nutrition label formats. FDA recently completed a contracted survey of 1,460 food shoppers in eight large and small urban areas. The shoppers were shown five different types of nutrition information labels and were asked to use the labels to identify certain information about the contents of the food packages. The label formats ranged from the currently used type to others that contained substantially more information, even including one label that was a bar graph, designed to give information at a glance. The current, almost 18-year-old format scored the best in enabling consumers to see nutrition differences among various products. Now FDA wants to test the formats in stores.

The pilot program will run for approximately 8 months, beginning in August 1991. FDA believes that involving the industry and consumers in the selection process will encourage consumer education and foster acceptance of the selected label formats by both groups.

Also part of Phase Two is an FDA analysis of the potential benefits and costs of the entire labeling reform initiative, including its impact on small businesses. Early estimates have placed the cost to food manufacturers at \$1.3 billion over the next two years. (Estimates have not yet been developed for the restaurant industry.) Conservative projections place the potential benefits of reduced medical costs and increased productivity from a healthier diet at \$3.6 billion over the next 20 years.

The Phase Two proposals are scheduled to be published by November 8, 1991.

Phase Three: Nutrient Claims, Health Claims, Serving Size

Phase Three of the labeling initiative, also planned for proposal in the *Federal Register* by November 8, 1991, will include proposals for nutrient content claims (such as "low cholesterol"), health claims, and serving sizes.

Nutrient content claims will be addressed in two proposals. The first will cover the use of labeling claims regarding specific nutrients, such as fiber, vitamins, minerals, sodium, and calories, as well as terms such as "light" and "fresh."

The second proposal will address fat, fatty acid, and cholesterol content claims. FDA is concerned that claims that a product is "cholesterol-free," "low cholesterol," or "X-percent fat-free" are leading people to believe that the food itself promotes good health or that they can eat as much of it as they want. Many foods labeled that way either are no different from competitive brands, in that the type of food *never* contains cholesterol (for example, vegetable oil), or misleadingly base fat claims on a percentage of the product's weight. But when the fat content is related to the calories in the product rather than the weight, it can be seen that a high percentage of the calories in these foods come from fat. Therefore, FDA nutritionists believe the labels on foods high in calories from fat are misleading consumers with low-fat claims based on weight.

If restaurants use the terms in the first or second proposals, the law requires that they follow the agency's definitions.

The Phase Three proposal on health claims would allow such claims only if there is a valid relationship between the nutrient and the disease in question. Topic areas being considered by FDA are calcium and osteoporosis; sodium and hypertension; fat and fiber in cancer and cardiovascular disease; folic acid and neural tube defects; antioxidant vitamins and cancer; zinc and immune function in the elderly; and omega-3 fatty acids and heart disease. If available scientific data support the health claims on any of the topics, and if experts generally agree that the claims are supported, then FDA will publish a separate proposal for each claim.

In order to fully understand and compare nutrition labels, consumers need a consistent and reasonable serving size declaration as a point of reference. So FDA, on July 19, 1990, published a proposal to define serving and portion sizes on the basis of the amount of

152 different types of foods commonly eaten in one serving. The agency received many comments on that proposal, so on April 4, 1991, it held a public meeting to gather additional information for a supplementary proposal. The agency is now revising the proposal to reflect FDA's consideration of all the public comments, plus recommendations from the National Academy of Sciences' Institute of Medicine and the additional requirements of the Nutrition Labeling and Education Act. This new serving size proposal is also scheduled to be published as part of Phase Three by November 8, 1991.

As a final part of Phase Three, in mid-1992, after FDA finishes its label format surveys, the agency will publish a proposal that would require the use of a design that appears to most accurately and completely inform consumers of the nutritive content of foods.

To comply with the Nutrition Labeling and Education Act, FDA plans to publish the final versions of all these regulations by November 8, 1992. Food manufacturers would then have until May 8, 1993, to begin producing products with the new labels.

As FDA moves forward with the various phases of the food labeling initiative, it is also developing a major public education campaign to inform consumers on how to get the most from the new food label. This campaign would fulfill the provisions of the Nutrition Labeling and Education Act that directs the Secretary of Health and Human Services to educate the public about the new labeling requirements.

FDA Approves First New Pasteurization Test Since 1953

New highly sensitive testing method will allow dairy industry to raise quality control standards.

The Food and Drug Administration has ratified the first new pasteurization test for milk and other dairy products since 1953, an action that allows dairy processors to significantly improve quality control. The new testing method can detect more subtle pasteurization defects than existing methods and will better protect consumers from outbreaks of salmonella and other bacteria-borne diseases.

The new, patent-pending Fluorophos* Test System from Advanced Instruments, Inc. of Needham Heights, Mass., is 50 times more sensitive than the traditional colormetric (Scharer Rapid) method, making it possible to spot ultra-low levels of raw milk contamination in "Grade A" pasteurized milk that were previously undetectable.

Dairy processors that ship products across state lines and state regulatory agencies now are free to use the new fluorometric test instead of the widely used colormetric method. Advanced Instrument's new test measures alkaline phosphatase (ALP), a reliable indicator

of whether milk and other dairy products have been fully pasteurized.

"The Fluorophos Test System is highly sensitive," said Dr. Richard Rocco, Advanced Instruments product manager. "It allows milk processors to detect a problem as it is developing, rather than after it's too late, when thousands of gallons of milk must be destroyed."

"It's like an oil gauge vs. an 'idiot light' on a car's dashboard. Once the light comes on you already have a problem," continued Rocco. "In addition, the new test takes only three minutes to run compared to between 30-minutes and one hour for a typical colorimetric test."

The new testing method is an important breakthrough for the dairy industry and consumers for two reasons:

1) It allows dairy processors to detect traces of raw milk in pasteurized milk samples at levels well below the 0.1 percent (one gallon of raw milk per 1,000 gallons) limit. By detecting a minute increase in the percentage of raw milk present, processors can spot a problem well before it reaches the 0.1 percent level.

2) It also allows dairy processors to improve their quality control standards. By monitoring raw milk below the 0.10 percent limit - to levels as low as 0.003 percent - a processor will be able to better protect against outbreaks of bacteria-borne disease.

Before being considered by the FDA, Advanced Instrument's new ALP test received approval from the Interstate Milk Shippers (IMS) on April 26. Prior to IMS approval, the test was approved by the Association of Official Analytical Chemists (AOAC) in November 1990. The AOAC reviewed extensive documentation and conducted a full collaborative study on the test in nine laboratories.

Now that the test has been approved by all three regulatory bodies, it will be incorporated into the 1991 Pasteurized Milk Ordinance (PMO), the rules and regulations set forth by the IMS to regulate dairy production in the U.S. The method now can be used by interstate dairy shippers and processors and state regulatory agencies, and meets the individual state regulatory requirements for all 50 states.

The Fluorophos Tests System has been approved to test whole milk, skim milk, and chocolate milk. The test also is effective on goat's milk, buttermilk, cream, cheese, ice cream, butter, whey, and casein, however, due to time constraints, it has not yet received approval in the PMO for these products.

Advanced Instruments is a leading supplier of specialized instruments for the dairy, food, and beverage industries. The company's Dairy and Food Technology division markets cryoscopes and other testing devices for dairy and food safety, including tests for completeness of pasteurization and antibiotic contamination. Founded in 1955, the privately-held corporation is based in Needham Heights, Massachusetts.

For more information contact Tom Kivett, Gulko Public Relations at (617)451-3255 or John Whiteside, Advanced Instruments, Inc., at (617)449-3000.

*Fluorophos is a registered trademark of Advanced Instruments, Inc.

Report of the NCIMS Executive Board

Final Conference Action

The NCIMS Executive Board met with FDA on July 25, 1991 in Louisville, Kentucky to resolve any non-concurrence of problems passed at the 91 Conference. Following is a summary of final actions passed during the Conference.

Only Problem 233 was not concurred with by FDA. Additionally, Problems 123, 143, 144 and 230 needed work concerning details for implementation. Editorial and minor modifications were suggested for Problems 216 and 232.

Problems passed which FDA concurred with include:

- 101- Change Somatic Cell Count to 750,000, implementation date July 1, 1993.
- 105- SCC for goat milk to remain at 1,000,000.
- 108 - Allow SPC to be used when sample of goat milk shows 14-16mm zone on B. *sterotherophilus*.
- 110 - Accept Fluorometric Procedure for phosphatase.
- 112 - Conference Chairman to appoint committee to study methods of disposal of milk adulterated with drugs and report to 93 Conference.
- 116 - Request FDA to issue memo.
- 127, 133, & 134 - NCIMS Chairman to appoint committee to work with FDA on suggested changes in point value for violations of drug labeling and storage requirements.
- 132 - Drug ingredients/add requirement to 16r to list active ingredients on drug label.
- 137 - Requires multi-use cases be cleaned prior to use.
- 142 - Adds time delay test to 2F of Appendix I.
- 202 - Add definition of drug & change antibiotic to drug where appropriate.
- 203 - Include sheep milk in PMO/referred to Goat Milk Committee.
- 206 - Amend definition of Ultra-Pasteurized & recommend study by "qualified entity."
- 213 - Requires commingled samples be taken by regulatory agency.
- 234 - Bulk Milk Pickup Tanker Inspection/Send problem to MMSR Committee for proposed solution at 93 Conference.
- 235 - Requires compliance with Appendix N to request a rating.
- 237 - Review point values for receiving stations/send to MMSR Committee for report at 93 Conference.
- 239 - Sets up laboratory quality assurance program for alternative drug testing procedures.
- 240 - Changes Laboratory survey sheet re: Electronic Somatic Cell Count reporting.
- 241 - Modify procedure for acceptance of Equivalent Tests.
- 243 - Conference Chairman to send letter to states not practicing reciprocity.
- 244 - Conference Chairman to appoint committee to assist FDA in acquiring equipment for HTST training.
- 304 - Conference Chairman to appoint committee to study methods of financing Conference activities.
- 305 - Change working of Procedures to allow state rating

officers certified for farms to qualify for rating receiving stations.

- 310 - Conference Chairman to appoint committee to study problem of including manufacturing grade milk in NCIMS.
- 313 - Sets up third party data base for reporting results of drug residue tests.

Problems with which the NCIMS Executive Board and FDA concurred at the July 25 meeting:

- 123 - Added "as accepted by FDA" after "other equipment."
- 143 - Study to be completed by FDA Moffett Center, Chicago.
- 144 - Final wording to be worked out with committee.
- 216 - Modified PMO page 40, Section 6A, Administrative Procedures: "4. Disc assay methods for drugs specified in Appendix G. In addition, methods which have been evaluated by AOAC and recommended by FDA at currently referenced levels shall be used for regulatory action for each drug of concern. FDA shall review the AOAC evaluation for each test kit and make a determination as to the acceptability of the use of the method in accordance with all applicable sections of this document. Regulatory action shall be taken on all positive results (see Appendix N). A result shall be considered positive if it has been obtained by using a method which has been evaluated and deemed acceptable by FDA at levels established in memoranda transmitted periodically by FDA as required by Section III of Appendix N." Approved PMO pages 13 and 42 to reflect changes.
- 230 - Committee to be appointed later.
- 232 - Approved changes in Appendix N: I.A.-add period (.) after months in next to last line and delete rest of sentence. Add new sentence "Samples collected under

this random sampling program shall be analyzed as specified by FDA." (see M-a-75). II.A.2.-delete "determined necessary at a" and add "and tested at the." II.A.3.-leave in "bulk milk pickup tanker" shown deleted in document. II. last line add after Section 6 "M-a-75." II.B.-Enforcement - add period (.) after guidelines in 6th line and delete "for diversion to animal feed use." III. Established Tolerances - change "agency's" at end of line 7 to "FDA". II.A.1.- delete "those" in second line preceding drug residues and add question mark (?) after residues and delete "determined to be necessary?" III. delete last paragraph and add substitute language "Industry may employ other methods which have been evaluated by the VPI which have been demonstrated to provide positive results, as described in Section 6A.4. These methods or equivalently evaluated methods may be employed until they have been evaluated through AOAC and accepted by FDA.

Approved PMO pages 11 and 38 Section 6 last paragraph to reflect above changes in problem.

Approved PMO Section 3 page 32 and 3rd paragraph of Administrative Procedures, Reinstatement of Permits, to reflect above changes in Problem.

Approved implementation date of January 1, 1992 for Appendix N. I. and III. Approved implementation date of July 1, 1992 for Appendix N.II.

Approved removal of "animal" from in front of drug throughout Appendix where appropriate. (FDA will revise).

233 - Accepted FDA's non-currence with understanding FDA will issue memoranda addressing anomalies found in water supplies.

239 - Approved language that goes with flow chart adopted by NCIMS.

Reprinted from National Conference on Interstate Milk Shipments Newsletter, August, 1991, Vol. 91.1.

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Food and Environmental Hazards to Health

Clean Air National Health Objective for the Year 2000

An important national health promotion and disease prevention objective for the nation for 1990 was that "virtually all communities should experience no more than one day per year when air quality exceeds an individual ambient air quality standard with respect to sulfur dioxide, nitrous dioxide, carbon monoxide, lead, hydrocarbon and particulate matter." However, this objective was not achieved. In 1989, approximately 84 million U.S. residents lived in counties where one or more of the U.S. Environmental Protection Agency air quality standards had not been met.

One of the national health objectives for the year 2000 is to increase from 49.7% to 85.0% the proportion of persons who live in counties that have not exceeded any air quality standard during the previous 12 months. Collaboration of industries and other employers, community groups, individuals, and all levels of government are needed to achieve this objective.

Another objective for the year 2000 is a reduction in asthma morbidity, as measured by a reduction in hospitalizations for asthma, to no more than 160 per 100,000 persons (baseline: 188 per 100,000 in 1987). Asthma affects approximately 10 million U.S. residents, and the reported prevalence of asthma is increasing. The report *Healthy People 2000* suggests that environmental factors (e.g., ozone and other air pollutants) may have contributed to the increasing morbidity and mortality. National progress in reducing air pollution should contribute to reductions in hospitalizations for asthma.

MMWR 5/3/91

Cholera — New Jersey and Florida

Through April 30, 1991, epidemic cholera has been reported from five countries in South America: Brazil, Chile, Colombia, Ecuador, and Peru. In addition, in the United States a total of 10 confirmed cases of epidemic-associated cholera have been reported in Georgia, New Jersey, and Florida. This report summarizes information regarding these cases reported in New Jersey and Florida.

New Jersey

From March 31 through April 3, eight residents of Hudson and Union counties developed profuse watery diarrhea after eating crab meat transported from South America. Five of the patients also reported vomiting, and at least three had several leg cramps; five were hospitalized. Ingestion of the crab meat was statistically associated with illness; of the 11 persons who attended the two meals where the crab was served, all eight who ate the crab meat became ill; the three who did not remained well ($p < 0.01$). Each of the patients

had onset of symptoms within 3 days of ingesting the crab meat. Stool samples from four of the eight patients yielded toxigenic *Vibrio cholerae* O1, serotype Inaba, biotype El Tor, the same serotype responsible for the epidemic in South America. In convalescent serum specimens obtained from the four patients who were culture negative, vibriocidal antibody titers were $>1:11280$, indicating recent *V. cholerae* infection.

The crab was purchased in a fish market in Ecuador, then boiled, shelled, and wrapped in foil. On March 30, it was transported into the United States, unrefrigerated, in a plastic bag on an airplane. It was delivered to a private residence, refrigerated overnight, then served in a salad on March 31 and April 1. No crab meat was available for culture.

All eight patients have fully recovered. No cases of secondary transmission have been reported.

Florida

On April 6, a woman with severe watery diarrhea was admitted to a Dade County hospital on her return from Ecuador. Although stool cultures were negative for *V. cholerae* O1, testing of acute and convalescent blood samples detected a 32-fold rise in vibriocidal antibody titers, indicating recent infection with *V. cholerae* O1.

The patient had traveled in Ecuador from March 27 through April 6. She reported eating raw oysters in Salinas Beach, Ecuador, on March 29 and ceviche on March 30; she also consumed ice during her stay. On April 2, she developed watery diarrhea with 30-40 stools per day. On return to the United States, she was admitted to the hospital. The patient recovered, and no cases of secondary transmission have been identified.

Editorial Note: Epidemic cholera had not been reported in South America this century until January 1991, when cholera appeared simultaneously in several coastal cities of Peru. As of April 29, 169,255 probable cholera cases and 1244 deaths in Peru had been reported to the Pan American Health Organization; cholera had also been reported in Ecuador (3898 cases and 140 deaths), Chile (26 cases), Colombia (176 cases), and Brazil (four cases). These cases reported in Florida and New Jersey bring to 10 the total number of confirmed cases in the United States associated with the epidemic in South America.

No reported cases of cholera have been linked to commercially imported food products. In New Jersey, the confirmed *V. cholerae* O1 infections resulted from consumption of noncommercial crab meat that had been grossly mishandled and illegally transported into the United States. Although it is unclear how the crab meat became contaminated, contamination may have occurred at harvest, at purchase, or after cooking. *V. cholerae* O1 can survive in contaminated crabs that are boiled for less than 10 minutes. Because *V. cholerae* biotype El Tor strains multiply rapidly at room temperature in cooked shellfish, the lack of

refrigeration during transport may have permitted growth of vibrios.

Previous cases acquired in the United States have been associated with undercooked crabs or raw oysters harvested domestically in the Gulf of Mexico. In the United States, secondary transmission from imported or domestic cases is unlikely because of the availability of safe drinking water and proper treatment of sewage.

The risk for cholera to tourists in affected areas is considered extremely low. Although it cannot be determined whether the source of infection in the traveler to Ecuador was consumption of raw oysters, ceviche, or contaminated ice or some other vehicle of infection, this case illustrates the need for travelers to areas with epidemic cholera to follow scrupulously the precautions described for prevention of travelers' diarrhea. The general rule "boil it, cook it, peel it, or forget it" has been proposed for preventing travelers' diarrhea. In particular, travelers to Colombia, Ecuador, and Peru should not consume 1) unboiled or untreated water and ice made from such water; 2) food and beverages from street vendors; 3) raw or partially cooked

fish and shellfish, including ceviche; and 4) uncooked vegetables. Travelers should eat only foods that are cooked and hot, or fruits they peel themselves. Carbonated bottled water and carbonated soft drinks are usually safe if no ice is added. *Cholera vaccination, which protects approximately 50% of vaccinated persons for 3-6 months, is not recommended for travelers and is not a substitute for scrupulously choosing food and drink.*

V. cholerae may not be isolated from stool samples of cholera patients if the samples are collected late in illness or after antimicrobial therapy is begun. Vibriocidal antibody titers peak 10-21 days after infection and can be used to confirm *V. cholerae* infection.

Travelers who develop severe watery diarrhea, or diarrhea and vomiting, during or within 1 week after travel to an area with known cholera should seek medical attention immediately. Physicians should request that specimens from suspected cases be cultured on media designed for isolation of *V. cholerae* and should report suspected cases of cholera to their local and state health departments.

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10. Extent and Nature of Circulation <small>(See instructions on reverse side)</small>	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total No. Copies (Net Press Run)	3,733	4,100
B. Paid and/or Requested Circulation 1. Sales through dealers and carriers, street vendors and counter sales	0	0
2. Mail Subscription <small>(Paid and/or requested)</small>	3,218	3,253
C. Total Paid and/or Requested Circulation <small>(Sum of B1 and B2)</small>	3,218	3,253
D. Free Distribution by Mail, Carrier or Other Means <small>Samples, Complimentary, and Other Free Copies</small>	9	9
E. Total Distribution (Sum of C and D)	3,227	3,262
F. Copies Not Distributed 1. Office use, left over, unaccounted, spoiled after printing	506	838
2. Return from News Agents	0	0
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11. I certify that the statements made by me above are correct and complete		
Signature and Title of Editor, Publisher, Business Manager, or Owner <i>Margaret Marble, Nat. Executive Manager</i>		
<small>(See instructions on reverse)</small>		

PS Form 3526, Feb. 1989

Updates . . .



Steven Halstead Earns Certified Association Executive (CAE) Designation

Steven K. Halstead, Executive Manager of the International Association of Milk, Food and Environmental Sanitarians, was one of 98 individuals who earned the Certified Association Executive (CAE) designation from the American Society of Association Executives (ASAE) in May.

Prior to certification, applicants are rated on their experience and accomplishments in association management and must successfully complete a comprehensive, one-day examination, which tests general knowledge of the association management profession. The 1991 Class brings the total number of association executives who have earned the CAE designation to over 1,900. Among association professionals, "CAE" is an indication of demonstrated skill in leadership, activity in community affairs, and expertise in association management.

The American Society of Association Executives, Washington, DC, is an individual membership society made up of more than 20,000 association executives and suppliers. Its members manage leading trade associations and professional societies across the country and also represent suppliers of products and services to the association community.

CORRECTION

The August 1991 issue of *Dairy, Food and Environmental Sanitation* featured an article entitled "Food Service Sanitation Guidelines to Avoid Food Poisoning Outbreaks" by Marvin E. Winston of Winston Laboratories, Ridgefield Park, NJ. This article actually was written by Mr. George A. Smith, Jr., R.S., Director of Public Health, Town of Lexington, Lexington, Massachusetts and published in the Lexington Board of Health Food Service Sanitation Programs Board of Health Food Service Sanitation Programs pamphlets. These pamphlets were first published in 1983 and revised in 1984, 1989, 1990 and 1991 by the Lexington Board of Health.

ATTENTION IAMFES MEMBERS

1992-1993 IAMFES ANNUAL MEMBERSHIP DIRECTORY

Advertising Space for the 1992-1993 IAMFES Annual Membership Directory is now available.

Once again, the Directory will feature **COMMERCIAL LISTINGS** in addition to listings of IAMFES Members, Associations and Government Agencies. **To Reserve Your Company's Listing in this valuable reference source:**

Complete the Post Card Insert (Both Sides) at the front of this magazine, and return to IAMFES with payment.

Deadline for Listings: January 3, 1992

Federal Register

Food Safety and Inspection Service

9 CFR Parts 318 and 381

[Docket No. 88-033P]

RIN 0583-AA95

Finished Product Inspection

Agency: Food Safety and Inspection Service, USDA.

Action: Proposed rule.

Summary: The Food Safety and Inspection Service (FSIS) is proposing to amend the Federal meat and poultry products inspection regulations to allow canning establishments more flexibility in complying with the regulatory requirements concerning finished product inspection of thermally-processed shelf stable canned product. The existing regulations allow establishments to use quality control programs to ensure compliance with the regulations. However, an association of processors expressed, in two petitions, that they have little flexibility in developing different, yet equally effective quality control procedures for finished product inspections, because the scope of quality control programs now permitted is limited by the regulations.

Dates: Comments must be received on or before November 25, 1991.

Addresses: Written comments to: Policy Office, Attn: Linda Carey, FSIS Hearing Clerk, room 3171, South Agriculture Building, Food Safety and Inspection Service, U.S. Department of Agriculture, Washington, DC 20250. (See also "Comments" under Supplementary Information.)

For further information contact: Mr. William C. Smith, Director, Processed Products Inspection Division, Science and Technology, Food Safety and Inspection Service, U.S. Department of Agriculture, Washington, DC 20250, (202)447-3840.

Supplementary Information: Executive Order 12291

The Agency has determined that this proposed rule is not a "major rule" within the scope of Executive Order 12291. It will not result in (1) an annual effect on the economy of \$100 million or more; (2) a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or (3) significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Effect on Small Entities

The Administrator has made an initial determination that this proposed rule will not have a significant economic impact upon a substantial number of small entities, as defined by the Regulatory Flexibility Act. (5 U.S.C. 601). Finished product inspections are conducted in accordance with §§ 318.309 and 381.309 of the Federal meat and poultry products inspection regulations. All canners of thermally-processed shelf stable meat and poultry products, therefore, have operating costs related to the requirements

of these sections of the regulations. The proposed changes would permit increased flexibility in developing effective quality control procedures for finished product inspections. Establishments choosing to continue complying with the existing regulations will not be affected by this proposal. Establishments voluntarily choosing to create different quality control programs would have to provide for at least the same level of assurance as that of the requirements in §§ 318.309 (d) and 381.309 (d) of the meat and poultry products inspection regulations. However, it is expected that such a voluntary quality control program would not be considered unless the establishment determines it is a more cost-effective procedure than previously existed.

Paperwork Requirements

Under this proposal, quality control programs may differ from the specific regulatory requirements if they are determined to be equivalent to the requirements or meet the intent of the requirements which is to provide assurance of the safety and stability of canned products. Currently, quality control programs must comply with the requirements of §§ 318.309 and 381.309 of the Federal meat and poultry products inspection regulations. The proposed rule would require establishments voluntarily choosing to develop a quality control program that is different from, but equivalent to, the requirements for finished product inspection, to submit quality control program plans to the Administrator for approval in accordance with §§ 318.4(c) and (d) and 381.145 (c) and (d) of the regulations. Establishments may develop a quality control program to address all or some of the requirements of §§ 318.309 and 381.309 of the current finished product inspection regulations. The information collection requirements contained in this rule have been submitted to the Office of Management and Budget for approval.

Comments

Interested persons are invited to submit written comments concerning this proposal. Written comments should be sent to the Policy Office and should refer to Docket Number 88-033P. Any person desiring an opportunity for an oral presentation of views as provided under the Poultry Products Inspection Act should make such request to Mr. William C. Smith so that arrangements can be made for such views to be presented. A record will be made of all views orally presented. All comments submitted in response to the proposal will be available for public inspection in the Policy Office during the hours of 9 a.m. and 12:30 p.m. and 1:30 p.m. and 4 p.m., Monday through Friday.

Background

The Agency has received two petitions from the National Food Processors Association (NFPA) to amend the Federal meat and poultry products inspection regulations to allow canning establishments more latitude in complying with the specific requirements contained in §§ 318.309 and 381.309 (9 CFR 318.309, 381.309) of the Federal meat and poultry products inspection regulations. Sections 318.309 and 381.309 of the regulations allow establishments to control all or part of finished product inspection operations with a quality control program or, in lieu of a quality control program, to follow all of the current requirements covering incubation procedures, monitoring container condition, and shipping. Currently, all establishments, whether or not they have quality control programs, must comply with all of the following requirements.

Establishments must sample at least one container for incubation from batchtype thermal processing systems and one container per 1,000 from continuous systems. Sample containers must be incubated for not less than 10 days (240 hours) at 95±5°F (35±2.8°C.) The finding of abnormal containers among incubation samples is cause to officially retain at least the code lot involved. Likewise, when abnormal containers are detected by means other than incubation, the affected lots cannot be shipped until the Program has determined that the product is safe and stable, meaning that the product was not contaminated or adulterated during processing and the product remains wholesome. Moreover, establishments cannot ship canned product before the end of the required incubation period unless the establishment has approval from the FSIS area supervisor of written procedures for preventing the shipped product from reaching the retail level of distribution before sample incubation is completed. The procedures must assure that the product could be returned to the establishment promptly should such action be deemed necessary due to the incubation results.

One of two petitions from the NFPA request revisions to the regulations that would permit establishments to ship product to retail outlets before the completion of incubation, provided they operate under an approved quality control program that exceeds certain elements of existing regulations. As an example, it suggested an augmented incubation program and development of a program for evaluating process deviations and the significance of abnormal containers found during incubation. The second petition from the NFPA requested that §§ 318.109 (d)(1)(iv)(b) and 381.309 (d)(1)(iv)(b) of the meat and poultry products inspection regulations (incubation sampling frequency for continuous-type thermal processing systems) be revised " ***to provide greater equality with the required minimum sampling rates for batch-type processing systems." The petitioner suggested that at least one container be drawn for incubation sampling at time intervals not to exceed the process time for the product. For example, if a particular product/container has a process schedule of 25 minutes at 250°F, then at least one incubation sample would be selected every 25 minutes. However, because some systems operate at a very high volume (e.g., several hundred containers/minute), the NFPA suggested a minimum sampling rate of at least one container for every 20,000 processed.

Both of the above-mentioned petitions are being addressed in this proposal. However, rather than amend current requirements for finished product inspection concerning sampling frequency and developing quality control requirements specifically for shipment of product before the end of the 10-day incubation period as requested by the petitioner, the Agency is proposing to provide establishments the option to develop quality control programs containing provisions that are different, but no less effective, than current requirements. For example, the shipment of products before the end of incubation and decreasing the sampling incubation rate, as discussed in the above-referenced petitions, may be addressed in such quality control programs. Quality control programs would be required to provide for at least the same level of assurance as the existing requirements of §§ 318.309 and 381.309

which are designed to ensure that thermally-processed canned product is wholesome and unadulterated. Therefore, FSIS is proposing that the regulations be amended to permit the use of FSIS-approved quality control programs that vary from the specific requirements in §§ 318.309 (d) and 381.309 (d) of the regulations. Establishments currently operating quality control programs which comply with finished product inspection requirements in accordance with §§ 318.309 (a) and 381.309 (a) would be able to continue to do so. The regulations in paragraph (d) of §§ 318.309 and 381.309 would still be applicable in the absence of an approved quality control program.

Variations from the regulatory requirements would be allowed only as long as a particular proposal provides at least the same level of assurance as that of the requirements in §§ 318.309 (d) and 381.309 (d). For example, a quality control program proposing a reduction in the incubation sampling rate for a continuous system from the required incubation sampling rate 1/1,000 to 1/10,000, would have to provide for at least the same level of assurance as that of the existing requirements in §§ 318.309 and 381.309. An example would be to incubate the samples for more than 10 days at no less than 95°F. Similarly, a processor wishing to ship product at any time after processing may be expected to exceed current incubation sampling requirements by increasing the number of incubation samples. Moreover, a quality control program would have to contain a provision that would invoke tightened criteria compared to those regularly employed in the establishment's quality control program in cases where unwholesome product, abnormal containers, or other irregularities, which may compromise product wholesomeness, occur. Such tightened criteria could include, for example, increasing the incubation sampling rate, lengthening the incubation period, delaying product shipment until after the incubation period has ended, intensifying container condition examinations prior to shipment, or other actions depending upon the quality control program. An establishment would use these tightened criteria until the cause of the irregularities is identified and resolved and the Program has determined that the corrective action taken by the establishment is sufficient to produce wholesome and unadulterated product with the routine provisions contained in the approved quality control program.

Proposed Rule

For the reasons discussed in the preamble, FSIS is proposing to amend parts 318 and 381 of the Federal meat and poultry products inspection regulations as set forth below.

List of subjects

9 CFR Part 318

Meat inspection; canned products; quality control.

9 CFR Part 381

Poultry products inspection; canned product; quality control; packaging and containers.

Federal Register/Vol. 56, No. 185/Tuesday, September 24, 1991/Proposed Rules

Sanitary Design

A Mind Set (Part V)

Donald J. Graham
Senior Food Technologist
Sverdrup Corporation
St. Louis, MO

Sanitary Design

Plant and equipment layouts for a new plant are as important to sanitary design as the structure erected to house the layouts. In fact, good equipment and plant layout will dictate where the walls should be placed, allowing adequate space between pieces of equipment for maintenance and cleaning. Good sanitary design develops a product flow which prevents finished product from coming into contact with raw materials or product-in-process, avoiding cross contamination. Ideally raw materials and ingredients should enter the process stream near the receiving dock, flow into the preparation area, into the process area, to the packaging area and into the finished goods warehouse without any backtracking or contact with previous processing steps. This design allows for proper air pressure conditions in the processing and packaging rooms as well as contributing to the overall efficiency of the plant. Some food processing plants have applied the antibacktracking concept to personnel and equipment as well as product flow. Personnel doors in these facilities are designed so workers can only pass from a clean area to a less clean area. To return to the "cleaner" area, they must go through a uniform change and sanitizing step usually followed by entrance through an air lock or pressurized vestibule. Many new food processing techniques and products are approaching the need for "clean room" environments.

Renovation of an existing plant where product flow does not necessarily follow the straight line concept offers a design challenge to the project engineer. Many times physically changing the existing flow is not economically feasible, so other arrangements, such as the erection of barriers to prevent interchange of product utensils or equipment and the strict enforcement of prohibitions against mixing or exposing processed product with raw materials and unprocessed ingredients can be made.

One of the greatest luxuries that can be afforded to a designing engineer is to have the process design completed and all the necessary equipment identified *before* the structure that is to house it is designed. All the equipment can then be laid out in a correct and logical manner, amount of required floor space calculated and the plant designed around it. Usually, however, the process is still being modified and equipment decided on while the building design is underway. Often this results in equipment being "shoe horned" into the structure or causing the engineer to redesign the structure incurring extra engineering and construction costs.

Equipment placed in a processing room requires, at a minimum, 36 inches of clear space around it for adequate cleaning and maintenance. Distances from the nearest wall or other barrier should be at least 36 inches unless minimum safety code requirements specify greater distances for aisles.

Distances between pieces of equipment can vary, depending on their size and function. Shell and tube heat exchangers, for instance, require more than 36 inches to pull the tubes for servicing. Each piece of equipment has to be evaluated separately and the specific clear space necessary for servicing, cleaning and sanitation calculated using the 36 inch minimum as a guideline. At least 18 inches of free space over each piece of equipment must be provided to allow for adequate cleaning.

Floor mounted equipment should either be sealed directly to the floor or mounted at least 6 inches off the floor. Floor clearance can be different for different types of equipment, taking into account frequency of cleaning, waste generated, types of product being run, utilities required and where the utility lines originate. Normally, six inches is the minimum requirement to allow for cleaning.

Good design will replace equipment so access doors and instruments are easily seen and used. Parts requiring service must be positioned for ready access. Some pieces of processing equipment such as metal detectors, require periodic inspection, adjustment and cleaning while the equipment is operating. It is the responsibility of the engineer and designer to correctly locate this equipment so it is accessible for maintenance, inspection and sanitation without the operating personnel having to climb over other pieces of equipment to gain access to it. The writer and, I am sure, many of the readers have been in processing areas housing equipment packed in so tightly it is never cleaned in many blocked and inaccessible pockets. These pockets of dirt create ideal areas for microbial growth, rodent and insect infestation, and debris buildup. It is a rule of thumb that if an area is difficult to reach it probably will not be cleaned very often or very well.

Renovation of plants with crowded processing areas can sometimes be accomplished without having to build an addition onto the plant. Rearrangement of product flow, upgrading equipment to newer, compact models designed for easier cleaning and sanitation can help ease the overcrowding often seen in older processing plants. Spreading the equipment out and developing clear space around it will create a more efficient area and will provide a much more appealing cosmetic appearance. Cosmetic appearance in and

around a food plant is very important to regulatory inspectors, employees and visitors. It creates an impression that can effect judgments about the rest of the operation.

Lighting

Older plants often have inadequate lighting and companies under U.S.D.A. inspection are being required to upgrade their lighting levels to 50 or more foot candles at the product contact surface. The F.D.A. is also agitating for increased light levels, especially in the preparation and processing areas. Part of the rationale for improved lighting argues that if dirt and debris can be readily seen it will be cleaned up. This is not always the case but I have seen enough instances where increased light has resulted in better clean up to make the argument valid.

Lighting levels in a food plant are usually required to be at a higher intensity than those specified in the *Illumination Engineering Society* handbook. The desired levels should be determined for each operational activity. Products in the preparation stage may require higher intensity lighting at visual inspection stations for defect inspection and control.

Depending on the source of information, recommended lighting levels for food processing plants have a wide range. According to Imholte, and I concur, the following recommended lighting for food plant operations are suggested:

Area	Foot Candles
Raw material receiving	20-30
Ingredient warehouse	20-30
Bulk ingredient storage	30-40
Processing departments	55-65
Product inspection	110-130
Packaging	70-80
Finished product warehouse	20-30
Maintenance areas	70-80
Administrative offices	60-90
Cafeteria	40-50
Locker and rest rooms	30-50

Lighting levels will be at their best with new fixtures, newly painted or cleaned walls and new stainless steel equipment in place. As the environment loses its newness and the reflective surfaces of walls, floors and fixtures become dull and dirty the brightness levels will drop off significantly. In addition to a well planned and executed cleaning program, for the light fixtures and other surfaces, Imholte recommends oversizing the light levels by at least 20% to account for normal light fixture degradation.

There are various types of lighting approved for food processing plants. Regardless of the type selected, the associated fixture must be equipped with a nonbreakable or shatterproof shield so broken glass can not fall onto exposed

food or food contact surfaces. The shields also protect employees from flying glass in the event a bulb of lamp breaks.

Incandescent lights are almost a thing of the past in new and renovated food processing plants. They are energy inefficient and require constant maintenance. However, if incandescent lights are used, the bulbs can be protected with clear globes made of Lexan or other polycarbonate materials. Some incandescent bulbs are coated with a plastic material to prevent shattering. Similar coating are available for fluorescent tubes. Fluorescent tubes can be purchased precoated with shatterproof material already applied. There are advertisements in many of the trade magazines showing a fluorescent bulb tied in a knot to demonstrate the point. Other types of lighting are metal halide, mercury vapor, high pressure sodium and low pressure sodium. Each of these types have their pluses and minuses and should be evaluated for each application. For example: if color control by visual inspection is a criteria then low pressure sodium lights would be a poor choice. Low pressure sodium causes a color distortion significantly worse than with other types of lighting. Metal halide lights, on the other hand, cause a very low color distortion and are sometime equated with light produced by the sun.

Lighting in a food processing plant is highly important for a number of reasons. It not only can create an effect on employee morale, but it plays a major role in sanitation. If a process area is brightly lit, experience has shown that sanitation levels improve significantly. It is a topic that warrants detailed attention when building or renovating a plant.

Fixtures themselves can become a sanitation problem if they are not cleaned on a regular basis. Fluorescent fixtures usually have a flat top and must be cleaned routinely. The tops of the fixtures for any type of lighting collects dust, dirt and dead insects. Therefore, a plant sanitation program must include periodic cleaning of lighting fixtures. The author has found that a good time to clean the light fixtures is the same time the overhead pipe lines are cleaned. If there are no overhead pipe lines in a process area, then a minimum of once a week should be sufficient. But here again, it depends on the plant, the product and the sensitivity of the product to contamination, as well as the potential contribution to contamination by the configuration of the light fixtures.

References

- Kaufman, John E. 1981. *IES Lighting Handbook*. Illuminating Engineering Society of North America, New York, NY.
- Imholte, T., 1984. *Engineering for Food Safety and Sanitation*. Thompson and Co., Minneapolis, MN 238 p.
- Katsuyama, Allen M. 1980. *Principles of Food Processing Sanitation*. Food Processing Institute, Washington, DC.

Industry Products



Shat-R-Shield® High Output Fluorescent Lamps Safety Light Refrigerated Areas

Shat-R-Shield, makers of the original shat-proof lamp, offers a high output lamp (HO/R) for refrigerated areas where food protection is necessary.

If the lamp is accidentally broken, the Ho/R Surlyn® safety coating contains virtually all dangerous glass shards, hazardous phosphors and mercury thus protecting products, employees and the workplace.

Designed for environments of 45 degrees or less, Shat-R-Shield HO/R lamps are ideal for meat and poultry processing areas as well as other cold food processing areas.

The HO/R lamps are easy to install, and cleaning is simple, too: just remove, wash and reinstall. Dependable lighting performance is another benefit: HO/R lamps won't yellow or crack with age.

HO/R lamps are USDA approved, meeting all FDA and OSHA standards.

Shat-R-Shield offers a full line of plastic-coated fluorescent and incandescent lamps.

Shat-R-Shield - Salisbury, NC

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New Antimicrobial Supplement Simplifies Listeria Testing

Isolation and identification of *Listeria monocytogenes* from food and dairy samples has been simplified by the use of LPM Agar prepared by combining Bacto® LPM Agar Base and Bacto® Moxalactam Antimicrobial Supplement. This selective medium will recover *Listeria monocytogenes*, which is recognized as an important widespread problem in public health and the food industries.

The preparation of LPM Agar, mandated in new FDA regulations for milk and dairy processed food products, is simplified by the use of Moxalactam Antimicrobial Supplement. The supplement is easy to rehydrate and eliminates the need to prepare and filter sterilize the antimicrobial solution.

LPM Agar was developed to recover low numbers of *Listeria* species from highly mixed cultures. The ingredients within the medium will aid in the suppression of gram-negative and gram-positive bacteria other than *Listeria*. The supplement will increase the inhibition of staphylococci, bacilli and *Proteus* species.

Difco Laboratories extends their line of *Listeria* testing products with the addition of Bacto Moxalactam Antimicrobial Supplement. Other new *Listeria* testing products include Modified Oxford Antimicrobial Supplement, Fraser Broth Base and Fraser Broth Supplement. All Difco *Listeria* testing products are available from leading laboratory distributors.

Difco Laboratories - Detroit, MI

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New Housing for Segmented Filter From MicroPure Filtration, Inc.

A new housing brings added performance features to the MicroPure segmented filter for air and gas filtration. The housing is constructed of 316L stainless steel and has a tri-clamp type of inlet-outlet connection. The filter cartridge consists of a vertical series of 304 AISI or 316L stainless steel discs with PTFE filter membranes sandwiched between the discs. A bayonet connection is used to secure the cartridge in the housing.

Capacity of the filter varies from a flow rate of 24 scfm at 100 psi with a 1/4-inch inlet-outlet to a flow rate of 1680 scfm at 100 psi with a 3.0-inch inlet-outlet. The filter removes bacteria and particulate down to 0.2 micron for sterile filtration. The stainless steel components can be cleaned and sterilized repeatedly with no loss of efficiency. The only portion of the cartridge needing occasional replacement is the filtering media.

MicroPure Filtration, Inc. -
Rockford, IL

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Knight's New Power Bowl "Plus" Solid/Dry Chemical Dispenser

The New POWER BOWL "PLUS" from Knight Equipment Corp. is designed to liquefy solid or screen supported dry warewashing detergents enclosed in any 6" diameter container. An above the screen center spray jet erodes the containerized chemical evenly and efficiently to eliminate product waste.

The positive mechanical water inlet valve is opened automatically by insertion of the chemical container and closed when the container is removed. This prevents operators from being sprayed with hot water.

Special features: Positive Water Inlet Control, Rugged reinforced plastic, Top, Wall or Front Mount, Efficient Spray Nozzle Design, Integral anti-clog Screen, Accepts any 6" O.D. Container, Complete Installation Kit with Fittings, Screws and 5/8" O.D. Vinyl Tubing.

Knight Equipment Corp. -
Costa Mesa, CA

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Aseptic/Extended Shelf Life Processing

New 6-page brochure discusses aseptic and extended shelf life processing technologies and their applications in the food, dairy and beverage industries. Described is APV's complete selection of heat exchange methods offered which include plate heat exchange; steam infusion and injection; tubular heat exchange; scraped surface heat exchange; ohmic heating; and aseptic surge systems.

Also discussed are the most suitable processes for applications that include low acid or high acid products, viscous products, or products with small or large particulates.

Brochure explains APV's expertise and vast experience in aseptic processing that processors can count on to help them match an aseptic/ESL process system to their exact requirements.

APV Crepaco, Inc. - Lake Mills, WI

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1991 Presidential Address



Robert L. Sanders, President

Presented at the
78th Annual Meeting in Louisville, Kentucky
July 24, 1991

I would like to take this opportunity again to welcome you to the 78th annual meeting of the International Association of Milk, Food and Environmental Sanitarians.

I will take a few moments to review with you some highlights of the past year's accomplishments. We successfully published 12 issues of the *Journal of Food Protection* and 12 issues of *Dairy, Food and Environmental Sanitation*. All issues were on time, in fact many issues were ready for the printer ahead of schedule. We also reduced our printing costs for these journals. Both journals continue to be the outstanding journals in their field. We do need to encourage our colleagues and fellow authors to continue to submit their papers for publication in these journals. We still have a backlog of articles waiting for publication, however, it is not as long as it has been in the past.

Membership has remained stable over the past year, about 3500 members. We currently have 78 Sustaining members. That is an increase of 2 new Sustaining members over last year.

We have not added any new affiliates this year. The Oregon affiliate was disbanded during the past year. However, there is a group of IAMFES members in Oregon who are working toward reorganizing to form a new Oregon affiliate. Several other groups are working to form new affiliates. The European group under Mike Stringer in England is getting close and will be ready for presentation of their charter soon. Another group that is calling themselves the Chesapeake Area affiliate are from Maryland, Delaware, Northern Virginia and the District of Columbia are working to get their constitution and bylaws in order for submission. A group from New Jersey currently known as the Metropolitan Dairy Tech Society are about ready with their application for affiliation.

About four months ago I received a letter from the President of the South Africa Health Officers Association inquiring about possible affiliation. I responded to him and the Ames office also followed up with a letter but so far we have received no further response from them.

The membership has voted not to change the name of the association at this time. We will continue to be known as International Association of Milk, Food and Environmental Sanitarians. (IAMFES) Over 60% of the votes were not to change the name. Mike Doyle will have more to say about the activities of the name change committee in his report that will be published in this journal.

As usual many of our committees have been very active this past year. I will name a few of their highlights. The committee on Communicable Diseases Affecting Man has completed its work on a new booklet on HACCP. This has been sent to the printer and should be available in the month of August. If you wish to place an order for a copy of this booklet you can order one from the registration desk. The Dairy Quality and Safety Committee has just issued a "Pocket Guide to Dairy Sanitation." Single copies are available to members at the registration desk or multiple copies can be purchased through the Ames office. The committee on Sanitary Procedure, commonly called the 3-A committee has completed the revision of the 3-A Accepted Practice for HTST and HHST Pasteurization Systems. Plans are under way to publish this document as a separate or 13th edition of *Dairy, Food and Environmental Sanitation* next year. In addition 3-A has revised or amended 12 other standards this past year. They will be published in *Dairy, Food and Environmental Sanitation* next year. The Food Sanitation committee has been working on Temporary Food Service Guidelines. They will be available in the next 60 days.

The audio visual library has remained a popular service to our members. They have had over 1,000 requests for use of materials this past year. Unfortunately because of the large demand for some material, we could not fill all requests. The IAMFES Foundation has agreed to provide additional funding to purchase additional copies of some of the more popular tapes so that next year you won't have to wait so long to get the material you have requested. We also request that when you have completed the use of the material that you return it as soon as possible. That way someone else can use it.

IAMFES participated, with 20 other societies, in an IFT sponsored workshop on "Food Packaging, Food Protection and the Environment." You will find additional details in Charles Felix's report. (The membership later voted to endorse the recommendations of this report and send it to IFT for action).

The Ames office staff has continued to function smoothly under the leadership of Steve Halstead, Executive Manager and Margie Marble Assistant Executive Manager. We have purchased four new Mackintosh computers and are networking them together to perform the desktop publishing for the journals. We have attained complete control of both journals through the desktop publishing. This has resulted in considerable savings in printing costs. We no longer need to pay the printer fees for typesetting. We just send them the computer disks and the final printed copy is made from the disks. This feature alone has saved the association over \$50,000 this past year.

We have changed accountants to a new firm. One that is familiar with and has worked with other non profit associations. We have purchased a new IBM compatible computer and the software recommended by the new accountant. We are now converting all accounting to the new computer system. When completed we can determine our financial condition at any point we wish to see it. Because of this change over the accountants have not completed the annual audit. We do know that our income has exceeded our expenses during the past year. The audit should be completed in the month of August.

We are planning a membership recruitment and retention campaign for the coming year. We will be working with the affiliates to get more affiliate members to become members of IAMFES. We hope to gain several hundred new members by this time next year.

By your ballots you have chosen Dee Clingman as your new Secretary for the coming year. Welcome aboard Dee, we are glad to have your experience to add to the Executive Board for the next five years.

Don't forget next years annual meeting will be in Toronto, Ontario, Canada on July 26-28, 1992. The program committee and local arrangements are already hard at work to make that meeting an outstanding success.

In closing I want to thank each and every member, the Executive Board, our committee chairs and members for the fine cooperation that I have received during the past year. Serving the past year as your President has truly been one of the highlights of my career in the Public Health Service. As I approach retirement I will cherish this year. Thank you all.

Highlights of the 78th

Combine three outstanding days of educational sessions, networking with colleagues, seeing old friends and making new ones, informative exhibits, social events and committee meetings, along with all the people involved and you have another successful IAMFES Annual Meeting.

This year's meeting was held at The Galt House, along the beautiful Ohio River, July 21-24 in Louisville, Kentucky.

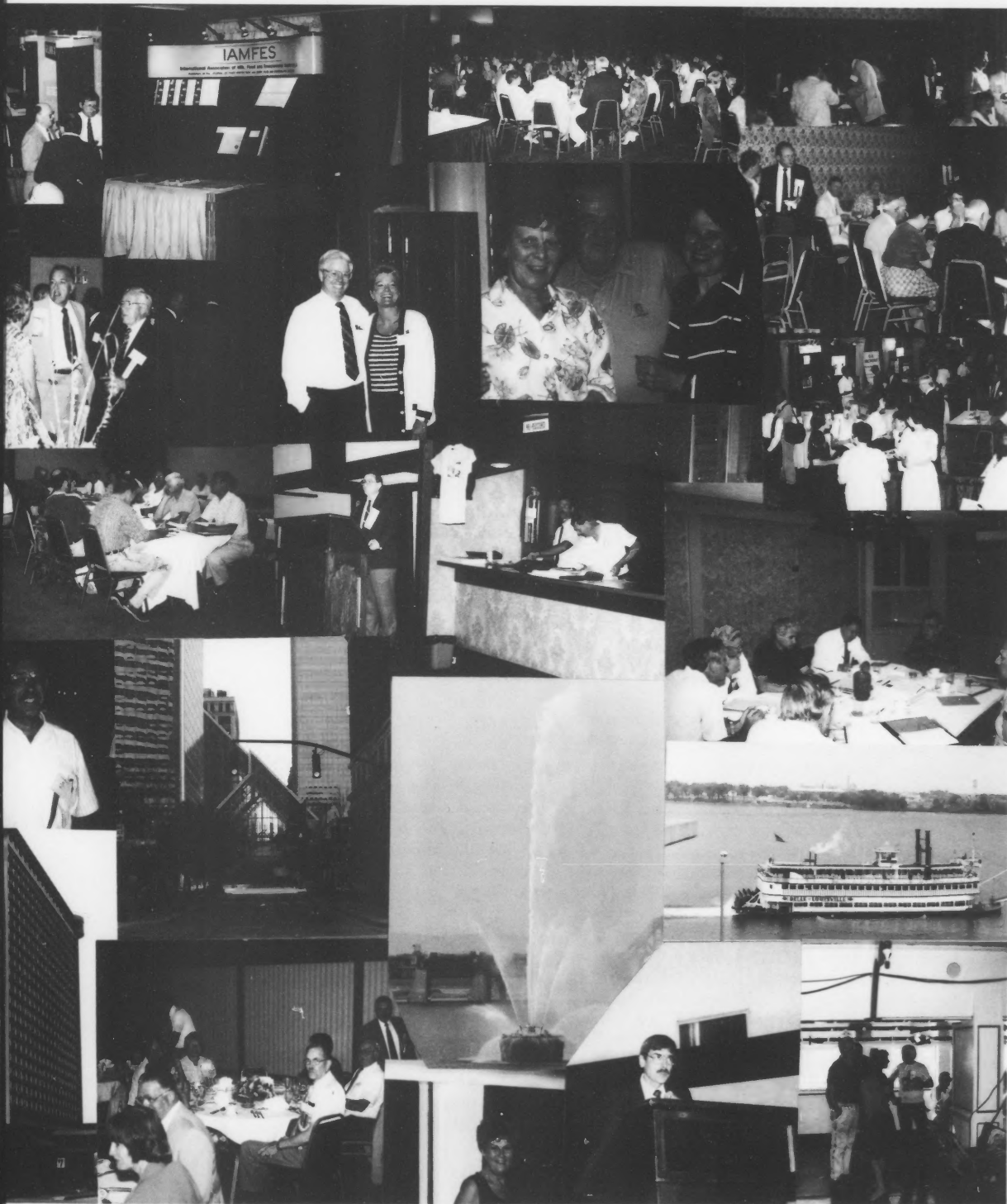
The following is a summary of the 78th IAMFES Annual Meeting. If you weren't able to attend, plan now for the 79th in Toronto, Ontario, July 26-29, 1992. All meeting and hotel registration forms will be in the February issue of both journals. Look for the Preliminary Program in the spring issue! If you haven't submitted an abstract for your presentation at the Toronto meeting, check your September and October issues for the blue abstract forms. Deadline for submission of abstracts is December 16, 1991.

A special thanks goes out to the Kentucky Association of Milk, Food and Environmental Sanitarians, the IAMFES Board, the Program Committee, all Annual Meeting Sponsors and the Ames Office for their hard work and devotion. The meeting was a great success!

See you in Toronto!



IAMFES Annual Meeting



Minutes of the IAMFES 78th Annual Business Meeting

3:15 p.m. July 23, 1991 Louisville, KY

Welcome and Introduction: President-Elect Damien Gabis welcomed those assembled and introduced IAMFES President Robert L. Sanders.

Presidential Address: Mr. Sanders proceeded to deliver the 1991 Presidential Address.

Business Meeting:

I. Call To Order: Following his address, President Sanders called the 78th Annual Meeting of the International Association of Milk, Food, and Environmental Sanitarians, Inc. to order at 3:47 p.m. on Tuesday, July 23, 1991 at the Galt House Hotel located in Louisville, Kentucky. A quorum, as defined by the IAMFES Constitution, was declared to be present.

II. Moment of Silence: Mr. Sanders asked the audience to rise and to observe a moment of silence in memory of departed colleagues.

III. Minutes of the Last Meeting: Secretary Harold Bengsch reminded the meeting that the Minutes of the 77th Annual Meeting had been printed in the November, 1990 issue of *Dairy, Food, and Environmental Sanitation*. He proceeded to identify highlights of the meeting.

MOTION To dispense with the reading of the Minutes
Bengsch of the 77th Annual Meeting and to approve
Price them as printed in the November, 1990 *Dairy*,
PASSED *Food, and Environmental Sanitation*.

IV. Reports: The meeting then received the following reports:

- A. Executive Manager: Steven Halstead
- B. Affiliate Council: Ronald Schmidt
- C. Name Change Committee: Michael Doyle
- D. *Dairy, Food, and Environmental Sanitation* Management Committee: Ruth Fuqua
- E. *Journal of Food Protection* Management Committee: Robert Marshall

V. Old Business: Charles Felix, Chairman of the Nominating Committee reported that Dee Clingman and Gale Prince had been nominated to the office of IAMFES Secretary and that in the ensuing election, Mr. Clingman had been elected to the post. The President thanked Mr. Felix and his committee for their work and directed Mr. Felix to destroy the ballots.

Charles Felix and Roy Carawan reported on a workshop entitled "Food Packaging, Food Protection and The Environment" they had attended as representatives of IAMFES. The workshop was sponsored by the Institute of Food Technologists and was held in Washington, D.C. The gentlemen spoke to a report on that workshop and to the recommendations it contained.

They then presented a resolution in support of those recommendations. (A copy of that resolution is attached to these minutes.)

MOTION To accept the resolution dealing with the
Felix recommendations contained in the report of the
Case IFT workshop.
PASSED

Mr. Felix and Mr. Carawan were thanked for their contributions on this important issue.

MOTION That the IFT Report "Food Packaging, Food
Klee Protection and the Environment" be sent to all
Musson IAMFES affiliates and that they be encouraged
PASSED to make it available to their state legislatures.

VI. New Business: President Sanders named Rusty Bishop as Chairman of the Nominating Committee for the 1992 election of the IAMFES Secretary.

VII. Resolutions: Immediate Past President Ronald Case presented two resolutions to the meeting for its consideration:

Resolution #1: Relating to the meeting's gratitude to the Kentucky Affiliate for their outstanding performance as hosts of the 78th Annual Meeting.

MOTION To adopt Resolution #1.
Bengsch
Brazis
PASSED

Resolution #2: Relating to the meeting's gratitude to the Galt House Hotel for its outstanding performance in serving the 78th Annual Meeting.

MOTION To adopt Resolution #2.
Fry
Klee
PASSED

President Sanders directed that the resolutions be attached to these Minutes as Addenda and that they be printed in an upcoming issue of *Dairy, Food, and Environmental Sanitation* (see page).

VIII. Adjournment: There being no further business to come before the meeting, President Sanders called for a motion to adjourn.

MOTION To adjourn.
Brazis
Darrah
PASSED

President Sanders declared the meeting adjourned at 4:48 p.m.

Respectfully submitted,
Harold Bengsch, RS
Secretary

Protecting our Food Supply: An Industry, Regulatory and Academia Joint Effort

*Ivan Parkin Lecture presented at the 78th Annual Meeting of
the IAMFES, The Galt House, Louisville, Kentucky*

**Gary Hanman, Chief Executive Officer,
Mid-America Dairymen, Inc., 3253 E. Chestnut Expwy,
Springfield, MO 65802**

Since the creation of man, food has been a daily requirement for the maintenance of life. This objective was met in the early days of mankind by literally living off the land and even more fundamentally each individual was responsible for their own food supply.

The last 200 years and more specifically the last 100 years has been associated with the development of an industry directed to the production, processing and distribution of food by a relatively small group, resulting in millions of consumers being dependent upon an industry to provide an adequate daily supply of a safe food.

As the food industry developed, it was quickly recognized that food must have the capability of being held for extended periods of time without spoilage, one of the first definitions of product safety. Obviously a product which is spoiled does not taste good and it was observed early on that the consumption of a spoiled product could result in sickness and even death. The issues of food preservation and likewise food safety were addressed by such giants as Louis Pasteur and Nicolas Appert who established the principles required for preservation by heat treatment. Additional knowledge was sought with vigor by Universities throughout the U.S. and the World in regards to the relationship between bacteria and the safety of foods and as the 20th century unfolded, product safety expanded to recognize "chemical hazards." Thus the role of academia became a fundamental partner in the overall objective of providing the world with an adequate and safe food supply.

Likewise another partner evolved in the 20th Century, regulatory. Regulatory is often mistakenly viewed as a policeman, but rather regulatory should be viewed as aiding in the overall objective of providing assurance to the consumer that the task of producing, manufacturing and distribution of food is conducted in a manner whereby the consumer can be confident that all foods on the market are safe and wholesome. There have been those situations where regulatory must act as a policeman but fortunately the vast majority of the industry strives to produce a safe and wholesome product.



The credibility of the food supply in regards to safety was without significant challenge in the first half of the 20th Century. The last half of the 20th Century, however, is well recognized as an era whereby each passing 10 years resulted in more knowledge being developed than had been developed in the prior 100 years. We are all aware of enhanced technological capabilities which allow our laboratories to measure parts per billion and now parts per trillion. Inconceivable but yet such measurements can be achieved with reliability. Likewise the science of association, epidemiology, is revealing that illness or even death can be the result of consuming an unsafe food. A correlation of cause and effects which in years past would have gone undetected. The net result being issues which have caused the consumer to question the safety of food in the market place.

The goal for all reputable food companies was and is today to market products which are unquestioned by the consumer as being safe and wholesome. But for the consumer to have such confidence, the regulatory and academic community must likewise have no concern in regards to safety of the foods which the industry introduces into the market and be heard clearly by the consumer that food or a specific food is in fact safe.

A company and our industry as a whole must conduct its business in a manner that it is worthy of such confidence from consumers but yet the business of producing, processing and marketing must make money for its owners. A fair profit must not be viewed as a dirty word but rather a fundamental requirement if an adequate supply of safe and wholesome food is to be available in the supermarket.

Individual companies or the food industry as a whole cannot meet this challenge by being an island to itself. It's only through a cooperative effort of the food industry, regulatory and academia can an affordable product be produced and likewise be safe and wholesome.

Having said this, how do we do it!

For the most part, the burden falls on the shoulder of the Industry, for it is they who must implement the task. But to do the task, a company must know how to conduct a given

task (have the technology) and there must be a clear understanding as to what is good and what is not good.

Quality and Quality Control has been ingrained into the food industry however, the obvious is being emphasized which is, everyone in a company is a partner in the task of producing a safe product. In part, it is a recognition that just because a laboratory technician analyzed a sample and the results were acceptable, it does not mean that a truck load of product is acceptable. A case in point is the issue of food products being free of Salmonella and Listeria. A random sample can be shown to be acceptable but yet product in a truck or on a grocery shelf may be unacceptable. This is because we, the industry, regulatory, and academia have generally agreed that one Salmonella organism in a pound or even a hundred pounds of product is unacceptable, but the laboratory analyzes a very small sample and very likely can miss detecting the Salmonella or Listeria organism. The laboratory is a vital tool to a "Total Quality Commitment" but it is only a part of the program. A "Total Quality Commitment" means simply we do everything correctly all the time and we constantly study and review our practices for areas that need improvement or additional control. To properly implement such a philosophy, it requires commitment and support of everyone, management, staff, employees on the production line, warehouse, etc.

Our technical departments have jazzed up the nomenclature for such a philosophy with names such as Hazard Analysis Critical Control Points (HACCP) and Statistical Process Control (SPC). But in the case of our Salmonella example, a total commitment by myself, my staff, and employees means keeping the dirt or residues in our plants clean and free from Salmonella, and thereby gives us assurance that any product produced in our plants are likewise free of Salmonella. This kind of Total Quality commitment goes far beyond the laboratory.

All segments of the food industry are reviewing and "beefing up" their commitment to Total Quality Commitment but we continue to face the question as what is a safe product and are our actions perceived as being suitable.

Our technological advancements of the last ten to twenty years in many senses have raised only questions of concern rather than verifying the validity of the concern and if valid, develop a solution. The appropriate reaction to "concerns" will indeed require joint efforts between Industry, Regulatory and Academia.

The dairy segment of the food industry is currently managing one of these concerns, "Animal Drug Residues" in milk and milk products. New technologies of the last few years has revealed that there is a valid reason to be concerned that there may be unacceptable residues in milk but at the same time it is recognized there is no such thing as zero with sophisticated technology of today. One of the most significant actions by the recent National Conference for Interstate Milk Shipments (NCIMS) was the agreement to establish "Safe Levels" for Animal Drug Residues. Or simply said, a means of recognizing what is good and what is bad.

Likewise, the industry has been willing to look at itself and they have concluded that the job can be done better by doing such things as increased testing, sharing data with regulatory and new programs to increase awareness on the

part of Dairymen. These new programs which will provide assurance to consumers that there is no reason to be concerned about Animal Drug Residues would not be possible without the contribution of Academia particularly in areas of developing and verifying more rapid and accurate tests. The net result is a classic example of how confidence concerning the safety of the food supply can be achieved and still comply with the basic mandates of the Industry, Regulatory and Academia.

To have a satisfactory joint effort, each segment must comply with its own charters but they must have an understanding of all issues. No one likes the word risk, but at some point there is an acceptable risk, FDA lives with this fact every day. I live with this fact every day, however, our position must be only to tolerate an acceptable risk. This was defined in the case of animal drug residues, wherein something greater than zero is permissible for Penicillin in milk; however, more than 10 parts per billion is unacceptable.

A joint effort to provide the consumer with a safe food supply not only requires mutual understanding but there must be a forum whereat all issues, views, knowledge, etc. can be hashed out and an agreed definition and course developed. The dairy industry is very fortunate in that its leaders organized the National Conference for Interstate Milk Shipments. The wisdom of such a forum increases with each passing decade. It is a forum which keeps a correct relationship of "church and state" if you like. It allows the industry to be heard, but the final word, final vote as to what is safe and how do we get there is in the hands of state and federal regulators.

The implementation of a successful joint effort is not limited solely to commitment, rules, mutual thinking, technological capability and knowledge, but at the very foundation is a need for adequate funding, money.

The cost of producing a safe product is increasing annually, the cost of academic efforts is increasing annually, the cost of effective regulatory programs is increasing annually. The monies which were traditionally available at the state and federal level for funding research and regulatory efforts is drying up. The consumer says, "I want an unquestionably safe product, but at a lesser cost."

Where do we go from here? As regulatory and academic funding has disappeared, our legislators have implemented an additional tax by requiring the user, the processor, to pay for the cost of regulatory and for the cost of research. In many cases, the industry has agreed to pick up some of the expenses which was previously provided by public funds.

Of all the issues which will be dealt with in the remainder of this century and into the 21st Century, money concerns are at the top of the list. The confidence of the consumer must be restored, and it will be restored if we as a total team agree as to what is a safe product and the industry on its own is shown to comply with that definition. The industry must earn the right to be trusted thereby reducing the need for enhanced "police" activities. It is unfortunate that the FDA commissioner believes it necessary to increase the enforcement segment of the Food Industry. This approach cannot continue, and it will be turned around by joint efforts of Industry, Regulatory and Academia.

Committee Reports

If you wish to serve on a committee, please contact the IAMFES Office so that we may put you in contact with the committee chairperson, (800)369-6337 (US), (800)284-6336 (Canada) or (515)232-6699.



The Affiliate Council Committee Meeting

Minutes of IAMFES Affiliate Council

The Affiliate Council of IAMFES convened its annual meeting at 1:00 p.m., Saturday, July 20, 1991, at the Galt House in Louisville, Kentucky. Affiliate Council Chairperson Ron Schmidt called the meeting to order. Twenty-two (22) delegates and five (5) guests were present. Ruth Fuqua, Affiliate Council Secretary, read the minutes of the 1990 meeting, which were approved by the Council.

Steve Halstead, IAMFES Executive Manager, reported on IRS laws and rules for associations regarding taxes and filing requirements. Delegates were encouraged to investigate the tax status of their affiliate, and seek the best status available.

Dee Buske, IAMFES Affiliate Liaison, reported on the status of several affiliates:

- 1) Mississippi and Wyoming are again in good status;
- 2) North Dakota and South Dakota are working to get enough members;
- 3) the Oregon affiliate was dissolved. Reestablishment work is being done, and a request was sent to the former treasurer to release the existing treasury funds to Ames for escrow until the new affiliate is established; and
- 4) new affiliates are planned for the New Jersey, Arizona, Europe, and Chesapeake area (Washington, Maryland, Delaware).

Dee then spoke about member recruiting and retention, and requested that each delegate send a letter to IAMFES to be included in a recruiting packet. The letters should talk about:

- 1) being an active affiliate member;
- 2) the affiliate meetings; and
- 3) benefits of affiliate membership. Also, the delegates were requested to send in a list of potential members, and ideas about recruitment.



Guest Speaker, Michael Skinner

A review of the proposal on Affiliate Council Bylaws was conducted article by article. The proposal, as amended, is attached, and will be submitted to the delegates for their consideration for adoption, further amendment, or non-acceptance.

The council appointed Ron Schmidt and Ruth Fuqua as Affiliate Council Chairperson and Secretary, respectively, on an interim basis until the bylaw issues are resolved. Further, the Affiliate Council voted that the balloting of the bylaws shall be completed prior to the 1992 annual meeting in Toronto.

Chairman Schmidt encouraged the affiliates to utilize the certificates of merit awards to recognize affiliate members.

He reported that a score sheet was developed for the Shogren Award. Although further development is needed, the scoring will be done based on 100 points considering

- 1) the annual report quality;
- 2) IAMFES to affiliate membership ratio;
- 3) educational conferences;
- 4) newsletter; and
- 5) miscellaneous.

No affiliates were nominated for the Shogren Award for 1991.

John Holah gave a report concerning the progress in establishing an European affiliate.

The Affiliate Council business meeting was adjourned. Special guest speaker Michael Skinner then presented "Taking Control of Your Personal and Professional Lives."

Ruth Fuqua Affiliate
Council Secretary



Applied Laboratory Methods Committee Meeting

Applied Laboratory Methods

The meeting was called to order at 1:30 PM on July 21, 1991, at the Galt House, Louisville, KY. The meeting was chaired by Dr. Michael Brodsky, with Dr. Ann Draughon as vice chair and Dr. Jim Dickson as vice chair-elect. Approximately 26 members attended. The minutes of the previous meeting were distributed and read by Dr. Ann Draughon. The minutes were approved as written.

Mission Statement:

Dr. Brodsky discussed the goals and role of the committee within IAMFES, and solicited comments for the development of a mission statement. The comments relating to the mission statement included:

- the committee provides a forum for informal discussion on laboratory methods
- the committee provides for an exchange of ideas on laboratory methods, both published and unpublished methods of interest to one or more laboratories
- potential role of the committee to contribute to the AOAC as a liaison; communicate feelings of those who are actively using the official methods to AOAC, Standard Methods and Compendium
- the committee allows members to comment on official methods, sharing problems and suggestions

Dr. Brodsky has proposed the following mission statement, and is soliciting comments from all members of the committee, as well as the membership at large.

Proposed Mission Statement:

To provide a forum for the exchange of information related to laboratory methods and procedures and to encourage and promote studies to address relevant analytical concerns of industry, academia and regulatory agencies.

Completed Projects

1. Comparison study on extended incubation of LST broth for the detection of coliforms by the MPN method. There is a working draft of a manuscript of this project, which will be reviewed, revised and submitted to the *Journal of Food Protection*.
2. The Committee recommended the elimination of all mouth pipetting to Standard Methods.
3. Efficacy of refrigerating inoculated plates prior to incu-

bation. Additional data was submitted on water samples and has been incorporated into the analysis. The data suggest that refrigeration of inoculated plates for 3 days prior to incubation does not statistically alter the results. There was a brief discussion regarding the effects of the humidity in the refrigerator on the results. Some collaborators reported problems with membrane filters because of high humidity. A manuscript will be prepared from this study and submitted to the *Journal of Food Protection*. Michael Brodsky also reported preliminary data from his laboratory's participation in an AOAC collaborative study conducted by Dr. Jean Y'ves D'Aoust with *Salmonella* testing which indicated that refrigeration of inoculated enrichment broths prior to incubation was also valid.

Continued Projects

1. Optical somatic count method and the Direct Microscopic Somatic Cell Count Method. No report.
2. Proposed reduction on coliform limits in dairy products. The proposal was voted down by the FDA, and the coliform limit will remain unchanged.

New Projects

1. Rapid and confirmatory inhibitor testing methods. No report.
2. Antibiotic and drug residue testing methods. Dr. Rusty Bishop reported on a comparison of 13 methods for 24 different drug residues in fluid milk. He concluded that, as a first step, adequate methods were available for the detection of specific drug residues at specific levels. A manuscript has been prepared and submitted to the *Journal of Food Protection*.
3. Michael Brodsky discussed laboratory accreditation programs and sources of reference materials. He also discussed a Quality Assurance questionnaire that is useful for internal laboratory audits. This material is available from him to any interested parties. There was a discussion of quality assurance procedures for media and a summary of the comments follows:
 - ATCC type strains may not be the best indicators for some types of analyses; some members use typical isolates from the products being tested, in addition to type strains.
 - "fresh" cultures should be used for best results, and not those from repeated transfers.

Other Reports and Discussion

1. Upper counting limits on selective media. At present, only VRB has an upper counting limit less than the standard limit, i.e., 300 per plate. There was a discussion on the possible need to establish limits for other selective media, and the committee would welcome input from the membership at large on this subject.
2. Changes have been made in the AOAC collaborative study process. The experimental design must be approved first, after which the method and study stand entirely on the data. Studies can no longer be delayed after the data has been collected because of questions regarding the experimental design. The Official Methods Board (OMB) can now approve methods without a full ballot by the membership.

Also, the Board is trying to establish a procedure whereby methods can be approved by the OMB without physically meeting. Contact Michael Brodsky for further details.

3. Test kit rapid verification program. The AOAC has established an "R-2" system to validate manufacturer's claims on test kits. This program allows for independent verification of any claims. Contact Michael Brodsky for further details.

4. Effect of incubation temperature on recovery of dairy pathogens of concern. A study has been completed and the data is currently being analyzed to determine the effect of different incubation temperatures (i.e., 21°C, 25°C, and 32°C) for the standard plate count on the recovery of dairy pathogens. A very preliminary assessment of the data indicates that 32°C may in fact be the optimum temperature of incubation. Contact Rusty Bishop for further information.

5. Other topics briefly addressed:

- Spread vs. pour plates: higher counts with spread plates but increased variability of counts possibly attributable to variation in techniques
- Environmental sampling: Ontario standard is that a reusable eating utensil cannot have more than 100 colony forming units by standard plate count; no one in attendance was aware of other standards or guidelines
- Experiences with TECRA (a.k.a. REPORT) *Salmonella* and *Listeria* tests, in comparison to other methods such as DNA hybridization
- Automated systems, including Vitek, AutoBak, Malthus and Biolog
- Protos colony counter

Election of Officers

Michael Brodsky completed his term as chairperson, and appreciation was extended for his leadership of the Committee. Ann Draughon became chairperson for 1991-1992. Jim Dickson became vice chairperson. Tom Graham was elected vice chair-elect.

Respectfully submitted,
James S. Dickson
Vice Chair-Elect

Audio Visual Library

Date of Meeting: July 21, 1991
Members Present: Bob Darrah, Charles Felix, Harry Haverland, Dr. Sid Barnard
Presiding: David McSwane

Summary of Activities and Actions Taken: Between 8/1/90 and 7/1/91 the Association received 999 requests for tapes and other programs from the AV Lending Library. Three hundred and twenty-six of these requests were filled. There are large numbers of people waiting to view certain tapes in the library. To help reduce this backlog the committee agreed to purchase one additional copy of a tape for each 25 members who are waiting to view it.

A video theater will be held at the Annual Meeting to give members a chance to preview some of the tapes in the library.

Recommendations to the Executive Board: The Committee recommends the Executive Board adopt the following "If a borrower fails to return a tape and does not pay for the item, he/she shall have his/her lending privileges revoked until such time as the material is returned or paid for in full."

Submitted by: David McSwane, H.Sci.D.

Annual Report of the BISSC Committee of IAMFES

Since 1949 the BISSC Committee of IAMFES has played a vital role in preserving Public Health Requirements in the formulation and eventual publication of Standards covering forty-two (42) categories of Baking Equipment.

In the past three to four years, the IAMFES BISSC Committee has been called upon to act as a consultant to the General BISSC Committee in an increasing number of areas. Among others, the following is a cross section of some of the requests handled by our Committee:

Meeting with a special Task Committee concerning the revision of Standard #29 (Motors) which was held in Chicago, January of 1990.

A special review and evaluation of a bread slicer distributed by NJCT (New Jersey Candy & Tobacco) Company, conducted in their plant facilities in New Jersey for the purpose of obtaining BISSC certification.

A detailed report of modifications necessary to bring the Bread Slicer into compliance with the BISSC Standards was submitted to the manufacturer and discussed in detail at a special meeting of the BISSC Office of Certification during the 1990 Winter meeting in Chicago.

In view of the accelerated number of requests made to the IAMFES BISSC Committee Chairman to act as a consultant representing BISSC, it has become evident that additional IAMFES members be recruited to serve on the BISSC Committee.

In an effort to recruit additional committee members, I submitted an article, which was published in the January 1991 issue of *Dairy, Food and Environmental Sanitation*, regarding the functions of the BISSC Committee and requesting that Sanitarians with expertise in the Baking field offer their services to act as consultants. Replies to my article were very gratifying, and we hope several Sanitarians will opt to join us as members of the IAMFES BISSC Committee.

No Committee meetings were held since the BISSC Committee meeting at the last IAMFES Annual Meeting in Chicago which was attended by only two Sanitarians, one from Industry and one from a Public Health Regulatory Agency. During the past several years, I have devoted considerable time in an effort to recruit IAMFES members to serve on the IAMFES BISSC Committee with only spotty response.

Among probable reasons for the lack of interest among Sanitarians and Industry people are that:

IAMFES does not offer a symposium on Baking Equipment Review and Baking Sanitation during their Annual Meeting.

Over a long period of time anything regarding the Baking Industry and the role of the Baking Industry Sanitarian has been conspicuous by its absence from the Annual Meeting agenda.

As a result, the Baking Industry as well as Public Health Regulatory Agencies that I have spoken to feel that since IAMFES apparently does not give a high priority to Bakery Sanitation and Bakery Equipment Evaluation, they have been reluctant to provide the necessary funding to enable their employees to attend any IAMFES BISSC Committee Meetings or the IAMFES Annual Meeting.

Among our goals for the coming year are to solicit suggestions for the preparation of an agenda to be presented to the Executive Board for a symposium at the 1992 Annual Meeting. For example:

Emphasis should be placed on enlisting Sanitarians to exchange ideas and to offer specific recommendations for the design and manufacture of equipment used in the production of bakery products and suggest changes that would be beneficial in making a standard (s) more practical and all inclusive.

In addition, request Bakery Sanitarians to prepare a list of pieces of bakery equipment in use, displaying the BISSC Seal of Acceptance, but which do not comply with specific BISSC Standards, including Basic Criteria, and if possible, itemize the areas that are difficult to clean because of improper design, and forward them to me at the address listed below.

I would like to take this opportunity to request that the Executive Board give very serious consideration to allotting time during the 1992 Annual Meeting for a symposium on Baking Sanitation and Baking Equipment Review and an in-depth discussion on BISSC and how Sanitarians can be of assistance to make the BISSC Program more viable.

Respectfully,
Martyn A. Ronge, Chairman
IAMFES BISSC Committee

Communicable Diseases Affecting Man

Date of Meeting: July 21 and other times during and after meeting (July 22-24)

Members present: 6
Presiding: Frank Bryan

Summary of Activities and Actions Taken: The manual "Procedures to Implement Hazard Analysis Critical Control Point System" has been completed and is being printed at this time.

Steps will be taken to determine the need to revise "Procedures to Investigate Waterborne Illness" and "Procedures to Investigate Arthropod- and Rodent-Borne Illnesses."

The Committee reviewed some computer programs on Investigation of Foodborne Disease Outbreaks and logging

imported illnesses and surveillance data. This matter is under consideration for future action.

Data will be collected on implementing foodborne disease surveillance and HACCP systems at health department levels to determine whether manuals, articles or something else would be applicable for development by the Committee.

Recommendations to the Executive Board: To develop a more efficient protocol to expedite publication of technical manuals.

To not overprice manuals for either members or nonmembers and to have fixed and reduced prices for purchase of quantities of manuals.

Submitted by: Frank Bryan



Dairy, Food and Environmental Sanitation Management Committee Meeting

Dairy, Food and Environmental Sanitation Management Committee Report

Meeting date: July 21, 1991

Members present:

Henry Atherton	Janet Munson
Sidney Barnard	Dan Hearn
Dick Jolley	Damien Gabis
Darwin Kurtenbach	Bob Sanders
Gary Hoffman	Margie Marble
Nelson Cox	

Presiding: Ruth Fuqua

Activities and Actions: The committee selected the winners of the DFES article award presented by the IAMFES Foundation. Three winners were selected from the submitted DFES articles in the calendar year 1990 from articles in the categories of Dairy, Food or Environmental topics. There were 17 dairy articles, 26 food articles and 6 environmental articles in 1990.

The committee plans to further develop criteria used for award selection, and the new criteria will be published in DFES.

The committee supported the Executive Board's plan to publish a special edition of DFES in 1992 which will contain new 3A Standards.

Submitted by: Ruth Fuqua



Dairy Quality and Safety Committee Meeting

Dairy Quality and Safety

The Dairy Quality and Safety Committee is divided into two groups: the Farm Section, chaired by Mr. John Scheffel, and the Plant section chaired by Mr. Gaylord Smith. Each section also has a leadership cadre.

The Farm section leadership cadre includes Mr. Ted Hickerson, Ms. Brenda Holman, Mr. Terry Mitchell, Mr. Charles Price, Mr. Joseph Scolaro and Mr. Gary Trimmer.

The Plant section leadership cadre includes Dr. Sid Barnard, Mr. Robert Darrah, Mr. J.J. Jezeski, Ms. Diane Lewis, Mr. Darwin Kurtenbach, Ms. Genny McArthur, Mr. William McCarty, Mr. Vince Mills and Mr. Bruce Meyers.

Both sections share a common mission statement:

"This IAMFES committee works to improve quality and safety in production, processing and distribution of dairy product; from farm to consumer."

Each section works toward this goal using the same key activities: - Identify the needs of the dairy industry. - Develop procedures and recommendations which address these needs. - Disseminate information to appropriate dairy industry groups.

The Farm section has recently completed three projects. These include:

1. Developing materials that States and IAMFES affiliates can use to prepare and present a "Dairy Farm Inspection" course which can be varied in length and content to meet the needs of the audience and the time available. This course will be similar to the FDA 306 "Farm Inspection Course."
2. A "long form" of the milk pipeline installation application. This form expands the one page 3-A milk pipeline application form for these states who wish to verify 3-A compliance in more detail.
3. The final version of the IAMFES Dairy Quality and Safety Committee recommended pictograms for farm chemicals.

The Plant section has also been active. They have prepared and printed, through IAMFES, the "IAMFES Pocket Guide to Dairy Sanitation." They have also procured and conveyed three videotapes to the IAMFES Library. Two of these tapes, "Pasteurizer: Design and Regulation" and "Pasteurizer Operation," were donated by Kraft General Foods. The third, "Purely Coincidental," was donated by the Quaker Oats Company.

Both sections met in conjunction with the 1991 IAMFES Summer Meeting in Louisville, Kentucky.

Farm section Chairman John Scheffel conducted a meeting of the Farm section on Sunday, July 21, 1991 at 9:30 a.m.

Twenty-four members were present. The committee took several actions to implement previously developed materials. The recommended uniform farm chemical pictogram symbols will be sent to chemical manufacturers and distributors by both the Dairy Quality and Safety and the Farm section Chairmen. These will also appear in "Dairy, Food and Environmental Sanitation" either as part of the committee report or as a supplemental report.

The newly completed pipeline application will appear in this same publication. It will also be sent to IAMFES affiliates and be presented to 3-A for eventual inclusion in 3-A standards.

The Dairy Farm inspection training materials will be sent to affiliates for their use in planning local training and/or annual meetings.

Within the next 6 months the farm section will send a mailing to update the membership list and solicit ideas for future projects.

The next full meeting of the Farm Methods Committee will be held in conjunction with the NMC meetings in February 1992.

Plant section Chairman Gaylord Smith conducted a meeting of the Plant section on Sunday, July 21, 1991 at 10:30 a.m.

There were 22 members and seven guests present.

The accomplishments of the committee in the past year were reviewed. Order forms for "IAMFES Pocket Guide to Dairy Sanitation" were distributed.

Chairman Smith then opened up the floor for discussion of what the committee should do in the future.

The idea of cross referencing the training aids available from the FDA Training Branch with the Audio Visual Aids section in the Journals was discussed. Robert Darrah, who is on that committee, will convey this suggestion at their next meeting.

It was suggested that many new construction materials, processing machines, concepts, etc. are available for use but sometimes are not widely known due to lack of advertisement or advertisements not properly placed. It was decided that when a committee member finds such material that the information will be sent to Chairman Smith who will contact IAMFES for follow up for either advertising and possibly an article of some type.

All committee members should continue to look for good training videos, slides etc. so that these can be channeled to the Audio Visual Aids Committee.

Chairman Smith will distribute copies of a dairy plant supervisors manual to members for their review.

Steve Sims then distributed copies of FDA memorandum M-1-19-3 dated 7/15/91. This document deals with vitamin addition to milk and milk products.

Respectfully submitted,

Steven T. Sims

IAMFES Dairy Quality and Safety Committee Chairman

Environmental Issues in Food Safety

Date of Meeting: July 21, 1991

Members Present: Roy Carawan (Chair), Mike Doyle (IAMFES Vice President), Ron Case (IAMFES Past President), Allen Saylor, John Rushing, Charlie Felix, Gerald Shick, Don Briner, Jim Peterson, Pat Jensen, Cathy Minarik, Perry Fisher, Dora May Coleman, and Gene Wolff.

Presiding: Roy Carawan

Summary:

1. Introductions and Review of the Year's Activities
a. Represented at TAMFES Annual Meeting with presentation.

b. Committee membership expanded to 25 members.

c. Symposium on "Water in Food Processing" planned for Wednesday, July 24th at IAMFES Annual Meeting.

2. Draft Mission Statement prepared:

To address environmental issues which affect the safety, economy, and quality of the food supply throughout the cycle of food production and consumption.

3. Name change for Committee to be recommended for Board action. Suggested name to become: Environmental Issues in Food Safety Committee.

4. Recommendation that a one to two day workshop precede the next annual meeting. Topic being considered would be: Food Packaging and Recycling

5. Recommendation that IAMFES endorse the Executive Summary and Recommendations of the "Food Packaging, Food Protection, and the Environment" workshop report organized and chaired by the Institute of Food Technologists' Office of Scientific Public Affairs for the U.S. Congress and the legislators of the 50 states.

6. Concluded that sub-committee chairmen should be appointed for a focus on the environmental issues of:

Air Quality

Water Quality

Solid Waste Management

as they do/might impact food safety.

Respectfully submitted,
Roy Carawan, Chair

Foodservice Sanitation Committee

Date of Meeting: July 21, 1991

Members Present: Twelve

Presiding: Bennett H. Armstrong, RS
Quality Assurance Manager
General Mills Rest., Inc.

Summary of Activities and Actions Taken:

1. Duain Shaw discussed the scope of NSF Standards #2, #3, #5, and #12, that are being reviewed this time period. A decision was reached to ask the Executive Board for assistance with two areas; additional members to assist with the review process and a change in thinking about "our" NSF standards.

2. Charles Otto discussed the completion date within three months of the pamphlet for IAMFES distribution for "Temporary Foodservice" events. The pamphlet would highlight a "HACCP" flow of events for both a foodservice operator and a regulatory official to take to assure the public a safe meal at a temporary event.

3. Bennett Armstrong discussed a need for our association to compile information of local regulatory agencies, that have developed computer systems to solve their training and education needs, personnel scheduling, enforcement strategies, and reporting. A decision was reached to develop within three months a questionnaire for each attendee to survey respondents in their geographical area of responsibility. A second focus is to survey what grants, or other sources of financial aid is available for the regulatory or members of higher education to permit the purchase of computer equipment or software.

Recommendations to the Executive Board:

1. To publish in the journal a request for additional members to assist with the review process of the NSF standards that are due this year for their five year review process.

2. To ask the Executive Board to revise IAMFES position with NSF so that a "Global View" of standards is taken. This Global View in evaluating equipment that is in use or being imported into the United States, its trading partners of Canada and Mexico and the changing nature of the European market all require a broader, global view of equipment standards for food safety.

3. Advise the other committees of this committee's direction on surveying for computer programs, computer equipment in use that is satisfying local needs that we can promote for broader use in our associations' mission.

Submitted by: Bennett H. Armstrong

Foundation Fund

Chairman: Harry Haverland
Date of Meeting: July 21, 1991
Committee Members: (* those attending meeting)

Michael Doyle, Exec. Board	Executive Board Members
Robert Marshall	Damien Gabis
James Reeder	Robert Sanders
Leon Townsend*	Steven Halstead,
Earl Wright*	Exec. Mgr.

Report of the Committee: The Committee reviewed the programs being funded by the Foundation, which are:

Ivan Parkin Lectureship

Developing Scientist Awards

Loaning Library

Journal Awards (Dairy, Food and Environmental Sanitation)

The Committee felt that the programs were being carried out in a very responsible manner.

Action was taken in a positive way regarding a request to provide a one year student membership to all participants in the Developing Scientist Program. It was agreed that a proposed donation of \$1,000.00 be used to underwrite this activity for the next two (2) years. We were pleased to learn that the Journal Awards Program would be instituted this year.

The next item of business involved the budget for 1992. After hearing the Library Committee's discussion regarding training materials, and the continued popularity of the library, it was agreed to increase funding for the purchase of additional copies of existing materials to reduce the waiting period and to purchase new materials.**

Budget

Ivan Parkin Lectureship	\$1,600.00
Developing Scientists Awards	1,700.00
Loaning Library	9,000.00
Journal Awards	750.00
Incorporation Fees	800.00

Total \$13,850.00

**\$6,000.00 for this activity

A portion of the income from Sustaining Members is allocated to the Foundation for support of activities beneficial to the over-all membership and objectives of IAMFES.

Considerable time was spent in reviewing a draft of the By-Laws for the proposed establishment of the Foundation as an independent entity within IAMFES. During the year the Committee reviewed two (2) drafts of the subject By-Laws.

Recommendations:

Request that the Executive Board approve the use of the proposed \$1,000.00 (when received) to underwrite student membership to all participants in the Developing Scientists Awards Program. Two (2) year activity The activity will be reviewed after the designated period of time. The Committee would appreciate receiving data on how many of the students that received a year's membership in the past, retained membership in IAMFES.

Recommend that the Memorial Fund become a part of the Foundation.

Recommend that the Foundation become a separate legal incorporated entity.

Recommend that the Executive Board direct the Executive Manager to work with the IAMFES attorney to seek and finalize incorporation of the Foundation.

Recommend that the Executive Manager seek a letter of determination from IRS on a tax exempt status for the Foundation upon finalization of incorporation.

Submitted by: Harry Haverland

Journal of Food Protection Management

Chairman: R.T. Marshall

Date of Meeting: July 21, 1991

Committee Members:

Stan Bailey	Lloyd Bullerman*, Editor
Michael Davidson*	Steve Halstead*, Man. Editor
Joseph Frank*	Lloyd Luedecke
Damien Gabis*,	Ewen Todd*
Liaison of Exec.	Bill Sperber
Committee	

Report of the Committee: Approved 1990 minutes.

Heard report of JFP operations by Editor Lloyd Bullerman and by Executive Manager, Steve Halstead. Considered income and expenses related to the Journal, finding them practically in balance. Considered flow of manuscripts concluding that members who hear excellent review or overview type papers should encourage authors to submit them to JFP for consideration for publication.

Reviewed the status of acceptance of the journal, especially in international circles, finding that we should encourage Latin American professionals to publish in JFP. Revised questions as to the potential for organization of IAMFES Affiliate(s) in Mexico.

Found JFP to have been published and mailed on time in 1991.

Suggestions to the Executive Board: Suggestion that the Executive Board consider how one or more affiliates might be started in Mexico. For example, could affiliates in border states work toward that end?

*Members who attended. Others who attended were Bob Sanders, President; Harold Bengsch, Secretary; Margie Marble, Asst. Executive Manager; Nelson Cox (for Stan Bailey).

Name Change

Date of Meeting: July 21, 1991

Members present: Michael Doyle (chair), Bill Coleman, Lawrence Roth, Ruth Fuqua, Harold Bengsch

Summary of Activities and Actions Taken: The Name Change Committee was organized in 1990 to evaluate IAMFES members' interest in changing the name of the Association. Results of the ballot of the Name Change Survey which was sent to all voting members of IAMFES were discussed. The final tally was 305 (39%) votes (yes) for a name change and 474 (61) votes (no) not to change the name. Specific comments provided by respondents were reviewed.

Recommendations to the Executive Board: The membership has voted not to change the organization's name at this point in time, hence the Committee will take no further action and recommends that the Committee be disbanded.

Submitted by: Michael Doyle

Summary of Program Advisory Committee Meeting

As is customary, the Program Advisory Committee (PAC) of IAMFES met during the Annual Meeting. Mark Banner, Chairman of the committee, opened the meeting by reviewing the responsibilities of the PAC which are:

1. To recommend topics for symposia for the annual meeting.
2. To help organize the symposia including:
 - a. selecting symposium chairpersons/conveners
 - b. finding/recommending speakers
3. Review and screen abstracts of submitted papers
4. Schedule symposia/technical sessions
5. Review overall annual meeting program structure and components and make recommendations on improvements

A few general comments on the 1991 Annual Meeting were offered by participants at the PAC meeting including:

1. The overall technical program was well done.
2. The Ivan Parkin Lecture by Gary Hanman was excellent and set the theme for the rest of the meeting.
3. Common problems identified with regard to symposia include: not being on schedule, "no shows," and conflicts with other symposia.
4. The poster session received positive comments, but it is still too early to determine the feelings of the general membership and what it costs to have poster sessions.
5. Conflicts with other symposia posed problems for people waiting to attend the video theatre. Multiple showings on different days may solve this problem.
6. There was a strong consensus that the Ivan Parkin lecture should set a theme to be carried throughout the course of the meeting, much like Gary Hanman's talk did so effectively this past meeting.

The Committee spent most of the meeting generating ideas for next year's symposia and workshops. Below is the list of those topics:

Workshops

1. HACCP for health department personnel training
2. Education/training
3. Environmental sanitation, techniques, approaches to monitoring sanitation in food/dairy plants

Symposia

1. The media is the message: consumer advocates discussing issues and concepts pertaining to food, water, and environmental safety, packaging, recycling
2. International food standards/free trade issues, could be subject for general session. Should include a worldwide perspective, e.g. Canada, U.S., Asia, Europe. Discuss quota systems
3. Seafood safety: new FDA regulations, HACCP programs, safety issues, programs, and worldwide perspectives on seafood safety, parasites and residues relative to seafood
4. Food irradiation: Current international status, regulations, economic impact
5. Update on foodborne pathogens: cholera status, *Salmonella enteritidis*, *Campylobacter jejuni*, etc. FDA, CDC and international perspectives
6. Automation in dairy process control, statistical process control
7. Computer modeling, predictive modeling, pathogen detection through computer modeling techniques
8. Sanitation and disaster control
9. Dairy Symposium I: Update on milkborne pathogens, novel biocides/sanitizers, methods of sanitation, production, consumer health, *Bifidobacterium*
10. Dairy Symposium II: Animal health, mastitis, mycotoxins, residues, new farm technologies

Respectfully submitted,

Mark J. Banner

Chairman, Program Advisory Committee

IAMFES Awards Presented . . .

SAMUEL J. CRUMBINE CONSUMER PROTECTION AWARD



Charles Felix (r) presenting the Samuel J. Crumbine Consumer Protection Award to Candace Ledford (l).

. . . is presented annually for excellence in a comprehensive program of food and beverage sanitation at the local level. The award was presented by Charles Felix to **Candace Ledford** of Tacoma-Pierce County Health Department of Tacoma, WA.

NORBERT F. SHERMAN AWARD



Paul Martin (r) presenting the Norbert F. Sherman Award to Dr. Frank Bryan.

. . . is sponsored by the Educational Foundation of the National Restaurant Association, Chicago, IL. This award was presented by Paul Martin to **Frank Bryan** for his article, published in *Journal of Food Protection*, November 1990, "Hazard Analysis Critical Control Point (HACCP) Systems for Retail Food and Restaurant Operations." Mr. Bryan received a plaque and \$500.00.

DAIRY, FOOD AND ENVIROMENTAL SANITATION ARTICLE AWARDS

This year, for the first time, the IAMFES Foundation awarded certificates and \$250 to authors with outstanding articles in *Dairy, Food and Environmental Sanitation* during 1990. This year's winners were:

Food Article: -"Changing Poor Handwashing Habits: A Continuing Challenge for Sanitarians" by Homer C. Emery, R.S., PhD., US Army, San Antonio, TX.

Dairy Article: "Where are *Listeria* Likely to be Found" by John H. Nelson, University of Wisconsin, Madison, WI.

Environmental Article: "The Hazard Communication Standard Implications for the Food Industry" by Homer C. Emery, R.S., PhD and Florence P. Emery, San Antonio, TX.

CERTIFICATE OF MERIT AWARD

. . . is presented to those affiliate members who are active within their state/province affiliate group and IAMFES. This year the award was presented to **V. Bruce Parizo**, Delaware County Dairies, Inc., Roxbury, NY and **James L. Sevchik**, New York State Department of Ag and Markets, Buffalo, NY.

MEMBERSHIP ACHIEVEMENT AWARD

. . . is presented to the IAMFES Affiliate who has had the most new members in the past year. This year's winner is the Associated Illinois Milk, Food and Environmental Sanitarians.

SHOGREN AWARD

. . . is presented to an Affiliate of IAMFES for service to their members in the past year. This year the Georgia Association of Food & Environmental Sanitarians received a certificate and \$100 check for their services and contributions.

DEVELOPING SCIENTIST AWARDS

. . . were presented to five students, judged on their paper and presentation at the IAMFES Annual Meeting. These awards are sponsored by the IAMFES Foundation Fund. First place went to **Andrea O. Baloga** of University of Minnesota, St. Paul, MN. Andrea received \$500.00 and a plaque for "Comparison of Methods for Molecular Epide-



The Developing Scientist Award Winners are (l to r): Andrea Baloga, First Place, Eric Line, Third Place, Elaine Berry, Second Place and Donna Williamson, Fourth Place. Not pictured is Keith Schneider, Fifth Place.

miology of *Listeria monocytogenes*." Elaine D. Berry of North Carolina State University, Raleigh, NC won second place with \$250.00 and a certificate for her presentation "The Use of Bacteriocin-producing *Pediococcus* to control Post-processing *Listeria monocytogenes* Contamination of Frankfurters." Third place received \$100.00 and a certificate for "Optimized Enrichment Methods and Selective Media for Recovery of *Campylobacter jejuni* from Broiler Chicken Carcasses" and went to Eric Line of the University of Georgia, Griffin, GA. The winner of fourth place was Donna Williamson of Cornell University in Ithaca, NY. She won \$50.00 and a certificate for "A National Survey of Consumer Home Food Preparation Practices." Fifth place went to Keith R. Schneider of the University of Florida, Gainesville, FL. He received \$50.00 and a certificate also. His presentation was titled "Determination of Ozone Produced Oxidants and By-products in Artificial Seawater."

CITATION AWARD



Ron Case (l) presenting the Citation Award to Dr. Frank Bryan.

... for many years of devotion to the ideals and objectives of the Association. A plaque was presented this year to Dr. Frank L. Bryan of Lithonia, GA. Bryan is a food safety and training consultant. Dr. Bryan has worked extensively in the development of training programs in foodborne illness investigation and the Hazard Analysis Critical Control Point (HACCP) system.

HAROLD BARNUM INDUSTRY AWARD



Damien Gabis (r) presenting the Harold Barnum Industry Award to Thomas C. Everson

... given in recognition of outstanding service to the public, IAMFES, and the profession of the Sanitarian. This award is sponsored by NASCO International, Fort Atkinson, WI. A \$500 check along with a plaque was presented to Thomas C. Everson of Grande Cheese in Brownsville, WI.

Currently the Vice-President of Technology at Grande Cheese Company, Dr. Everson has made considerable contributions to improve the quality and safety of dairy products, including research on somatic cell counts.

EDUCATOR AWARD



Henry Atherton (r) presenting the Educator Award to Dr. William E. Sandine.

... presented by Henry Atherton to an educator in recognition of outstanding service in academic contributions to

the profession of the Sanitarian went to **Dr. William E. Sandine**. The award is sponsored by IBA Incorporated, Milbury, MA. Sandine is with Oregon State University, Corvallis, OR. He received a \$1,000 check and a plaque.

SANITARIAN AWARD



Mr. James I. Kennedy the Sanitarian Award recipient.

... in recognition of outstanding service to the profession of the Sanitarian, was presented this year to **Mr. James I. Kennedy** of Jefferson City, Missouri. Kennedy is the Executive Secretary of the Missouri Milk Board.

Kennedy received a plaque and \$1,000. The Sanitarian Award is sponsored and presented annually by the Klenzade Division of Economics Laboratory, St. Paul, MN, Diversey Corporation, Wyandotte, MI, and the Monarch Division of H.B. Fuller Co., Minneapolis, MN.

PAST PRESIDENT'S AWARD



President-Elect (r) Damien Gabis presenting the Past President's Award to Robert L. Sanders.

HONORARY LIFE MEMBERSHIP



President Robert L. Sanders presenting the Honorary Life Membership to Leon Townsend.



Dick B. Whitehead upon receiving the Honorary Life Membership and a plaque for his contributions to IAMFES and the Committee on Sanitary Procedures.

... for devotion to the high ideals and principles of IAMFES. This award, sponsored by IAMFES, entitles the winner to life membership with IAMFES including the *Journal of Food Protection and Dairy, Food and Environmental Sanitation* and a plaque. This year's winners were **Leon Townsend**, Executive Secretary of the National Conference of Interstate Milk Shippers, Frankfort, KY and **Dick B. Whitehead**, Consumer Safety and Health Consultant, Brandon, MS.

1991 Annual Meeting Exhibitor Review

Acculab, Inc., Newark, DE—302-292-8888

Acculab specializes in microbe identification. We can identify a wide range of aerobic and anaerobic bacteria and yeasts (including 8 species of *Listeria* and 9 of *Salmonella*). Reports on pure cultures that include identification to species or below are returned in 72 hours or less for an average cost of \$45.00 per culture.

Advanced Instruments, Inc., Needham Heights, MA—617-449-3000

Advanced Instruments displayed the Fluorophos^R line of rapid chemistry products for the dairy and food laboratory. The AOAC approved 3 minute Alkaline Phosphatase Test for finished dairy products; EIA procedures for Beta Lactams and Sulfamethazine, and a three minute quantitative acid phosphatase test for determining the temperature at which meats have been cooked. A new microprocessor controlled milk cryoscope was also demonstrated, providing rapid analysis with automatic calibration and % added water display.

Ampco Metal, Incorporated, Milwaukee, WI—414-645-3750

Ampco Pumps, part of Ampco Metal, Incorporated, manufactures centrifugal pumps in 316 stainless steel and nickel-aluminum-bronze construction. Displayed at the Annual Meeting was a "D" series cutaway in 316 stainless steel used for CIP/COP solutions. The "D" series of rugged construction is specially designed for hot solution service, low NPSH and conforms to the revised 3A practices for solution pipelines - Number 605-03.

Anderson Instrument Co., Inc., Fultonville, NY—518-922-5315

The Anderson Instrument Company, Inc., is a manufacturer of indicating, recording and process-control instrumentation for the food and dairy industries. Displayed at the IAMFES Annual Meeting was: a Safety Thermal Limit Recorder for HTST pasteurization control and featuring a dual RTD input and self-diagnostic circuitry which continuously monitor the integrity of its operation; a JD Differential Pressure Switch which controls critical HTST process pressures to prevent recontamination of pasteurized milk in the regenerator section of an HTST; the Differential Reference Thermometer which outperforms existing mercury-in-glass thermometers in all respects.

Aquionics, Inc., Erlanger, KY—606-341-0710

Advanced ultraviolet disinfection equipment for use in food and dairy industries. Applications include water, air, and surface disinfection. Dairy applications include disinfection of cottage cheese curd wash, sweet water, incoming plant water, make-up water for juice and beverages and captive cooling loops. Latest advances in equipment design include use of high intensity lamps, an automatic cleaning device, total monitorability and fail safe ground-fault detection interlinks which provide the keys to successful new applications.

Atkins Technical Inc., Gainesville, FL—800-284-2842

Atkins Technical manufactures digital thermometers, solid state recording thermometers, digital panel/wall/stem thermometers, and thermocouple thermistor and RTD temperature probes for food service, food processing, dairy and environmental health. New High Temperature Handle, Indicating Solid State Recorder with Probe. See ad p. 639

Biolog, Inc., Hayward, CA—415-785-2585

Biolog, Inc. exhibited, for the first time at the IAMFES Annual Meeting, its test panels and instrumentation for identification of an extremely broad range of bacteria. The Biolog System can identify over 700 species including both pathogenic and environmental species. The Gram-negative panel (GN MicroPlate) can identify Gram-negatives important to the food industry: *Salmonella*, *Shigella*, *Escherichia*, *Yersinia*, *Vibrio*, and more. The Gram-positive panel (GP MicroPlate) can identify Gram-positives important to the food industry: *Listeria*, *Lactococcus*, *Streptococcus*, *Staphylococcus*, *Bacillus*, and more. Biolog also markets companion software and instrumentation to go with the test panels. The system can be used in either a manual mode or an automated mode of operation.

BS & B Safety Systems, Inc., Tulsa, OK—918-622-5950

BS & B Safety Systems, proudly announced the revolutionary type FRB-S rupture disk. It is a reverse buckling rupture disk device designed for pharmaceutical, biotech and other sanitary applications. The FRB-S is designed for use with standard 1 1/2" Tri-

CloverTM clamped ferrels. The ultimate in explosion venting...VENT-SAF PLUS. Vent-Saf Plus providing explosion venting with a one piece construction. The faster response time of a one piece construction lessens the effect of an explosion. For all your safety needs, turn to the experts in rupture disks....BS&B Safety Systems.... over 60 years of experience.

Becton Dickinson Microbiology Systems, Cockeysville, MD—301-584-8977

Becton Dickinson Microbiology Systems displayed products utilized for the cultivation and identification of foodborne pathogens, including *Salmonella* and *Listeria*. In addition the company exhibited autoclave controls and a complete line of bottled media utilized in sterility testing and environmental monitoring.

Capitol Vial, Inc., Fultonville, NY—518-853-3377

Capitol Vial displayed its All New Tamper Evident and Tamper Proof Vials, produced in a class 10,000 FDA certified clean room. Capitol Vial manufactures one piece, hinged top cap, leak proof, airtight (over 30 psi internal pressure) plastic sterile vials. In addition to various size vials, Capitol has a complete line of accessory items such as: automatic vial opener and closer, styrofoam vial shippers, poly cellrafts and wire racks to transport vials.

Carmel Chemical, Westfield, IN—800-544-8990

Carmel Chemical Corp. is a manufacturer of cleaning compounds, sanitizers and disinfectants. Carmel Chemical also manufactures a full line of fogging equipment and insecticides for pest control. For complete details, call toll free at 1-800-544-8990.

CEM Corporation, Matthews, NC—800-726-3331

Rapid Microwave Sterilization of Microbiological Media for Total Plate Counts. CEM Corporation introduced a new MicroClaveTM Sterilization System to prepare and sterilize microbiological media in less than 10 minutes. The instrument performs sterilization in a fraction of the time required by the autoclave. Sterilizing a wide variety of media in varying quantities on short notice provides media when it is most needed. Eliminates preparation of excess media and frees

valuable storage space. Utilizing microwave energy, the instrument quickly heats the media to elevated pressures for a very brief period which make flash sterilization possible. Programmable control automatically maintains agar media at pouring temperature or remelts solidified agar. For more information, call (800) 726-3331.

Charm Sciences, Inc., Malden, MA—617-322-1523

Charm Sciences, formerly Penicillin Assays, presented the latest technology in Charm Testing for food and dairy products: Rapid Charm Tests for Antibiotics, Aflatoxins and Alkaline Phosphatase. Recent innovations such as the 3 Minute Charm Transit Test and the Total Bacterial Count on the Charm II System were introduced. The Auto-Timing Charm Farm Test, with built in programmable features, was also displayed.

See ad, Back Cover.

Columbus Instruments, Columbus, OH—614-488-6176

1) O_2/CO_2 Respirometer (MICRO OXYMAX) measures oxygen consumption and CO_2 production by bacteria and fungus. It can also be used to measure oxidation of fats and dairy products (e.g. powdered milk). Respirometer can simultaneously measure 20 samples under IBM-PC control. Resolution is 0.2 microliters O_2 /hour. Chambers can be user's own in size 50ml to 20 liters. 2) Computerized Thermometer - 256 channels thermocouple interface to IBM-PC computers. Accuracy 0.1°C. Resolution 0.017°C. Supplied with graphic software.

See ad, p. 653

Custom Control Products, Inc., Racine, WI—414-637-9225

Custom Control Products, Inc. is an electrical process engineering group that designs and builds electrical automation control systems for the dairy industry. Providing the highest quality control system for batching, tank gauging, HTST, CIP Process and report generation, together with our Field/Start-Up Service, we offer a complete engineering package. Custom Control Products, Inc. introduced the New Flow Diversion Valve Control, 100% solid state, conforms to 3A/PMO regulations and guidelines and is compatible with any 3A/PMO recognized flow diversion valve to be used in a Grade "A" milk plant.

Difco Laboratories, Detroit, MI—800-521-0851

Difco Laboratories, your partner in microbiology, featured Hycheck™, convenient hygiene contact slides used to assess the microbiological contamination of surfaces or fluids as well as a complete line of dehydrated culture media, ingredients and reagents. Also featured were new products for the detection of *Listeria* and *Salmonella*.

Diversey Corp., Wyandotte, MI—800-521-8140

Exhibition included the newest technology in cleaners and sanitizers. Included was new gel technology, non-foaming acid iodine sanitizers and monitoring equipment that constitute the verification of clean concept in a HACCP program.

DQCI Services, Inc., St. Paul, MN—612-785-0484

DQCI SERVICES, INC. is a wholly owned subsidiary of DAIRY QUALITY CONTROL INSTITUTE, INC. DQCI Services was formed to market component samples for infrared testers and somatic cell samples. We also do special testing for our customers—such as Mojonniers, solids, etc. All DQCI Services samples and tests performed are done according to AOAC, *Standard Methods for the Examination of Dairy Products*. Our component and somatic cell samples meet the requirements of Wisconsin AG 107.

See ad, p. 698

Educational Testing Service, Princeton, NJ—800-251-3663

Educational Testing Service provides the Food Protection Certification Program to certify food service personnel responsible for prevention, detection and correction of foodborne illness in food service establishments. For more information contact the Program Director, Betsy Willey, 1-800-251-3663.

Escort Instruments of America, San Francisco, CA—415-826-2282

Continuous time, temperature and humidity monitors are self-contained, computer programmed quality assurance devices. As pocket size, portable units, these monitors are highly accurate, flexible, durable, easy-to-use and price-competitive. They are currently used by both fortune 500 corporations, as well as, small companies during testing, manufacturing, storage, transport and

display. They are ideal for use in applications such as ice cream/dairy, fruit degreening rooms, potato storage, hen-houses, hatcher-ies, hi-tech clean rooms and various processed foods.

Charles Felix Associates, Leesburg, VA—703-777-7448

Charles Felix Associates is a consulting firm specializing in public health promotion, particularly in the area of food safety. The CFA exhibit offered samples of CFA publications: *Food Protection Report* and *Food Talk*; also materials from CFA clients relating to single service (the Foodservice & Packaging Institute) and ice sanitation (the Packaged Ice Association).

Foss Food Technology Corp., Eden Prairie, MN—612-941-8870

Foss Food Technology featured the Auto-Sampler and BactoFoss. The AutoSampler takes an aseptic, representative sample from bulk tanks or milk plant. Sampling is performed continuously during the entire flow period to give the desired volume. The instrument is simply adjusted to the flow rate/pump capacity in the estimated volume of the liquid to be sampled. Sampling starts automatically when liquid flow past, and is independent of the pumping system. When the liquid volume is transferred, sampling is completed. The BactoFoss provides a fully automatic bacteria count reading in raw milk in less than three minutes. The BactoFoss provides reliable and immediate microbiological quality test, enabling a cost effective administration of raw milk. The BactoFoss is based on bioluminescence, a technology giving it accurate and reliable bacterial count in a very few minutes.

See ad, p. 699

H.B. Fuller Company, Monarch Division, Minneapolis, MN—800-328-4594

Monarch Division of H.B. Fuller Company is a market-driven company that delivers quality sanitation chemicals and value added services to the food processing and dairy farm industries.

Funke Dairy Supplies, Inc., Newtown, OH—513-272-3100

FUNKE DAIRY SUPPLIES, INC. led by Wm. F. Funke, president/owner, has serviced the dairy and food industry for 25 years. FUNKE DAIRY SUPPLIES sells frozen concentrate "Handi-Set" cultures, vitamins, stabilizers, etc., along with filtration products to prevent contamination in air blow, water, ice cream over-run, blow mold systems, etc., plus providing sterile air filtration requirements to meet your needs.

General Polymers, Cincinnati, OH—513-761-0011

General Polymers, a leader in resinous flooring technology for over 25 years, introduced Macroscopic flooring systems. Macroscopic floor systems contain Intersept[®] which is an E.P.A. registered antimicrobial agent which inhibits the growth of a broad spectrum of Gram-positive and Gram-negative bacteria, a variety of fungi, yeasts and viruses. Offering the only seamless flooring system with a build-in biostat.

See ad, p. 643

GENE-TRAK Systems, Framingham, MA—508-872-3113

DNA probe tests for the detection of food-borne pathogens such as *Salmonella*, *Listeria*, *E. coli*, *Staph. aureus*, *Campylobacter*, and *Yersinia enterocolitica*. Also, Hygicult Agar Slides for monitoring microbiological hygiene, and Boehringer Mannheim food enzymatic test kits.

Gist-brocades Food Ingredients, Inc., King of Prussia, PA—215-272-4040

Gist-brocades Food Ingredients, Inc. featured DELVOTEST[®], a standard diffusion test for the determination of antibiotic residues in milk. Gist-brocades also manufactures DELVOCID[®] - mold and yeast inhibitor for cheese, KID and CALFLIPASE - animal lipases, PICCANTASE[®] - microbial lipase, MAXILACT[®] - yeast lactose, CHEESE COLOR and MAXIREN[®] - 100% pure chymosin.

GRiD Systems, Dallas, TX—214-761-1979

GRiD Systems Corporation manufactures and markets a comprehensive range of battery-powered laptop computers, industry standard desktop computers, operating systems, software development tools, portable peripherals and electronic mail/networking systems. GRiD, with installed systems in more than one third of Fortune 500 companies, has a worldwide direct sales and support organization. GRiD Systems Corporation displayed its breakthrough handheld computer, GRiDPAD. GRiDPAD is a fully PC and MS-DOS compatible keyboardless computer that accepts hand-printed characters. It weighs 4.5 pounds and is shaped like a clipboard.

IDETEK, Inc., San Bruno, CA—800-IDETEK1

IDETEK is the leader in bringing biotechnology, convenience and reliability to food and dairy quality control. The LacTek[™] family of milk antibiotic residue tests is the fastest growing product in the industry. All

LacTek kits use the exact same procedure and can be run simultaneously. The inexpensive LacStation II[™] allows a total test time of only 7 minutes, with actual hands-on test time of just under 2 minutes. The equipment takes the guess work out of reading the tests and provides a printed record of the test results.

IDEXX Corporation, Portland, ME—207-774-4334

IDEXX is a leading biodeflection company that markets over 40 diagnostic products. IDEXX displayed its line of quality assurance diagnostics for Beta-Lactams, Gentamicin, Tetracyclines, Sulfamethazine, Sulfa-dimethoxine, Sulfathiazole, Aflatoxin M₁, and Aflatoxin B₁. Also, displayed was the PROREADER, an optical reader designed specifically to read all CITE PROBE tests.

Integrated BioSolutions, Inc., Monmouth Junction, NJ—908-274-1778

Hazard Analysis Critical Control Point monitoring (HACCP) has been difficult to manage from a microbiological standpoint. The Lumac BioCounter provides a rapid indication (within two minutes) of line hygiene, raw material and finished product quality bringing the HACCP concept into reality. Also on display was the highly successful Q.A. MicroKit designed for differential contact surface testing and biocide efficacy, and a new line of products developed for rapid and accurate screening of *Salmonella*.

KLENZADE, A Service of Ecolab Inc., St. Paul, MN—612-293-2233

Klenzade, A Service of Ecolab Inc., is the market leader in sanitation products, programs and services for the dairy, beverage and food processing industries. The complete line of products include proprietary, innovative solid products, such as sanitizers, lubricants and cleaners, and Ononia Active, peroxyacetic acid sanitizer. Klenzade Engineering provides in-house expertise and single service solutions for CIP systems and controls and monitoring.

Lincoln Suppliers, Inc., Owatonna, MN—800-622-8425

Wholesale Distributor of processing equipment for the Dairy and Food Industry. Manufacturer of milk sample vials and vial accessories. Lincoln Suppliers displayed snap-cap and hinge cap vials, vinyl coated racks, conveyor trays and styro shippers.

Meritech, Inc., Tempe, AZ—800-932-7707

Introduced the SaniTech[™] 2000 Hand Sanitizing System. SaniTech provides state-of-the-art protection from the dangers of hand transmitted foodborne illnesses. It will help prevent the spreading of such diseases as hepatitis and *salmonella*. It is the best, low cost insurance you can not afford to be without. The 78th Annual Meeting of IAMFES experienced its "Invigorating" massage like wash.

Microbac Laboratories, Inc., Pittsburgh, PA—412-369-9900

Microbac Laboratories, Inc. is a full-service environmental testing company, providing quality analyses to schools, industries, commercial businesses and homeowners for the past 20 years. Our staff consists of over 150 highly-qualified chemists, microbiologists, sampling technicians, asbestos inspectors, food technologists, sanitation inspectors and other environmental specialists. Microbac's multiple locations (18 laboratories nationwide) allow us to effectively provide food-borne illness investigations, hazardous waste sampling and analyses, drinking water testing, and other services to address areas of concern to the IAMFES membership. Each laboratory adheres to strict quality control protocols to assure accurate testing results. We can also perform analyses to assist you in the quality control of your own laboratory.

Micro Diagnostics, Inc., Addison, IL—708-628-6055

Manufacturer of prepared culture media servicing the needs of microbiologists and laboratory technicians. Our reputation for producing superior quality products at competitive prices and being a dependable supplier are well established. We also provide dehydrated media, microbiological supplies and equipment. Custom services for your specific needs are available; specialty formulations, special packaging requirements and custom quality control procedures.

See ad, p. 663

Minnesota Valley Testing Laboratories, New Ulm, MN—507-354-8517

Established in 1951, MVTL is an independent laboratory which offers confidential microbiological and chemical analyses of food, water, agricultural and environmental samples. These include: *Listeria*, *Salmonella*, *E. coli*, proximates, dry milk grading, nutritional labeling, fatty acid profiles, cholesterol, minerals, metals, vitamins, sulfa drugs in poultry tissue, water and wastewater analyses, waste oil, fuel, and sludge analy-

ses; overburden and soil analyses. Our capabilities extend beyond this list. MVTL offers fast and reliable service at competitive prices.

See ad, p. 653

Nasco International, Fort Atkinson, WI—414-563-2446

Nasco is a manufacturer of the internationally known Whirl-Pak sampling bag, and related sampling products. Whirl-Pak bags have been on the market for over 30 years and are available in a wide range of sizes for a large variety of uses. Whirl-Pak features a new "Puncture Proof Tab" eliminating the possibility of the tab piercing another bag. Whirl-Pak bags are actually sterilized in a separate operation, with documentation on each batch. With its unique closing system, which prevents leakage, the Whirl-Pak bag is recognized as the standard in the industry.

Nelson-Jameson, Inc., Marshfield, WI—800-826-8302

A food and dairy laboratory specialist, Nelson-Jameson, Inc. distributes the RCS Centrifugal Air Sampler and other environmental sampling aids. Products selected by Nelson-Jameson provide users with accurate results using proven technology without the hassles of involved preparations. These and hundreds of other supplies are stocked for immediate shipment. For a free catalog, call (800) 826-8302 or (715) 387-1151.

See ad, p. 644

Organon Teknika Corporation, Durham, NC—919-620-2353

Organon Teknika Corporation featured its ELISA-based rapid testing system for *Listeria* and *Salmonella*. Rapid ELISA testing is one of the most reliable systems available, providing accuracy, objective results, and savings of time and money.

Plastic Packaging Concepts, Inc., Eaton, IN—800-333-3086

Plastic Packaging Concepts, Inc. manufactures Mojonnier Sample Bags and exhibited its complete line. Mojonnier sterilized bags are used world wide for all types of sample collection and transportation. Also featured were bags for use in the Stomacher™ Lab Blender. These top quality, heavy duty bags have been specially designed to eliminate lost samples and wasted time due to bag leakage during blending. Mojonnier bags are available in "Jumbo" sizes for your extra large sampling needs. We have a bag for your sampling requirements or we can probably make one for you. Call 800-333-3086.

See ad, p. 642

Polar Tech Industries, Inc., Elgin, IL—708-697-1400

ICE BRIX gel refrigerants - leakproof and reusable. RE-FREEZ-R-BRIX - Foam refrigerant - rigid shape and reusable. Both come in a variety of sizes and work to extend shipping times of products. THERMO CHILL Insulated shippers and mailers. Engineered to be lightweight, one piece, molded EPS foam for dependable insulation. Packaging you can trust for safe shipment of temperature sensitive products. Complete line of in-stock models and refrigerant packs.

Promega Corporation, Madison, WI—608-274-4330

A leading biotechnology company, Promega Corporation now offers two new tests for quick screening of milk. The new Enliten™ Milk Total Viable Organisms Assay detects all microbes, including bacteria, yeasts and molds. It is especially useful in detecting psychrophiles (cold growing bacteria). The Enliten™ Direct Microscopic Count Assay for Milk permits rapid screening of raw milk in 10 minutes or less and is both easier to perform and more accurate than standard DMC procedures.

Q Laboratories, Inc., Cincinnati, OH—513-662-1300

Q Laboratories, Inc. is an independent testing and consulting laboratory, providing microbiological and analytical chemistry support to the food, beverage, cosmetic, pharmaceutical, and medical device industries. Services include QC/release testing, antimicrobial efficacy testing, GMP testing, plant sanitation audits (HACCP approach), nutritional labeling, Barrier testing, preservative analysis, shelf-life studies, and complete pathogen testing. Q Laboratories' Research and Development division provides analyst training and education programs in compendial and rapid methodologies, provides product and method development services, and designs and implements check sample programs for corporate quality assurance. Q Laboratories' professional staff offers complete services in protocol design and implementation of collaborative studies.

R-TECH, Minneapolis, MN—612-481-2583

R-TECH is contract research fast and economical with over 150 scientists, technicians, and engineers supporting your needs. R-TECH offers contract research in the areas of: analytical services, sensory evaluation, test kitchen services (dairy, meats, bakery, aseptic), application, exploratory, engineering (packaging, process, industrial, energy

management, environmental, project management, design) quality control, regulatory affairs, specification services.

R & D Laboratory, Columbus, OH—800-228-4865

R & D Laboratory distributed free copies of their current catalog which lists their complete line of tests as well as current prices. R & D is a full-service laboratory which offers both microbiological and chemical testing to the food and dairy industries. Since 1949 it has assisted those companies who share a concern for quality with the testing of their products and raw ingredients. Its experienced personnel will also assist your firm in setting quality control standards or in the implementation of quality control procedures.

Radiometer America, Inc./Malthus Division, Westlake, OH—216-871-8900

Featuring the Malthus rapid microbiology product line:

- Malthus 2000 Systems - for routine quality assurance and/or research and development, capable of utilizing both reusable and disposable cells.

- Malthus 1000S Systems - for rapid *Salmonella* detection, utilizing disposable cells.

- Malthus Disposable Salmonella Cells - available in pre-filled with sterilized media.

- Malthus Disposable CO₂ Cells - for an alternative way to measure microbial growth, monitoring production of CO₂.

REMEL, Lenexa, KS—800-255-6730

REMEL is a leading manufacturer of microbiology products, including prepared culture media, stains, reagents, diagnostic tests, environmental testing products, and other related products. Custom formulations are invited.

SHAT-R-SHIELD, Salisbury, NC—704-633-2100

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Silliker Laboratories Group, Inc. Chicago Heights, IL—708-756-3210

The SILLIKER Advantage. SILLIKER LABORATORIES GROUP, INC., an internationally respected network of laboratories, offers a comprehensive spectrum of services designed to help ensure the safety and quality of your food product. Quality services include confidential microbiological, chemical, and nutritional analyses, water and hazard

analyses; Testing for extraneous matter, pesticide residues, and trace metals; Custom design, client-sponsored research programs; Shelf-life studies; Consultation and problem-solving; Sampling programs; Quality control programs; HACCP programs; Food plant sanitation audits; Food poisoning investigations; Food safety education and training programs; Microbiology short courses. Open 365 days a year, Silliker's network of laboratories include labs in Chicago Heights, IL; Hayward, CA, Carson, CA; Columbus, OH; Stone Mountain, GA; Garwood, NJ; Sinking Spring, PA; Dallas/Fort Worth, College Station and San Antonio, TX; and Mississauga, Ontario.

SmithKline Beecham Animal Health, Exton, PA—215-363-3757, Booth #14

SmithKline Beecham Animal Health offers technology to enable food and milk processors to test products for aflatoxin and antibiotic residues. The Signal AccuCup Aflatoxin Test screens to 20 ppb aflatoxin contamination in corn, feed, raw and roasted peanuts. The Penzyme III Antibiotic Residue Test detects beta-lactam antibiotics in milk. The Signal ForeSite Sulfamethazine or Gentamicin Tests can be run on milk, tissue, serum or feed to detect these residues in four minutes.

See ad, Inside Front Cover.

Tekmar Company, Cincinnati, OH—513-247-7000

Stomacher Lab Blender - Food Microbiology: The Stomacher may be used for bacterial counts in food samples including fruits, grains, meats, and dairy products. Damage to microbial cells and tissues is minimal. A temperature rise in the sampling is reduced during blending. Features: No sample cross contamination; no machine clean up; fast operation.

3-A Sanitary Standards Symbol Administrative Council, Cedar Rapids, IA—319-395-9151

The 3-A Sanitary Standards Symbol Administrative Council authorizes equipment manufacturers to display the 3-A Symbol on equipment which complies with existing 3-A Sanitary Standards. The 3-A Symbol is recognized world wide as a mark of excellence on Dairy and Food Processing equipment. Information on the function of the program, its administration and benefits were available at the 3-A Symbol Council booth.

3M Microbiology Products, St. Paul, MN—612-733-9164

3M Microbiology Products would like to show how you can increase your lab efficiency with Petrifilm™ plates. Also available is the Petrifilm test kit-L for liquid samples, Petrifilm test kit-HEC for hemorrhagic *E. coli* 0157:H7 for testing meat and poultry and the NEW Petrifilm test kit-C for coliform testing in food and dairy products. Each kit contains all elements needed for on-site sample testing. Report™ visual immunoassay kit is the easiest method available for *Salmonella*, *Listeria* and Staphylococcal Enterotoxin testing.

Trojan, Inc., Mt. Sterling, KY—606-498-0526

Trojan, Inc. manufactures a full line of coated and uncoated incandescent and fluorescent lamps. The incandescent lamps are coated with Teflon, which will withstand up to 500°F, and our frost silicone rubber which are ideal for cooler/freezer applications. Saf-T-Cote fluorescent lamps are coated with our special Polymer coating, offering protection against shattering glass contaminating gases. All of our lamps have USDA approval and comply with FDA and OSHA requirements.

Troy Biologicals, Troy, MI—313-585-9720

Microbiology Products for Industry and Research.

Unipath Co., Oxoid Division, Ogdensburg, NY—800-567-8378

Oxoid is a primary manufacturer of peptones, hydrolysates, dehydrated culture media and supplements for the identification of bacterial micro-organisms. Specifically for *Listeria* and *Salmonella*. Available are Oxford Medium and PALCAM Medium. A range of products for toxin detection by diagnostic kits for Staphylococcal, *E. coli*, *Bacillus cereus* and toxic shock. A complete Anaerobic System.

Vicam-Aflatest, Somerville, MA—617-623-0030

Vicam is an established Biotechnology company dedicated to ensuring food safety. Vicam exhibited a simple, rapid, sensitive, quantitative test for the detection of *Listeria* and Aflatoxin in foods.

Walker Stainless Equipment Co., Inc., New Lisbon, WI—608-562-3151

Since 1943, Walker Stainless Equipment Company has been a leading manufacturer of quality sanitary stainless steel equipment

for the process industries. We manufacture transportation tanks, storage silos, processing tanks, and custom equipment for dairy, food, pharmaceutical, beverage, chemical, biotechnical, nuclear and semiconductor applications.

Weber Scientific, East Windsor, NJ—609-452-0443

Weber Scientific distributed its brand new 72-page catalog dedicated to water, wastewater, dairy and food analysis. Also featured was a comprehensive selection of sampling supplies, thermometers, pH meters and products for the plant sanitarian.

Resolutions Adopted by IAMFES

RESOLUTION #1

WHEREAS: The Kentucky Association of Milk, Food and Environmental Sanitarians and the Local Arrangements Committee have labored long and hard to plan, coordinate and host the Seventy-eighth Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians in Louisville, Kentucky, and

WHEREAS: The entire Annual Meeting was conducted and planned with style and grace by the affiliate and the Local Arrangements Committee, and

WHEREAS: The hosts coordinate the efforts of industry, educational and governmental members towards the success of this Annual Meeting, and

WHEREAS: The 1991 Meeting was truly outstanding and contributed to the goals of our Association.

THEREFORE, BE IT RESOLVED:

That the International Association of Milk, Food and Environmental Sanitarians, Inc. adopt this resolution of appreciation and gratitude to the Kentucky Association of Milk, Food and Environmental Sanitarians, and the Local Arrangements Committee and further that a copy of this resolution be sent to the Kentucky Affiliate and be published in the Journal of Dairy, Food and Environmental Sanitation.

RESOLUTION #2

WHEREAS: The personnel of the Galt House in Louisville, Kentucky were very accommodating to the needs of the members and guests of the International Association of Milk, Food and Environmental Sanitarians, Inc., and

WHEREAS: The facilities for the entire program including the technical sessions and social activities were outstanding,

THEREFORE, BE IT RESOLVED:

That an appropriate expression of our gratitude be sent to the management and staff of the Galt House.

RESOLUTION #3

WHEREAS: The International Association of Milk, Food and Environmental Sanitarians holds food safety as a primary objective, and

WHEREAS: The International Association of Milk, Food and Environmental Sanitarians has a long tradition of cooperation with governmental agencies and other associations, and participated in the "Food Packaging, Food Protection and the Environment" Workshop sponsored by the Institute of Food Technology, and

WHEREAS: The workshop brought together 32 scientists representing 19 scientific societies to study the problems of food packaging, food protection and the environment, and

WHEREAS: The Workshop Report contained eleven recommendations aimed at assuring food safety, which were discussed at length by the membership,

THEREFORE, BE IT RESOLVED:

That the International Association of Milk, Food and Environmental Sanitarians, Inc. at its Annual Meeting on July 23, 1991 in Louisville, Kentucky, does support and concur with the recommendations found in the Workshop Report.

Book Review

Packaging Foods with Plastics by Wilmer A. Jenkins and James P. Harrington is a text of twenty-two chapters (326 pages). Chapters one through five contain information about current plastics technology and packaging machinery currently utilized.

Chapters six to twenty-one are devoted to single food type categories. These chapters cover origins of packaging for each particular category, some financial data, and a general description of the food product pertinent to the package. These chapters finish with a discussion of product packaging requirements and future trends.

The text ends with a chapter relating to environmental concerns about plastic packaging and a glossary of technical terms.

Throughout the book all types of food packaging practices are mentioned, but the main emphasis is on food products packaged in plastic. *Packaging Foods with Plastics* was designed at being selective, never intending to be a comprehensive all encompassing text. Three criteria were used to achieve this: 1. the packaging techniques discussed feature work done in the United States and Canada, 2. the authors concentrated on plastic package types that are durable and here to stay, shying away from transitory type products, and 3. cost, which is used only in a qualitative way, not quantitative discussions.

The authors have drawn on *many* sources for this text: consultants, food company experts, packaging converter engineers and scientists, materials supplier personnel, trade literature, and standard reference works. All are appropriately acknowledged in the preface or at the end of each chapter.

Packaging Food with Plastics has been aimed at a diverse audience, but the authors specifically mention:

- food company employees involved in product packaging,
- specialists who supply plastic resins and films to packaging converters and end users,
- students planning a career in packaging,
- professionals working for packaging converters.

Although not designated for my profession as a regulator in food protection, I found this text most interesting and very informative!

Packaging Foods with Plastics is available through Technomic Publishing Company in Lancaster, Pennsylvania.

Letter to the Editor

Dear Editor:

This past meeting of IAMFES was my first. I attended the pre-meeting workshop and gave a poster presentation. You, as a group, are to be congratulated on your efforts for the meeting. It was by far the best meeting I have attended and now look forward to next year. The willingness of people to meet new people, the opportunities for interaction and the overall collegiality were tremendous.

As a faculty member here at Mankato State I was particularly impressed with the workshop. Frank Bryan's interest in the subject and his presentation of material were good and thought-producing, in short - good education. I hope to be able to convey some of what I learned to my students this next year and to encourage them in their consideration of food microbiology/public health as potential, satisfying careers.

Sincerely,
Dorothy M. Wrigley
Department of Biological Sciences
Mankato State University
Mankato, MN 56002-8400

New IAMFES Members

California

Theodoros G. Kallitsis
University of California - Davis
Davis

George Weinberger
A-1 Sandwich Co.
San Francisco

Colorado

Steven DeFeyer
Mesa County Health Department
Grand Junction

Florida

Mark L. Tamplin
University of Florida
Gainesville

Sally K. Williams
University of Florida
Gainesville

Georgia

Harry Soderstrom
Flowtech, Inc.
Smyrna

Tong Zhao
University of Georgia
Griffin

Illinois

David Hedlund
Orval Kent Food Co.
Wheeling

Kansas

Karen P. Penner
Kansas State University
Manhattan

Minnesota

Russ Gaylord
Associated Milk Producers, Inc.
New Ulm

David C. Joachim
Tetra Pak
St. Paul

David R. Senogles
New Brighton

Nebraska

Marvin Schuman
Hydrite Chemical Co.
Overton

New Jersey

Jack Bozzuffi
M&M/Mars
Hackettstown

New York

Kimberly A. Orr
U.S. Army/Veterinary Corps
APO

Pennsylvania

Michael L. May
Kunzler and Company, Inc.
Lancaster

James Wempe
Lancaster Laboratories, Inc.
Lancaster

MaryBeth Zapotosky
Nabisco Brands
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South Carolina

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Columbia

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Shirley Etzell
Wyoming Dept. of Agriculture
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Winnipeg, Manitoba

Great Britain

Brian Levett
Biotrace Ltd
Bridgend, Mid Glamorgan

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 - 1 - 8,000 Gal. Cold Wall Tank w/ S.S. Front Head Frt. Agit.
 - 1 - 7,500 Gal. Cold Wall Storage w/ S.S. Front Head
 - 4 - 6,000 Gal. Insul. Horiz. Storage Tanks w/ Agits.
 - 1 - 1,500 Gal. Pressure Wall Processor Dome Top
 - 1 - 1,000 Gal. Vert. Pressure Wall Processor w/ Bridge Covers
 - 1 - 600 Gal. Pressure Wall Processor Dome Top
 - 1 - 500 Gal. Pressure Wall Processor Dome Top
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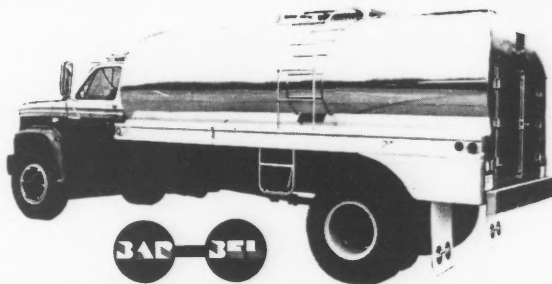
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Our College Park, Maryland Laboratory has an opening for a Laboratory Manager.

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Interested candidates can call Mr. Jeffrey Bloom, Vice President, Food and Dairy Division, at 1-800-541-2116 or write to him at the address below.

Environmental Systems Service,
218 N. Main St., P.O. Box 520,
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Wanted: Independent and mature professionals with experience in QC/QA, production, and/or sanitation disciplines to work full time or part time consulting our clients in food processing sanitation programs (chemicals and procedures). Send resumes to: **Eric Bonewitz, West Agro, Inc., 11100 N. Congress Avenue, Kansas City, MO 64153**

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Coming Events

1991

December

- 2-4, Freezing Baked and Unbaked Products**, sponsored by the American Institute of Baking, will be held at AIB in Manhattan, KS. For more information call (913)537-4750, (800)633-5137 or FAX (913)537-1493.
- 3-5, Microbiology and Engineering of Sterilization Processes** to be held at the St. Paul Campus of the University of Minnesota. For further information contact Dr. William Schafer, course coordinator, Department of Food Science and Nutrition, 1334 Eckles Avenue, St. Paul, MN 55108, (612)624-4793.
- 3-5, Good Manufacturing Practices (GMP) for the Food Industry**, sponsored by The Center for Professional Development, will be held in East Brunswick, NJ. For more information call (908)613-4535; to register by phone call (908)613-4500.
- 4-6, Introduction to Food Processing Systems**, UC Davis, Davis, CA. Contact: Sharon Munowitch, University Extension, University of California, Davis, CA 95616-8727, (916)757-8899.
- 9-11, Food Microbiology**, sponsored by The Center for Professional Development, will be held in East Brunswick, NJ. For more information call (908)613-4535; to register by phone call (908)613-4500.
- 9-12, Better Process Control School**, UC Davis, Davis CA. Contact: Sharon Munowitch, University Extension, University of California, Davis, CA 95616-8727, (916)757-8899.
- 17-19, Pasteurizer Operator Workshop**, sponsored by Penn State's Food Science Department in cooperation with the Pennsylvania Department of Agriculture, will be held at Penn State's University Park Campus. For more information contact Sidney E. Barnard, program chairman, at (814)863-3915, or Gary R. Peterson, conference coordinator, at (814)865-8301, FAX (814)865-7050.

1992

January

- 6-17, Ice Cream Short Course, 100th Anniversary**, will be held at the J.O. Keller Conference Center, The Pennsylvania State University, 306 Ag. Administration Building, University Park, PA 16802. For further information call (814)865-8301 or FAX (814)865-7050.

February

- 3-6, Freezing Technology Short Course**, sponsored by the University of California-Davis, Davis, CA. Contact: Sharon Munowitch, University Extension, University of California, Davis, CA 95616-8727, (916)757-8896.

- 9-12, Pacific Fisheries Technologists 43rd Annual Meeting** to be held at the Sheraton Hotel, San Pedro, California. For further information, contact: Pamela Tom, Food Science & Technology Dept., University of California, Davis, CA 95616-8598. Telephone: (916)752-3837; FAX: (916)752-4759.

- 10-12, National Mastitis Council 31st Annual Meeting** to be held at the Crystal City Hyatt in Arlington, Virginia. For more information contact Anne Saeman, Director of Operations, National Mastitis Council, 1840 Wilson Blvd., Suite 400, Arlington, VA 22201, Phone: (703)243-8268, FAX (703)243-8268.

- 12-13, Dairy and Food Industry Conference** will be held at The Ohio State University, Department of Food Science and Technology, 2121 Fyffe Road, Columbus, Ohio 43210-1097. For more information contact John Lindamood at (614)292-7765.

- 28, Baking Industry Sanitation Standards Committee Annual Membership Meeting** to be held at the Chicago Marriott Hotel, Chicago, IL. For more information, contact the BISSC headquarters at 401 North Michigan Avenue, Chicago, IL 60611; (312)644-6610.

March

- 16-18, Food Product Development/Ingredient Technology**, sponsored by the University of California-Davis, Davis, CA. Contact: Sharon Munowitch, University Extension, University of California, Davis, CA 95616-8727, (916)757-8896.

- 16-19, Better Process Control School**, sponsored by the University of California-Davis, Davis, CA. Contact: Sharon Munowitch, University Extension, University of California, Davis, CA 95616-8727, (916)757-8896.

- 18, Indiana Dairy Industry Conference** to be held at Purdue University. For more information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, Phone: (317)494-8279.

- 23-27, Midwest Workshop in Milk, Food and Environmental Sanitation** will be held at The Ohio State University, Department of Food Science and Technology, 2121 Fyffe Road, Columbus, OH 43210-1097. For more information contact David Dzurec at (614)292-7723.

April

- 12-15, Application of Predictive Microbiology and Computer Modeling Techniques to the Food Industry (SIM International Workshop)**, will be held at the Hyatt Regency Hotel, Tampa, FL. For information, contact Dr. Robert L. Buchanan, Microbial Food Safety Research Unit, USDA-ARS-ERRC, 600 East Mermaid Lane, Philadelphia, PA 19118, call (215)233-6620, FAX (215)233-6581.

•25-29, **The Sixth Conference for Food Protection** will be held at the Tremont Plaza Hotel, Baltimore, MD. For further information contact Leon Townsend, Executive Secretary, Conference for Food Protection, 110 Tecumseh Trail, Frankfort, Kentucky 40601, (502)695-0253.

May

•3-6, **Centennial Conference of the Ice Cream Short Course** to be held at the J.O. Keller Conference, The Pennsylvania State University, 306 Ag. Administration Building, University Park, PA 16802. For further information call (814)865-8301, FAX (814)865-7050.

•4-6, **Food Processing Automation Conference**, sponsored by the Food & Process Engineering Institute, will be held at the Hyatt Regency, Lexington, KY. For more information, contact Jon Hiler, Conference Manager, FPEI, 2950 Niles Road, St. Joseph, MI 49085-9659; Phone (616)429-0300, FAX (616)429-3852.

•11-14, **Purdue Aseptic Processing and Packaging Workshop** to be held at Purdue University. For more information contact James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907, Phone: (317)494-8279.

July

•26-29, **79th International Association of Milk, Food and Environmental Sanitarians Annual Meeting** to be held at the Sheraton Centre, Toronto, Ontario. For more information, please contact Julie at IAMFES, (800)369-6337 (US), (800)284-6336 (Canada) or FAX (515)232-4736.

August

•10-14, **Biotechnology: Principles and Processes** to be held at the Massachusetts Institute of Technology. For more information contact the Director of Summer Session, MIT, Room E19-356, Cambridge, MA 02139, Phone: (617)253-6721.

To insure that your meeting time is published, send announcements at least 90 days in advance to: IAMFES, 502 E. Lincoln Way, Ames, IA 50010-6666.

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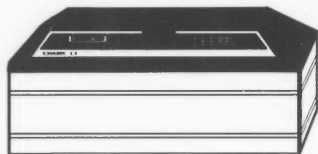
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